SYSTEM DESIGN AND USABILITY EVALUATION OF

HOOT HOUSING: A REVIEW WEBSITE FOR OFF-CAMPUS
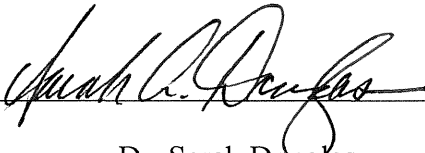
STUDENT HOUSING

by

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A THESIS

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Dr. Sarah Douglas

Review websites play an integral role in many people's decision making process on a regular basis. Review websites target a range of users including people choosing which businesses to support, products to purchase, or services to subscribe to. This thesis addresses a particular target audience, University of Oregon (UO) students, in order to introduce positive changes to the current climate of the off-campus student housing experience. Through the design and development of a review website for student housing, Hoot Housing, this thesis ultimately seeks to raise the bar for property management and enrich students' lives by creating an online community of shared housing experiences.

Designing and developing a new website gives rise to a myriad of usability issues that could potentially be constructive or destructive to its the future success. To determine the strengths and weaknesses of the design of Hoot Housing, UO students participated in usability testing where they performed tasks using the Hoot Housing website. The performance and preference data collected gave feedback on the effectiveness, efficiency, and user satisfaction of the website.

Overall the usability study found that students could effectively and efficiently use the Hoot Housing website. Student participants expressed satisfaction with their experience, but communicated concerns with the usefulness of the site. These concerns originated from the issues of gaining traction amongst the website's target audience, the accuracy of the website's search engine, and the feedback provided while troubleshooting. Although these pain points did not render the website unusable, they must be addressed in the redesign of the Hoot Housing website. Participants' feedback shed light on possible design solutions to mitigate these usability issues as well as helped establish usability benchmarks for future usability testing.

Acknowledgements

I would like to thank Professor Douglas for supporting my exploration of human-computer interaction (HCI) topics through the design, development, and evaluation of a review website. Douglas encouraged my pursuit of learning new web-related technologies, introduced me to HCI related literature and resources, and helped me discover career opportunities that would allow me to apply my diverse interests. I would also like to thank Professors Young and Jacobsen for their interest in my research and willingness to be a part of this process. Their help with critiquing and refining my ideas was invaluable to completing this thesis. I am truly grateful for the experience of working with such excellent professors.

I would also like to acknowledge Taylor Oyama, Alisha Kawaguchi, and Greg Henkhaus for giving me the tools and support necessary for completing this research. Oyama conceived the idea of the Hoot Housing website and encouraged my adoption of the website as the basis of my research. Kawaguchi and Henkhaus volunteered their time and skills during the development of the Hoot Housing website. Without their mentorship this research would not have been possible.

Finally, I would like to thank Judith Hurlburt and Wyatt Pearson, for their immeasurable support throughout my undergraduate career. They offered me the inspiration and motivation I needed to complete this thesis, in addition to my degree.

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Chapter 1: Introduction

1.1 Purpose of Study

The emergence of review websites has changed the way people make decisions on a daily basis. People are choosing which restaurants to dine at, movies to watch, professors to take classes from, and salons to get services at by depending on the advice of strangers. The value of the ratings and reviews provided by review websites is dependent upon magnitude. Hearing about a good movie from a friend means relying on one person's taste profile, their experience is extremely subjective. However, if fifty movie critics and thousands of other people mutually support that same movie, the quality of the movie is less disputable.

As a student I use multiple review websites including *Yelp*[1], *Rotten Tomatoes*[2], and *Rate My Professors*[3] on a regular basis. Sites like these give me a higher degree of confidence in my decision making. Unfortunately, I have experienced the pitfalls of relying on review websites that fail to draw in a large user base or that deliver a frustrating user experience. While the number of users often dictates how successful a review website might be, there is an important aspect that influences those numbers, the website's design.

The design of a website is pivotal to its success. Color scheme, graphics, and overall aesthetic are all core components of a website's design. However, the user experience is the most important design component. Making educated, deliberate

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[1] http://www.yelp.com/
[2] http://www.rottentomatoes.com/
[3] http://www.ratemyprofessors.com/

decisions about the system requirements and user interface of a website must be part of its conception. More specifically, making these design decisions should abide by the principle of user-centered design. Otherwise, the website will be designed in a way that fails to optimize usability. This can lead to a lack of traction with a website's target audience, whether it be expanding its number of users or retaining its existing users. "Usability has become one of the main ways to separate one's product from a competitor's product in the customer's mind."[4].

My objective is to develop and evaluate the user-centered design of a review website for off-campus student housing, Hoot Housing, in order to improve the process of finding student housing and the student housing experience itself.

1.2 Statement of Research Question

The purpose of this thesis is determine key components that make a review website usable, implement those components, and evaluate them. This process will address the research questions:

1. Is the design of the Hoot Housing site usable provided the usability measures of usefulness, efficiency, effectiveness, and satisfaction?

2. Given feedback on what aspects of Hoot Housing's website are unusable, why are these aspects problems and what improvements should be made to solve them?

1.3 Methodology

I will begin by determining the requirements specifications for the Hoot Housing website. This includes the functional requirements for the site, which means

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[4] Rubin, Jeffrey, and Dana Chisnell. Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests (Indianapolis, IN: Wiley Pub., 2008. Print) 23.

what the website should do and what the core functions will be. It also includes the usability requirements for the site like overall learning time for each task, time spent utilizing help functions, and the time it should take to complete the core functions.

Next, I will address how the requirements will be implemented. In order to determine the user interface specifications, I need to consider what the interface style should be and why. I will also determine how the user interface should work for both the core functions and when handing trouble issues. The user interface interaction will also be specified through the use of an interaction network of core activities.

The final phase of my research involves testing and evaluating Hoot Housing's user interface design. Before this phase I must implement an interactive prototype of Hoot Housing. Once the prototype is complete I will conduct usability testing with participants in a lab, analyze the results gathered through the testing sessions, and determine design solutions to mitigate identified usability issues.

Chapter 2: Literature Review

2.1 Usability

In order to evaluate the usability of a website it is important to establish the principles upon which usability will be measured. Part of understanding how to measure usability is identifying what makes something usable. "When a product or service is truly usable, the user can do what he or she wants to do the way he or she expects to be able to do it, without hindrance, hesitation, or questions"[5]. The attributes of usability include usefulness, efficiency, effectiveness, learnability, satisfaction, and accessibility.

A product that is useful is one that helps users achieve his or her goals. Usefulness can gauge how likely a user will use the product. Efficiency relates to how quickly the user can accomplish his or her goals with accuracy and completeness. This attribute is most often a measurement of time. Effectiveness evaluates whether the behavior of a system aligns with users' expectations. In other words, it measures if users are able to accomplish what they intend to with ease. Learnability measures how well a user is able to operate a system with some defined level of competence after some predetermined amount of training or experience. Satisfaction refers to how a user feels about a product. This can include their personal opinions and perceptions, which are most commonly collected as qualitative data. Finally, accessibility deals with whether a user has access to a product to accomplish his or her goals. More specifically, accessibility often relates to users with disabilities or limitations.

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[5] Rubin, Jeffrey, and Dana Chisnell 4.

2.2 User-Centered Design

The principle of user-centered design (UCD) is a design process that "seeks to support how the users actually work, rather than forcing users to change what they do to use something."[6]. To ensure UCD there should be an early and continual focus on users, early and continual usability testing, and an iterative approach toward implementing the design of a system. These three strategies help mitigate the risk of developing a system that is unusable upon its release.

Focusing on users includes tactics like interviews, questionnaires, and observation in order to understand the characteristics of potential users[7]. Furthermore, the early stages of the design of a system can include participatory design sessions in which users take a hands-on role alongside professional designers. Continually conducting usability testing helps evaluate design decisions and guide future decisions as the development of the system progresses. Thus, potential usability issues can be identified and eradicated as early as possible.

Finally, an iterative development process reinforces focusing on users and continual usability testing. Introducing usability testing throughout multiple iterations of development provides a high quality, scalable product. The requirements and specifications of features can be developed in a responsive manner so that continual adjustments can be made throughout the development life-cycle.

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[6] Rubin, Jeffrey, and Dana Chisnell 50.
[7] Douglas, Sarah A. "How to Do Usability Testing." (1998).

2.3 Usability Testing

Usability testing is "a process that employs…testing participants…to evaluate the degree to which a product meets specific usability criteria."[8]. Usability testing is one way to ensure user-centered design because it informs the design of a website prior to the public release of the site. To optimize the utility of testing, participants should be representative of the target audience. After determining the criteria that will be evaluated, collecting empirical data helps uncover usability issues impeding the fulfillment of the criteria.

There are many usability testing techniques in use today, each catering to specific types of feedback. The types of usability testing include exploratory, assessment, validation, and comparison testing. They differ in the degree of the involvement of test moderators, the testing environment, and use of participants. "Each test will vary in its emphasis on qualitative vs. quantitative measures, and by the amount of interaction between test moderator and participant,"[9]. Since the appropriateness of each type of test varies depending on the various development life-cycle phases, it is important to consider when to use each type of usability testing.

Exploratory testing should be used early in the development cycle when a product is in its preliminary stages of design. The objective of this type of test is to examine the effectiveness of preliminary design concepts. Potential research questions could be whether the interface communicates the intended workflow effectively or how well the interface supports users' tasks while completing a goal.

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[8] Rubin, Jeffrey, and Dana Chisnell 21.
[9] Rubin, Jeffrey, and Dana Chisnell 27-28.

Assessment testing should be used early to midway through the development cycle when the fundamental design of a product has been established. The objective of this type of test is to evaluate the usability of specific functions and aspects of a product. Assessment testing "seeks to examine and evaluate how effectively the concept has been implemented,"[10]. This type of testing is crucial when identifying usability deficiencies before moving forward to the next stage of the development cycle.

Validation testing should be used late in the development cycle before a product is released to the public. Using specific usability benchmarks and performance standards, this type of test confirms that previously identified usability issues have been solved and that new problems have not emerged. Lastly, comparison testing can be used throughout the entire development cycle and in combination with exploratory, assessment, or validation testing. Comparison tests help designers choose between different design solutions whether the solutions are broad interface ideas, specific elements, or examining competing products.

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[10] Rubin, Jeffrey, and Dana Chisnell 36.

Chapter 3: Website Design and Development

This chapter includes the documentation of the design and development process for the Hoot Housing website. This includes introductory sections discussing the problem statement, programs of similar functionality, user studies conducted, and potential users. The requirements specification sections outline the overall functionality, context, functional requirements, and usability requirements for the website. Finally, the user interface specifications determine the overall interface style, how the interface works, and interaction specifications for Hoot Housing.

3.1 Problem Statement

Hoot Housing is a student review website for property rentals in Eugene, Oregon. The purpose of the site is to give university students a platform for viewing, rating, and reviewing their housing experiences. Hoot Housing aims to build a wealth of information through the culmination of shared individual experiences. While users add value to the websites' source of reviews, property information will be provided by Hoot Housing. The site will give students confidence in deciding where their next home might be.

Hoot Housing users can explore properties and reviews without creating an account. However, in order to submit a property review, users must create an account using their first name, last name, and a valid email address. These credentials were modeled after other successful review websites on the market. To ensure public anonymity, users will be required to create a username that will be displayed with their

reviews in place of potentially sensitive identifying information (i.e. name or email address).

3.2 Programs of Similar Functionality

Currently there are many popular review websites on the market including *Angie's List*[11], *Yelp*, and *Rotten Tomatoes*. However, the most widely used review websites do not target university students and property rentals successfully in Eugene, Oregon. Some of the most widely used review sites for university students include *Rate My Professors*, *Niche*[12], *Unigo*[13], *College Confidential*[14], and *StudentAdvisor*[15]. Some of the most widely used review sites for property rentals include *ApartmentRatings*[16], *TripAdvisor*[17], *AirBnb*[18], *ForRent*[19], *Zillow*[20]. These existing websites fail to target university students and off-campus student housing simultaneously which is what Hoot Housing aims to do.

3.3 Potential Users

Hoot Housing's target users are university students or prospective university students looking to review previous housing experiences or read ratings and reviews of rental properties. Since the majority of users will most likely be students attending the University of Oregon, the diversity of the student body from the University of Oregon

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[11] http://www.angieslist.com/
[12] https://colleges.niche.com/
[13] https://www.unigo.com/
[14] http://www.collegeconfidential.com/
[15] http://www.studentadvisor.com/
[16] http://www.apartmentratings.com/
[17] http://www.tripadvisor.com/
[18] https://www.airbnb.com/
[19] http://www.forrent.com/
[20] http://www.zillow.com/

serves a reliable representation of Hoot Housing's target audience. The following information is from the UO Facts section from the Admissions Page of the University of Oregon's website[21].

Origin	Number of Students	Percentage
Oregon residents	12,603	52%
Out-of-state residents	8,443	35%
International	3,135	13%

Table 1. Geographic Origin

The table above (Table 1. Geographic Origin) shows that Hoot Housing's target audience will be approximately 52% Oregon residents, 35% Out-of-state residents, and 13% International students. This indicates that Hoot Housing should be designed to be accessible to students who are non-native English speakers. Furthermore, the language and cultural diversity that will be present in Hoot Housing's potential users can be determined by looking at the composition of the University of Oregon's international student body. The design of Hoot Housing's site should be accessible to students from the top most represented countries at the very least. The top 3 most represented countries are China, Republic of Korea, and Japan.

Beyond accessibility to students with different language backgrounds, the cultural barriers that come with international students must explored. This could include differences in terminology used to describe rentals and property management. It might also extend to variation in standards of living, what is and isn't acceptable, for student housing. The range in geographic origin also reflects a range in economic status of Hoot Housing's target audience. Disregarding scholarships and other forms of tuition assistance, attending the University of Oregon is more financially demanding for out-of-

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[21] "UO Facts." Admissions. University of Oregon. (Web. 20 Apr. 2015).

state and international students than for Oregon residents. This implies that certain off-campus housing opportunities may be affordable for some, while unreasonable for others.

Table 2 shows that Hoot Housing's user will have a degree of ethnic diversity; approximately 22% students of color. Of the 22% that are not White, non-Hispanic students the three largest ethnic identities are listed in descending order: Hispanic or Latino or Chicano, Multiethnic, and Asian. Although the ethnic representation displayed below suggests the type of language and cultural barriers that must be considered, the ethnic composition of Hoot Housing's potential users does not directly correlate with language and cultural attributes present.

Ethnicity	Number of Students
Hispanic or Latino or Chicano	2,043
Multiethnic	1,330
Asian	1,284
Black or African American	483
American Indian or Alaska Native	162
Native Hawaiian or Pacific Islander	99
Total Student of Color	5,401
Percentage of student body	22.3%

Table 2. Ethnic Identity

In addition to the diversity in geographic origin, the the student target audience will comprise of a range of ages. Approximately 85% of the target audience will be undergraduate students, while the remaining 15% will be graduate students (See Table 3). The median age of undergraduates is 20.8 while the median age of graduates is 27.6[22].

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[22] "Enrollment Reports." Office of the Registrar. University of Oregon (Web. Apr. 2015).

Enrollment Level	Number of Students
Undergraduates	20,569
Graduates	3,612
Total	24,181

Table 3. Enrollment

Furthermore, looking at the undergraduate student body at the University of Oregon, Table 4 provides us the percentage of students living on campus by academic class. The number of students seeking off-campus housing can be approximated using these statistics. This leads to the conclusion that Hoot Housing's potential student users will be approximately 20% freshman, 90% sophomore, 95% juniors, and 98% seniors. Although these percentages indicate a potential demand for a review website that compliments searching for off-campus housing, they fail to specify the number of students willing to review their own off-campus housing experiences.

Academic Class	Students Living on Campus
Freshmen	81%
Sophomores	12%
Juniors	5%
Seniors	2%

Table 4. Student Life

The information in Table 3 and Table 4 illustrates the age distribution of Hoot Housing's target audience and the potential number of students seeking off-campus housing, but they do not describe the type of housing desired by potential users.

The following figures are taken from the *University of Oregon's Residence Hall Feasibility and Market Demand Study[23]*.

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[23] Ira Fink and Associates, Inc. University of Oregon: Residence Hall Feasibility and Market Demand Study. (Final Report. September 2011. Print).
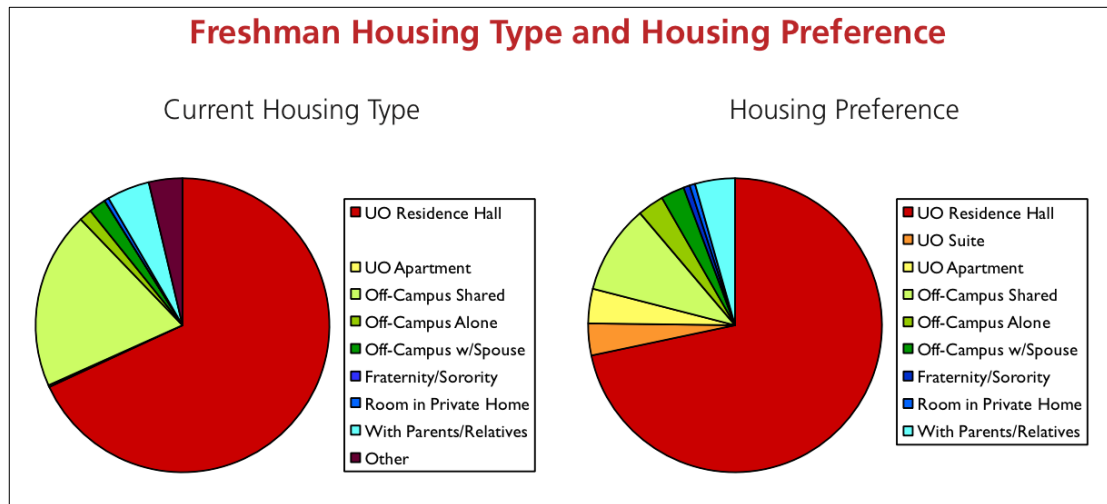
Figure 1. Freshman Housing Type and Housing Preference

Figure 1 shows that the majority of freshman students live in and prefer UO Residence Halls, similarly described in Table 4. The next largest housing type and housing preference represented amongst freshman students is off-campus shared housing.
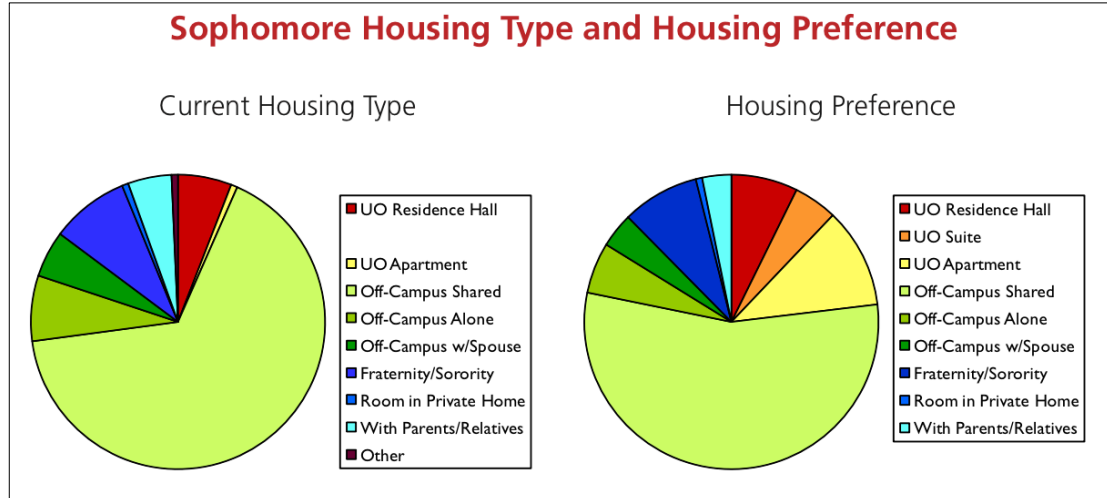
Figure 2. Sophomore Housing Type and Housing Preference

Figure 2 shows that the majority of sophomore students live in and prefer off-campus shared housing. Although off-campus alone and off-campus with spouse are not the most popular secondary preferences, they are substantially represented in the figure as well.

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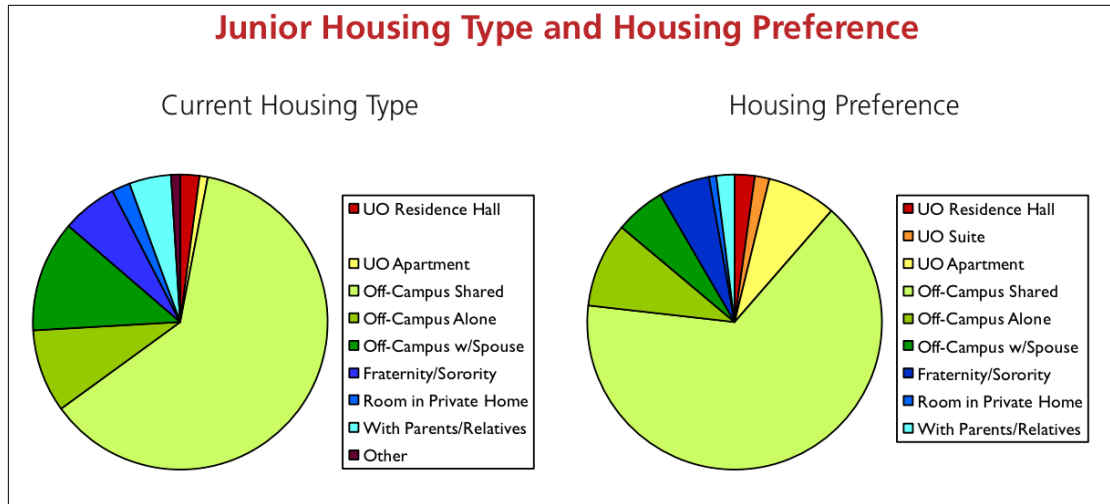
Figure 3. Junior Housing Type and Housing Preference
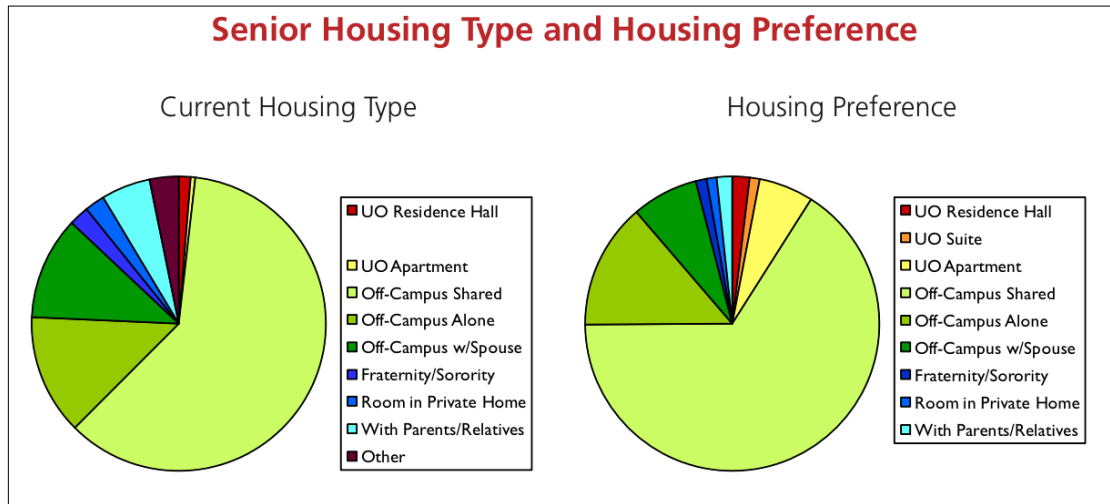
Figure 4. Senior Housing Type and Housing Preference

Figure 3 and 4 show similar trends in housing type and preferred housing for junior and senior students. The majority of juniors and seniors live in and prefer off-campus shared housing. Additionally, the number of students seeking off-campus and alone and off-campus with spouse housing increases with each class.

14
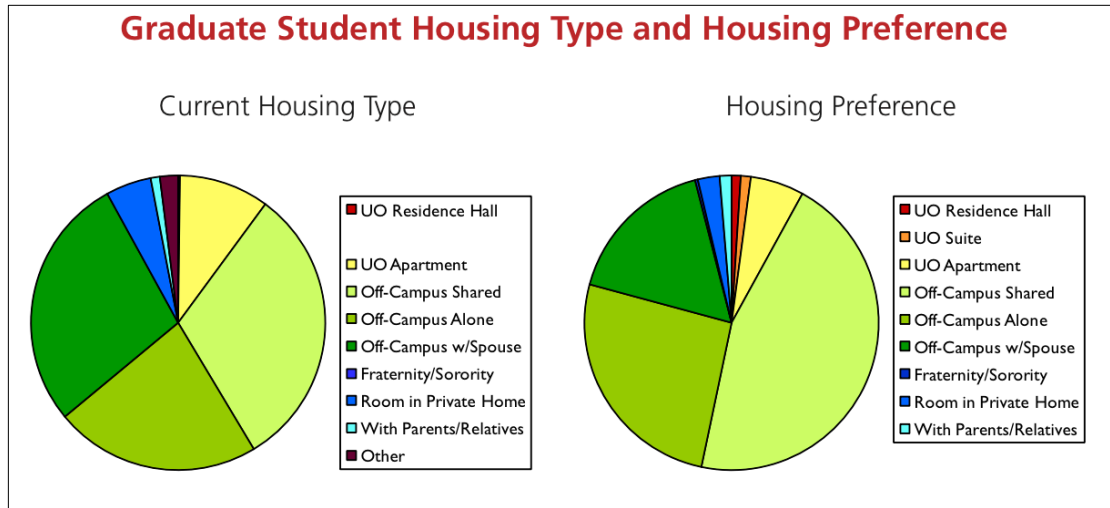
Figure 5. Graduating Housing Type and Housing Preference

Figure 5 summarizes housing type and preferred housing for graduate students. Graduate students live in an approximately equal distribution between off-campus shared, off-campus alone, and off-campus with spouse housing. Their preference reflects a greater amount living in off-campus shared housing, and then off-campus alone and off-campus with spouse housing.

The information derived from the University of Oregon's student body provides a sound representation of the diversity expected in Hoot Housing's potential users. The target audience will be students of diverse geographic origins and age. However, there are still factors that are not addressed but will certainly diversify Hoot Housing's target audience further. These include factors include economic diversity and students with physical or mental disabilities.

Lastly, potential users will be experienced internet users, most likely having prior experience using other review websites on the market.

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3.4 Overall Functionality

The Hoot Housing website will have a database of users, reviews, rental properties, and property management information. The website gives users access to rental property information and reviews, in addition to serving as a platform for users to submit reviews. All users will be able to search for a specific property address or simply browse properties surrounding the University of Oregon campus (within a 10-mile radius). Users will be able to refine their search using a number of filtering options. These filters will include distance, number of bedrooms and/or bathrooms, rent price range, and unit type. By selecting a particular property, users can view the property's reviews and ratings and look at its property management ratings. Finally, registered users who are logged in will be able to submit reviews summarizing their prior housing experiences.

3.5 Context

Target Hardware/Software

Hoot Housing will be used on multiple web browsers using a desktop or laptop computer, although it should be designed responsively for compatibility on tablet or mobile devices as well. The website will be written in Python[24] using the Flask Micro-Framework[25] along with the templating language, Jinja2[26]. Hoot Housing's site will store and retrieve information from the open-source database, MySQL[27].

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[24] https://www.python.org/
[25] http://flask.pocoo.org/
[26] http://jinja.pocoo.org/docs/dev/
[27] https://www.mysql.com/

Integration

Hoot Housing's website will be designed to integrate with the following other technologies:

- **Web Browsers:** Google Chrome, Safari, Firefox, Internet Explorer

- **Database:** MySQL

- **APIs:** Flask, Stormpath[28]

The website must be designed and developed to be compatible with the most popular web browsers to ensure a wide range of accessibility and flexibility for accessing the site's resources. The site will also be developed with cross-functionality in mind so Hoot Housing's target audience can use tablet-based and mobile devices to access the site using the web browsers listed. Although this is an important part of making the website widely accessible, this cross-functionality will not be a primary design focus.

The open-source database, MySQL, was chosen because of its scalability and because of the ease of integrating it within the Python-based framework of Flask. Using the MySQL Workbench[29] application to create the database schema and stored procedures introduced an additionally layer of ease that would not be offered if the database was created and managed from the command-line.

Finally, the use of the Flask framework and Stormpath API allowed for rapid development of the Hoot Housing prototype. Compared to alternative frameworks like

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[28] https://stormpath.com/
[29] https://www.mysql.com/products/workbench/

Django[30] or Ruby on Rails[31], Flask offered a light-weight foundation upon which the

website could be developed. Similarly, instead of handling user management from

scratch, Stormpath offered a layer of sophistication for user management and security

that would not be attainable otherwise given the short development timeline.

Outstanding Constraints on Design

Hoot Housing will adhere to the standards and laws outlined in the Terms of Use

and Privacy Policy documents included in Appendix A.

3.6 Functional Requirements

Core Functions

1. Users should be able to register for an account by submitting their first name, last name, email, username, and password.

2. Users should be able to log into their pre-existing account using their email or username, and password.

3. Users should be able to log out of their account if they are already logged in.

4. Users should be able to search for a property by keyword or address. Keywords should include a partial address (street number, street, zip code) or property management.

5. Users should be able to view search results and preview information for each property including property photo, property name, property rating (On a scale of 1-5), and property management.

6. Users should be able to filter property search by distance from the University of Oregon, bedrooms, bathrooms, rent range, and/or property management.

7. Users should be able submit a review for a particular property provided they have a pre-existing account and they are logged in. The review form

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[30] https://www.djangoproject.com/
[31] http://rubyonrails.org/

includes review title, property rating (On a scale of 1-5), management rating (On a scale of 1-5), rent range, would recommend (Yes/No), and review text.

8. Users should be able to select a particular property from the search results or after selecting a particular property management. Selecting particular property will direct users to a property's information, ratings, and reviews.

9. Upon selecting a particular property, users should be able to view property information including the property name, address, property management, and property photo.

10. Upon selecting a particular property, users should be able to view a property's average ratings including property rating (On a scale of 1-5), management rating (On a scale of 1-5), average rent, and would recommend (Percentage).

11. Upon selecting a particular property, users should be able to view a property's reviews. Each review should contain the review title, username (User who submitted review), date (Month, day, and year of the review submission), property rating (On a scale of 1-5), management rating (On a scale of 1-5), rent range, would recommend (Yes/No), and review text.

12. Users should be able to select a particular property management from the search results or after selecting a particular property. Selecting a particular property management will direct users to a property management's information, ratings, and properties.

13. Upon selecting a particular property management, users should be able to view property management information including the property management's name, address, phone number, and photo/logo.

14. Upon selecting a particular property management, users should be able to view a property management's average ratings including management rating (On a scale of 1-5), property rating (On a scale of 1-5), and would recommend (Percentage).

15. Upon selecting a particular property management, users should be able to view a property management's properties. The property photo, property name, property rating (On a scale of 1-5), and property management should be displayed for each property listed.

16. Users should be able to view Hoot Housing contact information including an email, phone number, and links to social medial profiles.

17. Users should be able to submit a contact form for complaints, comments, questions, etc. The contact form should include a user's name, email, subject, and message.

18. Users should be able to view Hoot Housing's origin story, mission, and team members.

19. Users should be able to use help functions like popover explanations for average rating categories for properties and property management. These explanations will describe what the rating means and how it was calculated. They will also be used in the review form to give users explanations of each entry field.

20. Users should be able to use help functions like alert messages to help guide the users through functions including search by address or keyword, login, and registration.

21. Users should be able to use help functions like FAQs (Frequently Asked Questions). This help function will give information to users about each function of the site and its purpose.

22. Users should be able to use help functions like a glossary. The glossary will include definitions of terminology used throughout the site.

What other functions would be nice to have?

1. Users should be able to reset their password if they are unable to remember it. This will be carried out by requesting a password change and receiving an email to the email on record for their account.

2. Users should be able to search properties' reviews by keyword. This includes review title and review text.

3. Users should be able to search property management by name.

4. Users with pre-existing accounts and who are logged in to their account should be able to access their personal profile information including, first name, last name, username, avatar or photo, and submitted reviews

5. Users should be able to edit profile information including their avatar or photo, delete a submitted review, and email.

6. If a particular property doesn't appear on Hoot Housing's site, users should be able to submit a request to add a new property provided they have a pre-existing account and they are logged in. They should be able to submit information about the new property including the property

name, property address, property photo, property management, number of bedrooms, number of bathrooms, and unit type.

3.7 Usability Requirements

Overall Learning Time

Users should be able to learn how to use each of Hoot Housing's core functions in a walk-up and use manner. In other words, once a user has successfully completed core functions like submitting a review, searching for a property, or reading reviews for a property, the next time the user attempts the same functions they will be able to recall the steps they previously made toward accurately completing each function.

Online Help Time

Users should spend at most three minutes using Hoot Housing's built-in help functions in order to complete any of the website's core functions. Help functions like popover explanations, alert messages, FAQs, and a glossary should supplement the user interface design. However, the user interface should be designed to minimize users' dependence on the available help functions.

Overall Performance Time

Performance time varies for each of the core functions and for each user. The following performance times represent the time needed to complete each core function; the times do not accurately represent the range of real-use performance times since those vary for each user.

1. New user registration: 1 minute
2. Log in: 1 minute

3. Log out: 30 seconds

4. Search for property address or keyword: 1 minute

5. Browse properties/view search results: 3 minutes

6. Filter properties: 1 minute

7. Submit a review: 3 minutes

8. View property information: 1 minute

9. View a property's average ratings: 1 minute

10. View a property's reviews: 3 minutes

11. View property management information: 1 minute

12. View property management average ratings: 1 minute

13. View property management properties: 3 minutes

14. View Hoot Housing contact information: 1 minute

15. Submit a contact form: 2 minutes

16. View Hoot Housing's origin story, mission, and team members: 2 minutes

17. Popover explanations: 1 minute

18. Alert messages: 1 minute

19. FAQs: 3 minutes

20. Glossary: 2 minutes

3.8 Overall Interface Style

The interface was designed with a focus on minimalism. This focus included mitigating the risk of cognitive overload while optimizing ease of use and learning for students. In turn, Hoot Housing would provide a user experience that was satisfying and aesthetically pleasing. Furthermore, the design of other successful sites including *AirBnb* and *Yelp* helped guide the design of the interface.

Since University of Oregon students created Hoot Housing, we were able to draw upon our own experiences as students to design a site that we hoped to use ourselves. As students having searched for housing opportunities or having wanted to leave reviews for past housing experiences, we knew that the site needed to be easy to use. The interface needed to provide a frictionless user experience that attracted student users because of its familiarity and attractive modern design. The user interface needed to provide a walk-up-and-use experience.

The Hoot Housing website consists of basic design elements including buttons, links, drop downs, radio buttons, check boxes, and text input fields. The use of color is sparing and the color palette of the site is simple — using only shades of red, green, grey, and tan on a white background. The font color is limited to the same shades previously listed.

3.9 How the Interface Works: Core Activities

New user registration: User selects 'Log In' link from the navigation bar at the top of every page of the site. The user is redirected to Log In form. Next, the user selects 'Create an account' link and is redirected to Create an Account form. After entering a username, first name, last name, email, and password the user selects 'Create Account' button.

Log in: User selects 'Log In' link from the navigation bar at the top of every page of the site. The user is redirected to Log In form. User enters his/her username or email, and password. Then, the user selects the 'Log In' button.

Log out: Once a user is already logged in, user selects 'Log Out' link from the navigation bar at the top of every page of the site.

Search for property address or keyword: User enters address or keyword (i.e. partial address, property management, unit type, etc.) and selects 'Find' button.

Browse properties/view search results: User scrolls through thumbnails of properties. Each thumbnail includes a property photo, average property rating, address, number of bedrooms and bathrooms, and property management.

Filter properties: User selects options from distance, bedrooms, bathrooms, min rent, max rent drop downs; and checks unit type checkboxes. To apply selections, user selects 'Apply Filters' button.

Submit a review: User selects 'Add Review' button and fills out review title, property rating, management rating, rent, review text, and would recommend. To add a review, the user selects the 'Submit' button.

View property information, ratings, and reviews: User selects property thumbnail from the property search results thumbnails and is redirected to the property's page. User views the property's information, ratings, and reviews by scrolling through the page from top to bottom.

View property management information, ratings, and properties: User selects property management link from the property search results thumbnails or from a specific property's page and is redirected to the property management page. User views the property management information, ratings, and properties by scrolling through the page from top to bottom.

View Hoot Housing contact information: User selects 'Contact Us' link under the Help section in the footer located on every page of the site. The user is redirected to the contact page and can view contact information on the right side of the page.

Submit a contact form: User selects 'Contact Us' link under the Help section in the footer located on every page of the site. The user is redirected to the contact page and can fill out a contact form on the left side of the page with their name, email, subject, and message. The user selects the 'Submit' button to send the form.

View Hoot Housing's origin story, mission, and team members: User selects the 'Our Story' link under the About section in the footer located on every page of the site. The user is redirected to the about page that includes the Hoot Housing team's background story and mission, as well as photos of the team members.

3.10 How the Interface Works: Handling Trouble

Popover explanations: Users can view explanations regarding the meaning of property and management ratings by moving their cursor over a term or label. The explanation will appear upon hover-over.

Alert messages: Users will encounter alert messages in response to deviations from the typical workflow and/or problems while searching by address or keyword, logging in, and registering an account.

FAQs: User selects 'FAQ' link under the Help section in the footer located on every page of the site. The user is redirected the the FAQ page and can scroll through questions and answers.

Glossary: User selects 'Glossary' link under the Help section in the footer located on every page of the site. The user is redirected the the Glossary page and can scroll through definitions of terminology used throughout the site.

3.11 Overall Interface Interaction

The relationship between presentations and user actions is outlined on the next page in Figure 6. In this figure the nodes represent presentations, in other words the different pages of the website. Screenshots of the website pages can be found in Appendix E.3, Figures 47-69. The link (arrows) represent users' actions necessary for moving between the presentations (website pages).
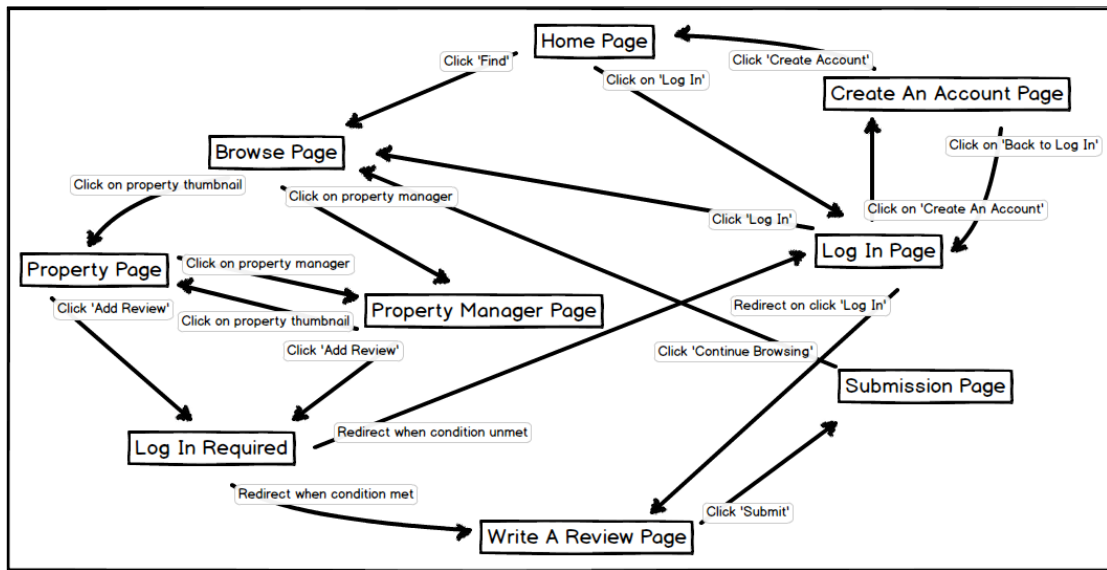
Figure 6. Interaction Network

It is important to note that this interaction network is not an exhaustive visual representation of all possible links between each node. Instead, it focuses on the primary interactions for accessing each website page.

Chapter 4: Usability Test Plan

4.1 Purpose

The Hoot Housing website has been designed and prototyped, but it has not been tested or evaluated for usability until now. Currently, there is no data that indicates whether Hoot Housing's target audience can use the website effectively. In order to establish baseline usability measures for the website, I conducted a usability test that examines the most frequently used core functions that have been implemented and ready to be tested.

The following sections (4.2 – 4.11) describe the plan for evaluating the usability of Hoot Housing before it was conducted.

4.2 User Studies Conducted

Usability testing will be conducted to evaluate the design of the Hoot Housing website and collect feedback for improving the website's usability. Since the fundamental design of the Hoot Housing site was established and developed, the most appropriate type of usability testing for this research study was assessment testing. Pairs of University of Oregon students will participate by performing seven tasks in order to evaluate the usability of specific site functions. After the test session each pair will take part in a debriefing interview where feedback on their experience using Hoot Housing's website will be collected. The usability testing will help measure how effectively the design of the Hoot Housing site was implemented, as well as help identify usability issues that need to be addressed for the next phase of developing the website.

4.3 Overall Objectives

I will collect data during test sessions about the design of Hoot

Housing's most frequently used core functions. The goals of this usability study are to:

- Evaluate the usefulness, efficiency, effectiveness, and satisfaction of the Hoot Housing website for its target audience performing frequently used tasks.

- Identify problem areas while completing frequently used tasks.

- Establish baseline usability measures and a usability testing protocol.

4.4 Research Questions

This usability study will attempt to address the following research questions.

- How easily and successfully do users…

  o Search for properties meeting specific criteria?

  o Search for a specific property (in database)?

  o Search for a specific property by address (not in database)?

  o Find property ratings and reviews for a specific property?

  o Find property management information and ratings they are looking for?

  o Register an account and log out?

  o Log in and submit a property review for the website?

- What are the usability problem areas that prevent users from completing common tasks?

- How do users feel about the the steps it takes to complete common tasks?

- How well does the organization and flow of the website align with users' expectations?

4.5 Participant Characteristics

I will select participants who are undergraduate students currently enrolled at the University of Oregon. The participants must have prior experience using similar review websites on the market. They also much have prior experience searching for off-campus student housing or who prior have experience living off-campus. I will recruit a total of 10 participants with the characteristics summarized in the table below (Table 5).

Characteristic	Desired Number of Participants
Off-Campus Living Experience	
Less than 2 years	5
More than 2 years	5
Age	
18-23	10
Gender	
Female	5
Male	5
Geographic Origin	
Oregon resident	4
Out-of-state resident	4
International	2

Table 5. Desired Participant Characteristics

4.6 Methodology

This usability study will primarily be an assessment test about the effectiveness of Hoot Housing's site. However, the study might gather some exploratory data. I will use pairs of participants that will perform seven common tasks (Figures 12-29).

Searching for properties that meet specific criteria
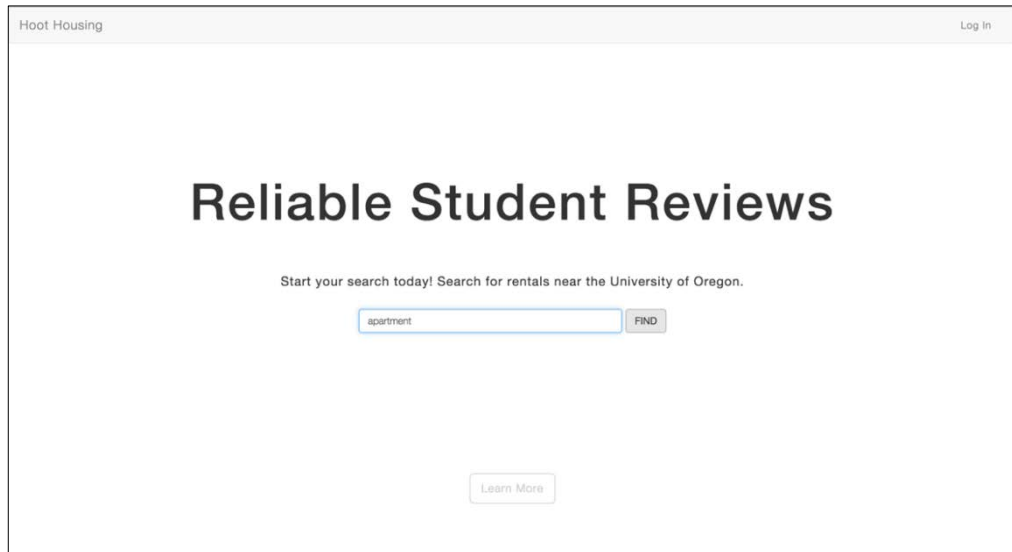
Figure 7. Home Page - Search for an apartment
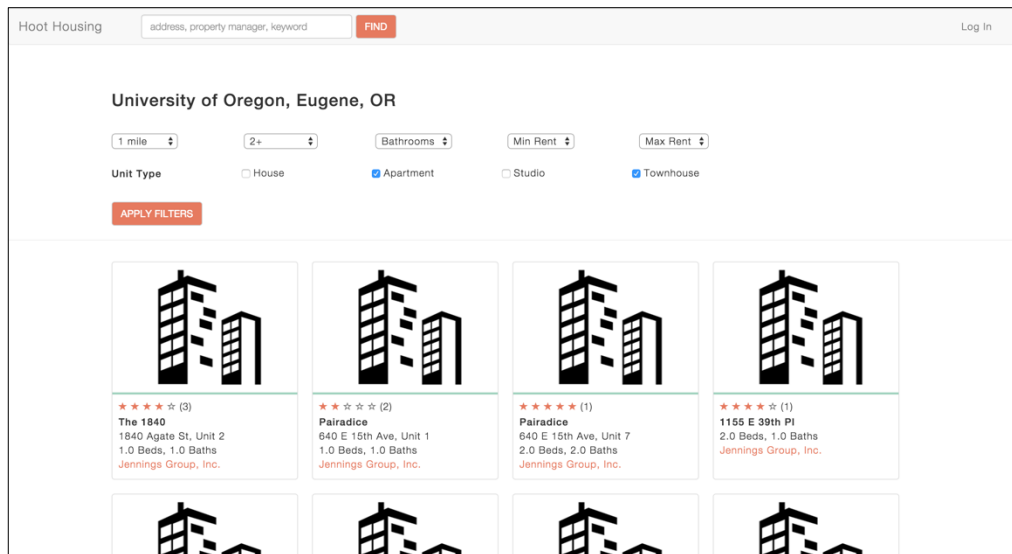
Figure 8. Browse Page - Filter search results
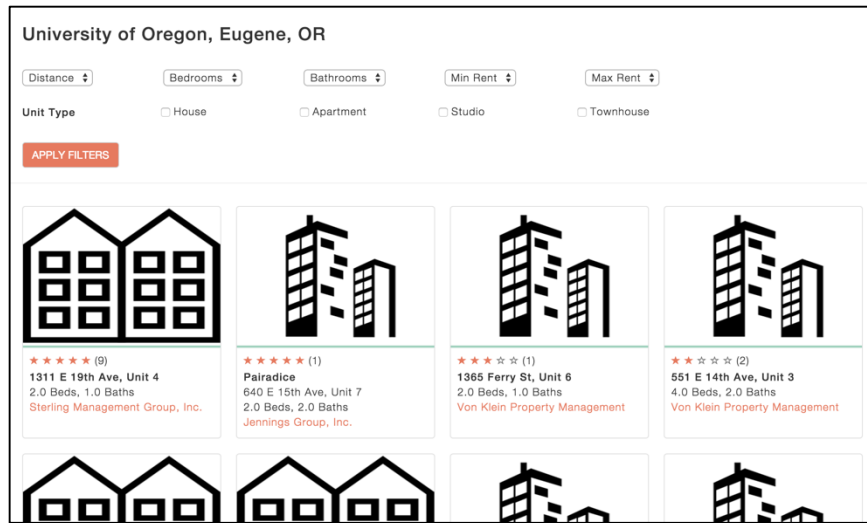
Figure 9. Browse Page – Browse search results

Searching for a specific property (in database)

Figure 10. Home Page – Search for house on Agate street

Figure 11. Browse Page – Look for house managed by Jennings Group

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Searching for a specific property by address (not in database)

Figure 12. Home Page – Search for property: 1436 E 20th St

Figure 13. Browse Page – No search results

Finding property ratings and reviews for a specific property

Figure 14. Home Page – Search for property: 1311 E 19th Ave

Figure 15. Browse Page – Select property: 1311 E 19th Ave

Figure 16. Property Page – Read property ratings and reviews

Finding property management information and ratings for a specific property
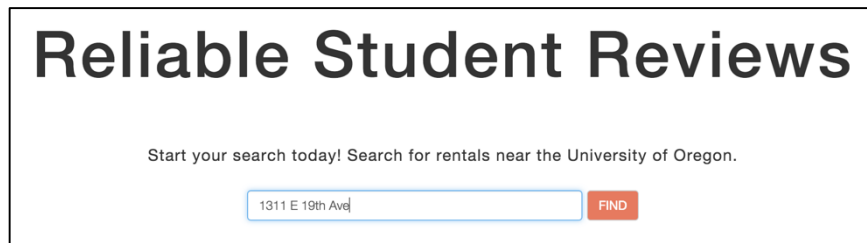
Figure 17. Home Page – Search for property: 1311 E 19th Ave
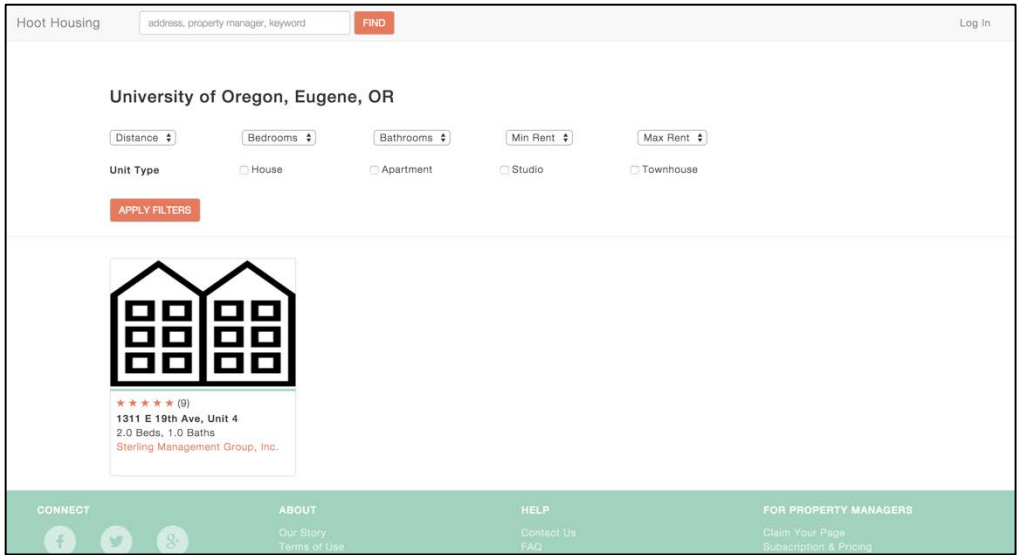
Figure 18. Browse Page – Select property management link for: 1311 E 19th Ave
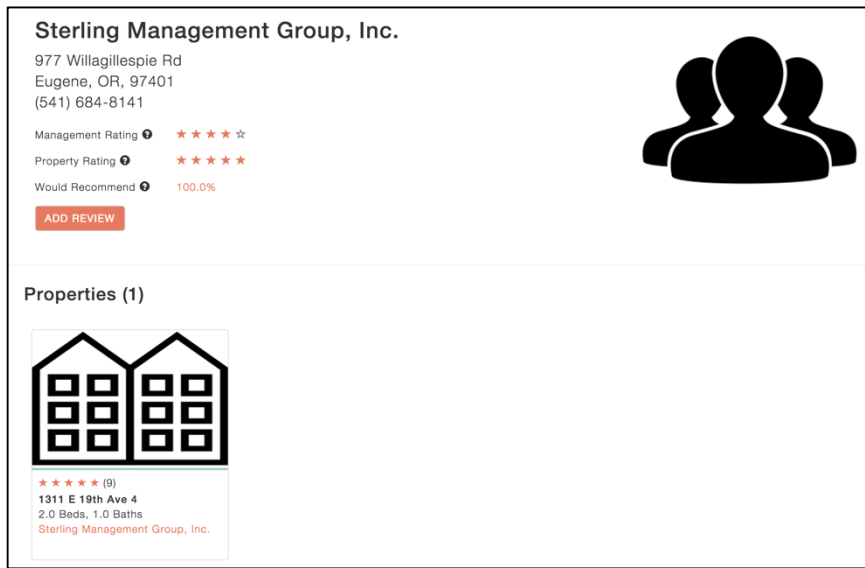
Figure 19. Property Management Page – Read information and ratings

Registering an account, and logging out
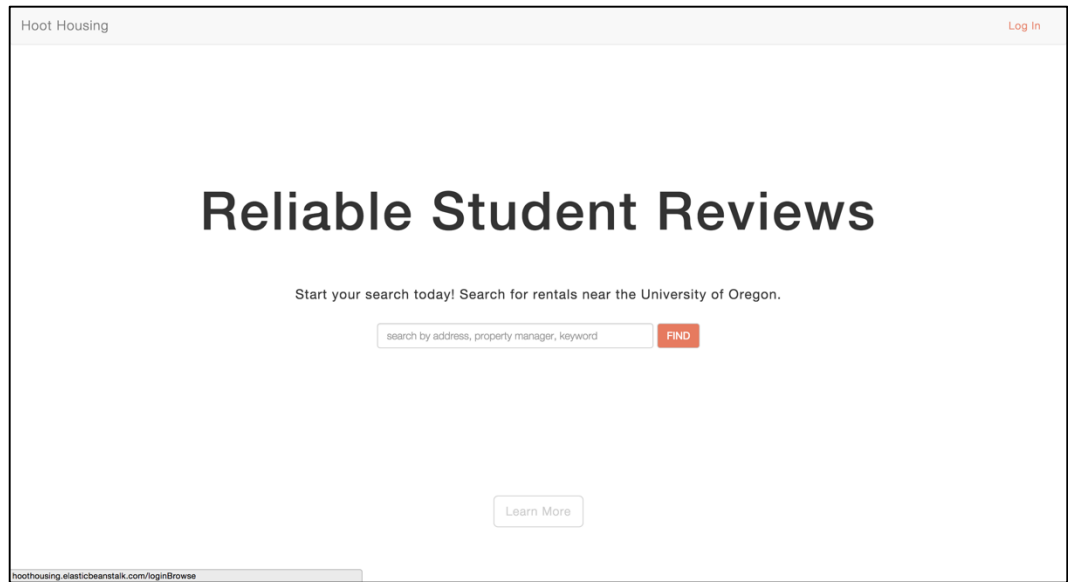
Figure 20. Home Page – Click on 'Log In' Link
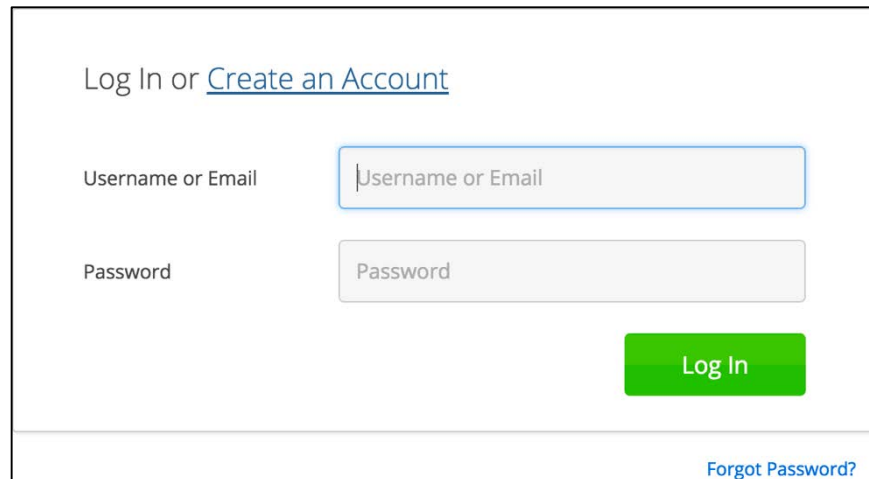
Figure 21. Log In – Click on 'Create an Account' link

Figure 22. Create an Account – Enter account information

Figure 23. Home Page – Click 'Log Out' link

Logging in and submitting a property review for a specific property.

Figure 24. Home Page – Search for property: 1311 E 19th Ave

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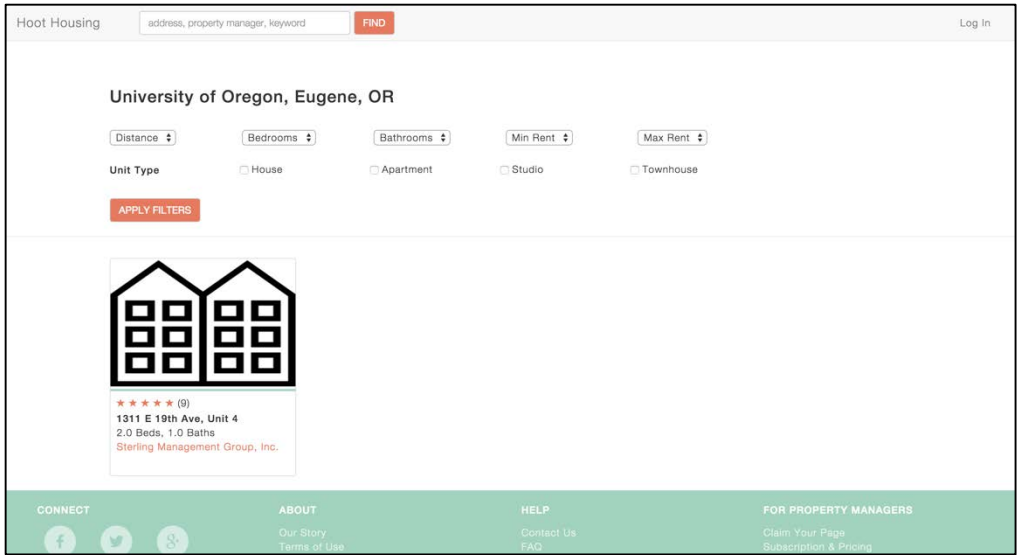
Figure 25. Browse Page – Select property: 1311 E 19th Ave
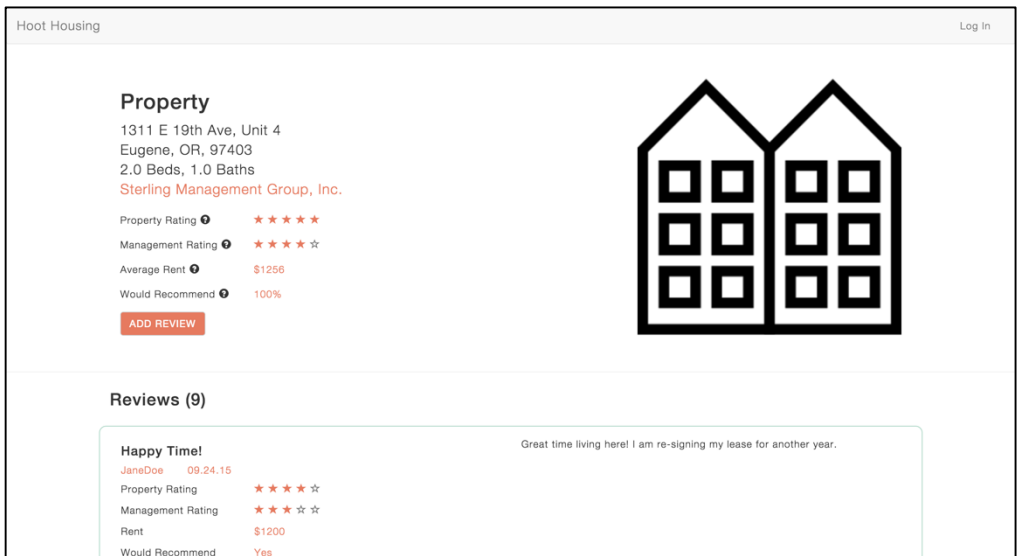
Figure 26. Property Page – Click 'Add Review' button

Figure 27. Log In – Enter account credentials

Figure 28. Review Page – Write a review
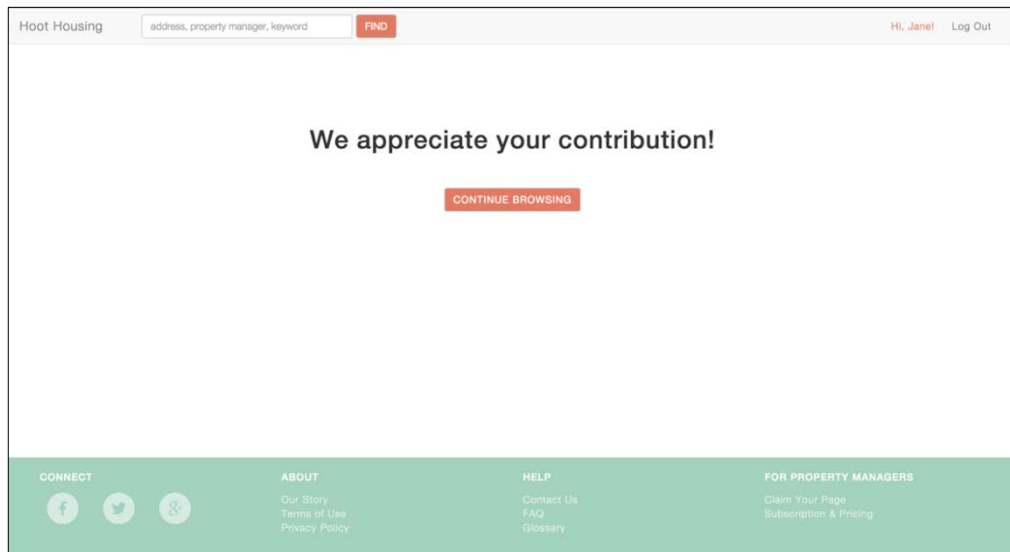
Figure 29. Submission Page – Submit Review

I will collect time on tasks, completion rates, and number of problems while completing each task in addition to qualitative data about participants' experiences using the website.

I will use a within-subjects design where each pair of participants will work through all seven tasks. I will conduct a total of five usability test sessions and debriefing interviews for each pair of participants, lasting approximately one hour. The first ten minutes of each session will be used to explain the session to the participants and provide necessary background information. The middle thirty-five minutes of the session will be reserved for participants to perform the seven tasks. Then, the last fifteen minutes of the session will be used to conduct a post-test debriefing interview.

4.7 Test Session Outline and Timing

Each test session will last one hour. The first ten minutes will be used for introductions and background questionnaires. The last fifteen minutes will be used for post-test debriefing interviews. The sessions will take place in a reserved room (160

Deschutes) at the University of Oregon. The test materials used to conduct each session can be found in Appendix B.

Introduction (5 minutes)

The test moderator will discuss the importance of the study, test session outline, test environment set up, and moderator's role. The participants will read and sign informed consent forms.

Background Questionnaire (5 minutes)

The test moderator will collect information including name, age, gender, geographic origin, marital status, academic level, major(s), years living off-campus, housing type, and familiarity with review websites.

Tasks (35 minutes)

During each session each pair of participants will attempt to complete the following:

1. Search for properties that meet specific criteria
2. Search for a specific property (in database)
3. Search for a specific property by address (not in database)
4. Find property ratings and reviews for a specific property
5. Find property management information and ratings for a specific property
6. Register an account and log out
7. Log in and submit a property review for a specific property

Post-Test Interview (15 minutes)

The test moderator will debrief participants following each test session.

1. Overall, how did you like the website?

2. Describe any particular problems you experienced while completing any of the tasks?

3. Was there anything that surprised you while completing any of the tasks?

4. Do you have any concerns about submitting your own property review?

5. Is there any additional information you'd find useful or helpful that wasn't included?

6. Were you able to accurately predict the steps toward completing each task? If not, why?

7. Did you think the number of steps required to complete each task was reasonable? If not, why?

8. Would you use the site to search for off-campus student housing and/or leave your own property review in the future? Why or why not?

9. Are there additional features you'd like to see added to the final product?

4.8 Session Schedule

The test session schedule is outlined in Table 6 below.

Session	Date	Time	Participants
Pilot	May 29, 2015	3:30 PM	PA
1	June 1, 2015	4:30 PM	1A, 1B
2	June 3, 2015	4:30 PM	2A, 2B
3	June 4, 2015	5:15 PM	3A, 3B
4	June 5, 2015	10:30 AM	4A, 4B

Table 6. Session Schedule

4.9 Test Environment, Equipment, Logistics

I will use a controlled test environment for the test sessions. Each test session will take place in a reserved room (160 Deschutes) at the University of Oregon. The testing room will be set up with a desk, MacBook Pro 15" Laptop, and two chairs for

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each pair of participants. The computer will run Silverback, a usability testing software, to document the participants' dialogue and behavior during the sessions. The test moderator will observe from a chair set up behind both participants. Figure 30 shows an example of how the test environment will be set up.
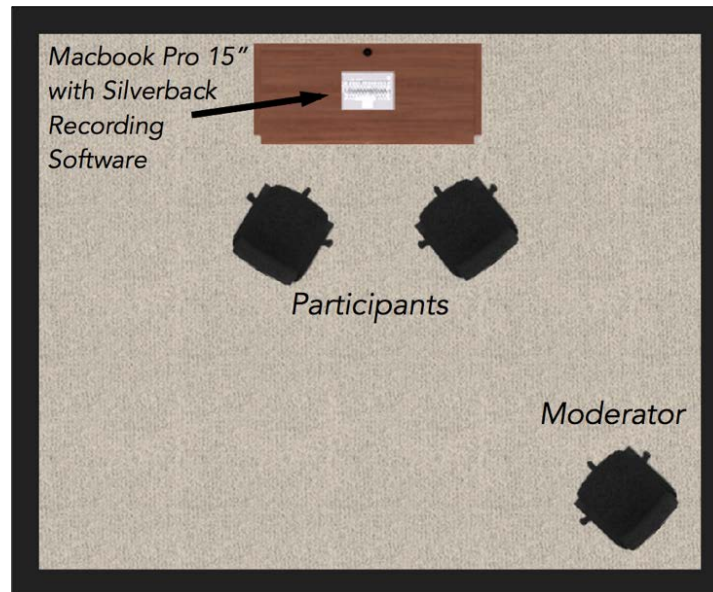
Figure 30. Test Environment

4.10 Test Moderator Role

As the test moderator I will observe each test session but will have minimal interaction with the participants during each session. Except for the session introduction, background questionnaires, and post-test interviews I will not engage with the participants. Minimal interaction during the test sessions will help mitigate the risk of leading the participants through each task or influencing their behavior in any way.

4.11 Evaluation Measures

To answer the usability study research questions listed above in Section 4.4, the following performance and preference data will be collected.

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Performance (Quantitative)

- Time on task

- Completion rate of each task

- Number of problems encountered while completing each task

Preference (Qualitative):

- Verbal conversational feedback and deliberation between pairs of participants

- Debriefing interviews will illuminate what stands out about the experience of using the website, which will help guide potential changes to the site and implementation of additional features

Chapter 5: Results

The usability testing results consist of quantitative and qualitative data. Some examples of quantitative data collected include the number of problems users encountered for each task, the number of tasks completed without problems, the number of tasks completed with problems, and the time for completing each tasks. The majority of the data gathered focuses on qualitative feedback including observational data and user feedback.

5.1 Participants

Nine participants responded to the recruitment email and attended a 1-hour test session in Deschutes 160 at the University of Oregon. The sessions included a pilot session with one participant and four test sessions with four pairs of participants. During the beginning of each session participants completed a Background Questionnaire (see Appendix B.2). A portion of the responses gathered using the Background Questionnaire are summarized below in Table 7.

Characteristic	Number of Participants
Off-Campus Living Experience	
Less than 2 years	3
More than 2 years	6
Age	
20-23	7
24-26	2
Gender	
Female	4
Male	5
Geographic Origin	
Oregon resident	4
Out-of-state resident	4
International	1

Table 7. Participant Characteristics

The table shows that participants had between 0 to 6 years living off-campus.

Participants ranged from 20 to 26 years old, with an average of 22 years old, of which

there was a four-to-five ratio of female-to-male participants. Four participants were

Oregon residents, four were Out-of-state residents, and one was an International

student.

The nine recruited participants closely resembled the desired participant

characteristics outlined in Section 4.5 (Table 5. Desired Participant Characteristics). In

general, participants had more off-campus living experience than expected. Participants

also represented a larger age range, 20-26 years old, than the desired range of 18-23

years old. The ratio between female-to-male participants varied by one participant, as

well as the number of international students. Ideally the Pilot test session would have

included a female international student with less than 2 years of off-campus living

experience. Nonetheless, the absence of these characteristics did not have any noticeable negative affects on the usability testing results gathered.

The Background Questionnaire also gathered the information summarized in Table 8 below. The ethnic identity, marital status, housing type, and familiarity with review websites characteristics are listed below in the order they appear on the Background questionnaire. The academic level and major(s) characteristics are listed in chronological order and alphabetical order respectively.

Characteristic	Number of Participants
Ethnic Identity	
Asian	1
Multiethnic	2
White, non-Hispanic	6
Marital Status	
Single	9
Married	0
Academic Level	
Freshmen	0
Sophomore	3
Junior	3
Senior	3
Major(s)	
Architecture & Allied Arts	1
Biology	1
Computer and Information Science	5
Environmental Science	1
Geography	1
History	1
Human Physiology	1
Psychology	1
Housing Type	
House	3
Apartment	7

Familiarity with review-based websites	
Angie's List	1
Yelp	6
Rotten Tomatoes	7
Rate My Professors	9
Trip Advisor	4
AirBnb	1
Other: Hostel World	1

Table 8. Background Questionnaire Responses

In summary, the ethnic identities represented by the nine participants included one Asian, 2 Multiethnic, and six White, non-Hispanic students. All nine participants were single and none of the participants identified their academic level as freshman students. There were three sophomores, three juniors, and three senior students. The majority of participants (5 participants) were Computer and Information Science majors, but the following majors were also represented: Architecture & Allied Arts, Biology, Environmental Science, Geography, History, Human Physiology, and Psychology. Participants had experience living in off-campus houses (3 participants) and apartments (7 participants). Lastly, all participants expressed familiarity with Rate My Professors and at least half of the participants were familiar with Yelp and Rotten Tomatoes. More specifically, at least one of the nine participants was familiar with each of the review-based websites listed on the Background Questionnaire and one of the participants listed familiarity with an alternative review-based website, Hostel World.

Looking back at Section 3.3 describing potential user characteristics, the users were represented by the demographic composition of the student body from the University of Oregon (UO). Based on the statistics from the UO Facts section of the Admissions Page of the University of Oregon's website[32], the geographic origin, ethnic

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[32] "UO Facts." *Admissions.* University of Oregon.

identity, and student life statistics depicted a certain degree of diversity of which this study aimed to capture in its pool of recruited participants. The participants displayed similar geographic origin characteristics (4 Oregon: 4 Out-of-state: 1 International) to that of the UO student body described in Table 1. The participants were slightly more diverse (33% students of color) than the UO student body (22.3% students of color) shown in Table 2. Lastly, the statistics shown in Table 4 suggest that 20% of freshmen, 90% of sophomores, 95% of juniors, and 98% of seniors reside in off-campus housing. Despite none of the participants indicating freshman academic standing, the even distribution of the participants indicating the remaining class levels (3 sophomores: 3 juniors: 3 seniors) mirrors the majority of Hoot Housing's target audience.

5.2 Performance Data

The effectiveness and efficiency of Hoot Housing's design was measured by collecting completion rates, time on tasks, and number of problems encountered by the participants during each test session. The ability of participants to complete each task and the number of problems participants experienced demonstrates the effectiveness of the design. The time on task measures the efficiency of the site's design. The Pilot session consisted of one participant; the remaining sessions 1-4 consisted of pairs of participants.

Table 9 displays the rate of completion all seven tasks performed during each test session. The completed tasks are indicated with an 'X', while the incomplete tasks are marked with an '–'.

Task	Pilot	Session 1	Session 2	Session 3	Session 4	Completion Rate
1	X	X	X	X	X	100%
2	X	X	X	X	X	100%
3	X	X	X	X	X	100%
4	X	X	X	X	X	100%
5	–	X	X	X	X	80%
6	X	X	X	X	X	100%
7	X	X	X	–	X	80%

Table 9. Completion Rate

The table above shows 100% completion for all but two tasks, task 5 and 7. Task 5 asked participants to review the ratings and information available for the property management of a particular property. Task 7 instructed participants to log into their newly created account, leave a review for a specific property, and go look at their submitted review to confirm it was successfully submitted.

During the Pilot session the participant believed they had successfully completed task 5 after examining the management ratings listed for a particular property instead of viewing the ratings and information listed for the property management. Task 7 was not completed by session 3 participants because they failed to 'go look for [their] newly added review'. Instead, they returned to the home page after creating a review and skipped confirming that their review successfully submitted. The 80% completion rates for tasks 5 and 7 were due to misinterpretation and failure to following provided instructions. As discussed in Section 2.1 the effectiveness "measures if users are able to accomplish what they intend with ease". Because the reasons for failure were related to participants' ability to interpret and follow instructions, the completion rates do not reflect negatively on the effectiveness of the site's design.

Table 10 shows the time in seconds spent to complete each of the seven tasks. Section 2.1 describes efficiency as "how quickly the user can accomplish his or her

goals with accuracy and completeness". The times on tasks were measured from the second participants began attempting to complete each task using the Hoot Housing website to the second participants returned to the home page to indicate they were done with each task. It is important to note that the mean times calculated for each task are not as reliable of a representation representation of efficiency as they would have been if all test session were conducted with two participants. This observation assumes that a single participant takes less time than pairs of participants because they do not spend time discussion each task with a partner.

Task	Pilot (sec)	Session 1 (sec)	Session 2 (sec)	Session 3 (sec)	Session 4 (sec)	Mean (sec)
1	98	270	142	79	368	191
2	40	132	48	16	104	68
3	137	185	259	98	261	188
4	33	30	42	111	120	67
5	34*	50	69	70	50	55
6	43	51	56	62	75	57
7	143	163	98	94*	117	123

Table 10. Time on Task (seconds)

*Participant(s) did not complete the task

In order to assess the efficiency of the design based on the times listed above, it is important to take into account the time needed to complete each core function outlined in Section 3.7. Comparing the mean times in Table 10 to the overall performance times determined prior to the usability testing conducted (Section 3.7) shows that participants could efficiently perform all seven tasks. The mean times spent completing each of the seven tasks show that on average, participants spent no longer than 3 minutes and 12 seconds on any of the tasks. While this is a relatively small amount of time spent using a website, this does not mean that the steps toward completing each task didn't include inefficiencies altogether.

The tasks that took more than 3 minutes on average included searching for properties that met specific criteria (Task 1) and searching for a property by address that was not in the database (Task 3). While the time users should spend exploring the site for prospective rental properties might vary drastically, the time users should spend searching for an address that isn't in the database should be finite and as minimal as possible. So long as users explore properties with specific criteria in mind without

encountering frustrations or design weaknesses that make the process *un*usable, the more time users spend on Hoot Housing the better.

Participants spent about 2 minutes on average working through Task 7: Logging in and submitting a property review for a specific property. The estimated overall performance times previously mentioned (Section 3.7) show that logging in and submitting a review should take a combined time of 4 minutes. This contrast in times reveals that the original estimate was twice the amount of time participants required and that Hoot Housing's log in and review submission features were support an efficient user experience.

The remaining tasks (Task 2 and Tasks 4-6) took between 55 to 68 seconds on average for participants to complete. Participants spent approximately 1-minute searching for a specific property (Task 2), finding property ratings and reviews for a specific property (Task 4), finding property management information and ratings for a specific property (Task 5), and registering an account and logging out (Task 6). Compared to the overall performance times estimated in Section 3.7, participants required less time than expected to perform task 2 and tasks 4-6. Again, despite inefficiencies that are discussed in the remainder of this chapter and explored in great detail in chapter 6, the data shown in Table 10 above supports the conclusion that Hoot Housing's design provided an efficient user experience with respect to time.

Table 11 displays the number of problems participants encountered while completing each of the seven tasks. Highlighting the total number of problems for each task reflects the effectiveness and efficiency of Hoot Housing's design. As discussed in Section 2.1, effectiveness doesn't solely relate to whether participants completed each

task. Measuring effectiveness must address the problems involved in completing each task because effectiveness relates to whether participants "are able to accomplish what they intend to with ease". Similarly, measuring efficiency not only involves the time required for users to achieve his or her goals, but also whether users can do so with accuracy and completeness.

Task	Pilot	Session 1	Session 2	Session 3	Session 4	Total
1	-	1	-	-	1	2
2	-	1	-	-	1	2
3	1	1	1	1	1	5
4	-	-	-	1	-	1
5	1	-	-	1	-	2
6	-	1	-	-	-	1
7	-	1	-	-	-	1

Table 11. Number of Problems

The table above shows that at least one problem was encountered while completing each of the seven tasks. Participants experienced a total of one problem for the following tasks:

- Task 4: Find property ratings and reviews for a specific property

- Task 6: Register an account and log out

- Task 7: Log in and submit a property review for a specific property

Participants experienced a total of two problems while completing the following tasks:

- Task 1: Search for properties that meet specific criteria

- Task 2: Search for a specific property (in database)

- Task 5: Find property management information and ratings for a specific property

Finally, participants experienced a total of five problems while completing Task 3: Search for a specific property by address (not in database). This higher frequency of problems indicates that this was the most difficult task for participants to complete.

Overall this data shows that despite the efficiency and effectiveness demonstrated through low time on tasks and high completion rates there were problems with the usability of each of the seven tasks, which indicates weaknesses in the design

of the Hoot Housing website. These issues will be explored in more depth in Chapter 6: Analysis & Recommendations.

5.3 Preference Data

At the end of each test session participants responded to questions about their overall experience using the Hoot Housing website. Section 2.1 describes satisfaction as "how a user feels about a product…[including] personal opinions and perceptions". The responses to each debriefing interview question are in Appendix C.

During the debriefing interviews participants said they liked the design of the Hoot Housing website. They described the design as straightforward, modern, simple, fast, responsive, and predictable. Despite the positive response to the experience, participants had some reservations about using the site in the future. One of the primary issues that arose was whether the site would gain enough traction with its target audience to offer depth in the number of reviews and information available to attract more users. As discussed in Section 1.1, the value review websites offer depends on the magnitude of contributors. One of the key components to gaining popularity amongst Hoot Housing's target audience is providing a user experience that encourages users to return to the site regularly and refer the site to others.

An important step in strengthening the user experience of Hoot Housing's site starts with implementing changes in the design of the site to improve its usability. During the debriefing interview participants discussed improving: the site's search engine functionality, help feedback provided while searching, and the visibility to the number of reviews for each property and property management. Participants expressed the need to add: more filtering search results options (ex: filter by blocks from campus,

amenities, side of campus, etc.), sorting search results functionality, a map feature, a similar properties section based on search parameters and/or selected filters, the ability to 'favorite' properties, the distance from campus to all property thumbnails and property pages, pictures of each property, the ability to upload user-submitted pictures, logging in using a Facebook account, and password verification while creating an account. The debriefing interview included a discussion about clarifying: how the site calculates rent (per person vs. per unit), that properties have reviews but property management do not, and how ratings for property management are calculated.

Finally, the during debriefing interview participants said they would like to be able to: save previously selected filters and/or search parameters, view all properties at once, and compare properties side-by-side. While the many changes previously mentioned have the potential to eliminate the usability issues encountered throughout the testing process, arguably the biggest usability issue remains. Providing incentive for leaving properties reviews is an aspect that all of the participants discussed and it is one that cannot solely be solved programmatically. The next chapter (Chapter 6) explores the usability issues in more depth and includes recommendations for improving upon each issue.

Chapter 6: Analysis and Recommendations

In order to explore in-depth each problem encountered during the five test sessions, each problem was analyzed including recommended solutions. The analysis of the fourteen encountered usability issues can be found in Appendix D. Problem Analysis. Each analysis includes the following information:

- Test session

- Location within the Silverback recording (time)

- Task participants are attempting

- Participants' goal or intention

- Participants' actions performed

- Participants' perceived effect of their actions

- Cause(s) of each problem

- Recommended solutions for eliminating the problem

6.1 Analysis

To summarize the problem analysis, the causes of usability issues encountered are addressed in order of most severe to lease severe. The primary cause of problems encountered during each test session was Hoot Housing's search engine. Participants struggled with understanding which search parameters would produce their expected results and what search parameters were acceptable. They also had difficulties identifying when an address was not included in the database and therefore impossible to find using the search engine or filtering features. This misunderstanding was caused by participants' failure to recognize the help message provided when there are zero

search results. More specific examples of this misuse and misunderstanding of the site's search engine include:

- Participants did not understand that the address might not be in the database

- Participants didn't recognize or understand the help message 'Still can't find a property? We're sorry, we might not have it in our database yet.' Provided on the browse page

- Participants didn't understand what search parameters were/weren't acceptable

- Search engine doesn't allow for combined searches by address, property management, and/or keyword parameters

- Search engine doesn't catch misspellings entered by the user

- Participants didn't use/notice the search bar located at the top of the browse page correctly

- Participants couldn't look through all the properties available

- Participants understood that the address might not be in the database, but weren't sure if that was true for the given address

- Participants didn't recognize or understand that the website targeted off-campus properties near the University of Oregon

- Search engine doesn't allow for searching by city and/or state, it already assumes that off-campus property for the University of Oregon are located in Eugene, Oregon

- Search functionality to find users of the Hoot Housing site was not available

- Profile pages, submitted reviews, or other forms of information are not available for each user of the Hoot Housing site

Closely related to the search engine, the ability to filter search results also caused problems for participants. Because participants couldn't look through all the properties using the search engine, many found that they achieve the same effect by

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clicking the 'Apply Filters' button with zero filters selected. While this was a creative

and resourceful use of Hoot Housing's filter search results feature, it is not the most

usable way for users to achieve their goal. Instead, it is most beneficial to clarify the

correct usage of the filtering feature of Hoot Housing's site and improve upon the other

problems that participants experience related to using the filters. These problems

include:

- Participants were unable to identify when filters were/weren't applied to their search results

- Participants did not understand that the max rent filter related to total rent for each property

Additional sources of problems experienced by participants related to property

management pages, logging in, and adding a review to the Hoot Housing site. One out

of nine participants failed to navigate to the property management page during task 5,

which indicated that they were not aware that such pages existed for property

management of each property included on the site. While the remaining 8 participants

easily navigated to the property management, they still displayed a lack of

understanding the information and ratings available the property management pages.

The following list elaborates upon the types of misunderstandings experienced by the

participants:

- Participants didn't recognize the property management names as links to the property management pages

- Participants did not understand that the property management name links were identical no matter where there were located on the site

- Participants didn't understand that the property management information and ratings for the specified property were different from the 'Management Rating'

- Participants did not understand how ratings for property management were calculated

- Participants did not understand and/or read the help message available for each rating available on the property management page

Lastly, participants drew attention to usability issues with regards to the site's logging in feature. Although the problems caused by this feature did not disrupt their ability to progress through tasks, it still contributed to inefficient and ineffective interactions with the site. The causes include:

- Participants expected to see two buttons/links, one for signing up and one for logging in

- Logging in automatically re-routes users to the browse page

- Participants believed they must log into their account using the 'Log In' link before writing a review using the 'Add Review' button

- Participants are not aware that clicking on the 'Add Review' button automatically requires participants to log in (if not previously logged in) and then proceeds directly to the review form

6.2 Recommendations

In order to eliminate these usability issues for future designs of the Hoot Housing website, recommendations for improving the design and usability of the site made up the final component of the in-depth problem analysis (see Appendix D). The cause of problems ranging from most severe cause of problems to least severe were addressed above. The recommended solutions will be discussed in the same order, starting with improving the Hoot Housing's search engine. The following recommendations should be the first changes implemented because the search engine feature caused the most severe problems during the usability testing and directly related to the usefulness of the website. Improvements related to the search engine functionality

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might possibly be the most difficult to implement from a programming and user

interface feedback perspective so the recommendations listed below should be

addressed before solving less challenging usability issues.

- Draw users' attention to help messages by increasing the font size, changing the font color, or animate its appearance (ex: popup, modal, etc.)

- Expand search engine functionality to allow for misspelled parameters

- Expand search engine functionality to allow for combined searches by address, property management, and/or keyword parameters

- Enhance the provided help message on the browse page by including search criteria previously entered (search parameters and)

- Improve help message on the browse page by providing examples of acceptable search parameters

- Provide participants more confidence in their search process by displaying search results on a map

- Make search bar at the top of the browse page more obvious to users (ex: center align, enlarge, etc.)

- Clarify purpose/usage of search bar on the browse page as identical to the search bar on the home page

- Add the ability to search for all available properties from the home and browse pages

- Increase the value of the information available after clicking 'Learn More' on the home page by including more help and guidance for using the search bar

- Provide participants more confidence in their search process by saving and displaying their search parameters once search results are generated

- Expand search functionality to include Hoot Housing users and add profile pages for each user

- Expand search functionality to ignore punctuation within search parameters

Following improvements to the search engine, the second most priority with respect to improving Hoot Housing's user experience involves filtering search results. To mitigate the problems caused by the filtering feature of the site, the following solutions should be considered:

Enhance the provided help message on the browse page by including search criteria previously entered (applied filters)

- Allow users to search by applying filters from the home page in addition to the browse page

- Increase the value of the information available after clicking 'Learn More' on the home page by including more help and guidance for filtering search results

- Provide participants more confidence in their search process by saving and displaying their previously applied filters once search results are generated

Once the search engine and filtering features of the site are addressed, the usability of the site will be improved greatly. The majority of problems encountered during the usability testing sessions originated from interacting with these features, causing participants to become frustrated. While the navigation to the property management page and use of information/ratings available for the property management were not as prevalent, they should be the next priority when improving the site. Since the information and ratings for the property management are inherently tied to the core of Hoot Housing's site, reading and writing reviews for off-campus student housing, it is crucial that users understand how to get to the property management pages and what insight the pages provide. Solutions for improving access to the property management related resources include:

- Emphasize the property management name links by creating a contrast between the on-hover vs off-hover colors, underlining the links, and/or changing the text color to a more conventional link color (ex: blue)

- Rewrite question-mark icon help messages to better communicate how property management ratings are calculated

- Include the number of reviews that go into calculating the ratings for property management next to each rating

Finally, the process of logging in must be clarified in order to address the problems that arose related to those features. The related problems previously discussed did not render the logging in feature *un*usable, but it still caused inefficient interactions for participants. The following solutions could eliminate inefficiencies for the future design of Hoot Housing:

- Add a 'Sign up' or 'Create an Account' link to the home page next to the 'Log In' link

- Change the labeling of the 'Log In' link to 'Log In/Sign up'

- Re-route users to the page they were previously on once they successfully log in using the 'Log In' link

Conclusion

This research study originated from an idea conceived in November 2014 by a group of students eager to impact the off-campus student housing culture surrounding the University of Oregon. As I began exploring ideas for my thesis I sought out a challenge that would require me to learn new skills and expand my knowledge related to the human-computer interaction field. The design, development, and evaluation of Hoot Housing was a perfect opportunity for me to achieve both goals. I assumed that the most challenging part of my research would be developing the website given my limited web development experience building static website with HTML[33], CSS[34], and some JavaScript[35]. To my surprise, I found that the programming phase of this research was the most straightforward despite learning how to create a dynamic website with a scalable database and the integration of the Flask and Stormpath APIs (Application Programming Interface). During the design phase of this research I learned how complex seemingly straightforward decisions could be. For instance, what the website should be able to do, which technologies would offer the appropriate means to implement those decisions, and how to build a usable product that brought those decisions to life. I also discovered exploring usability and usability evaluation techniques was more demanding than I anticipated originally.

Overall, the usability evaluation of Hoot Housing showed the website offered effectiveness, efficiency, and satisfaction for its target users. The most concerning usability measure was usefulness due to its high dependency on the website's ability to

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[33] https://en.wikipedia.org/wiki/HTML
[34] https://en.wikipedia.org/wiki/Cascading_Style_Sheets
[35] https://en.wikipedia.org/wiki/JavaScript

recruit and retain a large user base. However, none of the usability issues were significant enough to render the website unusable because there were many possible solutions to eliminate each problem. The usability testing revealed that the majority of design decisions for the website were appropriate given the purpose of the website.

Although the scope of this undergraduate thesis limits further exploration of the Hoot Housing website, it is important to discuss potential applications of the results gathered throughout this process. The next step toward delivering a highly usable website should include redesigning the website by incorporating recommended solutions included in this thesis. This version of the website should be developed and another phase of assessment usability testing should be conducted. After completing these steps, another phase of redesigning and developing the website should take place. Lastly, validation usability testing should reveal any usability issues that need to be mitigated before releasing the product.

The legacy of my research not only benefits the future design of Hoot Housing, but also has the potential to impact the lives of University of Oregon students. This includes raising students' expectations of housing opportunities, greater accountability for property managers' treatment of student renters, and building an online community through which housing experiences can be shared. On a larger scale, it shows the capacity of user-centered design to produce review websites that enhance all facets of people's lives and the complexity of creating usable websites.

Appendix A. Standards & Laws Documents

A.1 Hoot Housing Terms and Conditions of Use

Hoot Housing Terms and Conditions of Use

Terms

By accessing this web site, you are agreeing to be bound by these web site Terms and Conditions of Use, all applicable laws and regulations, and agree that you are responsible for compliance with any applicable local laws. If you do not agree with any of these terms, you are prohibited from using or accessing this site. The materials contained in this web site are protected by applicable copyright and trade mark law.

Use License

1. Permission is granted to temporarily download one copy of the materials (information or software) on Hoot Housing's web site for personal, non-commercial transitory viewing only. This is the grant of a license, not a transfer of title, and under this license you may not:

    a. modify or copy the materials;

    b. use the materials for any commercial purpose, or for any public display (commercial or non-commercial);

    c. attempt to decompile or reverse engineer any software contained on Hoot Housing's web site;

    d. remove any copyright or other proprietary notations from the materials; or

    e. transfer the materials to another person or "mirror" the materials on any other server.

2. This license shall automatically terminate if you violate any of these restrictions and may be terminated by Hoot Housing at any time. Upon terminating your viewing of these materials or upon the termination of this license, you must destroy any downloaded materials in your possession whether in electronic or printed format.

Disclaimer

The materials on Hoot Housing's web site are provided "as is". Hoot Housing makes no warranties, expressed or implied, and hereby disclaims and negates all other warranties, including without limitation, implied warranties or conditions of merchantability, fitness for a particular purpose, or non-infringement of intellectual property or other violation of rights. Further, Hoot Housing does not warrant or make any representations concerning the accuracy, likely results, or reliability of the use of the materials on its Internet web site or otherwise relating to such materials or on any sites linked to this site.

Figure 31. Terms of Use (Part 1)

Limitations

In no event shall Hoot Housing or its suppliers be liable for any damages (including, without limitation, damages for loss of data or profit, or due to business interruption,) arising out of the use or inability to use the materials on Hoot Housing's Internet site, even if Hoot Housing or a Hoot Housing authorized representative has been notified orally or in writing of the possibility of such damage. Because some jurisdictions do not allow limitations on implied warranties, or limitations of liability for consequential or incidental damages, these limitations may not apply to you.

Revisions and Errata

The materials appearing on Hoot Housing's web site could include technical, typographical, or photographic errors. Hoot Housing does not warrant that any of the materials on its web site are accurate, complete, or current. Hoot Housing may make changes to the materials contained on its web site at any time without notice. Hoot Housing does not, however, make any commitment to update the materials.

Links

Hoot Housing has not reviewed all of the sites linked to its Internet web site and is not responsible for the contents of any such linked site. The inclusion of any link does not imply endorsement by Hoot Housing of the site. Use of any such linked web site is at the user's own risk.

Site Terms and Use Modifications

Hoot Housing may revise these terms of use for its web site at any time without notice. By using this web site you are agreeing to be bound by the then current version of these Terms and Conditions of Use.

Governing Law

Any claim relating to Hoot Housing's web site shall be governed by the laws of the State of Oregon without regard to its conflict of law provisions.

General Terms and Conditions applicable to Use of a Web Site.

Figure 32. Terms of Use (Part 2)

A.2 Privacy Policy

Hoot Housing Privacy Policy

Your privacy is very important to us. Accordingly, we have developed this Policy in order for you to understand how we collect, use, communicate and disclose and make use of personal information. The following outlines our privacy policy.

- Before or at the time of collecting personal information, we will identify the purposes for which information is being collected.

- We will collect and use of personal information solely with the objective of fulfilling those purposes specified by us and for other compatible purposes, unless we obtain the consent of the individual concerned or as required by law.

- We will only retain personal information as long as necessary for the fulfillment of those purposes.

- We will collect personal information by lawful and fair means and, where appropriate, with the knowledge or consent of the individual concerned.

- Personal data should be relevant to the purposes for which it is to be used, and, to the extent necessary for those purposes, should be accurate, complete, and up-to-date.

- We will protect personal information by reasonable security safeguards against loss or theft, as well as unauthorized access, disclosure, copying, use or modification.

- We will make readily available to customers information about our policies and practices relating to the management of personal information.

We are committed to conducting our business in accordance with these principles in order to ensure that the confidentiality of personal information is protected and maintained.

Figure 33. Privacy Policy

Appendix B. Test Materials

These test materials were used throughout the usability testing phase of this research study. They were created with the help of reference materials provided by Dr. Sarah Douglas[36] in conjunction with examples discussed in *Handbook of Usability Testing*[37].

B.1 Recruitment Email

The email below was sent to students from the Computer and Information Science Department, Robert D. Clark Honors College, and other students previously known by the test moderator.

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[36] Douglas, Sarah A. "How to Do Usability Testing.".
[37] Rubin, Jeffrey, and Dana Chisnell.

Figure 34. Recruitment Email

B.2 Background Questionnaire

The test moderator asked each participant to complete the following questionnaire in the figure below.

Background Questionnaire

Full Name:

Age: **Gender:**

Geographic Origin (Circle One):   Oregon Resident   Out-of-state Resident   International

Ethnic Identity (Check One):
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latino or Chicano
- ☐ Multiethnic
- ☐ Native Hawaiian or Pacific Islander
- ☐ White, Non-Hispanic

Marital Status (Circle One):   Single   Married

Academic Level (Circle One):   Freshman   Sophomore   Junior   Senior

Major(s):

Years living off-campus:

Housing Type (Check all that apply):
- ☐ House
- ☐ Apartment
- ☐ Studio
- ☐ Townhouse

Familiarity with review-based websites (Check all that apply):
- ☐ Angie's List
- ☐ Yelp
- ☐ Rotten Tomatoes
- ☐ Rate My Professors
- ☐ TripAdvisor
- ☐ AirBnb
- ☐ Other (Please specify in space provided below)

_____

Figure 35. Background Questionnaire

B.3 Informed Consent

The test moderator asked each participant to review and sign the following consent form shown in Figure 36 and Figure 37.

Informed Consent

Introduction
- You are being asked to be in a research study to evaluate the usability of a review-based website for off-campus student housing.
- You were selected as a possible participants because you are currently an undergraduate student attending the University of Oregon, have prior experience searching for or living in off-campus student housing, and you are familiar with similar review-based sites on the market.
- We ask that you read this form and ask any questions that you may have before agreeing to be in the study.

Purpose of Study
- The purpose of this study is to examine the most commonly used functions of the Hoot Housing site and gather data to inform the future design. The results of this test session will be used to help improve the usability of Hoot Housing.

Description of Study Procedures
- If you agree to be in this study we ask you to do the following things: complete a background questionnaire, perform seven tasks, and participant in a debriefing interview about your overall experiences. The session will last one hour.

Confidentiality
- The records of the study will be kept private. In any sort of report that may be published, any possible identifying information will not be included.
- The audio, video, and screen capture recordings will only be used in the context of this study for educational purposes. They will be destroyed after the entire study is completed.
- Access to the records will be limited to the researches.

Voluntary Participation/Withdrawal
- Your participation is voluntary. If you choose to not participate, it will not affect your current or future relations with the University of Oregon or the test moderator. There is no penalty or loss of benefits for not taking part or stopping your participation.
- You are free to withdraw at any time, for whatever reason.

Contacts and Questions
- Feel free to ask any questions or voice any concerns now.
- The researcher conducting this study is Joy Hurlburt. For questions or more information following your participation in this study you may contact her at joyh@cs.uoregon.edu.

Figure 36. Informed Consent (Page 1)

Statement of Consent

I have read the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I voluntarily give my consent to participate in this study conducted by Joy Hurlburt for the purposes of evaluating the design of Hoot Housing. I understand that my participation will be recorded and that the data and information I share today will be handled confidentially and anonymously.

_____

Study Participant (Print Name)

_____

Participant's Signature   Date

Figure 37. Informed Consent (Page 2)

B.4 Session Outline & Script

The test moderator used the following parts of the Session Outline & Script document to facilitate each test session. Figure 38 through Figure 43 include the session checklists, session introduction, tasks, and debriefing interview questions 1-9 that makeup the Session Outline & Script document.

Session Number: _____

Session Outline & Script

Pre-Session Checklist
- ☐ Setup Chairs
- ☐ Setup Webcam
- ☐ Setup Silverback Session
- ☐ Clear Browser History
- ☐ Clear Browser Cache
- ☐ Informed Consent Forms
- ☐ Background Questionnaire
- ☐ Task Binder

Post-Session Checklist
- ☐ Save Silverback Session
- ☐ Clear Browser History
- ☐ Clear Browser Cache
- ☐ Informed Consent Forms
- ☐ Background Questionnaire
- ☐ Task Binder

Figure 38. Session Checklist

Session Number: _____

Session Introduction

Welcome, my name is Joy Hurlburt and I want to thank you for agreeing to take part in this research study. During our session, I will be using a script to ensure that my instructions to everyone who participates in the study are the same.

My goal today is to observe you using the Hoot Housing website, a review-based website for off-campus student housing. I am testing the website's design, not your performance.

As the test moderator I will be sitting behind you in a chair. I will not interfere in the session in any way other than to mediate technical issues that may arise.

During the session you will work with your partner to complete common tasks using the Hoot Housing site. As you perform these tasks, try to do whatever you would normally do.

Please talk with your partner while you are working through each task. Please try to voice your thoughts and communicate freely. Your participation provides feedback as to what works or doesn't work about the site.

To document this session I will use Silverback, a usability testing software, to collect audio, video, and screen capture recordings.

I will now hand out informed consent forms which I would like you to review and sign. I will also hand out background questionnaires that I'd like you to complete. The consent forms state the purpose of this study, explains that all information you provide will be used anonymously, and that you can quit the study at any time. The background questionnaires gather basic demographic information.

[Hand out Background Questionnaires and Informed Consent forms]

Go ahead and read and fill out the forms now.

Here's how the session will work. I will give you a task binder that contains information and instructions for each task. You will work together to do each task, one at a time. Once you complete a task you will turn the page to move on to the next task. Please don't look ahead at other tasks and don't skip any tasks.

After you complete the tasks I will ask you a few questions about your experience using the site.

The remainder of the session will take about 50 minutes.

Do you have any questions before we begin?

Figure 39. Session Introduction

Session Number: _____

Tasks

Great! Let's get started.

[Hand out Task Binder]

Here is your task binder. The computer is setup and ready to start capturing today's session. The computer screen will appear black until you press the SPACEBAR to begin the screen capture. Upon pressing the SPACEBAR you will see a new web browser window open and ready for you to use.

Do you have any further questions?

Please turn to the computer, open your task binder, and begin reading first page now.

Figure 40. Tasks

Session Number: _____

Session Conclusion

Having used the site now I'd like to ask you a few questions.

1. Overall, how did you like the website?

2. Describe any particular problems you experienced while completing any of the tasks?

3. Was there anything that surprised you while completing any of the tasks?

Figure 41. Debriefing Interview Questions (1-3)

Session Number: _____

4. Do you have any concerns about submitting your own property review?

5. Is there any additional information you'd find useful or helpful that wasn't included?

6. Were you able to accurately predict the steps toward completing each task? If not, why?

Figure 42. Debriefing Interview Questions (4-6)

Session Number: _____

7. Did you think the number of steps required to complete each task was reasonable? If not, why?

8. Would you use the site to search for off-campus student housing and/or leave your own property review in the future? Why or why not?

9. Are there additional features you'd like to see added to the final product?

Thank you again for your participation today. Your feedback will help guide future improvements to the design of the Hoot Housing website.

Figure 43. Debriefing Interview Questions (7-9)

B.5 Task Binder

During each test session the participants used the following Task Binder to guide their experience using the Hoot Housing website. Figure 44 through Figure 52 include each component of the Task Binder used during each test session including the cover page, scenario, and tasks 1-7.

Task Binder

By Joy Hurlburt

Figure 44. Cover

Scenario

Imagine that you are just finishing up your freshman year at the University of Oregon. It is time for you to move out of your dorm and move into off-campus housing when you return to school in the fall. You haven't decided how many roommates you are going to live with, but you and your best friend have thought about living together.

Turn the page to read Task 1

Figure 45. Scenario

Task 1

Start at: *http://www.hoothousing.elasticbeanstalk.com/*

Using this website, you want to look at properties for you and your best friend. You know that you don't want to live in a house and that you want to live within walking distance of the University of Oregon.

Go ahead and explore some rental properties that you might be interested in. For example, consider how close properties are located to the University of Oregon, the price range for rental properties, or the type of housing.

Return to the home page when you are done.

Turn the page to read Task 2

Figure 46. Task 1

Task 2

Using this website, you want to look up the property your three friends from the dorm had mentioned yesterday. You forgot the address but you remember they said it was a house on Agate street and managed by Jennings Group, Inc..

Once you've found the property they were talking about, return to the home page when you are done.

Turn the page to read Task 3

Figure 47. Task 2

Task 3

Using this website, you want to look up the property: *1436 E 20th St*

Once you've found the property, return to the home page when you are done.

Turn the page to read Task 4

Figure 48. Task 3

Task 4

You've decided you want to live with your best friend and not your friends from your dorm. You both decide to take a tour of a two-bedroom townhouse and you both feel pretty good about the place. Before you and your new roommate sign a 12-month rental agreement you want to check what other people have said about the property.

Explore the ratings and reviews for the property: *1311 E 19th Ave*

After reading the ratings and all the reviews for the property, return to the home page when you are done.

Turn the page to read Task 5

Figure 49. Task 4

Task 5

The ratings and reviews you read for the two-bedroom townhouse looked good, but after talking with your future roommate you both decided that you still aren't ready to sign the 12-month rental agreement. Now you want to know what people have said about the property manager for this property.

Explore the information and ratings available for the property manager of the property: *1311 E 19th Ave*

After reading the information and ratings for the property manager, return to the home page when you are done.

Turn the page to read Task 6

Figure 50. Task 5

Task 6

Fast forward 12 months. You have lived at *1311 E 19th Ave* with your best friend for almost a year now. It is spring term of your sophomore year and you find yourself exploring housing options for next fall.

Since this is your second time using Hoot Housing you decide you want to register an account.

Once you've created an account, log out of your new account.

Turn the page to read Task 7

Figure 51. Task 6

Task 7

Now that you have an account you want to share your first off-campus student housing experience. Go ahead and leave a review for the two-bedroom townhouse: *1311 E 19th Ave*.

Write a review using the information below.

Review Title:	*Love it here!*
Property Rating:	*5 stars*
Management Rating:	*4 stars*
Rent:	*$1250*
Your Experience:	*This was the first place I've lived off-campus after the dorms my freshman year. I loved living here this past year and how close it was to campus!*
Would Recommend:	*Yes*

After adding your review go look for your newly added review.

Once you've found your review and confirmed that it was successfully submitted, return to the home page when you are done.

End of Tasks

Figure 52. Task 7

Appendix C. Debriefing Interview Responses

The following tables (Table 12-20) summarize participants' responses to each

debriefing interview question asked at the end of each test session.

Question 1: Overall, how did you like the website?
• "I thought it was like a really well laid out website" • "Overall it's a good website" • "Makes sense" • "It's pretty like slick, pretty fast" • "No like mechanical errors that I could see, except for I was trying to search one of the addresses 1436 East 20th and it wasn't working" • "I liked it" • "Yeah, it was pretty good…it looks like it's a modern site" • "The only thing that I could remember is…you have to click on log in, there's no create an account button…that's generally what I've seen" • "For the home page it doesn't have the various options to…narrow down your search" • "It wasn't too bad" • I liked its simplicity in a lot of ways, it wasn't cluttered" • "I didn't like the fact that there weren't pictures, like actual pictures from the properties…it just kinda helps you visually to see what you're looking at" • "A map would've been nice" • "It's fine, although like all review websites it suffers from, you don't want to be the first person using it 'cause it's useless, you want everyone else to have been using it for the past three years" • "It's fast and responsive, and I like the icons" • "I usually expect more color like a very distinct color as the brand…I like the salmon color that you guys use for the accent but if that was more prominent I think it would develop the brand more, but in terms of the usability of the website I liked it" • "I didn't like how after adding a review there was a weird landing page…I've never seen it done that way" • "I noticed that…after we searched for a property and then applied filters it reset the search, if a lot of people wind up using it or if there's a lot of data and you want to apply filters to a search then that might be relevant" • "I didn't like the lack of pictures…one of the main things that I look for on housing websites is [pictures]…so I can visually see the property, add pictures of the property" • "I think the fact that the little tabs reset every time was sorta annoying" • "I felt like it has more limited reviews…or there aren't that many properties in reviews"

Table 12. Responses to Debriefing Question 1

Question 2: Describe any particular problems you experienced while completing any of the tasks.
• "Searching for a specific address, 1436 East 20th Avenue…couldn't find that one and I searched like every…combination of that too. Just type in the address or just the street or anything"

- "From the home page you can't access [the filter options]"
- "We couldn't find…the one house…on 20th, was it just not in here?"
- "I kinda thought so 'cause it looked like we could see all of [the properties] on one page and it wasn't there"
- "Well we couldn't find that one house"
- "We couldn't tell it was like a trick question or if we were just…not using the program right"
- "It would be nice…if you didn't know at all what you were looking for, just to be able to look at a map"
- "I wanted to know how many reviews someone had left reviews on a thing…feedback problem"
- "We couldn't find one of the properties and we came to the conclusion that it wasn't listed there"
- "Well we couldn't find that house"
- "We couldn't find the one property and so it was frustrating because we're like 'Why isn't it on here'"
- "I feel like we would write in searches…the searches wouldn't necessarily bring up everything that should be associated with them…I don't know if that's just because…the database is limited…and I was 'But no there's definitely houses here', and why aren't they showing up…and they aren't in the database yet"
- "I feel like this is a website you wouldn't want to do your initial search on unless it gets more reviews, you would just use this as a supplementary thing"

Table 13. Responses to Debriefing Question 2

Question 3: Was there anything that surprised you while completing any of the task?

- "Nope, no everything…made sense, flowed well, no…weird issues. I mean that's a good thing…glad nothing shocked me, surprised me"
- "Not really"
- "I think you'd have to add more stuff that people wouldn't expect or something…it pretty much does one thing and it does it pretty well"
- "Not really"
- "One of the first things I look at when I want to find especially properties is pictures of the property and perhaps not just realtor submitted but user submitted pictures 'cause that tends to be more honest I think"
- "We don't know for certain that reviews are submitted by real people, which is I'm sure also a problem with actual review sites…most property managers couldn't write their own script to generate reviews, but I'm sure some of them can"
- "Maybe if it asked me to log in with a University of Oregon email address…when I made my account then I would at least have some assurance that people leaving reviews had UOregon email addresses and are less likely to be bought out"

• "I guess…maybe that we couldn't find that house"

Table 14. Responses to Debriefing Question 3

Question 4: Do you have any concerns about submitting your own property review?
• "Nope, I submitted one [it] was smooth, loaded really quickly…there was no weird issues with it. Everything made sense on the submission page"
• "No, like what kind of concerns"
• "Yeah, I don't know"
• "No, not really"
• "No, I don't think so…I think it would be nice to submit an anonymous review if you wanted to…if you thought it was really horrible and you didn't want your name hooked to that, that would be nice to have"
• "I think it would be nice to show how many people have rated both management and property just so you have a feel of just how many people felt this way versus just seeing a star, and knowing how much weight was behind that star"
• "Not a concern just I probably wouldn't bother. I'm moving out…I'm done with that part of my life now, I got to pack my [things] in a car…there's not an incentive to leave a review. There's an incentive to find other people's review. So again the review problem which is people with…strong negative feelings are more likely to leave reviews than anything else"
• "I think people who have either had a REALLY good experience, like an abnormally good experience, or even a tiny bit of a bad experience are the people going to be leaving reviews so it's going to be a little bit like sample bias I think"
• "I'd be worried about…how aggressive some of the like 13th and Olive for example, they might say…get half off your last month's rent for a good review on Hoot Housing"
• "For me the biggest thing about using a site like this is credibility and reliability of the reviewers and the independence of them, so…if you after making the account or even just on the site you said, 'These are some things we're doing to ensure that reviews are reliable', maybe highlighting that"
• "Trust"
• "All Yelp reviews are moderated…by a human to fish out fishy stuff"
• "I'm notoriously bad about submitting stuff myself…I'm more of a user than a provider…not that I wouldn't, it's just that I generally don't"

Table 15. Responses to Debriefing Question 4

Question 5: Is there any additional information you'd find useful or helpful that wasn't included?
• "None that I could really think of except for on the submission page…maybe could be a little bit more clear that it's…wanting to submit a description of the property and the management company 'cause it just says kinda leave a

- review of the place and…I guess I just didn't know to like talk about the management company in that area too"
- "Yeah, definitely a map"
- "I probably wouldn't make a decision based on this website, I'd mostly do it based on Google Maps"
- "What side of the campus it's on, that kind of stuff"
- "I'd want to know exactly far it was 'cause you're going to be living there for a year and then…you can end up walking a lot or having to ride a bus"
- "Like the whole separating it up by one mile increments…there's a difference between a block and a mile…I might just want to be a block or two away"
- "So stars and a map…and photos"
- "Number of reviews to calculate"
- "I want a map of where [a property] is…I don't think in terms of address and I would have to google map every single address"
- "What I think would be really cool in terms of a feature is like…you know how when you're shopping on Amazon…and you decide I'm really interested in these things I'm going to add them to a list…it would be really cool if I could say these are the ones I'm interested in…and then it would compare the stats for the four and also put them on a map…that way it makes it really easy to decide 'cause at the moment this is just a lot of information and it's hard, especially 'cause I can't see more than one on the same page, for me to then a good decision based on this even though it's good info"
- "Pictures…also it seems like the data need to get a little bit better…for pricing, because I feel like pricing is a huge component of when people are looking for housing"
- "What I thought was interesting was the…first task…and there were two things coming up, then it seemed once we like even just looking through options that were there maybe they weren't within the…parameters but I feel like they were, but they weren't coming up"
- "Not everything came up that should come up [while searching]"

Table 16. Responses to Debriefing Question 5

Question 6: Were you able to accurately predict the steps toward completing each task? If not, why?

- "Yes except for the one where I couldn't find the address"
- "They were all pretty clear and I didn't have any issues"
- "I think it was pretty straightforward, I mean only the one that wasn't in there"
- "I think it's fairly predictable"
- "Yeah, I wasn't surprised by anything…I'm used to using these kind of websites…but it's pretty straightforward I think"
- "Yep"
- "All the log in stuff was very straightforward"

• "When we couldn't find the one property I was like well I don't know what else we're supposed to do"
• "I guess the beginning was a little bit frustrating because we were like, 'But there should be more'"
• "You have sorta pricing and you have the street address, but that's not necessarily saying 'Oh that's a mile from campus'…maybe they were outside the parameters we were searching but…it was hard to tell because we were putting in miles and but then everything was in streets and I'm not that great at converting or keeping that mental map"

Table 17. Responses to Debriefing Question 6

Question 7: Did you think the number of steps required to complete each task was reasonable? If not, why?
• "Yeah…there wasn't any extra steps that I could see"
• "I like how you don't need to make an account to be able to browse the submissions, I really like that, it's just open"
• "Yeah, it just flowed nicely"
• "It seemed like a really minimal amount of steps for each task"
• "I'm trying to think of like anything to critique but I honestly can't"
• "I think so"
• "Yeah it doesn't really have extra steps…I've been on a lot of websites that do and this didn't really feel like that"
• "I thought so"
• "Yeah, I think so too"
• "Yep"
• "Overall, but…we were just more confused at the lack of [properties] that actually showed up...so we were kind of searching for more than there was on the website…taking more steps that we actually [expected]"

Table 18. Responses to Debriefing Question 7

Question 8: Would you use the site to search for off-campus student housing and/or leave your own property review in the future? Why or why not?

- "Yes, I would"
- "I'd leave reviews in the future for sure just to recommend a house or just to let people know to steer clear of a place that I had a bad experience in. Also I just don't like the idea of management screwing over students who might not know exactly what they're doing…I think that it's really important to look out for…incoming freshmen who are looking for new places off campus, I think that's really important. So I honestly…would leave reviews if I had a really bad experience at a property…and just to let people know what to look out for…like 'Oh these guys are really strict about the security deposit', just things like that…then there's more transparency, hold management companies accountable a little bit more"
- "I probably wouldn't use it because I just probably wouldn't have heard of it…it's kind of hard to get these things out there"
- "I would probably be more likely to use like Yelp or something just 'cause I know about it"
- "I like the design of this one"
- "I would, I don't know if there's a site like this around here by now, if there is I haven't found it when I was doing apartment, house searching, but it's really nice to very easily filter it by the price and the type of room and the type of place and the distance…it's nice to have the information on there…sometimes I have to call places which is a little bit annoying, but if you can have the places give you all the information that's really nice"
- "I think if it actually stayed very up-to-date it would be super helpful 'cause I find when I'm looking for places on management websites, first of all I'm only looking at one management at a time, and second cross-reference, but a lot of the times they're not current and so you end up wasting a lot of your time. So if this gained more popularity and a lot of people put forth legitimate input about places and if it stayed up-to-date I think it'd be really helpful"
- "It would also be nice if it had little logos or something on the side saying whether a particular property had the certain…bonus things like a free parking space thrown in which each room"
- "Kind of like on maps or something like here's a tent, here's a Wi-Fi icon…what it comes with, like there's a pool here, there's free Wi-Fi"
- "Yeah…maybe laundry units in the apartment"
- "I would not leave a property review because I would forget about it and because I don't deeply hate my property or deeply love it…I might use it if I remembered it exists"
- "I think for me, I hate making accounts on things because everyone ends up emailing me…but I like Facebook and I like logging in with Facebook, so if you made it so that I can just randomly stumble upon this site, already having logged into Facebook, and I just say okay I authenticate through Facebook then I'm must more likely…to leave a review because then I'm not…going

through the hassle of making an account and verifying and account and getting emails and all that"
• "I might look into but it wouldn't be my first choice I'm looking for properties"
• "I think definitely once more properties are on there and reviews are on there it would be a big, it's nice that you can look at…some of the apartments specifically, I could see how that could also maybe…bog down the database…maybe if there's a way to get a subset…like…here's 13th & Olive, generally they're this pricing, generally people have these reviews, but you can also, so if you're interested in it you can click on 13th & Olive as a property and then look at the various units as a subset"
• "I feel like generally people, pricing and distance are the first things you look at and then…is this nice or not"

Table 19. Responses to Debriefing Question 8

Question 9: Are there additional features you'd like to see added to the final product?
• "Honestly, I can't think of anything. I really can't…I feel like this is…even more streamlined, minimalist, easier to use version that like Yelp"
• "It's like if Yelp was just more…just to the point and effective. This is what it would like like, seriously it's really great, it's a really good website"
• "The map"
• "Floor plans are cool too if they are available"
• "Maybe just a little bit more detail on each place"
• "It would be cool to have…a little google map that you can click on"
• "I like the color scheme though and that doesn't really matter but I like it"
• "Maybe click on more rent information to get the breakdown for different types of rooms"
• "It might be interesting to see a bar across the bottom, 'You searched this, here are some similar properties that might interest you' so you don't have to go back to start every single time, you can kind of follow a path to get closer to what you want"
• "Sorting"
• "Direct comparison and maps"
• "Number of reviews"
• "Sorting everything in general…maybe I want to sort by price"
• "Being able to sort by how far away they are distance, that's a big one for me, and maybe even by how many stars and what the average rating is"
• "I just don't see this having a very distinctive branding…I think just to stand out especially on campus you have to have really strong branding"
• "I presume this is made by CS students and it would be really cool to know…if it's made by UOregon students I'd be more likely to use it rather than some corporate overlord"

- "The one thing I might like is just a button for just listing of everything instead of searching some random thing for find and then applying no filters"
- "Another cool thing is...[Kayak] will do stuff like this for flights and find you the cheapest flight or the best flight…what they'll also do is say 'Hey look, we think we're the best but…we can show that to you' and it will direct you to links for the same search from rival websites just to show…that they are indeed the best, so if you guys have a site that is way better than everyone else, then…own that and then go…'Go look at this property on Yelp, go look at this property on Angie's list', and then because Kayak does that I will use Kayak for everything because I know that it have its comparison across everything"
- "You need a logo"
- "Pictures, distance, and just sort of a depth of…"
- "Just kinda like Trip Advisor where people can upload their own pictures of the rooms and the properties…kinda like a Trip Advisor type format but for properties where you have pictures and reviews, and the overall you know"

Table 20. Responses to Debriefing Question 9

Appendix D. Problem Analysis

The following tables (Table 21 through Table 34) include in-depth exploration of each problem experienced during the five test sessions conducted.

Test Session	Pilot
Location	3:33 – 5:40
Attempted Task	Task 3: Search for a specific property by address (not in database)
Goal	Look up the address '1436 E 20th St' from the home page
Actions Performed	• Re-enter address '1436 E 20th St' from the browse page • Search for '1436' from the browse page • Search by spelling out abbreviations '1436 East 20th Street' from the browse page • Use 'Hoot Housing' link to return to home page • Search for '20th st' from the home page • Use 'Hoot Housing' link to return to home page • Search for '1436 east 20th st' from the home page • Use 'Hoot Housing' link to return to home page • Search using no parameters from the home page • Search for '1436 E 20 St' from the home page • Use 'Hoot Housing' link to return to home page • Search for '1436' from the home page • Search for 'E 20th st' from the browse page • Use 'Hoot Housing' link to return to home page • Search for '1436 East 20t Street' from the home page
Perceived Effect	• Participant believed that searching by the given address, '1436 E 20th St' was not producing the expected search results • Participant expected that entering variations of the given address would produce the expected results • Participants believed that entering identical search results using the search bar on the home page vs on the browse page would produce different results • Participants believed they could view all available properties by searching using no parameters
Cause of Problem	• Specified address was not in the database • Participant did not understand that the address might not be in the database • Participant didn't recognize or understand the help message 'Still can't find a property? We're sorry, we might not have it in our database yet.' Provided on the browse page

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	• Participants didn't understand what search parameters were/weren't acceptable
Recommended Solutions	• Draw users' attention to help message by increasing the font size, changing the font color, or animate its appearance (ex: popup, modal, etc.)

Table 21. Problem 1

Test Session	Pilot
Location	7:16 – 7:32
Attempted Task	Task 5: Find property management information and ratings for a specific property
Goal	Look for ratings for the property management of '1311 E 19th Ave'
Actions Performed	• Click on 'Management Rating' (not a link) listed within a review for '1311 E 19th Ave' • Read the 'Management Rating' of four out of five stars • Quickly skim the property page for '1311 E 19th Ave' by scrolling up and down a few times • Use 'Hoot Housing' link to return to home page
Perceived Effect	• Participant believed the task was complete after locating and reading the 'Management Rating' listed for the specified property
Cause of Problem	• Participant did not realize they hadn't completed the task • Participant didn't recognize the property management names as links to the property management pages on the browse page and on the property page • Participant didn't understand that the property management information and ratings for the specified property were different from the 'Management Rating'
Recommended Solutions	• Emphasize the property management name links by creating a contrast between the on-hover vs off-hover colors, underlining the links, and/or changing the text color to a more conventional link color (ex: blue)

Table 22. Problem 2

Test Session	1
Location	0:40 – 1:54
Attempted Task	Task 1: Search for properties that meet specific criteria
Goal	Search for apartments
Actions Performed	• Search for 'appartments ' from the home page • Select filters (1 mile, 2+ Bedrooms, Apartment, Studio, Townhouse) to continue search • Click 'Apply Filters' button to apply selected filters
Perceived Effect	• Participants believed search results for apartments would appear on the browse page

Cause of Problem	• Participants misspelled the word 'apartments' as 'appartments'
Recommended Solutions	• Expand search engine functionality to allow for misspelled parameters • Draw users' attention to help message, 'There aren't any results that match your criteria. Please check your search or try changing your filters' by increasing the font size, changing the font color, or animate its appearance (ex: popup, modal, etc.) • Enhance the provided help message on the browse page by including search criteria previously entered (search parameters and/or applied filters) • Allow users to search by applying filters from the home page in addition to the browse page

Table 23. Problem 3

Test Session	1
Location	5:30 – 5:42
Attempted Task	Task 2: Search for a specific property (in database)
Goal	Search for a property by looking for its provided property management and/or street name
Actions Performed	• Search for 'jennings group agate' from the home page • Use 'Hoot Housing' link to return to home page • Search for 'agate' from the home page
Perceived Effect	• Participants expected search results to appear for properties managed by Jennings Group and located on Agate St.
Cause of Problem	• Search engine doesn't allow for combined searches by address, property management, and/or keyword parameters
Recommended Solutions	• Expand search engine functionality to allow for combined searches by address, property management, and/or keyword parameters

Table 24. Problem 4

Test Session	1
Location	7:50 – 10:45
Attempted Task	Task 3: Search for a specific property by address (not in database)
Goal	Look up the address '1436 E 20th St' from the home page
Actions Performed	• Use 'Hoot Housing' link to return to home page • Search for '1436 E 20th street' from the home page • Use 'Hoot Housing' link to return to home page • Search for '1463 E 20th st' from the home page • Use 'Hoot Housing' link to return to home page • Search for ' E 20th' from the home page

	• Use 'Hoot Housing' link to return to home page • Search for 'E 20th' from the home page • Use 'Hoot Housing' link to return to home page • Search for '1436' from the home page • Use 'Hoot Housing' link to return to home page • Review previously used search parameters for errors • Search using no parameters from the home page • Search for 'E' from the home page • Use 'COMMAND+ F' shortcut to find occurrences of '20' amongst search results • Continue using 'COMMAND + F' shortcut to find occurrences of '20th' amongst search results • Continue using 'COMMAND + F' shortcut to find occurrences of '1436' amongst search results • Slowly scroll through search results on the browse page looking for properties close to '1436 E 20th St'
Perceived Effect	• Participants believed that searching by the given address, '1436 E 20th St' was not producing the expected search results • Participants expected that entering variations of the given address would produce the expected results • Participants believed they could view all available properties by searching using no parameters • Participants believed that searching by the character 'E' and using 'COMMAND+ F' they could find the given address amongst the search results • Participants believed that returning to the search bar on the home page was necessary to start a new search • Participants didn't understand what search parameters were/weren't acceptable
Cause of Problem	• Specified address was not in the database • Participants did not understand that the address might not be in the database • Participants didn't use/notice the search bar located at the top of the browse page • Participant didn't recognize or understand the help message 'Still can't find a property? We're sorry, we might not have it in our database yet.' Provided on the browse page • Participants couldn't look through all the properties available • Participants didn't understand what search parameters were/weren't acceptable

Recommended Solutions	• Draw users' attention to help message by increasing the font size, changing the font color, or animate its appearance (ex: popup, modal, etc.) • Make search bar at the top of the browse page more obvious to users (ex: center align, enlarge, etc.) • Clarify purpose/usage of search bar on the browse page as identical to the search bar on the home page • Add the ability to search for all available properties from the home and browse pages

<p align="center">Table 25. Problem 5</p>

Test Session	1
Location	13:13 – 13:28
Attempted Task	Task 6: Register an account and log out
Goal	Sign up for an account
Actions Performed	• Slowly scroll through home page looking for a place to start signing up for an account • Click on 'Log In' link at the top of the home page • Click on 'Create an Account' link available on the 'Log In' page
Perceived Effect	• Participants believed they would see a button/link for signing up for an account from the home page • Participants believed the 'Log In' link would take them to the place for signing up for an account
Cause of Problem	• Lack of direction for registering an account from the home page • Participants expected to see two buttons/link, one for signing up and one for logging in
Recommended Solutions	• Add a 'Sign up' or 'Create an Account' link to the home page next to the 'Log In' link • Change the labeling of the 'Log In' link to 'Log In/Sign up'

<p align="center">Table 26. Problem 6</p>

Test Session	1
Location	14:33 – 14:10
Attempted Task	Task 7: Log in and submit a property review for a specific property
Goal	Log in and write a review
Actions Performed	• Click on 'Log In' link from the property page for '1311 E 19th Ave' • Enter required credentials on the log in page • Click 'Log In' on the log in page (automatically returned to the browse page)

	• Look for '1311 E 19th Ave' within the search results on the browse page • Access the property page for '1311 E 19th Ave' by clicking on its thumbnail within the search results on the browse page • Click 'Add Review' button on the property page
Perceived Effect	• Participants believed logging in would re-route them to the page they were on before initiating the log in process
Cause of Problem	• Logging in automatically re-routes users to the browse page • Participants believed they must log into their account using the 'Log In' link before writing a review using the 'Add Review' button • Participants are not aware that clicking on the 'Add Review' button automatically requires participants to log in (if not previously logged in) and then proceeds directly to the review form
Recommended Solutions	• Re-route users to the page they were previously on once they successfully log in using the 'Log In' link

Table 27. Problem 7

Test Session	2
Location	4:15 – 8:22
Attempted Task	Task 3: Search for a specific property by address (not in database)
Goal	Search for '1436 E 20th st' from the home page
Actions Performed	• Search for '20th street' from the browse page • Use 'Hoot Housing' link to return to home page • Search for the house number '1436' from the home page • Use 'Hoot Housing' link to return to home page • Search for '20' from the home page • Look for '1436 E 20th St' amongst search results for '20' on the browse page • Use 'Hoot Housing' link to return to home page • Search for '1436' from the home page • Read help message for no search results on the browse page • Use 'Hoot Housing' link to return to home page • Search for '1436' from the home page • Select and 2-mile distance filter on the browse page • Click 'Apply Filters' button to apply selected filter and continue search • Look for '1436 E 20th St' amongst search results for 2-mile filter on the browse page

	• Use 'Hoot Housing' link to return to home page • Search using no parameters from home page • Search for 'all' from the home page • Select 5-mile distance filter on the browse page • Click 'Apply Filters' button to apply selected filter and continue search • Use 'COMMAND+ F' shortcut to find occurrences of '1436' amongst search results • Continue using 'COMMAND+ F' shortcut to find occurrences of '20th' amongst search results
Perceived Effect	• Participant believed that searching by the given address, '1436 E 20th St' was not producing the expected search results • Participant expected that entering variations of the given address would produce the expected results • Participants believed that using the search bar on the home page was more effective than the browse page • Participants believed they could view all available properties by searching using no parameters • Participants believed they could view all available properties using 'all' as a search parameter • Participants believed that filtering search results by distance, 2-mile and 5-mile, they could find '1436 E 20th St' • Participants believed that filtering by a 5-mile distance they could use 'Command + F' to find the given address amongst the search results
Cause of Problem	• Specified address was not in the database • Participants understood that the address might not be in the database, but weren't sure if that was true for the given address • Participants couldn't look through all the properties available • Participants didn't understand what search parameters were/weren't acceptable
Recommended Solutions	• Clarify purpose/usage of search bar on the browse page as identical to the search bar on the home page • Add the ability to search for all available properties from the home and browse pages • Enhance the provided help message on the browse page by including search criteria previously entered (search parameters and/or applied filters) • Improve help message on the browse page by providing examples of acceptable search parameters

	• Provide participants more confidence in their search process by displaying search results on a map

<div align="center">Table 28. Problem 8</div>

Test Session	3
Location	2:56 – 4:20
Attempted Task	Task 3: Search for a specific property by address (not in database)
Goal	Look for address '1436 E 20th st' from the home page
Actions Performed	• Search for '1436' from the browse page • Search for '20th' from the browse page • Use 'Hoot Housing' link to return to home page • Search for '1436' from the home page • From the browse page, click 'Apply Filters' button without any filters selected in attempt to search for all properties • Use 'COMMAND + F' shortcut to find occurrences of '1436' amongst search results • Scroll to the bottom of the search results to confirm there are no occurrences of '1436' • Re-use 'COMMAND + F' shortcut to find occurrences of '1436' amongst search results • Use 'Hoot Housing' link to return to home page • Click 'Learn More' button and explore information available about Hoot Housing on the home page • Search 'E' from the home page • Scroll through search results on browse page to look for '1436 E 20th St' address • Use 'COMMAND + F' shortcut to find occurrences of '1433' amongst search results for 'E' • Continue using 'COMMAND + F' shortcut to find occurrences of '20' amongst search results for 'E' • Click 'Find' for the search bar on the browse page without any parameters entered • Use 'COMMAND + F' shortcut to find occurrences of '20' amongst search results
Perceived Effect	• Participant believed that searching by the given address, '1436 E 20th st' was not producing the expected search results • Participant expected that entering variations of the given address would produce the expected results • Participants believed that entering identical search results using the search bar on the home page vs on the browse page would produce different results

	• Participants believed that searching through all properties using the 'COMMAND+ F' shortcut they could find the given address amongst the search results • Participants believed the clicking the 'Learn More' button from the home page would give them information that might help their search process • Participants believed there were filters applied to their search when there were none
Cause of Problem	• Specified address was not in the database • Participants understood that the address might not be in the database, but weren't sure if that was true for the given address • Participants were unable to identified when filters were/weren't applied to their search results • Participants continued searching for the given address after making multiple observations that the property might not be in the database
Recommended Solutions	• Clarify purpose/usage of search bar on the browse page as identical to the search bar on the home page • Add the ability to search for all available properties from the home and browse pages • Enhance the provided help message on the browse page by including search criteria previously entered (search parameters and/or applied filters) • Increase the value of the information available after clicking 'Learn More' on the home page by including more help and guidance for using the search bar and/or filtering search results • Provide participants more confidence in their search process by saving and displaying their previously applied filters and/or search parameters once search results are generated

Table 29. Problem 9

Test Session	3
Location	4:55 – 5:04
Attempted Task	Task 4: Find property ratings and reviews for a specific property
Goal	Search for specific user
Actions Performed	• Search for 'jeff' from the property page of the given address '1311 E 19th Ave' • Use 'COMMAND + Back Arrow' shortcut to return to previous page, the property page

Perceived Effect	• Participant believed they could search for a user, their friend Jeff, in the Hoot Housing database
	• Participant believed that a profile, submitted reviews, or some other form of information would be available for Hoot Housing users
Cause of Problem	• Search functionality to find users of the Hoot Housing site was not available
	• Profile pages, submitted reviews, or other forms of information are not available for each user of the Hoot Housing site
Recommended Solutions	• Expand search functionality to include Hoot Housing users
	• Add profile pages for each user

<div align="center">Table 30. Problem 10</div>

Test Session	3
Location	7:00 – 7:36
Attempted Task	Task 5: Find property management information and ratings for a specific property
Goal	Determine how many ratings there are for the property management of the given property '1311 E 19th Ave'
Actions Performed	• Hover over question-mark icons next to property rating and management rating to read their associated help messages
	• Observe that there is no number of ratings available
	• Click on 'Add Review' button in attempt to calculate how many ratings there are for the property management
	• Go back to property management page after selecting the 'Add Review' button once the log in page appears
	• Discuss creating an account, adding a review with 1-star in each rating field, and calculate how many other people have rated the property management
	• Click on the property management name link located on the property thumbnail for '1311 E 19th Ave' from the property management page for '1311 E 19th Ave'
Perceived Effect	• Participants believed the question-mark icons would review help messages related to the number of ratings for the property management
	• Participants believed that they could add a review without logging in
	• Participants believed they could calculate how many ratings were submitted for the property management of '1311 E 19th Ave' by creating an account and adding a review

	• Participants believed that the property management name link located on the property thumbnail for '1311 E 19th Ave' from the property management page for '1311 E 19th Ave' would take them to a different page than their current one
Cause of Problem	• Participants did not understand and/or read the help message available for each rating available on the property management page • Participants did not understand that the ratings on the property management page were calculated from the ratings for the properties owned by that property management • Participants did not understand that the property management name links were identical no matter where there were located on the site
Recommended Solutions	• Rewrite question-mark icon help messages to better communicate how property management ratings are calculated • Include the number of reviews that go into calculating the ratings for property management next to each rating • Disable property management name links for all property thumbnails found on property management pages to avoid redundant/circular navigation

Table 31. Problem 11

Test Session	4
Location	0:18 – 4:20
Attempted Task	Task 1: Search for properties that meet specific criteria
Goal	Look for 2-bedroom apartments at the University of Oregon
Actions Performed	• Type in 'university of oregon' into the search bar on the home page • Search for 'campus apartment' from the home page • Select 1 mile, 2+ Bedrooms, 1+ Bathrooms, 600 Max Rent, Apartment, Studio, and Townhouse filters on the browse page • Click 'Apply Filters to apply selected filters and continue search • Click on the property thumbnail for '1727 Mill St' and look at its property page • Go back to search results on the browse page • Click on the property thumbnail for '540 E 14th Ave' and look at its property page • Go back to search results on the browse page

	• Select 2 mile, 2+ Bedrooms, 1+ Bathrooms, and 800 Max Rent filters on the browse page • Click 'Apply Filters to apply selected filters and continue search • Scroll through search results on the browse page • Select 2 mile, 2+ Bedrooms, 1+ Bathrooms, 800 Max Rent, Apartment, Studio, and Townhouse filters on the browse page • Click 'Apply Filters to apply selected filters and continue search • Click on the property thumbnail for '540 E 14th Ave' and look at its property page • Go back to search results on the browse page • Click on the property thumbnail for '1727 Mill St' and look at its property page • Go back to search results on the browse page • Select 2 mile and Apartment filters on the browse page • Click 'Apply Filters to apply selected filters and continue search • Scroll through search results on the browse page
Perceived Effect	• Participants believed that they needed to start their search by specifying the University of Oregon location • Participants believed that 'campus apartments' would show search results for apartments near the University of Oregon campus • Participants believed that the filters they selected and applied were not producing the expected search results • Participants believed the max rent filter related to rent per individual and/or room • Participants believed that selecting a longer distance and higher max rent filters would produce more search results • Participants believed that broadening their search by excluding filters for bedrooms, bathrooms, rent, studio, and townhouse would produce more search results
Cause of Problem	• Participants didn't recognize or understand that the website targeted off-campus properties near the University of Oregon • Participants didn't understand what search parameters were/weren't acceptable • Search engine doesn't allow for combined searches by address, property management, and/or keyword parameters (ex: campus apartments) • Participants did not understand that the max rent filter related to total rent for each property

Recommended Solutions	• Expand search engine functionality to allow for combined searches by address, property management, and/or keyword parameters • Add hover-over help for filters to indicate that min and max rent filters relate to total rent for each property • Save previously selected filters to avoid tediously re-selecting filters for each search attempt

Table 32. Problem 12

Test Session	4
Location	6:45 – 7:15
Attempted Task	Task 2: Search for a specific property (in database)
Goal	Search for properties on Agate Street managed by Jennings Group
Actions Performed	• Search for 'agate jennings group' from the home page • Search for 'Jennings Group Inc' from the browse page • Search for 'agate street' from the browse page
Perceived Effect	• Participants expected to see search results for properties located on Agate Street and management by Jennings Group
Cause of Problem	• Search engine doesn't allow for combined searches by address, property management, and/or keyword parameters • Search engine produces results for 'Jennings Group, Inc' but not 'Jennings Group Inc'
Recommended Solutions	• Expand search engine functionality to allow for combined searches by address, property management, and/or keyword parameters • Expand search functionality to ignore punctuation within search parameters

Table 33. Problem 13

Test Session	4
Location	8:55 – 13:00
Attempted Task	Task 3: Search for a specific property by address (not in database)
Goal	Look for address '1436 E 20th St'
Actions Performed	• Search for '20th' from the browse page • Search for '20 st' from the browse page • Search for '1436' form the browse page • Use the 'Hoot Housing' link to return to home page • Search for '1436 E 20th St' from the home page • Search for '1436 E 20th Street' from the browse page • Search for '1436 20 street' from the browse page • Search for '20 street' from the browse page

	• Search for 'East 20th street' from the browse page • Use the 'Hoot Housing' link to return to home page • Click 'Learn More' button and explore information available about Hoot Housing on the home page • Search for '1436 E 20th St. Eugene OR' from the home page • From the browse page, click 'Apply Filters' button without any filters selected in attempt to search for all properties • Scroll through search results on the browse page • Use 'COMMAND + F' shortcut to find occurrences of '1436' amongst search results • Use the 'Hoot Housing' link to return to home page
Perceived Effect	• Participant believed that searching by the given address, '1436 E 20th st' was not producing the expected search results • Participant expected that entering variations of the given address would produce the expected results • Participants believed that entering identical search results using the search bar on the home page vs on the browse page would produce different results • Participants believed the clicking the 'Learn More' button from the home page would give them information that might help their search process • Participants believed they needed to specify the city and state for the given address • Participants believed that searching through all properties using the 'COMMAND+ F' shortcut they could find the given address amongst the search results
Cause of Problem	• Specified address was not in the database • Participant did not understand that the address might not be in the database • Participant didn't recognize or understand the help message 'Still can't find a property? We're sorry, we might not have it in our database yet.' Provided on the browse page • Participants didn't understand what search parameters were/weren't acceptable • Search engine doesn't allow for searching by city and/or state, it already assumes that off-campus property for the University of Oregon are located in Eugene, Oregon
Recommended Solutions	• Draw users' attention to help message by increasing the font size, changing the font color, or animate its appearance (ex: popup, modal, etc.)

	• Enhance the provided help message on the browse page by including search criteria previously entered (search parameters and/or applied filters) • Improve help message on the browse page by providing examples of acceptable search parameters • Clarify purpose/usage of search bar on the browse page as identical to the search bar on the home page • Add the ability to search for all available properties from the home and browse pages • Increase the value of the information available after clicking 'Learn More' on the home page by including more help and guidance for using the search bar and/or filtering search results

Table 34. Problem 14

Appendix E. Design Documentation

The following figures document the design process of the Hoot Housing website. The design began with a collaborative pencil-and-paper brainstorming phase with Taylor Oyama, a graphic design student and the founder of Hoot Housing. The early-stage sketches guided the creation of wireframes using Balsamiq[38], a wireframing software (See Appendix E.1). The next design phase centered around the creation of detailed mockups (See Appendix E.2) using Sketch 3[39], a digital design software. Finally, designs explored through the wireframes and mockups were implemented in the development of the website's user interface (See Appendix E.3).

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[38] https://balsamiq.com/
[39] http://www.sketchapp.com/
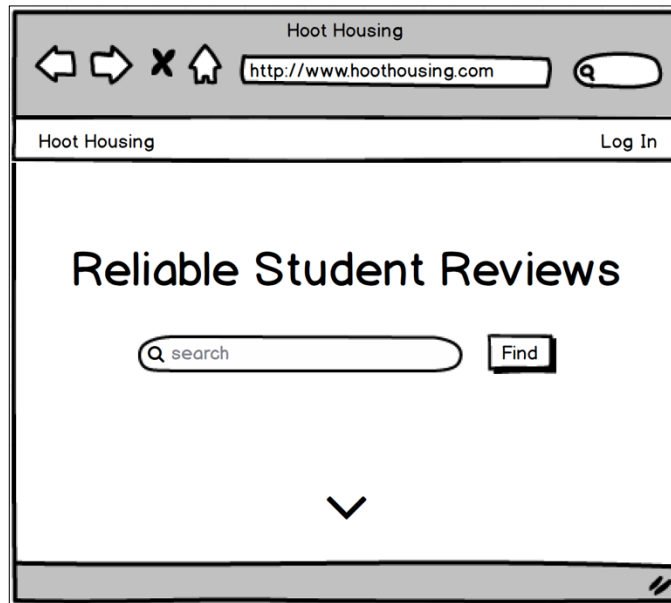
E.1 Wireframes

Figure 53. Home Page Wireframe

Figure 54. Log In Page Wireframe

Figure 55. Browse Page Wireframe
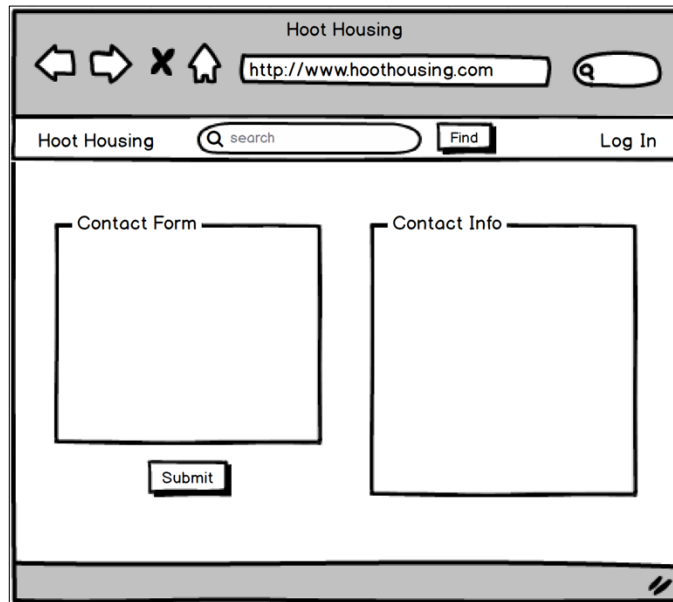
Figure 56. Contact Page Wireframe
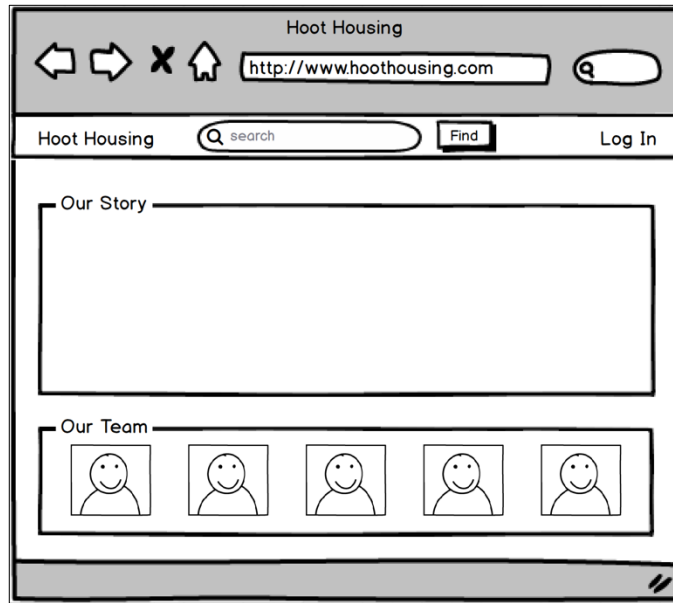
Figure 57. About Page Wireframe
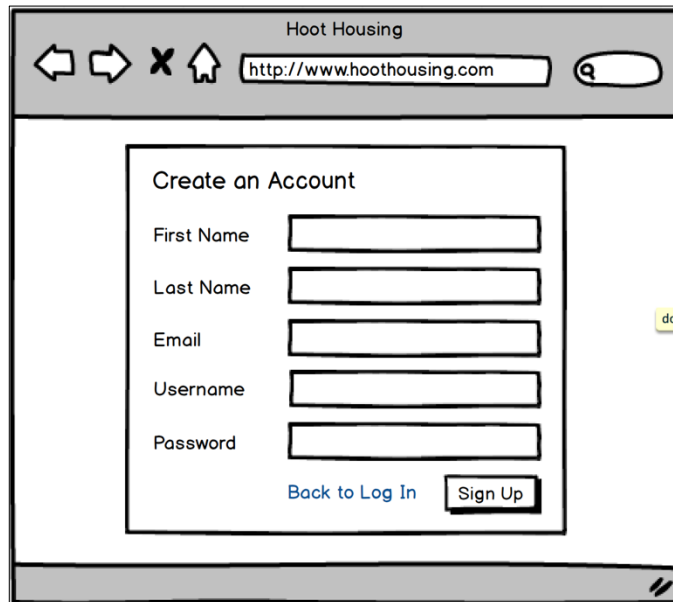
Figure 58. Create an Account Page Wireframe
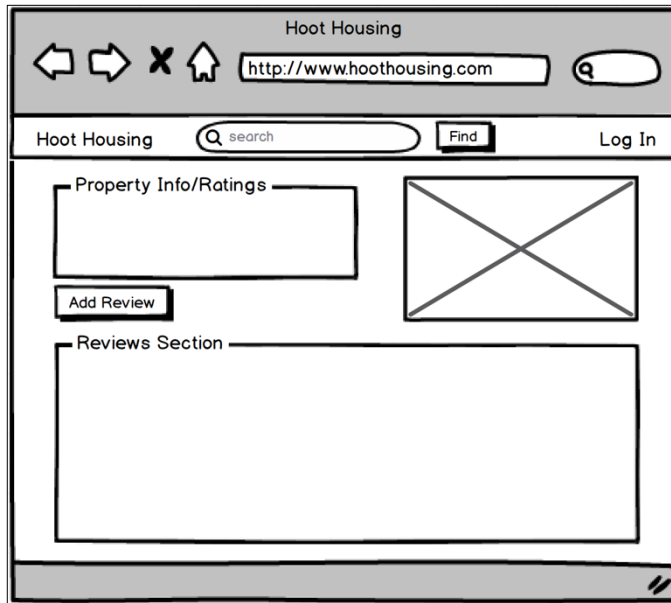
Figure 59. Property Page Wireframe
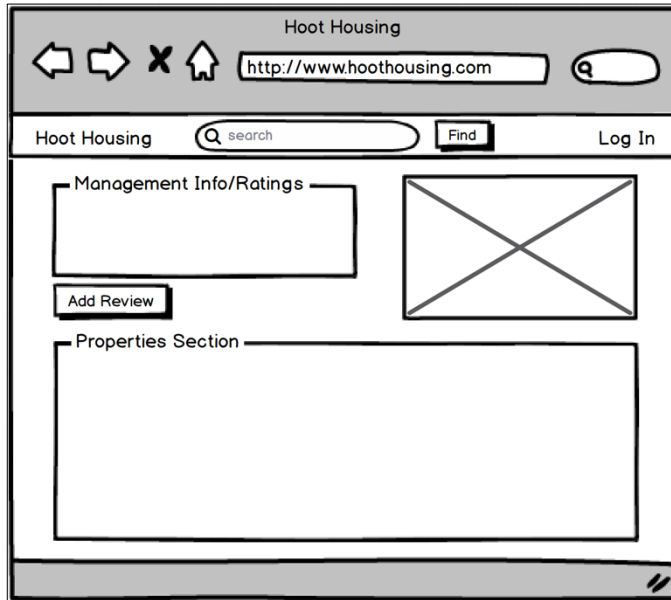
Figure 60. Management Page Wireframe
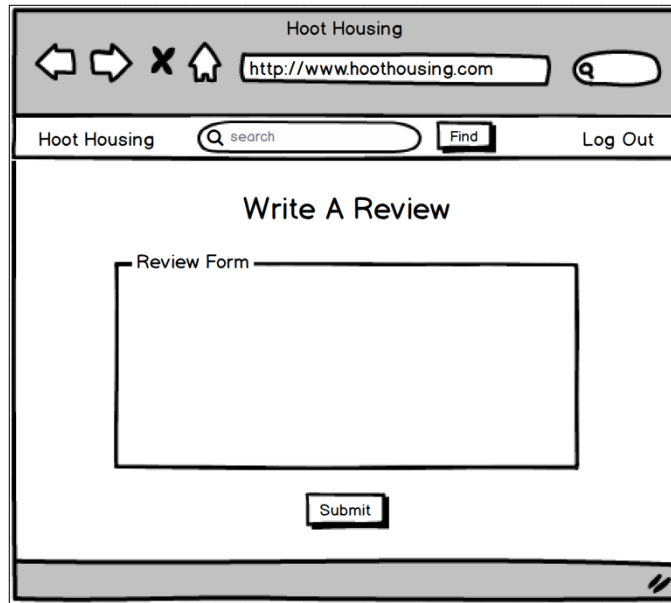
Figure 61. Review Page Wireframe

E.2 Mockups
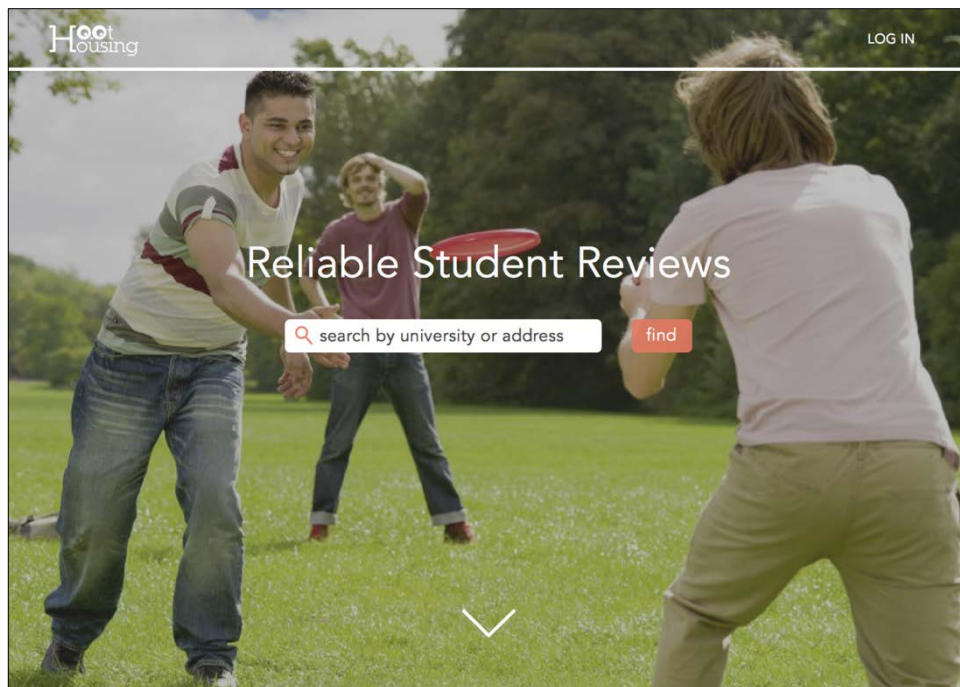
Figure 62. Home Page Mockup
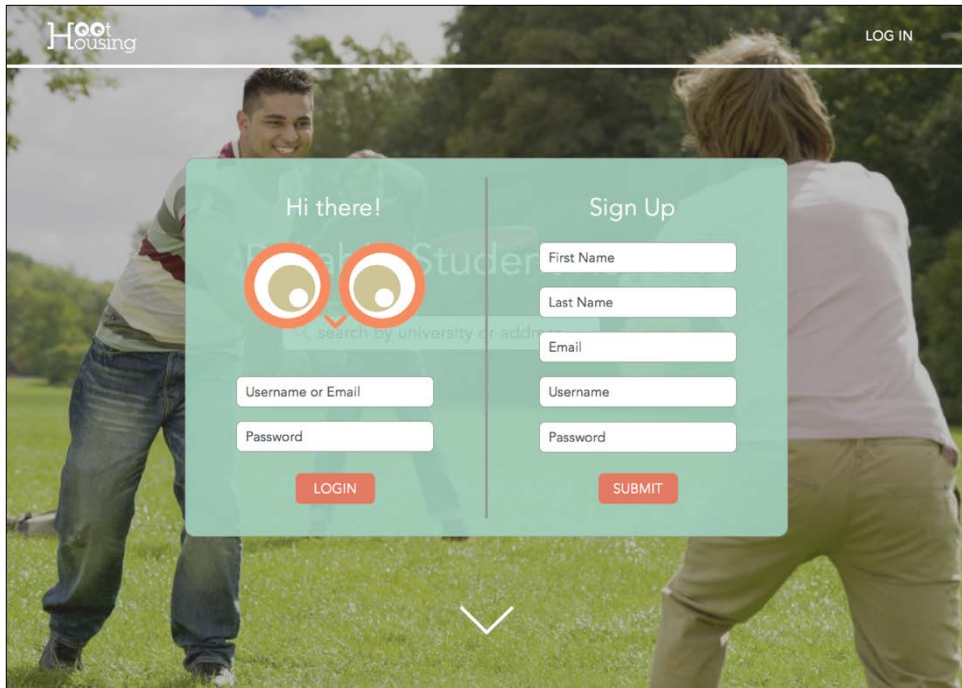
Figure 63. Log In + Create an Account Page Mockup
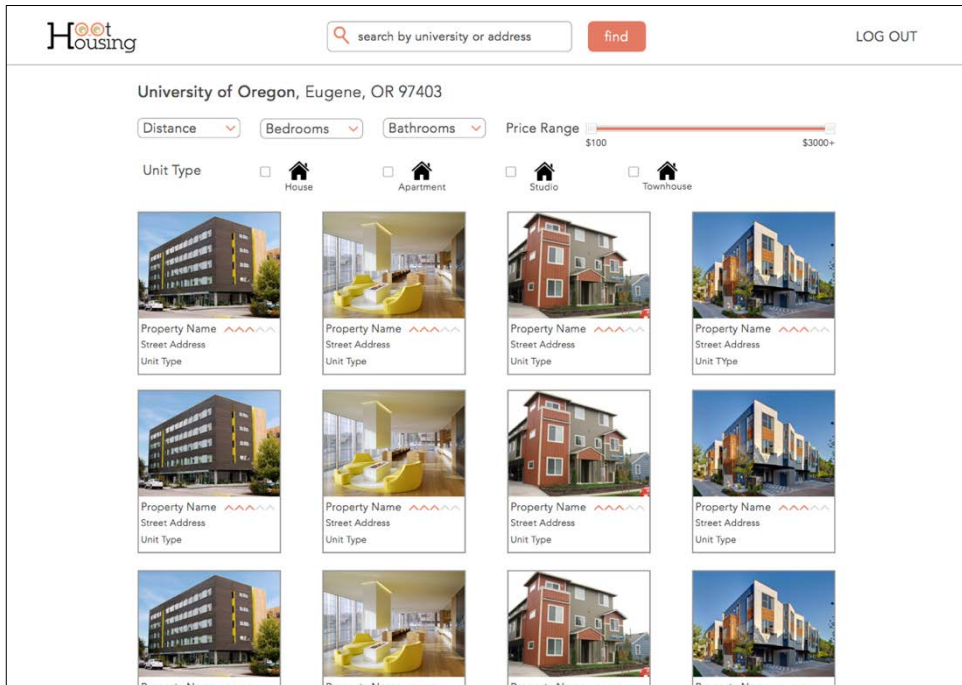
Figure 64. Browse Page Mockup
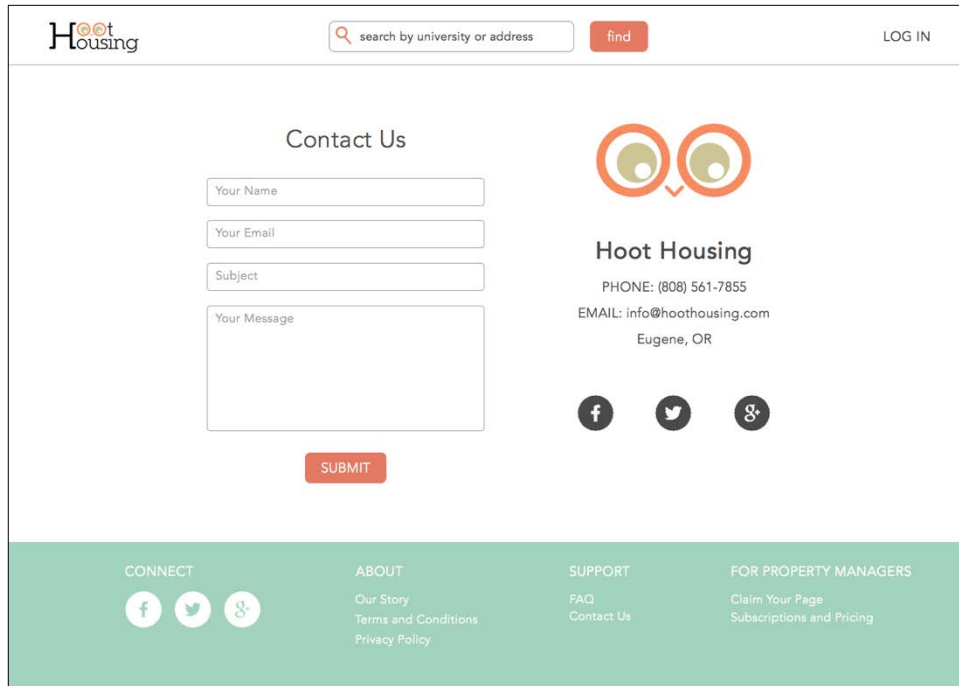
Figure 65. Contact Page Mockup
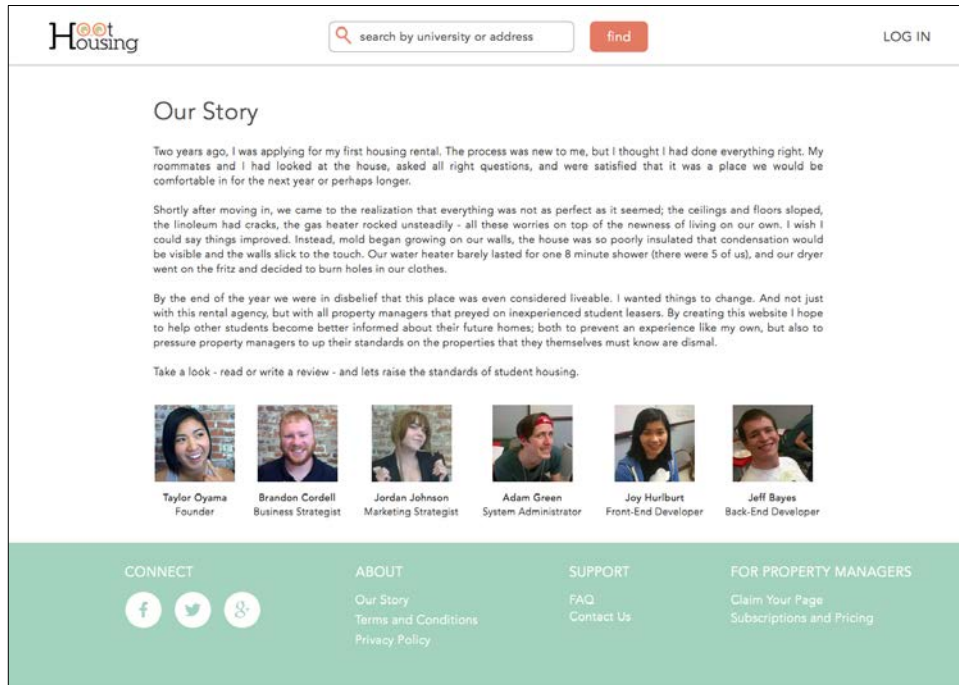
Figure 66. About Page Mockup

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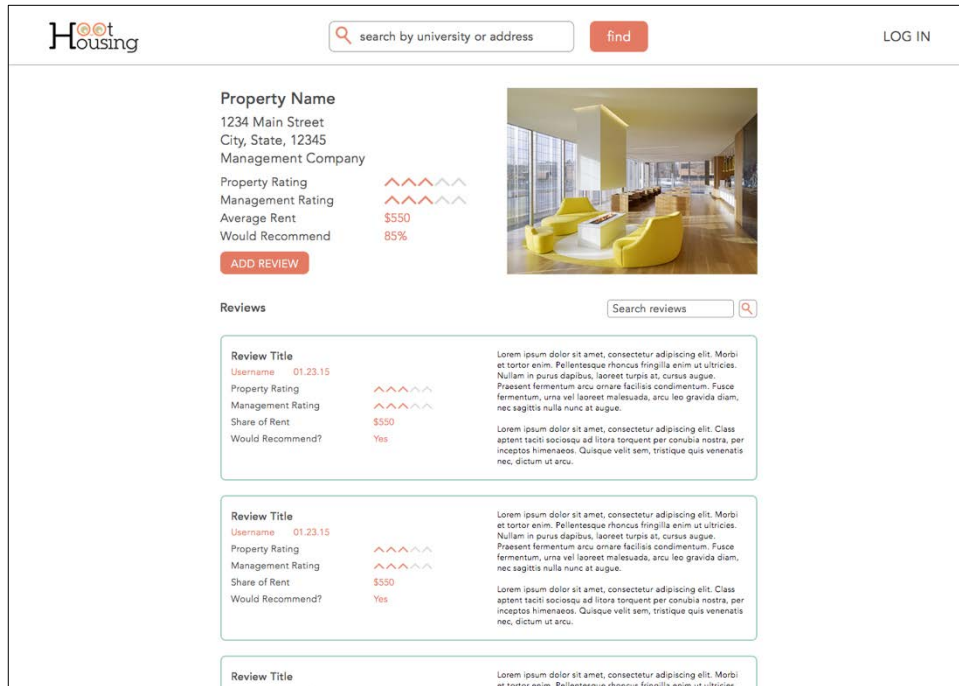
Figure 67. Property Page Mockup
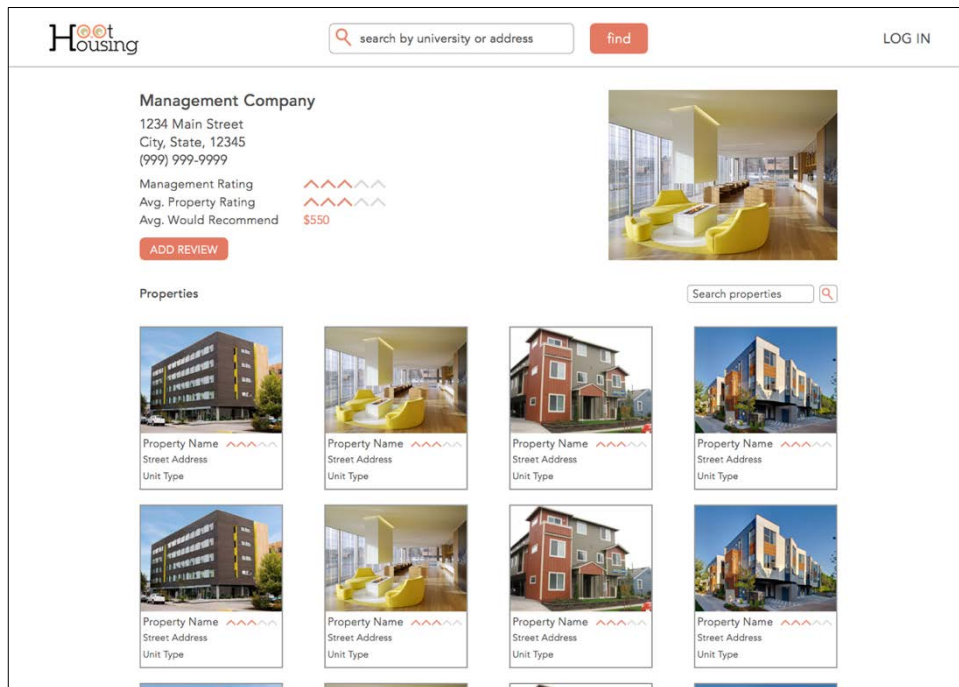
Figure 68. Management Page Mockup
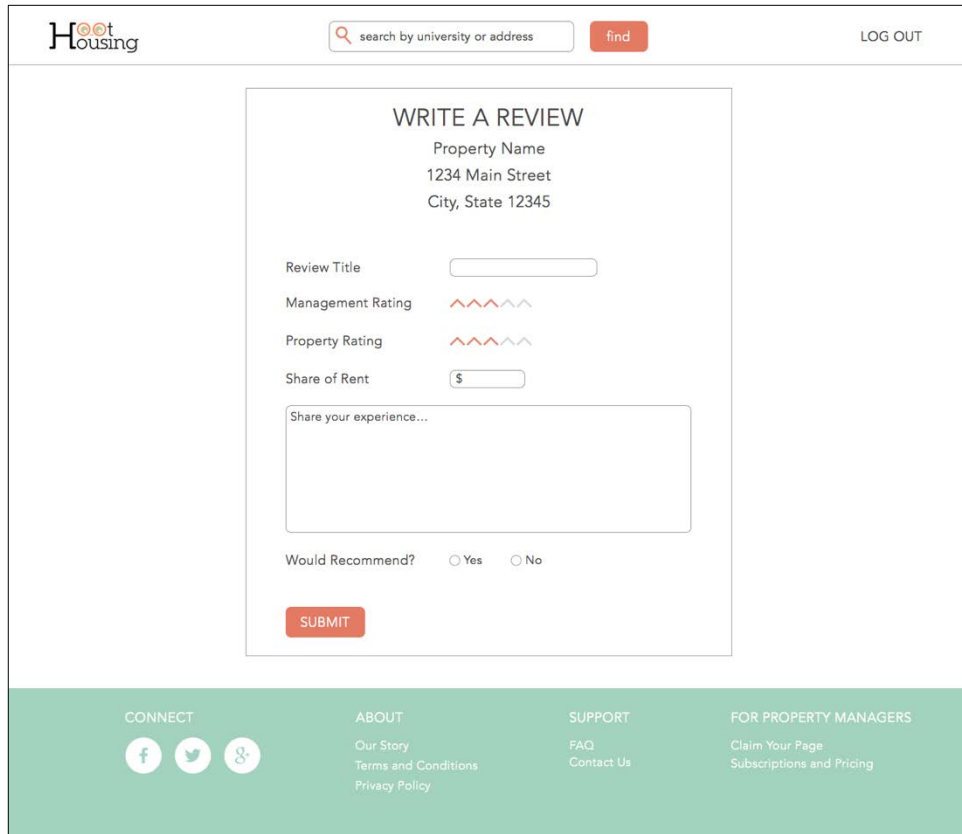
Figure 69. Review Page Mockup

E.3 Screenshots
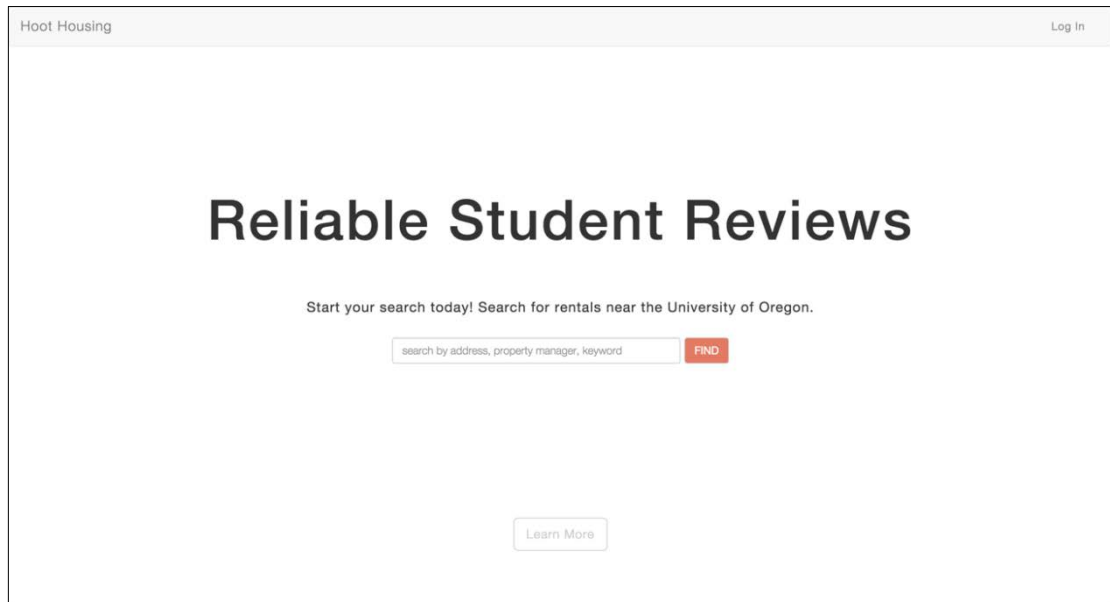
Figure 70. Home Page Screenshot

123
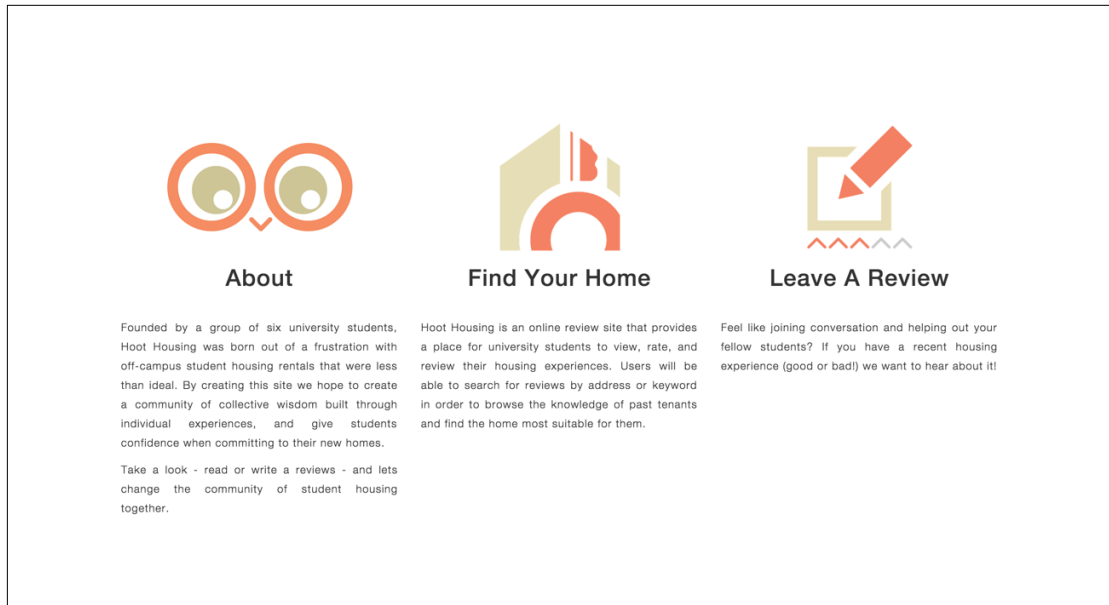
Figure 71. Home Page – More Info Screenshot

Figure 72. Footer Screenshot
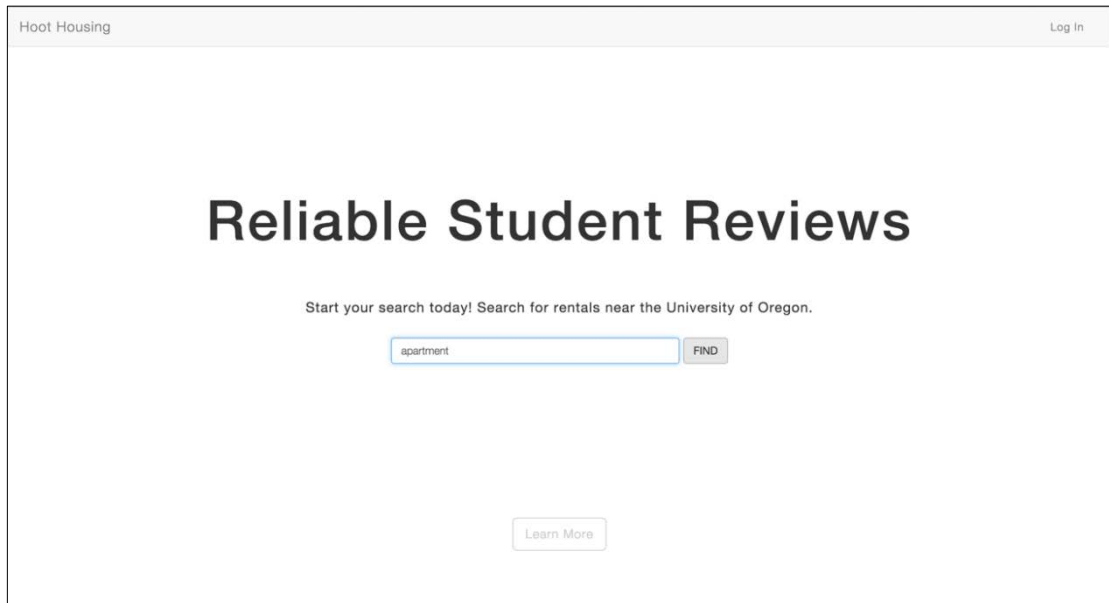
Figure 73. Home Page – Apartment Search Screenshot

Figure 74. Browse Page – Search Results Screenshot

Figure 75. Browse Page – Filters Screenshot

Figure 76. Property Page Screenshot

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Figure 77. Property Page – Reviews Screenshot

Figure 78. Management Page Screenshot

Figure 79. Log In Page Screenshot

Figure 80. Create an Account Page Screenshot

Figure 81. Home Page Navbar – Not Logged In Screenshot

Figure 82. Home Page Navbar – Logged In Screenshot

Figure 83. Global Navbar – Not Logged In Screenshot

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Figure 84. Global Navbar – Logged In Screenshot

Figure 85. Property Thumbnail Screenshot
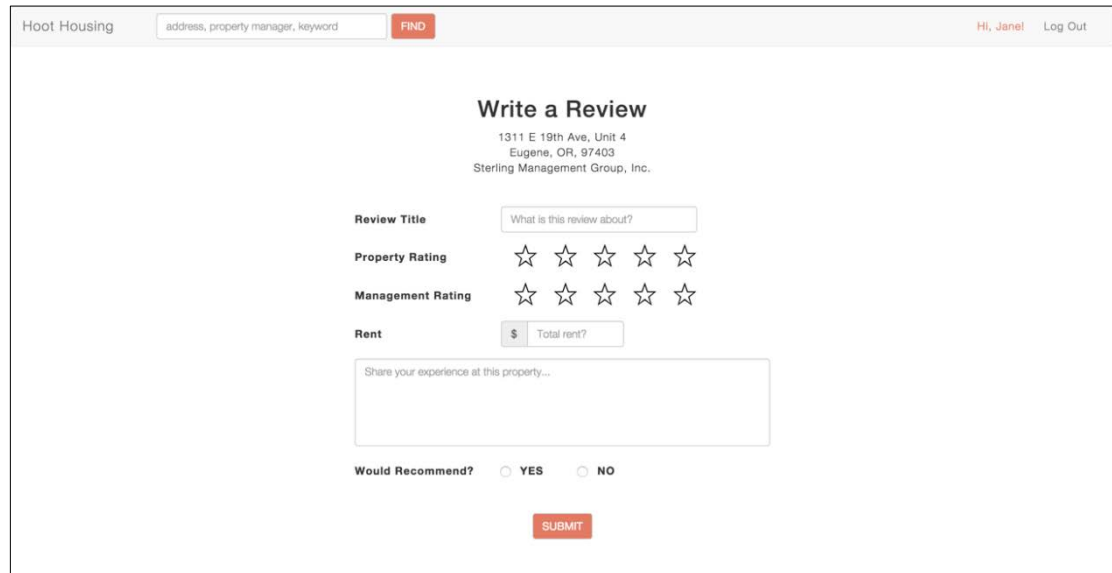
Figure 86. Review Page Screenshot

Figure 87. Review Form – Filled In Screenshot
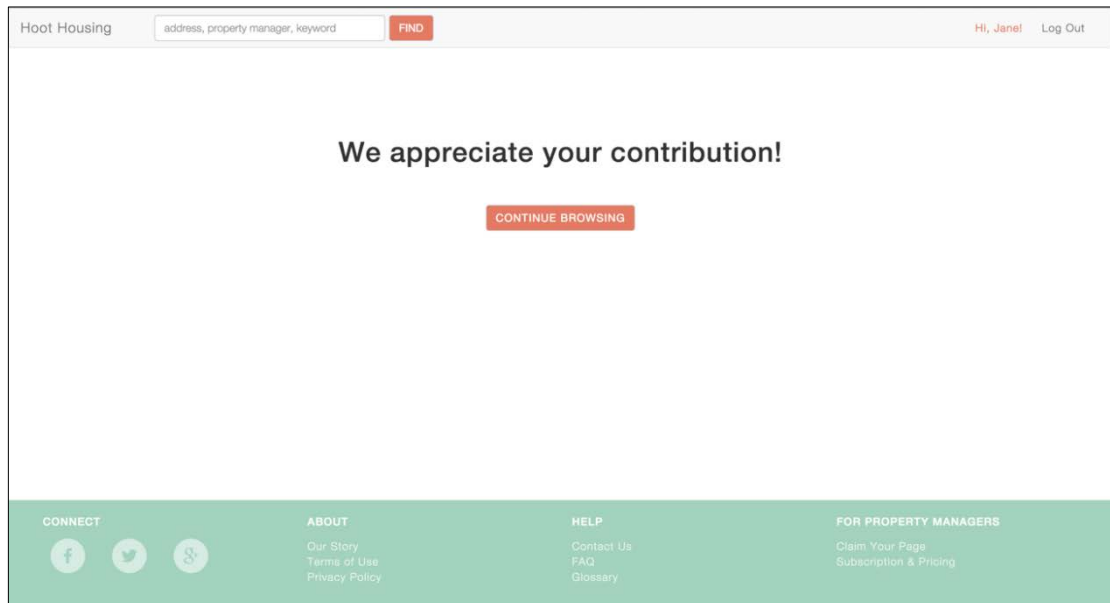
Figure 88. Review Submission Page Screenshot
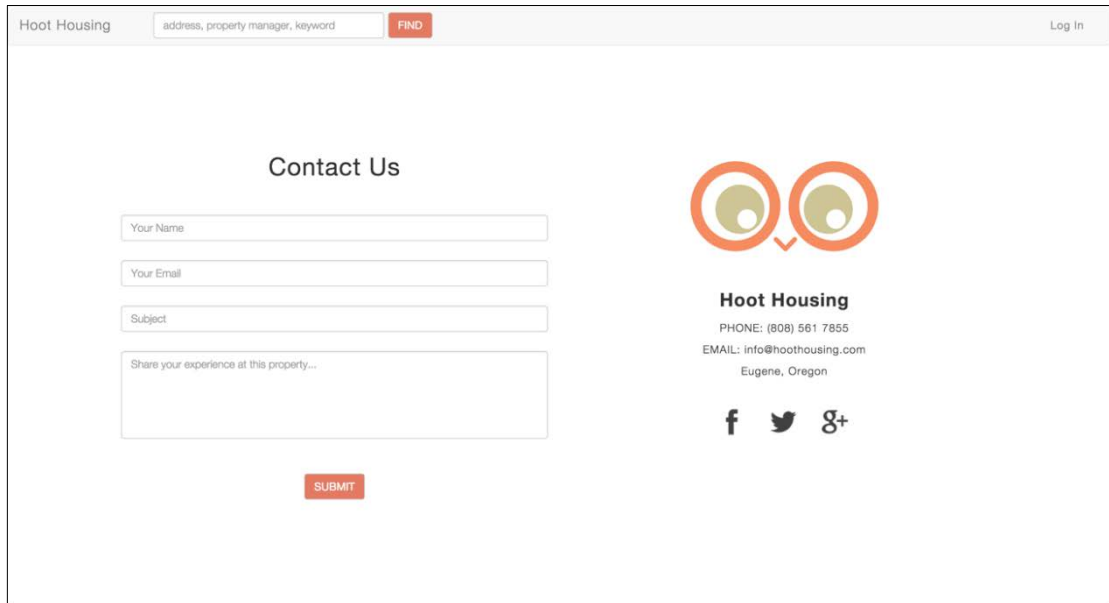
129
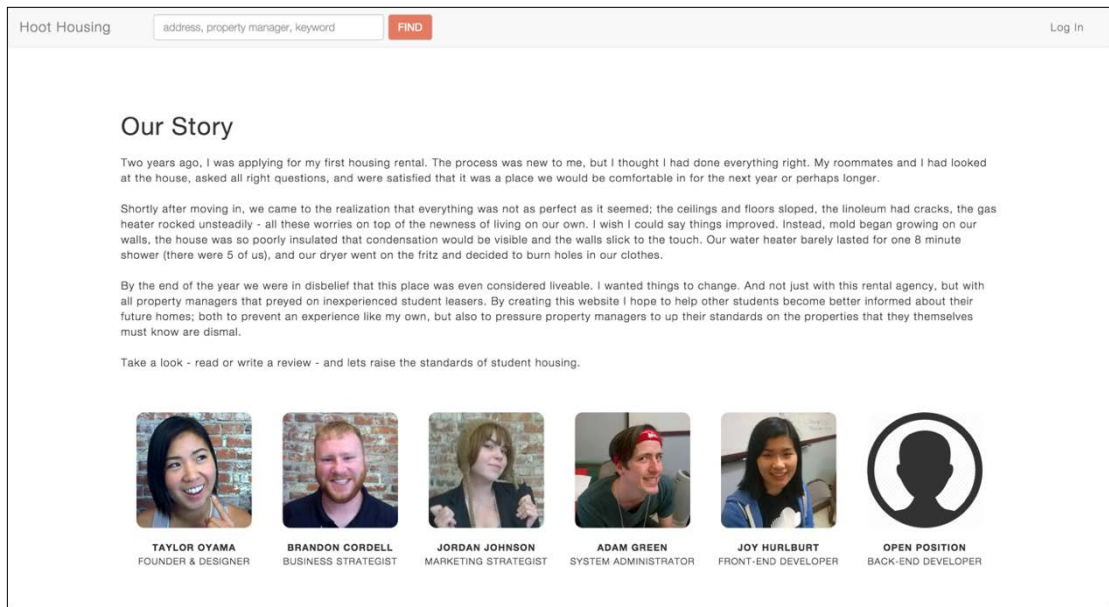
Figure 89. About Page Screenshot
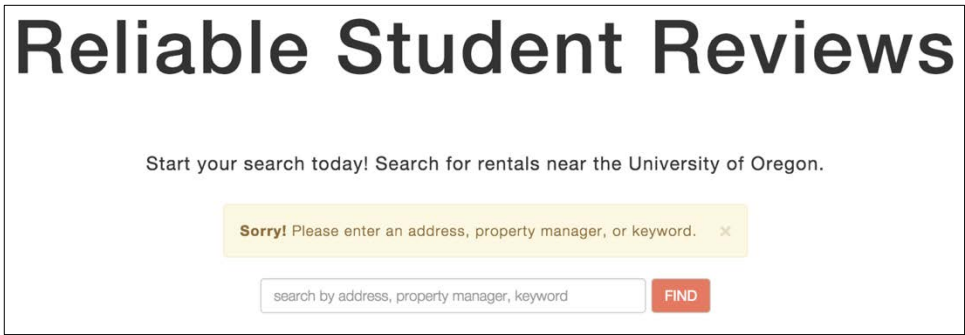

Figure 90. Contact Page Screenshot

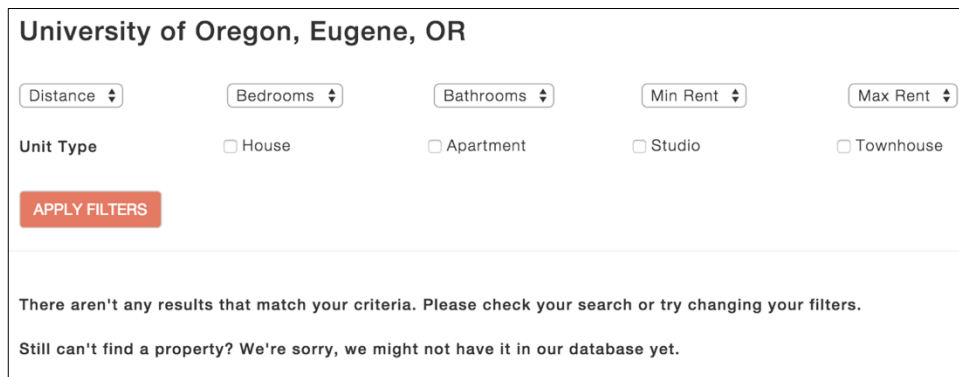Figure 91. Home Page – No Search Parameter Error Screenshot

Figure 92. Browse Page – No Search Results Error Screenshot

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