

**Project Deliverable B: Needs, Problem Statement,
Metrics, Benchmarking and Target Specifications
GNG 2101**

Faculty of Engineering - University of Ottawa

Present to :

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For the course :

**Introduction to Product Development and Management For Engineers
GNG 2101**

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Introduction

In day to day life, it is often difficult for people with visual impairments to navigate and utilise all the various devices that exist today, such as phones, tablets and computers. To help facilitate this, many people with such problems use screen readers and external peripherals that are used to quickly read out the text on the screen. The problem with many of these softwares is that they are not compatible with the millions of apps on the market today, and they tend to restrict what the user is able to do on their device.

Our goal is to solve the ease-of-use problem that haunts many screen reader users. The tool should first and foremost be easy to use without changing how the rest of the device is able to work. Ideally, a single button press, voice command, or keyboard shortcut would activate the software, allowing the user to select the part of the screen they would like to read out to them. Another key feature we intend to include is the ability to read non-selective text. Images and embedded text often poses a challenge for other screen readers available right now. By using tools similar to Google Image Text Reader, our tool would be able to read any non selective text that the user chooses.

The following report covers our client's needs and desires, while creating a clear end goal for our product by assigning an importance to each feature listed. The report also documents the priorities of the group, and the cost of each feature relative to each other. Each section serves to make each feature clear and concise, while illustrating its importance in the overall project.

Client Statements

- Uses a lot of technology to do his work
- Work mainly with PC, only recently started using iPhone
 - Used things like Windows magnifier, Text recognition software, diction software
- English and Spanish
- Would like to be able to communicate on phone with voice only
 - Need voice recognition that understands his accent
 - Reads what you want, when you want, on any app
 - Turn on and off easily
- iPhone 7, iPad Pro, Personal Computer
 - Hates when his text to voice apps do not work with messaging apps (WhatsApp, Skype, etc)
- Uses a lot of external tech, like gaming hardware
- Every single messaging app has its own problems with his text to voice software
- Would be nice for something external to connect to his devices with bluetooth
- Has different settings for his softwares that he can save as profiles (Same button does different things depending on his profile)

Needs List By Importance

The following is a list of needs that the client brought forward during our first interaction with them. The needs are ranked on a scale from 1 to 5, one being undesirable to be satisfied and five being that the need is critical.

Number	Need	Importance (5-1)
1	Software that doesn't restrict the user's Phone/PC, able to turn on and off very easily	5
2	External peripheral tool to connect to various devices	2
3	English/Spanish quick change translator	2
4	Voice recognition with various Phone apps	4
5	Selection of what they need the app to read, Non-selective text reader	5
6	Compatible with gestures, keybinds, or gaming mice	2
7	Compatible with messaging apps	4

Problem Statement

People with a low to high visual impairment are in need of an assistive device, or application to aid their use of smart technology. This device should include voice recognition technology, screen selection readers, availability in multiple languages, and should be compatible with other devices and their applications.

Benchmarking

By ranking the importance of each category in this chart, the group can decide which key features from each example and try to incorporate these factors into our product. The colours represent the importance of each feature: **Red=1**, **yellow=2**, **green=3**.

	Importance (Weight)	Be My Eyes (app)	Sullivan + (app)	Dolphin ScreenReader
Selection reader	5	3	2	3
English/ Spanish quick translate	2	3	1	2
Compatibility with messaging apps	4	1	2	3
Voice Recognition	4	3	1	3
External hardware/ Bluetooth	2	1	1	3
Easy to turn on and off (keybinds, etc)	5	2	2	3
Link		https://www.bemyeyes.com/	https://blog.mysullivan.org/2019/09/total-blindness-people-with-low-vision.html	https://yourdolphin.com/product/features?pid=3
Score		49	36	64

Target Specification

This engineering design specifications chart shows and explains all the important functions, constraints, and non-functional requirements specifications for our greenhouse.

Testing these functions and constraints, will help us finalize our ideal and innovative design.

	Design specifications	Relation (=, <, or >)	Value	Units	Verification Method
	Function Requirement				
1	complexity(easy to navigate & easy to learn)	<	5	min	Test the tool with eyes closed
2	Different language settings (English and Spanish)	=	2		Run tests with Spanish speaker
3	Speed of turning on and off	<	5	sec	Repeatedly turning the tool on and using it
4	App response time (send/receive messages through voice)	<	1	sec	Sending messages to our phones
	Constraints				
1	Cost	<	50	\$	Estimate, BOM
2	Size	<	30	mb	
3	maintenance/repair	=	1	Update per month	Version history/notes
4	WiFi dependent	=	Needed		Test the tool without wifi
	Non-Functional Requirements				
1	aesthetics(colours, design)	=	2	Colour schemes	Testing black/white, and colored visibility
2	Text size	>	40	pixels	Testing visibility from various distances
3	OS availability	>	1	OS	Test tool on MacOS, Windows, etc

Reflection

Prior to the client meeting, our initial plans for the project were quite simple but still vague. With the project background, we developed ideas for the tool, but with none of us having problems similar to the ones listed in the project problem document, it was hard to understand exactly what features would be important. At first, our biggest priority was translating non-selective text into audio. While that is still important, our priorities shifted after meeting with our client.

Without much experience in the area related to our client's problems, we spent a lot of time listening to their struggles with current screen readers, and empathized with whatever we could. Once everything was laid out by our client, and after they answered some questions, we found that it was a combination of two problems that became the source of their struggles.

Results/Analysis of Client's statements

First was the difficulty in using various screen readers in general. While most were able to read text that was able to be selected, problems arose when trying to use these tools with various messaging apps, or even navigating through their device while the readers were active. Second, the inability to read non-selective text was expanded on in our features draft, becoming a selection area for the reader.

Conclusion

In general, the meeting with our client helped us to understand their point of view, and how they would like our product to work, along with helping us to refine and re-prioritize our initially drafted features to better accommodate the actual needs of our client. From this interview we have concluded that our job is to design an assistive device or application that is compatible with other applications to help people with visual impairments.