

Project Deliverable B: **Need Identification and Problem Statement**

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

Objective:

Empathize with your client and truly understand their problems, limitations, frustrations, desires, and needs. Translate their statements into a list of interpreted needs. Then, organize and prioritize their needs and formulate a problem statement. Reflect this information as a team to determine whether you are actually “solving the right problem”.

Instructions:

Teams will put together a briefing (2-page max) regarding their clients' needs. This will be based on their first meeting with the clients.

1. This briefing should contain many needs, which will be identified by empathizing with the clients. Feel free to speak to other potential clients related to the project on your own and to look at other similar products on the market. This will help strengthen your results.
2. It is important to take the time to convert what the client is saying and/or doing into properly interpreted need statements.
3. Once a list of needs has been identified, organize these needs into similar groups and prioritize them, justifying what you do as you go along.
4. Once you are confident that your team has identified all of your clients' needs, use them to formulate a problem statement, including all important aspects, while ensuring that it remains short, specific and sexy.
5. Remember to also benchmark *user perceptions* of similar products (i.e. user benchmarking) to make sure that you have a thorough understanding of the problem and related needs of the eventual and for other potential users.
 1. Remember: your client may not know or be able to put into words all the things that they want or need.
6. There may also be unknown information that needs to be clarified or defined (i.e. issues or questions that were not addressed in the initial client meeting). There may also be new issues or needs that are identified *after* that meeting too. These all need to be documented here and in the next deliverable, depending on when they are identified.

Introduction:

The objective of this document is to determine the needs of the company Mines Action Canada in order to design a solution. The goal of this project is to create a virtual reality environment that demonstrates the ethical concerns of having autonomous weapon systems. We will achieve this by listing the requirements the company has stated, interpreting their needs into a problem statement, conducting technical and user benchmarking, organizing the needs, and prioritizing them.

Raw data (needs) and Interpreted Needs:

Raw data:	Interpreted Needs:
Needs VR to show how civilians would adapt and protect themselves against autonomous weapons.	Have the virtual environment showcase creations and defenses that could possibly be created by civilians given their situation.
Needs the built environment to be realistic, recognizable and immersive.	The virtual environment should have audio and the landscape should look semi-realistic.
Needs video to be short, simple, and creative.	No storylines/characters, only a simple walk through of the altered cityscape.
Need to demonstrate how autonomous weapon systems select their target.	The environment should capture real methods on how the autonomous sensors would work (facial recognition, body temperature).
Videos need to be short to catch attention.	Must be 30-60 seconds long.
Needs to evoke empathy and concern.	Needs a balance between being fearful/concerned of the simulated environment and being hopeful for a better future.
No blood and gore.	Showing destruction of buildings and implied human harm, no images of death or wounds.
Needs to convince the decision makers.	Should be able to make the decision maker concerned enough to realize that it's a problem.

Organize and Prioritizing:Length of video:

1. Needs video to be short, simple, and creative (30-60 seconds)
2. Video needs to catch attention
3. Needs the built environment to be realistic, recognizable and immersive

Persuasive/emotions:

1. Needs to convince the decision makers

2. Needs to evoke empathy and concern

Ethical Concerns:

1. No blood and gore.
2. Need to demonstrate how autonomous weapon systems select their target.
3. Needs VR to show how civilians would adapt and protect themselves against autonomous weapons.

Benchmarking (What other products are out there and customer reviews):

Technical:

Landmines use a variety of sensory systems. They can be activated either from direct pressure from above using a plate system, or they can activate through a motion sensor which would be set to detonate from a predetermined distance. They can only be deactivated by activation or by someone removing them.

Heat seeking missiles utilize thermal sensors to track their targets.

VR Walking Simulation:

https://store.steampowered.com/app/1539640/VR_Walking_Simulator/

User:

- Digital dehumanization: www.stopkillerrobots.org
- Destabilizing nations.
- Will cause inhumane injuries on soldiers and civilians if hacked.
- Will cause collateral damage.
- Discrimination towards race and gender: www.stopkillerrobots.org

Questions (If there are any unanswered questions):

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Problem Statement Ideas (Best ideas highlighted):

- Mines Action Canada wants a video of a VR environment in Canada that **persuades decision makers** not to create autonomous weapons by showcasing the harm that could come to innocent civilians. - Jeanine's Idea
- Mines Action Canada needs a **short, simple, and immersive virtual reality video showing the ethical concerns**, and how civilians would adjust if autonomous weapons were used by the military. - Hannah
- VR environment that displays the **environment that automated robot killers will provoke**. -Marho
- Mines Action Canada needs an empathy evoking virtual reality experience showcasing the damage autonomous weapons could cause to the daily lives of normal people. - Jon

Final Problem Statement and Conclusion:

After organizing the user's ideas, benchmarking and brainstorming problem statements, we have come to a conclusion for our problem statement. Final problem statement: "Mines Action Canada needs a short, simple, and immersive VR video environment to persuade decision makers showing the ethical concerns that automated robot killers will provoke". We will be using this problem statement and list of ideas to create a plan for our solution.