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

GNG 2101 – Intro. to Product Dev. and Mgmt. for Engineers
Faculty of Engineering – University of Ottawa

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Objective:
Empathize with your client and truly understand their problems. Translate their statements into a list of interpreted needs and prioritize them. Create a problem statement, do benchmarking, develop a list of metrics and define target specifications. Finally, reflect on the process. This will ensure that you are truly "solving the right problem".
Instructions:
Teams will put together a document outlining the following key elements of the problem definition process (in the order below):

1. A list of client statements/observations obtained from client interviews.

- The client was wearing colourful clothing: red top, orange scarf
- The client felt numbness in her fingertips, mostly on her right hand
- The client has trouble gripping onto objects such as glass without support
- The client wants to be able to hold small objects just as needle
- The client mentioned a project she was interested in with three-fingers and an arm support but did not hear back from them
- Some features that the client would like to have are: pressure sensor in thumb, arm support, fingertips exposed, and comfortable to put the glove on/off
- The client preferred orange, green and yellow colours but disliked neon
- The client is into knitting, gardening and using keyboards
- The client has a busy schedule with moving into a new house
- The client is retired but used to work as an administrator
- The client has not tried a hand grip glove before
- The client does not like compression glove, she prefers the glove to be of medium or large size

2. A list of translated and prioritized customer needs (using the five techniques shown in class: what not how, specificity, positive, attribute of the product and avoid words must and should)

Number	Need		Importance
1	The Hand Grip	increases strength in a pinching motion.	5
2	The Hand Grip	has exposed fingertips or covered until the first knuckle.	4
3	The Hand Grip	has to be comfortable to wear.	4
4	The Hand Grip	should have freedom of fingers.	3
5	The Hand Grip	should be small.	2
6	The Hand Grip	should be flexible.	3
7	The Hand Grip	has to be easy to put on and take off.	4
8	The Hand Grip	has to be a colourful in appearance.	1

*(5 is the most important and 1 is the lowest)

3. A problem statement (what is the problem, who has the problem, and what form can the solution be)

- Design a comfortable hand grip device which will help the client have a more strength in a pinching motion.
- Due to muscle lose, the client has difficulty in bending her both thumbs to grip things.
- A client, Adrienne, with thoracic outlet syndrome
- Robotic assisted device

help clients with a disability in their thumb

4. Benchmarking of similar products (this can be products which satisfy some or all of the needs defined above). Provide descriptions and pictures when possible!

- Client liked another attempt at a solution to the problem that included a pressure sensor on the tip of her thumb, but their design ended up being too uncomfortable.
- Client liked a concept from another company that felt her muscles trying to grip in her forearm with a sensor to activate the grip assistance.

Benchmarking projects	Technology	Price	Sizing	Target Client	Picture of the Product	Website
Saebo Glove	Electrical Stim(NMES)	$559 CAD	Small, Medium, Large	Neurological and orthopedic injuries patients		https://www.saebo.com/saebogloove/
The Third Thumb	Bluetooth - pressure sensors	N/A	One size	Everyone		https://www.daniclodedesign.com/thethirdthumb
Gripit	Manually	N/A	circular diameter: 30mm Height: 20mm	Patients with spinal cord injuries.		https://www.wevolver.com/wevolver.staff/gripit./master/blob/Overview.md

5. A list of metrics with associated units. Identify which needs each metric address

Metrics number	Importance	Metrics	Units
1	2	Total mass	g
2	5	Minimum gripping strength generate by the device	kg
3	3	Device size for client	size
4	3	The time the device can last	hour
5	1	Water Resistant	bars
6	1	Wireless Charging	qi
7	4	Manufacturing Cost	$ CAD
8	4	Time taken to disassemble/assemble	minute
9	2	Instills pride	Subjective

*(5 is the most important and 1 is the lowest)

6. A set of target specifications (both ideal and marginally acceptable values). Provide reasons for your choices.

Metrics Number	Metrics	Units	Acceptable Value	Ideal Value	Reason for the values
1	Total mass	g	< 500	< 300	The product needs to be as light as possible. Boxing gloves weigh 250g on average
2	Minimum gripping strength generate by the device	kg	> 15	> 20	This is the average grip strength.
3	Device size for client	Size	=Large Size	=Medium Size	The client prefers medium or large

					glove sizes.
4	The time device can last	hour	< 3	< 6	Client will use the product for a long duration.
5	Water Resistant	bars	No	Yes	Product might come in contact with water
6	Manufacturing Cost	$ CAD	< 100	< 90	Competitive price must be lower than competitions.
7	Time for client to take off the device	minute	< 2	< 1	Product must be easily removable.-
8	Instills pride	Subjective	A bit	A lot	Meets requirements and satisfies customer needs
9	Wireless Charging	qi	No	Yes	Product will be able to recharge quickly and without much effort.

7. A reflection on how the client meeting impacted your results and the process.
Feel free to speak to other potential clients related to the project on your own. This will help strengthen your results. The mountain bike fork tables developed in the lecture can be used as an example for doing this.

- The client informed us that a full coverage glove isn't ideal due having less feeling while wearing a glove.
- Client informed us that pinching power, such as to use a needle or to knit, is the primary function to assist with.
- Client informed us that in a previous attempt 3D printing was used leading to a rigid design that wasn't very comfortable for her.