EECS 582 Spring 2019

Team 9 Final Project Design

Book Trader

11 February 2019

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Project Synopsis

Book Trader is an app that allows KU students to buy and sell used books and other school supplies from one another in a quick and easy manner.

Project Description

Why is the project being undertaken?
This project's purpose is to provide a simplified means for KU students to buy and sell school books and other school supplies with one another. Through an iOS app with a simple user interface, our project allows students to get the most out of their book transactions.

Describe an opportunity or problem that the project is to address.
Students run into a number of obstacles when buying and/or selling their school books. First of all, buying brand new school books is expensive. And while buying used school books and rentals through traditional vendors can solve this problem by being more cost-effective, these vendors don't always carry the used book you're looking for (e.g. custom-edition books unique to schools). Our app makes it easier for students to buy used books by providing them with an interface to interact with fellow students on-campus, in a community where there is a high likelihood that there is someone else who has what you need. On top of this, students are afforded another avenue in which to sell their books when they can't find a vendor that will buy back from them.

What will be the end result of the project?
Buyers will be able to purchase school books/supplies at cheaper prices from others in a quick, easy manner, and sellers can sell their books at a fair price without having to worry about the fees of a middleman service.

Project Milestones

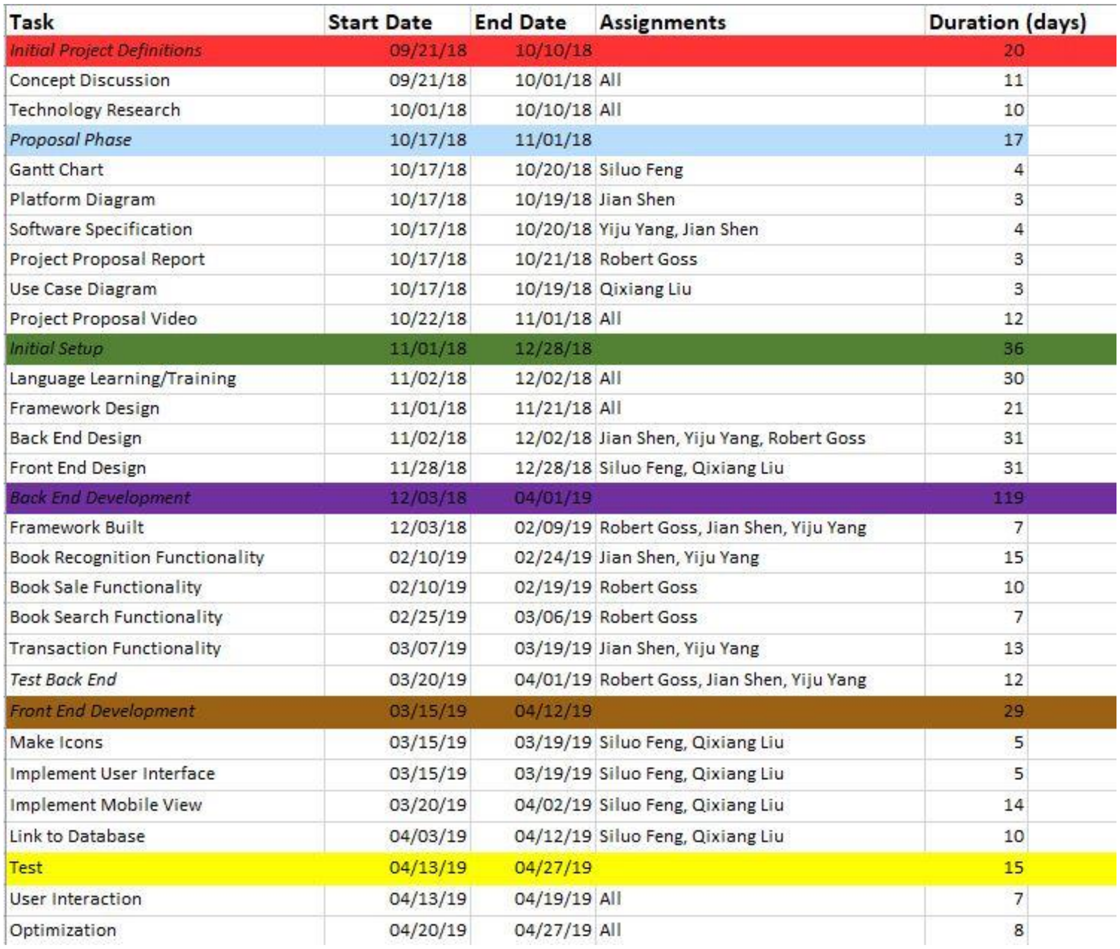
First Semester

Objective	Anticipated Completion Date
Framework Design	11/21/18
Back-End Design	12/2/18
User Interface/ Front-End Design	12/28/18

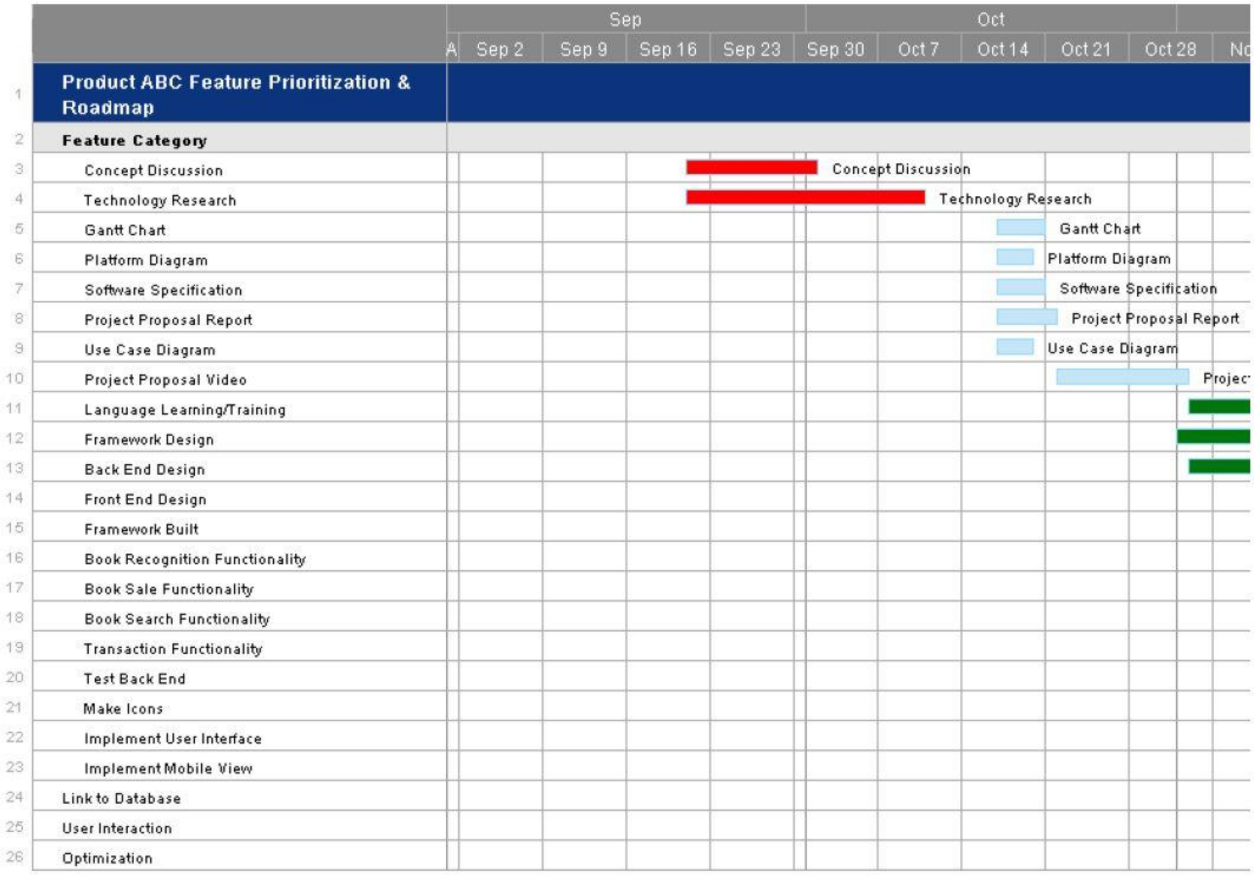
Second Semester

Objective	Anticipated Completion Date
Framework Completion	2/9/19
Completion of Back-End	4/1/19
Completion of Front-End	4/12/19
Completion of Product and Documentation	4/27/19

Gantt Chart



Task	Start Date	End Date	Assignments	Duration (days)
Initial Project Definitions	09/21/18	10/10/18		20
Concept Discussion	09/21/18	10/01/18	All	11
Technology Research	10/01/18	10/10/18	All	10
Proposal Phase	10/17/18	11/01/18		17
Gantt Chart	10/17/18	10/20/18	Siluo Feng	4
Platform Diagram	10/17/18	10/19/18	Jian Shen	3
Software Specification	10/17/18	10/20/18	Yiju Yang, Jian Shen	4
Project Proposal Report	10/17/18	10/21/18	Robert Goss	3
Use Case Diagram	10/17/18	10/19/18	Qixiang Liu	3
Project Proposal Video	10/22/18	11/01/18	All	12
Initial Setup	11/01/18	12/28/18		36
Language Learning/Training	11/02/18	12/02/18	All	30
Framework Design	11/01/18	11/21/18	All	21
Back End Design	11/02/18	12/02/18	Jian Shen, Yiju Yang, Robert Goss	31
Front End Design	11/28/18	12/28/18	Siluo Feng, Qixiang Liu	31
Back End Development	12/03/18	04/01/19		119
Framework Built	12/03/18	02/09/19	Robert Goss, Jian Shen, Yiju Yang	7
Book Recognition Functionality	02/10/19	02/24/19	Jian Shen, Yiju Yang	15
Book Sale Functionality	02/10/19	02/19/19	Robert Goss	10
Book Search Functionality	02/25/19	03/06/19	Robert Goss	7
Transaction Functionality	03/07/19	03/19/19	Jian Shen, Yiju Yang	13
Test Back End	03/20/19	04/01/19	Robert Goss, Jian Shen, Yiju Yang	12
Front End Development	03/15/19	04/12/19		29
Make Icons	03/15/19	03/19/19	Siluo Feng, Qixiang Liu	5
Implement User Interface	03/15/19	03/19/19	Siluo Feng, Qixiang Liu	5
Implement Mobile View	03/20/19	04/02/19	Siluo Feng, Qixiang Liu	14
Link to Database	04/03/19	04/12/19	Siluo Feng, Qixiang Liu	10
Test	04/13/19	04/27/19		15
User Interaction	04/13/19	04/19/19	All	7
Optimization	04/20/19	04/27/19	All	8



1	**Product ABC Feature Prioritization & Roadmap**
2	**Feature Category**
3	Concept Discussion
4	Technology Research
5	Gantt Chart
6	Platform Diagram
7	Software Specification
8	Project Proposal Report
9	Use Case Diagram
10	Project Proposal Video
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12	Framework Design
13	Back End Design
14	Front End Design
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16	Book Recognition Functionality
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18	Book Search Functionality
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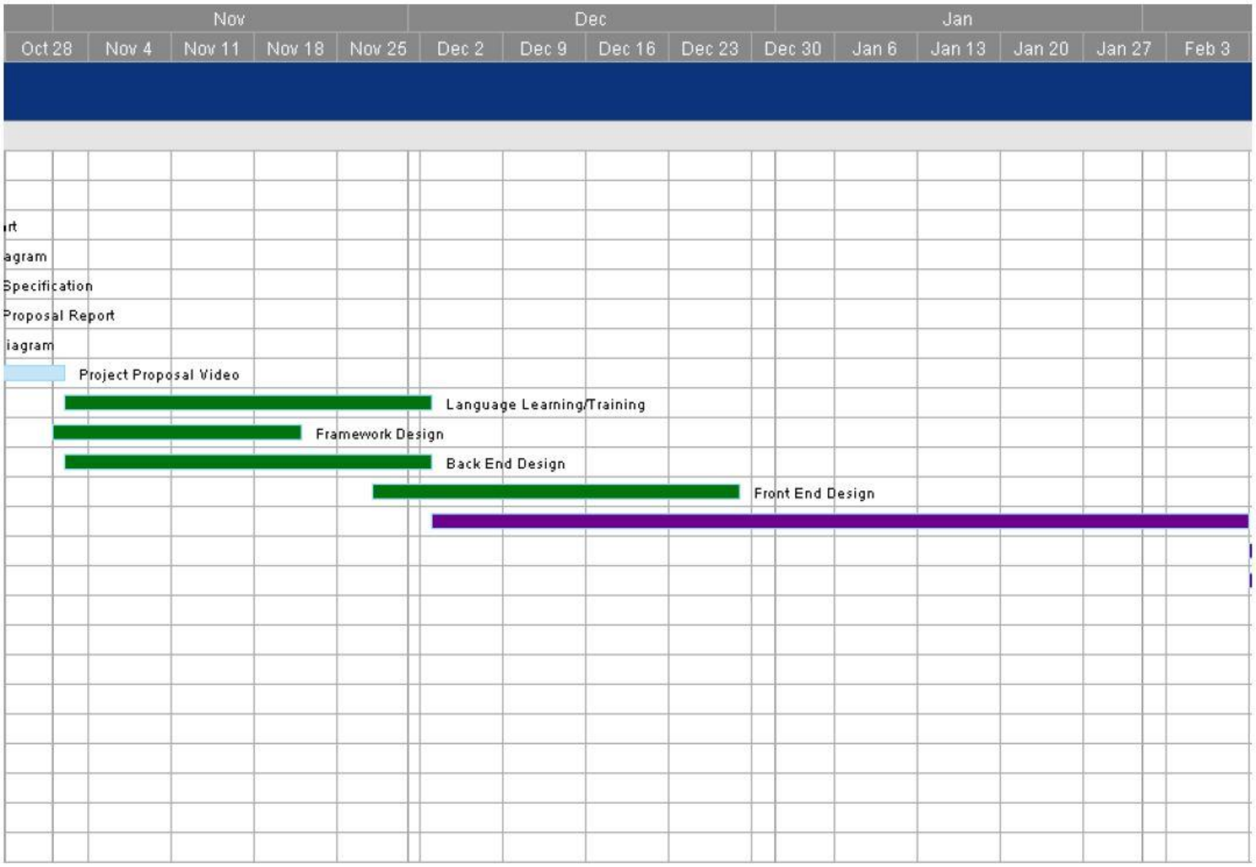
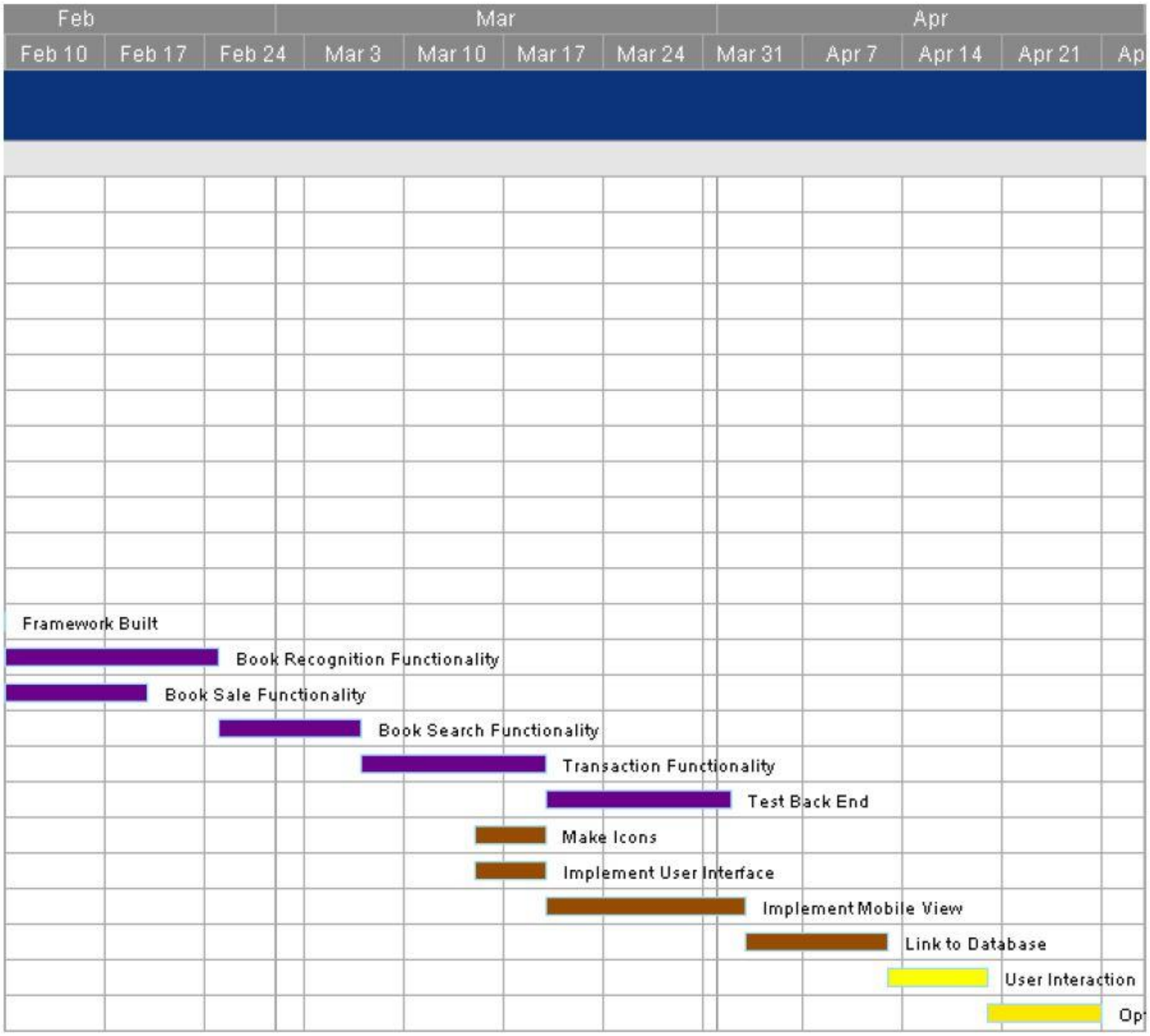
22	Implement User Interface
23	Implement Mobile View
24	Link to Database
25	User Interaction
26	Optimization





Project Budget

With the exception of an annual Apple Developer membership cost of $99.00, there are no other anticipated project costs. All of the other resources at our disposal are free of charge. The software that we will be using is practically all open-source. Training will also not incur any costs. On top of all of this, we will not need to acquire any special hardware for the completion of our project as well.

GitHub Repository

https://github.com/YijuYang/Senior_Design

Work Plan

Team Members

Tasks

	Siluo Feng	Robert Goss	Qixiang Liu	Jian Shen	Yiju Yang
Research on iOS Development	●	●	●	●	●
Front-End Design	●			●	●
Back-End Design		●	●		●
3rd Party Book Pricing Reference (Utilizing Databases)		●	●		●
3rd Party Location Services Research/Development			●		
Communication	●	●			●
Documentation		●	●		
Testing			●	●	
Debugging and Optimization	●	●	●	●	●

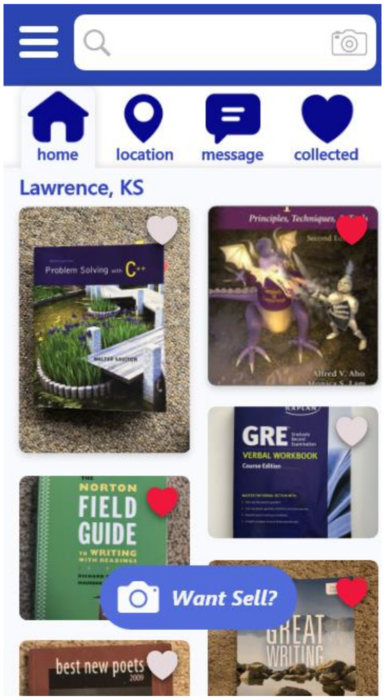
Final Project Design

Overview

Book Trader consists of two layers: a front-end web app built on iOS written in Objective-C, and a server hosted by Amazon Web Services (AWS), using MySQL as the database management system. For the purpose of providing users with information on the books they are buying/selling, we will be pooling information from the databases freely available through Goodreads. There is also the potential for us to utilize Google Maps (or possibly another location service) in providing users a means to locate each other for face-to-face transactions.

Using the App

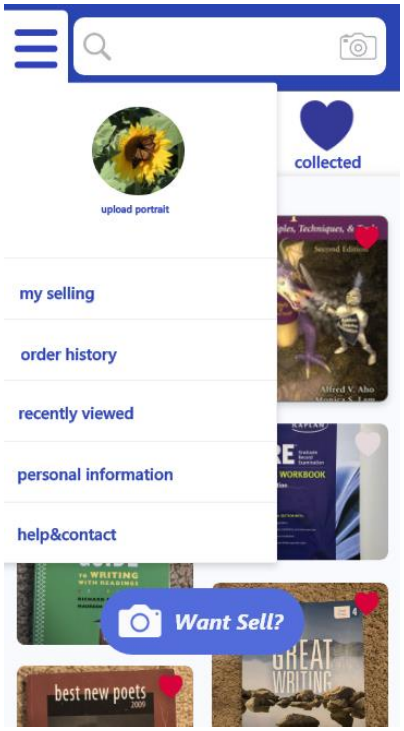
The Homepage



On the front-end, all users are required to have created an account before being able to use the application. Upon creation of an account, all users will have the option to either buy or sell books.

Buyers can search for the books that they need via class department and number. That will be the first way that users can search for books. This won't necessarily be the only way to search for books, as there is also certainly room to allow other means for searching for books, such as entering an ISBN number, or simply entering the book's title. However, we feel that the use of the class number will serve as the quickest and easiest way for buyers to find the books that they want. So, development of that feature will take priority over other means for searching for books. On top of that, if buyers are not able to find a certain book that they are looking for, they can put out a request for that book.

Profile View

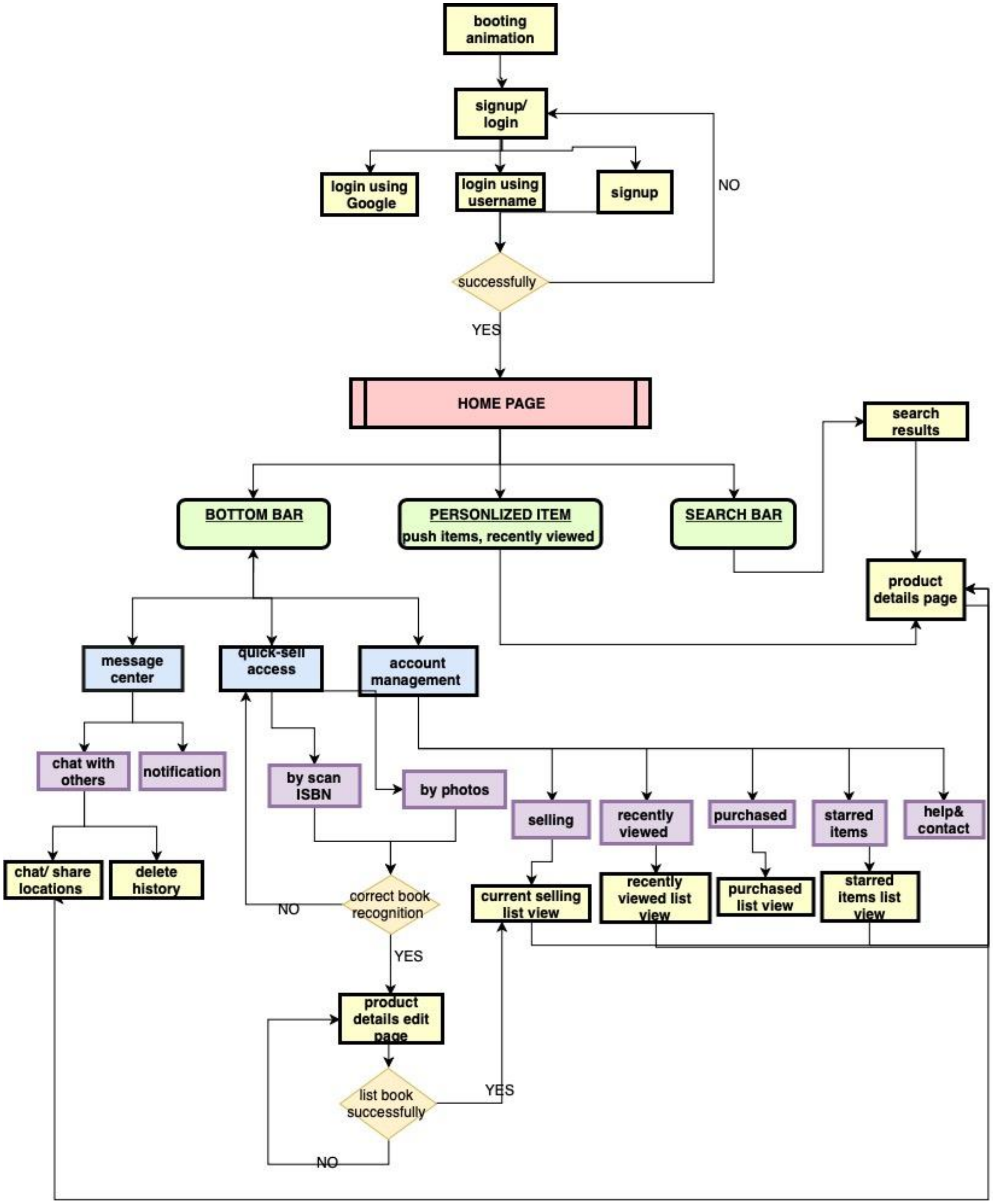


Sellers are also offered a simple way to list their books. Simply by scanning their book's ISBN code, they can quickly gather all of the necessary information pertaining to the book (e.g. edition, publication date, etc.) and find an appropriate price to charge for the book, which is retrieved via an online database. On top of this, we would also like to implement a machine learning feature that can simply scan the title or cover of the book and find the pricing and information for it as well.

When it comes to the pricing of books, it will be at the seller's discretion as to how much money they want to charge for their book. That being said, buyers will be provided with a suggested listing price (e.g. the lowest price offered by an online vendor for the book) for the book to compare with what the seller is charging. This should motivate sellers to charge a fair price for the book that they are selling.

All users can easily communicate with each other via a messaging system that will be incorporated into the app. They can negotiate prices and meeting places for face-to-face transactions this way. Since this project will only serve students at the University of Kansas, making face-to-face transactions should be simple. As for the payment system, users will use cash during their face-to-face transactions. That will be the primary means for transactions.

A Flow Diagram of the UI



Administrative Responsibilities

As administrators, it is extremely important that we design our product such that our users' personal and financial information is secure. This means limiting the amount of personal information that users can procure from one another and ensuring that our payment system is not vulnerable to any sort of hacking that may lead to theft of funds. This issue will be discussed further in the ethics section of this report. Administrators can also make announcements to users about recent updates to the app, among other things.

Potential Add-On

There is the potential for us to incorporate the feature of allowing users to make transactions for other school supplies besides school books. The incorporation of this feature would likely require the pricing of items to be done solely at the discretion of the seller, as the suggested price listing of our system is tailored towards school books. It would then also be the responsibility of the buyer to do their research on the appropriate price that they should pay for the item they are thinking of buying.

Design Constraints

When it comes to the design constraints of our project, there are a number of things to consider. First of all, and as I mentioned earlier, when incorporating the feature of allowing transactions of items besides books, the app won't be able to make any suggestions as to the pricing of such items. This is because the databases we will pull from will only contain information on books. So, it will be up to the users to negotiate a price. In this way, this aspect of the app would operate in the same manner as marketplaces like Craigslist do, where there is no authority over how much an item should cost.

While discussing the matter of suggested price listings for items, another thing to consider is that some books, such as custom-edition books available only at the University of Kansas, may not have any data available online. In these cases, these books would have to be treated in a similar manner to how non-book items are treated, such that suggested prices may not be available for them. It will then be the users' responsibility to negotiate prices in however way they see fit.

There is also the issue of preventing fraud within our system. What if sellers lie about the books that they are selling, and sell damaged/false books? How can buyers be sure they are buying from someone trustworthy? We do not have access to a fool-proof identification system for users. The ideal solution would be to require users to use verified accounts that are linked to their KU student accounts, so that dishonest users can be tracked down and dealt with accordingly by school officials. The problem there, is that obtaining access to that user information from the school is very likely beyond our reach. Another solution could involve us incorporating a user rating system similar to eBay, where users can rate one another, so that future buyers/sellers can know that who they are interacting with can be trusted. However, dishonest users can always make new accounts to circumvent negative reviews. You might think that we should then limit the selling capabilities of new accounts, much like how eBay does. However, this severely limits the number of available sellers on the app. So that route will not be taken. While reporting dishonest users to admins may be a likely feature, we are quite limited with we can do in terms of preventing them from committing fraud. Much like how Craigslist operates, it will be up to user discretion as to how to avoid fraudulent transactions.

Ethical and Intellectual Property Issues

Ethical Issues

To ensure the security of user's financial information, should a credit card payment system be included, we will employ end-to-end encryption as a means to protect users' data. User accounts are protected with passwords.

We have already extensively talked about the potential for fraudulent usage of our app. While we think that the vast majority of transactions will not involve such crimes, they are always a possibility. Should a user try to scam another, the least that can be done on the administrative end is to ban fraudulent users. Reporting such individuals to the school, given that they can be identified, would be important as well.

Intellectual Property Issues

Obviously, there are many other apps/websites out there that are similar in concept to ours. Craigslist is perhaps the most obvious example, as it offers a similar platform for users to exchange items and services between one another. That being said, our project is still quite distinct. It appeals to completely different set of users, and it is not being distributed for profit. On top of that, we intend on building this application using our own unique stack of resources. There are no software copyrights for a conceptual idea such as this one, so there is very little, if any, risk of us infringing on the copyrights of previously-developed applications.

Change Log

Not many changes have been made since the Project Proposal Report:

- Shipments and credit card payments are not focuses in the final product. The app will push for face-to-face transactions with cash payments. While credit card payments are not off the table, their implementation isn't of high priority. They come with obvious security risks, and it's something we only want to deal with if we have the spare time to do so. We also won't implement a shipping feature. It's a complicated feature that just isn't really necessary for the environment that users are in (living on campus). Users, at their own discretion, could use third-party services like Venmo or PayPal for electronic payments.
- A few changes in responsibilities were made in the work plan. We just wanted to switch up some roles. Siluo and Jian will focus on front end development, while Qixiang and Robert will focus on back end development. Yiju will work on both.
- AWS is now being used as the web hosting service, rather than Award Space. It comes with more storage.
- We've added new illustrations of the UI. Just an update on how things will look.
- The Use Case Diagram has been replaced with a flow diagram showing User interaction options. It gives a better representation of what the user can expect out of the product.