

Sherpa

“Your guide to exploring the world”

Team Roles

We don't specifically have defined roles in our team since we work in a collaborative way. We meet once a week to generate main content/ideas and delegate tasks. No one person has a set defined task. We often have team members that tend to do certain tasks, but it's also fair game for them to do other team member tasks as well. The “tend to do” tasks are listed below:

Ahmed Awwad generating initial content, compiling information for final documents

Timothy Kwan generating sketches, submits assignments

Amanda Loh creating a Google doc for each assignment and copy/pasting rubric, editing documents

Carina Salcedo editing documents looking for rubric requirements and grammatical errors/syntax

Problem and Solution Overview

In the United States alone, there are 3.5 million people who never leave their homes, 3.3 million of which are wheelchair users [1]. Most of these people have mobility in their upper body with various types of paralysis/limitations from the waist down. These types of wheelchair users we aim to target. After user research we uncovered how discouraged these types of people are from traveling to new places. Airlines often damage their \$2,000+ wheelchairs, they have to wait around for days for wheelchair replacements, and loading a wheelchair onto and off a plane can be time consuming. Wheelchair users are pushed into an “I can't” mentality due to the limited and inconsistent accessibility infrastructure around the world. A lot of people we talked to in wheelchairs never allowed themselves to consider the notion of traveling as a possibility. Our solution builds on the trying to change the mindset of users one step at a time. We aim to get them comfortable exploring a little outside their comfort zone: by doing self guided tours in a local area led by a wheelchair user that's explored the area before. Also, our user research strongly indicated a desire to want to connect to wheelchair users of a similar disability. We also aim to give users the option to explore tours with other wheelchair users, because we believe defeating an “I can't” mindset can be best be done collaboratively with others.

Design Research Goals, Stakeholders, and Participants

The focus for our project is just the Seattle area, for now, so we interviewed several people from the local area. We interviewed people that have experience with wheelchair users, are wheelchair users, or have information regarding accessibility standards having travelled abroad. A detailed list of participants are listed below:

Our first participant, Natalie* works for the Disability Resources for Students (DRS) at the University of Washington as a specialist in mental health and psychology. She is a voracious traveller and has spent time travelling in Europe, Asia, and the Middle East. Though not a wheelchair user herself, she has many observations and opinions about the way wheelchair users are treated in the US and abroad. We interviewed Natalie in the Disability Resources for

Students at the University of Washington in the basement of Mary Gates.

Our second participant is Molly*. Molly is a wheelchair user from birth. Molly also works in the DRS as a consultant. She spent her undergraduate years at the UW and is currently working on her master's degree in social work. She does not have much experience travelling abroad, having only been to Canada. Molly provided valuable first person information being a wheelchair user herself. She was very awkward to interact with mainly because we asked her a lot about travel, which she hadn't done before. She had a very grim outlook on it, which was interesting to observe, and she emphasized she feels that way because there are so many issues to overcome in the travel sector before she would even considering traveling: especially on a plane. We interviewed Molly also in the DRS at the University of Washington in the basement of Mary Gates.

Our third participant was Terry*. Terry is the director and co-founder of Seattle Adaptive Sports (SAS). The mission of SAS is dedicated to supporting individuals with physical disabilities, by giving them the opportunity to participate in athletic and recreational activities. Terry has a son with cerebral palsy who is wheelchair bound, which inspires her to do work for other wheelchair users through SAS. She has traveled extensively across the country by plane with several children with wheelchairs so they can play sports competitively all over the U.S and Canada. She gave us valuable information about why it's so hard for wheelchair users to travel via planes and what the mentality is like for a wheelchair user who believes they can't travel. We interviewed Terry over the phone.

Design Research Results and Themes

Theme #1 Perception of Ability

To quote Terry, "when you grow up with a disability you are brought into a system of 'you can't.'" The general perception of ability in the United States is that there are two distinct groups of people, the abled and the disabled. In the American education system, people of with all types of disabilities are lumped together in special education classes that can make them feel isolated and different from other people. This binary perception of ability can be very harmful to a wheelchair user's perception of themselves, forcing some to believe they are less capable than they actually are. We first noticed this phenomenon in our interview with Molly. She has never flown on an airplane because she believes the process would be too frustrating for her. When asked where she would like to fly if all barriers were removed, she was hesitant to respond, saying that there were just too many challenges to make that hypothetical a reality. Molly was born with her disability and has a hard time imagining her life in any other way. However, others who acquired their disability later in life often try to challenge themselves to do things in their chair that their legs used to do for them.

In order to improve the perception of one's ability, our interviewees suggested connecting people of the same level of ability. Whether face to face, or via mobile chat, this would allow them to connect with people who face similar difficulties and then discuss a solution together.

Theme #2 Awareness

Cultures have many definitions of what it means to be disabled, and each has offered different levels of support based on that perception. Sadly, we live in a world where disabled people are generally not treated equally. While the United States is generally considered a good example for treating people with disabilities, the care and support offered by the US is still not ideal and can fall short from some of the most basic needs of people with mobility issues, such as the availability of elevators among other things. Furthermore, other cultures in Asia and the Middle East, according to Natalie, sometimes view disability as a socially negative trait. Such a stance can easily change the level and nature of care that is offered to disabled people in these cultures.

One misconception of wheelchair users is that a person is only their biological body. People often do not appreciate that, for a wheelchair user, the chair is as much a part of their entity as any other limb. A wheelchair user without his or her chair is very much like an

able-bodied person whose robbed of their legs. Another misconception is the one-size-fits-all solution to a very wide range of disability problems. For example, when buying travel tickets as a disabled person, the questions about the nature of the disability are usually never specific enough, and do not cater for the different levels of ability that people have. Therefore, there is no way of narrowing down the kind of need that the traveller requires, and they are instead met with a system that gives them either too much care, or too little.

For these reasons, and many more, raising awareness by helping people see that disability is not having less of something, but a having different form of it, can help counter the “you can’t” culture that exists in society today.

We’ve found that the issues stem from cultural stigma and systematic categorization of people with disabilities. In order to combat these hindrances, and to assist in providing awareness, we believe that it would be most effective to expose able-bodied people to people with disabilities who lead very normal lives.

Theme #3: Improving Accessibility

Another theme that surfaced was the lack of support that people with disabilities encounter. And along with this is the inability to make timely changes within the infrastructure to better accommodate people with disabilities. For instance, Terry told us that when airlines damage equipment (wheelchairs, motor chairs), there is often a slow turnaround time as the chairs may not be returned for up to a week. This is not simply a matter of losing baggage, but this means that someone loses their ability to transport themselves for the time being. This could even spell future health problems as some chairs are designed for the specific needs that the user has. This slow turn around time is not only apparent in travel, but also in infrastructure. Our source Natalie pointed out that in certain places elevators break and they may not get fixed for up to a week. Again, this could mean that a disabled person is not able to get to their destination during that time. So it seems, that the only way the accessibility community has found to get these problems solved is through lawsuits. “In order to make changes you have to sue” Terry said, as she referred to Anderson Cooper’s short on “drive by lawsuits”. Thus, suing in order to force change is not only common, but seemingly the only way to incite timely change. We can then see that the support systems for people with disabilities are in a poor state, and there is yet a system that would cater to their needs.

This issue is very broad as worldwide infrastructure is not catered to people with disabilities. There needs to be a way of efficiently reporting all accessibility issues (broken elevators, crumbling sidewalks, etc.) to the people who can fix them and a guarantee that it will be fixed quickly. This is a major task that we do not have a solution for. However, there are some smaller instances where improvements could easily be made. For example, airlines could make their ticket buying process friendlier to people with limited mobility by simply asking outright what kind of support the passenger will need.

Answers to Task Analysis Questions

Who is going to use the design?

Wheelchair users disabled from the waist down, that have had a physical mobility issue since birth or through accident/illness, that own smartphones.

What task do they perform now?

When traveling, disabled travellers usually have to do research about their intended location to travel by reading disability travel blogs and connecting with disability travel agencies. Wheelchair users often use accessibility maps in a new city to figure out how to get to new destinations. Otherwise, wheelchair users tend to use automobile travel mainly, due to the difficulty they face throughout the airplane travel process.

What tasks are desired?

Wheelchair users have expressed the desire to connect with other people who may have a similar disability or, someone who is familiar with accessibility in different places. Also reducing limitations regarding travel is of large interest to the disability community. They want to be able to travel in a stress free independent way.

How are tasks learned?

Wheelchair users often find accessibility maps to get around through the internet. Also booking and making special accommodations for trips are most often made through the internet. Getting travel information also involves a lot of skill from wheelchair users in being persistent in gathering travel data from different sources and being able to consolidate it themselves.

Where are the tasks performed?

The tasks are often performed at home or at a comfort zone place of a use such as school or work.

What is the relationship between person and data?

Users often search for travel resources on their own computers and smartphones. Often, many users are looking at one travel blog or travel site to get data on what accessibility requirements they need. Most data is not restricted, but not very customizable and general to the wheelchair user population. Users may try to ask more detailed customized questions in the comments of a blog or travel site, but often receive no replies.

What other tools does the person have?

The tools are travel agencies specializing in disabilities, personal blogs such as Curb Free with Cory Lee, books, magazines, social media, accessibility maps, and encouragement/support from current friends and family that can help our target group tackle the challenge of travelling.

How do people communicate with each other?

People post stories of their own personal experience travelling in a wheelchair and other wheelchair users read their stories via internet. Also, some forums do exist to chat about travel experience in a wheelchair as well, where the communication is more two-way, but these are less prevalent. Also, social media is a good way for wheelchair users to find active wheelchair user groups. For example, Seattle Adaptive Sports has a Facebook page that gives great communication portal to other wheelchair users.

How often are the tasks performed?

Users often look up accessibility/trip information whenever they are deciding whether to explore a new area either in their local area or farther away. This could be very rarely for wheelchair users who are more wary of traveling (we found often those who were born with disability who have an "I can't" mentality) or frequently for wheelchair users who like travelling (we found those who became disabled through accident/illness and used to be very active before becoming a wheelchair user to have more of an "I can" mentality).

What are the time constraints on the tasks?

When a user is lost in an unknown area, it's important that they know immediately how to get the information they need to find out where they are. Wheelchair users may be afraid to explore new areas for fear of getting lost and not knowing where accessible routes are. If users can figure out where they are in real time and always know every step of the way where they are, they'll feel more comfortable travelling. Tasks like connecting to other wheelchair users can be more gradual and less time constrained.

What happens when things go wrong?

When airlines damage a wheelchair user's chair it often takes a long time for these chairs to get repaired. This leaves wheelchair users without their "legs" and ultimately their freedom for some time. There is currently no backup strategy and they must wait until their wheelchairs are returned to them.

Proposed Design Sketches - “3x4”

Due to change in our design, we ended up changing all our six tasks. Therefore, our initial designs were based on older tasks we had created. The 6 new tasks will be listed below our initial 3 designs. Improvements on the interactive map design, which we modified for our final design will be discussed in later sections.

For the following design proposals, we have used six different personas who represent various types of people within the target group:

Hermione is a freshman at UW. Since birth, she has struggled with cerebral palsy that allows her with no mobility in her legs. As a result, she has relied on wheelchair her whole life. She was unable to join her able bodied friends on a study abroad trip to Italy in her senior year of high school. Hermione wants a way to that helps minimize her disability so she can feel just like any other able bodied girl hanging with friends.

Luna is a graduate student at UW. She has been in a wheelchair all her life due to an illness she contracted when she was four months old. She has never traveled far, not even out of her home state. She would really love it if there was a tool to help inspire her tour areas around her she hasn't seen before that are wheelchair compatible.

Bill is a wheelchair user in Seattle who suffers from poliomyelitis. He took French in high school and has since dreamed of traveling to Paris. However, he appreciates the immense difficulty of travelling in his condition. He wants advice from someone with the condition so that he can learn how best to overcome his specific obstacles. Bill wishes there was a platform to help him connect with someone like himself that could talk with him about his trip.

Percy has always loved the idea of adventuring to far off places. He started noticing the lack of TV travelers with impaired mobility after he suffered from paralysis from the waist down in a car crash when he was 25. Consequently, he gave up his dreams, thinking it wasn't possible to go anywhere with his disability. Percy would appreciate the chance to hear about people like him who still manage to travel to exotic locations; to be motivate him and help him realize that travel is still possible with his disability.

Ginny is a wheelchair user who is a successful business woman. She just acquired some time off to travel to her dream vacation spot: Madrid. Even though Ginny really wants to travel to Madrid, she's scared. She doesn't know anyone who would want to travel with her and would understand her needs as a wheelchair user. She would feel better traveling if she could connect with people who understand her limitations and want to go to Madrid with her.

Albus is a man who loves live music and its history. Unfortunately, he missed an exhibit on the history of American music because it was displayed at a museum that he didn't know about that's accessible to wheelchair users. Albus wants a way to be notified about accessible events based on his interests so that he won't miss another music event.

Design #1: Online Interactive Map

The purpose of this design is to connect a wheelchair user with a local tour guide from another country, who has the same disability. This design features a display of an interactive map of all countries and major cities of the world. A user can click on a country to reveal a list of wheelchair-bound individuals who have traveled to that location. With a direct messaging component embedded in the platform, wheelchair users can customize a travel itinerary that caters to their needs. With a local tour guide who knows the lay of the land, the wheelchair user can benefit from learning how to get around a new area as someone with limited mobility. The tour guides targeted could either be able-bodied individuals who have experience in accessible areas or could be wheelchair users themselves. The service is targeted as an mobile app or web interface.

Task Two: Motivating wheelchair users to travel: In Luna's case, having an app that allows her to find a personal travel tour guide, Tom, will ease her worries about travel. Knowing the

travel guide has seen the area before makes her more confident, since he will help her get around the way she wants to.

Task Three: Connecting to others with a similar disability: Bill can get his questions answered more effectively about his condition by filtering the platform to find tour guides that have experience with poliomyelitis

Task Four: Learning about wheelchair users who have inspirational travel stories: Percy really wants to travel but feels depressed about his accident. Talking to a tour guide, Jerry, who also lost mobility in his legs in an accident, will help Percy learn how to travel with his recently acquired paralysis. It will inspire him to meet up with Percy in his country to learn more about how he copes with his paralysis day by day.

Task Six: Learning about travel opportunities and local events related to your interests: If Albus signs up and subscribes to the app, he can find several wheelchair users in his area that can help him keep updated with music events near him. He can filter for tour guides that also love music at accessible spots and have them ping him when they know of events going on. He might even match with a tour guide in Germany who encourages him to go out to a music festival in Frankfurt, even though he's never considered traveling that far before with his condition.

Online Interactive Map Storyboard



Design #2: Virtual World Experience

Imagine a virtual reality experience in which a wheelchair user could explore a foreign city along with a local/traveler who may have a similar disability. We want to deliver a rich virtual cultural experience that targets wheelchair users who may not even consider traveling, due to their disabilities. Using VR, we would create an interactive experience in which users from different locations can connect to each other and explore together. For example, a user in Agra, India could connect to a user in Seattle, and they would have the opportunity to explore each others worlds. This would allow for a unique communication portal and experience that encourages wheelchair users to step out of the zones and explore the world further.

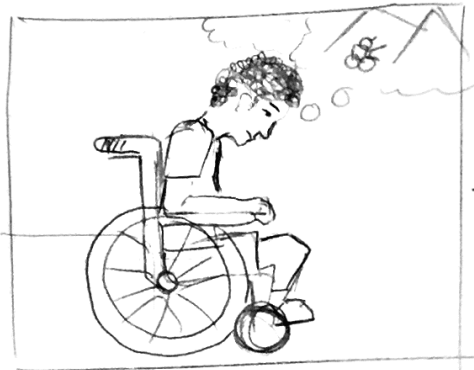
Task One: Learning about places and people from different cultures: As a young teenager, Hermione can invite her friends for a fun night out at the VR center. Because everyone is in wheelchairs or offered a chair there, she can have an experience with her friends without feeling limited. They can also understand further what's it like to be her and develop understanding for her condition.

Task Two: Motivating wheelchair users to travel: Luna is really pessimistic about travelling, but the VR experience is the first stepping stone to getting her to realize traveling is really fun and exciting and worth the risk.

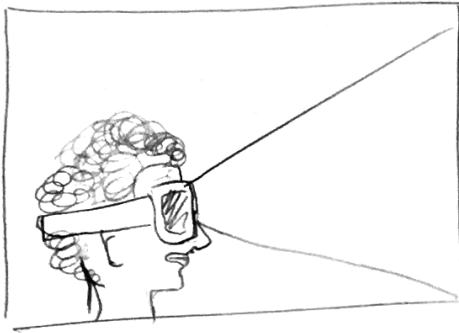
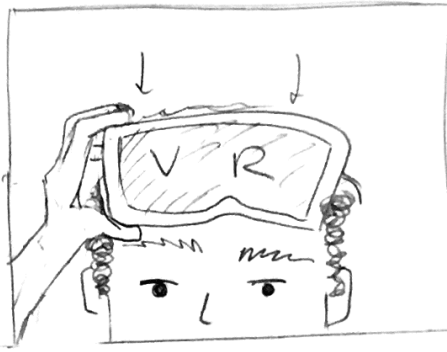
Task Three: Connecting to others with a similar disability: Through the VR experience, wheelchair users can connect with other individuals with the same VR technology all over the world and explore virtual worlds together.

Task Four: Learning about wheelchair users who have inspirational travel stories: Stories about real wheelchair travelers can be created for the VR experience. The videos used in the VR experience can be taken from footage that wheelchair users filmed in foreign lands. The videos these wheelchair users shoot can inspire and help other wheelchair users learn travel is possible with a disability.

Virtual World Experience Storyboard



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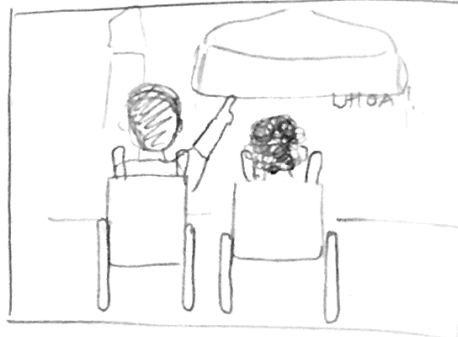
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5.



Design #3: Augmented Reality Bulletin Board

This design uses augmented reality and special real world “bulletin boards” to help connect and inform travelers. The bulletin board provides a communal space for users to post about upcoming events and the trips they have taken. Each post will include a link to message the writer so other users can contact them with further questions. The bulletin board also provides a physical space where users are more likely to meet each other in person. This board could be located in a central local area so wheelchair users are encouraged to meet each other in person and encourage users to get out of the house to check events/trips.

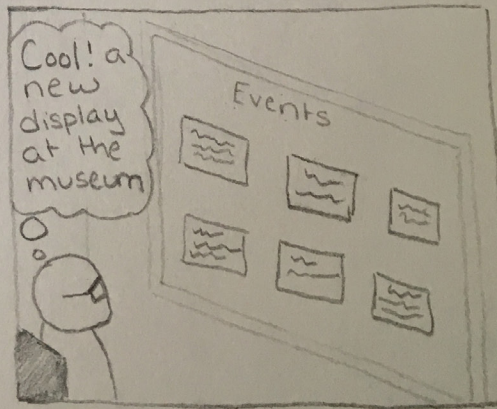
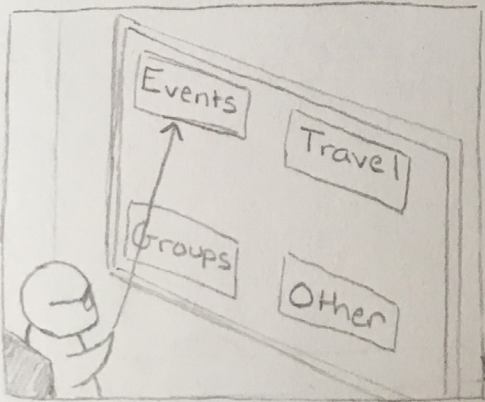
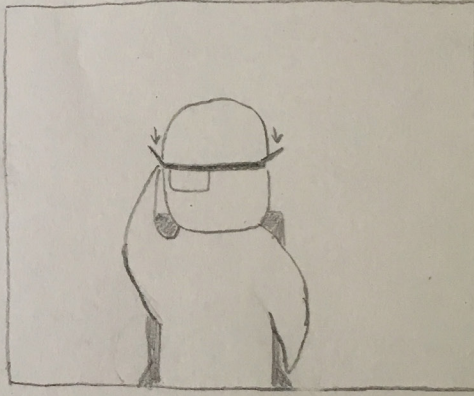
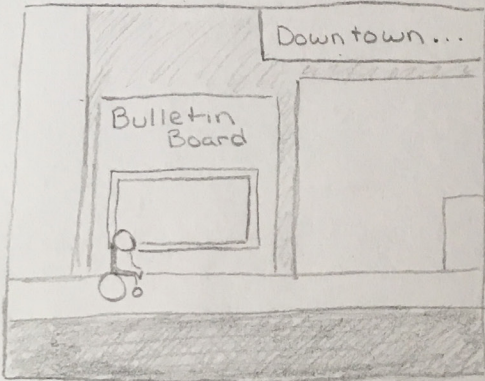
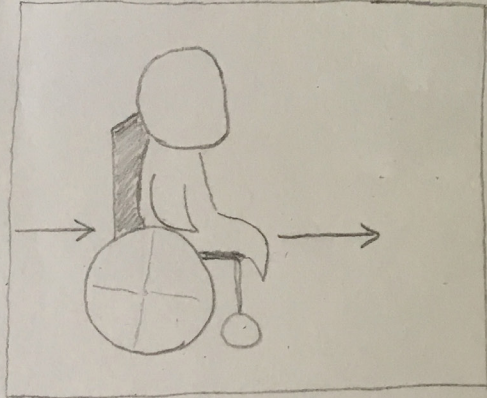
Task Three: Connecting to others with a similar disability: Users like Bill will have the ability to filter posts based on the similarity of the writer’s profile to their own so that only the most relevant information is visible. When Bill finds a post from someone with a similar condition, he can send a message to ask questions about their post.

Task Four: Learning about wheelchair users who have inspirational travel stories: The bulletin board provides a space for users to post their best travel stories to help inspire people like Percy who need encouragement to travel.

Task Five: Connecting to wheelchair users who also want to travel: Users like Ginny who want to create a travel group can write a post detailing when and where they want to go. Other users who see the post would then be able to message the first user to join their group.

Task Six: Learning about travel opportunities and local events related to your interests: Each user’s profile will have information about their interests, that way the board can filter event posts and show each user only the most relevant information.

Augmented Reality Bulletin Board



Updated Tasks

Our updated tasks are as follows:

1. Inform wheelchair users about wheelchair users who have inspirational travel stories
2. Connect wheelchair users with similar disabilities and interests
3. Connect wheelchair users to a local tour guide who is a wheelchair user or understands accessibility in the area well
4. Motivate wheelchair users to explore their local area
5. Inform wheelchair users about travel opportunities and local events related to their interests
6. Encourage wheelchair users to create local tours for other wheelchair users

Written Scenarios - “1x2”

Connecting wheelchair users with similar disabilities and interests.

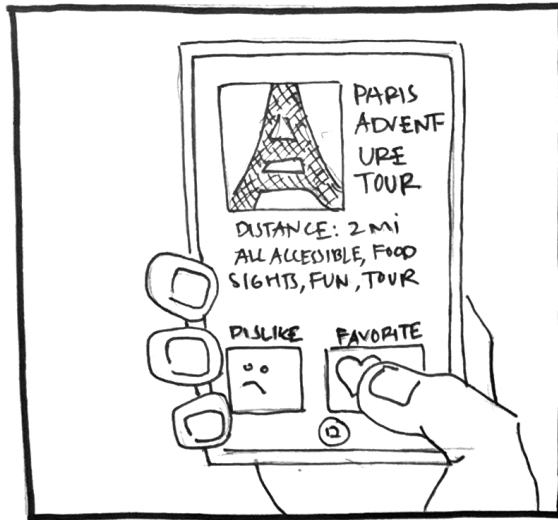
George is a wheelchair user who lives just outside of Paris and he wants to go to the Eiffel Tower. He also don't know how accessible Paris is inside the city so he is hesitant to go to the Eiffel tower by himself. He found an interesting looking tour on the Sherpa app, that is accessible. George favorites the tour. (Scene 1) and then he is then given the option whether he would want to go on the tour with a group of people (Scene 2), or by himself. He decides he would like to go with a group as it would be more fun and also going in a group would help him feel less anxiety about going to a new place. After determining that he would like to go with a group in the app, he is matched with other users like him who also would like to go on the Eiffel Tower tour. (Scene 3 & 4) After chatting for a bit with the others they decide on a date, and they meet up and go to the Eiffel Tower! (Scene 5 & 6)

Motivating wheelchair users to explore their local area.

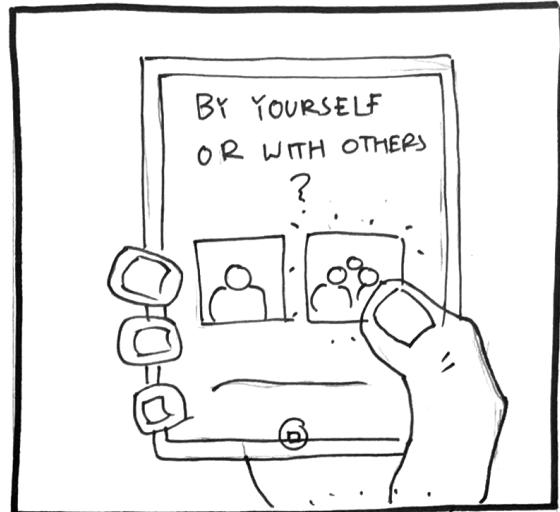
Janis is not very motivated to explore anything new in Seattle. Because of her disability she lives mainly a life commuting from school back to her home (Scene 1). After seeing ads for the Sherpa app however, Janis sees that there are a couple of accessible tours that she can do in Seattle (Scene 2). Curious, she peruses a Seattle accessible food tour and notices that there is a tour that has many restaurants that she hasn't been too and that look really tasty (Scene 3). Janis then goes on the tour and discovers that the entire tour is very wheelchair friendly and she can travel throughout Seattle by herself with ease (Scene 4 & 5).

Storyboards of the Selected Design

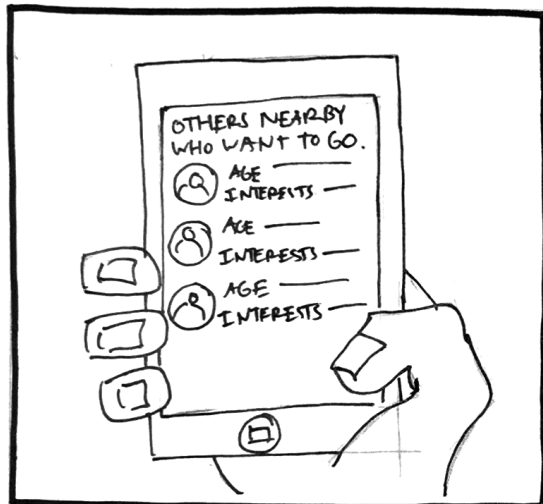
Connecting nearby wheelchair users with similar disabilities and interests



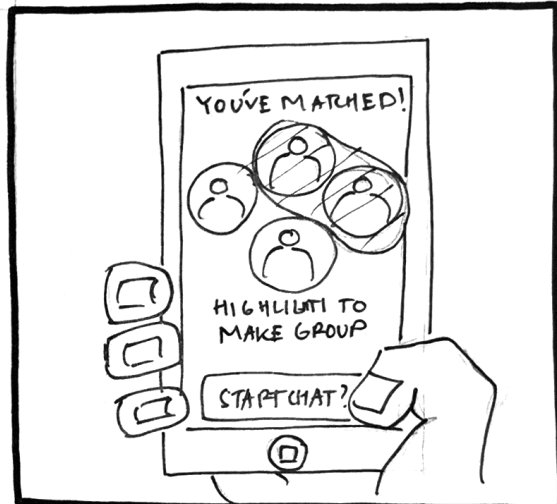
FAVORITE TOUR



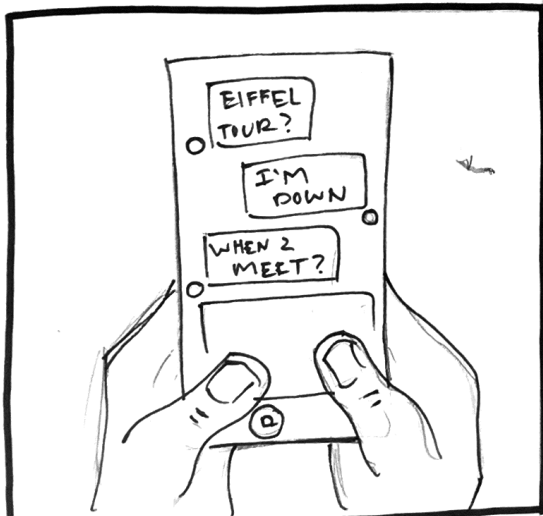
INDIVIDUAL OR GROUP :



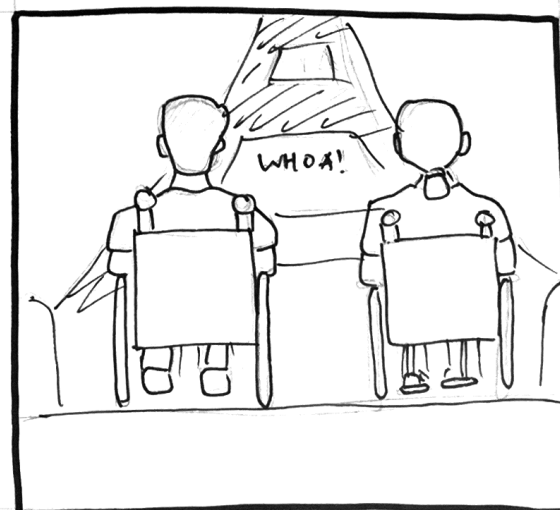
POSSIBLE PEOPLE TO MEET



MATCH WITH PEOPLE SIMILAR

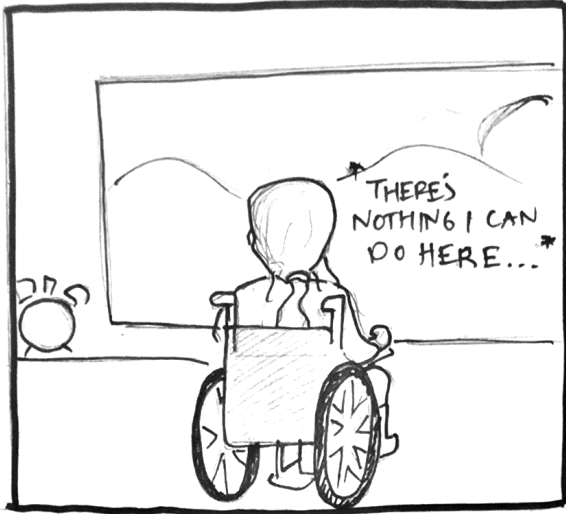


COORDINATE SCHEDULES



GO EXPLORE TOGETHER

Motivating wheelchair users to explore their local area



FIND TOURS NEAR YOU



VIEW TOUR



GO ON TOUR!



References

- [1] R. Reznik, 'Wheelchair Facts, Numbers and Figures [Infographic]', 2015.
[Online]. Available:
<https://kdsmartchair.com/blogs/news/18706123-wheelchair-facts-numbers-and-figures-infographic>. [Accessed: 10- Oct- 2013].