

Project Deliverable B

Needs, Problem Statement, Metrics, Benchmarking and Target Specifications

Submitted by

Group Z13

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1. Introduction

This deliverable is a result of our meeting with the client which wants us to create a power grabber. The goal of this report is to better understand the needs of our clients and to organize and prioritize them. This will help us create a clear problem statement which will make the realization of the project easier.

2. Understanding the client's needs

2.1 Client statements

Table 1 - Client statement converted in needs

Question	Client statement	Client needs
Typical use	The grabber tool should be able to grab objects of different sizes and weights	Capable of grabbing larger, heavier objects, as well as smaller objects.
		The grip force needs to be controllable to prevent the gripper from destroying fragile objects.
	The grabber tool should hold the object for long enough that the user can reach it, or place it as they wish.	Gripper can maintain its hold on an object.
		Grab and drop items with a certain precision.
	The grabber should be long enough that it can be used when the user is standing and sitting, but not too long that it is hard to manage.	The size should be between 16 to 20 inches.

What the client likes	The grabber should be easy for a child to use.	Features should be intuitive and simple.
		The grabber should be lightweight.
Suggested improvements	Users with low grip strength should be able to easily use the grabber.	Sensitive button or activation mechanism (does not need too much force to activate it).
		Wrist protection for user safety and support.
	The activation should be customizable to suit different users' needs.	Buttons with adjustable positions (to meet users in different situations).

2.2 Customer needs

Importance (imp)

5 – Satisfying the need is critical

4 – Satisfying the need is highly desirable

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

2 – Satisfying the need is not important

1 – Satisfying the need is undesirable

Table 2 - Prioritization of client needs

#	Need	Imp
1	Capable of grabbing larger, heavier objects (water bottles) as well as smaller objects	5
2	Gripper can maintain its hold on an object	5
3	The grip force needs to be controllable to prevent the gripper from destroying fragile objects.	4

4	Grab and drop items with a certain precision	3
5	The size should be between 16 to 20 inches (approximately 0.41m–0.51m)	3
6	Touch sensitive button or activation mechanism (does not need too much force to activate it)	4
7	Wrist protection for user safety and support.	4
8	Buttons with adjustable positions (to meet users in different situations)	2
9	Features like flashlight, audio control	1
10	The weight should be as light as possible	2

2.3 Problem statement

The client requires a powered device which attaches onto a sturdy, user friendly and lightweight grabber reacher, and would permit users with low grip strength to use it adequately.




2.4 Metrics

Table 3 - List of metrics

Metric #	Need #	Metric	Imp.	Units
1	5	Size (length)	3	m
2	10	Weight	2	kg
3	1,2	Gripper capacity	5	kg

2.5 Benchmarking

Table 4 - Benchmarking of existing solutions

	Pro trash picker [1]	Jadd's grabber	Stainless Steel Grabber reacher [2]
Image			
Price (\$)	130	20	60
Size (cm)	244	75	70 to 150
Weight (kg)	0.66	0.155	0.3
Gripper capacity (kg)	4.5	2	13
Gripper activation	Manual	Manual	Manual

2.6 Target specifications

Table 5 - List of target specifications

#	Metric	Units	Value
1	the length of handle	m	< 0.508
2	The weight of handle	kg	< 3
3	Maximum load of the grabber	kg	> 1
4	Gripper as a percentage of the entire handle	%	< 20
5	trigger angle to horizontal part	degree	> 30

6	The force needed to press the trigger	N	< 10
7	Budget	CAD	< 100
8	The size of wrist protection	m	< 0.3
9	The size of the object that can be held	m^3	<0.006

2.7 Client meeting reflection

The client really helped us understand the user's reality and made us understand why this power grabber is important. The meeting also helped us to understand the different needs the user has and helped us prioritize them. A list of metrics and target specification was created from that meeting, and this will help us in the creation of concepts that surround the client and the user needs. The grabber reacher type that is going to be used will need to be determined which one would be the best for our application. Also, the type of mechanism to activate our power grabber will need to be determined.

3. Conclusions and Recommendations for Future Work

The client meeting allowed us to begin the design process. By empathizing with the client during the interview, we were able to convert client statements into client needs. Next after team consensus, we prioritized the needs to get a better idea of the problem we were facing. Following this we made a short and sexy problem statement to define the problem and make sure everyone was on the same page. For the coming weeks, we will begin conceptualizing our idea, while keeping constant communication with the client to make sure we are always on topic.

4. Bibliography

[1] Pro Trash Picker—96" H-6579—Uline. (n.d.). Retrieved May 13, 2022, from

<https://www.uline.ca/Product/Detail/H-6579/Grounds-Maintenance/Pro-Trash-Picker->

[96?pricode=YD968&gadtype=pla&id=H-](#)

[6579&gclid=Cj0KCQjw4PKTBhD8ARIsAHChzRIrHXKI-](#)

[Ie579HlLmmZdpJ8_SKQjTjrRmZQOISZVrs4ukGDYJx-0tcaAuhxEALw_wcB&gclid=aw.ds](#)

[2] FTH All Stainless Steel Grabber Reacher 40 inch (100cm) Pickup Tool Heavy Duty Trash

Picker Log BBQ Fireplace pits Snake Tongs: Amazon.ca: Health & Personal Care. (n.d.).

Retrieved May 13, 2022, from <https://www.amazon.ca/FTH-Stainless-Reacher-Grabber-40->

inch.dp/B086VM41QN/ref=sr_1_4_sspa?gclid=Cj0KCQjwg_iTBhDrARIsAD3Ib5jOam7UYHP

aaoHVzbPVb3EsYG6TURtPmpnCmxIH8iwJSUzOWrvyVr8aAoRMEALw_wcB&hvadid=311

[781191967&hvdev=c&hvlocphy=9000697&hvnetw=g&hvqmt=b&hvrnd=4456515451622418](#)

[212&hvtargid=kwd-](#)

297298340864&hydadcr=23337_10093181&keywords=reach+grabber+tool&qid=1652467383

&sr=8-4-

spons&psc=1&spLa=ZW5jcmlwdGVkUXVhbGlmaWVyPUExR0Q0TTc4NzdTRjRLJmVuY3J5

cHRIZElkPUewNjE1MjEyMkJFQ1dHRktWWUxCUSZlbnNyeXB0ZWRBZEIkPUewMzcwM

[jg3MkRER0NVNlA4SkNVQyZ3aWRnZXROYW1lPXNwX2F0ZiZhY3Rpb249Y2xpY2tSZW](#)

RpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU=