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Alaska Airlines Accessibility: Final Report

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EXECUTIVE SUMMARY

A team of five University of Washington Human Centered Design and Engineering Masters students worked with Alaska Airlines to design and implement a web accessibility study of the Alaska Airlines website flight booking process. The purpose of the study was to evaluate the accessibility of booking a flight with Alaska Airlines for users who are blind or have low vision and use screen readers to navigate desktop websites. In addition to evaluating the accessibility of the website, Alaska Airlines expressed a desire to study the qualitative experience of using their website for the user group.

Six participants were recruited and tested in two hour long sessions in their homes, offices, or schools, using their own devices. Participants completed a pre-test questionnaire, six to ten discrete booking tasks, and a post-test questionnaire. Data was collected using a modified think aloud protocol and observation. Participants and their screens were recorded.

PURPOSE OF THE STUDY

The purpose of the study is to evaluate the accessibility of booking a flight on the Alaska Airlines website for users who are blind or have low vision and use screen readers to navigate desktop websites. Additionally, Alaska Airlines would like to go above and beyond the required criteria to meet current web accessibility guidelines. They would like to make their website as easy to use as possible and make the experience of booking a ticket with Alaska Airlines delightful for people who are blind or have low vision. We are conducting the study to find usability issues for which improvements could be made to achieve this goal.

STUDY DESIGN

OVERVIEW

We tested the booking process from the homepage to seat selection with all participants. The tests were conducted using a modified think aloud protocol and several questionnaires in participants' homes with their preferred devices. The tests took between one and two hours.

PILOT STUDY

A Human Centered Design and Engineering PhD student from the University of Washington who is blind and uses a screen reader agreed to let us observe her as she went through the booking process. She listened to her screen reader with headphones and followed an unmodified think aloud protocol to explain what she was doing and experiencing. She was an experienced Alaska Airlines user and UX designer, so her commentary and suggestions were integral to the design of our study..

RECRUITMENT

We recruited participants through our pilot study participant, who had many friends and contacts in the local blind community, and through our contact at Alaska Airlines, Liz Aderhold.

Though Alaska Airlines initially approached us with hopes of a full web accessibility evaluation, given our time constraint, we decided to focus on recruiting people who are blind or have low vision and use a screen reader. There are other accessibility softwares and devices, such as magnifiers or braille readers, that would need to be studied to conduct a full accessibility evaluation.

We screened the recruits to find both JAWS and VoiceOver users, people who had booked their own travel before on a website, and both people who had and had not previously used the Alaska Airlines website to book flights.

SCREENING

We began with 11 participants from recruitment. We sent them a screening questionnaire ([Appendix B](#)) in text form by email. We made this choice because our pilot study participant indicated it would be the most accessible way to survey. We eliminated two participants who did not use a screen reader. Of the nine remaining participants, three had scheduling difficulties and could not find time to participate.

PARTICIPANT PROFILES

Participant #	Screen Reader	Browser	Self-Booking	Has Used Alaska	Vision	Age	Gender
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				website			
P1	JAWS	Firefox	Yes	Yes	Total Blindness	35	Male
P2	Voice Over	Safari	Yes	Yes	Near total blindness	33	Male
P3	JAWS	Chrome	No	No	Profound low vision	30	Female
P4	JAWS	Internet Explorer	Yes	Yes	Profound low vision	23	Male
P5	Voice Over	Safari	Yes	Yes	Severe low vision	44	Male
P6	JAWS	Firefox	Yes	No	Near total blindness	31	Male

STUDY IMPLEMENTATION

TEST ENVIRONMENTS AND EQUIPMENT

Four tests were conducted in the participants' homes. One test was conducted on campus, in a private room at the University of Washington, and one was conducted in a private room at Lighthouse for the Blind. All participants used their own preferred devices with their preferred accessibility tools. These environment and equipment decisions were made to elicit natural behaviors from participants.

INCENTIVE

Alaska Airlines provided participants with generous incentives. For studies that ran one hour or under, participants received a pre-activated \$100 Visa gift card. For studies between one hour and 1.5 hours in length, participants received a \$100 Visa gift card and two \$20 Starbucks gift cards. For studies over 1.5 hours, participants received two \$100 Visa gift cards.

CONFIDENTIALITY

Participants signed an Alaska Airlines confidentiality agreement and a University of Washington study consent form ([Appendix C](#)). They received digital copies of the agreements at least a week ahead of time by email, so they could more easily read them. This was also recommended by our pilot study participant.

METHODS

We asked participants to imagine they were purchasing a flight from Seattle to Los Angeles in late March and to complete their flight booking process on the Alaska Airlines website. We then asked participants to complete tasks while describing what they were hearing, expecting, and thinking as much as possible. After each task we had participants pause and answer a series of questions. After the test concluded, we interviewed participants about their experience and asked them three questions about their demographic information. We screen recorded the sessions using Zoom and video recorded the participants' facial expressions and gestures. See [Appendix A](#) for our usability study scripts.

MODIFIED THINK ALOUD PROTOCOL

We used a modified concurrent think aloud protocol in this study. Because the purpose of the study is to understand the experience of the participants, it was important to us to have participants express their candid thoughts aloud as they navigated the website. Traditional think aloud protocol would not work for us, however, because participants need to listen to their screen reader to navigate the page and could not reasonably be expected to listen and speak at the same time. See [Appendix F](#) for the research we conducted prior to the study. When not in the usability study, our participants typically listened to their screen reader using headphones and a very high speaking speed, unintelligible to us as inexperienced users. We asked them to play their screen reader audio through the speakers so that we could avoid interrupting them while they were listening. Additionally, because our pilot participant informed us that it would be disruptive to many people to slow the speaking speed of their screen reader down, we asked participants to retain their preferred speaking speed but set up visual text display of the screen reader's output.

TASKS

Task 1 (Flight Search) – Open the Alaska Airline’s website and search for a round-trip flight from Seattle to Los Angeles that is departing March 15th and returning March 23rd.

Task 2 (Select Departing Flight) – Select your preferred departing flight.

Task 3 (Select Returning Flight) – For your returning flight, select the cheapest, non-stop flight.

Task 4 (Review Flight Summary) – Proceed through this page as you normally would.

Task 5 (Checkout as Guest) – Continue the booking process as a guest and fill out the passenger name and contact information.

Task 6 (Seat Selection/Depart) – Select whichever seat you would like for your departing flight... **Please proceed to the next page.**

Task 7 (Seat Selection/Return) – Select the first available aisle seat in the main cabin.

Task 8 (Travel Add-ons) – Proceed through this page as you normally would.

Task 9 (Review/Payment) – Review your itinerary and complete the payment with fake information.

Task 10 (Confirmation Page) – Review the confirmation page.

DATA ANALYSIS

After all of the sessions were complete, we gathered the data from our notes from each participant in an aggregated spreadsheet. Each team member recorded specific issues on sticky notes, and we created an affinity diagram to locate common occurrences and themes ([Appendix E](#)). We then created a table to organize and annotate our findings. We decided upon a severity rating scale and analyzed each finding in order to give it a rating. Because Alaska had approached us with the intention of improving the experience of using their website, our main focus was on qualitative data and participant feedback. We collected additional quantitative data, such as errors on task and task failures, but we mainly focused on our qualitative data analysis to make our findings and recommendations. See [Appendix C](#) for quantitative data analysis.

FINDINGS AND SUCCESSES

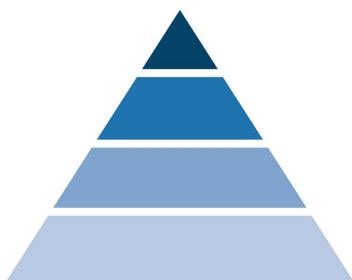
OVERVIEW

Analyzing our study data resulted in 21 findings. The majority of issues were not severe. The most issues resulted from the flight selection (flight search results) page.

SEVERITY RATINGS

Each of the following findings include a severity rating intended to rank the finding in terms of its impact on the experience of booking a flight on Alaska Airlines' website for a person who is blind or has low vision. Ratings are based on:

- A. **Frequency**¹ - How many participants experienced the issue? How many times?
- B. **Impact** - How difficult was it for participants to overcome the issue? Did the issue cause them to fail the task?
- C. **Persistence** - How avoidable was the issue? Could the participants take an alternate route to avoid the issue?
- D. **Experience** - How did the issue affect the participant? Did it cause frustration, anger, confusion?



Level 4 - Severe: In need of immediate fix

Level 3 - Major: High priority

Level 2 - Moderate: Medium priority

Level 1 - Minor: Low priority

ADDITIONAL CONSIDERATIONS

SUCCESSSES AND IMPROVEMENTS

In general, we found the test methods and modified think aloud protocol worked very well together to help us acquire participants' thoughts and feedback in a timely manner. We also found the combination of video and

¹ From Professor Leah Findlater, HCDE 598E Winter 2018

screen recordings very helpful for data analysis. We highly recommend continuing to prompt participants to turn on the braille/ text display on screen for future studies, which provides a direct visualization of the screen reader content and simplifies the data analysis part.

However, we would recommend further narrowing the scope of the study. On average, our usability study session took between ninety minutes to a hundred and twenty minutes depending on participants' familiarity of the testing website and the skills of using a screen reader. We would recommend narrowing the scope to keep the study session within sixty minutes, or at most ninety minutes.

NEXT STEPS

In Depth Study on Screen Reader Functionality

During our study, we noticed that different screen readers function differently, even for the same content. Even within the same screen reader, different versions of the screen reader function differently and the same screen reader seems to interact differently with different browsers or operating systems. We think it would be helpful to have an in-depth study on the functionality of the various screen readers in order to gain insights to make the website more accessible.

Evaluate the Website Using Different Accessibility Tools

Different accessibility tools interact with the website so differently that they can create a very different user experience. Our study focused on evaluating the accessibility of the site using screen readers. We think further study with different accessibility tools, such as magnifiers or braille displays, will be helpful to create a better experience for a wider range of potential users.

APPENDIX A: USABILITY STUDY SCRIPTS

PRE-TEST INTRODUCTION

Thank you so much for taking the time out of your day and participating in our Alaska Airlines web accessibility study. We already introduced ourselves, but just to remind you, I'm ____ and I'll be moderating today. ____ will be video recording, and _____, _____, and _____ will be taking notes.

As you may know already, the general purpose of this study is to observe and gather your thoughts and feelings about the flight booking process on Alaska Airlines website. The goal of this web accessibility evaluation is to inform Alaska of any accessibility issues on their website, so they can make improvements.

I want you to know that we are in no way testing you. There are no right or wrong answers to the questions I'll be asking you today. We are interested in your honest impressions and feedback, so please feel free to share what you think of your experience, both positive and negative. Please do not worry about hurting our feelings, we are doing this to improve the site, so we value your honest reactions.

I would also like to note to you that we are students. As much as possible we are trying to be professional and respectful, but we may make mistakes. Please feel free to let us know if we have.

As you use the site, I'm going to ask you as much as possible to try to think out loud: to say what you're looking at, what you're trying to do, and what you're thinking. This will be a big help to us.

If you have any questions as we go along, please ask them. I may not be able to answer them right away, since we're interested in how people go through this process when they don't have someone sitting next to them to help, but if you still have any questions when we're done, I'll try to answer them then. And if you need to take a break at any point, just let me know.

With your permission, we're going to record you and what happens on your screen. The recording will only be used to help figure out how to improve the site, and it will be kept safe and secure by Alaska. So if you would, I'm going to

ask you to sign two simple permission forms for us. One is an Alaska Airlines confidentiality agreement which we are using for video permissions. By signing it you agree to allow us to record you and give that video to Alaska Airlines. The second is our study consent form. By signing it, you are stating that you know participation in this study is voluntary and you can withdraw at any time.

SCENARIO

Now we're going to move on to the booking process. I'm going to ask you to think through this scenario:

You're planning a trip to Los Angeles in March. You need to book a roundtrip flight and only have access to your computer. You heard from a friend that Alaska Airlines offers inexpensive flights to LA, so you decide to head to their site and begin your flight booking process.

So let's get started! Remember, I'm going to ask you to think aloud as you move through some tasks.

TASK SCENARIOS

Task 1 (Flight Search) – Open the Alaska Airline's website and search for a round-trip flight from Seattle to Los Angeles that is departing March 15th and returning March 23rd. Please pause before moving on to the next page.

Task 2 (Select Departing Flight) – Select your preferred departing flight. Please pause before moving on to the returning flight.

Task 3 (Select Returning Flight) – For your returning flight, select the cheapest, non-stop flight. Please pause before moving on to the next page.

Task 4 (Review Flight Summary) – Proceed through this page as you normally would. Please pause before moving on to the next page.

Task 5 (Checkout as Guest) – Continue the booking process as a guest and if you feel comfortable, fill out the passenger name and contact information. (If you do not feel comfortable, enter fake passenger information). Please pause before moving on to the next page.

Task 6 (Seat Selection/Depart) – Select whichever seat you'd like for your departing flight. Please pause before moving on to the next page.

Task 7 (Seat Selection/Return) – Select the first available aisle seat in the main cabin. Please pause before proceeding to the next page.

Task 8 (Travel Add-ons) – Proceed through this page as you normally would. Please pause before you continue to the next page.

Task 9 (Review/Payment) – Review your itinerary and complete the payment with fake information. Please pause at the end of this page.

Task 10 (Confirmation Page) – Review the confirmation page; let us know when you're done

APPENDIX B: SURVEYS AND QUESTIONNAIRES

SCREENING QUESTIONNAIRE

The following questions were sent to participants over email. We made the decision to send the questions over email in text form as opposed to in a google survey or other method because we were informed by our pilot study participant that this was more likely to be accessible to all participants.

1. What computer accessibility software do you use, if any? (screen reader, magnifier, etc.)
2. What are the brands of the software you use? (JAWS, VoiceOver, etc.)
3. Do you have a personal computer? If so, what operating system do you use? (Windows, OS, etc.)
4. How often do you use a computer?
5. What is your preferred internet browser?
6. How often do you travel by air?
7. Do you book your own travel when you fly?
8. If you do book your own travel, how do you usually book your flights?
9. Do you ever use Alaska Airlines to book your flight? If so, do you use your phone or a desktop computer to do so?

PRE-TEST QUESTIONNAIRE

I'd like to ask you a few questions before we get started. Some of these you may remember being asked during our emails, but we are asking again to get a more detailed response.

Travel Questions

- On average, how often do you travel by plane?
- Why are you usually traveling?
- Have you booked flights on your own?

- How was the experience? What was the most satisfying / difficult part?
- Which website do you (or your proxy) usually use to find and book airline tickets? Why?
- What other websites have you (or your proxy) used to find and book airline tickets in the past?

General Questions

- Have you had a really frustrating experience with a website or app recently? Which website/app? Why was it frustrating?
- Have you had a really good experience with a website or app recently? Which website? Why was it enjoyable?

POST-TASK QUESTIONNAIRE

Task 1 (Flight Search)

- Was there anything you expected to find that was not present on this page?
- Did you encounter any difficulty completing this task?
- Did you encounter any things you enjoyed while completing this task?

Task 2 (Select Departing Flight)

- What were your criteria when you were selecting this flight?
- Was there anything you expected to find that was not present on this page?
- Did you encounter any difficulty finding a flight you wanted?
- Did you encounter any things you enjoyed while completing this task?

Task 3 (Select Returning Flight)

- Did you encounter any difficulty completing this task?

- Did you encounter any things you enjoyed while completing this task?
- I notice you did/didn't use filters to accomplish this task. Why/why not?

Task 4 (Review Flight Summary)

- If they skip the page, we will ask:
 - I notice you didn't read through the flight summary. Why not?
- If they did read through the flight summary we will ask:
 - Was there anything you expected to find that was not present on this page?
 - Did you encounter any things you enjoyed while completing this task?
 - Do you find this page useful?

Task 5 (Checkout as Guest)

- Was there anything you expected to find that was not present on this page?
- Did you encounter any difficulty completing this task?
- Did you encounter any things you enjoyed while completing this task?
- If user did not tell us they found the request assistance link: Did you encounter the link to request assistance on this page?
 - If you had found the link, would you have requested assistance? Why or why not?

Task 6 (Seat Selection/Depart)

- Was there anything you expected to find that was not present on this page?
- What were your criteria when you were searching for a seat?
- Do you feel confident that the seat that you found fits the criteria of the seat you were searching for?

- On a scale of 1-5, how difficult did you find it to find an available seat? (1 being very easy and 5 being very difficult) Why was it easy/difficult?

Please proceed to the next page.

- On a scale of 1-5, how difficult was it to proceed to the next page? (1 being very easy and 5 being very difficult) Why was it easy/difficult?

Task 7 (Seat Selection/Return)

- Did you encounter any difficulty completing this task?
- Did you encounter any things you enjoyed while completing this task?

Task 8 (Travel Add-ons)

- Was there anything you expected to find that was not present on this page?
- Did you encounter any difficulty completing this task?
- Did you encounter any things you enjoyed while completing this task?
- Did you find this page useful?

Task 9 (Review/Payment)

- Was there anything you expected to find that was not present on this page?
- Did you encounter any difficulty completing this task?
- Did you encounter any things you enjoyed while completing this task?
- How closely did you read this information?

Task 10 (Confirmation Page)

- Was there anything you expected to find that was not present on this page?
- Do you find this page useful?

POST-TEST QUESTIONNAIRE

I would like to ask you a few follow up questions now that we're done with the study.

- On a scale from 1 to 5, how would you rate your experience booking these tickets today? (1 being "very bad" to 5 being "very good").
- What did you like the most? Why?
- What did you like the least? Why?
- How likely would you use Alaska Airlines website to book your travel in the future?
- Is there anything else you would like to tell us about your experience?

We have some questions about your demographic information. Please only answer if you feel comfortable.

- How old are you?
- Which of the following best describes your gender?
 - Male
 - Female
 - Non-Binary
 - Other
 - I do not wish to answer
- Which of the following best describes your vision without vision aids?
 - Near-normal vision (20/30 to 20/60)
 - Moderate low vision (20/70 to 20/160)
 - Severe low vision or legally blind (20/200 to 20/400)
 - Profound low vision (20/500 to 20/1000)
 - Near-total blindness (less than 20/1000)
 - Total blindness (no light perception)
 - Unsure
 - I do not wish to answer

APPENDIX C: CONFIDENTIALITY AGREEMENTS

ALASKA AIRLINES CONFIDENTIALITY FORM CONFIDENTIALITY AGREEMENT

This confidentiality agreement (hereinafter referred to as “Agreement”) is made and entered into as of the _____, 2018, by and between Alaska Airlines, Inc., an Alaska corporation, hereinafter referred to as “Alaska” or the “Alaska”, and _____, an individual, hereinafter referred to as the “Participant.”

In connection with Participant’s participation in a research project for Alaska, Alaska will provide Participant with proprietary and confidential information related to Alaska or its affiliates, Virgin America Inc. or Horizon Air Industries Inc. It is essential to Alaska that the information provided by Alaska to Participant remain confidential. In view of these considerations, this Agreement sets forth the terms and conditions pursuant to which Alaska will disclose information to Participant.

1. Alaska intends to provide to Participant information and data. All such information (whether written or oral) disclosed to Participant (whether such disclosure took place on or after or took place before the date of this Agreement), together with any documents or records based on or otherwise reflected or are generated in whole or in part from such information, are collectively referred to herein as the “Confidential Information”. Participant agrees that it will not use such Confidential Information, or any information derived therefrom, for any purpose other than its participation in the research project for Alaska. Participant will not disclose such Confidential Information to any third party. Participant will not make any copies of Confidential Information. Upon Alaska’s request, Participant shall promptly (i) destroy all copies of Confidential Information disclosed to them by or on behalf of Alaska in their possession and (ii) destroy all records prepared by them which contain, are based on or otherwise reflect or are generated in whole or in part from Confidential Information (including that stored on any computer, word processor or other similar device). Any oral Confidential Information will continue to be held subject to the terms of this Agreement. The term “Confidential Information” as used in this Agreement does not include any information which (a) is or becomes generally available to the public other than by disclosure by Participant, (b) was available to Participant on a non-confidential basis from a source (other than Alaska), or (c) is developed by Participant

independently of access to any of the confidential Information and without otherwise violating the obligations of Participant under this Agreement. Furthermore, ten (10) years from the effective date of this Agreement, such Confidential Information will no longer be deemed Confidential Information and from and after that date, Participant's obligations under this Agreement will cease to exist.

2. In addition to protecting the Confidential Information, Participant agrees and acknowledges that any feedback, ideas, concepts and designs that Participant may disclose to Alaska as part of the research project will become property of, and Confidential Information of, Alaska and will be protected in accordance with this Agreement.
3. Participant understands and agrees that Participant may be photographed or filmed during the course of the research project, and that Alaska will own all images, film or footage and may use them for purposes of the research project (but not for marketing, advertising or other purposes other than the research project) without further approval of Participant.
4. In the event that the participant is requested or required (by deposition, interrogatory, request for documents, subpoena, civil investigative demand or similar process) to disclose any Confidential Information to any person not authorized by Alaska to receive such Confidential Information, Participant will provide Alaska with prompt written notice of such so that Alaska may seek a protective order or other appropriate remedy and shall cooperate with Alaska's efforts to do so. In the event such protective order or other appropriate remedy is not obtained, Participant will disclose in consultation with Alaska, only that portion of the Confidential Information which it is advised by counsel is legally required and will exercise best efforts to obtain confidential treatment for such Confidential Information.
5. The parties agree that the remedy at law may be inadequate to protect Alaska against any actual or threatened breach of the terms of this Agreement by Participant, and therefore, without limiting any other remedy available, Participant agrees to the granting of an injunction, specific performance or other forms of equitable relief in Alaska's favor without proof of actual damages. In addition to any other liability that a party may have in connection with any breach of

this Agreement, each party agrees to indemnify and hold harmless the other for the cost and expenses of enforcing this indemnity (including any legal fees and disbursements).

6. This Agreement and all controversies arising from or relating to performance under this Agreement shall be governed by and construed in accordance with the laws of the state of Washington without giving effect to its conflicts of laws.

IN WITNESS WHEREOF, the parties have duly executed this Agreement as of the date first written above.

PARTICIPANT

ALASKA AIRLINES, INC.

By: _____

Its: _____

UNIVERSITY OF WASHINGTON STUDY CONSENT FORM

UNIVERSITY OF WASHINGTON CONSENT FORM

Alaska Airlines Accessibility: Usability Study

RESEARCHER'S STATEMENT

This project is being conducted by Nicole Alvarez, Toni Saylor, Anthony Ugas, Anting Chen, and Amy Chen at the University of Washington as part of the course "Usability Studies" in the Department of Human Centered Design and Engineering. Professor Sean Munson teaches this class.

Note: This project is being performed as part of a course and has not been reviewed by the University of Washington Human Subjects Division.

PURPOSE OF THE STUDY

The purpose of this project is to evaluate the Alaska Airlines website booking process for its accessibility to users of screen readers.

STUDY PROCEDURES

Participants will proceed through the booking process, segmented by tasks delivered by the researchers. During the tasks, participants will be asked to use a “think aloud” technique by explaining their thoughts and reactions to information presented by their accessibility tool as they move through the booking process. Participants will be interviewed after every task or as needed during the tasks to elucidate their reactions and understandings. Participants will be asked to run their screen reader out loud so that researchers can avoid interrupting the participants while their screen reader is speaking. Participants will also be asked to set up text display of the screen reader output, so that the researchers can better understand what the participant is hearing. Additional quantitative measures will be taken during the test. It is important for participants to note that it is not the researchers’ intent to test the participants, only the website. Participants will also be interviewed after completing the booking process for their overall thoughts and opinions. They will then be asked to take a survey.

RISKS, STRESS, OR DISCOMFORT

The risks and discomfort associated with participation in this study are no greater than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. The experience is expected to be informative, inherently interesting and generally a positive experience.

BENEFITS OF THE STUDY

Participants will receive a Visa gift card, provided by Alaska Airlines, in the amount of \$100-\$150 depending on the length of the session. Participants will be providing valuable feedback to Alaska Airlines about the accessibility of their booking process, which has the potential to affect the accessibility of the website in the future.

CONFIDENTIALITY OF RESEARCH INFORMATION

We will refer to you anonymously (e.g., using a pseudonym) in any material that is shared with the entire class rather than just the instructor (Sean Munson). The instructor will be aware of your name and will receive a copy of this consent form.

RIGHT TO WITHDRAW AND QUESTIONS

Your participation in this project is completely voluntary. You may choose not to take part at all. If you decide to participate in this project, you may stop participating at any time. If you decide not to participate in this study or if you stop participating, you will not be penalized or lose any benefits to which you otherwise qualify.

If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the project, please contact the investigators:

Toni Saylor trsaylor@uw.edu

Nicole Alvarez nicoleya@uw.edu

Anthony Ugas adugas@uw.edu

Anting Chen antchen@uw.edu

Amy Chen sjjinc@uw.edu

SUBJECT'S STATEMENT

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, or if I have been harmed by participating in this study, I can contact one of the researchers listed on this consent form. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098 or call collect at (206) 221-5940. I will receive a copy of this consent form.

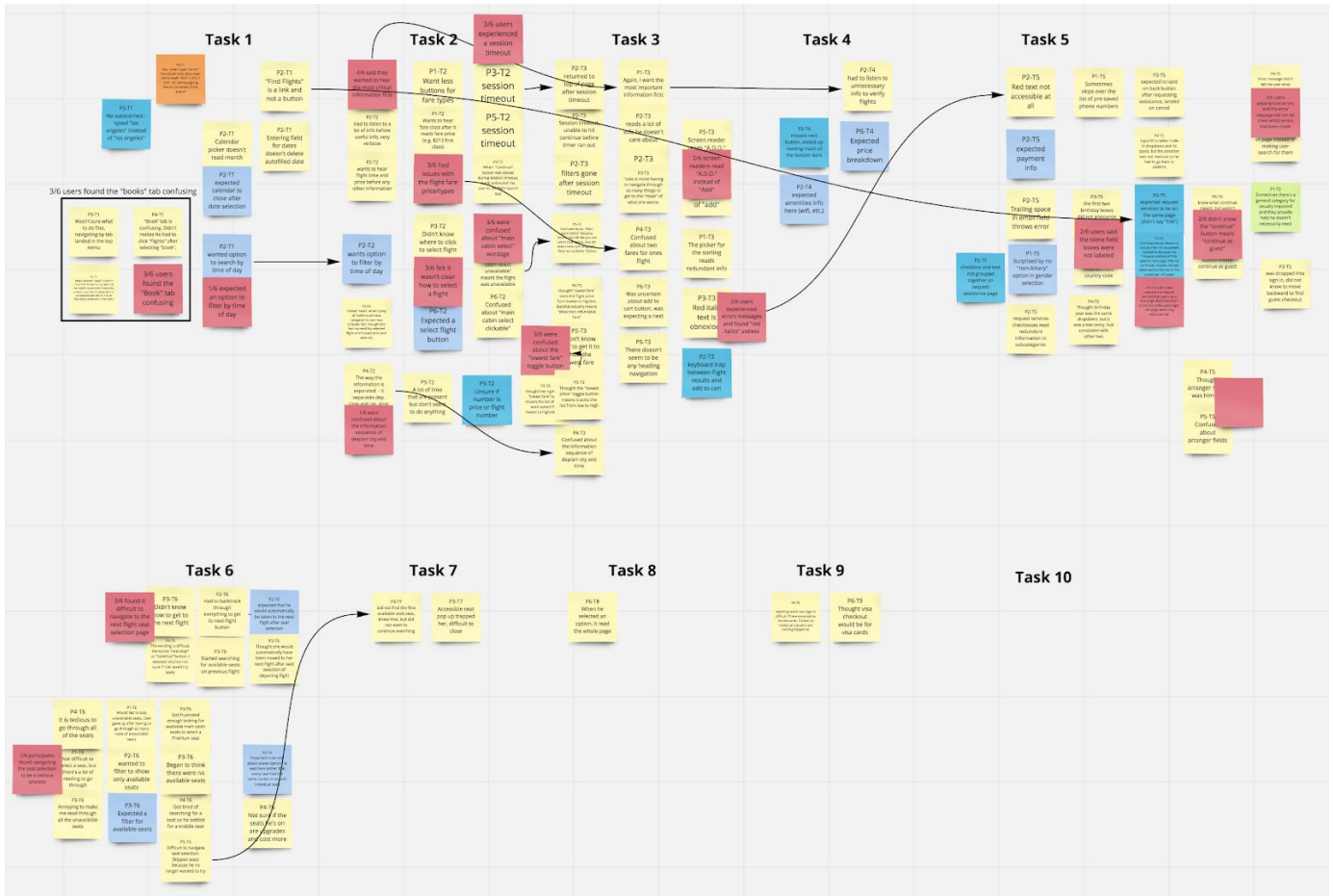
Note: This research has NOT been reviewed according to the University of Washington Human Subjects Division for research involving human subjects but is, instead, being used as an educational exercise for Dr. Munson's Usability Studies course.

Printed name of subject

Signature of subject

Date

APPENDIX E: AFFINITY DIAGRAM



KEY

- Screen reader issue?
- Experienced by 1 users, but should be included in General Findings table
- Experienced by 2+ users
- Original user data
- Future Research

APPENDIX F: SECONDARY RESEARCH

As we prepared our study and decided to use a think aloud method with our participants, we understood this method is more complicated and often discouraged when using screen readers. We conducted academic research to further explore this topic to validate our planned method. We found an article that helped inform our choices to use a modified concurrent think aloud protocol in our study. We also used an additional resource published by the same researchers, *Usability evaluation with screen reader users: a video presentation of the PCTA's experimental setting and rules*, to explore the implementation of the modified think aloud protocol.

Borsci, Simone & Federici, Stefano. (2009). The Partial Concurrent Thinking Aloud: A New Usability Evaluation Technique for Blind Users. 421-425. 10.3233/978-1-60750-042-1-421.

https://www.researchgate.net/publication/228079064_The_Partial_Concurrent_Thinking_Aloud_A_New_Usability_Evaluation_Technique_for_Blind_Users

Federici, S., Borsci, S. & Mele, M.L. Cogn Process (2010) 11: 285.

<https://doi.org/10.1007/s10339-010-0365-9>

Although this research was very helpful to us, it is clear that more published research would be valuable in this subject, and we hope to explore this further.

APPENDIX H: LINK TO COMPLETE TEST KIT

<https://drive.google.com/open?id=1v8zEfHIWqoSeGE95a40Dg-WyU8erYzle>