Project Deliverable C: Design Criteria & Target Specification

Introduction

Upon reviewing and interpreting the needs of our client (Mines Action Canada) we will now list and discuss the technical needs. This document will go over the functional and non-functional requirements, constraints, and technical benchmarking we must do to ensure our final product meets the interpreted needs.

Design Criteria

Functional Requirements

	Design Specification	Relation (>, <, =)	Value	Units	Verification
1	Create a real-world environment where lethal autonomous weapons rule.	=	yes	N/A	Testing Final Product
2	Produce a video demonstrating the final product that can be shown to lawmakers	=	yes	N/A	Testing Final Product
3	Emotionally move audience	=	yes	N/A	Testing
4	Demonstrate how civilians would adapt or lives would change under this law.	=	yes	N/A	Testing
5	Tell a story	=	yes	N/A	Testing

Non-Functional Requirements

	Design Specification	Relation (>, <, =)	Value	Units	Verification
1	Frame Rate *[1]	>=	30	FPS	Testing on Phone and Quest 2
2	Image Quality *[2]	>=	1440/1600	Resolution / Eye	Benchmarking display hardware

3	Portability	=	yes	N/A	Hardware Benchmarking
4					
5					

*1: Low framerates can cause general nausea and motion sickness. 30 fps is standard. *2: Low image quality may cause eye strain. Our standard is based on the Quest 1.

Constraints

	Design Specification	Relation (>, <, =)	Value	Units	Verification
1	Budget	<=	50	$	Keeping Receipts
2	Duration	~=	1	min	Testing
3	Play Space *1	~=	1.5	m^2	Testing
4	Can not refer to specific people or places	=	yes	N/A	Testing
5					

*1: While a play space is not technically necessary for the client, it would be best to add VR functionality so that users can experience the environment for themselves.

Technical Benchmarking

While we will not have the choice between these systems, to demonstrate technical benchmarking we will be comparing hardware options and seeing which one would be best. Currently, there are few competitive options for portable VR headsets. These are the Meta Quest 1, 2 and 3 and the Apple Vision Pro. The Meta Quests (for our purposes) are all the same, the main difference being their screen resolution and price tag.

Product	Quest 1	Quest 2	Quest 3	Apple Vision Pro	Google Cardboard	Priority
Price ($)	~ 200 *1	419.99	649.99	3499.99 *2	~ 10	5
Resolution / Eye	1440/1600	1832/1920	2064/2208	< 4k	Phone Dependent	2
VR Functionality	Yes	Yes	Yes	Yes	No	3
Developing Tools	Yes	Yes	Yes	Yes *3	Yes	5
Score	53	48	48	40	45	

*1: Quest 1 is no longer available; this is Facebook marketplace price.
*2: Apple Vision Pro is not yet released; Price TBD
*3: AVP developing tools are very new and unexplored.

Given our budget, the only thing that we can afford is a Google Cardboard. It may be possible to use the google cardboard, since the client needs a video of a 3d environment rather than a fully functional game. However, the Quest 1 would be the most reasonable option as it has a great game developing community as well as a reasonable price tag.

VR Experiences

Half Life: Alyx – This is a stimulating VR game that it immerses player with great storytelling, character animation, dynamic interaction, and detailed environment. It has depth and realism which keeps the players fully engaged and on the edge of their seats eager to discover more of this virtual world.

Bone Works - This VR game is renowned for its dynamic interaction, realistic combat mechanics, and player agency, which gives the players a high degree of freedom to interact, strategize, and adapt to the virtual world, which enhances the emotions the players feel.

Blade runner: Revelation – It excels at character interaction, immersive atmospheric design, and story-based gameplay that enables players to interact with NPCs and create their own story, which adds emotional depth, prompting players to reflect on the consequences of their actions.

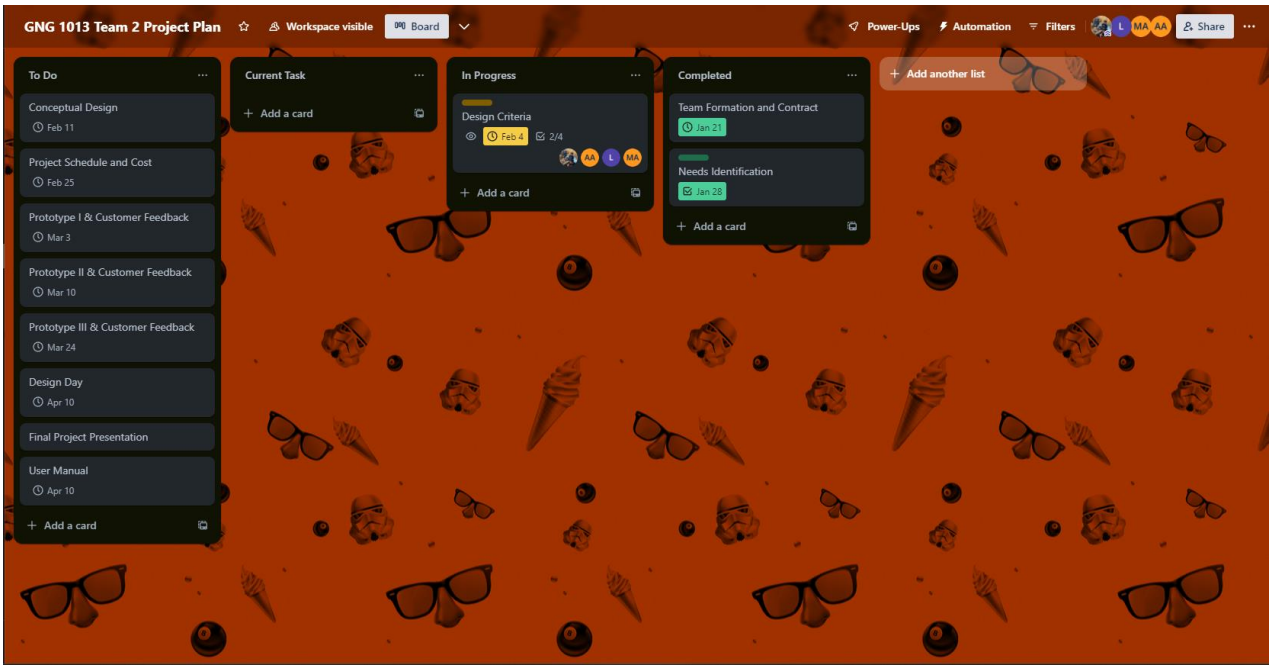
Asgard's wrath – This game shows an impressive deep game play, visuals realism and immersion which engages the player and evokes a wide range of emotions from the player compelling them to reflect on their values and beliefs.

These VR games are technical benchmarks as they possess many specifications that can meet the clients needs which includes creating a real-world environment where lethal autonomous weapons rule, emotionally moving the audience, demonstrate how civilians would adapt or lives would change under this law and tell a story.

Reflection on Client Meeting

Meeting with the client narrowed the focus of our task and gave us direction. Now we know what specifically the client wants, as well as the technical requirements to operationalize their wishes. Knowing this we can know begin ideating and producing aspects of the story to display. We can also research relevant historical events and products to get a better sense of our final design.

Updated Project Plan



Conclusion

In conclusion, throughout this document our team effectively listed and thoroughly discussed the technical needs of our client. We developed a list of functional requirements which included, a design that is emotionally moving for the audience, a design that tells a story, and a design that illustrates a real world environment ruled by autonomous weapons. Moreover, we developed a list of non-functional requirements including, frame rate and image quality. Technical benchmarking was completed by analyzing products made by apple, quest, and google. With design criteria developed our team is ready to begin producing ideas for a conceptual design.