Project Deliverable B - Needs, Problem Statement, Metrics, Benchmarking and Target Specifications

GNG 2101 Group A4.4

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Introduction

As the world we live in becomes more diverse, it is critical that we are able to empathize with one another and truly experience what it's like to live life from someone else's perspective. This will not only allow us to close the empathy gap that exists between people, but also break down the socio-economic barriers that divide us as a society. Hanan Anis, our client for this project, is seeking a tool for users to immerse themselves in other people's lives that are different from their own.

One of the most complex perspectives to empathize with is that of a veteran. From enduring major injuries during deployment to developing post-traumatic stress disorder (PTSD), many veterans suffer from both physical and mental trauma. Our goal is to develop an immersive experience that utilizes virtual reality (VR) technology which allows people to step into the shoes of a veteran and experience a day in their life. This will unveil the overlooked challenges that veterans undergo on a daily basis and thus provide users a deeper understanding of the difficulties veterans face. Developing this empathy is significant as it will lead to the generation of new ideas focused on solving veteran-related challenges such as mental health, accessibility and more.

Provided below are the client needs and the problem statement that arose from those needs. Moreover, we provided metrics to measure the efficiency of our product and use other empathy development products as benchmarks on these metrics. Finally, we provided our team's target specifications based on the metrics.

Client Needs

The following table outlines the requested needs of the client from the project background and our interview with them. The needs are ranked from 1 to 5, which represents their importance in the experience, where 5 is of highest priority and 1 is of lowest.

ID	Needs	Priority
1	The experience is free	1
2	The experience is interactive	5
3	The experience is engaging	5
4	The experience is accurate	5
5	The experience is user-friendly	4
6	The experience is accessible to all	3
7	The experience seeks empathy from users towards issues they do not face	5
8	The experience focuses issues one might face such as: race, gender, sexual orientation, religion, visible or invisible disability, etc	5
9	The experience tells a story	4
10	The experience fosters new perspective to the user	4
11	The experience relates to users who can relate to the experience	2

Problem Statement

Given the needs above, the following problem statement was defined to be:

The need for an experience that fosters empathy towards other people's challenges and circumstances. The experience needs to allow users to put themselves in the shoes of others and gain new perspectives that they might not achieve in their day to day life. In order to deliver this need, the experience will be conveyed via VR technology.

Metrics

Metric #	Need #s	Metric	Type	Imp	Unit
1	3, 5	Frame rate	Non-functional	5	FPS
2	3, 5	Loading time	Non-functional	4	s
3	6	Memory	Non-functional	2	GB
4	6	File size	Non-functional	2	GB
5	1	Development cost	Non-functional	3	CA$
6	3	Duration	Non-functional	4	min

Benchmarking

	1,000 Cut Journey	Becoming Homeless: A Human Experience	"Now, After" (PTSD From A Soldier's POV)	Veterans Empathy Project
Company	Virtual Human Interaction Lab Stanford University	Virtual Human Interaction Lab Stanford University	BlueThreeProductions	Veterans Empathy Project
Description	"An Immersive Virtual Reality experience in which participants embody a Black male, Michael Sterling, experiencing racism as a child through disciplinary action in the classroom, as an adolescent encountering the police, and as a young adult experiencing workplace discrimination."	"Spend days in the life of someone who can no longer afford a home. Interact with your environment to attempt to save your home and to protect yourself and your belongings as you walk in another's shoes and face the adversity of living with diminishing resources."	"Disturbing images and haunting flashbacks plague a young soldier recently returned from the war in Iraq. Re-adjusting to his former life as a college student proves to be more difficult than he ever imagined - connecting with veterans of wars past may be just what he needs."	"to bridge the gap in the United States today between veterans of foreign wars and civilians who never served in the military"
Pictures (VR/Video Links)	https://stanfordvr.com/1000cut/	https://stanfordvr.com/becominghomeless/	https://www.youtube.com/watch?v=NkWwZ9ZtPEI	https://veteransempathy.lehigh.edu/
Customer cost	Free	Free	Free	Free
Frame rate	Hardware dependent, generally around 90 fps	Hardware dependent, generally around 90 fps	30 fps	N/A

Loading time	Hardware dependent	Hardware dependent	Hardware and network dependent	N/A
Memory	16 GB	8 GB	N/A	N/A
File size	100 GB free (must use SSD)	3 GB	74 MB (720p)	N/A
Development cost	Unknown	Unknown	Unknown	N/A
Duration	12 min	7 min	13 min 45 sec	N/A
Interactive	Yes	Yes	No	No
Product format	Virtual reality	Virtual reality	Video	Lesson plan
User friendliness (1-5, 1 being very user friendly, 5 being not user friendly at all)	2	2	1	4

Target Specifications

Metric #	Metric	Unit	Marginal value	Ideal value	Reasoning
1	Frame rate	FPS	>85	>90	If the VR experience's frame rate is regularly below 90 frames per second (FPS), the user is likely to experience motion sickness, nausea, and other negative user effects.
2	Loading time	s	<90	<80	Low loading times are important for a good user experience. If the experience takes too long to load, users will likely abandon it.
3	Memory	GB	<10	<8	Reducing memory usage will help the VR headset to maintain performance so it can run smoothly.
4	File size	GB	<5	<4	Saves disk space, allows easier and faster downloads over the internet.
5	Development cost	CA$	<60	<50	Keeping development costs low saves money and makes sure we limit unnecessary expenses.
6	Duration	min	15	12	Allotting enough time allows for users to get a full experience.

Conclusion

Prior to meeting with our client we assumed that we would be assigned an issue based on the client's past experiences. However, through meeting with our client professor Hanan, we realized that this was not the case and that her goal was to develop a library of immersive experiences to build empathy within the community. After we were familiar with our client's needs, we then shared our initial prototype idea which was to build a VR simulation showcasing the journey of a new immigrant in Canada. Professor Hanan enjoyed the idea but also explained to us to keep thinking and brainstorming new ideas based on our own previous experiences. Our team took this advice to heart and we had a brainstorming session to form new ideas based on our own backgrounds. In this brainstorming meeting, Engy shared with us her experience volunteering at Montfort Hospital where she met and cared for veterans who struggled with PTSD and physical and mental health. This personal story from Engy deeply inspired our group and we decided that we wanted to pursue an idea that would give back to veterans as they have given us the opportunity to reside in a safe and peaceful Canada. This idea would not have been possible if it were not for our conversation with Professor Hanan as she motivated us to keep brainstorming and share our past experiences with other members of the team.

Going forward our team still needs to finalize the story of the immersion experience to accomplish building empathy towards veterans in our community. Moreover, our group also needs to determine the technologies and the tools that we will use to develop and build our product. Lastly, we also would like to meet with our client to share our current idea and to receive some feedback and further advice on our idea.