

Project Deliverable C

Design Criteria and Target Specifications

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

Sunday, October 8, 2023

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Introduction:

At this stage of the project, we have obtained substantial information of the vision Mines Action Canada has of this product. During the first client meeting, we obtained the information needed to form our problem statement as well as gained insight into what their organization needs from our team. Now that we have generated a problem statement and have pondered what should be prioritized regarding this project, it is now time to use this information to address more specific criteria our design must have. This will entail conducting research on already existing products similar to the one we are trying to produce, constructing a ranking system to prioritize the most important aspects of our design, deciding on a budget for the project, and determining the system requirements of our virtual reality experience.

Prioritized Design Criteria: Technical/Non-Technical & Constraints:

Functional	Description and Design Criteria	Importance
User Interaction	The goal is to take the user through an experience. Minimize user interaction for easy use.	2
Safety and Accessibility	Health conditions should be considered. The experience should be made accessible to as many as possible.	1
Cinematography	Our experience should have quality visuals and camera work to establish another sense of credibility to the audience.	3
Non-Functional		
Empathetic and Relatable	The VR experience should be emotionally provoking.	1
Informative and Captivating	Information will be displayed throughout the experience in a realistic manner. Interesting story line. Good visuals.	2
Audio and Music	Audio should be clear and crisp, without being too loud or too quiet. Integrated into our virtual reality experience will be carefully selected music which is not copyrighted.	3
Constraints		
Fear factor	We do not want to scare the audience, we want to inform them of very real possibilities that could directly affect their lives if no action is taken. We want to instill a strong urgent sense of concern not fear.	1
Appropriate	There will be no gore, triggering words or audio, as well as no displays of abuse of any kind in the VR experience. PG	1
Length	In ≤ 60 seconds we must show an audience a potential reality and timing is a grand factor in that experience.	2

Technical benchmarking:

1. Perspective: Paradise:

Perspective: Paradise is a VR that dives into the 1952 test detonation of the first hydrogen bomb and the effect it had at Enewetak/Bikini Atoll, both upon the environment and the original inhabitants. This is very similar to what we are trying to accomplish in our Virtual reality, we want to basically show how humans would adapt to the new environment involving autonomous robots. This is what the people of Enewetak/Bikini Atoll had to do due to the bomb. The virtual reality is single-player operated.

System Requirements:

- Requires a 64-bit processor and operating system
- OS: Window 10 x64
- 16 GB RAM
- Storage: 3GB available space
- VR support: Steam VR

Specifications:

- Time Framing: During/After Bombing
- Camera Perspective: 360 degrees
- Interactable: The user can move the camera around.

User reviews:

<u>Positive:</u>	<u>Negative:</u>
<ul style="list-style-type: none">● Informative: Learned a lot.● Made users think how insane Nuclear weapons are.● Eye opener and a good teaching tool.● Moving experience.● Free● Simple● 2 languages. Finnish and English	<ul style="list-style-type: none">● Some of the videos can be hard on the eyes.● Long, 30 minutes long.● Very scary● Boring● Educational but not special.● Nuclear explosion did not look real.

2. After Solitary:

After Solitary is a mostly non-interactive virtual reality experience showcasing the long lasting effects solitary confinement can have on an individual's psychological wellbeing. The video follows a man's narrative of how he coped with the experience after being sentenced to solitary confinement at just eighteen years old. The virtual reality experience itself takes place in what a typical cell would look like while the narrator describes events that transpired during his isolation. The narrator delves into dark topics such as the development of mental illness and his experiences with self harm. This virtual reality experience, unlike Perspective: Paradise, takes a story-telling approach instead of just showing the user an off-putting event. An approach like this might prove to be strategic because having a human victim voice their thoughts and feelings regarding a topic tends to evoke certain emotions in people.

System Requirements:

- Youtube.
- Any popular OS.
- WIFI.

Specifications:

- The user can move the camera around.
- Time Framing: After the narrator's solitary confinement.
- Camera Perspective: 360°.

User Reviews:

<u>Positive:</u>	<u>Negative</u>
<ul style="list-style-type: none">● Really good look into what solitary confinement is like.● The video showcases that solitary confinement is an inhumane punishment.● Free	<ul style="list-style-type: none">● The video is too emotional.● It is scary.● The video features disturbing imagery. (Not PG).● Some people still believe the narrator deserved the punishment.

Target Specifications:

Functional Requirements				
Design Specification	Relation	Value	Units	Verification Method
Sensory Components	=	Yes	N/A	Testing
Size of room required	=	2 x 1.5	m	Testing – if the space is big enough/modifying
User movement (can they walk around in the simulation?)	=	No	N/A	Testing/Modifying
Video formats for 360° and VR compatible	=	Yes	N/A	Testing
Display ethical concerns of environment with autonomous weapons	=	Yes	N/A	Testing

Real-world simulation through exhibition of a realistic environment	=	Yes	N/A	Team feedback
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Non-Functional Requirements				
Design Specification	Relation	Value	Units	Verification Method
Size of VR environment				Testing/Remodeling
Safety while using VR	=	Should not require much movement	N/A	Testing
Camera Perspective	=	Interactable , 360	Degrees	Testing/Remodeling
VR quality	≤	90	FPS	Testing
Audio settings	=	Not excessively loud, can be changed	N/A	Testing/Team feedback
Resolution of VR/Video	≤	1280x720	Pixels	Testing
Sound effects/Music	=	Yes	N/A	Testing
Constraints				
Design Specification	Relation	Value	Units	Verification Method
Costs	≤	150	CAD	Calculations/verifications
Software	=	Unity	N/A	N/A
Length of video	=	30-60	seconds	Testing
Violence	=	No	N/A	Team feedback/tests
Aesthetics	=	Simple and captivating	N/A	Team feedback/tests
Size of file	≥	1	GB	Researching
Tolerable for those with health concerns	=	Sensory features should not be excessively flashy/loud/gory	N/A	Team feedback

Metrics:

- User engagement and impact
- Negative feedback

Reflection:

Our client meeting impacted the development of the specific design criteria and specifications, by defining specific criteria and allowing us to interpret what specifications would best fit their needs. For example, the client specifically asked for videos between 30s-60s in length. This specific length was directly inputted into our constraints. The client also stated they desired a video with a simplistic design and no violence. These needs were interpreted into our specifications by stating that the user would not be able to move around in the VR environment, but would have access to an interactable 360° view of the space instead. Furthermore, the client meeting impacted the priority order of our criteria. For example, the client repeatedly stated that they wanted a simplistic design that was convincing with no gore. This repetition was interpreted in our priority list by ranking these criteria among the most important.

Conclusion:

Through the use of raw data collected from the client meeting and research conducted online, our team compiled information, including design criterion, target specifications, and technical benchmarking for the design process aspect of this project. An in-depth reflection was carried out to ensure that our ideas are thoroughly being assessed and reviewed. In addition, our task list was updated to ensure organization, within the team, for upcoming deliverables. Next, we'll create an assortment of conceptual designs that address our problem statement.

Resources:

1. <https://help.irisvr.com/hc/en-us/articles/215884547-The-Importance-of-Frame-Rates#:~:text=Studies%20have%20shown%20that%20in,all%20times%20in%20their%20software.>
2. <https://yle.fi/a/3-10769930>
3. https://store.steampowered.com/app/1016390/Perspectives_Paradise/
4. https://www.youtube.com/watch?v=G7_YvGDh9Uc&t=59s

Note: Our Wrike snapshot was shared with the TA