Tab 1

## 1 Introduction

Following the completion of *Deliverable B* we were able to accurately assess the needs of the company and stakeholders, as well as identify them in an organized manner. We were also able to convert this information into a table, grouped together by similarity based on category, and ranked in terms of importance. Now, in *Deliverable C* we introduce a design criteria, also grouped by similarity with appropriate statements concerning criteria. We also conduct user benchmarking, as to compare three products currently on the market and their corresponding specs. Finally, we introduce target specifications, both functional and non-functional to meet the full scope of our products design criteria. This sets ourselves up for success following the completion of this deliverable, and into the next - where we will start designing our product. In the benchmarking section, we compare three products related to gardening and lawn mowing (Green represents the best, yellow in the middle, and red the worst).

## 2 Design Criteria

| **Grouping** | **Needs Statement** | **Design Criteria** |
| --- | --- | --- |
| Constraint/Functional | The final experience must be brief and concise. | The video must be less than 90 seconds |
| The manifesto should be less than be two pages long |
| Non-Functional | The experience must be engaging for the user. | Should include sounds, visuals and text. Experience should include a Narrative. |
| Non-Functional | The experience must be creative and not boring. | The experience should be unique and new (not done before). |
| Should be compared to similar products to ensure originality |
| Functional | The experience should show an alternative use case for the robot. | The robomaster must be a a filmable speed |
| The robomaster take cares of gardens |
| Constraint | The experience must not promote war. | It should not target humans or animals nor should the turret fire at them |
| Constraint | The final installation should be politically neutral. | The video should make no mention of politics or make any political comments |
| Constraint | The experience should be demonstrated on design day | Be able to perform in room temperature |
| Constraint | The robomaster, but be not damaged or changed | There must not be unremovable add ons |

*Table 1: Needs statements, with their corresponding design criteria, grouped by similarity.*

## 3 Benchmarking

| **Device** | **Source [Link]** | **Price [USD]** | **Size** |
| --- | --- | --- | --- |
| Gardena | [Amazon](https://www.amazon.ca/GARDENA-15201-20-SILENO-Minimo-Automatic/dp/B08LNQT5KW?source=ps-sl-shoppingads-lpcontext&ref_=fplfs&smid=A3DWYIK6Y9EEQB&gQT=1&th=1) | $850.40 | 51.82 x 33.99 x 22 cm; |
| Yuka | [Mammotion](https://ca.mammotion.com/products/yuka-mini-s-version-robot-lawn-mower?variant=51771912782188?utm_source%3Dgoogle&utm_medium=cpc&utm_campaign=mammotion-shopping&gQT=1) | $1,499.00 | 20.7\*16.3\*11.1 in. |
| Tertill | [Tertill](https://tertill.com/products/tertill) | $149.00 | ~ 10 X 10 X 10 (inches) |

*Table 2: Three existing products on the market, with their price, and size.*

| **Device** | **Weight [kg]** | **Mowing Distance [sq.ft]** | **Maximum Slope** | **Battery [hrs]** |
| --- | --- | --- | --- | --- |
| Gardena | 12.64 | 2700 | 25% | 24 |
| Yuka | 10.5 | 6534 | 45% | 24 |
| Tertill | Not Specified | 200 | 7% | 1-2 |

*Table 3: Three existing products on the market, with their corresponding specs.*

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## 4 Target Specifications

| **Design Specifications** | **Relation (>,=,<)** | **Value** | **Units** | **Verification Methods** |
| --- | --- | --- | --- | --- |
| Alternative Use | = | Yes | N/A | Analysis and test |
| Video length | < | 90 | Seconds | Checking timestamp on video |
| Manifesto length | < | 2 | Pages | Checking page numbers |
| RoboMaster S1 speed | > | 5 | km/h | Configuration in iPad app |

*Table 4: Design Specifications, with corresponding numerical quantities, for functional requirements.*

| **Design Specifications** | **Relation (>,=,<)** | **Value** | **Units** | **Verification Methods** |
| --- | --- | --- | --- | --- |
| The experience must not promote war. | = | Yes | N/A | User Feedback |
| No targeting of human | = | Yes | N/A | User Feedback |
| Non-political and neutral messaging | = | Yes | N/A | User feedback |
| Robomaster must not be changed | = | yes | N/A | Don't add modifications |
| Operating Temperature | = | 20-25 | Celsius | Test |

*Table 5: Design Specifications, with corresponding numerical quantities, for constraints.*

| **Design Specifications** | **Relation (>,=,<)** | **Value** | **Units** | **Verification Methods** |
| --- | --- | --- | --- | --- |
| Original Design | = | yes | N/A | User Feedback |
| Immersive experience | = | yes | N/A | User feedback |

## *Table 6: Design Specifications, with corresponding numerical quantities, for non-functional requirements.*

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## 5 Reflection

During the client meeting we were given information on parameters of the RoboMaster, and expectations for the visual experience and manifesto. Given this info we determined functional constraints for the video and manifesto length and the speed of the Robomaster. The primary goal of this project is to create an immersive experience that makes a clear, concise statement about the problems associated with training students to program autonomous weapons systems, and provide alternate uses. The client also emphasized that the video would be shown to diplomats and students, thus should be a respectable quick icebreaker into the subject. This helped us decide on the ranking of design criteria by emphasising the importance of how to use the RoboMaster for alternative uses to prevent it from being seen as a “killer robot.” There have been no changes since deliverable B, because there has not been a meeting since. However, there have been some additions to the user statements, such as showcasing the project on design day, and no permanent modifications added to the robomaster.