

# **QuickApply: A Modern Rental Application**

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## Introduction

QuickApply is a web application that aims to streamline the rental application process. It allows renters to easily fill out their personal and finance information online without the need to download and email application forms. Landlords can then access a centralized dashboard to view all submitted applications and track the status of each application.

When renting an apartment or house, renters must first submit an application to the landlord that provides relevant information, including their current address, social security number, driver's license number, and employment history. This information is used to perform background checks and screen applicants. Traditionally, landlords request this information via email and require applicants to download a PDF, fill out their information, and send the completed application back over email. Alternatively, landlords may display a form on their website, but these forms lack standardization and accessibility for all users. This process is inefficient and difficult for first-time renters: landlords must maintain their own system to manage the status of applications and applicants' information, and applicants must fill out applications with varying formats, readability, and accessibility.

The idea for QuickApply was conceived in EECS 497: Human-Centered Software Design and Development. In this course, we were tasked with creating a Minimum Viable Product while focusing on good project management practices, prototyping, and customer discovering. In EECS 497, I collaborated with two other students, Samay Shamdasani and Elliot Klein, to come up with the idea and initial planning for QuickApply, before continuing the development individually for my capstone.

The idea for QuickApply came about when one of our team members spoke to a friend who had recently applied for rental housing. The friend is an international student who found the current process frustrating. They were unsure how to fill out some of the questions and annoyed that they needed to download and fill out an email application for each property they applied to. The student also noted that some of the PDFs were difficult to read. Our team sought to create an application that would streamline this process for both landlords and students. After creating a prototype in EECS 497, I took on this project as my capstone and aimed to independently turn the project into a viable, working application. I focused on interviewing real users, designing for those users, and developing with accessibility in mind. The goal of QuickApply is to create a website that eases the current rental application process for both landlords and renters.

This project is not only beneficial to the University of Michigan community but also to the rental college industry as a whole. QuickApply provides a new solution to an inefficient system that has remained the same for many years. Additionally, this project is important because it prioritizes accessibility in the development process and contributes to the number of websites designed with accessibility in mind. Designing a website with accessibility in mind is crucial to ensure that all users, regardless of their abilities, can access and use the website. Despite the importance of accessibility, many websites are still developed without considering these needs, making it difficult or impossible for all users to use the products. Even many large companies develop first and iterate later to include accessibility. This project prioritizes accessibility in the development process and increases the amount of websites that focus on accessibility.

## Questions Investigated

As I started developing our rough product draft into a functional MVP that met user needs, I focused on three main questions. The first question was centered around the ease of use of the app: “Will the app be quick and easy for people to use?” My aim was to transform the demo frontend into a well designed website, making it easy for all users to accomplish their goals. Since the product has two users, this question has two subparts:

- a. How can the website be designed in a way that enables rental applicants to fill out the rental application form easily and quickly?
- b. How can I create a landlord dashboard that is easy and helpful for landlords when reviewing applications?

The second question I set out to address was “Is this a useful product and viable business?” Specifically, I needed to address “Is this website more helpful than the current process of submitting a rental application over email?” And in order to validate the entrepreneurial feasibility of this product, I needed to also analyze the business and potential usefulness for customers by establishing if landlords would pay for this service.

Finally, I set out to answer the third question, “Is this website accessible for all users?” Accessibility is often neglected in product timelines, but I wanted to make it a priority and ensure that the QuickApply was user-friendly for all users.

## Methodology

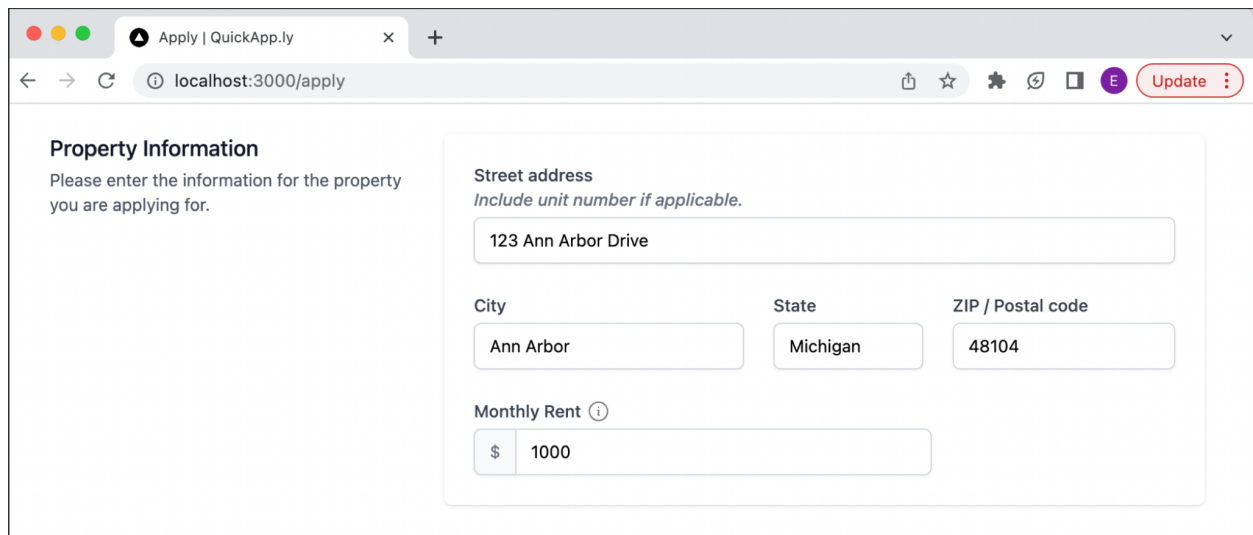
I used an iterative design process for this project, with user studies and feedback guiding each iteration cycle.

## Iteration 1

The first iteration began with the functional prototype my team created in EECS 497. To do this, we first identified a few key pain points each type of user had with the current process. Renters had one main requirement: a rental application form that was easy and quick to fill out.

Landlords had a larger variety of pain points and features they wished to see in a new platform. We identified three main landlord requirements: a centralized application dashboard, a form that is easy for renters to accurately use, and automated background checks.

The first iteration of the website contains a simple application form, a dashboard showing all submitted applications to landlords, the ability for landlords to view a specific application, and automated social security verification, as a simple proxy for background checks. Figure 1 shows the first part of the application form; figures 2 and 3 shows the landlord dashboard and application view menu.



The screenshot shows a web browser window with the title "Apply | QuickApp.ly" and the URL "localhost:3000/apply". The page content is titled "Property Information" and includes the instruction "Please enter the information for the property you are applying for." The form fields are as follows:

Street address	City	State	ZIP / Postal code
123 Ann Arbor Drive	Ann Arbor	Michigan	48104

Below these fields is a "Monthly Rent" field with a dropdown menu set to "\$" and the value "1000".

Figure 1: Iteration 1 Application Form

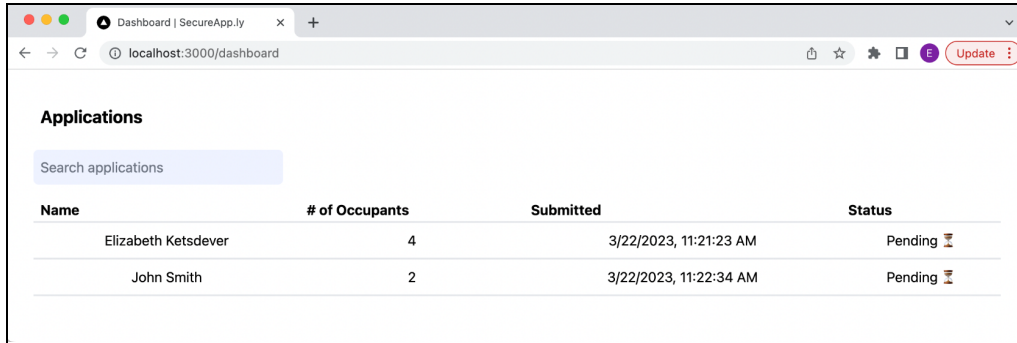


Figure 2: Iteration 1 Landlord Dashboard

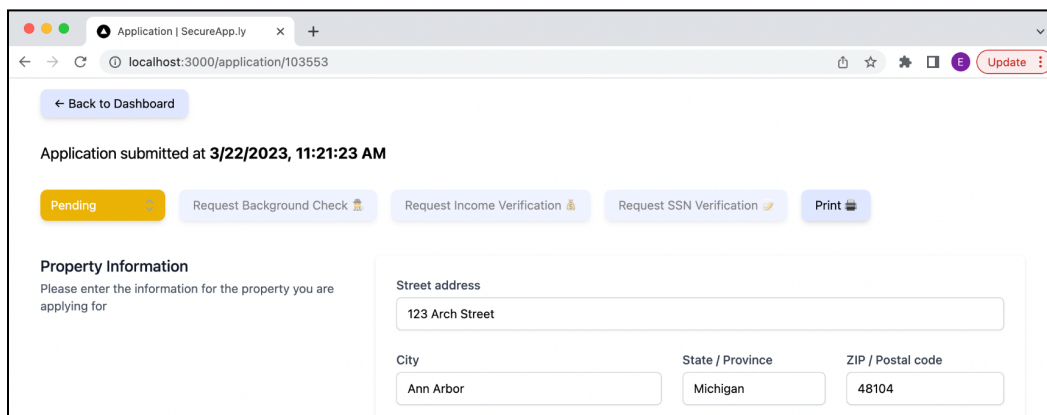


Figure 3: Iteration 1 Landlord Application View

### User Testing

Users were observed using the website and asked to rank the importance and satisfaction of each feature, as well as discuss overall how well they felt the product addressed the pain points they had with the current system. Figure 4 summarizes the results of the quantitative part of this user testing.

Requirement	User Type	Importance (1-5)	Satisfaction (1-5)
Fill out an application	R	4.8	2.9
Submit an application	R	4.7	3.1
View a single	L	4.7	3.1

application			
See an organized view of all applications	L	4.6	2.4
Application Status	L	3	4.3
Automated background and SSN checks	L	2.6	2.8

Figure 4: Iteration 1 User Testing

I also collected several user quotes that summarize key frustrations many users had:

*"I'm not sure if I should be putting in the total rent or just my contribution [in the forms' rent field]."*

*"Since my renters are all college students, I don't do background checks. I just collect their parent's information and have them fill out a separate form confirming they take responsibility."*

*"I currently store the applications in a file cabinet, with a separate folder for each unit. I need to be able to easily find all applications for a certain unit."*

#### *Iteration 1 Conclusion*

The main issue for renters was needing additional support to ensure the form is easier to understand and they make fewer errors. Based on this, I decided to make adjustments such as field validation, information hovers, and submission confirmation that would better guide users and prevent errors.

For landlords, the data was very inconsistent among users. In particular, there was a stark divide between college landlords and non-college landlords. While non-college landlords found SSN

validation useful and wanted automated background checks, college landlords found this unnecessary and distracting. Instead, college landlords said they tended to use different methods for determining acceptances, such as emailing references or having separate forms for parents. College landlords also expressed a strong desire for automatic emails to remind students to fill out the form and automatically request information from references.

Deciding how to approach this divide was a substantial challenge for me. I was unsure whether to attempt to support both types of users or select one. I originally tried to implement both features; however, I realized that it overcomplicated the application. I decided to instead narrow down the scope of the product to just focus on college landlords to ensure the best product for users. Based on this decision, I chose to implement a better dashboard layout and adjusted college-specific form sections for landlords in the next iteration.

## Iteration 2

In iteration 2, I made changes based on the feedback from iteration 1. Specifically, I adjusted 3 main things for renters. The first was adding field validation and required fields to ensure correct input and all mandatory fields are filled out. Secondly, I added subtitles and tooltips to clarify fields that users were confused about. Since many people filling out the form are first time renters, I wanted to ensure that any new wording was clarified and landlords receive all the information they need, such as unit number. The third change is a new submission confirmation page to ensure renters know that their form submission was successful. These changes can be seen in Figure 5.

For landlords, I made two main changes. The first change was not specifically a change to the app but rather to the target users, from all landlords to college landlords. Based on this, I then removed the background check, ssn check, and credit check options and adjusted the content to better



reflect college landlords' specific needs. I removed the employment information section and replaced it instead with a parent and current landlord section.

The second change for landlords was to the landlord dashboard. College landlords expressed that they currently store information in physical cabinets by address. One key usability principle is match between the system and the real world. To reflect this heuristic, the dashboard is now organized by address. These changes can be seen in figures 6 and 7.

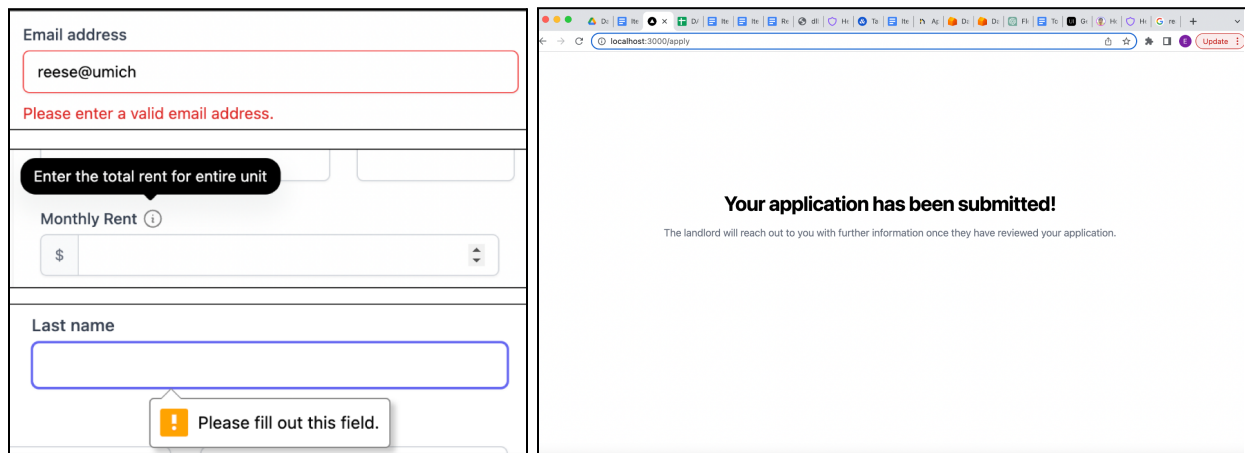


Figure 5: Iteration 2 Renter Changes

**Parent and Landlord Information**  
Enter information for your parent or guardian, current address, and current landlord. If you live in a dormitory, you may leave landlord blank.

Parent Name	Parent Phone Number	
<input type="text"/>	<input type="text"/>	
Parent Email Address		
<input type="text"/>		
Current Landlord Name	Landlord Email Address	
<input type="text"/>	<input type="text"/>	
Current Street Address		
<input type="text"/>		
City	State	ZIP / Postal code
<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 6: Iteration 2 New Form Sections

**All Applications**

Search applications

### 123 Arch Street

Name	Email	Submitted	Status
Elizabeth Kate	rketsdev@umich.edu	13 minutes ago	Pending

### 123 Ann Arbor Road

Name	Email	Submitted	Status
John Smith	jsmith@gmail.com	13 minutes ago	Approved
Jake Brown	jbrown@yahoo.com	14 minutes ago	Approved

### 111 Packard Street

Name	Email	Submitted	Status
Emma Smith	esmith@umich.edu	3 days ago	Rejected

Figure 7: Iteration 2 Landlord Dashboard

*User Testing*

In this iteration’s testing, I focused on determining if the problems found in Iteration 1 had been mitigated, as well as looking more specifically at usability.

Requirement	User Type	Importance (1-5)	Satisfaction (1-5)
Fill out an application	R	4.8	4.2
Submit an application	R	4.7	4.8
View a single application	L	4.6	4.1
See an organized view of all applications	L	4.6	4
Application Status	L	2.7	4.8

Collect information necessary to screen applicants	L	4.5	2.7
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Figure 8: Iteration 2 User Testing

I also collected several quotes from users:

*“One of the most time consuming things for me when sorting through applications is having to send all the emails to parents asking them to fill out the parent form.”*

*“Are they going to contact the parent, do I need to tell my mom to check her email?”*

*Accessibility Testing*

In addition to testing for usability in this iteration, I also focused on accessibility. I chose to evaluate accessibility using a number of different heuristics. To evaluate, I had myself and one other student who had studied accessibility in class rank the website. This evaluation is shown in Figure 9, with heuristics chosen based on Berkley’s 10 recommended accessibility heuristics.

	Application	Dashboard
Correct use of headlines	1.5	4.5
Proper alt text for images	2	5
Links have unique & descriptive names	5	5
Careful use of color	4.5	4
Forms designed for accessibility	5	4
Use of tables for tabular data not layout	4.5	1.5
Logical flow of keyboard accessibility	4	2.5
Thoughtful use of ARIA roles	3.5	2.5
Accessibility of dynamic content	5	5

Figure 9: Accessibility Testing Results

In addition, I used the WAVE testing plugin to directly test the website in my browser. With the application, there were some contrast errors, no page regions, and no first level heading. The landlord dashboard was missing form labels, didn't have page regions, and the application tables were built using html tables not css. These issues make the website difficult for screen readers and visually impaired users.

	Application	Dashboard
Correct use of headlines	1.5	4.5
Proper alt text for images	2	5
Links have unique & descriptive names	5	5
Careful use of color	4.5	4
Forms designed for accessibility	5	4
Use of tables for tabular data not layout	4.5	1.5
Logical flow of keyboard accessibility	4	2.5
Thoughtful use of ARIA roles	3.5	2.5
Accessibility of dynamic content	5	5

*Iteration 2 Conclusion*

Overall in this iteration, I learned that users were satisfied with the overall website in terms of being able to accomplish the requirements, after the adjustments from Iteration 1. However, there were still many usability issues that prevented users from being able to use the features as well as they would have liked. Renters would like more information on what to do if they don't have

certain fields (such as a driver's license) and a screen to automatically fill in new property information. I realized with the last question for landlords that each one has specific needs and slightly different extra sections. For the next iteration, further customizability should be given to landlords. Additionally, landlords want automated email sending to recommenders and parents, with the necessary forms for them to fill out.

A few key accessibility areas also needed to be improved. Specifically, aria labels, table formatting, and other small fixes. Aria roles/labels need to be added to submit buttons and clicking applications on the landlord dashboard. This ensures that users that don't use a mouse are able to submit forms or view specific applications. Secondly, the table format on the landlord dashboard should be created using css instead of the html table element, so that screen readers can better understand the content.

### Iteration 3

In the final iteration, I focused on fixing user testing and accessibility issues found in Iteration 2. I made two main changes for renters. The first is a new start screen that gives them a property dropdown to select and then auto fills the property information on the form. This helps address the issue of renters needing to check between the form and their email multiple times to find the new properties information. Secondly, I added further information to fields, such as how the landlord and parent contact information would be used. For landlords, I added a new settings page that allows them to customize the form sections and automatic emails to current landlords or parents asking them to fill out the necessary forms.

For accessibility, I added label tags to form elements, alt text on images, headers on the application page, and fixed contrast issues with descriptions and buttons. I also changed the table format in the landlord dashboard to be done using css not html. Figures 10 and 11 show the new first screen for renters, the landlord settings page, and automated email.

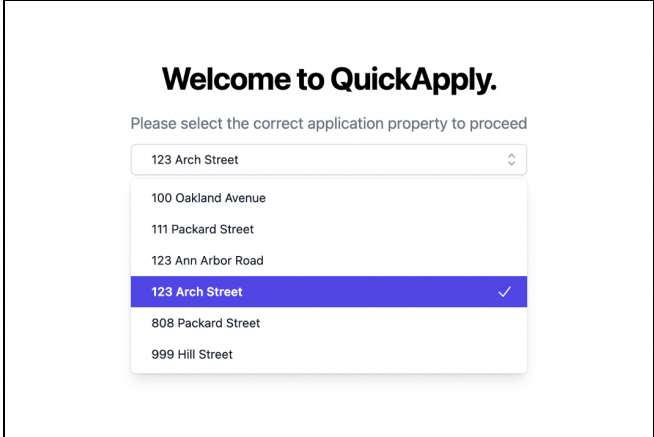


Figure 10: Welcome Screen Dropdown

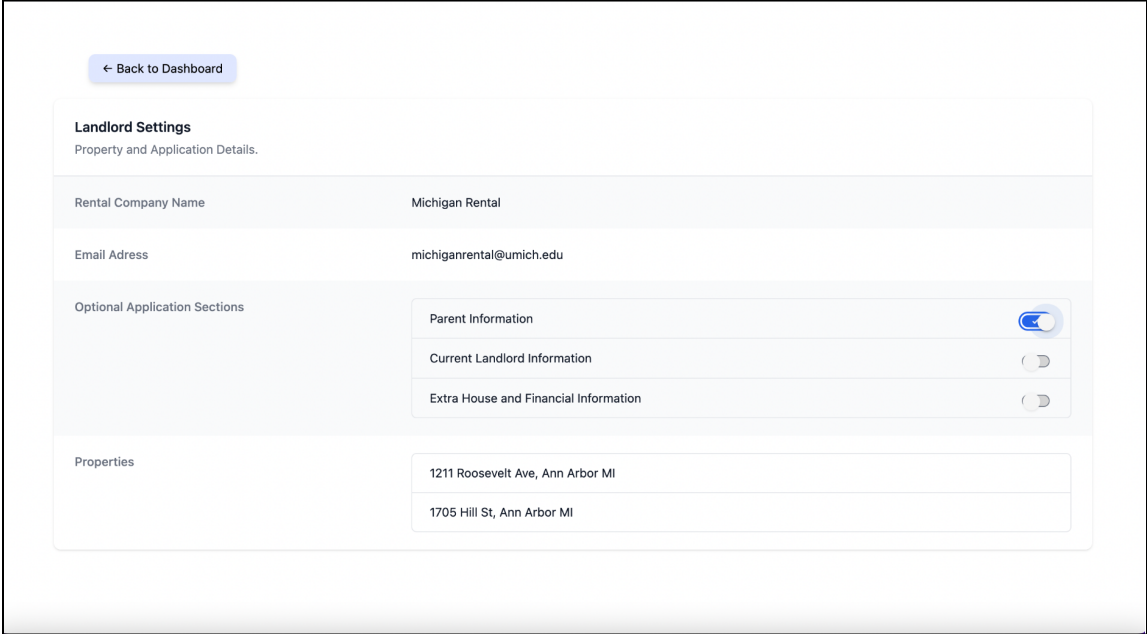


Figure 11: Landlord Settings Page

Testing

I performed the same testing for accessibility as done in Iteration 2. All categories improved to a 4 or greater, out of 5. The two lowest categories, correct use of headlines in the application and use of tables for tabular data not layout in the dashboard, improved from 1.5 to 4.5 and 5, respectively. I also used WAVE to test directly in the browser and found no errors.

For the final user testing, I asked landlords and renters to compare their current process to the new website on a few overarching criteria: efficiency, ease of use, effectiveness at completing the necessary tasks, and overall satisfaction. Figure 12 shows the results of this testing.

	Renters		Landlords	
	Old System	QuickApply	Old System	QuickApply
Efficiency	2.75	4.25	3.5	3.625
Ease of use	3.125	4.25	3.25	3.625
Effectiveness	4.375	4.625	4.5	4.25
Overall satisfaction	2.875	4.25	3.125	3.875

Figure 12: Iteration 3 User Feedback

All categories net gain except for landlord effectiveness: key feedback area from landlords here is that they still have more customization available with their current systems than QuickApply so in future iterations, we would add even more customization options. The biggest areas of improvement were renter efficiency, landlord ease of use, and overall satisfaction for both user groups.

I also asked the landlords a few final questions: would you use this product over your current method? If so, what price range would you be willing to pay annually for this product? 3 out of 5

landlords said they would be open to using QuickApply over their current systems, given security validation. One said they wouldn't because they still prefer a physical storage and would not yet consider any online product; one said they didn't see a big enough difference that they would switch. Most said they would consider the product for \$500-\$1000 annually.

## **Discussion**

The first question I sought to address was "Will the app be quick and easy for people to use?" I believe that based on the final user testing results, the answer to this question is yes. The new application rated highly in the "ease of use" and "efficiency" categories. Additionally, the user testing from Iteration 1 and Iteration 2 highlighted that, after adjustments, users were easily able to use the application and dashboard.

The second question I sought to answer was "Is this a useful product and a viable business?" QuickApply ranked higher in overall satisfaction, as compared with old systems, for both landlords and renters. This shows that the website is more helpful than the current process. However, there is still room for improvement in the application in terms of customization and pricing. The majority of landlords interviewed indicated that they would pay for QuickApply, but in the future, I hope to conduct more research with additional users to further analyze the business viability.

Lastly, the third question I set out to address was "Is this website accessible for all users?" In Iteration 3, I found that the website ranked above a 4 out of 5 in all 10 accessibility heuristics tested. It also passed all tests performed by in-browser accessibility testing plugins. Therefore, I think the answer to my final question was yes, the website is accessible for users. However, there



is always room for improvement with accessibility, and in future iterations, I would like to continue to design with all accessibility in mind.

## **Conclusion**

I learned a lot from this project and found it to be a very rewarding experience overall. I hadn't created a project with a user-first mindset before, where I had to focus on the user interviews and data first before considering development. I enjoyed the process of speaking with users, figuring out the best questions to understand their thinking, and deciding how to best proceed given their thoughts. I also improved my abilities to quickly develop a frontend application and use tools to test for usability and accessibility.

The next steps for QuickApply would be developing the backend, with a focus on security, and continuing to research the business viability of the application. In order to fully launch this product, the backend will need to securely store sensitive data, such as driver's license number. Overall, I am thankful to have done this project and gained beneficial entrepreneurial skills from it. I am thankful for my teammates in 497, Professor Ringenberg, and everyone who has helped me throughout this project.