Department of Engineering

GNG 1103

Deliverable F - Customer Feedback and Prototype 1

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Submission Date: March 6th, 2022

Table of Contents

Introduction

The pandemic has brought and unleashed a lot of tensions between people, especially in regards to people from minority groups. Unfortunately, this has also increased the amount of overt and subtle discrimination towards these minority groups. As a potential solution for this problem, the client, Professor Anis Hanan from the University of Ottawa, has asked us to create a virtual reality (VR) simulation that will increase the empathy a person feels. In this deliverable, we will cover the analysis of the critical components, the results and analysis of our first prototype, how the feedback and comments of the client was used to improve our design, the updated design, the test plans for Prototype 2, and the plan updates for the entire project.

Analysis of Critical Components

The critical components of this prototype are related to Subsystem A, which is the narrative content. The narrative is part of what will determine how effective the solution is because it is a major contributor for making the user feel empathy. The storyline will have the user be in the perspective of a minority character. The minority group that will be the focus will be a character with a disability, specifically one that requires the character to use a wheelchair.

The storyline will have the user go to a face-face interview at a coffee shop for a job position as an elementary school teacher. The user will experience both subtle and overt discrimination because of their disability from the inteviewer, and then experience being rejected for the position. This storyline was based on the experience of Dayniah Manderson, a tenured teacher in New York with fourteen years of experience who uses a wheelchair [1]. It was decided that the narrative would be directly based on the story of another person or author because none of us

have the skill set or experience necessary to precisely and accurately describe the experiences of a person who uses a wheelchair. We are all able-bodied, so if we were to write the story completely by ourselves, it may come off as inauthentic, offensive, and ableist.

This narrative's topic was chosen to involve employment because one group of our target users is the student body of the University of Ottawa. Many students are currently working and/ or looking for a job, so this story's message on topic can elicit empathy from the users because of some of the common difficulties the users and the character face when searching for employment. Then, the discrimination against the character should further cause the users to feel empathy because combined with the difficulty of looking for a job, the biased views of the interviewer should show what it is like to be in the character's position because of the character's disability. It was also in first-person to make the story more immersive for the readers.

Prototype 1 Test Plan, Results, and Analysis

After meeting with our client last week, she made it apparent to us that the most crucial part of our VR simulation is the storyline. She advised us to put more focus into creating a narrative that would promote empathy towards the user, and to disregard the technical attributes of our VR simulation for a later date. Taking our clients' feedback into consideration, our first prototype test plan was regarding our narrative in order to test if the readers felt empathetic towards the individual in a wheelchair. The table below is the first prototype test plan. We had created a google form containing our storyline which was accompanied by a list of questions (see below) to gauge the readers thoughts and opinions about it.

1. Which character do you most identify with?
2. Do you feel like a bystander to this situation?

3. Why do you feel or do not feel like a bystander?

4. How did you feel reading this story?

5. Do you think this happens often nowadays?

6. Were you aware these situations are still happening around you?

7. Do you think you could have done something differently in this situation?

Table 1: Prototype 1 Test Plan

Test ID	Test Objective	Prototype and Testing Description	Results and Their Usage	Estimated Test Duration
1	To make the user have an empathetic response to our narrative.	Showing several people (ideally those who do not have EDI training) the storyline and seeing their response to our questions and their review of it. This will be done through a Google Form. There should be a minimum of 10 people to test this.	Average review on the storyline. Answers to the questions at the end will also indicate what we can change and improve. This will indicate whether Subsystem A is working.	5 to 10 minutes per person Start: March 2nd, 2022

We received 14 responses which are summarized in the results table below.

Table 2: Prototype 1 Results

Female to male respondents	Percent of University of Ottawa students	Percent identifying with the interviewee	Percent that felt like a bystander in the situation

78.6% : 21.4%	71.4%	92.9%	64.3%
Reasons for feeling like a bystander	**How readers felt after reading the story**	**Did the readers think this happens nowadays?**	**Did the readers think these situations still happen around them?**
→ do not identify as a person with a mobility disability → have never been in such situation before where they were discriminated in the same way → a visual component was lacking	→ empathetic towards the interviewee → betrayed by the interviewer → brings back memories and similar past experiences → shocked, frustrated, and angry	→ almost all said yes	→ almost all said yes → some thought that the world had adapted and had changed → Our story gave them a better understanding of what certain people go through → Our story reminded some people that these issues are still prevalent

Feedback and Comments

Most of the users felt empathy and anger for the main character, and it was noted that all of them knew that these discriminatory interviewing practices still happen. So most of the target specifications for the narrative were met. However, many felt confused about a question regarding the immersivity of the story because of how it was worded. Although it was worded vaguely on purpose to avoid adding our own biases and stimulate the user's opinions with their own preconceived notions. The immersivity will need to depend more on Subsystem B and C to balance out the results for the prototype testing Subsystem A, so Prototype 2 will focus on testing the immersivity of the simulation. Many also felt that there was not anything actionable

and effective that the interviewee could do to improve the situation, and it could only change if the interviewer's attitude changed.

Updated Design

Since our last deliverable, our narrative has changed to the following:

The morning of my job interview brought excitement and anxiety. I had applied to a teaching position at a new school and I have been looking forward to this all week. From what I gathered over the phone and email conversations, my potential employers seemed thrilled to meet me, expressing their interest in my skill sets from my current job and the many years of experience. There could have been hundreds, maybe even thousands of applicants for this position, yet I made it to the first round of face to face interviews after passing through three rounds of phone interviews. It almost seemed too easy. This job would fit me so well given my expertise, all I had to do was go in there and convince them what I already believed, that I'm the best candidate they're going to get.

I met my interviewer for the first time at a coffee shop. Soon after I came in, I saw the smile leave her eyes. I noticed the fidgeting, a symptom of her discomfort. Instead of asking about my expertise and leadership style, she asked me how capable my physicality was, and how I'm able to get the students to listen to me. Something had changed. It all came clearly to me. She kept glancing below my torso every so often, and eyed towards the two wheels on either side of me. I've been using a wheelchair to get around for so long now. I can use gripper aids to reach high shelves, and I've gotten very good at maneuvering it around. I've done this kind of work before, why question my ability now?

Wheelchairs have never been a major issue for me, until this interview. It never occurred to me that using one would do this, that the organization was putting all of my chances of getting this job in the hands of someone who decides whether I'm respectable enough in my current state.

Later, I was informed that I was not selected for the position.

The Bill of Materials has not changed, and the immersivity will mostly rely on Subsystem B and C instead. The table below is the updated specifications table.

Table 3: Design Specification for Functional, and Non-functional Requirements of the Simulation

Rank	Design Specification	Relation	Value	Units	Verification
Functional					
5	Tells a story (user experience)	=	yes	N/A	analysis
5	Conveys a message (user experience)	=	yes	N/A	test
4	Has to use virtual reality (technical)	=	yes	N/A	analysis
Nonfunctional					
5	Non-disorienting (user experience)	=	yes	N/A	test
4	Intuitive to navigate (user interface)	=	yes	N/A	test
4	Bug free and reliable (technical)	=	yes	N/A	test
2	Short duration (duration)	=	5	min	test
Constraints					
1	Cost	<	50	$	analysis
4	Provided in English (technical)	=	yes	N/A	test
	Age	>=	18	years	analysis

Prototype 2 Test Plan

Prototype 2 will focus on mainly integrating Subsystems B and D. This prototype is mostly focused on the technical aspects because the narrative has already been tested in Prototype 1 for testing its ability to cause the user to feel empathy.

Table 4: Prototype 2 Test Plans

Test ID	Test Objective	Prototype and Testing Description	Results and Their Usage	Estimated Test Duration
1	Testing if the simulation begins when the start button is chosen. The prototype only needs to have one scene to test this.	Going into the simulation and seeing if it will run once the start button is chosen. We will see if the simulation starts. This is one test that will let us see if Subsystems B and D are properly integrated.	Seeing if simulation begins, and timing (in seconds) how long it takes to load. This is a test that can show us if there is something wrong with the code.	1 minute. Start: March 6th, 2022
2	Testing if the video can play in the simulation. The prototype does not have to be complete (ie. only have a couple of scenes from the narrative).	Going into the simulation and running only a couple of scenes. This will test if the video is playing properly.	Seeing what clips will play. This will be used to determine what clips play the best (like clips that do not take up a lot of space).	5 to 10 minutes. Start: March 6th, 2022
3	Testing if the images and	Going into the simulation and	Seeing what clips and images	5 to 10 minutes.

	video clips are legible. The prototype does not have to be complete (ie. only have a couple of scenes from the narrative).	running only a couple of scenes. We will see how blurry or clear the visuals are.	are legible/ good quality. This can show us what visuals users find disorientating, This is one of the tests that will determine what clips and images we will use.	Start: March 8th, 2022
4	Testing if the clips freeze or if images are not loading. The prototype does not have to be complete (ie. only have a couple of scenes from the narrative).	Playing through a couple of scenes in the simulation. We will see what clips are freezing and what images are not appearing.	Seeing what clips and images are not working, and timing (in seconds) how long it takes to load. This is one of the tests that will determine what clips and images we will use.	5 to 10 minutes. Start: March 8th, 2022
5	Testing if the user can exit out of the simulation at any time. The prototype only needs to have one scene to test this.	Going into the simulation and running only a couple of scenes. We will see if exiting at any time is possible. This is one test that will let us see if Subsystems B and D are properly integrated.	Seeing if exiting at any time is possible (only from a couple of scenes of what we have created so far), and timing (in seconds) how long it takes to load. This is a test that can show us if there is something wrong with the code.	5 to 10 minutes. Start: March 6th, 2022

Conclusion

Through analyzing what makes a good short story about implicit bias, we extracted some key concepts about pulling emotion, and first person immersivity which we put into a short story. We then launched a survey to determine if our story had the intended effect. Based on the reponses, the emotional response was what we intended, but the immersivity could have been improved. Therefore, our next prototype will focus more on building a simulation in VR.

Wrike Link

https://www.wrike.com/open.htm?id=829679480

Reference

[1] D. Manderson, "Does my wheelchair make you uncomfortable? How my disability may have cost me a job." USA Today, October 8, 2018. [Online], Available:

https://www.usatoday.com/story/opinion/voices/2018/10/08/disability-access-job-interview-teach er-discrimination-ada-ableism-accommodation-column/1501095002/, [Acessed: Mar 2, 2022].