GNG2101 – Introduction to product development and management for engineers and computer scientists

Laboratory 6: Project Deliverable D Presentation

Team Z22: The Fast and Fabricating Five (FFF)

Agenda: Project Progress Presentation

1. Empathizing With Our Client
2. Customer Needs & Problem Statement
3. Takeaway of Client Meet 1
4. Significant Metrics
5. Product Benchmarking
6. Simplified Project Plan
7. Concepts Generated
8. Overview of Concept Design
9. Client 2 Feedback
10. The Purpose and Objective of Prototype 1
11. Demonstration
12. Lessons Learned
13. Info to be Gathered

Difficulties with everyday tasks

Often dislocates shoulders

Single parent

Cannot do full ROM movements

Suffers from Ehler-Danlos Syndrome (EDS)

Can only use 1 brake handle

Imagine

Arm is kept in a sling

Very dependent on 11-year-old daughter

Folding the walker is essential

Limited mobility

Small apartment

Cannot depend on elevators

Customer Needs & Problem Statement

The client requires a **maneuverable**, **lightweight**, **easily attachable** device that allows them to steer the walker **effectively** with one arm through narrow spaces and diverse terrain.

Client Needs Listed by Priority

1. Optimized for single-handed operation
2. Adaptable (use with either arm)
3. Maneuverable (easy to take on/off and fold)
4. Effortless applicable braking system
5. Durable (withstand different weather conditions)
6. Installable without permanent changes to walker

Takeaway: Client Meet 1

01 Convenient

Using the walker with 1 arm easily

02 Flexible

Used in numerous circumstances

03 Portable

Maintain the simplicity of transportation while carrying the walker

Design Priorities: Significant Metrics

01
Total Weight
Less than 5 pounds

02
Length
Equal to 55 cm

03
Length (folded)
Less than 25 cm

04
Assembly Time
Less than 30 seconds

Product Benchmarking

Carex Folding Hemi Walker

Stander Let's Go Indoor Rollator (1 Handed)

S.T.I.N.G (single-handed steering component)

Simplified Project Plan

#	Task	Time												Owner
		Month 1				Month 2				Month 3				
1	Deliverable A	x												All members
2	Deliverable B		x											Tyler
3	Design criteria		x											All members
4	Conceptual design & Project plan			x	x									All members
5	Prototype 1, Tests and Feedback					x	x							Jonathan
6	Prototype 2, Tests and Feedback							x	x					David
7	Prototype 3, Tests and Feedback										x			
8	Material of Design Day & Presentation											x		All members
9	Production of user manual												x	All members
10	Project closeout												x	All members
Project risks	Delivery delay of important project components + Team conflicts + Low commitment													

X means one week

■ means milestones
- Client Meetings
- Design Day
- Final Presentation

Template retrieved from GNG 2101 lecture 11 slides

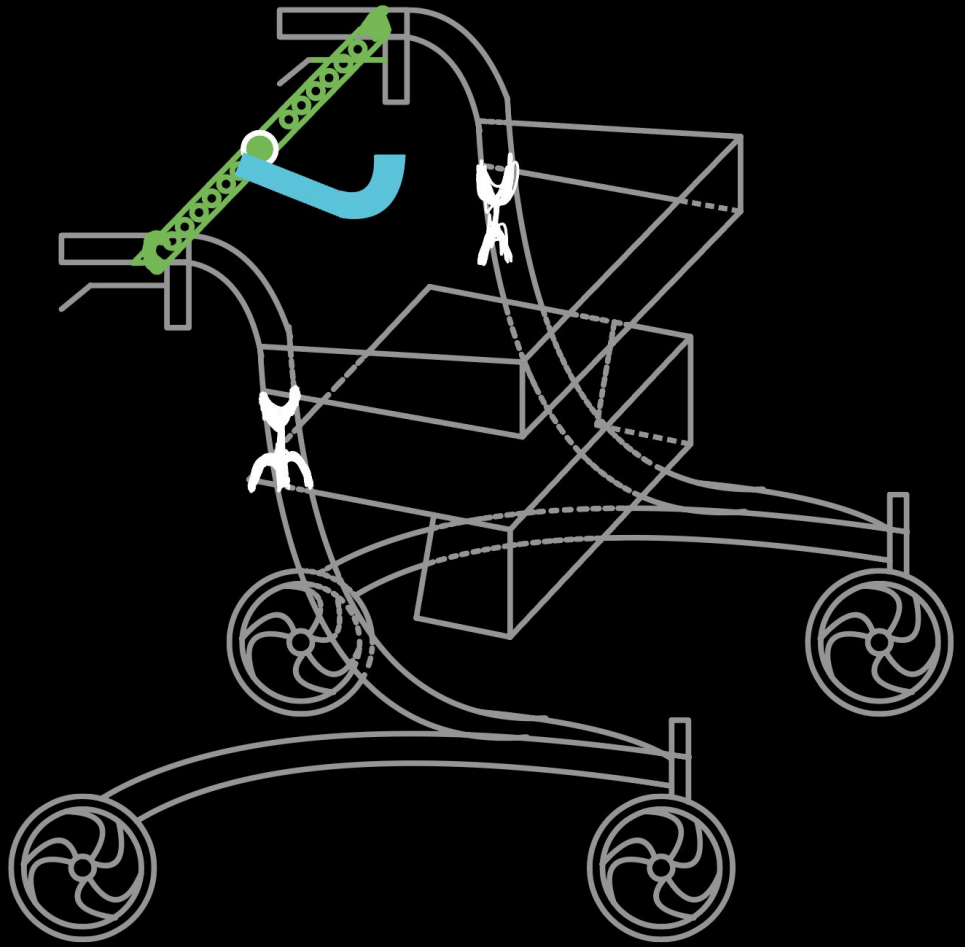
Concept Generation

4 Subsystems that we chose:

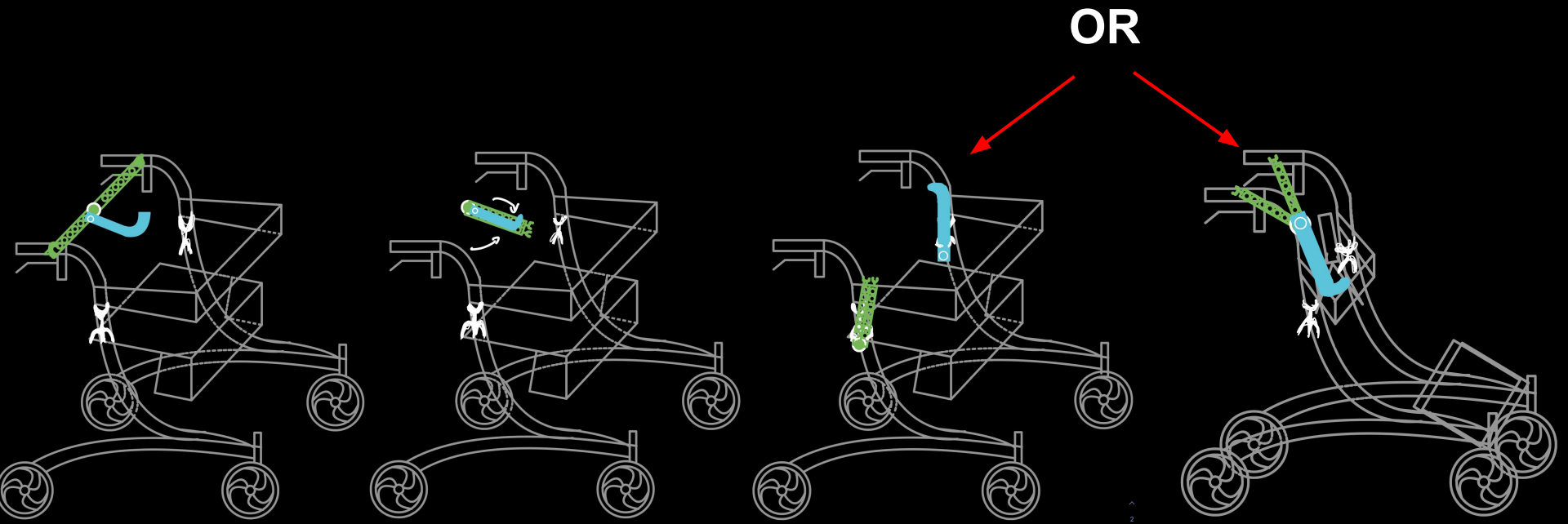
- Attachment Method
- Folding Mechanism
- Steering System
- Adapting System

Attachment method (To the walker)	**Folding**	**Steering**	**Adapting** (having system work on both sides)
Snap Clip	Bar aligned with walker's external post	Wheel	Circular clamp that can be tightened using a screw that twists to loosen/tighten, in a similar way to the function of a vice clamp.
Vice Clamp	Telescoping inside of itself	Extended handle	Sliding mount for the steering system.
Magnet	Bar has a pivot point in the middle where the bar can fold in half	Lever system	The mechanism will be able to be attached and removed from either handle. Using a clip-on method the mechanism can be attached and moved around depending on the clients comfort and preferences.
Magnetic weight stack pin		Electronic steering system (Buttons)	

How does it work?



Complete Design



Client Meeting 2 Feedback

Mostly positive feedback

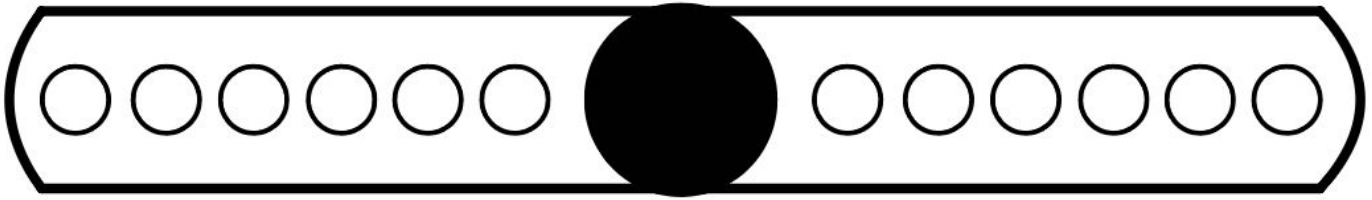
- Supports the idea of having a bendable bar

Main concern

- Fears that the plastic clamps may break overtime
- Where to buy snap clip materials to repair.
- Metal rusting

Objective of Prototype 1: The Main Bar Sub-system

- Validate assumptions made about the final prototype
- Test and verify our assumptions
- Test whether our concept is viable
- Testing whether our folding mechanism would be feasible for this use case.



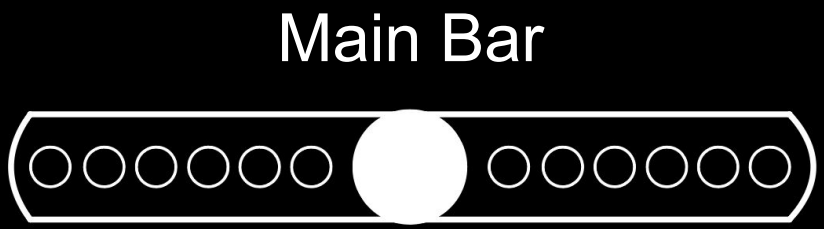
The Purpose

Determine:

- If a folding mechanism would be the right choice for the main bar. (As opposed to another method to allow our product to extra portable

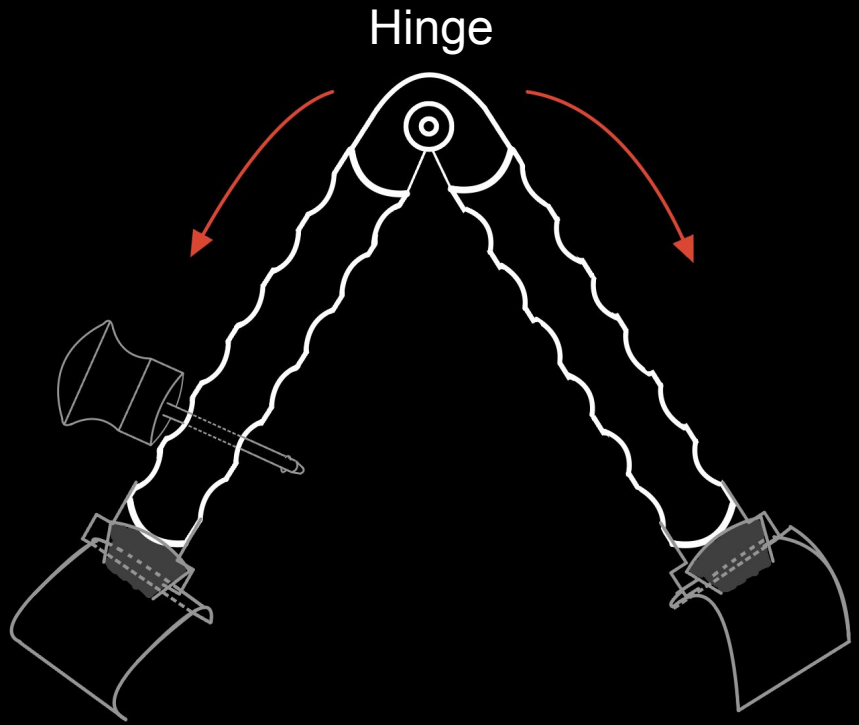
- Whether the selected hinge would be the usable in our product or if we needed to find another way of folding our main bar.

How Does it Work?

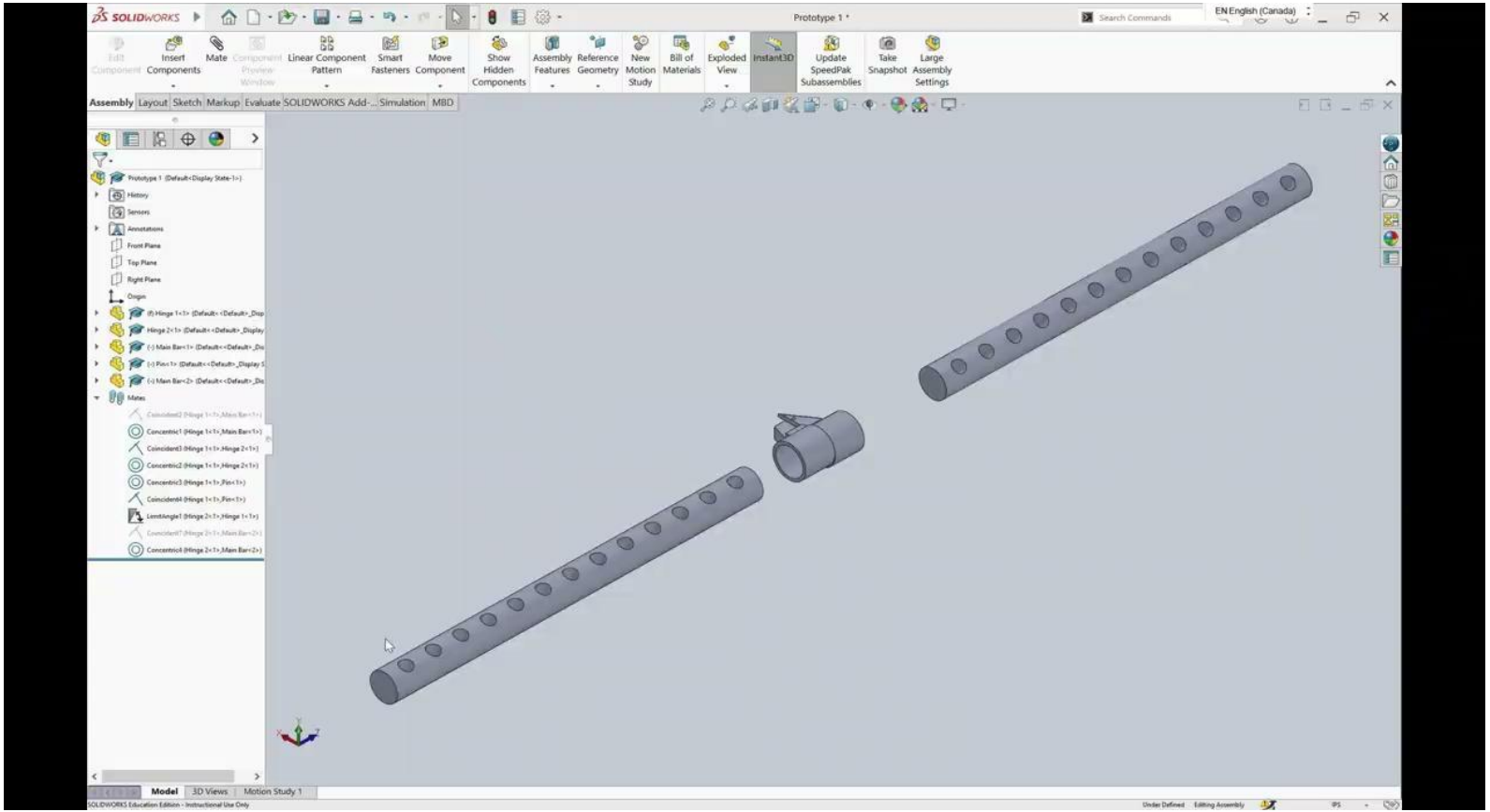


How Does it Work?

Main Bar Bending



Prototype 1: Demonstration



What Was Learned From The First Prototype

- Our main bar idea is feasible
- The hinge design we chose would be able to work in this situation
- It allows for easy folding with a one way folding system

Information to be Gathered in Next Client Meet

- Verify that the requirements are still being effectively met
- Ensure that the alterations/modifications made are satisfactory
- Ensure materials are functional and will work for the client
- Clarifying exact dimensions
- Confirm any lingering questions

Questions?