SW Engineering CSC648-848 Spring 2025

SwiftThrift

Team 09

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Milestone 1

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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.

Personae

Alex - Undergraduate Student and Part-Time Worker

- Alex is an undergraduate student who balances a busy schedule between school and part-time work. With basic web navigation skills, Alex prefers modern, user-friendly applications that are easy to navigate. When using a website, they are attentive to functionality and will report any bugs or issues they encounter, as long as the process is quick and straightforward. Alex enjoys purchasing used items and is currently looking for second-hand materials from graduating students to save money on class supplies. If they come across any technical issues while browsing, they are willing to report them, provided it doesn't take up too much of their time.

Elijah - Graduate Student and Tutor

- Elijah is a dedicated graduate student and tutor who is passionate about helping students succeed. With above-average web navigation skills, they are comfortable using online platforms but have limited free time due to a demanding research project. Having accumulated a large collection of class materials from their undergraduate years at SFSU, Elijah is looking to sell these resources, along with dorm items they no longer need. However, rather than selling to just anyone, they would prefer to pass these materials on to current SFSU undergraduates who could benefit from them. Given their busy schedule, they need a platform that makes managing sales quick and efficient.

Susan - Professor and Mother

- Susan is a dedicated physics professor and a busy mother, juggling the demands of both her career and family life. With limited patience for complex web applications, she values simplicity and efficiency when using online platforms. Understanding the financial burdens that come with education, Susan wants to make it easier for her students to access class materials. She has extra copies of textbooks and hopes to offer them at a discounted price specifically for SFSU students. As someone vocal about her online experiences, Susan is quick to share her opinions—if the website is intuitive and easy to use, she will recommend it to her colleagues. However, if she finds it frustrating or unintuitive, she won't hesitate to voice her concerns publicly on faculty forums and social media.

Trevor - Professor and Linux Enthusiast

- Trevor is a highly respected computer science professor and a devoted Linux enthusiast, known for his pioneering contributions to the CS community. He dedicates most of his time to lectures and teaching, firmly believing in his own methods and approaches. Stubborn by nature, he is confident that his way is the best and isn't easily swayed by alternative perspectives. When using a website, Trevor has no patience for inefficiencies—if he encounters bugs or issues, he will report them in a blunt, and often frustrated, manner. His primary focus is acquiring extra hardware for his research and hands-on classes, which emphasize practical learning over theory. While he is highly selective in what he buys, once something catches his interest, he won't hesitate to make a purchase, regardless of the website's design or usability.

High-Level Use Cases

1. Find/Purchase used Class Materials

Alex is a busy **undergraduate student** balancing coursework and a part-time job. He has basic WWW skills and prefers modern, easy-to-use platforms that don't waste his time. He enjoys buying second-hand items to save money and will **report bugs/issues** to ensure that the process is quick and convenient.

One day, Alex realizes he needs a textbook for an upcoming class but doesn't want to pay full price at the bookstore. He logs into **SwiftThrift** and navigates to the **Class Material** category. Using the built-in **filters**, he searches for books related to his class and finds a listing from a **graduating student** selling the book he needs at a discount. Since Alex has a busy schedule, he wants to make sure the book is still available before committing to the purchase. He messages the **provider** through the platform, asking about the book's condition and **location** for pickup.

The **provider** responds quickly, confirming the book is still available and suggesting a **meet-up on campus** between classes. Alex appreciates the convenience and finalizes the purchase.

2. Selling used Textbooks and Tutoring Services

Elijah is a **graduate student** and tutor who prioritizes helping undergraduates succeed. He has above-average WWW skills and is comfortable using online platforms, but due to his research workload, he values efficiency when selling items. As a former SFSU undergraduate, he has many old class materials, notes, and dorm essentials that he no longer needs and would prefer to sell or give away to current students rather than letting them go to waste.

At the start of the semester, Elijah decides to clear out space by listing his items on **SwiftThrift**. Since he has multiple things to sell, he uses the bulk listing feature, which allows him to upload all his items quickly and **categorize** them under Class Material, Appliances, and Technology. He also ensures that only SFSU **students** can view and buy his items, aligning with his goal of supporting the student community.

Within a day, he receives multiple messages from interested **consumers**. Because of his tight schedule, Elijah prefers to avoid negotiations, so he sets fixed prices for his listings, adhering to the **communication** policy of the platform. To further simplify the process, he designates a specific **location** on campus for pickup, allowing buyers to collect their purchases efficiently without arranging individual meetups.

3. Distributing Discounted Textbooks to Students

Susan is a busy physics **professor** balancing work and family. She understands the financial struggles of her **students**, especially when it comes to affording expensive class materials like textbooks. Wanting to provide an easy way for her students to access affordable materials, she decides to offer extra copies of textbooks at a discounted price through **SwiftThrift**.

One day, Susan logs into the platform and navigates to the **Class Material category**. She creates **product/service** listings for the textbooks her students need, ensuring each entry includes a clear **title**, a concise **description**, and at least one picture. To support her students, she applies a SFSU discount, making the books more affordable. She also designates a **location** on campus for easy pickup.

Susan ensures that the platform provides a clear and easy-to-follow checkout process, offering convenient payment methods. Once the listings are live, she shares the links with her students via email and the course platform. After a few days, she checks **SwiftThrift** to ensure the system is working as intended and that students are taking advantage of the discount.

Ultimately, Susan successfully helps her students access affordable textbooks while also providing constructive **reporting** feedback to enhance the platform.

4. Buying/Selling used Tech Equipment

Trevor is a prominent figure in the CS community, always looking for extra hardware to enhance his research and teaching methods. He values practicality over theory and often needs additional equipment to complement his lectures and hands-on learning sessions.

One day, Trevor **registers** and logs into the SwiftThrift website, typically through a university or research network, and navigates to the **Technology category**. He quickly identifies the **product/service** required for his current research and teaching needs, reviewing the **product specs** and user reviews. While he briefly checks the website for other details, his main focus is on whether the product will meet his practical needs, not on the website's user experience.

Eventually, Trevor successfully agrees to meet with the person at a **location** in order to purchase the hardware. Later, he continues his search for additional equipment elsewhere, still keeping an eye out for better deals or more suitable **products**.

Data Glossary / Description

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.

Products/Services - Items being sold on the platform should include:

- An appropriate name/title of 75 characters
- A description of the item with a limit to 800 characters
- At least one picture posted
- A category
- Price

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.

High Level Functional Requirements

Guests

1. Guests shall be able to browse the website but not view specific products
2. Guests shall register an account using their first name, last name, and sfsu.edu email

Registered users

3. Registered users shall have access to view specific products on the website by providers
4. Registered users shall log in using their email and password

Providers

5. Providers shall 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).
6. Providers shall be able to make multiple listing
7. Providers shall mark a product as sold after completion of transaction
8. Providers shall be able to edit or delete their listings

Consumers

9. Consumers shall be able to message providers
10. Consumers shall filter listings by category.
11. Consumers shall search for listings by keywords.
12. Consumers shall view details of a listing, including the provider's name and contact options.
13. Consumers shall be able to favorite specific products
14. Consumers shall be able to access a page of their favorites
15. Consumers shall be able to complete a personality quiz that will recommend items based on their results.

System

16. The system shall require users to have an sfsu.edu email to register.

Category

17. Listings shall be listed under at least one category
18. Categories shall be services, technology, class materials, clothes, and tools/appliances.

Non-Functional Requirements

1. Application shall be developed, tested and deployed using tools and cloud servers approved by Class CTO and as agreed in M0
2. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of two major browsers
3. All or selected application functions shall render well on mobile devices (no native app to be developed)
4. Posting of sales information and messaging to sellers shall be limited only to SFSU students
5. Critical data shall be stored in the database on the team's deployment server.
6. No more than 50 concurrent users shall be accessing the application at any time
7. Privacy of users shall be protected
8. The language used shall be English (no localization needed)
9. Application shall be very easy to use and intuitive
10. Application shall follow established architecture patterns
11. Application code and its repository shall be easy to inspect and maintain
12. Google analytics shall be used
13. No email clients or chat services shall be allowed. Interested users can only message to sellers via in-site messaging. One round of messaging (from user to seller) is enough for this application
14. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.
15. Site security: basic best practices shall be applied (as covered in the class) for main data items
16. Media formats shall be standard as used in the market today
17. Modern SE processes and tools shall be used as specified in the class, including collaborative and continuous SW development and GenAI tools
18. The application UI (WWW and mobile) shall prominently display the following exact text on all pages *"SFSU Software Engineering Project CSC 648-848, Spring 2025. For Demonstration Only"* at the top of the WWW page Nav bar. (Important so as to not confuse this with a real application). You have to use this exact text without any editing.

Competitive Analysis

Feature	**Marketplace**	**Craigslist**	**eBay**	**Us**
Services	-	+	-	++
Verification	+	-	+	++
Notifications	+	+	+	-
Filter Searching	+	-	+	+
Message System	++	+	+	+
Personalization	-	-	-	++

+ feature exists; ++ superior; - does not exist

Services

Our planned advantage in terms of service is that we will be including listings that are services for example like moving belongings into a dorm or lifting heavy furniture. Competitors like Facebook Marketplace and eBay don't allow services on their platform as they are primarily used for selling goods. Craigslist allows services and allows users to list services like needing transportation or volunteer work. Our advantage lies in the fact that since only SFSU students are allowed on our platform, it provides a sense of safety and community that fellow students are helping out each other. While asking strangers on Craigslist for services poses a safety risk.

Verification

Our planned advantage will be easily signing up and verifying the user when they sign up by validating only emails that sign up that end in @sfsu.edu. Compared to the other competitors like Facebook marketplace and eBay, they require a lot of information which can be overwhelming or unimportant to users. While it may be important to have these basic details like their names since they signed up with an SFSU email, any safety or issues that come up can be reported and information about the user can be found using their email through the university.

Notifications

Our competitors have in some way a notification system. They all have a built-in notification system within the website. Our site won't have this feature as it's too complex as well as unnecessary.

Filter Searching

Our product won't have an "advantage" in filter searching however, it won't be weaker than other competitors. FaceBook Marketplace and Ebay have a filter search that would look similar to what we want to implement where the user simply puts a label or selects a category that relates to the listing. Then if a user wants to search a specific category they can filter search things like electronics or textbooks which is super helpful for people who know what they want or just browsing listings.

Message System

Our product will have a messaging system however, it most likely won't have anything that is superior to other competitors and will be similar to a majority of other site's message systems. When we compare the competitors, FaceBook Marketplace's messaging system is far superior than Craigslist and eBay as it is a live chat system which allows users to send videos/images, showing read receipts, and online status. While Craigslist doesn't have an in site messaging system and instead externally uses phone numbers or email to contact the buyer/seller. eBay on the other hand does have in site messaging but its a simple messaging system that works like emails. Our product will most likely have something like eBay where a buyer can contact a seller and pop up on site.

Personalization

Our planned advantage comes from having a built-in personality quiz in our website which allows users to take a quiz and display items that might interest them. For example if a user takes a personality quiz and they are considered creative or inventive, it might just display a recommended category like electronics. Other competitors don't have this feature. We think this separates and differentiates us from other competitors because you are able to browse listings that are relevant to the users.

High-level System Architecture and Technologies Used

- **DB**
  - MySQL
- **WWW server**
  - Intel and https
- **Cloud service**
  - OVH
- **Front end frameworks:**
  - Alpine.js
- **Supported browsers**
  - Chrome and firefox

Use of GenAI

- **Personas and use cases (High)**
    - Generated a description for the use cases that followed the examples provided in the class materials

The GenAI tool that we used was ChatGPT. We used it to generate the personas and use cases that we believed would represent the users that would use our application. Based on the examples that were provided in class, it generated use cases along with some features that they might look for when using our site like filtering, or bug reporting. We believed that it's usefulness was pretty high as the AI was pretty creative and created personas that were unique and helpful. It also helped other aspects of Milestone 1. For example, based on the generated use cases, we were able to easily develop the data glossary/description based on the personas and what they were looking for and how they were going to use our site. Overall, ChatGPT was extremely helpful.

- **High level functional (High)**
    - Proofreading requirements list and expanding on it

Our team used ChatGPT in order to proofread the requirements as well as expand upon it. We would rate ChatGPT's usefulness high. The prompt we gave ChatGPT was referencing our use cases, and data glossary/description in order to help us come up with the high level function requirements that we need. For example, based on some of our use cases and data glossary and description we were able to come up with some functional requirements however, there were some that we might have forgotten such as the system only taking in @sfsu.edu emails to register. It was able to expand on the basis of information that we came up with.

- **Competitive Analysis (Low)**
    - Comparing to facebook marketplace, craigslist, ebay

We used ChatGPT for the comparison between competitors, Facebook Marketplace, Craigslist, and eBay. We used it to see what the differences were between the major market sites. The prompt we gave ChatGPT was to just compare the 3 market's messaging system. It wasn't too useful as it did just point out the basic details that were already given. However, it was useful at pointing out the obvious features that we might've forgotten about such as FaceBook Marketplace's activity status, and whether they've read your message. It essentially served as a proofreader/second opinion.

Team and Roles

Team Members	Roles	Email
Ty Bohlander	Team Lead	tbohlander@sfsu.edu
Eugenio Ramirez	GitHub Maintainer	eramirezmeneghello@sfsu.edu
Julia Bui	Front-end Lead	jbui1@sfsu.edu
Prince Lucky F. Santos	Back-end Lead	psantos3@sfsu.edu
Michael Tran	Utility Developer	mtran25@sfsu.edu

Team Lead Checklist

- ➢ So far, all team members are fully engaged and attending team sessions when required
  - **DONE**
- ➢ Team found a time slot to meet outside of the class
  - **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
  - **ON TRACK**
- ➢ Team reviewed class slides on requirements and use cases before drafting Milestone 1
  - **DONE**
- ➢ Team reviewed non-functional requirements from “How to start…” document and developed Milestone 1 consistently
  - **DONE**
- ➢ Team lead checked Milestone 1 document for quality, completeness, formatting and compliance with instructions before the submission
  - **DONE**
- ➢ Team lead ensured that all team members read the final M1 and agree/understand it before submission
  - **DONE**
- ➢ Team shared and discussed experience with GenAI tools among themselves
  - **DONE**
- ➢ GitHub organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)
  - **DONE**