**Project Deliverable C: Design Criteria and Target Specifications**

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**Group 6**

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# Introduction

Mines Action Canada tasked Rust In Peace to create a VR experience that depicts the impact of militarized AI robots on civilian life. After the client meeting, Mines Action Canada’s product needs were analyzed to help develop an optimal solution. In this deliverable, the user’s interpreted needs were used to create design criteria (functional, non-functional and constraints) to help focus prototype development. Additionally, technical benchmarking based on these design criteria was performed on similar existing products, these include: Home After War, Clouds Over Sidraand The Last of Us. The existing solutions were then ranked based on target specifications for Mines Action Canada’s solution. Moving forward, the target specifications established will be used to develop our concepts and ultimately benchmark how effective future prototypes meet the client’s needs.

# Design Criteria

 The interview with Mines Action Canada mentioned several features that were important for their VR experience. Those needs were transformed into design criteria to evaluate the quality of potential solutions. The importance of these criteria were also evaluated on a 1-5 scale based on their relative importance. This was determined based on how much the client emphasized certain features relative to others. This information is summarized in table 2.1. Overall, the Mines Action Canada emphasized creating a simple, environment focused VR experience that is emotionally compelling and inspires a call to action. However, some information such as language preference and specific hardware limitations were not discussed in-depth and will warrant further investigation with the client.

**Table 2.1.** Rust in Peace used Mines Action Canada’s product to establish design criteria, and their relative importance, to help evaluate potential solutions and prototypes. These criteria will be used to guide concept development and prototype testing.

| **Interpreted needs** | **Importance****(1-5)** | **Design Criteria** | **Functional****/Non-functional****/Constraints** |
| --- | --- | --- | --- |
| The VR experience is accessible | 3 | CostHardware requirementsAppropriate for public | Constraint |
| The VR experience is easy to set up and use  | 2 | Ease of UseHardware compatible | Non-Functional |
| The VR experience is simple | 5 | Environment-focusedMainly static elements | Functional |
| The VR experience is realistic to the civilian experience during conflict | 5 | Realism | Functional |
| The VR experience can be highlighted as a video in 30 seconds | 2 | Content curationDuration | Non-Functional |
| The VR experience shows how humans adapt to their living conditions | 4 | Human adaptations | Functional |
| The VR experience generates an emotional response and empathy | 4 | EngagingStory-driven | Functional |
| The VR experience portrays a strong message | 5 | Call to action | Functional |
| The VR experience informs the user of the dangers of AI | 3 | Informative | Functional |

# Technical Benchmarking

There are several existing products that are similar to the solution Mines Action Canada is seeking. To better understand what a good solution looks like, we benchmarked these products based on the design criteria established above. The first product evaluated was Home After War, a VR experience that follows an Iraqi father who returns to Fallujah following the Islamic State’s control[1]. The experience takes place in a single house with the father narrating his experience of returning to a home with dangerous traps. The second product benchmarked is Clouds Over Sidra. This VR experience follows the narrator, a 12 year-old girl and her experience living in a Syrian Refugee Camp[2]. Notably, it was created with a partnership with the UN[2]**.** The third product, The Last of Us, is a video game (non-VR) that follows a teenage girl and father-figure travel across a post-apocalyptic environment with dangerous threats such as zombies and bandits[3]. Although the story is science fiction, it highlights human adaptations to dangerous environments and a compelling story that has won awards and been adapted into a Netflix TV show. The benchmarking results of each of these products are listed in Table 3.1**.** The products were also evaluated against each other to establish which performed based per category and finally overall. Ultimately, Clouds Over Sidra best met the client’s design criteria, was used to develop design target specifications, and will be used to inform concept and prototyping.

**Table 3.1.**

Green = best (3pts), Yellow = moderate (2pts), Red = least (1pt). A weighted sum was scored to determine the product with the best fit.

| Specification | Importance | Home After War | Clouds Over Sidra | The Last of Us (2023) |
| --- | --- | --- | --- | --- |
| Cost | 3 | Free | Free | $79.99 |
| Hardware Requirements | 3 | Youtube-running devices/most VR headsets | Youtube-running devices/most VR headsets | PS4/gaming computer |
| Appropriate for public | 3 | Themes of violence and bombs | A young girl’s perspective | Blood, gore, violence (mature rating) |
| Ease of Use | 2 | Minimal environmental interactions | Automated viewing experience | Complex controls (gamepad) |
| Environment Focused | 5 | Yes - what a home looks like after war | Yes - life in a refugee camp | Yes but focuses on characters and gameplay |
| Mainly Static Elements | 5 | Yes (minimal elements) | Yes (almost no elements) | No (complex interactive elements) |
| Realism | 5 | Computer graphics / real life video | Real life video | Computer graphics |
| Content Curation | 2 | Mostly automated (some interactions) | Fully automated (linear) | Linear story but several paths |
| Duration | 2 | ~15 min  | ~10 min | ~15 hours |
| Human Adaptations | 4 | Yes (improvised explosives, shelter modifications) | Yes (temporary settlements, anti-personnel implements) | Yes (improvised tools, barricades, anti-zombie implements) |
| Engaging | 4 | Passive user experience/ some interactions | Passive user experience | Active user experience and immersive gameplay |
| Story Driven | 4 | Yes - story of father returning home after war | Yes - story of young girl in refugee camp | Yes - story of young girl in apocalypse |
| Call to Action | 5 | Yes - effects of war on civilians | Yes - effects of war on young children | No |
| Informative | 3 | Yes | Yes | No |
| **Total** |  | **118** | **142** | **74** |

# Target Specifications

 Based on Clouds Over Sidra, and the other benchmarked products, an estimate for the target specifications were developed. These specifications are listed in table 4.1. These will be used to develop concepts and measure how effectively a prototype meets Mines Action Canada’s product needs.

**Table 4.1**. List of target specifications developed from benchmarking Clouds over Sidra, Home After War and The Last of Us (2023) against user needs.

| Design specification | Relation (<, >, =) | Value | Units | Verification |
| --- | --- | --- | --- | --- |
| Functional |
| Environmental Adaptations | = | Yes | N/A | Testing/Review |
| Emotion evoking | = | Yes | N/A | Testing/Review |
| Realism | = | Yes | N/A | Testing/Review |
| Engaging | = | Yes | N/A | Testing/Review |
| Story Driven | = | Yes | N/A | Testing/Review |
| Call to Action | = | Yes | N/A | Testing/Review |
| Informative | = | Yes | N/A | Testing/Review |
| Dissuade use of autonomous robots  | = | Yes | N/A | Testing/Review |
| Non-Functional |
| Reliability | = | Yes | N/A | Testing/Review |
| Storage Space | <= | 2 | Gigabytes | Measure |
| Safety | = | Yes |  |  |
| Ease of Use | = | Yes | N/A | Testing/Review |
| Loading Time | <= | 30 | seconds | Measure |
| Response Time | < | 200 | milliseconds | Measure |
| Frame Rate | >= | 30 | Frames per second | Measure |
| Set-up Time | <= | 1 | minute | Measure |
| Constraints |
| Cost | <= | 50 | $ (CDN) | Measure |
| Hardware Requirements | <= | Mid-Range Smartphone | N/A | Test/Review |
| Disturbing Content | = | No | N/A | Test/Review |
| No Deadnaming | = | Yes | N/A | Inspection |
| Duration | <= | 30 | seconds | Measure |
| Deadline | <= | 2 | months | Measure |

# Client Meeting Reflection and Conclusion

 The meeting with Mines Action Canada established what the client wants, but also which needs to prioritize. The list of prioritized requirements will be helpful for creating concepts and evaluating prototypes. For instance, the client emphasized a simple, environment-focused VR experience which can be highlighted in thirty seconds. The client meeting helped narrow down what potential solutions will look like. Furthermore, the client also shared things that they did not want such as excessive violence, deadnaming and stereotypes. Therefore, as designers we can carefully create a solution that avoids these elements. The relative importance of design criteria was also impacted by the client meeting because we were able to gauge through body language, tonality, emphasis and repetition what were the most important features (such as simplicity, emotionality and environmental adaptations to AI robots). However, some information such as language choice and specific hardware choices are missing and will need to be pursued in further client meetings.

 In conclusion, in this deliverable, Mines Action Canada design needs for their VR experience were evaluated and associated with design criteria. The design criteria was then used to benchmark products similar to the client’s need to establish target specifications for concepts and prototypes. With these specifications, the VR environment that needs to be built is clearly defined and ideas can be generated.

# References

[1] “Virtual reality experience,” Home After War, https://www.homeafterwar.net/ (accessed Oct. 8, 2023).

[2] G. Arora et al., *Clouds Over Sidra*. United States: UN SDG, 2015.

[3] “Discover the last of Us,” PlayStation, https://www.playstation.com/en-ca/the-last-of-us/ (accessed Oct. 8, 2023).