Our Web App: "MarkeTree"

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Summary

MarkeTree is a platform for RPI students to buy and sell goods. Students will be able to login with OAuth using their RPI credentials in order to exchange items with other students. With COVID-19 still being of large concern worldwide, and many students being off campus for online learning, MarkeTree will provide students with a trustworthy platform that emphasizes safe non-contact transactions. MarkeTree will allow for school/dorm supplies to be found and purchased with ease. Our category and search system will help students quickly find urgent items such as textbooks, computers, and furniture. MarkeTree will be limited to RPI students using OAuth with their RCSID and Shibboleth password, as well as local communities through referral from existing accounts. This will curb the chances of scams and avoid potential fraudulent transactions. When each transaction is linked to your or your referrer's RCSID, as well as full name, there will be an incentive to maintain a good reputation on MarkeTree. If a transaction does go awry, you will be able to report sellers using the report feature on each user's profile. You will be able to select the transaction in question and specify what went wrong. When finished, the report will be handled through PayPal's report system to maintain privacy. In addition to the ability to report, every user on MarkeTree will have a star rating based on their reputation as a trader. After each transaction, both the buyer and seller will have the option to

rate their experience from zero to five stars, the average of all these ratings will be displayed on each user's profile. We understand that limiting MarkeTree to only RPI students can stunt the growth of our user base, so we are also implementing a feature that will permit each member of MarkeTree to invite one non-RPI student to the platform each week using a randomly generated referral code. These users will be able to login using a separate login which will be enabled by OAuth. Allowing other members this way will help us grow our user base more than if we only allowed RPI students on the site. Instead of opening it up to the whole world, this referral system ensures that the non-RPI members are trusted by users that already make use of the platform. These members will not lose access after the student that refers them leaves RPI. We will also include personal codes that allow alumni themselves to remain members of MarkeTree after they lose their access to their RPI email account. MarkeTree will also have a messaging system for each transaction. This "chat" feature will allow for easy communication between students, making showing interest in a transaction quick and painless.

Our purchasing system will be integrated with PayPal, providing an interface for quick and easy to handle transactions where there are already a lot of measures to limit scams and fraud. Accounts can also be created without linking a PayPal account, but these users will lose the ability to report, and will have to work out transactions physically. We do not want to encourage physical transactions when Covid is in full swing, so we may eventually decide to make linking PayPal a requirement. The final small feature of MarkeTree is being able to see the distance and location of a user. Using the Google Maps API, users will be able to set a location, and we will be able to calculate the distance between any two potential users for each listing. We believe that this is very important especially now with many students being off campus. Similar

to other marketplace platforms, we will not display users addresses, but rather their general location in the form of their town or city.

Our open API will allow for other developers to access data from MarkeTree including what items are purchased the most often, what users have the highest overall reputation, what users have made the most transactions, and logs of transaction history. This API could be used for many purposes, one we have in mind is helping the RPI administration easily determine what students need or would like to have already provided to them. This information could help improve student life in the future, and possibly attract more undergrad applicants. We could also Export listings for hot items to the RPI Union for advertising, which could attract more users to our site, as well as allowing RPI faculty to interface with our API.

Problem Space

In the time of COVID-19 pandemic, there are many travel advisory and quarantine requirements throughout the United States. Mandatory and voluntary measures are widely used, including three-day quarantine upon arrival in New York, 48-hour antibody testing before departure, etc. They help to stop the spreading but at the cost of making traveling hard. As undergraduate students living in the RPI community, we face the issue of seasonal moving-in and moving-out.

We need many items for student residence. Some people may prefer buying all of them brand new, but more people would like to make better use of the budget in this difficult time by getting used items instead. Some bulky or heavy items, like printers, PCs, or chairs, can be a lot cheaper if used than brand new.

We also need to clean our residence and clear out any belongings before leaving. Stuff like sofas and mattresses are extremely hard to transport. They are all subject to reselling.

Moreover, people sometimes only have a short period of time to check in or check out, due to the COVID-19 policy. They often would exchange certain items as urgent needs, meaning that timing is critical. For example, one may need to sell his or her queen size mattress in the week of graduation. Any time earlier or later would not work.

Things are getting more complex for international students. They have the pressure of following meticulous procedures and obeying different COVID-19 policies to go back home. Visa and flights can be extremely tricky when the borders are seriously regulated by local governments. People may find their flight tickets canceled just two weeks before departure, and it has happened many times where Chinese students are trying to go home after graduation. Therefore, we need more flexibility and better planning in terms of reselling.

There are many seasonal needs to exchange inside the RPI community. People usually need to get rid of some items throughout semesters, and new students coming to RPI may also need to buy stuff, most likely course-related or project-related. A marketplace exclusive to the RPI community would be what they want.

Solution

To help facilitate used item transactions and problems stated above, a web application that connects sellers and buyers within the RPI community, MarkeTree, is being created. MarkeTree is a community-based, member-only online marketplace that allows peer to peer exchanges of needed goods and services such as textbooks, furniture, and transport.

To assure legitimacy and prevent scam from happening, MarkeTree is built to be a member only platform that allows users to create accounts and login either using their RPI credentials referrals codes from existing accounts. Every member of the RPI community will receive one referral code every week upon account creation therefore local communities can also

join in through referral programs as well. Once logged in, users can either register as sellers and create listings for their used product, or browse through available products that are listed on the website. Aside from items, users can also create listings for services such as move-in and move-out or paid tutoring.

MarkeTree will also allow clubs and other organizations to post sales event information. The information will be incorporated with Google Map API to help other users to better navigate to the exact location.

To help with social distancing caused by COVID-19, MarkeTree will also integrate Paypal transactions to minimize contact between members. The funds will be held by PayPal and released to the seller once the buyer confirms the delivery of the product/service.

Users can report directly through the website in case of potential scams using PayPal's dispute transaction functionality. Since MarkeTree is a member only platform, each member will have their name and rcsid associated with each transaction. If a non-member was reported with a potential scam, the member who's referral code is associated with that person will be held accountable. We will keep a record of who referred this non-member account holder, then both users will get a penalty.

With MarkeTree, members of RPI can easily exchange products/services without the need to worry about scam and misinformation. The local community can also benefit from hosting sales events from this application.

Competitors

1. **Facebook Marketplace** - Facebook allows its users to post items up for sale on a publicly accessible database. It includes listings for a large variety of things ranging from used lawn mower engines to pots and pans around the house.

2. **Ebay** - Ebay started as an auction site but has modernized into a platform where people can post classified listings for a set price. One of its original big selling points to its users was its integration with PayPal which has more recently become a standard. For our platform to work well, we will need to work with a payment processor like PayPal to facilitate the transfer of money.

3. **Craigslist** - Craigslist offers a space to buy and sell almost anything. It sections off its listings to different cities so that users can search within the "Albany Craigslist" or the "Penn State Craigslist." The site determines the initial search location based on the user's IP. Unfortunately for Craigslist, it has become notorious for hosting scams and transactions with less-than-friendly people.

4. **Reddit** - While not a pure marketplace website, it is common for its users to post listings for things up for sale. Some members of this group have even sold things to other students through the RPI subreddit. The downside of posting a listing on reddit is that it can get easily pushed out of the way by higher-rated news articles and memes.

5. **OfferUp / LetGo** - OfferUp recently merged its user base with LetGo. It advertises as an extremely easy way to post listings. Sellers are given a profile so that they can build a reputation on the site. It also provides a messaging service to facilitate communication between buyers and sellers.Also, similarly to Craigslist, it lists postings locally. OfferUp will be the closest competitor to our platform because it aims at facilitating in-person transactions on a local level.

Our platform will have many competitors, however, MarkeTree will be distinguished from the competition by its locality to RPI. By ensuring that every buyer and lister is part of the smaller group of RPI students, our users will be ensured that they can trust the other party.

Stakeholders

- RPI Communities: MarkeTree would be the most useful for incoming freshman and graduating students as it would give them a platform for resource utilization as well as a way to help them reduce the tiresome for searching used goods and exchange them for mutual benefit. In addition, MarkeTree also would be useful for regular students who are seeking for pre-owned furniture, textbooks, or daily supplies. Furthermore, MarkeTree also provides a platform for listing services that allows people to offer or seek help with things such as moving out or moving in. Many students take the bus to school and carry lots of luggage by themselves, especially international students. This will ease the process of moving while providing students with much more affordable options compared to moving companies. Within MarkeTree, students might be able to seek help from schoolmates through tutoring. This will help the new students learn more about the school, do better in classes, and possibly make some new friends. In the same way as described above, students who are passionate about making new friends, earn some tips and will love to help others, they will be able to accept the "offer". Last but not least, many students are seeking for off-campus housing, MarkeTree will be holding a renting session on the site in order to reduce the trouble and time for students searching, but all services only open within the Troy areas.

- Landlords: Although MarkeTree is targeting for RPI communities, it still holds benefits for all the landlords within the Troy area. It can be used as a way to rent their house to students, so as not to worry about how to rent their house.

- Local area communities based on referral: Given the safety of RPI communities and the complexity of restricting personal. Local area communities can only use MarkeTree by the referral code from RPI communities. As they become a user of MarkeTree, they still hold benefits. They will be selling used items on the platform as well as a way to earn some tips and be a part of resource utilization. Within MarkeTree, we will have some clubs to hold sale events. You can attend the events as a seller as a user on MarkeTree.

Interesting Technologies

We are planning to use the PayPal API in order to facilitate transactions. This should help us with making sure that every purchase goes right, and will also provide us with an easy way to track transaction history. We are also going to use the Google Maps API to provide our clients with information and location on the sale events. We will be using OAuth which will allow for multiple ways to login. This will be used to allow RPI students and those with referral codes only to access MarkeTree.

Functional Requirements

- User account to store what they like and their transaction histories.

- Searching based on keyword and other specifications.
    - Tag / Filter system to directly point users to specific listings.

- Listing creating system
    - Items Image uploading and storing
        - Details about the item being sold

- - - ■ Post history on users accounts

  - ○ A short description about your item, include what kind of condition

  - ○ Add more tags on the item

  - ○ Distance from user to user

- Internal user Messaging system

  - ○ Buyer and seller can be in contact on the platform

- Users can review upcoming sale events

- Handling the file Report for scamming

- Referral system for non-RPI members

  - ○ New invite code every week

  - ○ Link referred members to the RPI students who referred them

Non-Functional Requirements

- Covid-19 safety Policies

  - ○ Remind users when in-person trade through email/push notifications

  - ○ PayPal transactions

  - ○ Users can ship products to one another

- Open API

  - ○ Allows other devs to access MarkeTree data

  - ○ User data such as transaction history, reputation

- Optimization on the platform

  - ○ Increasing overall performance

  - ○ Providing a smooth mobile experience

Milestones

I. February 2021

- Write Proposal and finalize the features on the site
- Determine the general structure and site navigation of site
- Setup all technical environment on computers
- Finalize design for the app
- Map out general schema for database
- Implementing static Frontend HTML pages / structures for landing pages.

II. March 2021

- Finish the Frontend pages structures
- Prepare for Mid Term presentation on 3/12
- Designing Backend workflows and Databases.
- Implementing Backend workflows and Databases.
- API Integration and testing

III. April 2021

- Finish implementing features on the site
- Frontend and Backend Integration
- Test and integrate components
- Make sure features work how they are expected to
- Finalize everything, prepare for Beta release
- Prepare for Final Presentation and Demonstration on 4/23

Site Map
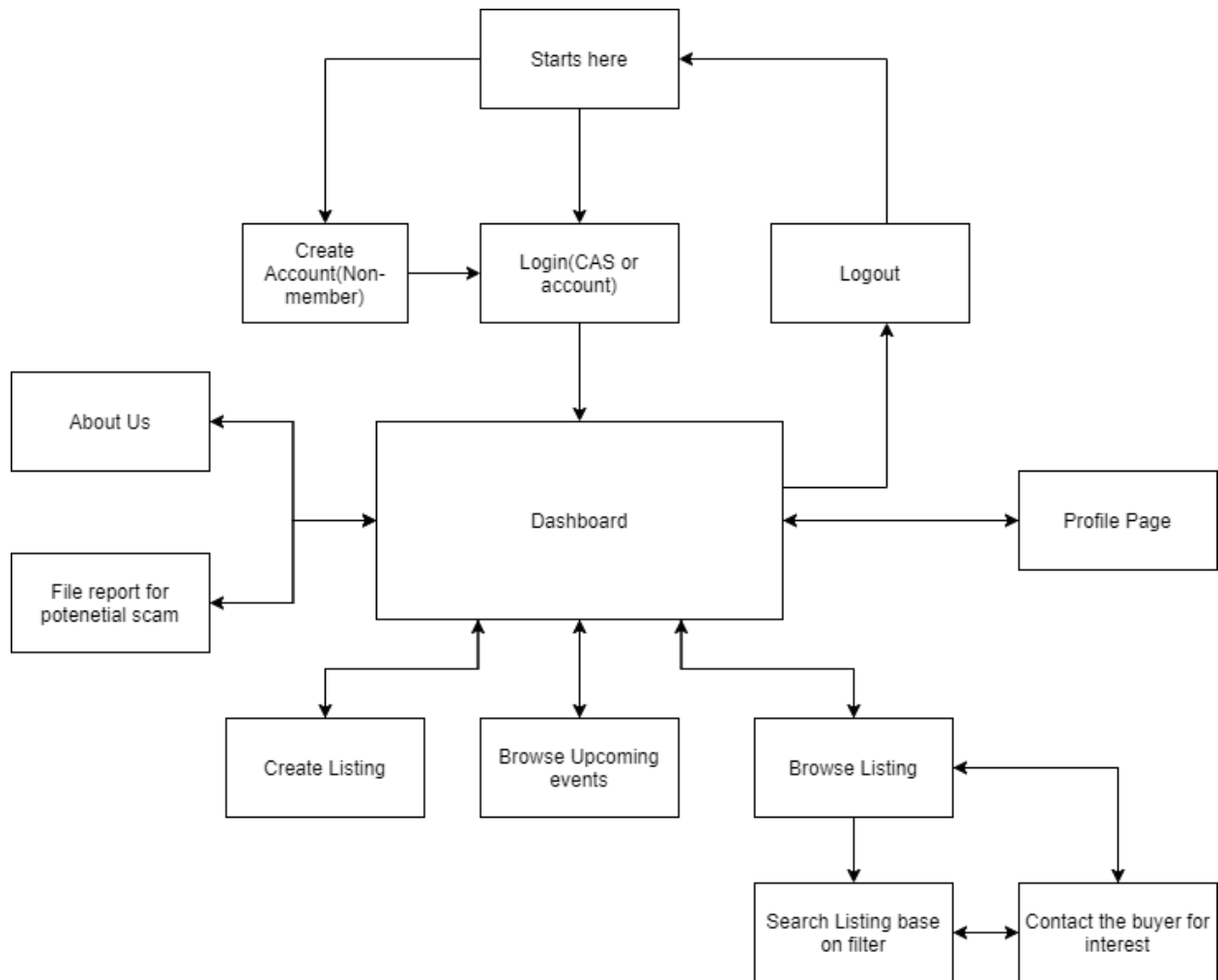
Wireframes

Your API Key: askdlfjasdlkfjasldkfjasdlkfjasdlkfajsdklfjasdf

/get-listings

Returns a list of all the listings as JSON text.

Example:
[
{ id: 'asdfasdf',
dsadfasdfasdfasdlkfjaskdlfjasdf...
...
...
...
...
..
.....

..
]

/post-listing

/delete-listing

/like-listing

Marketree

Flavor text to get people
wanting to sell their
stuff

Stock Photo

Earrings
$2000

Bag
$12

Pencil
$1

My Frog
$40

Vase
$20

Shoe
$50