

## **Book Marks:**

### **Team Contract:**

[https://docs.google.com/document/d/1KPpd\\_D8VOV1Vv8TJi\\_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.8xqgga1n1qs3](https://docs.google.com/document/d/1KPpd_D8VOV1Vv8TJi_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.8xqgga1n1qs3)

### **Deliverable A: client meet preparation:**

[https://docs.google.com/document/d/1KPpd\\_D8VOV1Vv8TJi\\_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.rk291rme9mck](https://docs.google.com/document/d/1KPpd_D8VOV1Vv8TJi_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.rk291rme9mck)

### **Notes from client meet 1:**

[https://docs.google.com/document/d/1KPpd\\_D8VOV1Vv8TJi\\_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.jhzq4hzhdt44](https://docs.google.com/document/d/1KPpd_D8VOV1Vv8TJi_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.jhzq4hzhdt44)

### **Deliverable B:**

[https://docs.google.com/document/d/1KPpd\\_D8VOV1Vv8TJi\\_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.wrlpaq8wui09](https://docs.google.com/document/d/1KPpd_D8VOV1Vv8TJi_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.wrlpaq8wui09)

### **Deliverable C:**

[https://docs.google.com/document/d/1KPpd\\_D8VOV1Vv8TJi\\_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.2a022k294vo3](https://docs.google.com/document/d/1KPpd_D8VOV1Vv8TJi_rOWnMKh7zZqDQgBHeDjVpc3xE/edit#bookmark=id.2a022k294vo3)

# TEAM CONTRACT

**GNG2101, Section # E01.3**

**Team Members:**

- 1) Fatma Abdo
- 2) Sara Elmalky
- 3) Ibrahim Ghamlouche
- 4) Ali Sherry
- 5) Noor Al-lafta
- 6) Liana Chu

**Suggested Projects:**

- 1<sup>st</sup> choice: One handed Laddalift
- 2<sup>nd</sup> choice: Sliding window opener
- 3<sup>rd</sup> choice: Phone accessibility

<b>Team Procedures</b>
------------------------

1. Day, time, and place for regular **team meetings**:

We plan to meet every Thursday at 2:30 pm on campus, if for any reason this doesn't work we plan to meet on Fridays at 2:30 on campus.

2. Preferred method of **communication** (e.g. e-mail, cell phone, Facebook, Blackboard Discussion Board, face-to-face, in a certain class) in order to discuss the project and to inform each other of team meetings, announcements, updates, reminders, problems:

The method of communication we will use during this project's duration is a group chat on WhatsApp. This will be used to keep track of tasks and plan in advance team meetings since we plan to meet in person for meetings.

3. **Decision-making policy** (by consensus? by majority vote?):

Our decision making policy is going to be by majority vote, since we want our team to have a collaborative environment.

4. Method for setting and following meeting **agendas** (Who will set each agenda? When? How will team members be notified/reminded? Who will be responsible for the team following the agenda during a team meeting? What will be done to keep the team on track during a meeting?):

Sara Elmalky will ensure to send updates on WhatsApp to remind everyone of tasks and team meetings and follow the plan on ClickUp to make sure everyone is on track.

5. Method of **record keeping** (Who will be responsible for recording & disseminating minutes? How & when will the minutes be disseminated? Where will all agendas & minutes be kept?):

Ali Sherry will keep a tally of time spent on meetings, and a concise point-form explanation of what was spoken during said meetings in a shared document.

## Team Expectations

### Work Quality:

1. **Project standards** (What is a realistic level of quality for team presentations, collaborative writing, individual research, preparation of drafts, peer reviews, etc.):

We will exceed expectations within our capabilities for example:

- Overall Quality:
  - Strive to submit all deliverables to the best of our capabilities.
  - Meet established deadlines and milestones.
  - Demonstrate a commitment to continuous improvement!

- Team Presentations:
- Aim for clear communication and effective collaboration.
- Ensure all team members contribute and share responsibilities.
- Strive for engaging and well-organized presentations.

**Strategies** to fulfill these standards:

To meet those standards, we plan to maximize efficiency by assigning different tasks depending on every team member's skill set and assisting them to enhance everyone's skill set by the end of the term. We also plan to fulfil these standards by meeting deadlines and milestones as well as keeping clear communication between team members. Additionally, we plan to remain open to constructive criticism in order to improve our work ethics and be able to produce the best quality of work!

**Team Participation:**

1. Strategies to ensure cooperation and equal distribution of tasks:
  - Ensure everyone is present whilst assigning tasks
  - Communication is key, if you believe the workload is unfair speak up
  - We will rotate the tasks so that everyone gets an opportunity to develop new skills
  - We plan to do regular team check ins to ensure everyone is on task and see if anyone has any concerns
  - We will ensure to check Click Up to keep track of tasks
  - If there are any issues we will be sure to sort them out ASAP
  
2. Strategies for encouraging/including ideas from all team members (team maintenance):
  - Mentality: No wrong ideas... collaborative environment!
  - We will brainstorm often to hear everybody's ideas
  - We will use active listening whenever everyone is talking
  - No talking over each other
  - We will use inclusive Decision-making so everyone has a say
  - We will always acknowledge each others contributions
  
3. Strategies for keeping on task (task maintenance):

- The team will regularly update and keep up with the ClickUp. Each team member will also be proactive in telling the other members about their task status by using click-ups.
- We will set clear goals and objectives to ensure we all know what's supposed to be done by when
- We will break down large tasks into smaller ones to make it easier to stay on task
- We will try to start working on deliverables early in order to make sure we have enough time and not rush
- When working for a long time we will take breaks to stay motivated

4. Preferences for leadership (informal, formal, individual, shared):

Within our group, we all possess shared leadership, and decisions on major issues/ideas will be resolved with a group vote.

**Personal Accountability:**

1. Expected individual attendance, punctuality, and participation at all team meetings:

It's expected for everyone to attend all meetings and if for some reason somebody can't attend, the team should be notified in advance if possible.

2. Expected level of responsibility for fulfilling team assignments, timelines, and deadlines:

If we all agree to complete a task it should be done by the set deadline and if for some reason someone is unable to do so tell the team in advance so we can make the required changes to plans.

3. Expected level of communication with other team members:

We expect to communicate regularly and respond to all team related messages as soon as possible to ensure that everyone is aware of what should happen and to arrange meetings.

4. Expected level of commitment to team decisions and tasks:

It is expected for all team members to be active and present when making team decisions and fulfilling tasks as we want to ensure everyone has equally contributed and participated.

**Consequences for Failing to Follow Procedures and Fulfill Expectations**

1. Describe, as a group, how you would handle **infractions** of any of the obligations of this team contract:

Infractions are to be resolved using our method of shared leadership and reminding said individual(s) of our contract, which is in place to keep us on track. We will speak to the mentioned person in a calm manner and try to understand what went wrong.

2. Describe what your team will do **if the infractions continue**:

To mitigate any further tension because of these infractions, we will contact the TA's and the professor as a group, with hopes an authoritative figure will be able to resolve this problem with us.

\*\*\*\*\*

- a) *I participated in formulating the standards, roles, and procedures as stated in this contract.*
- b) *I understand that I am obligated to abide by these terms and conditions.*
- c) *I understand that if I do not abide by these terms and conditions, I will suffer the consequences as stated in this contract.*

*Ibrahim Ghamlouche*

12/01/24

*Noor Al-lafta*

12/01/24

*Fatma Abdo*

12/01/24

*Ali Sherry*

12/01/24

*Sara Elmalky*

12/01/24

*Liana Chu*

12/01/24

\* This template was adapted from

[https://cns.utexas.edu/images/CNS/TIDES/teaching-portal/Team\\_Contract.doc](https://cns.utexas.edu/images/CNS/TIDES/teaching-portal/Team_Contract.doc)

## **Deliverable A: Client Meeting Preparation**

### **1. Summary of known facts about client:**

KPC currently has developed an existing device, the LaddaLift, that can be used to help persons with a disability to lift themselves up when fallen, but at the moment requires the help of an able-bodied person.

They are looking for a design or solution of a similar device to the LaddaLift that can be used with only one hand/arm to lift themselves up and can be used without the help of another person.

One of the considerations that must be acknowledged in the design is for the device to remain low-cost and accessible to a large audience but keep structural integrity and reliability. The safety of the device is critical and must prevent any accidental falls on the device.

### **2. List of unknown information:**

- How is the product meant to be used
- Physical requirements (is there a weight limit/ Or height limit)
- Power source
- Safety considerations
- How compact it should be (space requirement)
- Portability
- Existing feedback
- Maintenance and Longevity
- Accessible Features
- Is it meant to be customized to the person or is it universal

### **3. Interview tools and methods that's going to be used:**

- **Ask open ended questions:** allows for further discussions and more detailed responses. It will also allow the client to express themselves freely. (direct questions are subject to a single thought process)
- **Active listening:** paying close attention to what the client says and acknowledging their thoughts and feelings is a crucial part. In other words, not only hearing the words, but rather analyzing what's behind it.



- **Note Taking:** One of the team members will be in charge of noting down important points said during the interview to help us, as a team, sum up the meeting once it's done.
- **Specific questions:** Vagueness of questions could end up in the confusion of the client and the team members. Therefore the questions must be straight to the point but also follow point #1 (ask open ended questions).
- **Follow-up questions:** Asking questions that are based off of previous questions and answers to gain more insight and clarification on important information.

#### 4. Client Interview Guide

##### Interview Meeting Schedule: (30-45 minutes)

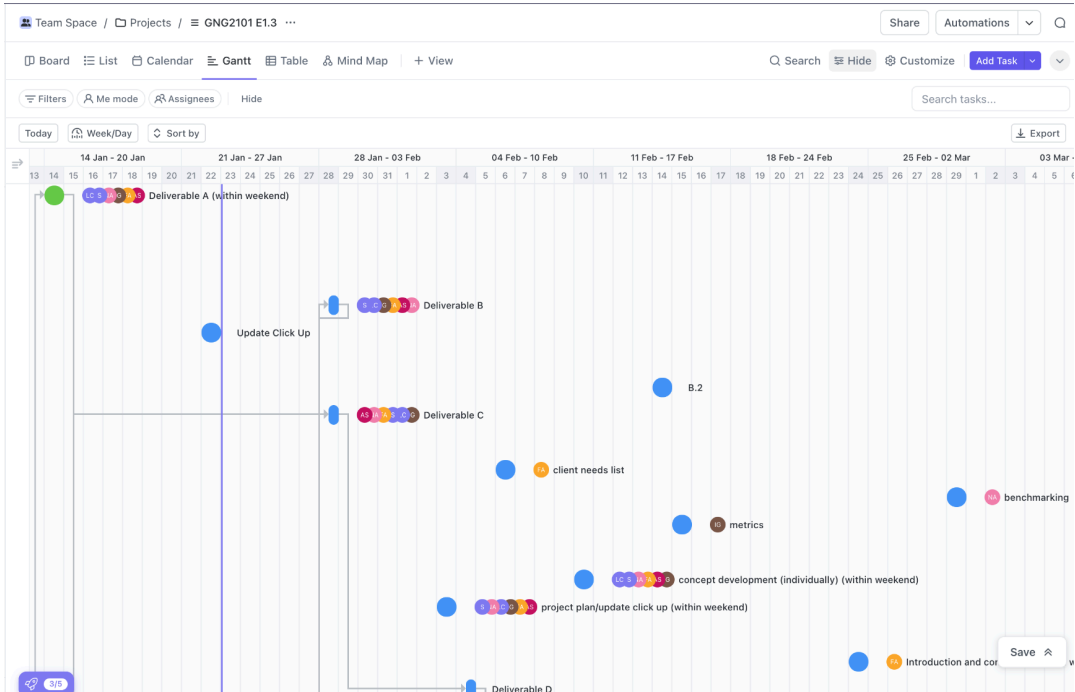
1. Introducing ourselves ( 5 min)
  - a. Name and program
2. Hearing from the client about the specific needs and requirements. (10 min)
  - a. Any preferences
  - b. Goals of the final products
3. Talking about the pre-existing products (5 min)
  - a. Any product similar to what they want
  - b. Any existing products they like
4. Asking questions (15 min )

##### Specific Questions:

1. Are you ok with us contacting you outside of the meetings? If yes, what is the preferred method?
2. What is your opinion on the KPC LaddaLift? What did you like and not like about it?
3. How do you envision the product to be used?
4. How automated do you want the product to be? No lets askthis cuz she didnt answer it/ / we already asked oh okay
5. Are there any non-negotiable criteria that you want in the product?
6. What power source is preferred?
7. Are there any size restraints for the product?
8. What is the weight requirement for the device to lift?

9. What are the safety concerns we have to keep in mind?
10. How portable does the device have to be? (one room or move around the house)
11. What is the target demographic we are trying to accommodate?
12. Are there any space constraints or limitations where the Laddalift will be used? (ex: Limitation in the storage of the Laddalift).
13. Has there been feedback from users or caregivers about the existing solution?

# Gantt Chart



Team Space / Projects / GNG2101 E1.3 ...

Board List Calendar Gantt Table Mind Map + View

Filters Me mode Assignees Hide

Today Week/Day Sort by Export

Group: None Subtasks: Expand All Columns 1 Filter Me mode Assignees Hide

Search tasks...

Tasks 19 + Add Task

Name	Assignee	Due date	Priority	Status	Comments
Deliverable A	AS, AS, AS, AS	Jan 14	High	COMPLETE	
Customer Interview Preparation	AS		High	IN PROGR...	
Deliverable B	NA, AS, AS, AS	Sun	High	IN PROGR...	
Update Click Up	AS	Yesterday	High	TO DO	
B.1 point 4	AS		High	TO DO	
B.2	AS	Feb 14	High	TO DO	
Deliverable C	AS, AS, AS, AS	Sun	High	IN PROGR...	
problem define/problem statment	AS		High	TO DO	
client needs list	AS	Feb 6	High	TO DO	
benchmarking	NA	Feb 29	High	TO DO	
metrics	AS	Feb 15	High	TO DO	
target specification	AS		High	TO DO	
concept development (individually)	AS, AS, AS, AS	Feb 10	High	TO DO	
project plan/update click up	AS, AS, AS, AS	Feb 3	High	TO DO	
global design (as a group)	NA, AS, AS, AS		High	TO DO	
Introduction and conclusion	AS	Feb 24	High	TO DO	
Deliverable D	AS	Feb 4	High	TO DO	
Deliverable E	AS	Feb 11	High	TO DO	
Deliverable F	AS	Feb 18	High	TO DO	

Save

## **Notes from client meet 1:**

Mechanism to help somebody that fell off the floor

What kind of disability they have

It depends on disability

Transportable

Big and expensive — cost down not expensive

Portable

Personal support are much smaller than the person they're taking care of ex 6'2 and 150 pounds support worker is 5'5 the support worker needs tools

Her lift costs 500\$ or 5000\$ missed it

Target market is thin and away cuz they're aren't that much

Grown demand

Economic aspect of it is as inexpensive as possible cuz most disabled ppl are on limited incomes and old ppl too.

Use of one arm

Lifted by one attended

Has to get inot small spaces

Can't be next to a wall cuz ppl don't usually fall next to a wall

So stand alone

Flexible for disability change

Electric wheel chairs have good batteries

Thinking about the asian population

kpc : problem not patent to

Simplicity is good simple and inexpensive

Set up is long

Safety concerns:

Alot to keep in mind

Offers enough support for ppl with no core stability

Inflate

Anytime u transfer from a to b something wrong could happen

So minnmoze transfer as much as possible

Use without thinking too much about it

## Deliverable B: Report Instructions

This document is a template for the project deliverable submissions. Your group will edit this document all semester and submit it each time you have an updated section (new deliverable is done). Please keep track changes ON so that the TA can see what has been changed every time it gets submitted. So that it does not become laggy when the document is too large, 2 templates are provided (PD B-D and E-I).

Template conventions:

- Remove all **red text**, it is only there to guide you
- Remove this page (instructions)
- Replace all instances of <xxx> with the appropriate information for your group, for example you could replace <GROUP NUMBER> by 'B1.3'

GNG2101  
**Design Project Progress Update**  
**Deliverable B**

**<GROUP NAME AND GROUP NUMBER>**

Submitted by:

<Noor Al-lafta, 300301892 >

<Sara Elmalky, 300333601>

<TEAM MEMBER 3, STUDENT NUMBER>

<TEAM MEMBER 4, STUDENT NUMBER>

<TEAM MEMBER 5, STUDENT NUMBER>

<Date>

University of Ottawa

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## List of Tables

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Table 2. Glossary

vi

# List of Acronyms and Glossary

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Provide a list of acronyms and associated literal translations used within the document. List the acronyms in alphabetical order using a tabular format as depicted below.

**Table 1. Acronyms**

Acronym	Definition

Provide clear and concise definitions for terms used in this document that may be unfamiliar to readers of the document. Terms are to be listed in alphabetical order.

**Table 2. Glossary**

Term	Acronym	Definition

# **1 Introduction**

Explain the basic context for your work and any assumptions that you have made for your work. Give an overview of the structure of your document (i.e. explain how it is organized) and summarize the purpose of the document and the scope of activities.

## 2 Sustainability report and DFX

### 2.1 Sustainability report

	Pros	Cons
Social	<ul style="list-style-type: none"> <li>● Independence</li> <li>● Quality of life</li> </ul>	<ul style="list-style-type: none"> <li>●</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>●</li> </ul>
Economic	<ul style="list-style-type: none"> <li>● Cost reductions from less injuries and less needs for a constant caregiver</li> <li>● Due to growing need and demand for accessibility devices, jobs can be generated in manufacturing, design, etc.</li> </ul>	<ul style="list-style-type: none"> <li>● Depending on cost of device, there cost be economic/cost accessibility barriers</li> </ul>

### 2.2 Design for X

	DFX	Explanation
1	Design for safety	<ul style="list-style-type: none"> <li>● Lift is used to help fallen individuals on their own</li> <li>● Needs to be reliable enough to prevent any injuries and accidental falls</li> </ul>
2	Design for portability	<ul style="list-style-type: none"> <li>● Device needs to be brought to any room, environment and space</li> <li>● Device needs to be moved by anyone</li> </ul>
3	Design for accessibility	<ul style="list-style-type: none"> <li>● Device can be used by a wide range of individuals, can adapt with the disability (because they can change), cost should be accessible, anyone can use design for worst case scenario</li> </ul>
4	Design for maintainability	<ul style="list-style-type: none"> <li>● Device need to last for a long time</li> <li>● Device need to handle going outside, other levels in the house</li> <li>● Adapt to different environment</li> <li>● Easily maintained by user/ caregiver</li> </ul>
5	Design for ease of use	<ul style="list-style-type: none"> <li>● Users can lift themselves up with limited help/alone</li> <li>● Helpers should also easily use device to lift user</li> </ul>

## **4 Conclusion**

Summarize your lessons learned and your work related to your project. Discuss any outstanding issues or implications for the project.

### **3 Bibliography**

Insert your list of references here.

## **Deliverable C:**



GNG2101

**Problem Definition, Concept Development, and Project Plan**

**Deliverable C**

**<GROUP NAME AND GROUP NUMBER>**

Submitted by:

Noor Al-lafta, 300301892

Sara Elmalky, 300333601

Fatma Abdo, 300278634

<Ibrahim Ghamlouche, STUDENT NUMBER>

<Ali Sherry, STUDENT NUMBER>

< Liana Chu, 300287510>

19/01/2024

University of Ottawa

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Insert your list of figures here (right-click to update this field).

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## 4 Introduction

Explain the basic context for your work and any assumptions that you have made for your work. Give an overview of the structure of your document (i.e. explain how it is organized) and summarize the purpose of the document and the scope of activities.

This technical document is an identification of all the needs required to create a mechanism to ease the transportation of individuals with disabilities.

Due to insufficient information and the premature stage of the project, we have established marginally acceptable target specifications with few ideal

This technical document is an identification of all the needs required to create a mechanism to ease the transportation of individuals with disabilities.

## Problem Definition

### 4.1 Client Needs/Problems Definition

#### Problem Definition:

The Client would like us to create a user-friendly and adaptable device to assist individuals lift themselves when fallen. The mechanism should be designed to accommodate individuals with varying mobility/disabilities, ensuring a safe lift process with as few transfers as possible. Consideration should be given to the ease of use for the person transferring and any caregivers involved (preferably the person should be able to use it on their own). The solution should consider different settings where individuals may have fallen and as a result be portable, of appropriate size, and should be adjustable to accommodate individuals with different physical abilities and needs. Additionally, the device should prioritize safety, stability, and minimal physical strain on both the user and the caregiver during the lift.

Our team will also need to define the main target audience and scope of the design the device is for. At the moment, the scope of the design is small and focused on our client specifically.

#### List of unknown Information:

After client meet 1, many questions have been answered. Below is a list of a few unknown pieces of information by the team and by the client.

- Type(s) and style(s) of wheelchair(s) we are designing for
- Standard wheelchair dimensions
- The majority of conditions in the disabled community
- The duration of help needed to determine how long the device needs to operate

#### Client Needs:

The client's needs are distributed across various components of the project. The primary focus is to develop a product that is not only efficient but also compact and portable. The product is required to be as simple as possible such that it contains user friendly components making it accessible and convenient for all users of all ages. Recognizing the need for ease of handling, the commitment to designing a solution that can be lifted and transported by individuals with varying levels of strength, is a required aspect as mentioned by the client. The design should strike the balance between functionality and affordability, ensuring that the user benefits from a seamless and an inexpensive experience.

Table 1. Client's Needs

Needs translation:

- Can't include (should and must)
- 

Client statement	Interpreted need	Subsystems	Importance and reason
Lift someone who has a disability up alone (if possible with one arm/hand) or with limited help	<ul style="list-style-type: none"> <li>● The device should lift a person up independently with one arm or minimal assistance.</li> </ul>		5: This component is critical since the main target of the device is to help the person in need to self-sustain.
Transportable	<ul style="list-style-type: none"> <li>● Minimal space occupied by the device and compact as possible.</li> </ul>		5: It's really important for the accessibility of the user.
Devices should be able to go up and down the stairs and possibly outside.	<ul style="list-style-type: none"> <li>● The product must be movable around the house.</li> </ul>		
The device Affordable (cost accessible)	<ul style="list-style-type: none"> <li>● Inexpensive, preferably, less than \$5000, which is what the current product's price tends to fall in.</li> </ul>		5: Making the device affordable makes it easier to have the target audience have access to the device.

<p>Usable for support workers no matter the strength.</p>	<ul style="list-style-type: none"> <li>• The support worker typically possesses a physique much smaller than the person under their care. Consequently the product intended to help out would need to accommodate the varying degrees of strengths.</li> </ul>		<p>5: It's important to have this element in the device since the whole point of the device is to have the device easy to use.</p>
<p>Could be accessible and usable for different people with different disabilities.</p>	<ul style="list-style-type: none"> <li>• There are a wide range of different disabilities. The product should be made based on the most profound levels of disabilities to therefore ensure the accommodation of mild disabilities.</li> </ul>		<p>5: The device has to accommodate for the different varieties of disabilities.</p>
<p>Safe and reliable</p>	<ul style="list-style-type: none"> <li>• A robust quality and safety control measures throughout the manufacturing process.</li> </ul>		<p>5: Safety stands as paramount consideration to ensure the well being of users.</p>
<p>The individual in care varies in size and the product needs to be able to securely withstand the user.</p>	<ul style="list-style-type: none"> <li>• Be able to lift someone of, at least 250 lbs.</li> </ul>		<p>5: the device has to have a minimum capacity so the device could accommodate many different people.</p>
<p>The more it is to minimize the transport of the disabled the more efficient and better the device is.</p>	<ul style="list-style-type: none"> <li>• The device should minimize the transportation of the user as much as possible to reduce the effort of the client..</li> </ul>		<p>5: minimizing the transportation of the user is a major factor since the aim of the device is to reduce transportation.</p>

- **Precis Problem Statement**

Problem statement outline (short,sexy)

- What is the problem
- Who has it
- Solution forms

Develop a user-friendly and adaptable mechanism for transferring individuals onto wheelchairs, accommodating various mobility levels. Prioritize safety, minimize transfers, and ensure ease of use for both users and caregivers. The portable and adjustable solution should address different settings and prioritize safety, stability, and minimal physical strain for both users and caregivers.

## 4.2 Metrics

\*any specific need that could be measured by units

Table 2. Metrics Obtained

Metrics	Unit	Value
Dimensions		
Weight capacity	lbs	
Power		
Mass	lbs	
Manufacturing cost	CAD \$	
Durability	Years	
Device weight		
Safety		

## 4.3 Benchmarking

Table 3. Benchmarking of other products

	LaddaLift	The Assist Handle	LEVANTAR	IndeeLift HFL 400	Camel Lifting Cution
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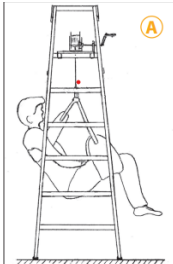




Company	KPC	RESENA	Drive medical	IndeeLift	Mangar
Description/ photos	 <p>KPC uses a step ladder along with a winch and a sling to form a home lift.</p>	 <p>The assist handles can be used in a variety of ways to perform different kinds of transfer.</p>	 <p>The LEVANTAR is a heavy duty patient lift. A caregiver sets the sling under the patient and then controls the device to lift them and move across the room.</p>	 <p>The IndeeLift is designed to pick up people from floor to seat level. With its simple remote control it could be used by anyone</p>	 <p>The camel lift is a lift that is designed to lift people off the floor with the help of one person. The fallen person lies on the device while it is deflated and waits for it to fully inflate.</p>
Cost	Affordable since it uses a ladder which is common.	Manufacturing cost: \$9.79	\$2 894.05	\$2 295	\$2 850-\$4 019.99 Depend on the website that sells it
Weight	250lbs	Not clearly stated. Made of plastic. Put 63.95% of the body weight on the handles	500 lbs	400 lbs	705.479 lbs
Portability	Hard to move around.	Outside, inside, up/down the stairs. Can be placed on the wheel to take anywhere.	Could be moved from room to room and outside	Easily portable anywhere by caregiver	Used inside or outside. Compactable into a bag to take anywhere.
Size	Big but compactable	Very small and compactable .	Hight: 76.3” Length: 52” Width: 27.7” Big	Medium size. Cannot be attached to the wheelchair	Lightweight and compactable. Rolled dimension 75cm x 20cm.
Power supply	Not needed	Not needed	Rechargeable batteries	Battery and charger	Rechargeable battery
Ease of use	Require set up. Not very complicated. Not usable by everyone. Require someone to move it	Require quick set up	Long and complicated assembly. Requires a caregiver to move the patient with the device	Easy to use. Powered by a remote control. Need someone to move it but people can lift themselves.	Simple and suitable for none professionals.
Independence	Not independent	Independent but require 2 hands	Needs a caregiver	Need some help	Need help of one person



Table 4. Benchmarking of other products evaluated with our ranking

	LaddaLift	The Assist Handle	LEVANTAR	IndeeLift HFL 400	Camel Lifting Cution
Company	KPC	RESENA	Drive medical	IndeeLift	Mangar
Cost	3	3	1	1	1
Weight	3	2	3	1	3
Portability	1	3	2	2	3
Size	2	3	2	2	3
Power supply	3	3	2	2	2
Ease of use	1	2	1	3	3
Independence	1	1	1	2	2
Total					

#### 4.4 Target Specifications

Table 5. Target specification of desired product

	Metrics	Relation (>, <, =)	Value	Units	
1.	Dimensions				
2.	Weight capacity				
3.	Power				
4.	Mass		Yes		
5.	Manufacturing cost		4-5		
6.	Durability		70	Years	
7.	Safety		Yes	NA	
8.			Yes	NA	
9.			Yes	NA	
10.			Yes	NA	
11.			Yes	NA	

12.			Yes	NA	
13.			250	lbs	
14.		=	Yes	NA	
15.		=	TBD	m <sup>2</sup>	

## **5 Concept Development**

### **5.1 Individual Prototype Concepts**

### **5.2 Concept Analysis Against Target Specifications**

### **5.3 Global Design Concept**

### **5.4 Visual Representation**

## **7 Conclusion**

### **Old problem statement:**

KPC Capability Inc. seeks a solution for individuals with limited mobility or one functional hand/arm, addressing the absence of an accessible, affordable, and reliable device for independent self-lifting. The challenge is to create a tool that ensures safety, promoting autonomy and inclusivity, aligning with the client's mission. The solution will have the form of a device that the client can take with them anywhere they go.