SW Engineering CSC648-848

Spring 2024

Campus Buy/Sell Application: SwiftSell
Team 04

Team Members:
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Alexis Alvarez, Back End
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Milestone 1

Milestone	Submitted	Revised
Milestone 0	February 24th 2024	March 6th 2024
Milestone 1	March 8th 2024	
Milestone 2		
Milestone 3		
Milestone 4		
Milestone 5		

1. Executive Summary

SwiftSell is a dynamic marketplace platform developed by a team of passionate undergraduate, graduate, and postgraduate students, aimed at revolutionizing the way students buy and sell goods within the San Francisco State University (SFSU) community. Our project is motivated by the need to create a safe, convenient, and student-friendly marketplace that offers an alternative to generic platforms like Facebook Marketplace and Craigslist. By providing a platform specifically tailored to the needs of college students, SwiftSell seeks to enhance the overall student experience at SFSU.

Motivation and Importance: The motivation behind SwiftSell stems from the recognition of the challenges students face when buying and selling goods in a university setting. Current platforms lack the safety, convenience, and campus-specific features that are essential for a thriving marketplace within a college community. By developing SwiftSell, we aim to provide SFSU students with a reliable, secure, and user-friendly platform for buying and selling goods, ultimately enriching campus life and fostering a sense of community.

Functions and Services: SwiftSell will offer a range of functions and services tailored to the needs of SFSU students. These include verified user profiles, local listings convenient for students to make their purchases, and chat messaging. The platform will also feature categories specific to college life, such as textbooks, furniture, electronics, and event tickets. The platform will also provide the user with the ability to list and accept job listings such as assisting in moving furniture sold on our marketplace. By providing these services, SwiftSell aims to simplify the buying and selling process for students, making it easier to find and sell items within the SFSU community.

Unique and Custom for SFSU: What sets SwiftSell apart is its focus on the unique needs and culture of SFSU. The platform will be customized to integrate with campus resources and student emails, providing a secure and seamless experience for users. Additionally, SwiftSell will feature a dedicated section for campus events and activities, allowing students to buy and sell tickets and items related to campus life. These customizations will make SwiftSell the go-to marketplace for SFSU students, setting it apart from generic platforms.

About Our Team: Our team is composed of driven and innovative students from diverse backgrounds, all united by a shared vision of enhancing the student experience at SFSU. With expertise in Computer Science and the guidance of our CEO Dragutin Petkovic and CTO Anthony Souza, we are equipped to develop and launch a successful

marketplace platform. Together, we are committed to making SwiftSell a valuable resource for SFSU students and a thriving marketplace within the college community.

2. Personae

Student: John - Seller and full-time student

"Generated by OpenAI's DALL-E model (OpenAI, 2024)”

About John	Goals and Scenarios
• Meet John, a 21-year-old Computer Science major at San Francisco State University (SFSU). • John is a tech-savvy student enthusiastic about using an online	• John aims to be time efficient and make extra money through the selling process.

platform for efficient selling.	• He seeks a user-friendly platform that simplifies selling, maximizes item visibility, and ensures safety. • The website should cater to John's preferences, providing a seamless and secure experience for SFSU students engaged in buying and selling activities. • Limited time and security concerns are constraints for John in the selling process.

Student: Sarah - Buyer

"Generated by OpenAI's DALL-E model (OpenAI, 2024)”

About Sarah	Goals and Scenarios
● Sarah is a 20-year-old Psychology major at San Francisco State University (SFSU). ● Sarah is in her second year and actively engaged in campus events and social activities.	● Sarah aims to find good deals on essential items like textbooks, furniture, and electronics. ● Sarah thinks it would be awesome to also request services such as tutoring, help with moving out furniture, etc.

• As an eager student buyer, Sarah values convenience, affordability when searching for items and hates wasting time. • Sarah is not as tech-savvy as some of her peers but is open to exploring user-friendly platforms for buying used items. • Limited budget and time constraints due to academics and part-time work are her challenges.	• The website should cater to Sarah's need for an easy-to-navigate platform. • Clear item descriptions and secure transactions are essential for enhancing her overall buying experience as an SFSU student.

Staff/faculty: James

"Generated by OpenAI's DALL-E model (OpenAI, 2024)”

About James	Goals and Scenarios
● James is a 47-year-old staff member at San Francisco State University (SFSU) working in the administrative office. ● James holds a position in student services, assisting with various administrative tasks related to student affairs. ● He is responsible for coordinating events and often helps students navigate administrative processes. ● James, has vision problems and gets confused when there is too much information at once ● Time is a precious resource for him, balancing work responsibilities and personal commitments.	● James seeks a user-friendly platform that facilitates smooth communication between buyers and sellers. ● The website should cater to James's need for simplicity, providing quick access to information. ● James has an sfsu email and would like to engage in either selling or buying products on the website

Admin: Alex

"Generated by OpenAI's DALL-E model (OpenAI, 2024)”

About Alex	Goals and Scenario
● Introducing Alex, the 21-year-old administrator overseeing the online marketplace at San Francisco State University (SFSU). ● With a background in information technology and a wealth of experience in system administration, Alex plays a crucial role in maintaining platform integrity and security.	● Alex seeks a platform that allows seamless oversight, quick problem resolution, and adherence to data security protocols. ● The website should provide a user-friendly administrative interface. ● This interface should enable Alex to efficiently manage the platform while ensuring a secure

• Detail-oriented and security-conscious, Alex ensures that the website complies with university policies and standards. • As an administrator, Alex values robust features for user management, transaction monitoring, and issue resolution. • With a busy schedule, time efficiency is a priority for Alex.	and reliable experience for all users in the SFSU community.

3. High-level Use Cases

Search Browse and Message

1. Users, like John, should have the ability to effortlessly browse or search for items on the SFSU marketplace (SwiftSell). For instance, John is looking for a specific textbook for his computer science class. He navigates to the website, enters the book title, and reviews the search results. Once he finds the desired item, he wants to be able to initiate a conversation with the seller directly on the platform to inquire about the book's condition, price, and potential meeting arrangements. The goal is to facilitate seamless communication between buyers and sellers within the SFSU community, enhancing the overall user experience. Only users who are signed in can have the option to message each other.

Posting Content

2. Users, such as Sarah, should have the ability to easily post content for sale on the SFSU marketplace. For instance, Sarah has a set of furniture items she wants to sell before moving off-campus. She logs into the platform, selects the "Sell" option, and proceeds to create a new listing.

Sarah uploads clear images, provides a concise description, and a price for each item. The system should allow her to efficiently post multiple items for sale within a short timeframe. The objective is to empower sellers like Sarah to showcase their items effectively, promoting a diverse range of listings on the platform.

Sarah might also want to request a service, she can use our platform to request a service to be executed, she can write a description of what the service entails and the price she is willing to pay for such service.

Dashboard View What is For Sale:

3. Staff member James, in his late forties, benefits from a user-friendly SFSU marketplace website designed for easy interaction. Featuring good color contrast and appropriately-sized text, James accesses a comprehensive dashboard upon login. The dashboard categorizes listings, including textbooks, electronics, furniture, and more, facilitating quick navigation, viewing of trending items, and application of filters for specific criteria.

   James logs in and is greeted with a dashboard displaying categorized listings, including textbooks, electronics, furniture, and more. The dashboard allows him to quickly navigate through sections of interest, view trending items, and access filters for specific criteria.

Admin Approval:

4. Administrators, like Alex, should have the authority to review and approve listings before they go live on the SFSU marketplace. For example, a user submits a listing for a high-value electronic item. Alex receives a notification and accesses the administrative dashboard, where pending listings are displayed.

   Alex reviews the listing for compliance with university policies, ensuring it aligns with the platform's guidelines. If everything meets the criteria, Alex approves the listing, making it visible to users.

   This approval process adds an extra layer of oversight, maintaining the integrity of the marketplace and ensuring that listings adhere to university standards. The focus here is on empowering administrators to control and curate the content that goes live on the platform.

Main Data Items and Entities

Items for Sale: Objects available for sale by registered users.
Sub-items include:

- Category (e.g., Furniture, Electronics, and Textbooks)

Services for Sale: Tasks that one registered user may purchase from another registered user.
Sub-items include:

- Category (e.g. tutoring, help moving furniture)
- Location (where to meet on campus)
- Time

Dashboard: A screen view within the website, available to registered users, which displays messages sent to the user.

Messages: Communication between two registered users on the website.

Register/Registration: The process whereby an unregistered user becomes a registered user by creating a username and password.

User: Visitors to the web application are part of one of three groups: unregistered users, registered users, and admin.

Unregistered User: An unregistered user is not allowed to sign into the website. The unregistered user is not allowed to login, post, or message, and cannot view the dashboard; the unregistered user is allowed to view items for sale, to fill out the form to post an item or send an item (but not submit the form), and to register.

Registered User: In addition to the actions allowed to an unregistered user, a registered user is allowed to sign into the website. Once signed in, a registered user is allowed to post items for sale (with admin moderation), message other registered users, and view the dashboard.
Admin: In addition to the actions allowed to a registered user, the admin shall have the responsibility to approve posts for sale that conform to terms of service.

Functional Requirements

5.**<u>List high level functional requirements</u>**

1. **Unregistered User**
    - 1.1. An unregistered User shall be able to search for specific items.
    - 1.2. An unregistered User shall be able to browse the store's items
    - 1.3. An unregistered User shall be able to categorize items for sale by area of use (electronics, textbooks, furniture, etc)
    - 1.4. An unregistered User shall be able to sort items for sale by majors.
    - 1.5. An unregistered User shall be able to see images for items with accurate description
    - 1.6. An unregistered User shall be able to filter through items based on price, date posted, etc.
    - 1.7. An unregistered User shall be able to only see items for sale that are approved by the admin.

2. **Registered User shall have ability to do all things above plus…**
    - 2.1. A Registered User shall have a dashboard with information containing order history, messages, and notifications.
    - 2.2. A Registered User shall be able to post items for sale with approval of admin
    - 2.3. A Registered User who posts items for sale shall upload at least one image, a brief description of said item, and a reasonable price for the item
    - 2.4. A Registered User shall be able to delete a post without the approval of an admin
    - 2.5. A Registered User shall be able to buy items for sale
    - 2.6. Only Registered Users shall be able to message other Registered Users
    - 2.7. A Registered User shall be able to post small jobs such as tutoring, moving furniture, etc.
    - 2.8. A Registered User shall be informed of occasional, optional social gatherings/meetups to complete transactions and provide our users a sense of community on campus.
    - 2.9. A Registered User shall be informed if they're post has been approved or not by the admin
    - 2.10. A Registered User shall be informed if another user wants to buy one of their items
    - 2.11. A registered User shall be informed by the admin when a post is pending approval

3. **Admin**
   3.1. An admin shall be required to approve or deny User posts to go online
   3.2. An admin shall be required to remove items for sale once a transaction has been completed

Non-functional Requirements

6.**List of non-functional requirements**

1. Application shall be developed, tested and deployed using tools and 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.

4. Data shall be stored in the database on the team's deployment server.

5. No more than 50 concurrent users shall be accessing the application at any time.

6. Privacy of users shall be protected.

7. The language used shall be English (no localization needed).

8. Application shall be very easy to use and intuitive.

9. Application shall follow established architecture patterns.

10. Application code and its repository shall be easy to inspect and maintain.

11. Google analytics shall be used.

12. No e-mail clients 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.

13. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.

14. Site security: basic best practices shall be applied (as covered in the class) for main data items.

15. Media formats shall be standard as used in the market today.

16. Modern SE processes and tools shall be used as specified in the class, including collaborative and continuous SW development and GenAI tools.

17. The application UI (WWW and mobile) shall prominently display the following exact text on all pages "SFSU Software Engineering Project CSC 648-848, Spring 2024. For Demonstration Only" at the top of the WWW page Nav bar. (Important so as to not confuse this with a real application).

Competitive Analysis

7.**Competitive analysis (functions/features only, not business or marketing)**:

Feature	SwiftSell	Amazon	Facebook	OfferUp	Craigslist

			Marketplace		
Product Listings	+	+	+	+	+
Services Listings	+	-	+	-	+
Community Engagement	++	+	+	+	+
Safety and Security Features	++	+	+	+	+
Text Search	+	+	+	+	+
Admin Approval of Items/Posts	++	-	-	-	-

- “++” Superior; “+” Feature Exists; “-” Does Not Exist

- The SFSU Marketplace is uniquely positioned to revolutionize how San Francisco State Universities’ community engages in online transactions allowing for students to obtain SFSU specific items from other students rather than just other retailers.

  By providing a secure, exclusive, and community-focused platform tailored specifically for its students, staff, and faculty. Contrasting from broad spectrum platforms like NextDoor, Amazon, Craigslist, Facebook Marketplace, and even OfferUp, our platform stands out by offering SFSU email verification for user authenticity, admin-approved listings for maintaining quality and relevance, and SFSU-specific functions like custom merchandise and tutoring services, directly addressing the unique needs of the university community.

  Not only do these features enhance the usability and appeal of the SFSU Marketplace, but also foster a sense of belonging and community spirit among users, positioning it as a premier choice for secure, convenient, and community-driven transactions within the SFSU ecosystem. By focusing specifically on the needs and experiences of the SFSU community, SFSU Marketplace promises to deliver unparalleled value, security, and convenience, creating a new standard for university-centric online marketplaces.

High-level System Architecture and Technologies

8. **High-level system architecture and technologies used:**

Server Host: AWS: EC2
Operating System: Ubuntu 22.04.3

Database: MySQL v. 8.3.0

Web Server: Apache 2.4.58
Server-Side Language: Python 3.12.2

Additional Technologies:
Web Framework: Flask
Frontend Framework: Bootstrap
IDE: VsCode
Web Analytics: Google Analytics
SSL Cert: DV SSL
SASS: 3.5.5

Use of GenAI Tools

9.<u>Use of GenAI tools like ChatGPT and copilot</u>

OpenAI's ChatGPT (Versions 4.0 and 3.5)

1. ***Task: Front-End Development***
    a. ***GenAI Tool/Version:*** *ChatGPT (GPT-4.0)*
    b. ***Helpfulness Rating:*** *High*
    c. ***Comments:***
        i. *Using the 4.0 version allows for the use of attaching pdfs, for Milestone 0, attaching the pdf allowed for ChatGPT to understand the tasks necessary for the front-end development.*
        ii. *Generated properly structured HTML/CSS code snippets while understanding our use of Flask and Bootstrap, thus adjusting the code to fit these frameworks.*
        iii. *Suggested the necessary file structure for proper development, and gave suggestions to the UI/UX components of the website.*
        iv. *Prompt: "Using the pdf attached, focusing on the front end development tasks, create templates for an about me page which has bubble-like features using white and black as the prominent shades of color. Note the code should be generated using Bootstrap and Flask framework in mind, furthermore make sure to give suggestions on the file structure of our project in order to make it as efficient/organized as possible."*
2. ***Task: Back-End Development***
    a. ***GenAI Tool/Version:*** *ChatGPT (GPT- 4.0)*
    b. ***Helpfulness Rating:*** *Very High*
    c. ***Comments:***
        i. *Again using the 4.0 feature of attaching pdfs, ChatGPT was able to break down step by step, in depth on how to properly set up the back-end development of the project, providing in detail how to properly run/develop the server.*
        ii. *Provided the necessary commands to download the necessary needs for the server, such as python, apache, flask, and git commands.*
        iii. *Gave meaningful insight on setting up MySQL database along with the necessary configurations needed to be made within certain Apache files along with developing a WSGI (Web Server Gateway Interface) file in order to provide the necessary paths for the server to use.*
        iv. *Prompt: "Focusing on the back-end tasks on the pdf, specifically task 3, break down step by step on how to do each task in detail, providing the*

necessary snippets of code/commands needed to fully complete the back end development. Again please note that we are using Apache with python as our language."

3. ***Task: AWS EC2 Deployment***
    a. ***GenAI Tool/Version:*** *ChatGPT (GPT-3.5)*
    b. ***Helpfulness Rating:*** *Medium*
    c. ***Comments:***
        i. *Offered high-level guidance on deploying Flask applications on AWS EC2.*
        ii. *Required additional research for AWS-specific configurations, particularly for Flask-Bootstrap deployments.*
        iii. *Provided insights into potential challenges and common troubleshooting tips for Flask applications on AWS.*
        iv. *Was Useful in dealing with errors that we would encounter in the terminal command line. If the solution was not exactly the right one, it pointed us in the right direction.*

Team and Roles

10.**Team and roles**:

Aymane Arfaoui	aarfaoui@sfsu.edu	Team Lead
Markus Reyer	mreyer1@sfsu.edu	GitHub Master, Frontend and Backend help.
Amandeep Singh	asingh51@sfsu.edu	Frontend Lead
Alexis Alvarez	aalvarez26@mail.sfsu.edu	Backend
David Daly	ddaly@sfsu.edu	Backend Lead

Team Lead Checklist

11. **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 | Done
- 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