

CS 307 Project Backlog

Team 13

Project Title: UNest

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Problem Statement

Our project is designing and creating an online marketplace for university students to post and view available subleases near campus. Currently, students use forms of social media such as Facebook Marketplace to find subleases, but they are less organized and students cannot directly rent rooms through those sites. Also, websites like apartments.com and airbnb only allow property owners to post or they are very expensive due to fees. Our website would be an organized interface displaying information regarding subleases and would allow students to easily identify properties based on their needs.

Background Information

a) Explain background information about the problem, the domain, and targeted users.

- i) Currently, it is difficult to find students subletting properties. There are students looking to sublet their properties but no organized interface to list. Finding properties for temporary stay is difficult as most properties require commitment for full terms.
- ii) The domain is real estate and property rentals. The website would focus on apartments near a university campus for subleasing. We would need to understand the legal processes regarding subleasing, user security, rental listings, and customer support.
- iii) The targeted audience are college students looking for temporary accommodations near campus or looking to rent out their current accommodation. Landlords and property managers would also be a part of the user base to facilitate contracts.

b) Mention whether there are any applications or systems that are similar to your planned work.

There are several websites that allow individuals to discover properties listed in their area such as Airbnb, apartments.com, and social media platforms such as Facebook Marketplace. These services often allow landlords to list different properties for their lease terms and allow users to contact landlords to reserve the spaces. Airbnb offers homes for rent for short term stays, mostly catered toward vacations. Apartments.com allows users to post and

view apartments in their area for rent. Facebook Marketplace contains a subcategory in which users can post properties they have available for rent.

c) Discuss the limitations of other solutions and how you address each limitation

While the market for property rentals is competitive, there exists no interface that focuses on student to student subleasing. The team believes that it is extremely difficult to find subleasing properties in the area as no site filters this market. For example, Airbnb and Apartments.com don't allow subleasing on their site. Airbnb requires the landlord to own the property, while Apartments.com requires the user to sign the lease for the entire term. Airbnb also focuses on vacation stays which are typically no longer than 2 weeks. The site also charges various fees, causing the rent prices to be higher than normal, as the company acts as a property manager for landlords. The disadvantages of subletting through social media are that not all necessary information about each property is listed, users are unable to directly reserve properties from the website, and overall they lack organization and a convenient real estate based user interface.

Requirements (Backlog)

Functional

User Registration

1. As a user, I would like to be able to make an account by filling out a user registration form.
2. As a user, I would like to be able to login with my username & password.
3. As a user, I would like my password to be hidden when I type it.
4. As a user, I would like to verify my password before creating my account.
5. As a user, I would like to be able to change the university associated with my account to a different university.
6. As a user, I would like to be able to view and update my user bio.
7. As a user, I would like to change and reset my password.
8. As a potential tenant, I want the site to verify that listers are students by confirming their school email.
9. As a lister, I want the site to verify that any potential tenants are students by confirming their school email.

Home Page

10. As a user, I would like to see a grid view of multiple properties in my selected area.
11. As a user, I would like a map to show all properties available in my selected radius.
12. As a user, I would view the name of the property, price, dates available for rent, and miles from campus of each property.

13. As a potential tenant, I would like to see all the available property listings with images and their location, date range, and cost.
14. As a potential tenant, I would like to filter the properties based on the room of a house or an apartment.
15. As a potential tenant, I would like to filter the properties by specifying a given price range.
16. As a potential tenant, I would like to filter the properties by a certain number of beds and bathrooms.
17. As a lister, I would like to have a button to create a new post.
18. As a lister, I would like to access my inbox with a single button.
19. As a potential tenant, I would like to have a button to view all of my favorite properties.

Listing information page (made for potential tenants only)

20. As a potential tenant, I would like to be able to view specific information about a property as described in features 26 and 27 below.
21. As a potential tenant, I would like to have the option to favorite properties so I can view them later.
22. As a potential tenant, I would like to be able to see the locations of the properties.
23. As a potential tenant, I would like to see the listers' contact information.
24. As a potential tenant, I would like to directly start a chat with the lister.
25. As a potential tenant, I would like to see that the lister is a verified student.

Lister's Own Listings Page (made for listers only)

26. As a lister, I would like to be able to fill out a form with all the specific information about a property including paragraph description of the property and a list of amenities.
27. As a lister, in the form, I would also be able to provide the property's exact location (will be shown in a map to the potential tenant) and pictures of the property to be displayed at the top of the page.
28. As a lister, I would like to be able to submit the information in the form and see it posted in the homepage listings.
29. As a lister, I would like to be able to view my posted listings on the page.
30. As a lister, I would like to be able to update my posted listings.
31. As a lister, I would like to see that the potential tenant is a verified student.

Message System

32. As a user, I would like to easily view all my messages.
33. As a potential tenant, I would like to be able to contact listers about their property.
34. As a lister, I would like to view all of my messages from potential tenants.
35. As a potential tenant, I would like to view all of my messages from listers.
36. As a lister, I would like to have my messages to other listers and my messages from potential tenants be separated.
37. As a potential tenant, I would like listers to have the names of their properties included to help differentiate them.

Map

38. As a potential tenant, I would like a map view to see where all of the properties are relative to campus.

39. As a lister, I would like the ability to input the location of my lease and have it show up on the map.
40. As a potential tenant, I would like the ability to scroll across the map and zoom in or out.
41. As a potential tenant, I would like the ability to search for an address on the map.
42. As a potential tenant, I would like my filters to be reflected onto the map.

Non Functional

Architecture and Performance

We will be using the MERN framework: Mongo.db, Express.js, React, and Node.js. We will develop frontend components using React. React is a library that reacts to changes in the data and re-renders the UI accordingly. The middle of the tech stack will be Express.js and Node.js. Express.js is a server-side web framework, while Node.js is a JavaScript server platform. We will be using MongoDB Atlas to host the database in the cloud, to avoid the maintenance issues with hosting the database on our local machines.

To make our website as efficient as possible, scheduled tasks will be incorporated to fetch data from the database and update the front end. The plan right now is to incorporate a scheduled task for every 2 minutes so that listings are automatically updated on the home page. Since a chat feature is a critical part of the application, efficient use of calls will be focused on to reduce load times.

List of Performance Features:

1. The page should load all the content within 5 seconds of a refresh
2. The site should use a scheduled task to update the listings every 2 minutes
3. A listing can be posted or updated 24 hours a day.
4. Users can contact customer service for help with technical difficulties 24 hours a day.
5. Chats should refresh at most 20 seconds after a message is sent.

Security

Security will be a major point of emphasis as the site will be dealing with people's personal information. We will be hiding personal information behind user authentication to help protect privacy. Since we are focusing on students, all users will need to be affiliated with a university. Accounts will be verified through an authentication API and only verified users will have access to certain features such as messaging and viewing contact info.

We will be using an authentication API, such as Auth0. For instance, Auth0 provides a React SDK, which would allow us to implement Auth0 authentication and authorization in React apps.

1. We plan to use Auth0, an authentication API, to authenticate student emails.
2. Auth0 will connect to our database to securely store identity information.
3. Auth0 will give us extensibility and security capabilities such as brute force and suspicious IP throttling.
4. Auth0 will give us up to 7,500 monthly active users and unlimited logins.

Usability

Our goal is to make the website easy to use while still giving the user all the information about the property that they need. We want to include a main home page for all users that will show all available apartments to lease, with the ability to filter by various features like location, price, etc. We also need an additional option for current tenants to easily input information about their property. The website will also feature an admin view for property managers to view contracts and manage renters. Finally, we want to ensure our application is viewable and adjusts to various screen sizes from a laptop screen to a large screen monitor.

Hosting/Deployment

We plan to just use GitHub and develop locally as we work through the project, and then we will deploy it and make one final release after we have the main functionality of the site done. We plan to host our MongoDB server on the cloud.