SW Engineering CSC648/848 Section 01 Spring 2017

Student Swap

Group 06

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Milestone 2

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Revision 2

Revisions

Date	Description	Revisor
2/28	Added title page	*agaesser*
2/28	Added team info to executive summary	*agaesser*
2/28	Removed author names from sections	*agaesser*
2/28	Grouped functional specs	*AveryCC17*
2/28	Added “meet ups” to features, comp. analysis	*agaesser*
3/15	Removed “meet ups” from features, comp. analysis	*agaesser*

1. Executive Summary:

Student Swap is an online marketplace built specifically for San Francisco State University students. Users will be able to buy, sell, or trade goods and services that relate closely to the needs of college students. Many students have experienced the struggle of finding the right book or the right tv with short notice. Our service takes a hyper-local approach to online commerce - users will be engaging with others that are often within walking distance of one another. They use the same textbooks year over year, have the same sized dorm rooms (meaning they need the same size couches), and have taken the same classes, allowing some users to monetize their knowledge by offering tutoring or homework help. A user will often find a textbook from someone who lives in the same building, allowing them to effortlessly pick up their purchase. A graduating senior will easily find a buyer for their now unneeded dorm furniture, since incoming freshmen will be in need of the same kinds of products. Student Swap leverages this interconnectivity as a competitive advantage over other online marketplaces (such as Amazon), where you often have to pay for shipping and charges introduced by the middleman. “Student Swap” is the incomparable solution.

Student Swap offers a few additional features that simplifies shopping and engages users to return to the site in the future. Users can browse for items or services they are in need of, and post “wanted” ads for those things that aren’t yet available for sale. Buyers and sellers can contact each other directly to communicate about their service, and bookmark posts to return to later while they’re waiting for a response. Since all of our users are San Francisco State University students (or faculty), they all either live close to each other or attend classes on campus - putting them close enough to engage with each other on or near campus.

Student Swap’s greatest strength is the tight focus we gain by having users with similar needs and close proximity. Our product will further leverage these advantages with a simple and robust user experience, inexpensive direct marketing, and by offering a place to trade niche items and services unique to the needs of an SFSU student.

We are a team of 7 hardworking students dedicated to simple, elegant software solutions to real world problems. As both users and developers of Student Swap, we are uniquely positioned to create a product that is without peer in suiting the needs of the San Francisco State University marketplace.

2. Use Cases:

Case 1: Karen (***Unregistered Guest***)

Karen is a San Francisco State University (SFSU) student new to college life as a freshman. She is renting around an apartment at ParkMerced and is looking to find some furniture. She decides to try out the new “students only” website after seeing a marketing flyer on a local bulletin board. After going online and navigating to the site, she **browses** through the homepage where some **featured items** are displayed. She decides to narrow her search in the furniture category. She browses through the furniture, noting the date posted, seller rating, and the image of each item.

As she shops, clicking on each of them she is able to proceed to the item’s page to look up the details such as **date posted**, the **description**, **price**, and **condition** of the item. She finds something she likes and the link takes her to the items page. She decides to purchase, and is asked if she’d like to have them delivered to her for an additional fee. She decides to have it delivered to her apartment since it is too heavy for her to transport on her own. She then proceeds to **checkout** where she is prompted to login to her account or sign up for the first time with her SFSU email. After creating an account, it takes her to the **Open Orders** page where she can see all the items she purchased awaiting completion and any other posts she creates while looking or selling items on the website.

Case 2: Tom (***Member***)

Tom is a registered student of the SFSU who has used Student Swap as a **buyer** and **seller** in the past. Today, Tom is looking for a used textbook for a course offered at SFSU, but is not offered at many other schools. Knowing that he will have a difficult time finding it in a store, and not finding it on Amazon, he navigates to Student Swap where he had placed a **wanted post** indicating he is looking for an **unlisted item**. From there his wanted post is also added into his **Open Orders** page in the background while he continues his visit. He checks his **notifications box** to see if anyone had offered the textbook for sale since he last checked, but no one has listed anything. He needs the book for a class later, so he decides to search for an older version. He navigates to the books **category** and scrolls around where he finds a few entries for the book, listed for sale by different students. He reviews the condition of each book via the **images** in each entry, takes note of the **seller rating**, and uses the **contact** feature to message one seller to inquire whether they live within the same building as Tom (making it very

easy for Tom to pick up the book). He adds that and other options to his **wishlist** so he can quickly return to them later.

Case 3: Harry (***Administrator***)

Harry is an administrator for Student Swap and has come to his weekly check in to review both **flags** of the site and checked the **notifications box** and noticed a few cases. As an administrator, he cannot buy or sell, so his inbox contains only **cases** as well as having a unique UI design to designate he is in user mode. He notices a case in which a user's post was flagged. Clicking the **flag link**, he is instantly able to **review** the post and **mark** the post for deletion or mark it as resolved. Another user has been **flagged for review** for suspicion of wrongful activity. He reviews the user's **history** and determines that the user's behavior is in violation of the **Terms of Use.** He decides to **suspend** the account, disabling access. The user can appeal Harry or another **administrator** to review the action - either confirming or reverting the account status.

Case 4: Myriah (***Member***)

Myriah is a student at SFSU and has had trouble with immunology class and is in need of a tutor. Surprisingly, along with the items she bought on the school, she learned that people have also advertised for **services** held for students. She goes over the **categories** tabs and selects the "**services**" tab and scrolls though the subjects for a tutor under biology. Typing out the course in the **Class Bar**, she finds a few tutors that teach her course. Looking at the user **reviews**, she finds one who lists immunology as one of the courses offered for tutoring and the corresponding grade for the course along with written in the **description**. She thought that a B+ was an adequate grade for such a difficult course and looks at the **rate**. From there she clicks the **scheduling button** and it takes her to a **calendar** page. From there she can see his **availability** and the locations he can meet up "school or custom." She selects by highlighting and dragging over the hours she wants to be tutored. Afterwards it prompts her, she clicks confirm and is notified as soon as the tutor accepts the hours and location. She then waits in anticipation for the upcoming exam.

3. Data Definition

- **Administrators:** The administrators after proper authentication can have access to the site's database and information about the items posted. They may also browse the items posted. Admin will also check if any inappropriate items are posted by members and have the right to delete members' posts from the site at any time and suspend members' accounts by email indefinitely.
- **Cases:** a particular situation, this is particular to administrators. These are referring to flags done by other users or admins in order to be reviewed.
- **Flags:** a data marker, used to identify fraudulent items or users. For admins, it is in the form of a notification and contains the Flag Link as part of the message.
- **Flag Link:** the link to a flagged item, accessed by administrators for other users to be acted upon based on the situation
- **Suspend:** officially prohibit (a member) from their account or carrying out their usual role for a particular length of time, is implemented by administrators until removed as such
- **Members:** a member is registered to our site, He/she can browse for items or services. A member can also buy items and sell items. The member must create a post in order to sell an item.
- **Bookmark Button:** stores selected items or tutors for later comparison or to go back to
- **Buyer:** In order to buy items, buyers have to register with us as well. Buyers can contact with the seller using our site as well before they buy anything.
- **Contact:** a datafield which users can acquire in order to contact another user
- **Flagged for Review:** when an item is given special attention to by a member for the administrator to assess or examine with the possibility of instituting a change if necessary
- **History:** a chronological record of a user's past events made throughout the site
- **Mark:** a symbol made as an indication of something
- **Notifications Box:** an electronic folder containing notifications or alerts. Members can get notified for items being bought or sold depending on whether he/she is buying or selling.
- **Open Orders:** a page displaying orders of items a member wants to buy from a seller or different sellers. These orders are pending based on the fact that the seller must review the order of the buyer attempting to buy their item. Once a member proceeds to buy an item, they must log in or become a member.
- **Review:** an assessment or examination of something, is written by members that buy either services or items**.**
- **Scheduling Button:** a button that lets a member arrange a tutoring session during a specific time and place, as defined by the calendar**.**

- **Calendar:** a chart portraying the days, weeks, and months of a particular year and shows the availability of the tutor and what hours are already booked by other students
- **Seller:** Sellers must have an account on our site in order to sell their items on our site. Seller may post image(s) of the items and have to choose categories like books, music, etc. Sellers will be able to post items/services and must define the description and conditions if applicable to the sold items.
- **User Rating:** a ranking based on the assessment of the tutor or seller's performance, quality, or standard. Can only be done by other users that buy from them.
- **Services:** a system supplying a public need. For Student Swap, our key services is tutoring where members can offer tutoring sessions for courses they define in their post.
- **Class Bar:** search bar under the services category, can type classes to compare to different tutors that offer tutoring in that course
- **Rate:** the desired amount of money per hour in regards to tutoring services
- **Wishlist:** a list of desired items or services, contains all the wanted posts for a particular user. Can be seen by other users.
- **Student Swap:** an online marketplace built specifically for San Francisco State University students
- **Unregistered Guests:** Unregistered guests can browse for items. An unregistered guest may also register to become a member of our site as well as log in if they are a member.
- **Users:** Users can browse for items, which includes both unregistered guests and members. A user must log in with a valid sfsu email in order to buy and post items.
- **Browse:** to survey items for sale through the listings, search bar, or categories
- **Category:** a class of things having shared characteristics. This is how we will be organizing our items for Student Swap
- **Listing:** a page that displays multiple post summaries
- **Post:** the page that displays detailed information about the item/service
- **Date Posted:** the month, day, and year of when an item has been posted on the site for users to view(post)
- **Items:** Items are appropriate objects posted on the site to be bought/sold by members. An item's name, price, condition, dimensions, map of location, and image(s) are included in the item's description.
- **Availability:** the state of being unoccupied, where an item is able to be bought or a tutor is able to provide a tutor session
- **Condition:** the state of an item in regards to its appearance, quality, and/or working order portrayed as a text field for an item to be bought or sold(items)
- **Description:** a written representation of an item to provide information on an item or tutor(item)
- **Featured Items:** items made a special attraction in the site's home page
- **Image(s):** a visible representation or picture of an item displayed on the site(item)
- **Price:** the amount of money required to buy an item or service. For services, this is determined by the rate/hour**.**
- **Unlisted Items:** an item not listed or posted on the site(item)

- **Wanted Post:** a piece of content desired by a user, can be tutoring for a particular class or an item. Can be defined as keyword, category, and class (for service categories).
- **Terms of Use:** rules by which one must agree to abide in order to use our site

4. Functional specs

Priority 1

Users:

- Users shall be able to search using categories. The categories shall be easily identifiable and labeled using common keywords that are familiar with college level academia.
- Users shall log in before they finalize and confirm any purchase.
- Users shall provide their San Francisco State email as part of registration.
- Users shall be able to report false items, inappropriate images, and specific members/posts via “Report link” button.
- Users shall be able to navigate to individual item listings.

Members:

- Members who are selling shall receive notifications when a buyer has confirmed purchase.
- Members shall post advertisements on products they want to buy but are not currently available.
- Members shall have a notification box for successful purchase requests.
- Members shall be able to denote the conditions of their products.
- Members shall buy/sell services similar to how they buy items. In addition, they may purchase hourly blocks in the quantities that they want.

Admins:

- Administrators shall be able to delete posts that are deemed inappropriate or are in violation of the Terms of Service.
- Administrators shall not be able to modify posts.
- Administrators shall be able to suspend or remove accounts found to be in violation of the site’s Terms of Use.
- Administrators shall only have an inbox for cases with links to heavily reported listings and reviews.

Priority 2

Users:

- Users shall browse through the “Featured” items page on the website. The “Featured” page shall display products from sellers.

Members:

- Members shall be able to indicate or click the “star” icon on their favorite items.
- Members shall be able to rate their transaction after a successful meetup.
- Members shall be able to purchase related items based on their recent purchases on a the same page as the receipt.
- Members shall have their own personal wish list and able to add their most wanted items on said personal wish list.
- Members shall message other users about their listings.
- Members shall be able to buy/sell services by a calendar interface.

Priority 3

Users:

- Users shall be able to search for specific items by a search bar. The search bar shall be conveniently placed at the top of most pages for quick access by any user.

Members:

- Members shall have items hand delivered for additional fee.
- Members shall be able to have items delivered to their homes..
- Members shall file for appeal when they are suspended.

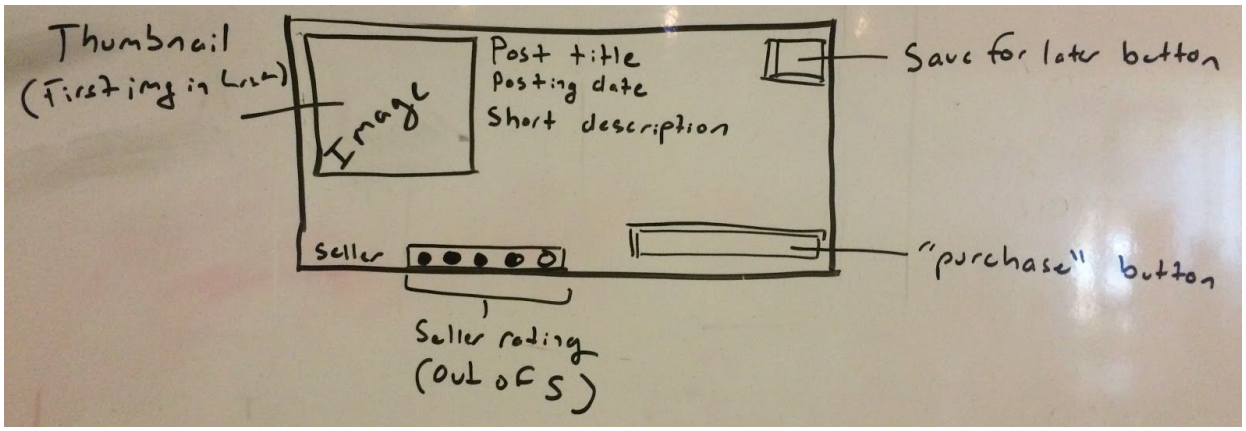
5. List of non-functional specs

1. Application shall be developed using the LAMP stack.
2. Application shall be developed using pre-approved set of software development and collaborative tools.
3. Application shall be hosted and deployed on Amazon Web Services.
4. Application shall be optimized for desktop/laptop browsers of Chrome,Safari,Internet Explorer.
5. The application shall render correctly on the latest versions of all major browsers.
6. The application shall adequately render on browsers of mobile devices.
7. Data shall be stored on team MySQL database.
8. Application shall be hosted on team account.
9. Application shall not support more than 50 concurrent users.
10. Application shall appropriately protect privacy of users and notify users appropriately.
11. Application shall have a Terms of Use page prior to registration.
12. The language of application shall be English.
13. The application shall be intuitive to use and easy to use.
14. The application shall include Google Analytics.
15. Messaging between users shall be done by class-approved methods.
16. Pay functionality shall not be implemented on the application.
17. Website security practices shall be applied.
18. Modern software practices including collaboration shall be applied.
19. The website shall prominently display “SFSU Software Engineering Project, Spring 2017. For Demonstration Only” on all pages.

6. UI Mockups and Storyboards

6.1 Basic UI Elements:

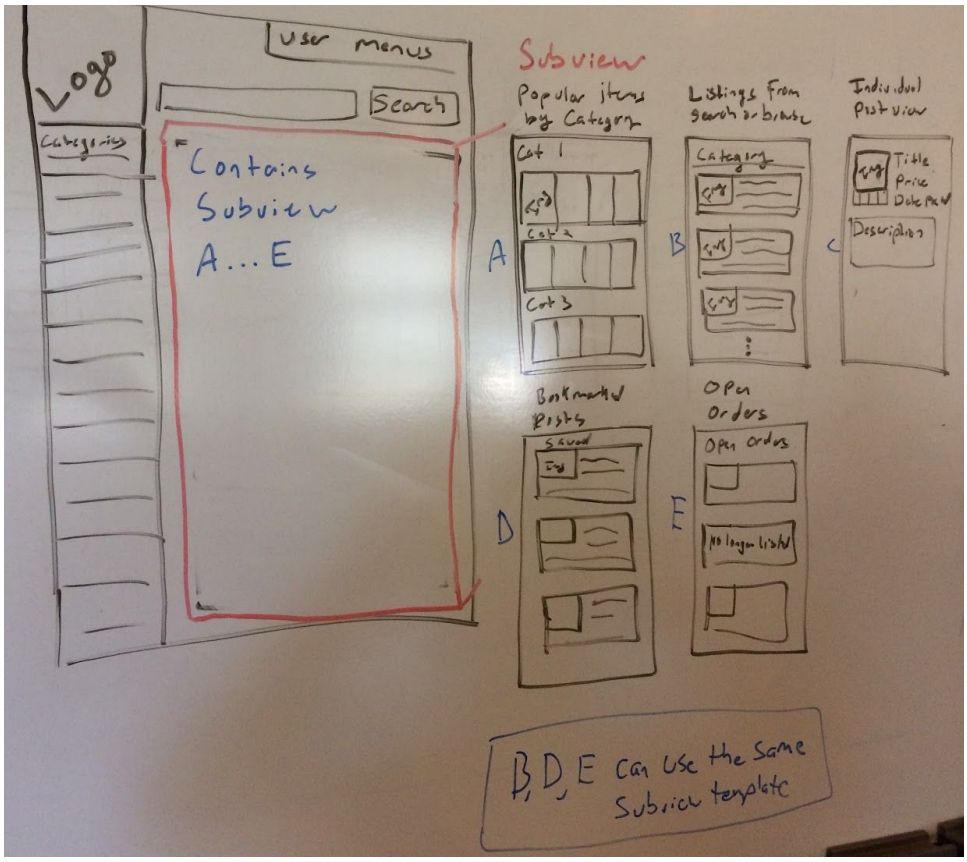
Card:



This is an example of a “**card**” which is a container that can hold items for sale or wanted items. It is designed to be flexible and reusable in different contexts. Some examples of use include:

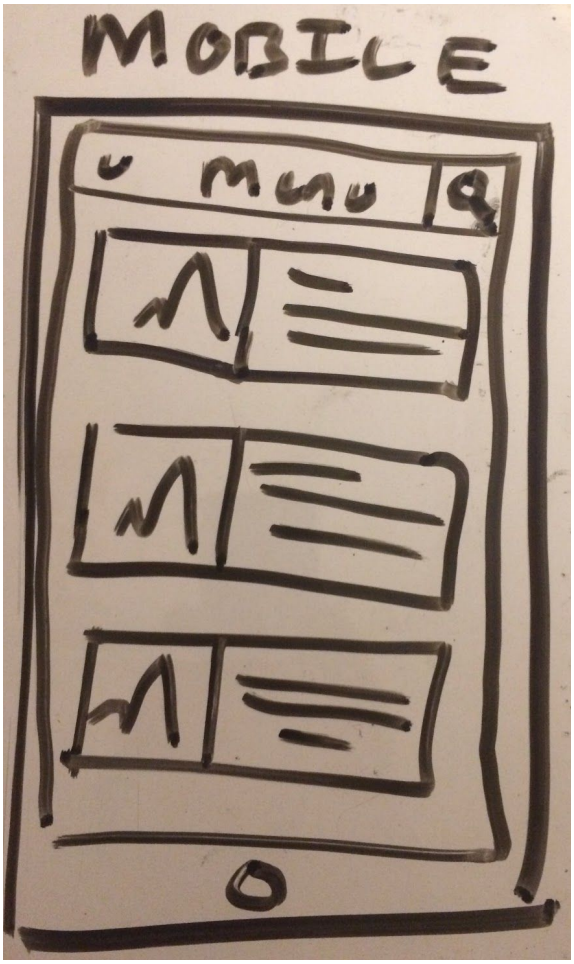
- As an array of items in **Listings**, which users can click on to view individual **posts**
- As an array of items in the **Open Orders** view, which contains incomplete transactions
- As an array of items in the **Wish List**, which contains posts saved for later
- As an array of items when **browsing** under **categories**

View Template and Subview examples:



The desktop version of the site will have a static “templated” display. This template will always display the categories list, logo, search bar and button, and user menus. Contained in the template is a **subview** which changes based on context. This allows users to always have a logical next step when navigating the site, and avoids navigational “dead ends.” Note: not all subviews are represented here.

Mobile View:

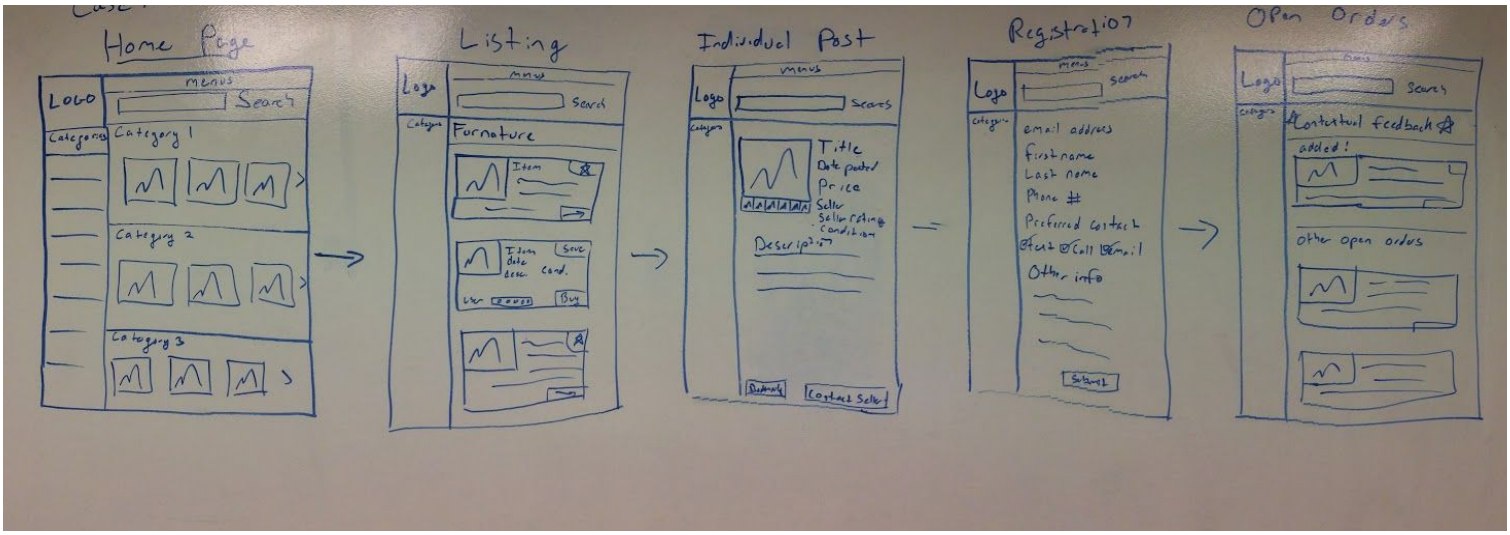


The **mobile view** takes advantage of **subviews** by abstracting the **template** menus into a drop down at the top, with a search button. The contextual subview can thus be reused with little modification, and site navigation is retained. Emphasis is placed on browsing over searching or account maintenance.

6.2 Workflows

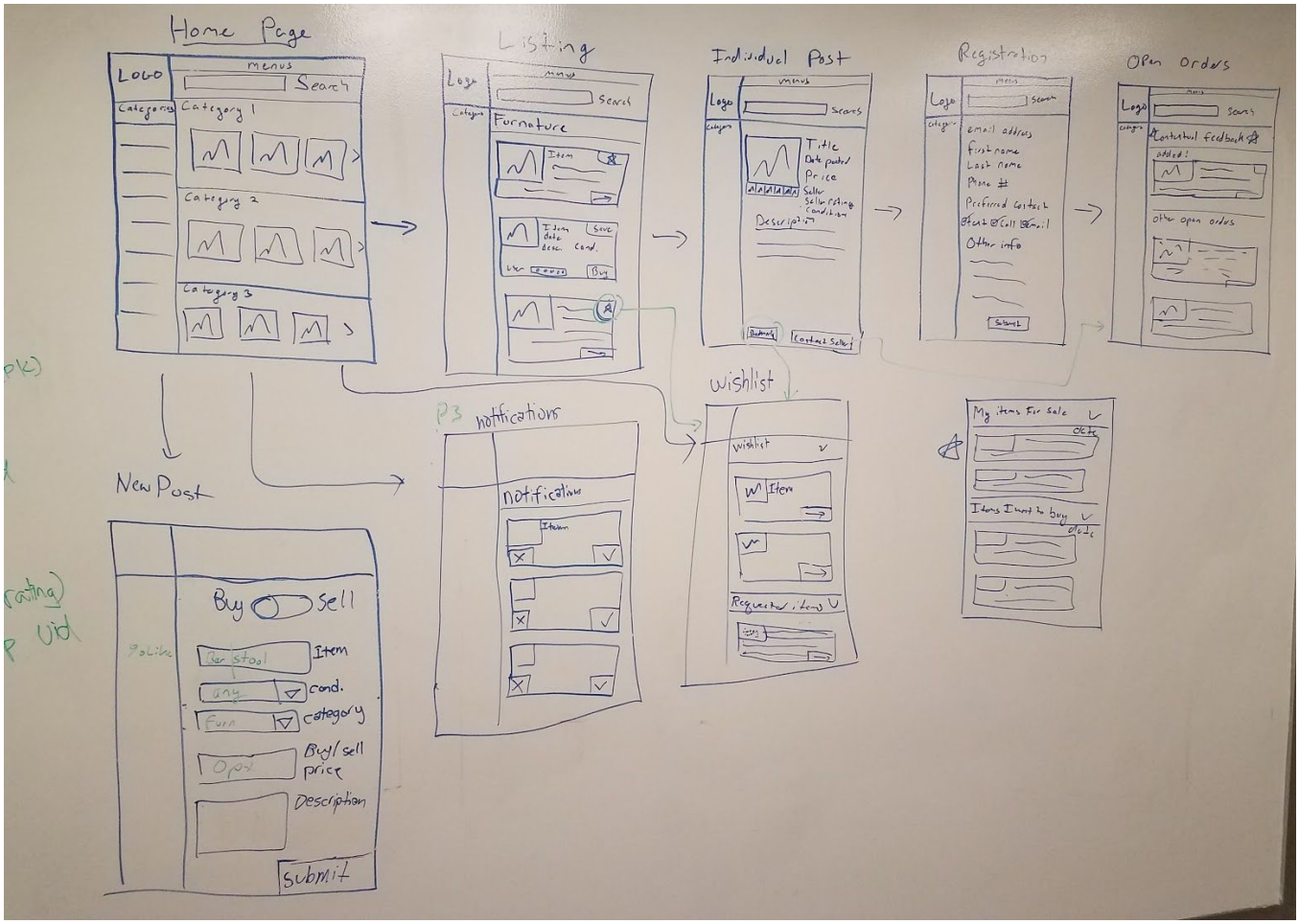
Please see the related case in section 2 for in-depth descriptions.

Case 1:



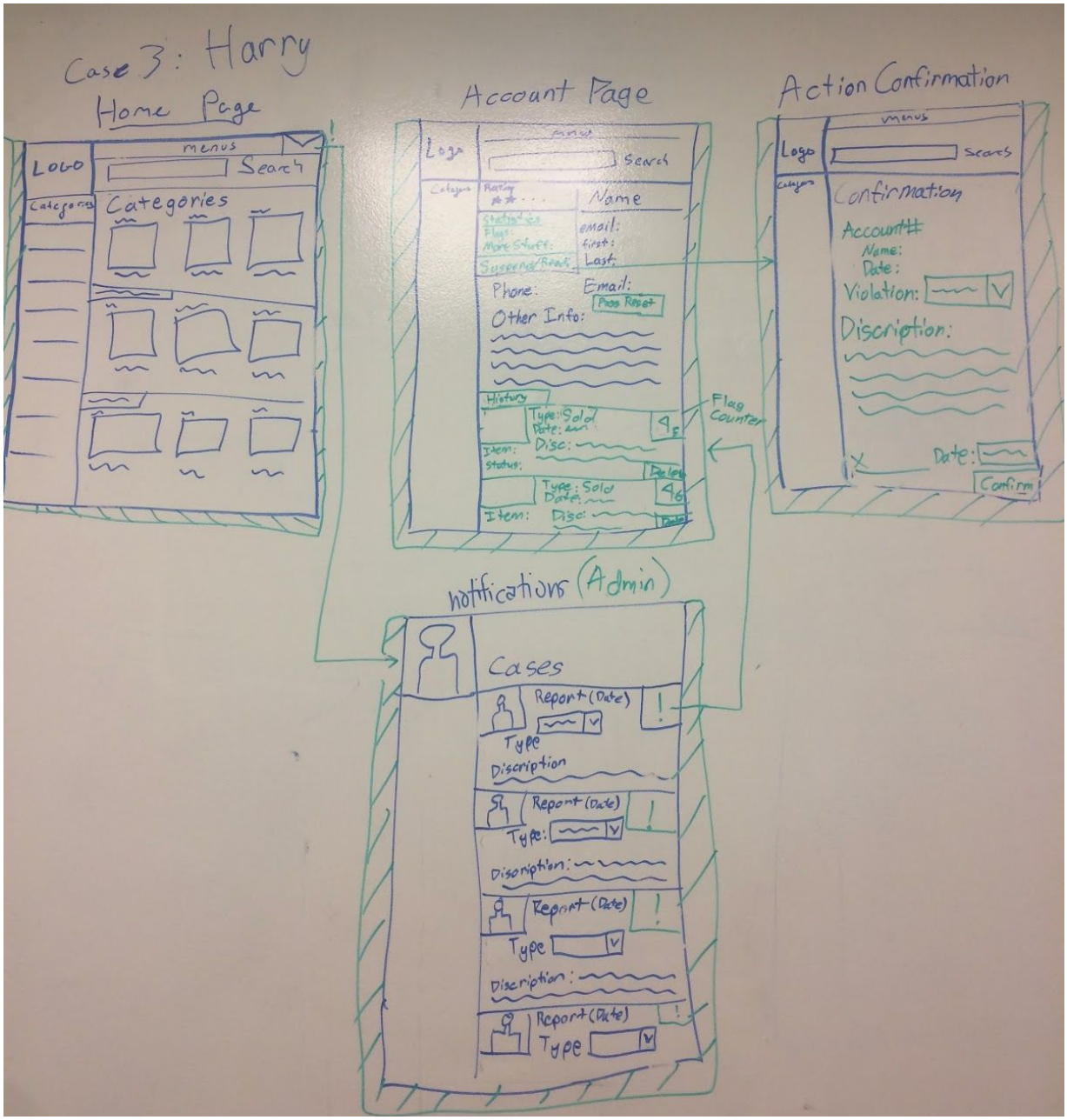
This workflow captures Use Case 1, where an unregistered user browses for furniture before deciding to contact the seller to purchase. The workflow demonstrates beginning at the home page, viewing listings (either search results or a category **browse**, the display is identical), clicking into an individual **post**, being prompted to **register**, and finally ending up in the **Open Orders** view confirming that the seller was contacted.

Case 2:



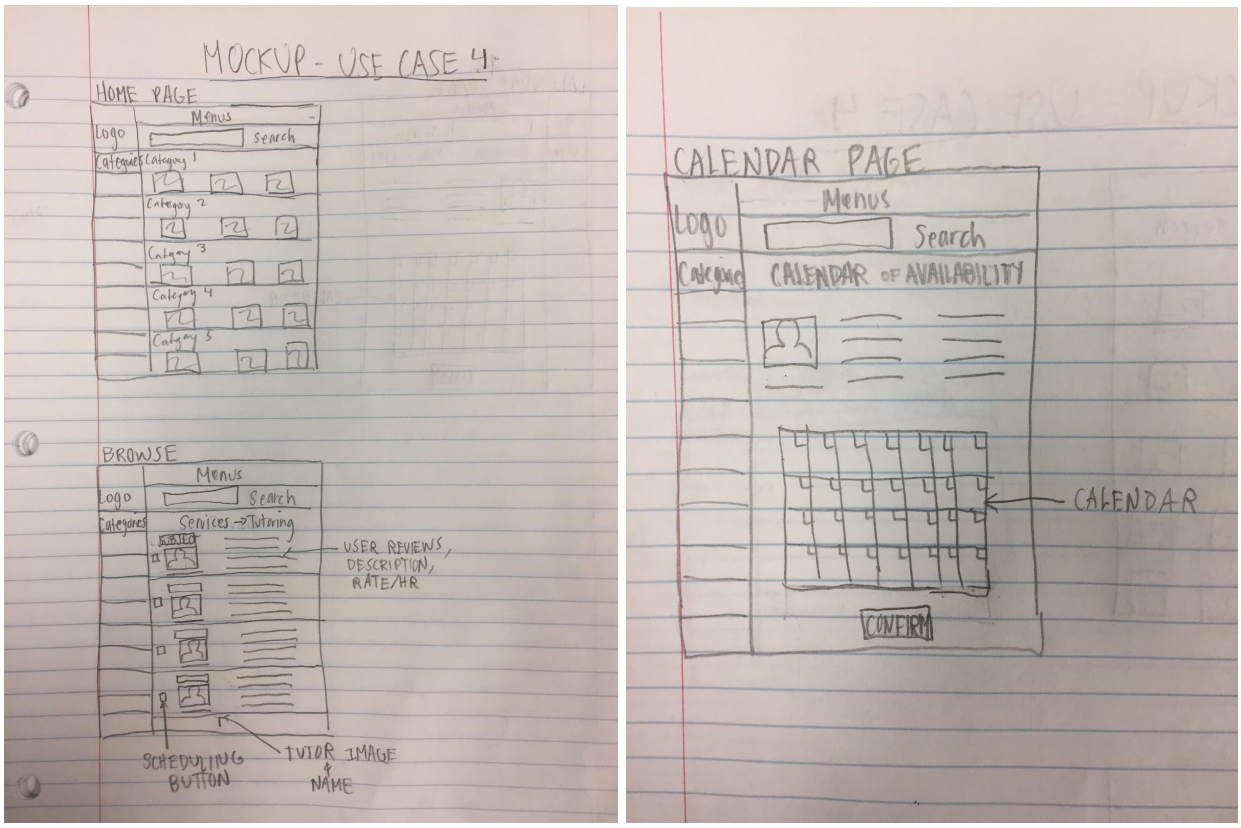
This workflow captures Use Case 2, where a **member** who has both experience as a **buyer** and **seller** visits the site to buy a book. Unable to find the item he is looking for, he creates a **wanted post** to let future sellers know he is looking for the item. This case also demonstrates bookmarking posts to return to later via the **wishlist**, as well as a rudimentary **notifications** section, which will likely be consolidated into either the **Open Orders** or **Wishlist** views as the utility is determined.

Case 3:



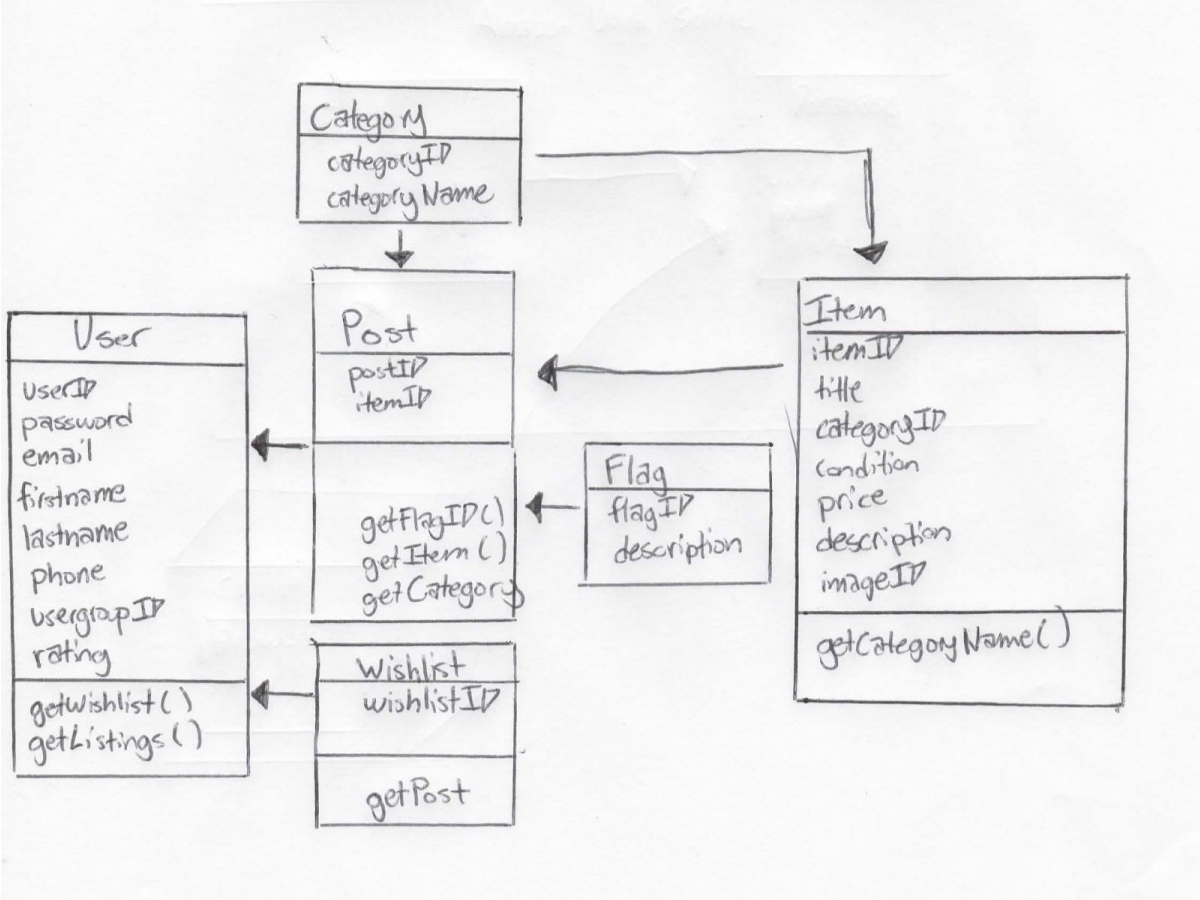
Case 3 demonstrates some administrative functions. Admins will access the same views as members as guests, but will have access to additional toggles and actions. These are demonstrated in green.

Case 4:



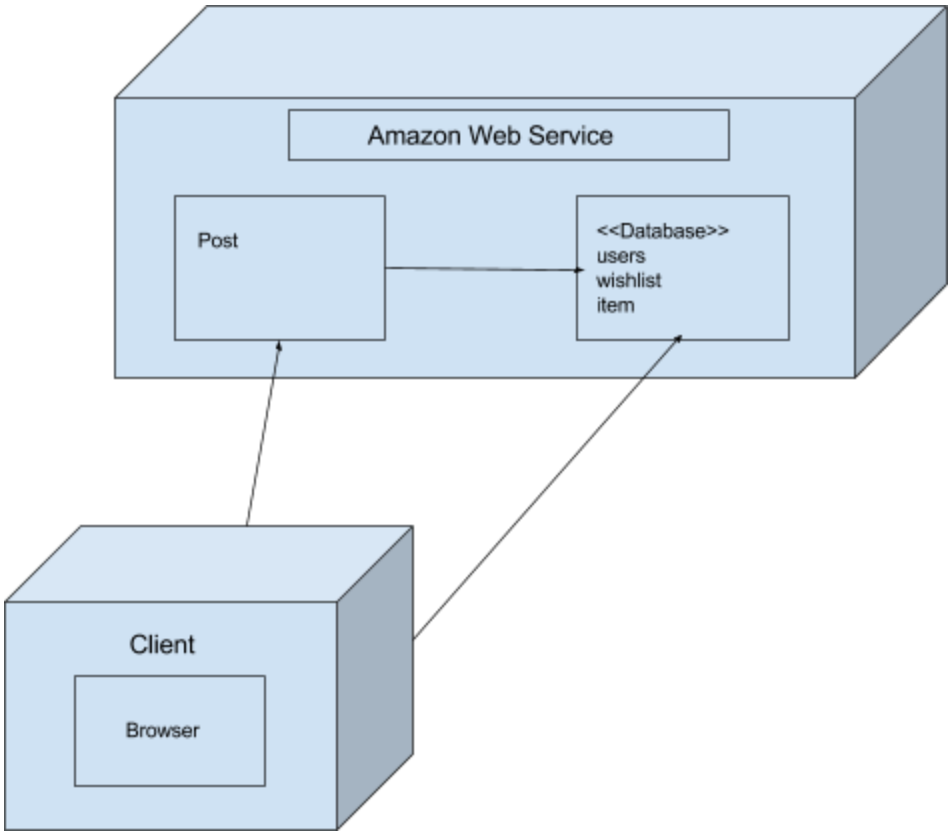
Case 4 demonstrates a user browsing for tutoring, a **service** that is functionally similar to an **item**. Key differences include a lack of **condition** and the addition of a **calendar** to assist buyer and seller in scheduling sessions.

7. High Level UML Diagrams



UML diagram for classes

UML Deployment Diagram



8. Competitive analysis

Feature	Student Swap	studentlistings.com	sellstudentstuff.com	amazon.com
Shopping cart	+	+	+	+
Buy/sell directly	++	+	+	-
Ratings	+	+	+	+
Wishlist	+	+	-	+
Price Comparison	-	+	-	+
Multiple product types	+	-	-	++

Student Swap has two clear advantages over competitor sites. One is the hyper-local focus that allows students to quickly and easily buy and sell to other SFSU students without needing to browse and parse large lists of information, or to deal with shipping and handling. The other is the ability to offer services and other product types outside of textbooks. This facilitates the exchange of other items or services that are key to the target demographic, like tutoring or dorm furniture.

9. High-level system architecture, database organization

9.1 High-level system architecture:

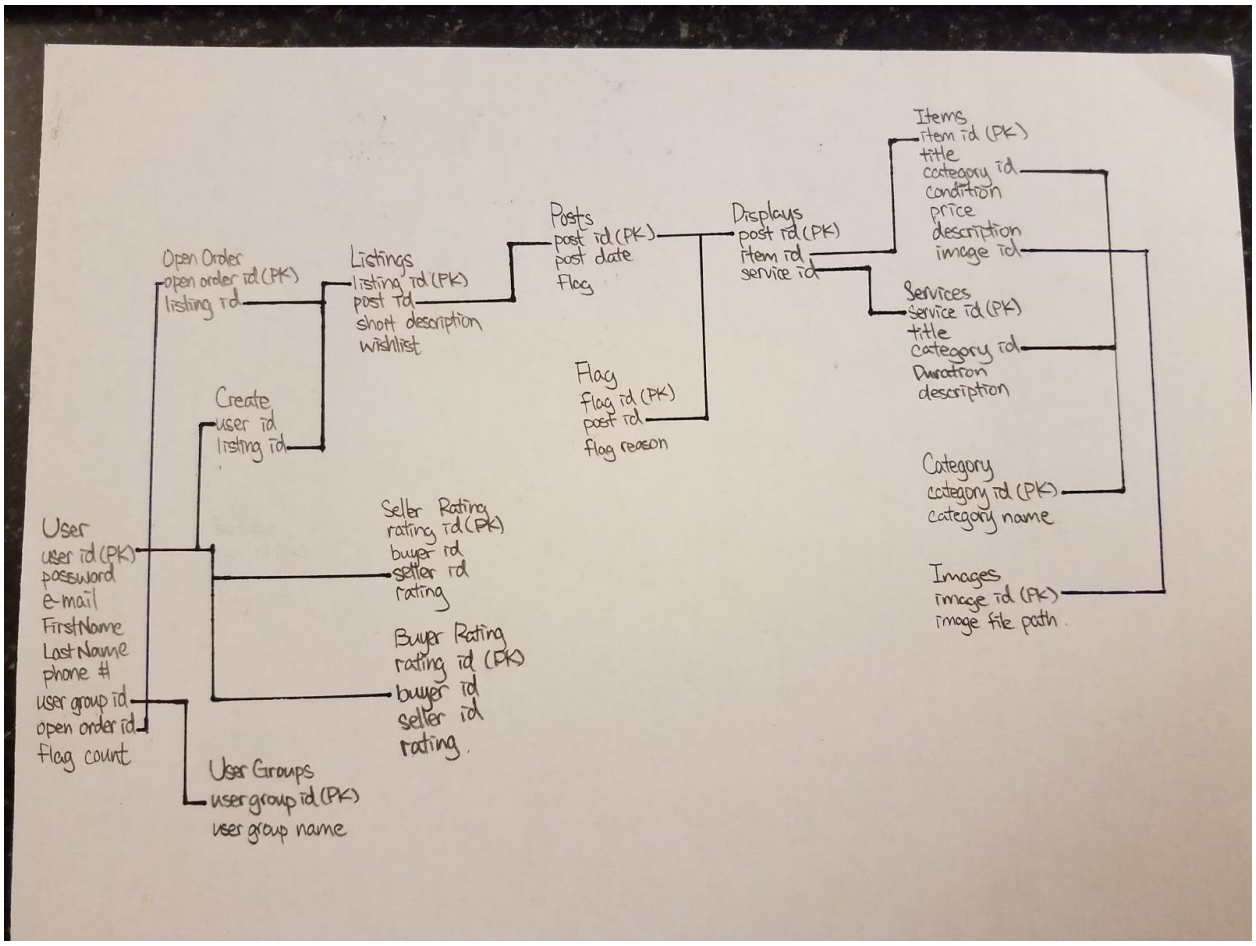
LAMP Stack: Web platform to run websites.
Linux: The base layer for the operating system.
Apache HTTP Server: Web server software providing a variety of extensions and modules.
MySQL Database Management System: Relational database management system for web application development.
PHP Programming Language: Scripting language for web development.
Amazon Web Services: Cloud computing platform web service.
Github: Git-based version control and source code management web service.
Symfony: PHP framework containing various templates and libraries.
HyperText Markup Language (HTML): Markup language for web pages and applications.
Cascading Style Sheets (CSS): Style sheet language for presentation and design of web pages.
Bootstrap: Front-end web framework to design web applications.
JavaScript: Object oriented programming language.
Google Analytics: Provides tools to measure and gain consumer insight.
Supported Browsers: Chrome, Firefox, Safari, Edge
Twilio: Messaging API

Images will be saved in the file system.

Application shall use SQL like wildcard function for the searching architecture. Search post titles entries.

Application shall use SQL average function rating algorithm.

9.2 Database organization:



Database schema with map of connections.

10. Key Risks

1. Skill Risks

   Our team has varying technical skill levels. Many of us are using the Symfony framework for the first time, and extra time will be required in order to compensate for learning as we go.

2. Schedule Risks

   The team has submitted a master schedule of availability, from which two weekly meeting blocks have been derived. Regardless, it is natural that student's schedules are typically more dynamic than in industry, and special consideration will need to be given to high-workload periods before exams and projects. Additionally, students often work nontraditional shifts, further complicating scheduling synergistic effort on this project. The team will function more like a distributed team than a local one, and care will need to be taken in reading and completing tasks in a timely fashion. Asynchronous communication resolves the need for coworking and meetings.

3. Technical Risks

   While the technology used in this application is familiar to many on the team, the vertical integration is entirely new. In order to sidestep potential issues, the team will need to study the stack independently and work on integrating these technologies as early as possible.

4. Teamwork Risks

   This is the first time many of our team have worked in a group this large. There are inherent organizational and communications risks. Key pressure points will be assignment of tasks, timely completion of tasks, communication between team members concerning interdependent tasks, and conflict resolution on organizational and architectural disagreements. Open, consistent, non-combative communication will be enforced.

5. Legal Risks

   Student Swap is subject to a host of legal risks due to its purpose as an online marketplace. It could be used for the trade of illegal items, like drugs or stolen property. Listings could be made with the sole purpose of defrauding buyers, and sellers could invent clever ways to defraud a buyer. The Terms of Use will explicitly forbid misuse of Student Swap, and abusers will be banned.

11. Team

Alex Gaesser – Chief Executive Officer:
Will handle all executive decisions in regards to the development of the product. Will be ensuring a well managed and proper work scheduling for team meetings. Secondary duties include handling any issues brought forth by the team as well as keeping in contact with Head CEO.

Gregory Ruffin – CTO:
The chief technical officer will be in charge of all coding and technical aspects of the development team. He will be lead advisor for all technical decisions made for the back end of all of the product's development stages. All issues and oversight on the coding of the product will be handled by the CTO.

Anthony Ma – documentation, system design, front-end programmer:
Handles all forms of development documentation as well as the system design of the website. Ensures all tasks are allocated to the appropriate team member and keeps tabs on the overall assembly line for our product development.

Robin Ma – front-end programmer, Database engineer:
Develops the database for the website as well as maintain the stability of the website environment, ensuring the database server is well organized and properly oversighted.

Leanna Pangan – Documentation, Database architect, Website Design:
Develops mobile and desktop interface for both front and back end. Contributes to database design and implementation, including how it interfaces with the website.

Avery Chua – Documentation, System Architect:
Will work and ensure Milestone documentation is written and consistent across the works of all the team. This will ensure synchronization of documentation through all the team members works. Along with that, he will understand the overlying architecture of the website and ensure maximum user experience with the concept of ease and consumer demographics in mind.

Elric Dang – back-end programmer:
Ensures code is working and properly maintained and documented. Supports all back end programming to ensure the overall structure of the code is functional. Develops, tests, and implements features.