

Software Engineering 648 Spring 2022

GatorMart

An online marketplace for SFSU students/faculty

Team #2

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Milestone #1

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I. Executive Summary

In most hallways on campus at San Francisco State University, we see multiple bulletin boards looking to buy, or sell goods and services. Slips of paper, in all sizes, shapes, and colors can be found posted for the passby to glance at. A person looking for a particular item or service could spend hours roaming the hallways of every building, looking across all these bulletin boards. Not only is this time consuming and frustrating, these efforts could prove to be futile.

In the fall of 2020, San Francisco State University enrolled 24,025 students. With a large and diverse student and faculty, the university lacks a centralized hub for them to buy, and sell goods and services. We have developed a website service, GatorMart which provides this service exclusively to current students, faculty, and staff.

GatorMart is a vast online “bulletin board” that is organized into specific categories, allowing registered users to quickly find a specific item. To register, all one needs is a sfsu.edu email that confirms they are a part of the San Francisco State community. Once a user’s registration has been confirmed, they are free to browse various categories for the items or services they are seeking. These include old textbooks, tutoring services, electronics, and job listings.

The bulletin board is maintained by an administrator who must approve all postings before they go public. This way, we are able to filter out any inappropriate or spam postings. The administrator’s responsibilities also include confirming a user as a current staff or student of the university.

A user can be distinguished by badges on their profile, indicating whether they are part of the staff or student body. Furthermore, users can elect to have more specific tags, such as “graduate student” or “adjunct lecturer”. These tags can help a user filter items and services that are pertinent to their areas of interest. Specifics of how a user can fully utilize GatorMart can be found in the following sections.

We believe GatorMart will pave the way for a streamlined online community of users at San Francisco State University to purchase, and sell. Due to the exclusivity of this service, users don't have to sift through advertisements for items offered to those outside of the university. GatorMart has the ability to consolidate the cluttered bulletin boards in the hallways, and become an online hub where students and faculty can securely find what they need within the San Francisco State community. We are fully confident that GatorMart will be expanded on and adopted by other universities in the future.

II. Personae and Use Cases

Personae

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| <p>Persona #1 Dylan</p>  <p>Student at SFSU The Buyer</p> | <p>About Dylan:</p> <ul style="list-style-type: none">• He has been a full-time student at SFSU for 2 years now and also has a part-time job at Peet's Coffee• He rarely buys his books new as he prefers to save more money buying used books.• He lives on campus.• Has good tech skills <p>Goals and Scenario:</p> <ul style="list-style-type: none">• Since he's a full-time student and has a job, he is normally very busy; therefore most of his day is spent on campus or at work. Because of this, he normally orders his books online as he doesn't have enough free time to pick books up. However he is finding that the costs of used books online are much more than they would be to pick up in person.• Additionally, he is also incredibly concerned about his safety in picking up books from strangers; if he were to pick up a used book in person; he would want to know that he would be safe/the seller is reputable. |
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| <p>Persona #2 Sophia</p>  <p>Not a member of SFSU</p> | <p>About Sophia:</p> <ul style="list-style-type: none">• Sophia is not a student at SFSU, however, she is visiting the school to see whether she would like to attend after she finishes high school.• Has decent experience in using tech and knows how to browse websites that sell items <p>Goals and Scenario:</p> <ul style="list-style-type: none">• Because she may become a student at SFSU later; Sophia has an okay idea of what classes she may take if she were to enroll; She would like to check the prices of books/notes for classes she may be interested in. |
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| <p>Persona #3</p> <p>Daniel</p>  <p>Student at SFSU The Seller</p> | <p>About Daniel:</p> <ul style="list-style-type: none"> • He has been a student at SFSU for 3 years • He has collected a lot of school materials over the years as a student and wants to get rid of them • He has difficulty traveling, commutes to campus <p>Goals and Scenario:</p> <ul style="list-style-type: none"> • From being a student for 3 years, Daniel has accumulated a lot of school material, such as textbooks, he no longer has a need for. He thought about throwing them away but then he thought other students might want some of the school material that he has. Knowing the cost of the material, Daniel believes he could sell what he has at a lower price so that other students will pay for it. • However, Daniel doesn't have an easy way to travel so he would want people to meet him for pick-up at a place that is accessible to him and the person he's selling to. |
|--|---|

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|--|--|
| <p>Persona #4</p> <p>Isabell</p>  <p>Staff/Faculty at SFSU Offer TA jobs</p> | <p>About Isabell:</p> <ul style="list-style-type: none"> • Is a math professor at SFSU • Look for a TA to help with grading • Has difficulty with computers <p>Goals and Scenario:</p> <ul style="list-style-type: none"> • Being a professor at SFSU, there's a lot of work that needs to be done so that students can have the best class experience. As a solution, Isabell wants to hire graders so she can focus on other aspects of the class. She wants the grader to be a SFSU student who has experience in the class she is teaching. • Isabell wants to post the position as a TA online but doesn't know how to navigate between programs well on the computer. |
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|---|---|
| <p>Persona #5</p> <p>Tom</p>  <p>A student at SFSU Provides tutoring services</p> | <p>About Tom:</p> <ul style="list-style-type: none"> • A senior at SFSU, Tom has taken a number of high level CS courses and has done very well at them. • Doesn't have a job, but wants money to buy a new computer. • Has prior experience tutoring. <p>Goals and Scenario:</p> <ul style="list-style-type: none"> • In his last semester at SFSU, Tom has learned a lot from the Computer Science courses he's taken so far. He wants to use the information he's learned so far to help others, but also wants to make some money in order to buy a new computer. He is interested in becoming a tutor but finds that the school doesn't pay the amount of money he'd like; however he deeply desires the ability to tutor on campus. |
|---|---|

Use-Cases

Use Case #1 - Dylan - Full Time student looking to buy Used Books

Dylan is a full-time student at SFSU and works a part-time job. Instead of buying his books new per semester, he prefers to buy used books as it saves him a lot of money. Normally, Dylan does not have enough time to leave campus or his job to pick up used books, so he resorts to ordering them online; which he finds is normally more expensive than picking them up in person. Additionally, Dylan is also someone who prefers to be very safe, so if he is picking up a used book, he would like it to be by a fellow student or by a seller who is reputable. By registering for our website as he is a student, he can use the app whenever he needs to buy a used book/item. Whenever he sees an item that he likes, he can send an offer he sees fit and a message to the seller. Additionally, Dylan's safety is also assured as once the seller and buyer are in agreement over an offer, he is able to select a meet-up spot on campus as to where he would like to pick up the book.

Dylan is also able to look at the review of a seller and check whether they are reputable; in which he is also able to put his own review once the transaction is done.

Use Case #2 - Sophia - Not a student nor faculty at SFSU; Interested in browsing website

Sophia is neither a student nor staff at SFSU, however she is hopeful that she may be accepted to the college soon. She would like to browse our website to see how the prices listed for books/notes compare to other online sellers. Because she is an unregistered visitor, she is able to browse user listings but is unable to do a number of things such as: Put items for sale, send an offer, message users, and any other permissions allowed to users of the website. Additionally, any time she clicks on an item when she's browsing, she should be redirected to a registration page.

Use Case #3 - Daniel - A 3rd year student looking to get rid of unneeded school materials

Daniel has been a student at SFSU for 3 years and has gathered a lot of school material he no longer has a use for. Instead of throwing away the school material, Daniel decided to see if he could give it to other students at a lower price than he got it for. Additionally, Daniel doesn't own anything like a car for easy travel so he wants a meeting place that's accessible to him and the person he's selling to. Through the website, Daniel is able to sell his school materials because he is a student at SFSU. He can make posts for each of his items and mark the price he wants to sell it at. Also, Daniel set the meeting point to be on campus as an accessible place for both him and the student he is selling to.

Use Case #4 - Isabell - A math professor at SFSU looking for a TA

Isabell is a math professor at SFSU and is looking for a TA as a grader to lighten the class load she has. She wants a SFSU student who has experience in the math classes she teaches to be her TA. Through the website, Isabell is able to make a job request for students to see. If a student is interested, they can contact her through her information on the job request page. Also, the website will provide easy navigation for professors to post job listings and these listing will be featured to the students so that students will be able to see them

Use Case #5 - Tom - A last year student at SFSU looking to provide tutoring services

Tom is a senior at SFSU in his last year. He's taken a number of high level Computer Science courses and is willing to tutor those who need it. However, he doesn't think the school pays the wage he would like, which is a shame because he really wants to tutor on campus. By using our website, Tom can register as he is a student. Once he is registered, he can post a service to the user listings where he can talk about his tutoring services and the wage he would like to be paid. He can also choose a spot on campus where he would like to meet with whoever is interested. Once someone is interested in his service, they could hammer out the details in messages.

III. Data Items and Entities

| Entities | Data Items | Permissions |
|---------------------------------------|---|---|
| Unregistered Visitor | | View user listings (services, selling, buying, surveys, job listings). |
| User | UserID, email, password, User Type (student/teacher/admin) profile, fullname, profile picture, payment method, buyer rating, seller rating | List services, items for sale, items they're looking to buy. Make offers / buy items, privately message users after making an offer. |
| Student (inherits user) | Student ID, major, minor, student standing (undergraduate/graduate and lower/upper division) | |
| Staff (inherits user) | Department, job title | List job/help positions, surveys (w/ or w/o reward), |
| Site Administrator (subclass of user) | | Remove/Approve listings, remove users, view other users' information, feature items |
| Website | URL, server, database | |

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|---------------|---|--|
| Registration | List of items, List of users, | |
| Items | Post ID, cost, item ID, image, tags, item name, description | |
| Message | Sender, recipient, date, time, status | |
| Reviews | Posted by, date, time | |
| Meet-up spots | Location ID, marker | |
| Offer | Offer ID, | |
| Notifications | | |
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IV. List of Functional Requirements

1. **View Marketplace (Unregistered Visitor)** - Unregistered visitors should be able to view limited marketplace. This entails the ability to view all listings, but the inability to view user contact information (name, email address, phone number, etc.). Clicking on an item to view or purchase will suggest to the user that they should register an account.
2. **View Marketplace (Registered User)** - Registered users should be able to view the full marketplace. This includes all listings with contact information, and the ability to purchase / make offers.
3. **Register Account** - Unregistered visitors should be able to register for an account with their active sfsu.edu email address and a desired password. This email address will be verified via a link in an email. Registered users will have more privileges than unregistered, as described in the Data Items and Entities 'Permissions' column. Additional optional information will be requested, such as major, minor, and interests.
4. **Log in** - Registered users should be able to log in to our site using the information they registered with. This will allow them the privileges of registered users.
5. **List item for sale** - Users should be able to post an item they would like to sell with a title, a description, a price, and (optionally) photos. They should also be able to decide what information of theirs is made public on the listing (i.e., do they want their email/phone number/name on the listing). Some form of contact information must be available.

6. **List Item Needed** - Users should be able to list items they are looking to purchase. Required information would be a title, description, desired buying price, and (optionally) photos.
7. **List Service (Needed)** - Users should be able to list services they need help with. Payment for these types of transactions will happen off-site. Service listings should have a title, description, a desired price, and some form of contact information (implementing private messaging is a tier 2 priority).
8. **List Service (Provided)** - Users should be able to list services they are able to provide to other students. Payment for these transactions will happen off-site. Provided services should have a title, description, desired pay, and some form of contact information.
9. **Make an Offer** - All registered users should be able to make offers on items available for purchase. This should be an offer below the listed price, since the site will not host auctions. Offers can be accepted or declined by the user who listed the item (when on-site private messaging is implemented, users will be able to make an offer with a message).
10. **Purchase** - Users should be able to purchase an item for its listed price. After the seller accepts the purchase, the buyer will be able to choose a pickup location, described in the list-item 13.
11. **Accept / Decline Offer / Purchase** - Users who have listed an item must be able to accept or decline an offer or purchase. This will prompt them to select pickup locations which they are willing to go to, as described in list-item 12.
12. **Set Desired Pickup Locations (Poster)** - Once the poster of an item has accepted an offer, they will be presented with an interactive, segmented map of SFSU campus (i.e., a high-level image of the map with highlighted, clickable

regions). This will allow them to pick the locations at which they are willing to do the transaction.

13. **Select Pickup Location (Responder)** - Users who have successfully purchased / responded to an item will be prompted to select a pickup location from the list of locations selected as available by the poster. For the safety of SFSU students/staff, all pickup locations must be on-campus and outdoors or in select buildings.
14. **Rate Transaction (Responder)** - Buyers will be able to rate transactions (from 1 to 5 stars, with a description) after they have taken place. These ratings will be listed on the opposing person's user profile.
15. **Rate Transaction (Poster)** - Similar to the last list item, only that posters will be able to rate their experience with the responder. This rating will also show up on the responder's user profile.
16. **Search Marketplace** - Users will be able to search the marketplace via a typed search-bar. Priority 1 will be simply getting the Regex to match exact strings to find items, and priority 2 will be getting the regex to match misspelled items (fuzzy search).
17. **Filter Listings** - Users should be able to filter the marketplace by tags placed on listings. This way, users can more properly find the items / services they're looking for.
18. **View Profile** - Users should be able to view other users' profiles. The user profile will show any information the user has made public (i.e., contact information, name, etc.), and will always show their poster / responder ratings as well as the other items they have listed.
19. **Remove Listing** - Site administrators will be able to remove listings which have already been made public if there is a good reason to do so. This will

permanently remove that listing from the marketplace, and users will no longer be able to interact with it.

20. Approve / Disapprove Listing - Site Administrators must review listings before they are made public on the site. If the content of the listing is not approved, the administrator will be able to disapprove that listing, and the poster will be notified that their item cannot be posted. A second priority would be adding the ability to include a message (written by the administrator) informing the user on the reason for their listing being removed.

21. Remove User - Administrators should be able to permanently remove a user from the website. This will block them from signing up to the site in the future. Their username and email will remain in the database, but will permanently be flagged as unable to login. When the user attempts to log in in the future, they will be signaled of their account's removal.

22. Report Listing - Users should be able to report a listing which contains content they find offensive/harmful/etc. This will notify the administrators that a post has been flagged, and allow them to decide whether to keep it up or remove it permanently.

23. Change User Settings - Users should be able to modify their settings (contact information, major, description, etc.) after their account has been created.

V. 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 must 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 should 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 practices shall be used as specified in the class, including collaborative and continuous SW development
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 2022. For Demonstration Only" at the top of the WWW page nav bar. (Important so as to not confuse this with a real application).

VI. Competitive Analysis

| Feature | Craigslist | eBay | Amazon | Facebook Marketplace | Our Future Product |
|-------------------------------------|------------|------|--------|----------------------|--------------------|
| Text Search | + | + | ++ | + | + |
| Browse | - | + | + | + | ++ |
| Sell/Purchase Products and Services | + | - | - | - | + |
| List/Apply Jobs | + | - | - | - | + |
| Pickup Option | + | - | - | + | + |

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

Summary:

GatorMart is an online hub that we plan to develop exclusively for SFSU students, faculty, and staff to buy and sell products and services. One of the planned advantages of our product compared to the competitors is that registered users can buy and sell not only products on the website, but also services. Our competitors such as eBay, Amazon, and Facebook Marketplace only allow registered users to buy and sell products. To provide a convenient and secure platform for the SFSU community, registered users on GatorMart will pick up the items or have the service done on campus. While eBay and Amazon only provide shipping options. Another planned competitive advantage is job listing. Registered faculty can list job openings, which will eventually make GatorMart an go-to online hub for SFSU community.

VII. High-Level System Architecture and Technologies Used

24. Server Host: Amazon AWS EC2 T3 (t3.small, 12 months free package):

- i. 2 vCPU w/ 24 CPU Credits/hour
- ii. 2 GiB Memory
- iii. EBS-Only Storage
- iv. Up to 5Gbps

25. Operating System: Ubuntu 20.04 LTS Server

26. Database: MySQL v8.0

27. Web Server: Apache httpd 2.4

28. Server-Side Language: Javascript ES12

29. Additional Technologies:

- i. Node.js and Express.js
- ii. Sequelize for communication between JS and MySQL
- iii. VSCode

VIII. Team and Roles

| Name | Role | Github Name |
|---------------|----------------|--------------|
| Shane Waxler | Team Lead | ShaneWaxler1 |
| Robert Garcia | Back-End Lead | RGarcia35 |
| Joe Guan | Back-End | Joeguan1 |
| Melissa Ho | Front-End | melissah717 |
| Minggu Ma | GitHub Master | Macgoogle |
| Chuting Yan | Front-End Lead | cctina516 |
| Xiaoqing Yao | Front-End | yao961002 |

IX. Checklist

1. So far all team members are engaged and attending ZOOM sessions when required **DONE**
2. Team found a time slot to meet outside of the class **DONE**
3. Back end, Front end leads and Github master chosen **DONE**
4. 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**
5. Team lead ensured that all team members read the final M1 and agree/understand it before submission **DONE**
6. Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.) **DONE**