Deliverable C

Design Criteria and Target Specifications

Team F13

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1. Introduction

This document outlines the design criteria for the virtual reality experience requested by the client *Mines Action Canada*. After having a detailed interview with the client, our team have updated and transformed the interpreted needs stated in the previous document titled GNG1103 Project Deliverable B: NEEDS IDENTIFICATION. These needs have been organized in a table where they were identified as function or non-functional requirements and as a constraint. The needs were also translated into different metrics and criteria that were used to create the target specifications of the experience. Our team then conducted an indepth technical benchmarking comparison between existing products that need some of our interpreted needs.

2. Design Criteria

The interpreted needs as identified in Deliverable B – Needs Identification and Problem Statement, are listed in Table 2.1. Each need is then identified as either functional or non-functional, and their associated need is stated. Functional criteria are criteria that affect the final solution of the product. Two additional needs are stated in section 2.1, which were not included in Deliverable B.

Table 2.1

Interpreted Ne	eds and Design	Criteria
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Number	Need	Importance	Functional/Non-Functional Design Criteria Requirements/Constraint		
1	The experience is capable of fitting in a small area.	4	Functional/Constraint	Maximum area (m ²)	
2	The experience is mobile.	5	Functional	Compatible devices File size (Gb)	
3	The experience is individual.	3	Functional	Single player	
4	The experience is brief.	3	Non-Functional/Constraint	Maximum time (min)	
5	The experience is convincing to the user.	5	Non-Functional	N/A	
6	The experience is rated for 'Teen' use.	4	Non-Functional/Constraint	N/A	
7	The experience portrays fictional characters.	4	Non-Functional	N/A	
8	The user can move during the experience.	1	Functional	Accessible controls	
9	The experience is personalized.	3	Non-Functional	Unique stories	

10	The visuals of the experience are cautious of the possible	5	Functional/Constraint	Inclusive
	health concerns of the user.			
11	The experience is interactive.	4	Functional	Few controls
12	The experience is emotional.	5	Non-Functional	User empathizes
13	The experience is bilingual	4	Non-Functional/Constraint	Languages (English/French)
14	The experience is in virtual reality	5	Functional	Viewing medium

2.1.Added Needs:

(13) The experience is bilingual: The experience should be available in both English and French since *Mines Action Canada* is a Canadian humanitarian organization.

(14) The experience is in virtual reality: The experience needs to bring the problem from the abstract to reality using VR technology.

3. Metrics

The identified design criteria can be organized as qualitative and quantitative. The quantitative criteria, called metrics, have been listed in Table 3.1.

Table 3.1

Product Metrics

Metric	Units	
Experience time	Minutes (Min)	
Set up time	Minutes (Min)	
File size	Gigabytes (Gb)	
Video resolution	Pixels (P)	
Cost	Dollars (\$)	
Movement space	Meters squared (m ²)	
Number of buttons on UI	Numbers (#)	

4. Benchmarking

Current products have been researched and identified that meet one or more of the set design criteria for our product. These products offer insight into what is on the market today, which will help when developing conceptual designs and prototypes.

4.1.User Benchmarking

User perceptions, including interactivity and game play are listed for each of the benchmarking products and are all compared.

4.1.1. ICRC: Enter the Room o Free Mobile App

- \circ Uses phone camera.
- How is it interactive:

• User must have a large open space and movement in the experience is based on the user's physical movements.

• User must "enter the room" where they will then experience what it is like to live in a warzone from the perspective of a child.

• The room being entered is a child's room and the user witnesses the gradual worsening of the living conditions, and this is also supported by the sounds; a bustling city and the sound of children's laughter, to silence broken up by the sound of planes and bombs.

• User perceptions:

• Based on user reviews, many were able to empathize with the situation and felt the lack of dialogue added to the user's immersion into the experience. (Enter the Room)

• However, some also added that it would be even more compelling if it was a VR experience instead of an AR experience.

- Many users also found trouble calibrating their phone camera or simply determining how to control the experience.
- Our perceptions:
 - Required too much space to move around and to allow the camera to calibrate
 - Had to be used outdoors which made it hard to become immersed in the experience as we had to be careful not to disturb the people around us

• Felt risky to use outdoors as we had to use headphones to get the full experience and made it hard to know what was happening around us

4.1.2.TARGO: Surviving 9/11

- Free documentary available through the Oculus headset (Surviving 9/11 27 Hours Under The Rubble)
- Shows impactful images from the events of 9/11
- It is personalized by using a testimony from the last survivor to be rescued after being trapped under the ruins
- How is it interactive:
 - Uses panoramic images to allow the user to tour the World Trade Center and the observation deck to view the rest of New York from before the fall
 - Generate images show what it was like to be inside the building when the crash happened and stuck under the rubble for 27 hours before being rescued.
- Our perceptions:
 - Using a testimony as a narrative really immerses the viewer
 - Gave visuals of the event without showing the gory or traumatizing details, simply gives life to Genelle's memories
 - Good use of the Oculus TV headset for a 360° experience
- 4.1.3.Canadian War Museum: Over the Top
 - Free online experience (Over The Top, n.d.)
 - No moving picture
 - Animated drawings
 - \circ How is it interactive:

- User enters their name & a name of their friend to personalize the experience
- At multiple points in the experience the user has the option to choose between two paths which will change the storyline
- User/Our perceptions:
 - Personalized naming often malfunctions, reverts to standard names. This makes the experience confusing due to lack of consistency.
 - The experience isn't immersive enough as you are just looking at your computer screen.
 - The "choose your own adventure" aspect made the experience more compelling and emotional as you had some control over the outcome
 - The experience illustrated the difficulties of being at war and the tough choices veterans must make.

4.2. Technical Benchmarking

The specifications and metrics of the three benchmarked products have been outlined for comparison in Table 4.2.1.

Table 4.2.1

Benchmarking Comparison of Similar Products

Similar experience	Enter The Room	Surviving 9/11	Over The Top
experience	International	Surviving #11	Over The Top
	Committee of the Red	TARGO	Canadian War Museum
Specifications	Cross		
Scenario length (min)	10-15	20	~15
Setup time (min)	~5	~5	~2
File size (MB)	793.4	N/A	N/A
Maximum video	None	1832 x 1920	None
resolution (p)			
Movement space (m ²)	10	Stationary	Stationary
Cost (\$)	Free	Free	Free
Compatible devices	Mobile device	Oculus Quest, Oculus	Personal computer,
		Quest 2	mobile device
Viewing medium	Augmented Reality	Virtual Reality	2D computer screen
Language	English	English	English, French

5. Target Specifications

The ideal and acceptable target specifications are outlined in sections 5.1 and 5.2 respectively. The ideal target specifications are the metrics which, if met, will be deemed as the most optimal solution. Acceptable target specifications outline a solution that is considered to meet the identified design criteria, but that generates a less optimal solution.

5.1.Ideal Target Specifications

Table 5.1.1

Ideal Target Specifications

Metric	Relation	Value	Units	Verification Method
Experience time	<	5	min	Test
Set up time	<	2	min	Test
File size	<	1	Gb	Test
Video Resolution	=	1080	p	Test
Cost	\leq	50	\$	Bookkeeping
Movement Space	\leq	4	m^2	Test
Number of	=	5	Buttons	Test
buttons on UI				

5.2. Acceptable Target Specifications

Table 1.2.1

Acceptable Target Specifications

Metric	Relation	Value	Units	Verification
				Method
Experience time	<	7	min	Test
Set up time	<	3	min	Test
File size	<	2	Gb	Test
Video Resolution	=	480	р	Test
Cost	\leq	50	\$	Bookkeeping
Movement Space	<	16	m2	Test
Number of	=	3	Buttons	Test
buttons on UI				

6. Conclusion

The client meeting had a large influence on our ranking of the relative importance of the criteria. The client put emphasis on specific needs compared to others, which helped rank the importance from 1 to 5. Since the submission of Project Deliverable B: NEEDS IDENTIFICATION, two new criteria have been added based on the needs of the client: the experience must be bilingual, and the experience must be in virtual reality.

7. References

Enter the Room. (n.d.). ICRC.

Over The Top. (n.d.). (Canadian War Museum) Retrieved 02 01, 2023, from https://www.warmuseum.ca/overthetop/

Surviving 9/11 - 27 Hours Under The Rubble. (n.d.). Oculus TV.