Project Deliverable C: Design Criteria and Target Specifications

Introduction:

Throughout the evolution of our project design, one key step of the design process is the formation of design criteria from the specified and interpreted needs of the client.

Our client's needs were identified, then categorized based on whether they impacted our product functionally or non-functionally and based on whether they were a design constraint. (Functional meaning they directly impacted how the product would operate, Non-Functional meaning they did not directly affect whether the product could operate or not but lacking them may frustrate users/clients). In-depth research was then put into user benchmarking products which reflect similar needs and functions that were interpreted from the client. Through technical benchmarking which set standards based off other products, we were able to qualitatively measure how pre-existing methods of achieving our identified needs have worked in other products, allowing us to measure the value of implementing similar design aspects into our own product or creating a standard which can be improved upon.

Technical benchmarking was used to set standards using products (movies, videogames, etc.) that influence the person watching / playing the game, mainly capitalizing on the methods used to inflict fear or sadness into the viewer's mind.

Through the development and categorization of these criteria, we can create a product which better suits our client's needs and is of the best quality.

Functional / Non-Functional Design Criteria, and Design Constraints (based on interpreted needs):

Set-up Size: The client specified that our experience must fit within a 20x20 ft area, however the product may still operate if it does not fit within that area. Therefore, it is a non-functional design requirement as it does not directly affect whether the product operates or not, however it is a design constraint.

Duration of Experience: The client specified that the duration of the experience we develop must fall within 5-10 minutes, however the product may still operate if it does not fit within that area. Therefore, it is a non-functional design requirement as it does not directly affect whether the product operates or not, however it is a design constraint.

# of Participants Accommodated: The client specified that the experience must include 3-5 players simultaneously, so that is a Design Constraint. However, if our product does not fall

within that boundary, it will still be able to operate, so therefore that is a non-functional design requirement.

Programming Language used for development: The Robomaster S1 is compatible with Python and Scratch, so that is a Design Constraint. If our product does not meet that constraint, it will not be able to operate properly, so it is a Functional design requirement.

User Manual: We must include a user manual in our product, however, if it is not present, the product can still operate, but with significant frustration from the user's side. Therefore, it is a Non-Functional design requirement. Since we have been instructed to include one, that is a design constraint. How we choose to design it, is not constricted.

Environmental Adaptability: Our product must be able to operate at the same level no matter what environment it is placed in, whether it is a noisy one, or a poorly lit one, drawn to a reasonable extent of course. That may not be a design constraint, as we have not been instructed to include this in our product, however it is a functional design requirement as the product does not operate properly without it.

User Understanding: The experience must be immersive and easy to understand for the users. That is not a design constraint. It is a Non-Functional design requirement as without that, the product can still operate, just at the cost of user satisfaction.

Portability: Every piece of equipment needed to set up the experience must fit within a standard size carry on bag. That is a design constraint that was inflicted by the client. However, if it does not fall within that constraint, the product will still operate, it just won't be portable. Therefore, it is a Non-Functional design requirement, and its absence would cause user frustration.

Content Warning: The product must include a trigger warning for certain noises, and bright flashing lights. That is not a design constraint. It is a Non-Functional requirement as the product can still operate without it, however it would cause client dissatisfaction.

Purpose: The experience must highlight a minimum of 3 ethical concerns linked to LAWS. Its outcome must also disappoint the user, and they should always leave with a sense of loss. The experience must also not be sexist, or racist, as one of the key dangers of LAWS is their inability to differentiate between these concepts, as they just continue to eliminate everything in their path. So, while that may not be a functional design requirement, these things are design constraints that were inflicted by the client, so we shall abide by them.

Technical & User benchmarking:

Technical Benchmarks: Similar products that meet design standards and fulfill needs.

User Benchmarking: Based off feedback on similar products.

- Product 1: Terminator Movie
  The movie terminator generates a powerful emotional connection with the audience and shows the dangers of LAWS through a long narrative. It effectively portrays the loss of human life as a result of the implementation of LAWS and AI in war. However, it being a movie, it does not provide much interactivity, and fails to connect with viewers on a deeper level as a result.

- Product 2: Detroit: Become Human (Videogame):
  This game is a very interactive experience, and it allows players to make decision that impact how the storyline plays out, allows them to connect on a deeper emotional level with the ethical concerns of LAWS. However, the game focuses mainly on AI, and while it may portray the dangers of that, it overlooks LAWS, as it has a much broader scope.
- Product 3: Boston Dynamics Spot (Physical Robot):
  This robot is a real-world physical robot. It provides military simulations. It allows users to interact with an example of advanced robotics, and shows how LAWS could operate in war zones. However, since it is a good product, it can glorify the use of LAWS to a certain extent, which is counter-productive.

Citations:

30 Minutes On: "The Terminator" | MZS | Roger Ebert

“Liberty for Androids!”: Player Choice, Politics, and Populism in Detroit: Become Human (openedition.org)

https://www.bing.com/search?q=boston+dynamics+spot+robot+article&FORM=AWRE

Target Specifications:

Mainly, product specifications would refer to weight, speed and dimensions. However, the robomaster S1 already has set dimensions, and weighs the same all the time, and goes the same speed all the time. Depending on developments that our team makes during the design process, this may be subject to change.

Client Meeting Reflection:

The client meeting certainly changed our perspective on the project in a very significant way. We all thought it was going to be a VR project, but it wasn’t. The meeting set our priorities – to an extent – and it also gave us specific design constraints. Now, since we have not actually had any hands-on time with the robot yet, it is difficult to ask good questions and truly reflect on the information we were provided. Luckily, we have a discussion channel with the client, and after next week’s lab, we should have some useful questions for them.