Deliverable B:

Product Benchmarking and Target Specifications

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Introduction

This document aims to organize customer statements from the first client meeting into their needs, which are considered in order of importance to the customer. Next, these needs are re-stated as neutrally worded metrics that allow the team to determine the final product's target specifications. These specifications will allow the team to effectively measure the performance of each prototype. Finally, the team will consider other products that perform similar functions. One such product is the Wayfindr system, currently used in the London Underground, and is now being tested in several other cities. Another product is the Key2Access system, which is used in over ten cities across Canada and was explicitly recommended by the customer. By completing this process, the team will better understand what the final product will look like and how it will perform.

1: List of Client Statements

The following list contains all the statements made by the client during the first interview.

- I want a wayfinding system to assist visually impaired people
- I want an app that enables users to access the information from their phone
- Key2Access currently uses remotes and beacons to relay information
- I want to be able to broadcast announcements through the app
- I want users to be able to find key locations in Morisset's first floor (Not books)
- I would like the system to be as precise as possible without getting too expensive
- I want the beacons (and the information they transmit) to be easily modifiable
- Currently, staff assist visually impaired people, but I'd like us to switch to using an app
- I want it to use a combination of notifications and audio notifications
- I want it to be easy for staff to change the information being broadcasted
- I want the cost to be kept within the library budget

2: Customer Needs

The following list includes the primary needs that had been requested and extracted from the client statements. These needs were then ranked numerically using a scale from 1-5 based on the client interview (1 being the least important and 5 most important).

1. The system assists visually impaired users (5)
2. The system is accessed through the users' phone (5)
3. The system is used to navigate to key locations within the library (5)
4. The system is reliable (5)
5. The system is for the first floor of the library (4)
6. The system is accessible for everyone, not only those who are impaired (4)
7. The system is easily modifiable (4)
8. The system notifies users via auditory and visual notifications (4)
9. The system costs less than similar products on the market (3)
10. The system enables staff to broadcast new announcements and change existing ones (3)

3: Problem Statement

Design a system that can be accessed by visually impaired and other library users through an app that allows users to navigate to important locations on the first floor of the Morisset Library.

4: Metrics

The list below features metrics created from the client's needs, categorized on a scale from 1-5 on their importance, along with the units they will be measured in.

#	Needs	Metric	Imp	Units
1	1, 2, 6	Time from app start to navigation start	5	Time (s)
2	1, 6	Customer Satisfaction	5	Subjective
3	3, 5, 9	Effective range of the beacon	5	Distance (m)
4	4	Battery Life of beacon	5	Years
5	7	Time to reprogram beacon locations	4	Time (s)
6	7, 9	Cost per beacon	4	CAD$
7	7, 9	Beacon Weight	4	Weight (g)
8	7, 9	Beacon Size	4	Size (cm)
9	8	Effectiveness of notification	4	Subjective
10	10	Time to broadcast announcement	3	Time (ms)

- Metric 1: The time taken to begin navigating from the app home screen. Includes the time it takes a user to find and select the target destination.
- Metric 5: Time refers to how long it takes to finish reprogramming the beacon from when the employee enters the management portal.
- Metric 8: Size refers to the longest dimension in any direction (length, weight, height, diameter).
- Metric 9: If the user receives the notification with enough time to change directions (ie, not receiving a "turn left" instruction when they're already passing the intersection).
- Metric 10: "Time" refers to the time from when an announcement is 'sent' to when it first appears on any client device.

5: Benchmarking

The table below displays the results of benchmarking the two similar systems were found while researching - the Wayfindr system first used on the London Underground, and the Key2Access (K2A) system used at the Ottawa Public Library (OPL) and the Ottawa City Hall (OCH). The team was able to look at the K2A system at the public library in person, but the system was not functioning correctly as cell phones were unable to maintain a steady connection to the beacons. The team was told by staff that the system was 'under repair', but the staff did not know who had more information regarding the system itself, limiting the information available to only what the team could directly observe.

Due to the COVID-19 Pandemic, the team was unable to access the Ottawa City Hall. The team is currently researching how to contact the person originally responsible for the deployment of the K2A system there to get more information.

Other notes are summarized in the *Benchmarking Notes* section below.

#	Imp	Need #	Wayfindr [1], [2]	K2A (OPL)	Units
1	5	1, 2, 6	--	10	Time (s)
2	5	1, 6	4/5	2/5	Subjective
3	5	3, 5, 9	100	5	Distance (m)
4	5	4	3	--	Years
5	4	7	--	--	Time (s)
6	4	7, 9	$132.64	--	CAD$
7	4	7, 9	86	--	Weight (g)
8	4	7, 9	6.9	~15	Size (cm)
9	4	8	5/5	1/5	Subjective
10	3	10	--	--	Time (ms)

Benchmarking Notes:

- Data with two dashes in the cell is not applicable, or data that was unable to be collected due to the reasons outlined below.
- Acquiring data for the Wayfindr system was difficult because Wayfindr appears to have shifted more towards providing consultation services instead of actual beacons. As such, little data on the beacons themselves are available.

- Data for the Key2Access system at the Ottawa Public Library is incomplete because the system was not fully functional at the time of benchmarking. Additionally, the team was unable to locate someone with knowledge of price data.
- Due to the COVID-19 pandemic, an in-person visit to the Ottawa City Hall was not possible as it was closed to the public. However, the system appears to be similar to the one installed in the Ottawa Public Library.
- Acquiring free use (non-copyrighted) pictures was not possible for the Wayfindr system. Additionally, physically visiting the sites was not possible as it would require international travel, which would exceed the prototyping budget.

6: Target Specifications

Target Specifications are the values the team would be content with and the values the team are striving for, in relation to each metric listed above. Values were determined by discussing what would be satisfactory to the client's needs while not placing an unnecessary burden on our team.

#	Imp	Need #	Marginal	Ideal	Units
1	5	1, 2, 6	$x \leq 30$	$x \leq 15$	Time (s)
2	5	1, 6	$x \geq 3/5$	$x \geq 5/5$	Subjective
3	5	3, 5, 9	$x \geq 6$	$x \geq 10$	Distance (m)
4	5	4	$x \geq 1$	$x \geq 5$	Years
5	4	7	$x \leq 420$	$x \leq 300$	Time (s)
6	4	7, 9	$x \leq 70$	$x \leq 30$	CAD$
7	4	7, 9	$x < 750$	$x < 500$	Weight (g)
8	4	7, 9	$x \leq 25$	$x \leq 10$	Size (cm)
9	4	8	$x \geq 4/5$	$x \geq 5/5$	Subjective
10	3	10	$x \leq 6000$	$x \leq 5000$	Time (ms)

7: Reflection on Client Meet 1

The client meeting went very well. Both of the librarians were very open and helpful when it came to answering our questions. The team was able to get answers to all of our pre-planned questions, along with additional information through the use of follow-up questions. Our team's system of two people asking questions and one person taking notes worked very well. The team used the techniques learned in class, to first empathize with the client, and then made the meeting more similar to a conversation rather than an interview.

Conclusion

This document is an organization of our current progress through gathering data and preparing our product's specifications. Our team experienced added difficulty while collecting data due to the consequences of the COVID-19 pandemic preventing us from visiting some of the sites in person. However, the team is quickly learning to adapt to the situation and find more creative ways to gather the needed data. The team is excited to continue working with the uOttawa library to see the heights that this project can reach.

Bibliography

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