Two case studies from innovation sprints at Google 2015 Assistive Makeathon and 2017 MIT VR Hackathon.

by Marlon Fuentes

Creative Technologists working at the intersection of human centered design, business, and technology.

---

mf@marlonfuentes.info
www.marlonfuentes.info
www.linkedin.com/in/fuentescreativas/

How might we improve mobility for people who are blind?

Organizations involved: Google, Tikkun Olam Makers, Stanford D. School
Need Knowers: Josh Miele, Michael Shaw

Google

d. HASSO PLATTNER Institute of Design at Stanford

Tikkun Olam Makers

Winner
"Best Mobility Award."
Google Assistive Tech Makeathon 2015

1 Empathy / Define

“Its hard getting around with this lousy app! Way too many directions. Can we make it easier?”

Josh Miele, Need Knower for our sprint

Though we had preliminary conversations with Josh about his condition, it was necessary for us to explore what opportunities there were for improving his ability to navigate independently. Over a cup of coffee, we discussed what it means to use an iphone to navigate, and mapped the high, neutral, and low points of how it feels to go out and meet with friends. We also discussed the cultural identity of being a part of the blind community.
As designers we were also reminded to leave assumptions behind after realizing many of our initial, although well-intentioned, assumptions were wrong.

Methods:
- Empathy mapping
- Interviewing
- Market analysis

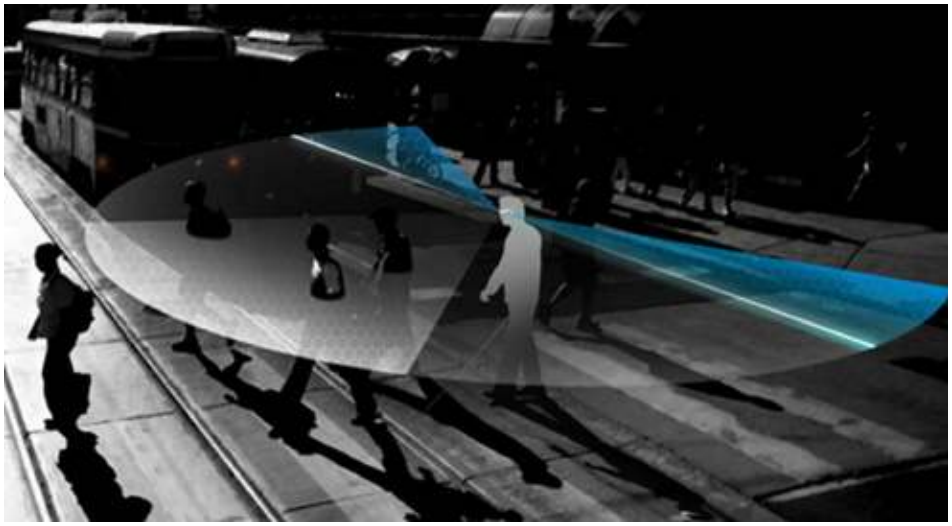
We Learned:
- Current apps up to $200.
- High cognitive load meant that our user had to put up with long, complex directions
- Interviewed our need knower and addressed assumptions, empathy mapping of a typical night out.
- For users of assistive mode, fast dictation is preferrable.
- The blind community has a rich cultural identity
- Long distance trips are OK on existing apps but something for when you arrive to a shopping center is needed.

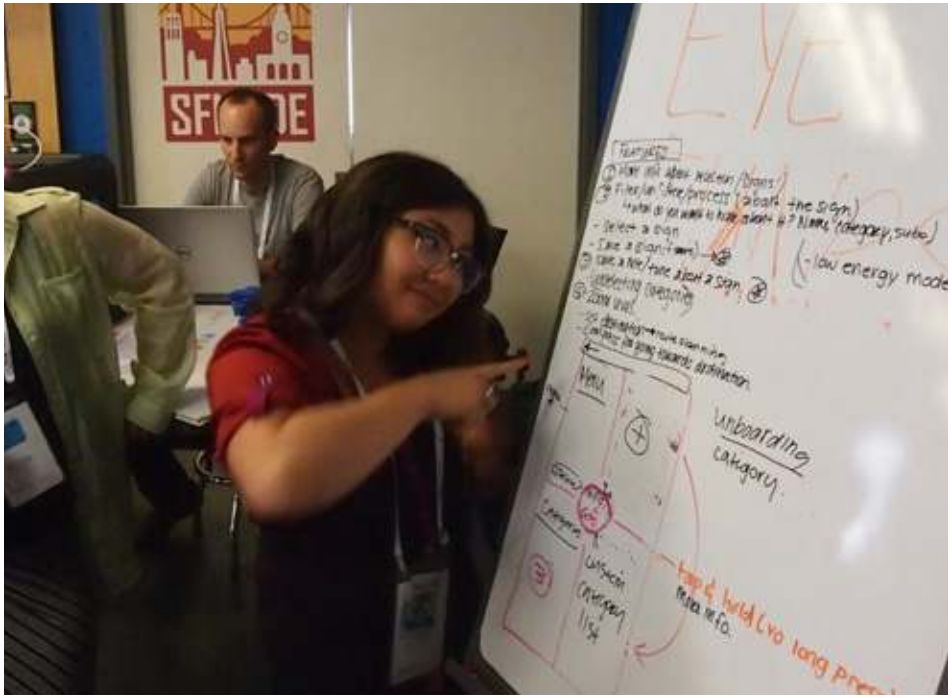
2 Define

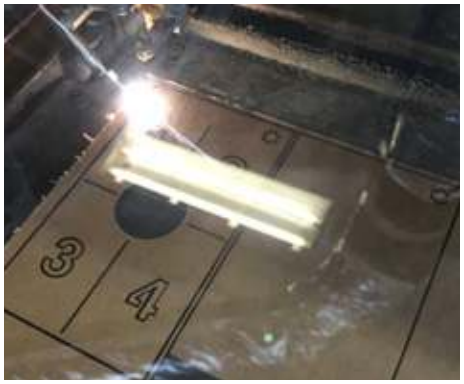
Lowering the cognitive load on assistive navigation for mobile users.

After a series of conversations with Josh, our team arrived at the conclusion that whatever we made, it had to

- Require less thinking to use
- Lower price point
- Be good for close proximity
- Less depth to the menu of choices, streamline the experience.







We delegated tasks between UX/UI and API/App development.
Our programmer connected the Google Maps API and leveraged the internal gyroscope of the iphone to function in the way a radio dial finds the signal. The hypothesis was that when the user turns away from his/her desired point of interest, they hear white noise.

3 **Protype**

Prototyping UI for the vision impaired.

Using the laser cutters available at our maker space, we cut the buttons into a piece of plastic in order to test out the user experience with our user. It was a great moment because we all knew that it would generate a lot of insight for relatively no cost.

1. Using Adobe Photoshop we designed two different UI/UX designs.
2. Used plastic and laser cutter to create a plate that we later placed on top of an iphone sized piece of cardboard.
3. Walk the user through the experience and tell them what the buttons do.

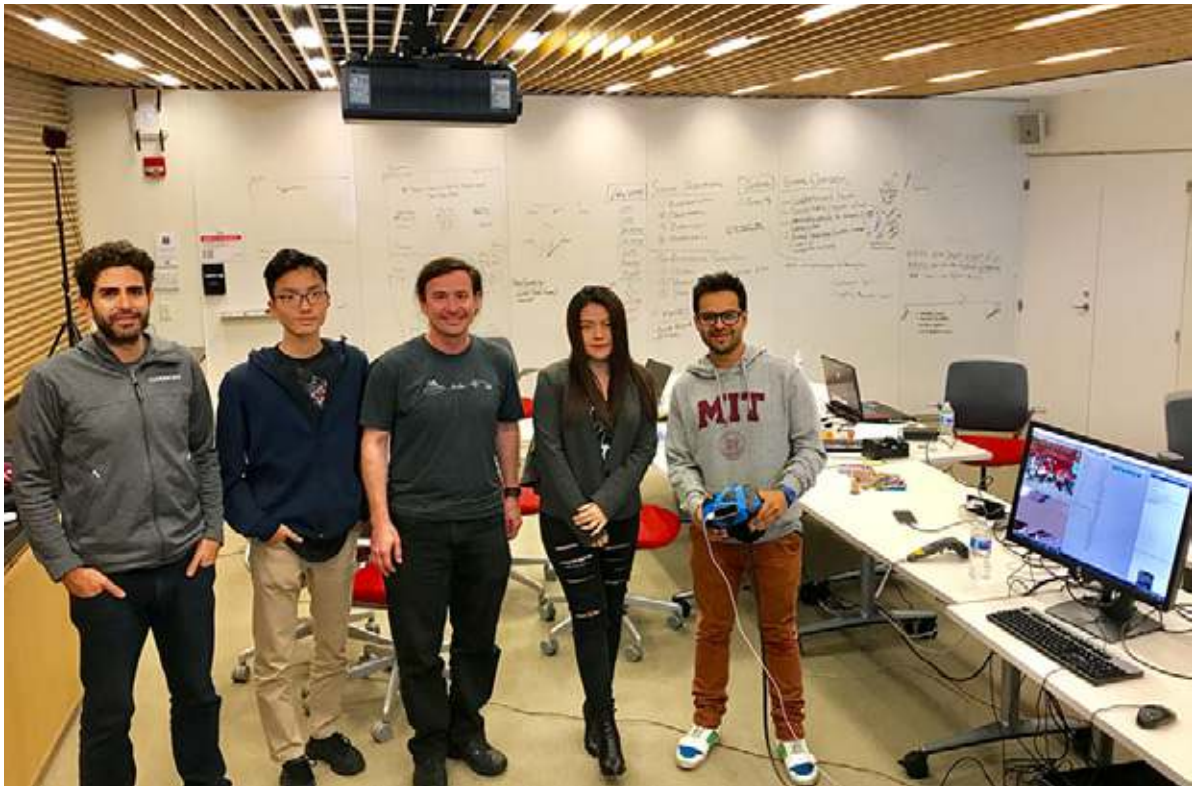
4 Test

“It’s like using a flashlight and a radio dial.”

Josh Miele, Need Knower for our sprint

After deciding that we would only validate hypothesis by building the functionality for the gyroscope and the points of interest, we took our barely functioning app into the streets. Josh tested the prototype and it worked! Although the connection would drop frequently, we did manage to get a few successful attempts. We were pleased to have won the Best Improved Mobility Award. Next steps would be to improve accuracy and reliability.

- Proof of concept achieved
- Winner of “Best Improved Mobility Award.”
- Need more accuracy



“How might we help improve and overcome our fear of public speaking?

Winner
Grand Prize
VIRTUAL REALITY
MIT VR HACKATHON
2017

mit media lab

MIT innovation initiative

1 Empathy / Define

“I get nervous and overwhelmed when asked to speak in public.”

Our team identified public speaking as a topic to explore. We then went around the hackathon floor and asked other participants how they felt about public speaking and what they wish they could improve. We also consulted with a public speaking expert in Los Angeles to better understand what it takes to train professional public speakers.

Methods:

- Interviews
- Secondary research online

We Learned:

- People with foreign accents showed more aversion.
- Some people put their hands in places during speaking that show insecurity or draw attention away from their speaking
- A good rate of speech ranges between 140 -160 words per minute (wpm).
- A rate higher than 160 words per minute can be difficult for the listener to absorb the material.

“What do I do with my hands?”

“I say like, umm, you know...”

“I don’t have a great speaking voice.”

2 Define

Practice makes perfect but mirrors don't cut it.

Through interviews we learned that practicing helps but that simply practicing in front of a mirror does not really help overcome some of the fear and bad habits. We considered how we might use 360° video as a backdrop to the settings people would find themselves in. We also considered what the use cases are for this type of simulation. They included:

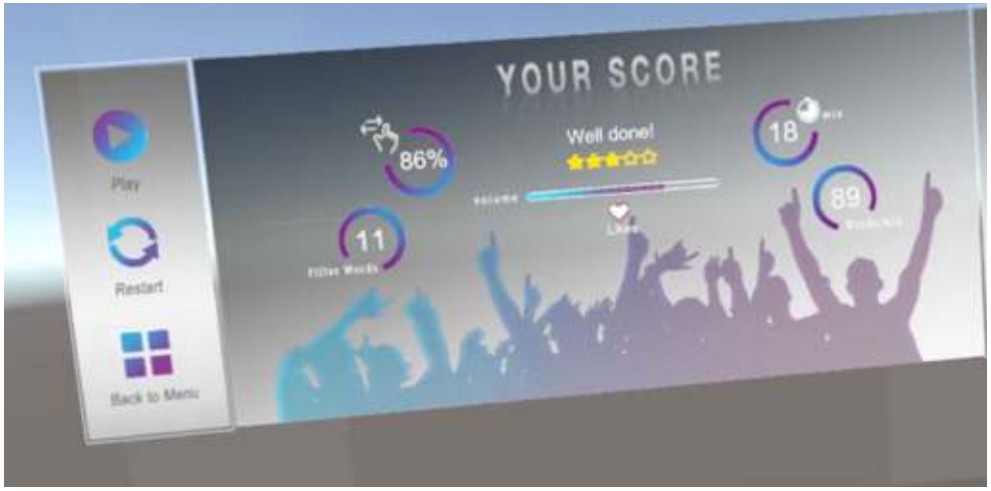
Use cases:

1. Speaking in front of a class
2. Wedding speeches
3. Political speeches
4. Job interviews
5. College admissions interviews

≠

1. Using the microphone on the VR headset and a plugin on the Unity engine, we designed an interface that registers the loudness of your voice, the dynamic range, and the number of words per minute (WPM)

2. Using a Leap Motion infrared sensor that was taped on the HTC Vive headset, we tracked the range of motion and the proximity to the “strike zone.”



Actual interface we designed to produce a score after your speech.

3 Protype

Let’s simulate the right environment with VR

Taking advantage of a captive audience during the workshops at the MIT Media Lab, we recorded 360º videos and asked the audience to cheer, boo, and remain nuetral. We then took these videos and included them in a virtual reality scene using Unity 3D software. Here’s how we addressed proxemics, speech dynamics and volume, filler words, and emotional anxiety.

2

4 Test

“It felt so real! Can we gameify it?”

Kathy, Need Knower for our sprint

We tested a classroom lecture hall experience and a job interview experience. Both experiments were well receievd by our testers. They responded with a high level sense of presence and immersion. Our feedback was to increase the fidelity of the 360º videos and to consider more customized solutions for users that want to simulate their own environment. This could include allowing them to upload their own 360º media. We also heard from users that they would like to turn this experience into a game and emulate other great speakers such as Barack Obama and Steve Jobs.