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PEOPLE WHO STUTTER CAN OVERCOME SOCIAL FEAR

VRBAL

Yuka Fukuoka
DSI, 2018 Thesis

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YUKA FUKUOKA

Yuka Fukuoka is from Japan, and studied Information and Service Design at Tama Art University, Japan. After graduating she worked at Yahoo! Japan as a designer and then attended the University of Tokyo's Interfaculty Initiative in Information Studies as a research student. She is interested in changing the general publics perspective on people with disabilities.

INTRO TO PROBLEM

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PROBLEM CONTEXT

Stuttering is a communication disorder in which the flow of speech is broken by repetitions (li-li-like this), prolongations (lllllike this), or abnormal stoppages (no sound) of sounds. There may also be unusual facial and bodily movements associated with the effort to speak. So what problems does stuttering actually cause, outside of making it hard to talk? First, you are not able to talk like the people around you. Your parents and teachers notice and friends tease you, so your repeated experiences instill you with a sense of failure. You blame yourself for being unable to do what everyone else can do. You conclude that you're inferior, and your self-confidence falls. Finally, you lose confidence in communication, stop approaching people, and miss out on opportunities in life. Through this process, people who stutter easily become people with social anxiety disorder. I definied that this is the core problem.

PASSION

When I was nine, I started stuttering, and I grew into a 24-year-old woman without ever being cured. Even now, I still battle with this issue each day whenever I try to speak to other people. At these times, this stuttering symptom is a prominent concern, and so I feel it has great influence on my life. I wanted to change people's perceptions around communication disorder. I had traumatic social experiences during my childhood due to my stuttering disability. My hypothesis is that if I could start with a handful of people who change their views towards their own disabilities, they could have rippling impacts on others and eventually create a universal norm to protect and empower the disadvantaged.

SUMMARY

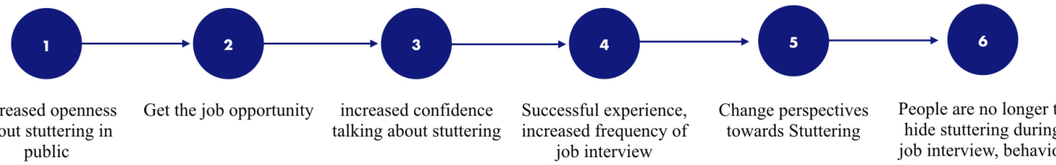
SUMMARY

THE CHALLENGE

1% of the total population suffer from stuttering. Stuttering is speech disorder in which the ability to utter speech sounds is disrupted, preventing fluent vocalizing. People who suffer from these symptoms experience difficulty in communicating smoothly with others and feel it is difficult to live a normal life. So what problems does stuttering actually cause? People who stutter can't talk like the people around them. So they blame themselves for being unable to do what everyone else can do. They may conclude that they are inferior, and their self-confidence falls. Through this process, people who stutter easily become people with social anxiety.

PERSONAL GOAL

The problem I wish to focus on in my thesis project involves employment and the job hunting problems of people who stutter. I asked adults who stutter which phase most felt the barriers of stuttering to identify the pain point in their lives. As a result, there was no problem even if there was much psychological and mental stress as students because friends and teachers cared about them. However, I realized that when they graduate from college and are looking for a job, they will face big obstacles because of judgments by prospective employers. Then, many stutterers decide to go for private therapy because they feel they really need help at that time.



INITIAL RESEARCH

DOCUMENTARY FILM

In order to understand the issue of stuttering, I first decided focus my research on Japanese people. My first step was to make a documentary featuring someone who stutters. Her name is Koyanagi, and she is a woman with a desire to use her own difficulties to help society while facing her complex of stuttering. By making a documentary featuring her, I became aware of one problem. Is the core problem of stuttering a low level of awareness? Outsiders assume that it is a lack of effort rather than a disability, and chide children for stuttering. In addition, as stutterers themselves aren't aware that it is a disability, they continue to hide it and blame themselves for their mistakes. I formed the hypothesis that because of this, they may steadily lose their self-esteem and self-confidence, and stop trying to communicate actively with people.

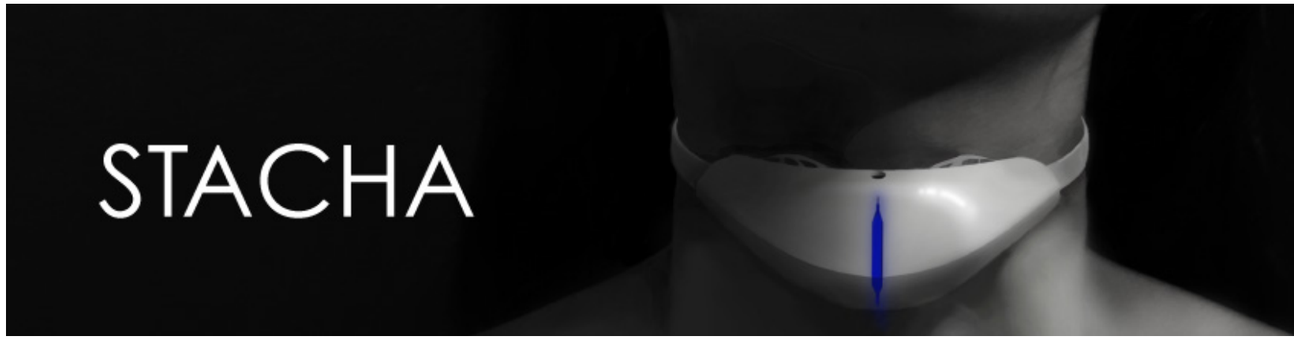
This documentary covers a stutterer who is troubled all by herself. Her life gradually became more lively after she found someone with whom she can share her troubles with. The protagonist, Nozomi Koyanagi, had been troubled by her stuttering since she was young. She became anorexic because she felt isolated by her troubles that she could not share with anybody, not even with her own mother. Even when she worked as a counselor, she experienced difficulties from her stuttering that people could not comprehend. She did not try to face this obstacle properly, and continued to carry her troubles by herself. Then, she attended the self-support stutterer group "Hirose Counseling Class." She was able to gradually accept herself as someone with stuttering by sharing her troubles with other stutterers who carry the same troubles.

Through the documentary described above, I postulated that the essence of the problem was the extremely low level of awareness of stuttering. Because of this, in order to improve awareness of the invisible disability of stuttering, I developed a wearable device.

https://vimeo.com/247587864

INITIAL RESEARCH

WEARABLE DEVICE STACHA



As a result of developing and exhibiting the device at SXSW, I haved gained extremely helpful insights about the American context. This was that in the United States, awareness of stuttering is by no means low. However, on examination, I found that there were people suffering from stuttering in the United States too. For that reason, I next carried out an investigation to grasp the essence of the problem in accordance with the context of American culture.

An extremely informative discovery I made was that in the United States, stutterers have attended therapy with a Speech Language Pathologist from the time they were young. Due to the fact that therapy services were extremely progressive within schools, awareness of speech disabilities was extremely high among teachers, parents, and society as a whole. Awareness of stuttering was also extremely high. So then, what is the essence of the problem? It's finding employment. Children who stutter, who have received strong support in schools, face extreme pressure after they graduate from university. They are unable to adapt well to the change of environment which places them in the position of being judged by society.

Then I decided proceeding the research to identify the difference between Japan and US.

THE PROBLEM OF STUTTERING IN THE UNITED STATES

An extremely informative discovery I made was that in the United States, stutterers have attended therapy with a Speech Language Pathologist from the time they were young. Due to the fact that therapy services were extremely progressive within schools, awareness of speech disabilities was extremely high among teachers, parents, and society as a whole. Awareness of stuttering was also extremely high. So then, what is the essence of the problem? It's finding employment. Children who stutter, who have received strong support in schools, face extreme pressure after they graduate from university. They are unable to adapt well to the change of environment which places them in the position of being judged by society.

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FIRST RESEARCH

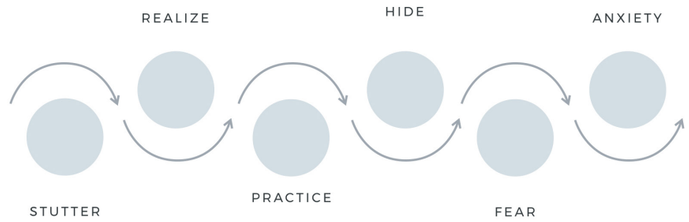
FIRST RESEARCH

ASSUMPTION

In terms of stuttering, I used to think that the main problem was the symptoms themselves. Now I believe the real problem lies in trying to hide the stuttering symptoms after they appear. I found that avoiding conversations in order to hide the symptoms creates intense pressure in daily life and feelings of solitude. Therefore, my initial target audience is Covert Stutterers.

“I first noticed the stuttering after my friends made fun of me. For a long time I considered stuttering to be embarrassing and a sickness that must be cured. I couldn’t get a job so I wanted to do something about it, so when I was 21 years old I went to stutter therapy for the first time. There, I learned about the National Stuttering Association. After that, I was able to become open about stuttering than before but even now I can only talk about my own stuttering with close friends. Someday, I’d like to be open about it at work too. When I hide my stuttering it’s a constant anxiety and it’s painful to be isolated.”

I met with the leader of a self-help group in NSA in San Jose, California. At first glance you wouldn’t know he suffered from stuttering His symptoms had first appeared when he was 8 years old, and he has been worried about it ever since. Many covert stutterers, he had found a community by taking part in NSA conferences. There, he has found a place to belong and feel freer to open up and discuss his own disability. However, just as there are people who continue to hide their stuttering until adulthood like Steven, there are many other stutterers who are unable to take part in therapy or self help groups.



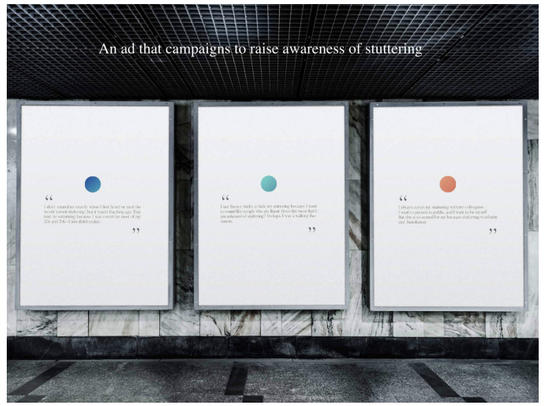
INSIGHTS

Covert stutterers do not recognize other stutterers because they hide their stuttering. Many stutterers do not get therapy, and past interviews show that they do not even join self-help groups. Stuttering non-profit organizations (NPO) have been trying to find ways to approach these people. Like the NSA, other NPO’s are struggling with how to reach covert stutters. I held interviews many times with covert stutters and mapped a stakeholder based on their answers. The first people that covert stutters are able to open up to are stutterers like themselves, then therapists, and then, finally are their friends and partners close to them. Speech therapy and self-help groups play a very important role to make covert stutterers open up about their stuttering. My initial problem statement were:

How might we invite them to the stutterer community?
How might we have them open up about their stuttering?

FIRST RESEARCH

FIRST IDEA



By representing the stutterers' feelings as colors, I expressed the complex feelings of covert stutters.

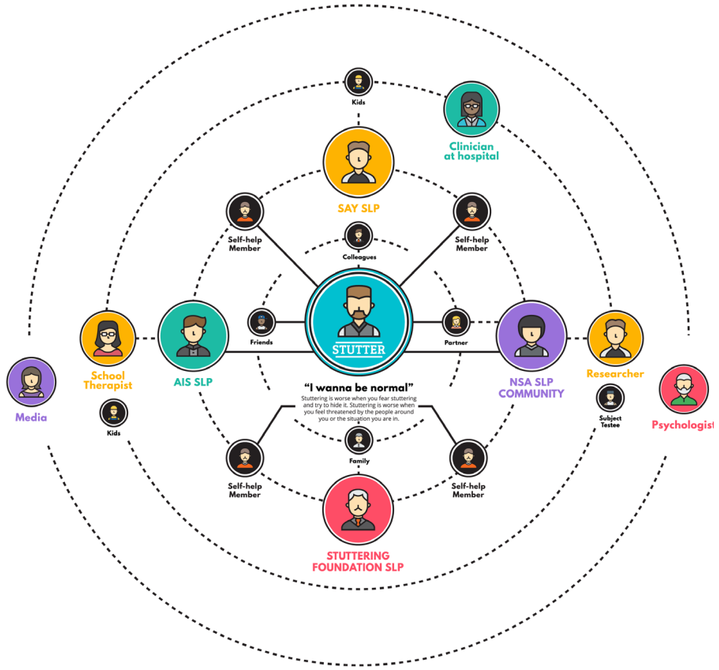
An advertisement and communication platform that allows covert stutterers to use colors to visualize and analyze the complex feelings in their communication. With the materials I produced, I want to make more visible the stress light stutterers experience in hiding their stuttering from the public.

This idea is a game for the general people to know the stress of covert stutters, and advertisements telling stutterers stories about other stutterers. I felt that bringing in draft ideas that become opportunities like this was extremely important in approaching NPOs as well.

SECOND RESEARCH

SECOND RESEARCH

USER RESEARCH



The first thing I did was organizing the related stakeholders. A large number of stakeholders were already involved in relation to the topic of stuttering issues. Therefore, I identified all the stakeholders in order to find the root of the problem. I interviewed people with Covert Stuttering and Severe Stuttering. The purpose is to find out the nature of their issues.

USER INTERVIEW WITH COVERT STUTTER

I first interviewed Bhareth Josh Ghani. The following is the main insight obtained from him.

When he was a child, his father made him practice reading text with fluency, so he had a strong complex about his stuttering. He says that hospitals were the same. The therapy that he received for his stuttering there traumatized him. In his home country of Australia, stuttering wasn't well understood, so many people were forced to undergo therapy. Later, he learned how to express himself with music, which he loves. He currently works part time using his musical talents to teach children how to sing. His message for the children is that it is important to accept yourself and not blame yourself for stuttering.

SECOND RESEARCH

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USER INTERVIEW WITH COVERT STUTTER

Next, I interviewed Daniel Mallon with Severe Stuttering. The following is the main insight. Daniel is a young man who has just graduated from university and is struggling to find a job. He is currently going to private therapy and trying to come to terms with his stuttering. He says that his friends at university respected him, because they understood his condition. However, after graduation, when he had to start looking for a job, he ran into problems. He failed many interviews and lost his confidence. He says that he can't get used to being judged by people, so during the interviews, he often panics and doesn't know what to say.

USER INTERVIEW WITH SPEECH LANGUAGE PATHOLOGIST WHO WORKS AT SAY

I also interviewed Speech Language Pathologists (SLP) specializing in stuttering. I first interviewed with Ryan Millager who works for SAY, a stuttering program for children. The following is the main insight. He works as a Speech Language Pathologist (SLP) at a nonprofit organization for young children and middle and high school students called SAY. He takes issue with SLPs who are ignorant about stuttering. This is because SLPs who don't specialize in stuttering often provide incorrect therapy that can worsen the condition. SAY's program is designed to make it easy for children to accept their stuttering.

USER INTERVIEW WITH SPEECH LANGUAGE PATHOLOGIST WHO WORKS AT A SCHOOL

The second SLP whom I interviewed was Yuko Yoshida. She is not specializing stuttering as she works at a high school in Bronx, however, she herself has stuttering. The following is the main insight. She is a Speech Language Pathologist (SLP) working at an elementary school in the Bronx. She is also a stutterer herself. She moved from Japan to America in order to become an SLP. She is working hard to treat her stuttering and says that as an SLP, the most important thing is to accept your stuttering instead of condemning yourself for it.

SECOND RESEARCH

FIELD RESEARCH

I also conducted an observation of American Institute for Stuttering and NSA Brooklyn Chapter Meeting. Although it is difficult to feature photos, the following are the insights I gained from each experience.

Stutterers often end up lonely. Therefore, it is important to create a safe space where they can talk without being anxious about their stuttering. But at the same time, many stutterers are shy, so holding exchange events with many people can also be a source of stress. Just being able to stutter while talking with friends isn't enough to make a safe space.

CONTEXT RESEARCH

Furthermore, I read a book titled "A Stutters Story" on stuttering and found the root of the problem in the United States. I also perceived the stuttering from different point of view by watching a movie "The Way We Talk." The following are the insights I obtained from these materials.

It is very important for stutterers to build confidence through repeated positive experiences. Because the more negative experiences they have, the more they blame themselves and the lower your self-esteem becomes. Finding a job is also a major hurdle. Additionally, because stuttering has a very negative image, it is important to find a way to change it into a positive one.

From the above research, it was found that that stuttering presents both superficial problems and deep-rooted problems. It was also found that these problems are mistaken by Speech Language Pathologists and stutterers themselves. The essential problem of stuttering is sometimes explained using the image of a psychological iceberg. As stuttering is classified as a language disorder, superficially the fact of the person stuttering is itself defined as the problem. However, the essential problem is that the person's anxiety about potential embarrassment caused by their stuttering leads to isolation and ultimately self-denial. This problem is common to both a severe stutter and a covert stutter.

This concluded my second round of research and interviews. Based on the above findings, I proposed the below areas of opportunity.

1. Incorrect treatment by Speech Language Pathologists (SLP) instills anxiety about stuttering. For example, a general SLP who is not specialized in stuttering attempts to treat children with the aim of enabling fluent speech. This causes them to have anxiety about the fact that they stutter. However, suitable SLP are not accessible because there are not many of them, and we are limited to only school as locations where children can be treated . How is it possible to establish proper access to suitable SLP?

2. What is most challenging for people who still have anxiety about stuttering? Also, what was the most challenging experience for people who have already overcome their trauma? Most people answered that it was job hunting.

I decided to change my previous topic, which was covert stutter.

THIRD RESEARCH

THIRD RESEARCH

IDENTIFY THE ISSUE

The areas of opportunity I proposed based on the insights gained from the second round of research were establishing access to suitable SLP, and the problem of job hunting. In order to narrow down to a single area of opportunity, I conducted interviews mainly with people who have already openly accepted their stuttering problem, and who have gained employment. I focused first on the job hunting problem.

Interview about Job Hunting and Lack of Access

JOB HUNTING - USER INTERVIEW WITH JIA BIN

I met Jia Bin at an NSA Conference. She is currently working as a language teacher at a school, and has successfully passed many interviews since coming to America. She is from China where there are no specialists in the treatment of stuttering, and language disorders are very poorly understood, creating an environment in which she had to continually hide the problem. That is why she moved to America where suitable therapies are available and stuttering is better understood. She also said that she is open about her stuttering, and making efforts to accept her problem. She is a severe stutter.

JOB HUNTING - USER INTERVIEW WITH SPRING KWOK

Spring is one of the co-leaders of the NSA Chapter Meeting in New York. She is currently working in merchandising at a fashion-related workplace. Although she had a complex about her stutter during her childhood, she has gradually become able to accept her stutter since coming to America and starting to participate in the NSA community in New York.

JOB HUNTING - USER INTERVIEW WITH MANNY GRANGEIA

His son is Glen Grangeia, who has a stutter. His son worked at the same company as an engineer for over 10 years, but has been unable to find work again since losing his job. I also interviewed him as a family member concerned for his son, and asked about the most challenging problems faced by his son and their causes. Below are the main insights I gained.

Insight

INSIGHTS OF LACK OF ACCESS WITH SPEECH LANGUAGE PATHOLOGISTS AND JOB HUNTING

I organized their life timeline from childhood to adulthood. To identify the pain point, I asked them in which phase they most felt the barriers of stuttering. They told me that when they were students there was no problem even if there was much psychological and mental stress, because friends and teachers could care about their stuttering. However, I realized that when PWS graduate from college and looked for a job, they should face a big obstacle because of judgement by hiring people. For this reason, most PWS decide to go to expensive private therapy which focuses on stuttering rather than school therapist, because they feel they really need help at that time. This means, this time after college is especially important because PWS often lose their support network right when they are going into the important time of putting themselves out into the world socially, looking for a job, and starting their career. I decided to focus on the problem of the employment and job hunting for people who stutter. Also, academic data has clarified that employment of PWS is a serious problem. 50% of employers reported that stuttering decreased employability. 83% reported that PWS made them uncomfortable. PWS earned approximately $9,500 less in annual earnings than people who do not stutter.

By repeating experiences that they are rejected and getting failures many times, they will lose confidence. And stuttering becomes more severe and they are not be able to get through the interview. So, important solution is that how to get out of the negative loop.

PWS can acquire more self-confidence by repeating actions and accumulating success experiences.

They need a strategy that is to switch it from a negative loop to a positive loop. As a result of hearing the stories from successful people, they mentioned about stuttering in the beginning of 1st interview, and they used their stuttering to make a positive self-introduction. On the contrary, those who were failing the interview kept hiding and avoiding their stuttering in the interview. This is because people who hide them do not have a strategy to make their stuttering self-appealing. Also, they continue to believe that stuttering is a negative asset for them.

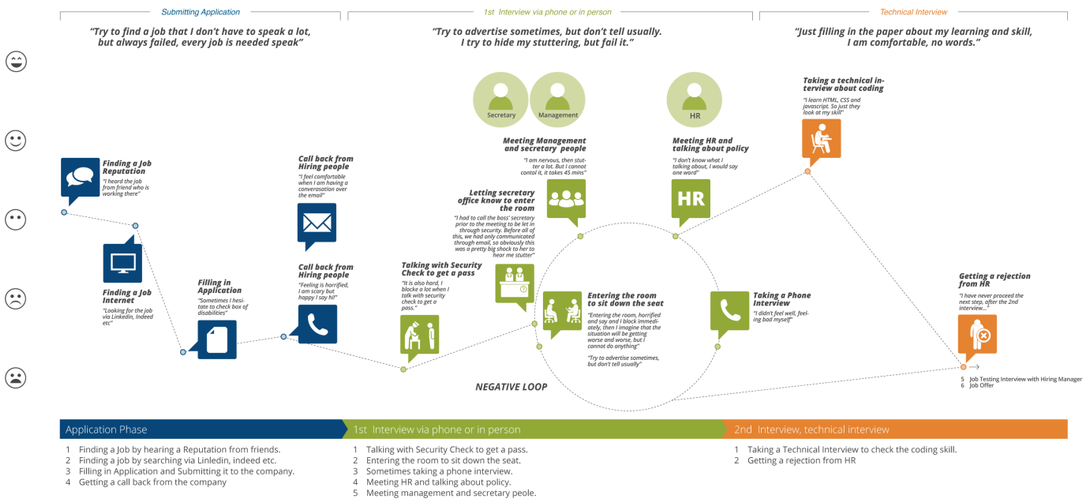
I defined the problem statement. It is important to establish confidence by changing their concept of stuttering to a positive asset. How might we build confidence and self-assurance for recently-graduated PWS during their job hunting process in order to increase their chances of being hired? I defined my target user as a person who stutters.

Also, I used Daniel's quote to highlight the issue. The detail is below:
Daniel is applying for a software engineering position, but he still has not been offered a position. He said,

"If I mess up and stutter a lot for that initial step, then my thought process goes south and I begin to think negatively. And since I messed that up, I began to assume the entire interview will go that bad. So for me, the first step of an interview is a big deal for my overall thought process"

This means once he stutters, his negative feelings are strengthened, and all his thinking is negatively affected.

THIRD RESEARCH



To define the leverage point, I made a user journey map for Daniel. He feels uncomfortable when stating he has no disabilities on an application, because this leads to pressure because he has to hide his stuttering to appear to be and honest candidate. He says stuttering is a very big problem for the first interview. He also talked about making trauma worse by repeating failures, because every time he finds himself talking to HR, or management people, the nervousness overwhelms him, and he can not move forward to the next step. Of course, the biggest stress point is the in-person interview, which I have indicated on a chart above with the color green. Daniel said that the technical interview is no problem, and that he feels comfortable because there are very few words.

Tom, another stutterer who is in the position of the recruiting, observes:

"People who stutter would get through the secondary interview more easily than the first interview."

This is because middle management and upper management have completely different points of view. Since middle management people, who typically conduct first interviews, empathize with work performance, so stuttering seems to be unacceptable to them. On the other hand, upper management focuses on matching, so they do not care much about differences in speech ability. Research has indicated that those who conduct first interviews make a decision by talking to an applicant for less than 20 seconds. This means the first impression is very important and depends on making a conveying competence in 20 seconds.

THIRD RESEARCH

ASSUMPTION OF FINAL OUTCOME

At this point, I defined the final outcome as goal as follows:

1. As my friend's father noted, stuttering is a speech impediment that worsens with anxiety and lack of confidence.
2. For that reason, if stutterers gain confidences by accumulating successful experiences, then stuttering symptoms will lighten gradually.
3. Ultimately, it is possible to change their concept of their stuttering from negative to positive as their stuttering becomes lighter and as they incorporate strategies that make use of their stuttering.
4. I define my biggest goal as succeeding at changing society's perception of stuttering itself from being a negative speech impediment to being a positive difference in communication style. I visualize spreading this mindset throughout the world.

After I finished the Gate 2 presentation, I got a great deal of feedback from thesis advisors through the Gate 2 presentation as follows:

"Social anxiety thing is very specific for people who stutter, like I have a social anxiety, but it is different as them. How is that different from anybody who have the social anxiety? Unless it is not, see you understand what is the difference between them. Stuttering is related to social anxiety physically, like I can sweat because of social anxiety."

"You should pin the picture of who has social anxiety, show the stuttering is different. I represent in my office, give talk on stage, in kind of situation like either I know somebody make me nervous I just shut down, I can say something stupid, anxiety thing is fear. It doesn't make sense."

"You should pin the picture of difference, you should clarify."

"Finding a job topic is tough to explore in 6 months, You gonna find somebody stutter, you gonna find somebody gonna look for the job clarify the goal. In case another opportunity could be explored, what is the other opportunity way they get the social anxiety, how they get the social anxiety? You are able to test, and you could say this is the cause of social anxiety. Why do people have a social anxiety? And why you don't have social anxiety? What is the difference?"

"How you gonna offer something different to people who stutter? Do the internet research, for example NSA has already done the mock workshop, so what is the difference? You have a topic, the idea would be clear nobody see it before. Make an innovative and unique idea."

FOURTH RESEARCH

IDENTIFY THE ISSUE

After taking the above feedback into consideration, I decided to search for the essence of the problem, separate from a lack of confidence just due to stuttering, by investigating social anxiety disorder. I changed the definition of the problem. At first, I had defined it as “being unable to talk with confidence in interviews due to stuttering.” Social anxiety often occurs together with stammering. However, in order to search for an answer to the question of whether social anxiety disorder was the root cause, I decided to specify the various problems and causes of this issue. For my investigation, I first conducted interviews within a Facebook group the connected sufferers of social anxiety disorder who do not have problems with stuttering. The questions I asked the group of people who do not stutter. The replies are below:

Jonathan Curtis
“Face to face contact triggers my anxiety”

Prudence Mindsey Goqwana
“Yelling triggers mine big time and lately when I can’t get hold of my twins on the phone..they teenagers and staying there ...everything closes up ..can’t breathe. Heart race ..loose tummy ..lump in throat…”

Brian Salzler
“My worst anxiety comes from performance around others, talking to girls, seeing those I know in a public place, etc. Some things I handle better than most others with SA like talking on the phone or even crowds at times, but we all are kinda unique in how we respond to our environment”

I was able to receive more than 50 replies from the responses and reactions of an extremely large number of people. Research was conducted in a similar manner on a Facebook group for stutterers. What follows is a portion of the answers:

Ailín Mac Roibeaird
“I’ve had anxiety issues from around the age 18. This was around the time I left school and started going to interviews which caused me enormous amounts of anxiety. I wouldn’t say I have social anxiety but more a general anxiety disorder which I’m sure stuttering played a major part in.”

Mohit Singh
“I definitely do deal with social anxiety related to stuttering. I actually feel the brute of the anxiety BEFORE I start to speak to someone, in anticipation of a stutter/residual feelings of shame and guilt associated with stuttering. Once I actually get talking though and stutter a couple times in front of somebody without the world opening up and swallowing me whole like I sometimes think it will, that anxiety starts to dissipate. So to answer your question then, I think the “trigger” would be negative thoughts of inadequacy related to stuttering that manifest before I start to speak in anticipation of a possible stutter.”

Manisha Arora
“I stutter, my heart pounds (to an extent i fear it would tear me apart and come out lol), my hands and feet go ice cold, I have trouble breathing, I make weird facial expressions and can not make eye contact”

An insight gained after analyzing two of the above responses is that, depending on the environment, non-stutterers may experience strong anxiety. Moreover, I hypothesized that what triggers a stutterer’s social anxiety is anticipatory anxiety that occurs before he or she begins speaking. In this context, anticipatory anxiety refers to a stutterer predicting before the fact that he or she would be laughed at or encounter other embarrassing situations because of his or her stuttering, then becoming fearful and losing the ability to speak normally, i.e. anxiety that arises due to anticipating symptoms specific to stutterers. This indicated that the nature of social anxiety disorder is different in stutterers and non-stutterers. Moreover, I have continued to research how to eliminate social anxiety in order to reduce the negative effects of social anxiety.

FOURTH RESEARCH

CONFERENCE AGENDA

	Kids/Tweens/Teens	Adults (16+)	Family & Friends
8:30-9:00	Registration/Breakfast		
9:00-9:30	Welcome/Icebreaker		
9:30-10:45 Sessions	Sarah Onofri *Fun & Games and Getting to Know You*	Nina Zito *The Stuttering Iceberg: A Closer Look*	Liz Gómez *Sharing Stories*
10:45-12:00 Sessions	Jess Giuffre *This is What My Stutter Looks Like*	Dr. Gerald Maguire, NSA Chairman Keynote Address	
12:00-12:45	Lunch & Minute-to-Win It Games for Kids/Tweens/Teens		
12:45-2:00 Sessions	Nina Zito *What Would You Do? Role Playing Your Way Through Stuttering*	Pam Mertz *Owning Your Space*	Diane Constantino *Stuttering 411*
2:00- 2:30 Sessions	Jess Giuffre *Closing Time*	Pam Mertz *Celebrating Your Courage*	Liz Gómez *Our Role as Advocates*
2:30-3:00	Wrap Up		

SAVE THE DATE

THE NSA ANNUAL CONFERENCE WILL ROCK YOUR WORLD!

CHICAGO, IL: JULY 4-8, 2018

Join us for four days of education, empowerment, and excitement for people who stutter, their loved ones, and professionals! Along with leading experts, we've put together a program of workshops and activities for adults who stutter, families, and speech language pathologists. Learn and engage with others in a safe stuttering environment, and remember:

If You Stutter, You're Not Alone!

NATIONAL CHANGING THE STUTTERING LIVES OF PEOPLE ASSOCIATION WHO STUTTER

119 W. 40th Street, 14th Floor, New York, NY 10018
Phone: 800-937-8888 | Fax: 212-944-8244
Email: info@WeStutter.org | Website: WeStutter.org

I participated in a conference on stuttering held in Boston, where I met a woman called Pamela Mertz from the National Stuttering Association. She is NSA Board Member, Special Projects Chair. Below is a poignant quote of hers:

"To gain self-confidence to face interviews or small talk, people who stutter should expand their comfort zones. They should put themselves in situations to practice small talk, public speaking and mock interviews."

The most important step to prevent the social anxiety specific to stutterers was to create a safe space where a stutterer can have the freedom to fail. To that end, I revised the previous Problem Statement.

The hypothesis below was formulated based on said Problem Statement.

1. The most important thing is to act as if they are confident.
2. They cannot be confident themselves and that makes it difficult for them to pass interviews.
3. But there are some people who stutter who pass interviews talking by stuttering with confidence.

IDEATION

IDEATION

PROTOTYPE APP TO PRACTICE THE JOB INTERVIEW

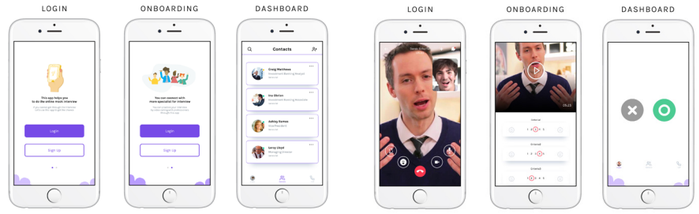
What follows is the ideation phase. In order to verify the hypothesis, I created a mockup of an iPhone app where stutterers could practise for job interviews as an initial prototype. The app matched interviewers (people who would provide interview practice) with people who had attended job interviewees. Initially, I created personas based on the pool of people who had attended job interviews in the past.

Francis

Background

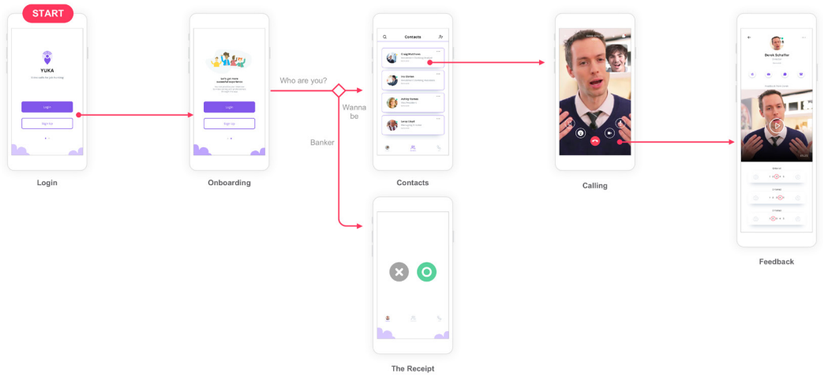
He is looking for a banker job. He has just graduated from the City University of New York as a graduate student. His major was finance, so he applied to Bank of America and Chase etc, but he failed to get through the interview many times. Now he is so depressed for himself, and he thinks fault is because of stuttering. When he talks with interviewer, he messed up so.

Age: 24
Martial Status: Single
Family: He lives with parents and sister
Location: New York



YUKA USER FLOW
JOB HUNTING APP

FEATURE
DON'T LET YOUR RESUME GO INTO A "BLACK HOLE." YOU NEED TO GET SOMEONE TO RAISE THEIR HAND AND SAY, "LET'S BRING THIS CANDIDATE IN."



Below is another poignant Quote from Speech Language pathologist who runs the private therapy that focuses on stuttering, whom I interviewed.

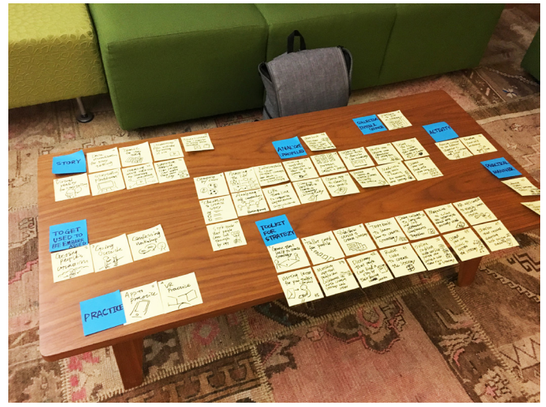
"Knowing other people's story can encourage PWS to take an action for getting self-assurance. Then, they can move forward"

Knowing other people's stories can be a cooperative tool that encourages one to take the next step. To that end, I created the below website as the next prototype. This is a prototype of an online platform where stutterers can share their individual stories.

IDEATION

ONLINE PLATFORM TO SHARE AND CREATE THE STORY

I then thought, "Using the stories posted on the above platform, could I create a safe space in the form of a virtual space where stutterers could practice for job interviews and have the freedom to fail?" Doing so would allow a stutterer to gradually increase their own self esteem by accumulating successful interview experiences, letting he or she gain confidence and be able to market his or herself at a job interview. By combining the above two ideas, I thought of a tool that would be able to increase a stutterer's chances of getting a job offer after an interview.



50 IDEAS IDEATION

Throw out 50 ideas for how to solve this problem.

Why is it so important to talk about stuttering-related experiences? Because it is vitally important for a stutterer to personally recognize and acknowledge his or her individual symptoms. From the above research, it was evident that interviewers look for candidates who are able to confidently market themselves, be they stutterers or not. Moreover, candidates who continued to advance through rounds of interviews usually forged a personal connection with interviewers by telling them their own life stories as stutterers. To a certain extent, these stutterers used stuttering a means of self expression.

I applied for and received a fellowship from the Verizon Connected Futures program jointly organized by NYC Media Lab and Verizon. Therefore, I am jointly developing a virtual reality app with a friend of mine. Currently, the possibility of realizing my idea is very high. The current product concept is as follows.

"Diving into the Narrative and Creating Your Own Space"

IDEATION

COMPETITIVE ANALYSIS

Before fleshing out my idea in concrete terms, I checked if there would be any competition with existing services on the market and past stuttering-related projects. Such services are shown below.

NSA - National Stuttering Organization
The NSA provides support, friendship, and information to the stuttering community, instilling the sense of self-worth so often missing in the lives of those who battle this condition.

AIS American Institute for Stuttering
AIS offers a whole-person approach to the treatment of stuttering. Services are available in New York City, Atlanta, and Online.

SAY - The stuttering association for young
SAY is a national non-profit organization, which through summer camp, speech therapy, and creative expression empowers, educates, and supports young people who stutter and the world that surrounds them.

Friends
FRIENDS is the only national organization dedicated solely to empowering young people who stutter and their families.

International Stuttering Association
The NSA provides support, friendship, and information to the stuttering community, instilling the sense of self-worth so often missing in the lives of those who battle this condition.

Stutter social
oin our “hangouts,” a free and fun way to have a video chat with up to 10 other PWS at a time.

Stutter Talk
A weekly podcast where the hosts talk openly about stuttering and interview people who stutter and leaders in the field.

Passing Twice
a support organization dedicated to the needs of gay, lesbian, bisexual, and transgender stutterers and their friends.

Below is a list of services related to social anxiety. Then, I found no competition with my idea after looking into each of the services. Therefore, for my Thesis Project, I have proceeded with the ideas of (i) an online story-sharing platform, and, (ii) a VR app that enables one to practice for job interviews in a virtual space.

The Social Anxiety Institute
The Social Anxiety Institute is the only treatment center in the world that specializes solely in helping people overcome social anxiety disorder.

AIS American Institute for Stuttering
AIS offers a whole-person approach to the treatment of stuttering. Services are available in New York City, Atlanta, and Online.

Social Anxiety Association
Social Anxiety is the third largest mental health care problem in the world today. Alcoholism is first, depression is second, and social anxiety is third.

Social Anxiety Meetup Group
Meet with other local people who suffer from shyness or social anxiety. Offer support and understanding and share your story with others. Learn and practice the skills it takes to overcome your challenges not just with society but all so yourself. Have fun with non judgemental people in a relaxed setting. Our meetups are to help people make friends, practice social skills, and have fun while doing both.A weekly podcast where the hosts talk openly about stuttering and interview people who stutter and leaders in the field.

Public Speaking and Social Anxiety Center of NY
Our workshop is focused on results. Discussion of social anxiety issues comprises part of a typical session, but the main emphasis is on gradual exposure with exercises targeting all aspects of anxiety in interpersonal and small group interaction. You will become a more skilled and confident communicator in all area of life. There is hope, and we can definitely provide the help in a comfortable, supportive environment.

PROTOTYPE

PROTOTYPE

USER INTERVIEW TO DEVISE A WAY OF GETTING THROUGH THE JOB INTERVIEW

Following the previous interviews with Spring, Tom, and Jia, I also interviewed George Daquila, who is currently employed at Goldman Sachs and he conducts interviews. He explained that he found many difficulties in hunting for a job post-graduation, but he was ultimately able to use the story of his struggles with stuttering as a form of self-promotion. Through my interview with him, I listed several things that could be taken from his experiences.

1. Outstanding Story
2. Having a standard greeting/introduction
3. Active Listening
4. Eye-Contact
5. Repeating section of interviewer's questions
6. Hand Gestures
7. Being aware and being objective; not taking anything personally
8. Going back to the memories where shame comes from
9. Not being humble or hide
10. Getting attention and trying to interact with your audience

As the above list demonstrates, those who have an easier time getting through interviews tend to stress practicing techniques repeatedly, such as active listening and making eye contact. From this, I learned that creating a safe space where people could obtain this repeated practice with peace of mind was of paramount importance.

Based on the insight provided in the interviews thus far, I was able to further improve my previously established Problem Statement. To that end, I set about developing the VR prototype as well as a prototype platform for users to share their stories.

"People who stutter that are transitioning from school to work life lack the confidence and positive outlook needed to overcome social anxiety for job interviews, and other necessary social interactions."

Afterwards, in verifying the repercussions implied by the above problem statement, I began development on a VR prototype and a platform which would allow users to share their stories.

PROTOTYPE

First, I created a 3D image prototype of a virtual conference room using Unity to put the user in a situation where they must speak to a virtual audience. Afterwards, I conducted my first user trial using Google Cardboard VR. The primary feedback received from the user was that the simulation accurately replicated the feeling of anxiety they had when speaking in real life. I was also able to locate a research paper which discussed the possibility of using VR to inspire feelings of anxiety. The citation is located below.

Utility of virtual reality environments to examine physiological reactivity and subjective distress in adults who stutter - Shelley B. Brundage, James M. Brinton, Adrienne B. Hancock

The contents from this paper and the results gleaned from the trial run provided the understanding that VR is very capable of replicating the feel of social anxiety, while at the same time providing a safe space where the user need not fear repeated failure or the feelings of shame triggered thereby. In order to realize this idea of VR, I created a demo video that demonstrated the user's performance before and after using the proposed app to practice in a virtual social space. The creation of this video provided an easier explanation of my thesis' objective to the target audience:

https://youtu.be/7yXywI1utLo

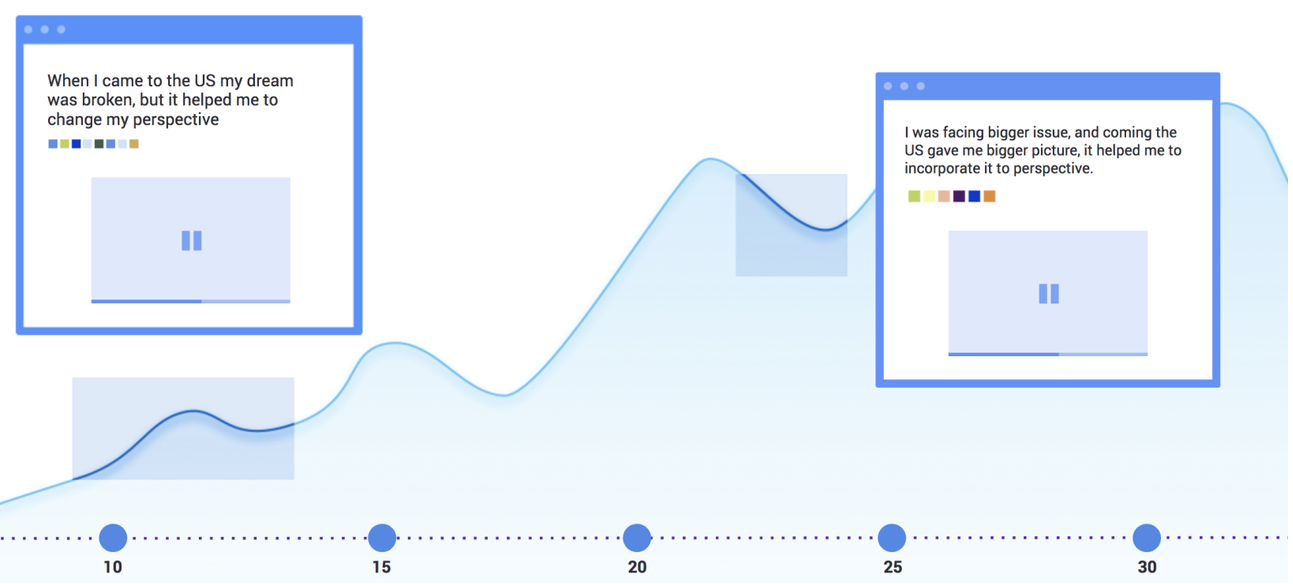
PROTOTYPE

RESEARCH ON THE STORYTELLING PLATFORM

As this step marked the completion of the initial VR prototype, I was able to proceed with creating the prototype of a platform which users could utilize to create and share their stories. I began researching online platforms based on a similar model to lend substance to my own idea, with an outline as follows.

1. Design Kit by IDEO.org
2. Doer
3. The Moth
4. Storyform
5. Story Telling by The A Factor
6. TED Talk - Facing Rejection
7. HISTOGRAPHY

The insight gleaned from the above case study revealed that a person's story could be organized and told by arranging past events in chronological order. Based on that information, I created an image of the prototype I had in mind, as seen below.



PROTOTYPE

HERO'S JOURNEY STORYLINE TO CREATE A POSITIVE STORY

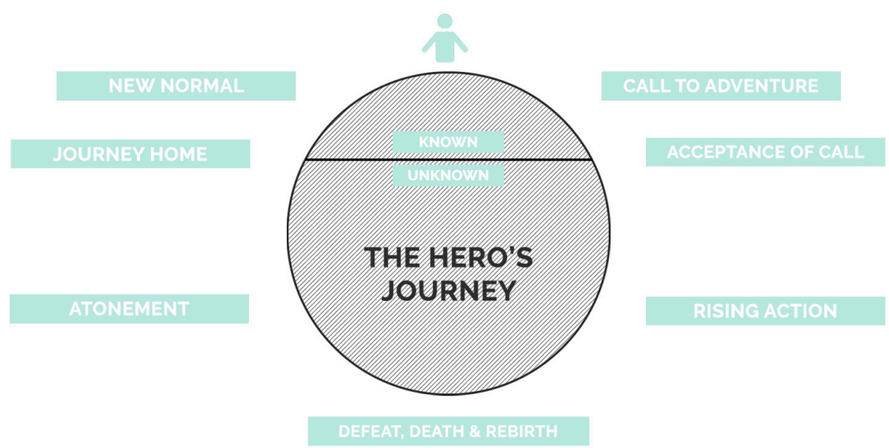
So how does one create a stutterer's story in chronological order? To gather clues, I interviewed stutterers who showed a high rate of success in interviews. Below is the insight I obtained as a result of these conversations.

"I try to present my story as more outstanding than other candidates, the criteria of the interview is how that person fits in with the team at the workplace." - Jia

"Being a participating NSA volunteer is useful to create a positive story." - Stavros

How does a user create a story that stands apart from the rest? Stuttering can be extraordinarily conducive to increasing a person's storytelling ability; however, if one does not have the tools to create a script for their own story, then they can't use a script as a strategy for success regardless of what helpful platform may exist. In other words, these people may have convinced themselves that they had never nor would ever stand apart from a crowd. They would need a helping hand to see themselves in a more positive light. Therefore, I developed a story template that would guide them into telling their story in a more positive way. I used a tale called "The Hero's Story Journey" to create the template. You can find a summary below.

http://www.well-storied.com/blog/heros-journey



"The Hero's Journey operates as a circular story structure, meaning that the hero's physical journey will end where it began, though their internal journey as a character will leave them forever changed. This physical journey, in particular, will take your hero from a known world into an unknown one, often introducing them to new powers or skills or encouraging them to utilize known abilities like never before. With these two functions of The Hero's Journey in mind, it's easy to see how one of the core themes of any Hero's Journey story is transformation. Rarely do such stories feature a flat character arc, in which the protagonist fights to stay true to their beliefs rather than undergoing change as a result of new experiences."

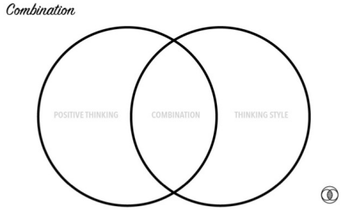
Using the above example as a guide, I first created a worksheet related to stuttering and seeking employment.

1 POSITIVE STORY WORKSHEET

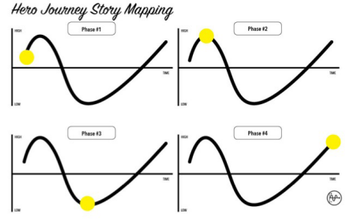
2 WORKPLACE THINKING STYLE

3 POSITIVE THINKING STYLE

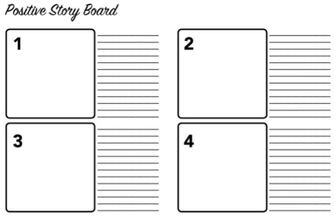
4 COMBINATION AND BRAINSTORM



5 POSITIVE STORY MAPPING



6 STORY BOARD AND SCRIPT



This is a worksheet to make a positive story. The purpose of the worksheet is to connect positive stories to characteristics that employers find attractive. What is the structure?

1. The company management categorizes employees based on workplace thinking style.
2. Combining this thinking style with a positive thinking style about stuttering helps user devise the structure of their story.
3. People who stutter can make positive stories based on the hero's journey storyline.
4. By combining these two elements they can make a storyboard and script for use in job interviews.

The actual user trial followed, with the main feedback presented below.

"I wanted to learn how to apply the necessary way of thinking for team work to my own personal story." - Glen
"It helped my own story become clearer by outputting. Made it easy to write along the lines of a hero's storyline." - Yuko
"I wanted to see online how other people create positive stories and how they use them in actual job interviews." - Daniel

I analyzed two insights through testing the prototype by using a worksheet. The first is that A worksheet which users can create a practical story usable in actual job interviews is necessary. The socond is that an open platform where people who stutter can share positive feedback is necessary. The feedback revealed an overwhelming demand to read about other peoples' stories and to share their own. This made it abundantly clear that the platform must be based online. This led to the question of how users could make use of their stories in job interviews. To find the answer, I interviewed Stavros, who had related the story of his struggle with stuttering as a part of his job interview. Though our conversation, he made it clear that it was extremely difficult to talk about his disorder during the interview. Finding the proper timing to portray his struggle as a positive, not a negative, was key. Both Stavros and George explained that they had discussed their stuttering conditions during the introduction portion which inevitably kicks off all interviews. From this, I determined that an artificial intelligence function would be necessary to promote the flow of conversation so that the user could practice telling their story in an effective way during a self introduction.

PROTOTYPE

GETTING ACCESS TO TEST THE PROTOTYPE

In order to test the prototype, I needed to expand my contacts, so I began participating in many events related to stuttering disorders, with the main three listed below. The contacts I formed from these were indispensable during the test user process.

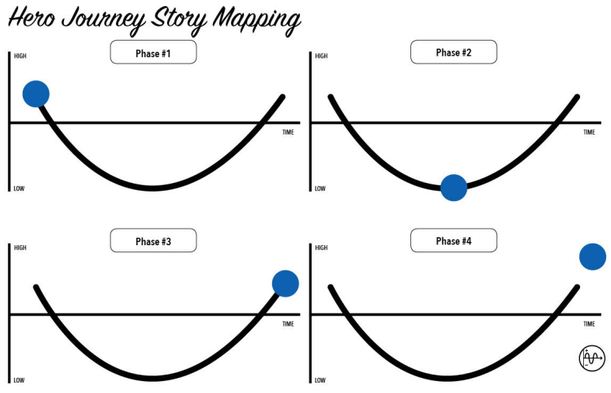
1. McGuire Programme Chapter Meeting in NYC
2. NSA NYC Chapter meeting Brooklyn and Manhattan
3. American Institute for Stuttering Group Meeting

IMPROVE THE HERO'S JOURNEY WORKSHEET

One of the discoveries revealed during the previous test was that it was extremely difficult to relate the details of one's personal life to work experience. Furthermore, our interview with Stavros revealed that he focused on his own personal experience and not work when he spoke with the interviewer. With that said, I abolished the worksheet style which related the topic of employment with the story of one's struggles with stuttering. My interview with Mohit also provided a valuable piece of insight. Here is a quote he provided:

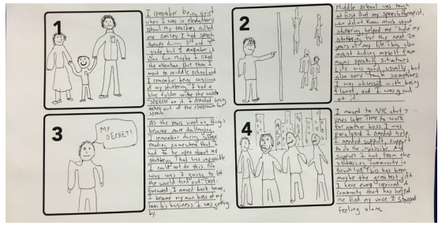
"Allowing people who have only negative story is more applicable. Also, people who only have negative stories can also post their stories, which makes it look like the journey is ongoing, and in progress." - Mohit

At this time, it was brought to my attention that people with exclusively negative stories had difficulties filling out the template style I had previously developed. With that in mind, I changed the template design so that people were able create a story-line of their own making, without being forced to follow rigid guidelines. In addition, the final phase was altered to give the option of presenting a more positive story for those trying to change their negative story into a positive one. In effect, the template was given a simpler design.



Flow in detail is below:

1. I am in the average…
2. I was depressed…
3. I overcame…
4. I change myself…



PROTOTYPE

TEST THE REVISED WORKSHEET

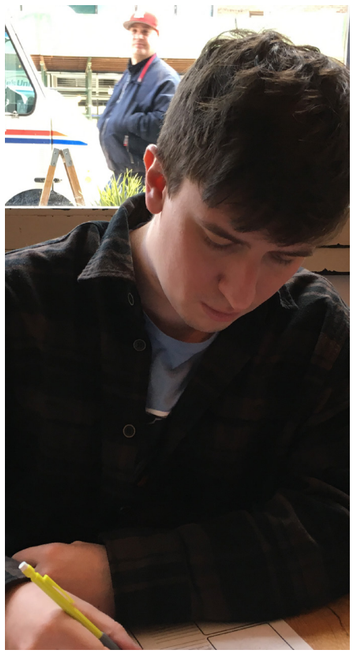
I then conducted tests using the altered worksheet with Daniel, Glen, Stavros, and Yuko as test subjects. Below are quotes they provided which I found useful.

“AI is very sensitive to sound so the experience needs to run in a quiet environment. Quality of the internet connection also affects the agent’s performance (delays or repetitive responses)”

“AI agent is still listening in level 1 scene. This is very distracting for the user as they are trying to focus on the interview.”

Based on the above feedback, I decided that an online platform which used photos or icons as avatars would make other users’ stories easier to understand. Furthermore, I had as many target users as possible describe their stories in order to assess my hypothesis.

This is Stavros worksheet. My review showed each user reporting an extremely high degree of satisfaction. These assessments cemented the current template as the base template style. The Iteration Phase of the story template, which could be used as a script for interviews, was thus completed.



PROTOTYPE

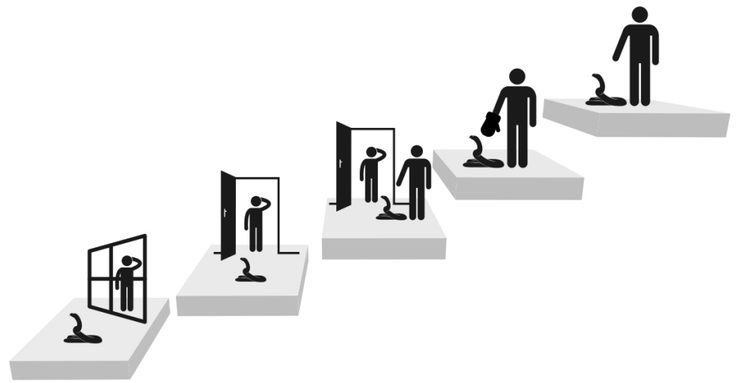
SYNTHESIS OF COMPONENTS

At this time, I decided to fully integrate all of my ideas up until that point. First, I credit The Harvard Business Review - Reclaim Your Creative Confidence with providing valuable insight on improving one’s confidence. Below is a particularly impressive account.

”Easier said than done, you might argue. But we know it’s possible for people to overcome even their most deep-seated fears. Consider the work of Albert Bandura, a world-renowned psychologist and Stanford professor. In one series of early experiments, he helped people conquer lifelong snake phobias by guiding them through a series of increasingly demanding interactions. They would start by watching a snake through a two-way mirror. Once comfortable with that, they’d progress to observing it through an open door, then to watching someone else touch the snake, then to touching it themselves through a heavy leather glove, and, finally, in a few hours, to touching it with their own bare hands. Bandura calls this process of experiencing one small success after another “guided mastery.” The people who went through it weren’t just cured of a crippling fear they had assumed was untreatable. They also had less anxiety and more success in other parts of their lives, taking up new and potentially frightening activities like horseback riding and public speaking. They tried harder, persevered longer, and had more resilience in the face of failure. They had gained a new confidence in their ability to attain what they set out to do.”

I summarized the article as below:

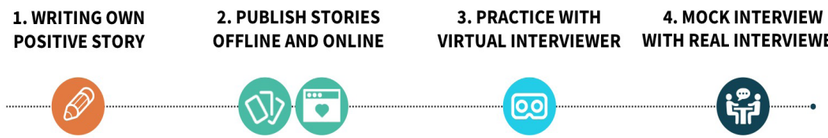
“The process for building self confidence is that of experiencing one small success after another, after which a person can finally achieve their biggest goal.”



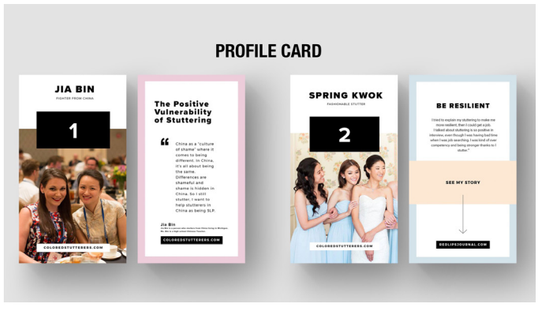
A particularly valuable source of inspiration was provided by the process of Guided Mastery, a psychological technique in which the patient is gradually exposed to their fears in order to build their confidence. In considering how this concept could be applied to my ideas, I was able to establish my Thesis Statement as below.

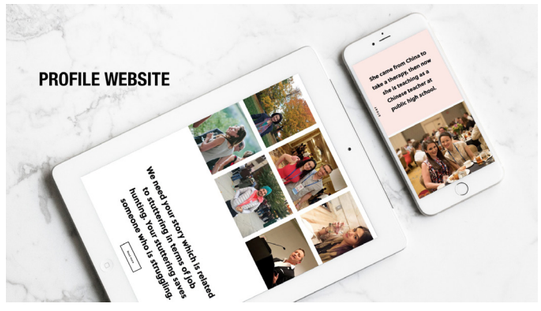
“How might we build a step by step system for people who stutter to help overcome their fear by changing their perspective toward stuttering?”

The solution is being a certified stutterer. How do they become proud of having a stuttering disorder?



This is the outline for building self-confidence. The first step, people who stutter can write their own positive story by hand. This story can be used as a strategy to give a positive impression to an interviewer. The second step is that they publish the positive story offline and online. Usually they don't want to show their weaknesses in public.





This is the prototype image of a profile card to publish a story offline. Users can employ it to introduce themselves, and show their story to others. This is a website to publish positive stories online.

The third step is that stutterers practice how to use a script with a virtual interviewer in a job interview by using VR. The final step is that they practice how to use a script with the real interviewer in a job interview by using The Mock Interview Workshop of the National Stuttering Association. Actually, these mock interviews were already held at Goldman Sachs and SAP last winter. Originally, I had intended to hold the Mock interview for my prototype with them.

Thus, I was able to finalize my Problem Statement and Thesis Statement. Below, you will find the feedback I received from the Gate 3 presentation at this time.

"Important that people get a certification from the workshop"

"Are there too many components of the workshop? Scale it back so the timeline and end goals are more achievable?"

"Need a more detailed prototype plan to see how you're breaking each part down, testing them, and making sure they work together as a unit for a successful workshop (they aren't isolated parts)"

Based on the above feedback, the Prototype moved forward into the Iteration phase.

ITERATION

ITERATION

COLLECTING THE FEEDBACK OF THE WHOLE PROCESS

I decided to continue the research in order to identify how the entire process works. The feedback was obtained through Facebook and in-person interviews and was categorized into several elements. This helped me obtain the following insights

Worksheet:

The story line did not work well. It was possible to create individual stories by dividing the story into four phases. Simpler templates are motivating to make entries. It is possible to effectively reinforce the story by using emoticons and photos, which in turn makes it easy to organize one's thoughts. Lots of stories are required as it is very inspiring to watch stories of other people. Two or three stories are not sufficient.

Invitation:

A lot of feedback was received which mentioned that the invitation element did not feel like a necessity. So, this element was removed. As long as there is motivation for individuals, they will never feel confident even if they are accepted by others and invited to the workshop.

Virtual Reality:

I received informations that the money paid for treatment so far need not be paid through the VR application. However, not everyone has a VR headset, and VR is not yet accessible. Therefore, it is necessary to consider a mechanism which people can continue to use even after the project is completed.

It was at this time that Verizon Connected Futures Fellowship began. I decided to temporarily end the Iteration phase, which listens to the user's voice, since we began implementing full-scale virtual reality applications. After that, I started developing VR applications and implementing online platform.

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IMPLEMENTATION

IMPLEMENTATION

MOCK OF ONLINE PLATFORM

In order to setup the online platform, I first set out to amass the necessary materials. That is, to accumulate the positive stories told by people who stutter. It is beneficial for people who cannot tell stories about their stuttering to see others telling positive stories. People who are already positive about their stuttering will serve a role similar to a coach.

TOM STORY

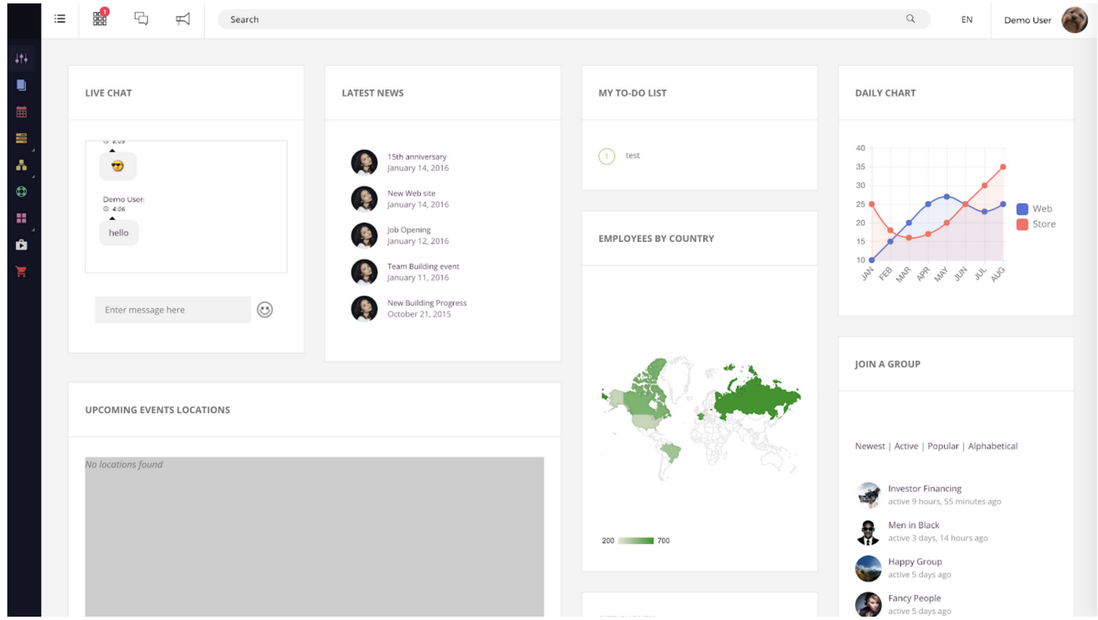
Phase1
I remember not talking during elementary school. I wanted to be like all the other kids, but I was different. I could barely talk, and, when I tried, my body did all this strange stuff trying to get the word out. I was embarrassed to go to “speech class” once a week, which amounted to reading out of a book. I didn’t have to answer in class, or speak at all. I think people tried to make me feel “special” because I stuttered, but I only felt “weird.” I didn’t know what to think about my stutter. (lower than the line)

Stage 2
Middle school. Abuse “conditioning” at home taught me that resistance meant prolongation and a worsening of the physical and emotional pain. In short time, the school bullies marked me as a “target.” I became the skinny kid who couldn’t talk and wouldn’t resist while beaten. Scars from these wounds would reopen frequently over the next several years. High school reaffirmed what a loser and outcast I was, with a future very, very limited. Growing up in a cult only exacerbated these feelings. (way lower than the line)

Stage 3
Early work years. I resigned to work with my hands, and never have to talk. EVER. Through much resistance, I hesitantly accepted a managerial position. It was horrible. I would block forever. Sentences took several minutes. I was devastated at the end of every day. BUT...tomorrow began to get better than yesterday. I mean, I’d still have days when I couldn’t hardly talk. BUT...those days began to move farther and farther apart. I began to excel, because I HAD TO. Outside work, I had limited fluency. On the job, I had “flow.” My confidence on the job didn’t transcend into my personal life. I never quite figured that out.
(beginning to move up)

Stage 4
Finding passion. And then, I found our NSA. Something deep inside me connected with making the world a better place for PWS. My purpose in life is clear. Without a doubt, the more I give, the more I get. So I give more. Our active cause is a magnet for passionate people, and I found my family in the NSA. Because of passion, I can speak in public. Because of passion, I have the yearning to lead. Because of passion, I want to keep moving us forward. (above the line with an arrow pointing up)

So I completed collecting the stories for my first trigger. Next, I created a mock-up online platform to solidify a conceptual image.



The mock-up platform concept is shown above. I created it based on the concept of a dashboard you can login to at any time. Additionally, users can communicate via chat, and can watch developments in other people’s stories as infographics. This mock-up was created with a heavy focus on communication functions. After creating this, I started creating the final website.

CODING THE WEBSITE

The mock-up platform concept is shown above. I created it based on the concept of a dashboard you can login to at any time. Additionally, users can communicate via chat, and can watch developments in other people’s stories as infographics. This mock-up was created with a heavy focus on communication functions. After creating this, I started creating the final website.

The programming languages I used to create the website are HTML, CSS and PHP. First as a prototype, I created an extremely basic design. I prepared only the bare minimum of functions for user test. The functions include being able to watch other people’s stories and login with a Facebook or Google account easily. After logging in, users can tell their own story. When they’re done, they log out, and can login again to edit whenever they want. Most importantly, however, users can comment other people’s stories. I have imagined a framework for a website that creates communication. Below is the first basic website I prepared. The design itself is also the bare minimum.

And the first story uploaded was Tom and Jia’s story. When users were notified that the website was ready, many came and read their story, and went on to upload their own stories as well. After that, stories naturally went on being uploaded to the platform.

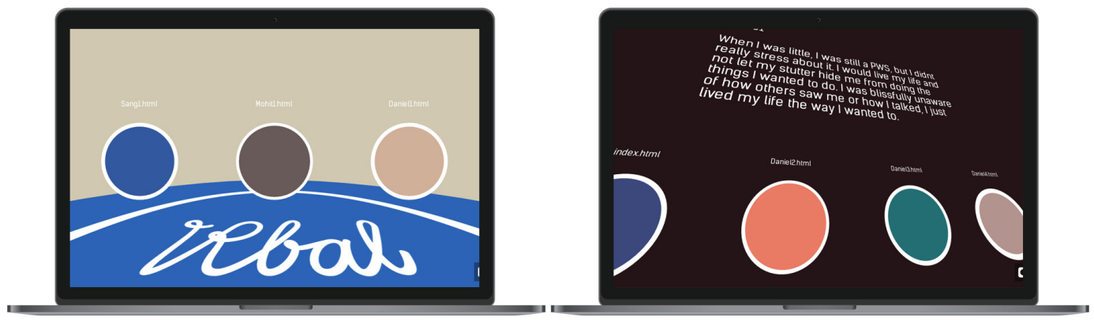
But I hit a wall. Creating a framework within a VR application for practicing with stories I created and uploaded to the website after posting them was very difficult. Many of the users are simply satisfied with uploading their own stories. In other words, they don’t practice writing their stories, and they tend to forget what they wrote over time. I also didn’t publish a video I made to encourage them to practice often. As a result, the biggest hurdle moving forward is how to get users to strongly associate the online platform and VR app with each other.

https://www.wearestarter.com/

WEBVR PLATFORM

New possibilities after accumulating stories. As stated above, my next goal was to create a stronger association between the VR app and the on-line platform. Initially, I tried thinking specifically about the user scene. First, if a user is going to use a story they made themselves, they should be watching it before they practice with it in the VR app. VR itself isn't very well-known today so raise awareness and create an accessible VR platform that will make people want to practice in a VR app. My Thesis Advisor told me about a new technology called WebVR, and I began building. Also, I completed the production of a brand guideline for the VR application, so I decided to unify the brands for the web platform as well. With that, I completed building my online platform and WebVR platform.

The programming languages I used to implement WebVR are HTML, CSS, and Java Script. Plus, you can view this website in a browser, and is also viewable with a VR headset. With this advances, I was able to design a system capable of smoothly transitioning from practicing your own and other people's stories, to practicing interviews. All these may be completed while wearing the VR headset.



UNIFY THE BRAND

I completed the production of a brand guideline for the VR application, so I decided to unify the brands for the web platform as well. With that, I completed building my online platform and WebVR platform.

VIRTUAL REALITY IMPLEMENTATION

VIRTUAL REALITY IMPLEMENTATION

IMPLEMENTING THE PROTOTYPE WITH VERIZON FELLOWSHIP TEAMMATES

First, all members of the team set milestones for the development of a VR application together.

- Jan 29 Research: Need/ Competitor Analysis; Target Audience; Persona; User journey. First meeting: Ideation // Design flow of app
- Feb 5: Prototype 1 (User test): Rough prototype for concept testing
- Feb 12: Prototype 2: Testing the mesh counts/ the quality of level of game objects
- Feb 19: Prototype 2 User Testing
- Feb 26: Prototype 3: Sensors
- March 5: Prototype 3 User Testing
- March 12: Prototype 4: Final tweaking
- March 19: Finalize presentation and documentation
- March 23: Final demo presentation and feedbacks

We developed a product design document. The concept revolves around allowing people with social anxiety disorder to gain confidence through gradually clearing levels in the VR application. As described below.

Prototype Goal

Develop working demo of a public speaking training scenario. With this prototype, our team hopes to illustrate how the user will be interacting with the AI agent in order to give this agent the appropriate information to personalize the training experience and eventually lead the user to a training scene.

Problem

Currently, there is no effective way for cognitive behavioral therapists to make sure their patients are practicing coping techniques in a safe environment outside of their therapist's office.

Target audience

Adults or adolescents with any form of social anxiety (For the purpose of this prototype, we are testing with a population of individuals who stutter and present symptoms of social anxiety as a consequence of their stuttering).

Use case

A user who suffers from social anxiety due to their stuttering hopes to reduce their anxiety levels for an upcoming interview. The user uses Vrbal on a daily basis before the event to practice effective coping skills using systematic desensitization that will help them be less anxious.

Solution

Vrbal is a smart VR experience that uses machine learning to helps the user prepare for a specific anxiety inducing event of their choice by creating step-by-step daily tasks in order to gradually expose the user to the situation.

Additionally, we also conducted a Competitive Analysis to see whether there were other competing products.

1. Mimerse: Reduce cost of therapy, more accessible. No customization/ AI
2. CleVR: Customizable by therapist, Not accessible, you need to use it with therapist
3. Virtually Better: Higher accuracy because you're with a therapist, Not accessible, No AI
4. SimSenSei: Uses facial / voice recognition (computer vision), Not immersive
5. Virtual Speech: Detailed measurement / feedback, Remote access, Dry measurement, not user-friendly
6. Game for autistic kids: Gamification, more fun, Not immersive, no use of AI, no measurement
7. Google glass for autistic kids: Facial recognition, no therapist needed, Only measure facial expression

Further, we created a minimum user flow for the initial product.

- User: "I'd like to feel less nervous when presenting"
- User: "In two weeks."
- User: "Yes."
- User: "Probably 8"
- Let's start level 1…
- In the conference room

To clarify the AI function, we tested Watson Unity ADK.
https://vimeo.com/253917802

We also conducted an interview with Daniel in order to investigate the kinds of circumstances under which the symptoms of stuttering might be triggered. We found that being in places with loud noises can cause severe stuttering. Because of this, the decision was made to implement a noise function while the VR peripherals are being worn.

In addition to this, we also conducted interviews with Speech Language Pathologists, professionals in the area of stuttering. Part of the rationale for this was our belief that by including VR applications along with their regular therapy methods, speech language pathologists may be able to more effectively ameliorate the symptoms of stuttering. As a result of these interviews, we were able to glean the following impressive quotes from two of the SLPs.

"Stuttering is like an iceberg. The only way you'll ever get over your fear of stuttering is by addressing what's underneath the surface level."

"Specific verbal and physical behavior is developed by individuals to avoid stuttering."

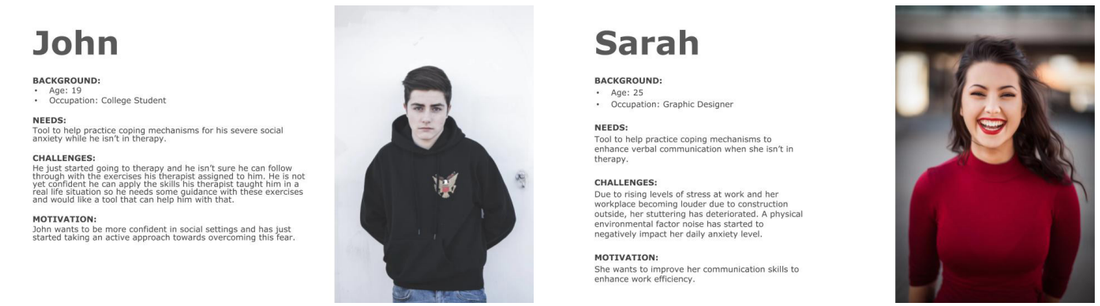
"Our therapy is structured. Firstly we help patients become more aware of the situations, then help to reduce fear and negative reactions to stuttering."

The method above is called as "Systematic Desensitization". Systematic desensitization is a behavioral technique commonly used to treat fear, anxiety disorders and phobias. Using this method, the person is engaged in some type of relaxation exercise and gradually exposed to an anxiety-producing stimulus, like an object or place. We decided to include the above method in the VR flow. In other words, we decided to include in our VR application a method of therapy that involves repeating alternate doses of tension and relaxation, combining this with the Step-by-Step approach method which forms the base of the concept of our thesis statement.

VIRTUAL REALITY IMPLEMENTATION

PERSONA

First, all members of the team set milestones for the development of a VR application together.



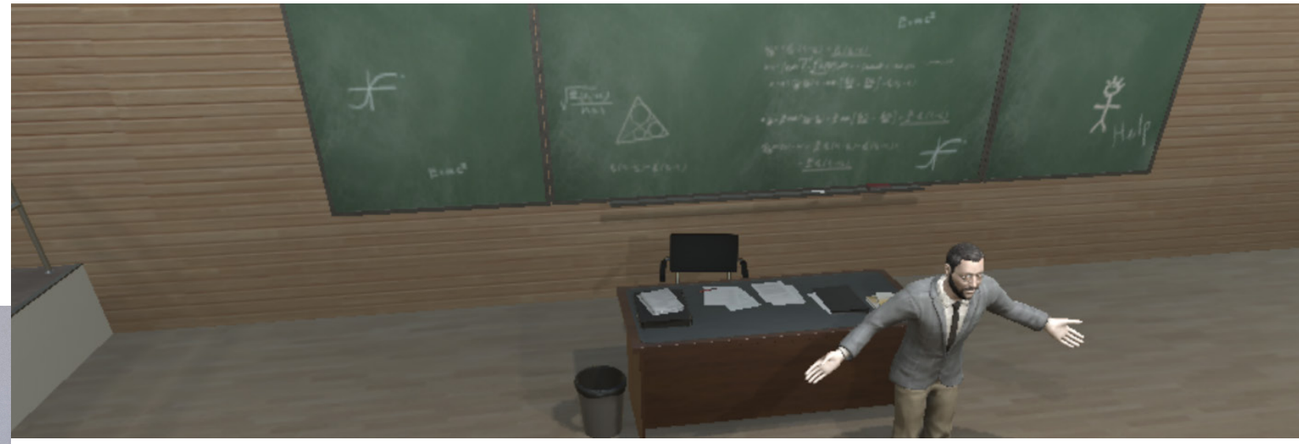
As a next step, we created a paper prototype, collecting an even larger amount of feedback on the scenes of relaxation and tension. Additionally, we decided to leave the preparation of vocal engagement and the assets for certain scenes to be started in the next stage. It was also decided that assets focused on scenes of tension and relaxation would be collected, due to our decision to apply the Systematic Desensitization method.

FIRST USER TEST

To start with, we conducted user tests of relaxation scenarios. We designed 3D screens using gentle music and soft colored backgrounds, and then had users actually don the headset to ascertain how they felt. A total of six individuals participated in this test. Below are screenshots from actual video used. According to the feedback we received from the actual tests, the combination of sound and soft colors were relaxing enough as to make participants feel drowsy.
https://youtu.be/g-iSo3HtF6A

Further, we conducted tests of the assets actually used in the relaxation scenes and collected feedback. Below are screenshots from the video. According to the feedback we received, the color saturation was a bit strong, and it might be easier to relax if slightly softer colors were used.
https://youtu.be/-6E1UI5nbyM

At this point in the process, we were contemplating a structure for the application which involved measuring the user's level of anxiety with sensors and advancing them to the next level once they reach a state of lessened anxiety. For this reason, we researched what sort of anxiety might be expressed by stutterers. As a result of this research, we hit upon indicators such as eye movement, heart rate, and perspiration. During the next stage, we began the implementation of concrete sensors.



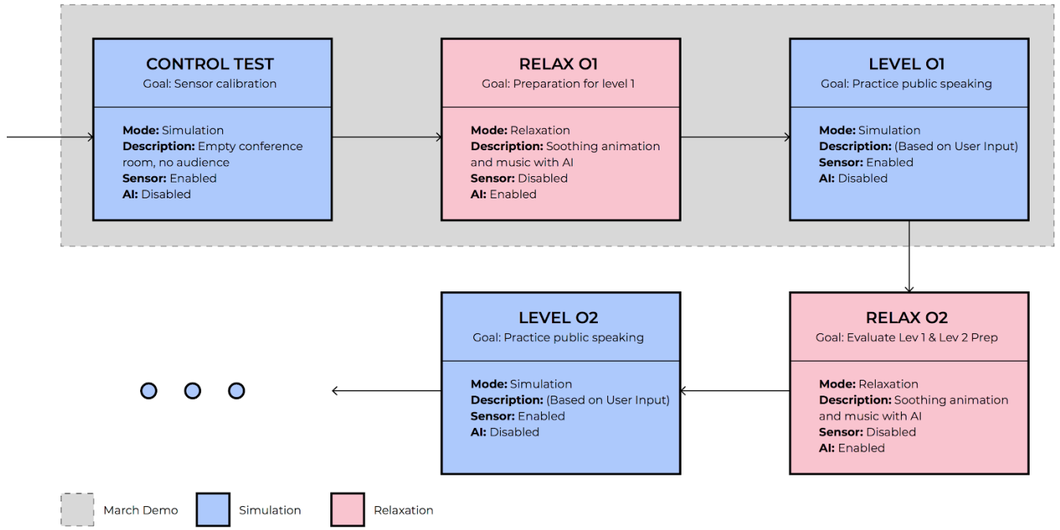
In addition to the relaxation scenes, we carried out initial testing on the tension scenes. A virtual classroom was created as a prototype in unity, and was viewed with Google Cardboard VR. The feedback gained as a result suggested that even faced with 3D figures, when the user is actually sitting in a chair, the scene is likely to induce tension. Thus, from users' actual experience of the tension scenes, we learned that it is necessary to take into account elements such as the user's line of sight, and whether they are sitting or standing when constructing scenes.

VIRTUAL REALITY IMPLEMENTATION

SECOND USER TEST

We also had our mentors from the Verizon Fellowship try out the final version of the prototype.

USER FLOW



Afterwards, we collected several assets likely to bring about a more relaxed state of mind and assembled them into a video. We then showed this to our fellowship mentor and received feedback on which scenes worked the best. Links to the video are below.
https://youtu.be/7qEOJ9OIjjw

Low-poly **Realistic**

After showing all of the above scenes to our mentor, the highest rated scene was the low-poly desert scenes. For this reason, the desert scenes were used in the first prototype. Additionally, we prepared test assets for the following interview scene, in addition to preparing a tension scene filmed with a 360 degree camera.

First, the scene we recorded in the Auditorium is as follows:

This failed to inspire feelings of tension in the subjects and it was thus decided it would not be used. Next, we conducted user tests to determine which scenes, between the low-poly or 360-degree versions, were most appropriate for relaxation scenes or tension scenes.

VIRTUAL REALITY IMPLEMENTATION

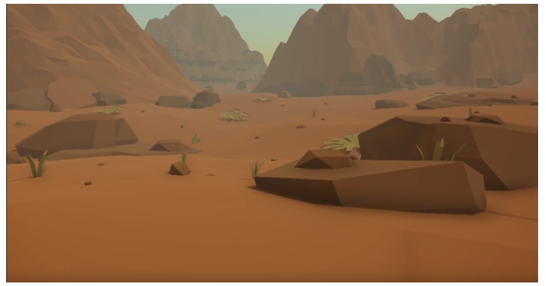
THIRD USER TEST

This time, we created a prototype for the VR application using all of the assets used last time. To begin, we used IBM's Watson for the user navigation AI. Then, we asked: upon actually conversing with the AI, which inspires greater tension, 360-degree or low-poly scenes? Which inspires greater relaxation? To find out, we carried out user tests. Through these tests, we were also able to gain feedback on the accuracy of the AI.

The following describes the state of the user tests. The results of the actual tests are as follows: Four of the test users said that they preferred the realistic environment for the practice simulations but they also expressed that it was too blurry and difficult to see. The other two expressed that they preferred the model based simulations and also expressed that they felt anxious when they say the model of the woman sitting behind a desk. Half of the users expressed that the positioning in the 360 videos was odd. Due to the preceding results, we decided to use the 360-degree method, which is able to portray more realistic situations, for the tension scenarios. The biggest issue that made itself known during this round of tests was that if the 360-degree recording device was of normal quality, the image quality of the video when actually viewed through the VR headset would appear to be poor and indistinct. We also decided to use the low-poly version for the relaxation scenes. The actual scenes used for user tests are as follows:

360-degree scenes of relaxation and tension
https://youtu.be/QgezbEOXays

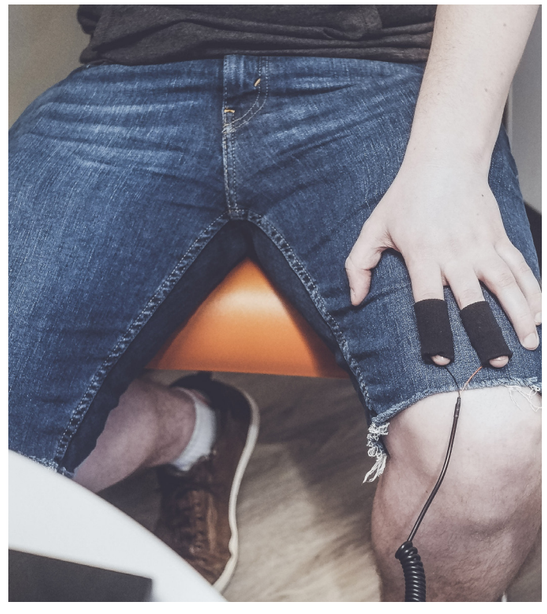
Low-poly scenes of relaxation and tension
https://youtu.be/r_iDK0L_69s



In addition, a GSR sensor was used to track levels of anxiety during user tests. The device's proper name is Galvanic skin response sensor, and it is a sensor which identifies levels of anxiety by tracking the amount of perspiration on a subject's skin. The state of the transition between levels of anxiety as measured by the sensor from one stutterer is shown in the video below.

https://youtu.be/Zqz4m1TNpBM

Upon actually employing the sensor, however, we came to understand that the reliability of the data was low. In some cases, the sensor reacted hypersensitivity even when the user reported feeling no anxiety. Due to this fact, the use of the GRS was abandoned after this initial test. In its place, the application was configured so advancement to the next level would be triggered by a direct declaration from the user to the AI that they would like to move to the next scene.



The main points of useful feedback gained with respect to the AI are as follows:

"AI is very sensitive to sound so the experience needs to run in a quiet environment. Quality of the internet connection also affects the agent's performance (delays or repetitive responses)"

"AI agent is still listening in level 1 scene. This is very distracting for the user as they are trying to focus on the interview."

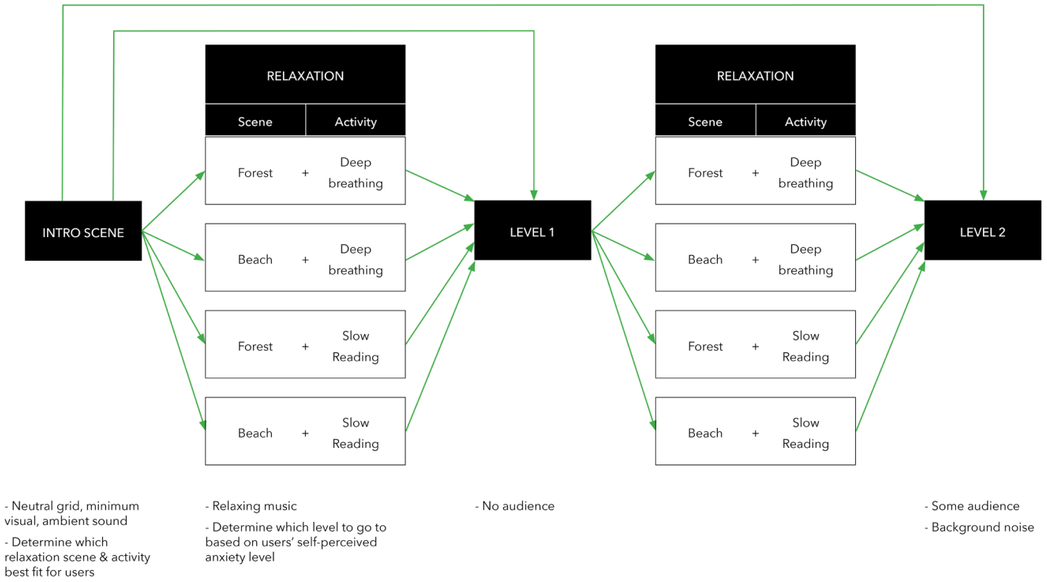
Based on the feedback above, we came to understand that conversing with the AI was a very important element in the immersiveness of the VR experience. Additionally, due to the fact that the GSR sensor would no longer be used, we decided to focus on deep learning in order to improve the quality of the AI. Also, we got an insight that all users were disoriented when they entered the control scene. They did not know what they were supposed to be doing. So, we decided to add an intro scene to navigate users when they start using the VR app. A total of seven individuals participated in user tests of this prototype. The completed VR demo video from these user tests can be found below.

https://youtu.be/OQtoU_bJ37U

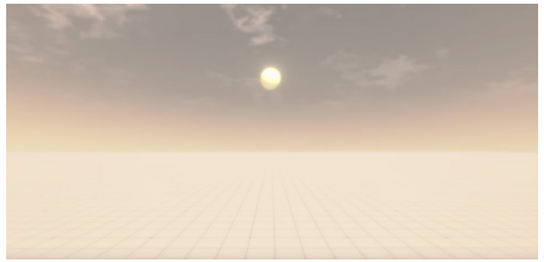
FOURTH USER TEST

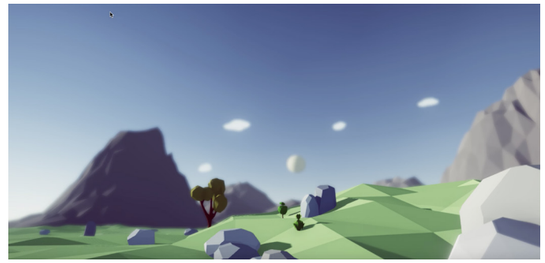
Based on the knowledge gained during the previous round of user tests, we made it so the user can advance to the next scene after conversing with the AI. Additionally, we increased the number of relaxation scenes. The user flow from the previous round was updated, resulting in the following version:

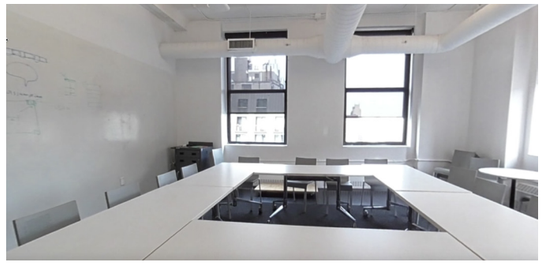
https://youtu.be/uKwaSOpoEfQ

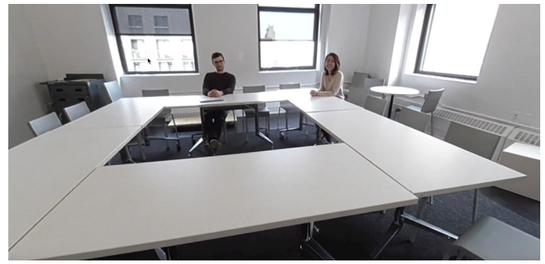


In addition to the desert scene, beach and forest scenes were added. From the previous hearing, we learned that the scenes which help people relax vary depending on the individual, so we aimed to include as much diversity as possible. Further, an introduction was added to the point when the user first starts up the VR application, in order to reduce confusion about how to proceed. All of this was learned from the previous round of tests. During the intro scene, the AI talks to the user, explaining features and how how to use the application.









With this, implementation of all assets was complete. As a final user test, a VR application combining the assets and AI was prepared, and tests were carried out. A total of six individuals participated in this user test. To summarize, according to the feedback gained from this test, most responses were extremely positive. Firstly, the improved accuracy of the AI made smoother conversation possible. Additionally, many people said that coming face to face with realistic people in the 360-degree video environment resulted in symptoms of nervousness/tension, including blushing and sweating. Beyond this, with respect to the relaxation scenes, users said that the relaxing music, together with the scenes of the forest or ocean allowed them to psychologically achieve a feeling of peace of mind. Not only that, but, similar to a therapist or meditation instructor, the AI's style of encouraging things such as deep breathing and a relaxed posture was highly praised by test users. Users said that being able to achieve feelings of relaxation before moving to the tension scenarios was a very refreshing experience.

We also had our mentors from the Verizon Fellowship try out the final version of the prototype.

After completing the final user tests, we created a video to introduce the completed version of VRbal. With this, a total of three rounds of user tests had been completed, with a total of 19 user tests performed overall. At this point, the portion off the process which focused solely on the VR application was completed for the time being.

https://vimeo.com/261867472

VIRTUAL REALITY IMPLEMENTATION

FINAL DEMO DAY

As the final step, the product was presented at the fellowship's Demo Day. The implementation as of Demo Day offers navigation via artificial intelligence up through Level 2, and multiple members of the audience were able to try it out. The response from audience members was extremely positive, and we received coverage in several articles. The venue was a a co-working space near the university called The Alley, and we printed booklets and posters, making a strong push to promote the value of VRbal as a product. We also received many encouraging words from people with stuttering and social anxiety disorder. Going forward, we'll be moving into a Final Intervention phase with the goal of offering an experience that combines the VR application with an online platform.

FIRST INTERVENTION

FIRST INTERVENTION

COLLECT THE FEEDBACK OF WHOLE PROCESS QUANTITATIVELY

I decided to collect quantitative feedback regarding the Thesis idea. To do that, I posted ideas that explained all the different processes on Facebook to gauge community reception. The Facebook group that I made the post in is named Stuttering Community, a public Facebook group which people around the world who stutter can participate in. By actually posting on the online platform about the idea of the VR application, I got lots of positive reactions. The following is one part of the feedback I got.

Nikhil Desai
"Hi Yuka, good to hear about your thesis, your field of study and the exciting project you are working on. What makes it even more exciting is the things, I share in coming with those. Like the subject of thesis, field of study aligns with my profession and how your project helps to address things. I work out of NYC, near Wall St. Do let me know, if I could be of any support to your project."

Hanan Hurwitz
"Great work, Yuka. I tend to agree that a large part of our difficulty in finding employment is due to our self-limiting thoughts and beliefs. Helping PWS find employment, and reach our full potential, involves educating both PWS and potential employers. Thanks a lot!"

Eurico Carrasco
"Hope it creates more awareness and limits discrimination."

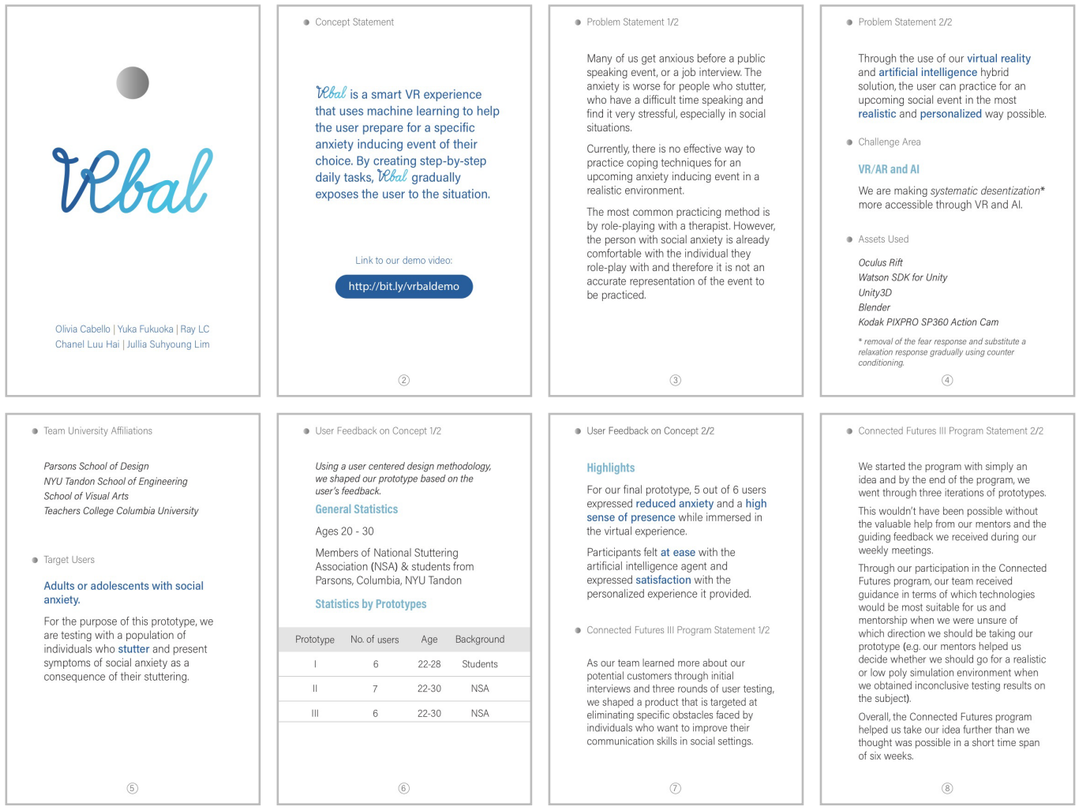
Because the post drew enthusiastic responses, we were able to gather a large number of test subjects to participate in user testing of the VR application. There was a total of 10 people who posted stories on the online platform and participated in the user testing of the VR application. In the user tests of just the VR application, we were able to conduct user testing on a total of 19 users.

CREATING THE BRAND GUIDELINE OF VRBAL

In order to promote VRbal more effectively and increase people's recognition of it, we decided to integrate the online platform and VR application brand which were previously separate. The initial online design that I created for storytelling was very basic. The background color was white and the main color was green. Only essential functions were implemented. I prepared all the brand guidelines, adopted the background color used in the VRbal intro scene as the secondary color, and used blue as the primary color to call to mind technology. The concept behind the logo is to speak fluently. During the fellowship, I decided to unite the design of all the Components based on that, as well as to create guidelines with my teammates.

First, I decided to design an experience so that the user could experience the entirety of the product more smoothly. Starting with the online platform to share stories, I put a link to a website that advertises WebVR and and the product itself, the VR application VRbal. This made it possible to jump to all product links from the online platform. Below are the brand guidelines actually created.

We also created a website to advertise the VRbal product itself. This website focuses on the VRbal product. What kind of functions does it have? What are the use cases? Also, where can I experience VRbal? Such information can be verified on the website. This was actually exhibited publicly at the Demo day of the Verizon Fellowship.



FIRST INTERVENTION

UNIFYING THE BRAND

In order to unify the VRbal brand, I decided to create a landing page that displays the concepts and visuals of individual ideas. First, I created a website wireframe to organize the concept of how to show it. That is shown below. The URL of the webpage that we implemented and launched is below. With this, we were able to fully unify the VRbal brand. Next, we advanced into the Final Intervention phase. Up until this point, I had only received feedback online, in user tests on a one-on-one basis, as well as from user interviews. However, in Final Intervention, starting with creating and sharing stories, practicing interviews with VRbal through the use of actual face-to-face interactions with each other, it is possible to experience a series of flows. By doing so, we can get more reliable feedback. After all the work was completed, along with a WS notice poster, we made posts to invite participation in the workshop. We also posted the unified brand website and were able to gather participants from the final workshop after getting them to understand the VRbal concept and function.

VRbal Website
https://vrbal.io

FINAL INTERVENTION

FINAL INTERVENTION

MEASURING SUCCESS

This is the final phase of the thesis project. In order to see how the overall flow functioned, a workshop was held at an open space called vrbar in Brooklyn. All of the participants had submitted personal stories to the online platform prior to the workshop.

I got an open space in Brooklyn called the vrbar, where for only $28 people can use VR for as much as they would like for 30 minutes. I have received permission from the owner to download the final VR applications and the online platform at this bar. And so, if any users would like to continue practicing interviewing on the VR app, coming to this location will make that possible.

A number of people were gathered at this open space prior to the workshop commencing. The names of the participants were Mohit, Sang, Yuko, and Daniel. I prepared the questions listed below in order to receive relevant feedback. If they agreed strongly with the statement they answered the question with a 5, if they didn't agree at all they answered with a 1. Personal comments were also collected on the feedback sheet.

FINAL INTERVENTION

COLLECTING THE FINAL FEEDBACK

Following the workshop, the participants responded to the questionnaire listed below.

1. Please rate your impressions of this VR experience.
2. Would you like to visit vrbar occasionally in order to continue using this app?
3. Do you believe that creating a story is helpful in interviewing for a job, and helpful for explaining the symptoms of stuttering?
4. Do you believe that practicing socializing scenes via a VR app are necessary for interviewing for a job?
5. Do you believe that talking about stuttering with others will result in an acknowledgment of your own stuttering?
6. Do you believe that acknowledging your own stuttering will eventually lead to building your confidence?
7. Did the story you submitted help when practicing the VR app?
8. Did seeing other people's stories or your own story on WebVR before practicing for the interview help you in the practice?
9. Did you experience any psychological change after practicing the VR app compared to before?
10. Did you experience any change when actually interviewing or speaking in front of others after practicing the VR app compared to before?
11. Did the relaxation experience you underwent in VR actually help you feel relaxed?
12. When actually speaking in front of others in VR, did you experience any feelings of tension?
13. If you can think of any ways to improve the VR app, please let us know.
14. Please write down the differences in levels of social anxiety (as a percentage) that you feel for each of these situations: before submit ting the story, after submitting the story, and after submitting the story and practicing on the VR app.
15. Before submitting story:
16. After Submitting Story
17. Practicing VR app
18. After going through the entire process of submitting a story, watching that story on the VR app, and practicing the interview, please share your thoughts about the experience.

As a result of conducting this workshop for Final intervention, I received some very useful insights. The following is a summary of this feedback.

1. Online Platform

Reading the personal stories of other users made me feel more motivated to share my own story. Talking directly with others while simultaneously being able to view their story on the screen or in the WebVR also gave me motivation to update my own story. These discussions helped me be able to look at my own story from a more objective standpoint. Because of this I felt like my story was once again proving to be a valuable experience. The four part Hero's Journey template allowed me to better organize my experiences. It also helped me realize that during an interview, I will need to figure out how to concisely summarize my story into spoken words that fit within a certain time limit.

2. WebVR Platform

Looking at my own story with the VR headset equipped prior to doing the VRbal interview practice served as a useful reminder since memory of exactly what I posted faded over time. Viewing my own story within the 3D web browser also felt like a new experience. However, the text within the VR was displayed overhead, making it difficult to read since I had to constantly look up. Discussing different topics with everyone while the online platform was displayed on the big screen was more fun than the WebVR. Hearing everyone's comments in regards to the story I submitted gave me confidence. If pictures and videos related to the story could be shown in the background, it would make for a better visual experience. Music would be nice as well.

3. VRbal - Virtual Reality App

The interview practice takes places in a room with 360 degree video footage of many different people sitting in chairs all facing you; I felt very embarrassed. Because of this, I was able to practice introducing myself while feeling the same kind of nervousness I would during an actual interview. In order to properly converse with the AI without the outside world interfering, the interview had to take place in an open space like that at vrbar, which felt kind of strange. An app where you can practice in your own home would be much more convenient. When the AI was encouraging you to relax by having you do things like deep breathing, I could feel myself relaxing. It was almost a meditative experience.

4. Overall Feedback

If VRbal was actually made into a product, I think it would definitely help people who suffer from social anxiety brought about by stuttering. In the past I have spent a lot of money on therapy, so if I could use this app everyday instead I would be able to save a lot of money as well. It would also benefit the people who don't have the money to spend on care by giving them access to appropriate Speech Language Pathologists. However, in its current state the project may not be able to motivate people to want to continue using it regularly.

"By writing my own story I was able to face the complex I had about stuttering head on. After that I was able to understand my own story from a more objective perspective by talking to others. After going through the entire process, I have more confidence and am able to accept my stuttering as a part of who I am."

Among all the feedback I received, these words were the most positive and uplifting.

With the information gained from this workshop, I was able to understand which functions and issues of Final intervention need to be improved for a better experience.

Over 20,000	80%	100	10
PAGE VIEW OF WEBSITE	**CONTINUE USING**	**LIKED ON FACEBOOK**	**SUBMITTED STORIES**

FINAL INTERVENTION

DANIEL MALLON FEEDBACK

Following the workshop, the participants responded to the questionnaire listed below.

Online Platform

"I really enjoyed having a place to write about my stuttering story, both from where I started to where I ended up, discussing emotional events along the way. It was reassuring to have a place to also read other people's stories, and getting insight on how similar people faced similar struggles and learning how they dealt with it. It was nice to have a community where I didn't feel alone, and a place where I could both give and receive comments on our personal journeys. I think if this gained more users it could have potential for a very successful online support group!"

WebVR

"Similar to the online platform, it was nice to have a unique experience and an interesting way to view other people's stories and learning about their experiences with their stutter. One critique I could give is that it would be beneficial to center the layout of the text, as looking directly up to read the stories may become tedious after a point. Other than that I really enjoyed it, and think it's a fun way to learn about people in similar situations."

VR Product

"Very entertaining! But more importantly, very helpful to people who stutter (or even just wish to practice their personal skills) and are about to experience the world of job hunting and job interviews. This product could help people deal with anxieties as well as learn new things about how they handle certain interview environments, in a safe place to be able to make mistakes without consequences. One recommendation I could offer is to have a difficulty setting, something to edit the experience to make it as leisurely or as stressful as the user wants. Inn doing this, they have a wider ranger of practice simulations to work with, broadening the target audience of potential users."

LEARNING

LEARNING

COMMUNICATION BARRIERS AND FAILURES

I came up against communication barriers. This occurred in February 2018, during the second half of the project. In the phase of actually testing the prototype, I had almost lost the trust of the target audience due to my insistent demands for their cooperation with the tests. Because I had assumed that the product I was developing would benefit them, my communication with them lacked compassion and respect. I believe this was unacceptable as a project leader, and I immediately explored a strategy to solve this. Finally, I attempted to solve it using a technique from Authentic Leadership, a book I read on leadership theory. Below is a summary of Authentic Leadership.

For actions which I carried out specifically, firstly I carefully expressed my own honest feelings. I apologized for my impoliteness thus far, and then I conscientiously put my sense of values and passions into words. I wrote this in a long email. After this, I received replies from everyone, and they agreed to cooperate on the user test. In short, I was able to regain their trust. Through this incident of communication failure, I learned the importance of always expressing your thoughts honestly. I also learned that unless you respect the culture and backgrounds of your target audience, you cannot accomplish social innovation. The reason why is that trying to solve social problems inevitably involves long-term projects. When this happens, it is difficult to manifest results with great impact by focusing only on short-term goals. I learned that as a social innovator, placing emphasis on long-term perspectives is extremely important. As an example, Bill George, who wrote a book related to Authentic Leadership, stated the following in the Harvard Business Review:

”It sure does. Unfortunately, many boards of directors were looking for a charismatic leader can who could come in from the outside and save the company. Most of these people, with two exceptions, destroyed much more value than they ever created. And boards looked more for charisma than character. They looked more for style than substance, and they looked more for image than integrity. And if you choose charisma and image and style instead of character, substance, and integrity, you’re going to get a leader that does not do the job for the long term.” - Bill George

FOR THE NEXT STEP

As a leader developing this thesis project, I leaned an enormous amount. I learned that you must always act in accordance with the other party’s context and culture. At a glance, this seems very simple. For example, when you think of the problem of stuttering, if you get to know one person with this issue deeply, then you assume that other stutterers must have the same problems. Humans are extremely flexible in their thinking about the existence of the unknown, but once they have been biased, it is extremely difficult to change this. Because of this, it is important to remove all your biases at all times, and continue to contribute flexibly. I also experienced firsthand the fact that the longer I tackle the same problem, the more my brain fills with biases. The essence of the problem in Japan and the United States is different. This is natural as they have different cultures, but I was able to realize my own weakness in stubbornly clinging to the insight I had struggled to gain. Thinking about this from the point of view of Authentic Leadership, it is a contradictory phenomenon. The reason behind these are the three factors from Authentic Leadership listed below.

1. Self-awareness: An ongoing process of reflection and re-examination by the leader of his or her own strength, weaknesses, and values
2. Relational Transparency: Open sharing by the leader of his or her own thoughts and beliefs, balanced by a minimization of inappropriate emotions
3. Balanced Processing: Solicitation by the leader of opposing viewpoints and fair-minded consideration of those viewpoints
4. Internalized Moral Perspective: A positive ethical foundation adhered to by the leader in his or her relationships and decisions that is resistant to outside pressures

Above, it is stated that continuing to act with passion is extremely important. However, at the same time, passion includes the danger of thinking being fixed as bias. Be that as it may, social innovation is essential, and thus one of my biggest lessons is that it is important to continue the project while bearing in mind the danger mentioned above.

NEXT STEP

MAKE VRBAL SUSTAINABLE

In order to make the product VRbal more sustainable, I am working on making a more concrete business plan. It would be very difficult to continue development if there is no funding. With the current model, the next closest step would be to sell the application as a downloadable app on places such as the Oculus app store. See below for images.

The main business plan is outlined below. Profits are expected to be gained solely from the VR app. The online platform would initially be provided for free. If the business goes on track, I am thinking of adding a subscription system through which users would pay for particularly outstanding stories. My team currently considering two market approaches, direct sales or sell to therapy service providers. For pros, cons and pricing details of each approach.

Direct sales

- Pros: Direct sales offer a larger target markets and there are people looking for training tools that they can use outside of therapy of fice.
- Cons: This approach requires expensive inventory, and initial advertising cost. It might also be difficult to reach our potential customers beyond help and social groups.
- Pricing Strategy: To begin with, I am planning to generate revenue by charging users to access application services. It can be a freemium model where the first week is free and then users will have to pay or subscribe to practice more.

Sell to therapy service providers

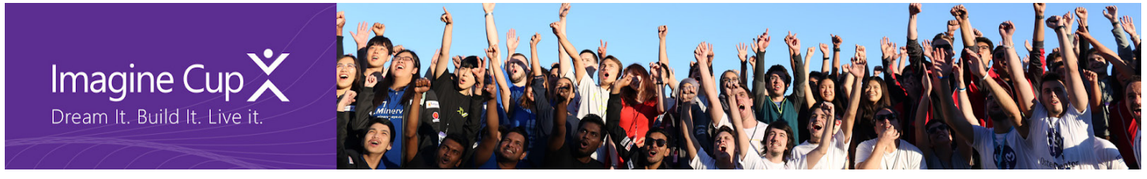
- Pros: JIT inventory (Just-In-Time, meaning I am only manufacturing to order) will help us eliminate inventory cost and it's easier to access existing patient base through the therapists.
- Cons: I need to get an approval from the FDA which can be a long process and I also need supports from stutter therapists and other speech professionals
- Pricing Strategy: I will only provide VRbal through the therapist service providers and generate venue from a subscription-based service with them.

Partnerships with tech companies or NGOs: This approach can be combined with either of the approaches mentioned above.

Pros: many big companies, including Microsoft, have philanthropy grant that I could tap into. These tech companies will benefit from our partnerships as well. It's known that ESG factors (Economical, Social and Governmental) is currently a trend for big corporations and "when integrated into investment analysis and portfolio construction, may offer investors potential long-term performance advantages."

My VRbal team is carefully considering the pros and cons of each approach as I pitch our ideas to more users and experts. I also think that we can start with a consumer-facing app before evolving into a formal therapy application later on.

Additionally, as mentioned in the Final Intervention part, I have established a partnership with vr-bar, an open space in Brooklyn where visitors can enjoy the facilities after paying a fee. More specifically, I had the VRbal app installed onto their gaming laptops. With this, anyone who wanted to practice and ease their tension before interviews were able to do so by paying $28 for 30 minutes of VRbal. The owner of vrbar, Kishore Doddi was able to see an increase in customers. In other words, we were able to develop a mutually profitable partnership for both parties. Thanks to this, I can continue providing VRbal to its target audience even if the project comes to an end. Also, I applied to the US Imagine Cup Competition organized by Microsoft and was able to qualify as a fellowship member. This is a technology fair that takes place only once a year. Check the website below for details.
https://imagine.microsoft.com/en-us/Country/Details/US



12 teams have been selected as finalists throughout the United States. For this reason, I will be traveling to San Francisco in May 2018 to deliver my pitch. Because this is such a well known competition, the pitch in San Francisco is expected to get media exposure and is an opportunity to develop connections with plenty of investors. If I can pass through the stage in San Francisco, I will have a chance to participate in the final in Microsoft's headquarters in Seattle. Winning the final round would result in opportunities to connect with even more investors and people in the tech industry. It would be possible to establish long term relationships with technology and business mentors in Microsoft. I am also planning to apply to entrepreneurship programs organized by universities such as NYU.

MAKE IT SCALABLE

As 1% of the population suffers from stuttering, this is an issue with huge impacts. I am thinking beyond the American market to further scale out the product. As stated above, after successfully establishing the business, I am thinking of developing products not just for America, but also the Japanese market. I have successfully connected with an individual developing VR products for stuttering in the Japanese market. We have been working together to plan user tests for VR products in Japanese clinics and schools.

I am also working with organizers to design workshops for the huge annual conference organized by the National Stuttering Association. It will be held in July in Chicago this year. The event has a large number of participants and the product will be incorporated into product workshops as a part of the employment support program. This will lead to greater awareness about the product. I expect the business to progress more smoothly as result. Also, by having a large target audience test out advanced versions of the product, I also expect to receive a lot of feedback.

CONCLUSION

CONCLUSION

MY ACHIEVEMENTS

The final goal that I had set for my thesis was a change in mindset, in order to get stutterers to not think that stuttering is a complex that needs to be hidden. Through the continued use of VRbal, I hope that the the image of stuttering goes from a negative speech impediment to a positive, special part of one's personality. I hope that, in order to achieve that, I will be able to continue to raise the quality of VRbal through development, leading to successful experiences like having stutterers pass interviews to increase, allowing them to be able to improve their self-confidence.

In addition, the final goal I set was a change in values, in order to get stutterers to not think that stuttering is a complex that needs to be hidden. Through the continued use of VRbal, I hope that the the image of stuttering goes from a negative speech impediment to a positive, special part of one's personality. I hope that, in order to achieve that, I will be able to continue to raise the quality of VRbal through development, causing successful experiences like having stutterers pass interviews to increase, leading them to be able to acquire self-confidence.

PROJECT SUCCESSES

In this project, I measured the success with qualitative and quantitative data.

Regarding quantitative data, the page views of the online platform where stories could be uploaded exceeded 20,000. In addition, when posting ideas to the Stuttering Community on Facebook, the number of likes exceeded 100. When compared to other posts, which on average did not even reach 10 likes, I was able to understand that this was a product that gathered goodwill from a very large number of people. Also, as the number of stories posted on the online platform produced as a prototype exceeded 10, I was able to complete the project as a fully-functional deliverable.

Moreover, in terms of qualitative data, I mainly received feedback from the workshop opened as a Final Intervention. In response to being asked whether or not experiencing the entire flow from start to finish left them with more confidence, 60% of testers answered "Yes." In addition, in response to a question asking whether they would want to continue using VRbal for a long time, 80% of people answered "Yes."

Moreover, as qualitative data, I mainly received feedback from the workshop opened as a Final Intervention. In response to a question asking whether or not experiencing the entire flow from start to finish left them with more confidence, 60% of testers answered "Yes." In addition, in response to a question asking whether they would want to continue using VRbal for a long time, 80% of people answered "Yes."

GENERAL LEARNING

I had never improved the quality of my ideas while actually doing test runs on users, just acting only on the first idea that comes to mind, never researched end users when I worked in the company. However, this time, while doing research, I also did ideations and execution together with the users. My most significant lesson was that I should never work on a project just by my ego. By answering the needs of the users, I can design solutions specifically catered to the root of their problems. That is how a designer capable of stirring up a social innovation should be. When I graduate, I would like to work as a designer able to understand the needs of end users.

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