

SW Engineering CSC648/848 Fall 2022

MarketGator

Team 05

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1. Executive Summary

The purpose of MarketGator is to connect the San Francisco State University community and create a platform where students and faculty can buy, sell, or share for free digital media. This platform shall facilitate the process of gathering items which shall range from obtaining textbooks, finding media resources that can be used for university projects, or to share created content among students and faculty. Our technology shall empower the SFSU students and faculty to pursue their academic or business goals and create a culture of commerce that will undermine the old ways of purchasing works at high prices from online vendors who charge at a premium price.

MarketGator will allow users to browse its selection and register MarketGator accounts for free in order to advertise, sell, and or buy digital media. MarketGator users will also facilitate the communication between buyers and sellers in the case users need to ask about certain items listed on the market. MarketGator will also have Administrators who shall be required to approve each media item before it becomes advertised in order to verify that it conforms to SFSU rules on digital media and other common ethical rules. Items deemed unsuitable or inappropriate shall be deleted by MarketGator Administrators.

A component of MarketGator that makes it uniquely useful for SFSU students and faculty is the ability for users to not only buy their digital and or physical media with United States dollars, but also facilitate the trade of digital media for digital media. MarketGator users will be able to advertise or offer their media items for the exchange of other media items listed. The reason for this is that we are aware that as university students, money is a valuable tool that is also used to obtain nourishment and supplies, and we want not only to provide an online marketplace, but also make it easier for students to obtain the resources they need.

Another component of MarketGator will be a search by major and course. We believe that this feature will help students and faculty find the digital media that they need in a very

clean and organized way. This feature will also help users who are advertising their digital media for sell or for sharing become discovered in an easily accessible way by other users who are looking to find and or purchase the digital media that they may need.

As Team 05, we are dedicated to get MarketGator in production as we believe this ecommerce application will be beneficial for the students and faculty of SFSU. We believe we are the right fit for this project because we are all senior students of SFSU, and we know first-hand the challenges of searching for media for our courses. With our expertise, we want to apply our technological skills and build MarketGator to expedite and ease the access for the required medias for our classes.

2. Personae and Main Use Cases

Persona One: Jack (Student)

About Jack:

- Jack is a very busy but determined student.
- Jack is tech savvy and understands the internet well.
- Jack's main priority is having something that is minimalistic and simple to understand.
His busy schedule does not afford him time to play around with badly made and overly complicated technology.

Goals and Scenario

- Jack needs to buy a textbook for his class and wants to have a way to buy it online and at a good price.
- Sometimes Jack is frustrated by the anonymity of sites like craigslist and wants a safer way to buy the things that he needs preferably from people in his immediate area.

Persona Two: John (Professor)

About John:

- John is a lecturer at SFSU who has been teaching for many years and is very passionate about his job.
- As John has aged, he has become increasingly frustrated with how complicated websites have become since the 90s when he started his profession.
- John wants an easily usable interface and is annoyed by extra details like ads.

Goals and Scenario

- With rising inflation John has had many issues where students of his were unable to purchase the required reading material for his class. He thinks that it would be much

easier if he could share his own ebook or other class related medias with students for a semester.

Persona Three: Jane (Student)

About Jane:

- Jane is a faculty member at SFSU who deeply values things like honesty and integrity.
- Jane is quite tech savvy and spends the majority of her free time on websites like reddit which has given her a strong grasp of the web.
- User interface is not huge issue for Jane however like most people she would prefer that it is easy to use and understand

Goals and Scenario

- Jane feels a strong conviction to make the web a safer place for the people who use it. After being scammed on craigslist multiple times she has become resolute in her new goal of policing the internet.

Persona Four: Joe (Admin)

About Joe:

- Joe is one of the admins of MarketGator who deeply cares about the user experience of the website. He has a strong user focus and likes the website to have good functionality and smooth user interface.
- Joe understands the web technologies, knows the ins and outs of the architecture of the website and has advanced programming skills.
- Joe has a lot of ideas for new features and changes but does not know if the users will like them or not.

Goal and scenario:

- Joe wants to release new features to stay relevant and ahead of competitors and get feedback on the new features from the existing users.

- Joe also wants the suggestions from the existing users to improve the website.

Persona Five: Jacob (Seller)

About Jacob:

- Jacob is a busy senior student at SFSU.
- Jacob has basic www skills and knows how to navigate and use all kinds of websites.
- Jacob has a lot of old textbooks which are in good condition and they have been in his apartments since he finished his junior semesters.

Goal and scenario:

- Jacob wants to get rid of his old textbooks and wants to get some extra cash for himself.
- Since being a full time senior student with a part time job, Jacob does not have a lot of free time. Jacob wants to sell his old textbooks at his convenience.

Use Cases

Use Case 1: Student Online Bookstore

Actor: Students, Faculty

Description:

Jane finds it difficult to get products and services at reasonable prices including books for their classes. As a result, she has to buy books often at expensive prices which is not ideal since she does not work enough to afford all the books she needs at full price. MarketGator will help with this problem by creating an online bookstore for the students and faculty of SFSU. Jane will browse MarketGator for books that were uploaded by either other students or faculty directly from the application at discounted prices instead of using services like Amazon and eBay where sellers would usually apply a premium price. Jane also discovers through MarketGator that faculty also hosts their course required ebooks for all the students in the class to download for free. Ultimately, MarketGator helps Jane get all her required textbooks in ebook format and helps her save money at the same time.

Use Case 2: User Moderation and Administration

Actor: Moderator, Students and Faculty

Description:

Joe is working as an administrator for MarketGator. MarketGator appears to be working properly however he seems to observe that users are uploading inappropriate media that is waiting to be approved to be published. Joe documents this inappropriate media and pinpoints the user who posted it for approval. Ultimately Joe denies the media from being published, and he gives a strike to the user who attempted to publish the inappropriate media. If the user does this again, they are banned from MarketGator as there will be a two-strike policy for account banning.

Use Case 3: Selling Items

Actor: Seller

Description:

Jacob wants to sell his notes containing important information and chapter summaries from the textbook he read after he passed his CSC256 course in order to recuperate some of the money he spent on the textbook. However, Jacob does not have the time to go around in person and ask colleagues if they are interested in buying his notes. Jacob then discovers MarketGator and becomes impressed by the easy navigation of media that is for sale organized by major and course number. Jacob then registers a MarketGator account and uploads his textbook notes under the tags CSC and 256 and advertises them for a dollar each download. By the end of the week, Jacob has already gotten more than ten sales on MarketGator.

Use Case 4: Free Download of Digital Media

Actor: Faculty Professor

Description:

Professor John is about to start a new semester of CSC 415 and he wants to have his students use the most recently released textbook on Computer Operating Systems. However, since the textbook is \$150 for a new edition, he wants to share his own digital copy that he bought with his new students. Professor John then uses MarketGator to register an account and upload the textbook under the tags CSC and 415. He chooses the option to have the digital textbook be downloaded for free so his students can easily access it. His students go on MarketGator, navigate to the CSC 415 results, register MarketGator accounts, and eventually download the newest operating systems textbook for free.

Use Case 5: Digital Media for Digital Media Trade

Actor: Buyer and Seller

Description:

Joe wants to purchase a digital movie off MarketGator, however they want to save their money. Joe messages the seller and asks if they are open to trading their personal library of tardigrade pictures for the digital movie and the seller accepts. MarketGator then facilitates the trade and sends the digital movie to the buyer and the tardigrade pictures to the seller. The buyer and sellers are satisfied, and the buyer ultimately saves money.

3. List of main data items and entities - data Glossary and Description

1. Users

- **Unregistered_user:** A general user without an account that can only search and navigate MarketGator and view seller posts.
- **Registered_user:** Inherits all functionality of unregistered users plus view all public pictures. Can post items for sale and buy items, but must be logged in.
- **Admin:** Inherits all functionality of registered users, but can modify user privileges, access all content, remove posts, modify database.

2. **Picture:** Public image accessible to all users

3. **Review:** Review that users are able to write for other users after a transaction. These include a rating and a description of why that rating was given.

4. **Transaction:** Transaction information with two user IDs of buyer and seller, transaction status, and a timestamp of transaction completion date.

5. **Item:** A media item with a listing price, sub-list items such as Course ID and or Major, description, and a single or multiple low-res photos of the digital media item.

6. **Private_message:** Message between buyer and seller to exchange contact or item information to complete a transaction.

7. **Registration_record:** The record of registration of a MarketGator user that holds information such as registration date and SFSU email.

4. Initial list of Functional Requirements

1. Unregistered User

- 1.1 Unregistered users shall be able to create a new account with valid SFSU email.
- 1.2 Unregistered users shall be able to access the homepage.
- 1.3 Unregistered users shall be able to browse listings.
- 1.4 Unregistered users shall be able to view the details of the listings such as price, pictures of the digital media, description of the digital media, classes and professors related to the digital media, ratings, and the reviews of sellers.
- 1.5 Unregistered users shall be able to sort and filter the items and the listings based on categories, price range, classes, reviews and etc.

2. Registered User

- 2.1 Registered users shall be able to sell items.
- 2.2 Registered users shall be able to buy items.
- 2.3 Registered users shall be able to log in with valid SFSU emails.
- 2.4 Registered users shall inherit all the access that unregistered users have.
- 2.5 Registered users shall be able to rate the sellers.
- 2.6 Registered users shall be able to write reviews on the items and the sellers.
- 2.7 Registered users shall be able to inquire about the items by sending a message to the sellers.
- 2.8 Registered users shall be able to receive responses from the sellers.
- 2.9 Registered users shall be able to respond to the messages from sellers.
- 2.10 Registered users shall be able to view the photos, conditions, and descriptions of the items they are selling.
- 2.11 Registered users shall be able to view the rating and reviews from the sellers.

2.12 Registered users shall receive the reviews and ratings on the items that have been sold to by another registered user.

2.13 Registered users shall be able to view the rating and reviews from the buyers.

3. Administrator

3.1 Administrators shall be able to log in with valid SFSU emails.

3.2 Administrators shall inherit all the access of registered users.

3.3 Administrators shall be able to review the listings from the registered users who are currently advertising a digital item for sale.

3.4 Administrators shall be able to deny listings that violate the rules and policies of the MarketGator before they are published.

3.5 Administrators shall be able to ban the registered users who violate the rules and policies of the website.

3.6 Admins shall be able to ask feedback from registered users on new features, user experience, and suggestions to further improve the website.

3.7 Admins shall be able to create, update, remove and improve the features and overall usability and functionality of the website.

5. Initial 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.
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 email 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, Fall 2022. For Demonstration Only"* at the top of the WWW page nav bar. (Important so as to not confuse this with a real application).

6. Competitive Analysis

The planned advantages between MarketGator and other online marketplaces already available is enticing for San Francisco State University students and faculty. While other online e-commerce marketplace competitors charge a fee for commission on buying and selling of items, MarketGator imposes 0% fees for all trades and even supports non-currency trade by providing the feature of trading digital media for digital media. This business model supports students especially as this will be the cheapest and most accessible way for them to buy and sell digital media without having to spend their own money. Another advantage is the specific search digital media by SFSU course number, professor, and major. This search feature will help students and faculty facilitate the findings of the digital media that they need in order to pursue their academic goals.

Marketplace	MarketGator	Competitor 1: eBay Inc.	Competitor 2: Amazon, LLC	Competitor 3: AliExpress
Fee	MarketGator takes away 0% portion of fees from sales	eBay takes away up to 12.9% of the sale price as a fee	Amazon takes away from 8% to 15% of the sale price as a fee	AliExpress takes away from 5% to 8% of the sale price as a fee
Fulfillment Method	MarketGator provides direct download of digital all items or local pickup	By courier or local pickup	Fulfillment by Amazon program or by courier	By courier
Purchase	Auction House and Buy Now	Auction House and Buy Now	Buy Now	Buy Now
Advertisement	Items are listed for free with no hidden fees	Sellers are charged when buyer purchases item	Sellers are charged when buyer clicks on item	Seller is charged the difference of their markup item price and wholesale item price
Registration	MarketGator provides absolutely free registration and service	Registering an eBay business account will impose selling fees on listing and selling of products	Basic Amazon account is free, however Amazon Prime is behind paywall to unlock all perks for buying items	Registering an account on AliExpress is free, however a commission fee is imposed when selling products
Search by SFSU course, major, professor	MarketGator is facilitates the search for digital media specialized for students and faculty	eBay does not have this feature	Amazon does not have this feature	AliExpress does not have this feature

Competitive Analysis Chart:

MarketGator vs Competitors (eBay, Amazon, AliExpress)

7. High-Level System Architecture and Technologies Used

- Server Host: Amazon Web Servers 1vCPU 2 GB RAM
- Operating System: Ubuntu Server 16.04 LTS
- Database: MySQL Community v8.0.30
- Web Server: Express 4.16.1
- Server-Side Language: JavaScript
- Additional Technologies:
 - Web Framework: Handlebars 4.2.0
 - IDE: Visual Studio Code 1.70.2
 - Web Analytics: Google Analytics 4
 - Image upload: Multer 1.4.5

8. Team Members and Roles

Patrick Celedio	Team Lead/Frontend Lead Engineer/Document Master
Michael Feger	Backend Lead Engineer
Ahmad Adnan	Github Master/Frontend Engineer
Rohit Devdhar	Backend Engineer
Nyan Ye Lin	Frontend Engineer
Ethan Lunderville	Backend Engineer

9. Checklist

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