

GNG 2101 Deliverable B

Accessible Buttons: Needs - Target Specifications

Gabriel, 300129767

Gianluca Coletti, 300065278

Hiruni Senarath, 300044216

Thuy-Vi Le, 300119477

Tony Zhao, 300129784

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University of Ottawa

Table of Contents

Table of Contents	1
List of Tables	2
1. Introduction	3
2. Client Statements from Client Interview	4
3. Customer Needs	6
3.1 Legend	6
4. Problem Statement	7
5. Metrics	8
6. Benchmarking	9
7. Final Target Specifications	10
8. Reflection	11
9. Conclusion	11
References	12

List of Tables

Table 1: Customer Needs	6
Table 2: Metrics	8
Table 3: Benchmarking	9
Table 4: Final Target Specifications	10

1. Introduction

Continuing forward from the previous deliverable, in which we planned the meeting with the client and established all necessary introductory steps, this deliverable seeks to show the results from that interview and gradually turn the clients statements into specific and measurable goals for our end result. We will do this by first establishing what was said and then interpreting the statements as the client and devices needs. Then, by using the clients statements and benchmarking similar products in this field, we can establish the necessary quantitative and qualitative values with which we will build our product. Finally, we will reflect on the results and see if they remain consistent with what we had at each state and how they remain useful for future stages of development

2. Client Statements from Client Interview

- Main problems
 - Touch is the most used sense but it is dangerous touching everything with COVID.
 - Difficulty with distancing because sometimes they take someone's arm and generally they don't know exactly where everyone is all the time.
- App/wearable technology that press automatic buttons for them.
- Buttons can be located anywhere in the vicinity of the related object. Inconsistent and may be obstructed.
 - Crosswalk button issues are not exclusive to only blind/low-vision people and can also affect people in wheelchairs during the winter.
- Usable while wearing gloves and in winter.
- Should be functional with only one-hand (because usually one hand is preoccupied with other tools, example: Cane)
- Wants a wearable device because having just an app brings the problem of potentially losing the phone or damaging it when it constantly gets pulled out to use. Having a cheaper wearable product would allow customers to use it without the free of having to spend a lot of money to replace it if needed.
- Cheaper, below \$50. She wants it not to be too expensive so that more people have access to it.
- Product could be set to different notification options.

- She said for areas she is more familiar with a vibration is good but in a new area a speaking function would be best.
- Customers could map their route beforehand.
- Could have a product that can link to an app via bluetooth.
- Key2Access tried to solve the issue before (required replacement of Ottawa crosswalk call buttons).
- She says there are no current similar products that she endorses or has used

3. Customer Needs

Table 1: Customer needs

Number	Need	Importance
1	Is usable with one hand	5
2	Can be used without having to pull out phone	4
3	Can be used while wearing gloves	4
4	Provides notifications by vibration or audio cues	5
5	Allows pre-mapping of routes	2
6	Can be integrated with smart devices	4
7	Is affordable for everyone	5
8	Is easy to learn to use	5
9	Is affordable to replace if damaged or worn out	3
10	Eliminates the need to touch surfaces to locate objects	5
11	Resistant to damage from accidental dropping	2
12	Can press buttons remotely (ex/ Doors, Crosswalk)	5
13	Is resistant to cold temperatures so it's functional in the winter environment	3
14	Functions as normal in rain	3
15	Is a wearable device	5
16	Targets a range of people with disabilities	2

3.1 Legend

5 - Satisfying the need is critical

2 - Satisfying the need is not important

4 - Satisfying the need is highly desirable

1- Satisfying the need is undesirable

3 - Satisfying the need would be nice, but is not necessary

4. Problem Statement

People with low-visibility require a wearable device that will help locate and press buttons remotely to prevent risks with touching public spaces.

5. Metrics

Table 2: Metrics

Metric Number	Need Number	Metric	Importance	Units
1	7, 9	Cost	3	\$
2	10, 12	Presses buttons remotely	5	Y/N
3	1, 2, 3, 8, 16	Usability(1 handed, with gloves)	4	Y/N
4	2, 6	Phone integration	4	Y/N
5	4	Notifies user to problem	5	Y/N
6	9, 11, 13, 14	Size and Weight(Durability)	3	List, lbs, pA, etc.
7	5	Route planning feature	2	Y/N
8	15	Wearability	4	Y/N
9	14	Waterproofing	3	Y/N

6. Benchmarking

Table 3: Benchmarking

Metric #	Key2Access	US Department of Transport.	Portal Entryways	Disability Systems	Camden
1	Free (app) ? (fob)	?	\$400-\$600 (installation/ door)	\$278 (per unit)	\$240 (per unit)
2	Y	Y	Y	N	N
3	Y	Y	Y	Y	Y
4	Y	Y	Y	N	N
5	Y	Y	N	N	N
6	Similar to a car fob	App <i>Dependant on phone</i>	App + Unit on wall <i>Dependant on phone</i>	4.538 x 4.538 x 0.675 in Recommended for interior use	4 x 1 x 1.5 in 0.4lbs
7	N <i>Partnership with GPS-app</i>	Y <i>Has GPS</i>	N	N	N
8	Y	N	N	N	N
9	? Probably	N/A	N/A	N/A	N/A

7. Final Target Specifications

Table 4: Final Target Specification

#	Metric	Units	Ideal Value	Marginal Accepted
1	Cost	\$	≤ 50	≤ 100
2	Presses buttons remotely	Y/N	Y	Y
3	Usability (1 handed, with gloves)	Y/N	Y	Y
4	Phone integration	Y/N	Y	Y
5	Notifies user to problem	Y/N	Y	Y
6	Size and Weight (Durability)	millimeters (mm), grams (g)	weight $\leq 0.15g$ <i>Size and weight dependant on design.</i>	$0.2g \leq \text{weight} \leq 0.5g$ <i>Size and weight dependant on design.</i>
7	Route planning feature	Y/N	Y	N
8	Wearability	Y/N	Y	Preferable
9	Waterproofing	Y/N	Y	N

8. Reflection

From the information we collected during the client meeting, we were able to clarify our assumptions for the product needs based on our client feedback. Then we translated these statements into client needs that were positive, specific, attributes of the product and described what, not how. Using these needs, we established a problem statement that is short, but descriptive and that will help make sure that we are solving the correct problem when creating the product. With the needs established, we also were able to create measurable indicators, metrics, which can be used to quantitatively and qualitatively measure the effectiveness of any product we make at achieving those needs. Finally, we analyzed existing products, basing our assessment on the set metrics so that the products' usability could be examined through our client's perspective.

9. Conclusion

Prior to the client meeting, we had a vague understanding of the client's needs and no specifications for the eventual product. During the interview, we learned more about the client's-- and other blind or low-vision people's-- experiences and their difficulties with mobility, particularly during the COVID-19 pandemic. With a greater awareness of challenges experienced by the blind/low-vision community, we can move forward with development and design a product more empathetically.

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