Deliverable B

Need Identification and Problem Statement

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Abstract

This report identifies, analyzes, and prioritizes needs for our XR/VR simulation project for the client to raise awareness about the results of climate change. The overriding objective of the project is the creation of user change through a combination of scientifically correct data, immersive storytelling, interactives, pre- and post-simulation assessments for measurement, and a strategic approach toward developing a simulation which will both inform and emotionally engage users. In this regard, this report discusses the context of the problem, identifies the needs of the client, and adopts a strategy towards developing a simulation to both inform and emotionally engage users. This report identifies the need for effective assessment of the proposed solution with quantifiable measurements and offers recommendations for anchoring and informing the design and development process.

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1.0 Introduction

The adverse effects of climate change are increasingly becoming a global reality. Rising sea levels, one of the most direct consequences of climate change, have already displaced millions of people, caused irreversible damage to ecosystems, and disrupted economic activities. Despite these pressing concerns, a significant portion of the global population remains unaware or indifferent to these challenges. Traditional methods of education and awareness, such as lectures or informational videos, often fail to elicit the emotional connection needed to drive impactful change.

Immersive technologies such as XR/VR offer a transformative way to bridge this gap. These tools allow users to experience the effects of rising sea levels in a highly engaging and realistic manner, fostering both understanding and empathy. Through simulated scenarios that demonstrate personal and societal consequences, users can gain a visceral understanding of climate change's gravity, motivating them to take meaningful action.

2.0 Client Needs and Insights

The client seeks an XR/VR simulation that highlights the environmental impacts of climate change. The tool should focus on raising awareness and building empathy by immersing users in a realistic 3D scenario showing how climate change affects lives and communities. The scenario could explore hurricanes, wildfires, conflict, flooding, or water shortages, among other climate change impacts.

Furthermore, the client emphasized the need for the simulation to be engaging, accurate, and an effective learning experience. It should help users understand climate change, its consequences, and its broader societal impacts through storytelling. The virtual story should last between 1 to 3 minutes.

In addition, they also stressed that the simulation must adhere to factual, scientific information. The content should avoid exaggerating or downplaying the realities of climate change, ensuring credibility, and avoiding distress caused by misinformation.

Moreover, the project should reflect values such as leadership, diversity, equity, inclusion, and sustainability. These principles should be embedded in the design to make the simulation relevant and inclusive for a diverse audience while addressing global challenges equitably.

To ensure user well-being, the simulation must include a clear warning about potentially distressing content and provide an option to opt out at the start to prevent unnecessary discomfort.

Finally, the client also suggests integrating pre- and post-simulation surveys to assess the simulation's educational impact. These tools will help measure changes in user awareness and understanding, guiding improvements to align with the project's goals.

3.0 Organized and Prioritized Needs

Need	Priority	Description
Realistic and scientifically accurate	High	Ensure the simulation reflects factual and verifiable climate change data.
Emotional engagement	High	Create scenarios that evoke empathy and motivate users to take meaningful actions.
Inclusive design	High	Address diversity, equity, and inclusion to cater to a wide range of users.
Clear educational purpose	High	Educate users about climate change impacts and provide actionable knowledge.
Pre- and post-simulation surveys	Medium	Integrate tools to measure user awareness and emotional impact before and after the simulation.
Accessible content	Medium	Include opt-out options and content warnings to ensure user comfort.
Story-driven experience	Medium	Connect scenarios through a cohesive narrative for better user engagement.
Sustainability	Low	Reflect sustainable values in the simulation design and message.

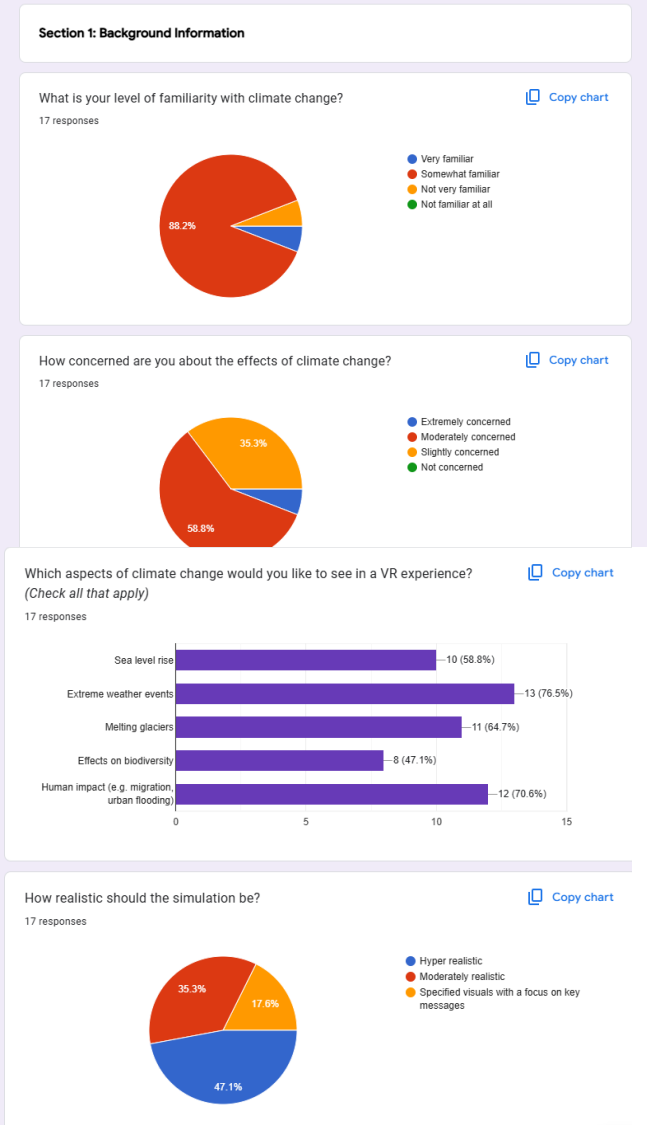
4.0 Problem Statement

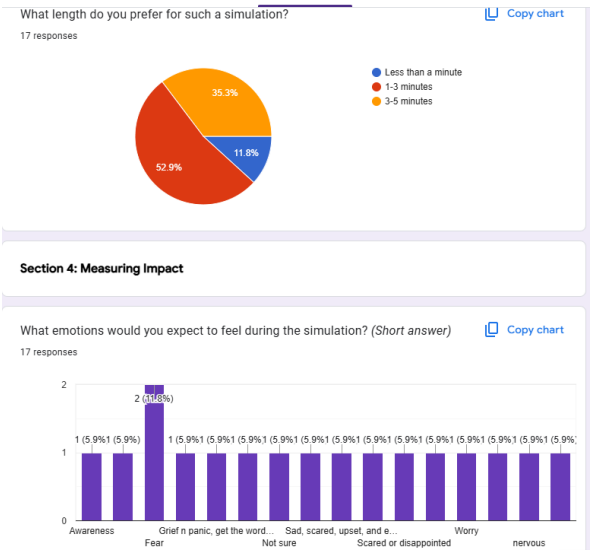
A VR simulation allows the user to deepen their understanding of climate change by immersing themselves in impactful scenarios that inspire empathy and action. The VR simulation will foster empathy towards a rising issue of rising sea levels, extreme weather events, and resource shortages, which continue to be neglected due to the limitations of traditional education methods.

1.1 Data Collected

A survey assessing the knowledge of average students revealed that many are unaware of the impacts of climate change and the urgency of the situation. Many students believe that no meaningful goals can be achieved due to the extent of damage society has inflicted on the planet's balance.

Figure 1-3: Survey





5.0 Conclusions and Recommendations

In summary, this project is aimed at the increasingly serious global climate change issue. It uses XR/VR technology to simulate climate change scenarios represented by sea level rise. The main requirement of this project is that the presentation of the scenes can evoke empathy in users, thereby enabling them to understand the movements taking place on Earth. Additionally, the client's main requirements include authenticity, attractiveness, and sustainability to enhance empathy and educational effects.

During the meeting, we received the following suggestions. Connect the scenes into a story to better present them to users; conduct questionnaires before and after use to collect data and make improvements; create based on real data and historical events; strengthen empathetic content to deepen the theme; and clearly define the educational significance and target audience.

6.0 Future Work

The next steps in this project will focus on developing a VR/XR simulation that highlights the impact of climate change on polar bears, ice caps, glaciers, and the pollution affecting their habitats. The team will create realistic and scientifically accurate environments that allow users to experience the melting of ice caps, shrinking habitats of polar bears, and the adverse effects of pollution. Initial prototypes will undergo user testing to gather feedback on visual accuracy, emotional impact, and accessibility. Based on feedback, the team will refine the simulation to enhance storytelling, connecting scenes to emphasize the urgency of preserving these ecosystems. Pre- and post-simulation surveys will be optimized to measure changes in user awareness and empathy towards environmental issues. Future iterations may include additional scenarios addressing the global consequences of these changes, such as rising sea levels and loss of biodiversity. The final simulation will ensure compatibility across platforms and will be presented to the client for review, ensuring alignment with project goals and audience needs.

7.0 References

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