

GNG 2101

Introduction to Product Development and Management for Engineers and Computer Scientists

**Project Deliverable B: Needs, Problem Statement, Metrics, Benchmarking and Target Specifications**

Lab Section: A02, Wednesday, Lab Group A7

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| Student Number |  | Name |
| 300077504 |  | Prisha Shetty |
| 300122381 |  | Liam Kennedy |
| 300062079 |  | Jeta Thavarasah |
| 300117908 |  | Joshua Coutinho |
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Professor: Dr. Hanan Anis

PM: Cooper Lawrence

TA: Jaya Kandimalla

Faculty of Engineering

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**Interpretation of Client Needs and their Importance**

Client needs are ranked based on the system outlined as follows:

1 - being the least important

5 - being the most important

|  |  |  |  |
| --- | --- | --- | --- |
| **Needs #** | **Client Statements** | **Interpreted Client Needs** | **Importance (1-5)** |
| 1 | I want a device that can open the automatic doors, traffic lights and elevators | The device activates automatic buttons for doors, traffic lights and elevators | 5 |
| 2 | My hands are always occupied, so I would prefer something on a lanyard or attaches to my body or on the guiding dog harness | The device is portable and can be used handsfree | 4 |
| 3 | I would like something that has a detection range of 1 meter | The device detects the automatic buttons within a range of 1 meter | 2 |
| 4 | I do not usually drop things but in any case, I would like a protective case | The device has a protective casing upon accidental damage | 3 |
| 5 | I am comfortable with using IOS software | The device can be compatible with iOS | 2 |
| 6 | I have difficulties following the 6 feet apart stickers on the ground | The device can detect the 6 feet apart stickers and alert the user | 2 |
| 7 | Has to able to withstand changing weather conditions | The device is durable and can withstand extreme weather conditions | 5 |
| 8 | Would like to be made aware of what the automatic buttons are before pushing them | The device identifies the instructions on automatic buttons | 1 |
| 9 | I prefer something that alerts me subtly instead of a loud notification | The device alerts the user using a subtle method instead of a blatant notification | 4 |
| 10 | Works during the day and night | The device performs consistently throughout the day and night | 5 |
| 11 | Would like a way to find her device in case she misplaces it | The device has a remote tracking mechanism | 4 |
| 12 | I have to guess where the automatic buttons are and would like a device that can find it for me | The device can detect the automatic buttons | 5 |
| 13 | I would like a notification or alerting system that could map the automatic buttons near me | The device detects nearby automatic buttons and maps their locations for the user | 1 |
| 14 | A device that has voice control/audible cues and vibrations are worth exploring | The device can make use of audible cues and vibrations for its alerting system | 2 |
| 15 | A device that is easy to use that does not involve pulling out a phone and pointing it to something | The device demonstrates ease of use and has easy accessibility | 5 |

**Problem Statement:**

*The client requires a portable device that detects the automatic buttons and performs hands free activation. This device is easy to use, sustainable in low-light settings, harsh weather conditions and cost effective for low vision and blind users.*

**Metrics From Needs:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric# | Need# | Metric | IMP | Units |
| 1 | 5,9,14 | Vibration strength | 4 | Hertz (Hz) |
| 2 | 2 | Mass | 2 | Kilograms (kg) |
| 3 | 3,6 | Range | 2 | Meters (m) |
| 4 | 8,9,14 | Sound Cue | 4 | Decibels (dB) |
| 5 | 12 | Shock Absorption | 2 | Newtons (N) |
| 6 | 2 | Dimensions | 1 | millimeters(mm) |
| 7 | 15,13 | Intuitive | 5 | NA |
| 8 | 4 | Cost | 2 | Dollars (CAD) |
| 9 | 2,4 | Protective covering protection | 2 | Low-High |
| 10 | 7 | Water Resistant | 5 | Yes or No |
| 11 | 5 | Capacity | 3 | GB |
| 12 | 10 | Brightness | 4 | cd/m^2 |

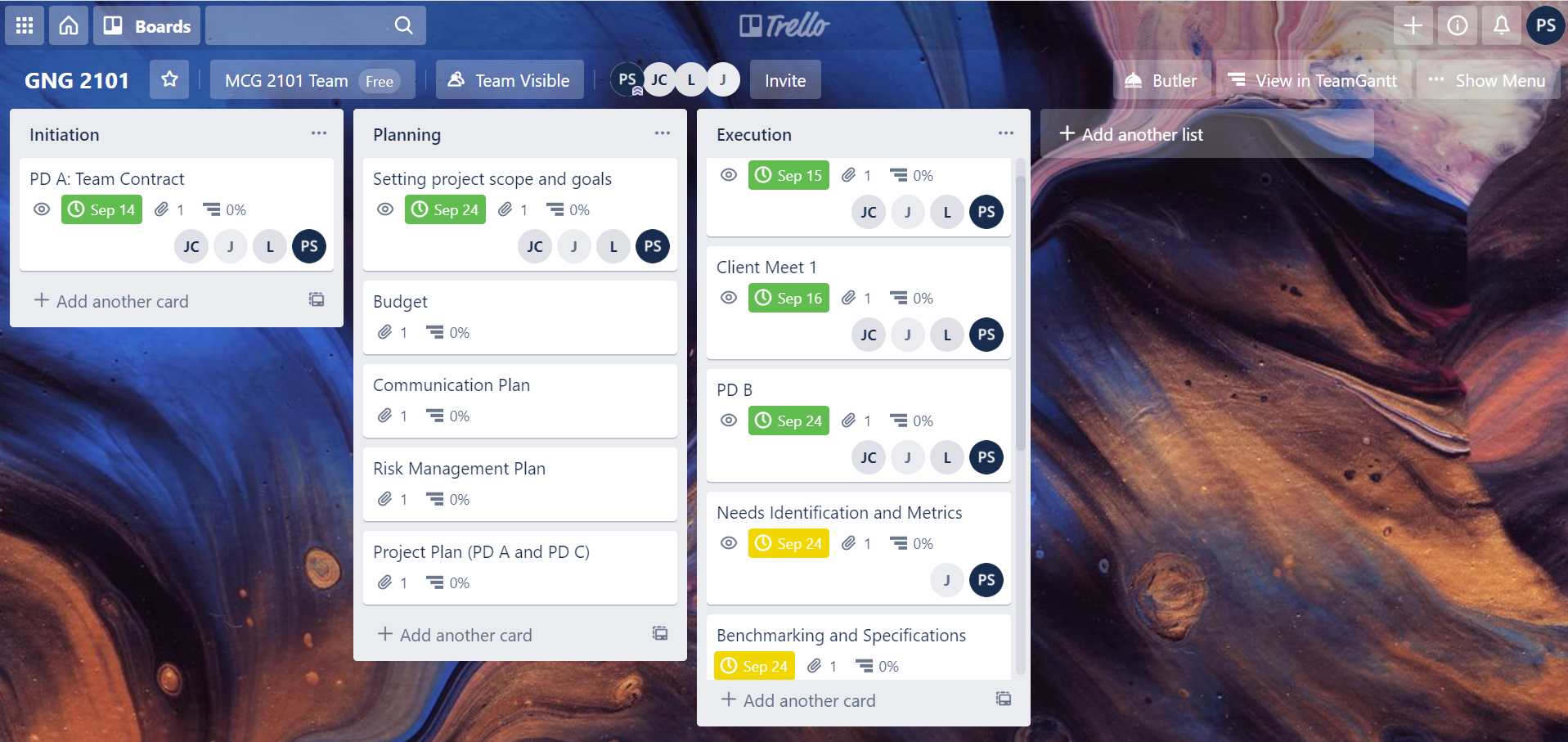
**Benchmarking on Metrics Competitive products:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Metric#** | **Needs#** | **Metric** | **Imp** | **Unit** | **Product 1**  **IOS 14**  **IPhone XR** | **Product 2**  **Ray Electronic Mobility Aid** | **Product 3**  **Loc8tor Lite Item Locator** |
| 1 | 5,9,14 | Vibration strength | 4 | High, Low, Moderate | moderate | moderate | NA |
| 2 | 2 | Mass | 2 | kg | 0.194 kg | 0.06 | (.060) + 2x(0.006) |
| 3 | 3,6 | Range | 2 | m | 1 | 2.85 | 122 |
| 4 | 8,9,14 | Sound cue | 4 | dB | 79.3 | N/A | 65 |
| 5 | 12 | Shock absorption | 2 | N | NA | N/A | NA |
| 6 | 2 | Dimension | 1 | mm | 150.9 x 75.7 x 8.3 | 120 x 29 x 19 | (86 x 54 x 6) (32x6) |
| 7 | 15,13 | Intuitive | 5 | Yes or no | yes | yes | yes |
| 8 | 4 | Cost | 2 | CAD $ | 799 | 299.95 | 113.53 |
| 9 | 2,4 | Protective covering protection | 2 | Low-High | Low-High | NA | NA |
| 10 | 7 | Water resistant | 5 | N/A | yes | No | No |
| 11 | 5 | Capacity | 3 | GB | 128 | N/A | NA |
| 12 | 10 | Brightness | 4 | cd/m^2 | 700 | N/A | NA |

**Target Specifications:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Metric # | Metric | units | Marginally accepted value(s) | Ideal value(s) |
| 1 | Vibration strength | High,Low Moderate | High-low | Moderate |
| 2 | Mass | (kg) | 0.15-0.04 | .06 |
| 3 | Range | (m) | 1-15 | 3-5 |
| 4 | Sound cue | (dB) | 75-50 | 55-60 |
| 5 | Shock absorption | (N) | 1.5-.4 | >1 |
| 6 | Dimension | (mm) | L:60-200  W:25-60  H: 10-25 | L:90-120  W:30-40  H:15-20 |
| 7 | Intuitive | NA | Yes | Yes |
| 8 | Cost | (CAD) | <100 | <100 |
| 9 | Protective covering protection | Low-High | Low-high | High |
| 10 | Water resistant | Yes or No | N/A | Yes |
| 11 | Capacity | GB | 128-0 | NA |
| 12 | Brightness | cd/m^2 | 700-0 | NA |

Gantt Chart



**Sources**

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