DELIVERABLE J-PROJECT PRESENTATION B25

Overview

1. Breakdown
2. Deliverable B: Needs, Problem Statement, Metrics, Initial Project Plan, Benchmarking and Target Specifications
3. Deliverable C: Conceptual Design, Project Plan, and Feasibility Study
4. Deliverable G: Business Model and Economics report
5. Deliverable D: Finalized Design + Potential Solutions
6. Prototype I
7. Prototype II
8. Prototype III
9. Lessons learned
10. Future plans

Breakdown

01 Portable Change Table

02 For use anywhere

03 Providing privacy

Project Objective

"People with physical disabilities that prevent mobility can often have issues with changing themselves. Design a portable change table that is compact, lightweight, ergonomic and provides privacy that can be used by a caregiver to assist a person with mobility issues in changing themselves. The design can be used both indoors and outdoors."

Initial Project Plan

#	Task	Time															Owner
		September				October				November				December			
1	Team Contract & Plan skeleton	x	x														Group
2	Client needs & problem statement		x														Group
3	Benchmarking		x														Ersan
4	Design Criteria		x														Frank
5	Concetpual Design, Feasibility Study			x													Devin
6	Prototype I Testing and results				x	x	x										Devin & Frank
7	Prototype II Testing and results							x	x	x							Devin & Frank
8	Protype III Testing and results										x	x	x	x			Devin & Frank
9	Design Day											x	x	x			Group
10	User Manual & Project closeout												x	x	x	x	Group
Project Risks: Delivery delay + Team Conflict																	
	x Means one week					Mllestone such as client meet or design day											

Client Statements -> Interpreted Needs

Client Statements	Interpreted Need
"Easy to carry and not too bulky. I kinda envisioned- you know how camping chairs fold out- maybe some kind of feature like that or something like patio lounge chairs that fold up into like a tri-fold. So do it like that or fold the way a camping chair folds"	Looking for a foldable and easy to carry table with similar features to a camp cot or patio lounge chair.
"About two feet by… five feet long"	Dimensions of device approximately 2' by 5'
"It does not need to be [cushioned] as long as it's not poking him"	Comfort is a priority
"It might need to be a little bit height adjustable but I don't know if that's feasible	Height adjustability desired

Customer Needs

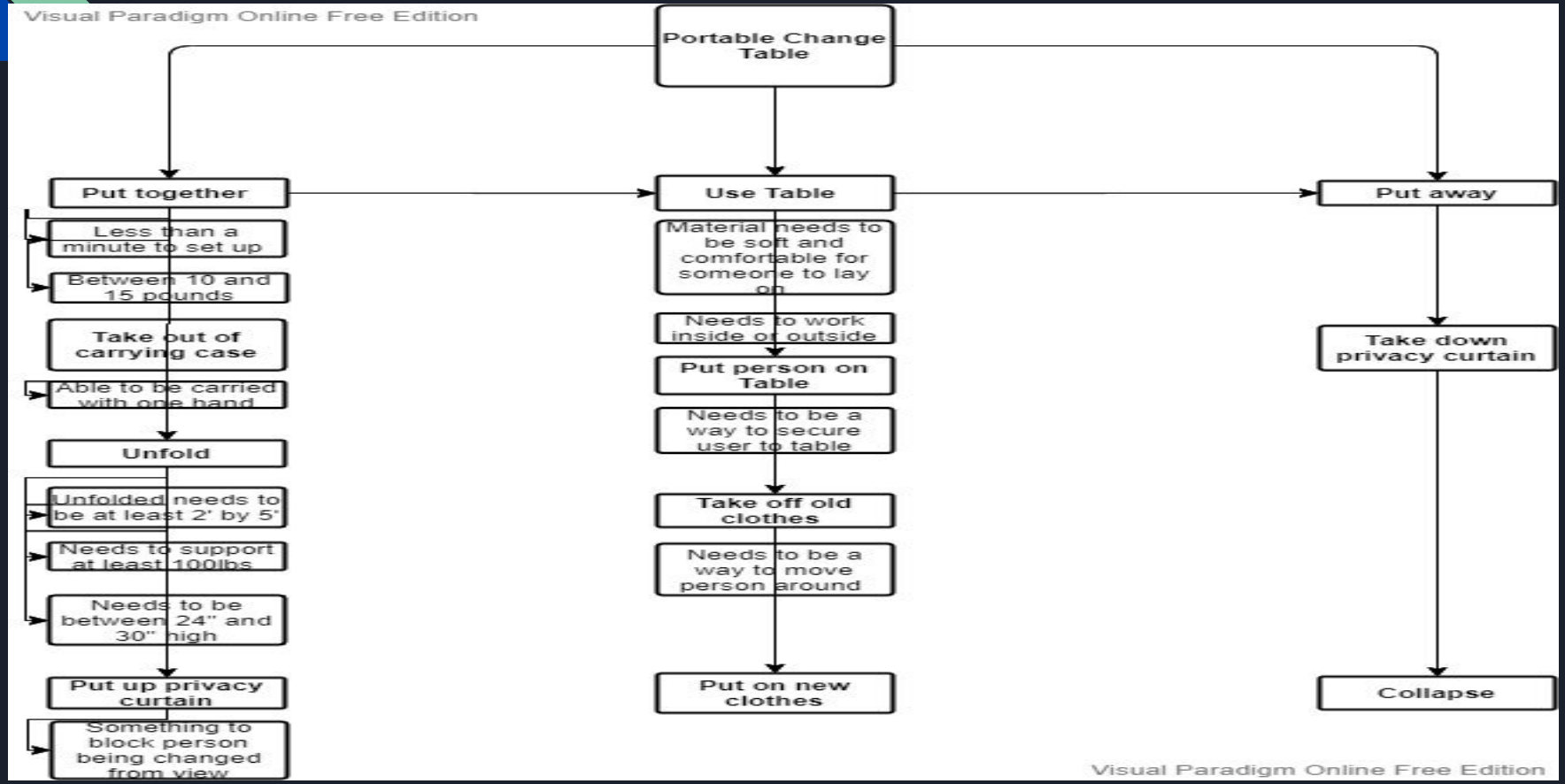
- Interpreted needs then taken and put into ranked statements
- Rank is decided based on either how much the client emphasised the interpreted needs importance
- Or based on amount of times client mentioned the need: eg if need is mentioned more than once the rating will be higher

#	Customer Needs	Importance
1	The change table is compact	5
2	The change table is portable	5
3	The change table is ergonomic for user	3
4	The change table is made of a comfortable material	3

Design Specifications

Metric	Unit	Functionality/ Constraint
Weight	Pounds (lb), Kilogram (kg)	Constraint
Height	Feet (ft), Metric (m)	Functional
Size of Table Top Width	Feet (ft), Metric (m)	Functional
Size of Table Top Length	Feet (ft), Metric (m)	Functional
Collapsible	Percentage (%)	Functional
Set up Time	Minutes (mins), Seconds (s)	Non-Functional
Cushioned	Binary	Non-Functional
Water Resistance/Proof	Binary	Non-Functional
Weight Supportive	Pounds (lb)	Functional
Cost	Dollars ($)	Constraint

Functional Decomposition



Benchmarking

- Results of benchmarking similar products
- Learned that not a lot of similar products exist on the market
- Learned that the weight may be more than expected
- Learned about best practices. Eg. security/support straps on these devices

Product	Cost	Material	Weight	Portable?
Armedica Hi-Lo Changing Table	$2330	Metal, with cushioned padding and rails	450lbs	No
Rifton Hygiene Support Station	$3270	Metal with cushioned padding	250lbs	No
Extra Large Portable Folding Comfort (Camp Cot)	109.99	Metal and polyester	23.37lbs	Yes

Business Model

<table>
<tr>
<td rowspan="2">Key Partners:
- Public stores (e.g. Walmart, Loblaws, etc.)
- Online shopping applications (e.g. Amazon)</td>
<td>Key activities:
- Mechanical Development
- Mass Production</td>
<td rowspan="2">Value Proposition:
- Support people with disabilities in terms of changing.
- Provide conveniences for caregivers while changing for the patient.
- Small, portable, and comfortable for both the caregiver and the patient.
- Privacy when changing.</td>
<td>Customer relationship:
- Social media
- Insurance
- Tech Support
- Customer Service.</td>
<td rowspan="2">Customer segment:
- For handicapped people who face inconveniences in changing.
- People who has a handicapped family member or friend who faces changing difficulties</td>
</tr>
<tr>
<td>Key resources:
- Material Stores (aluminium pipes, camping chairs, polyester fabric, Steel wire)</td>
<td>Channel:
- Websites.
- Stores/Office.</td>
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<tr>
<td colspan="2">Cost Structure:
- Product development
- Material for mass production
- Sales and Marketing
- Salaries for permanent employees</td>
<td colspan="3">Revenue Streams:
- Marketing solutions
- Sales from public branches/stores and online-shopping.
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Finalized Design

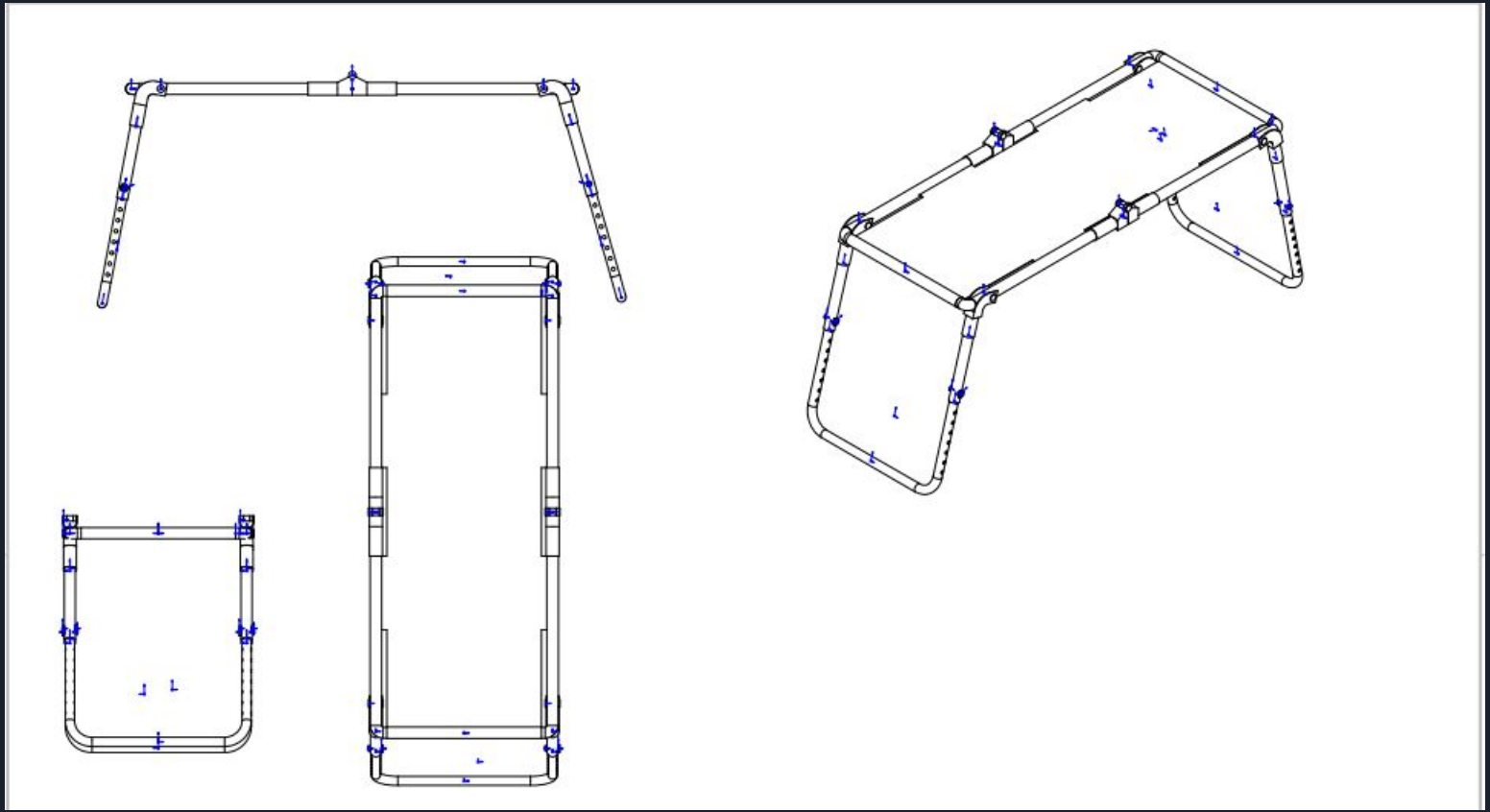
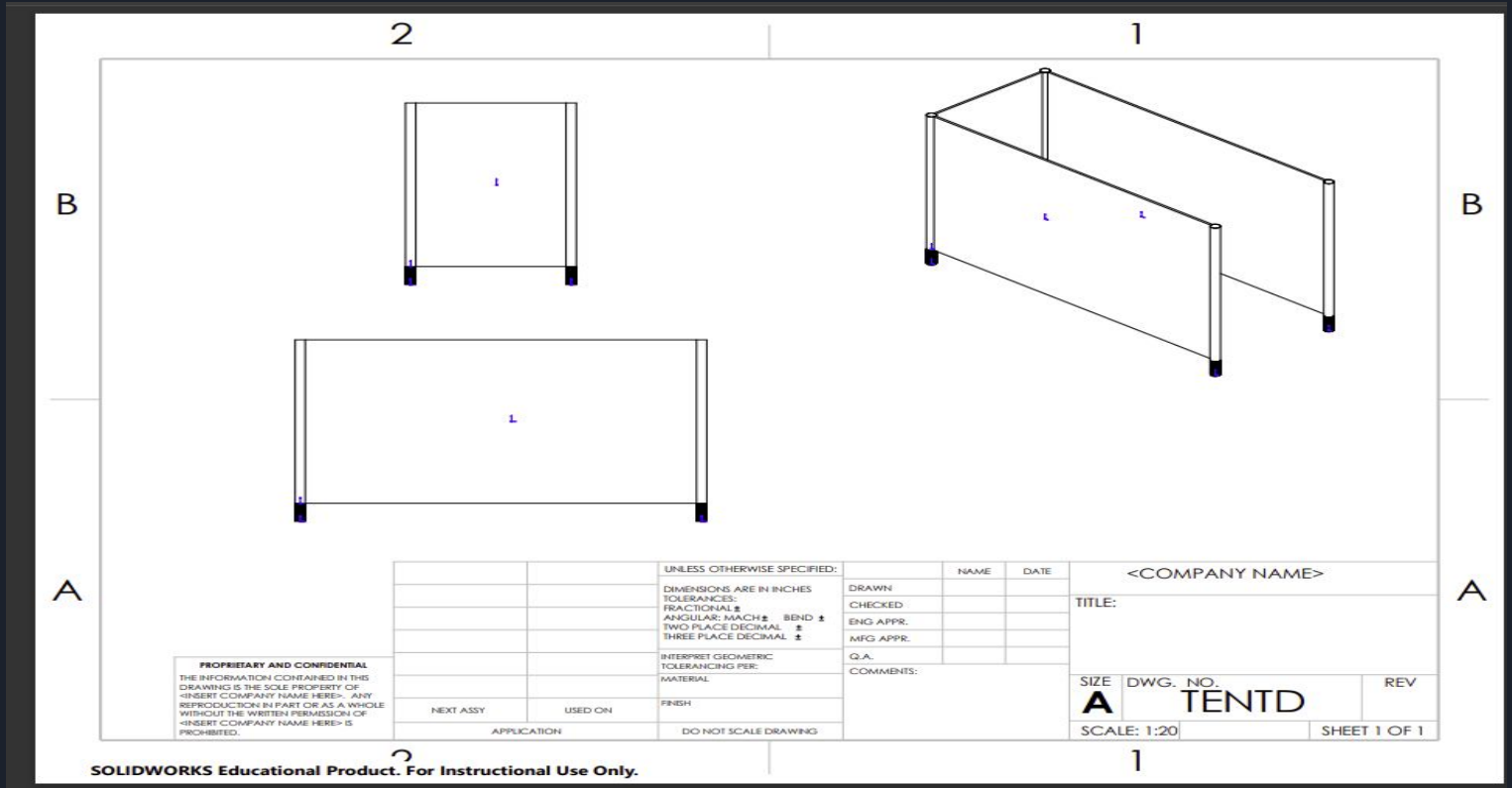


Table Subsystem



Tent Subsystem

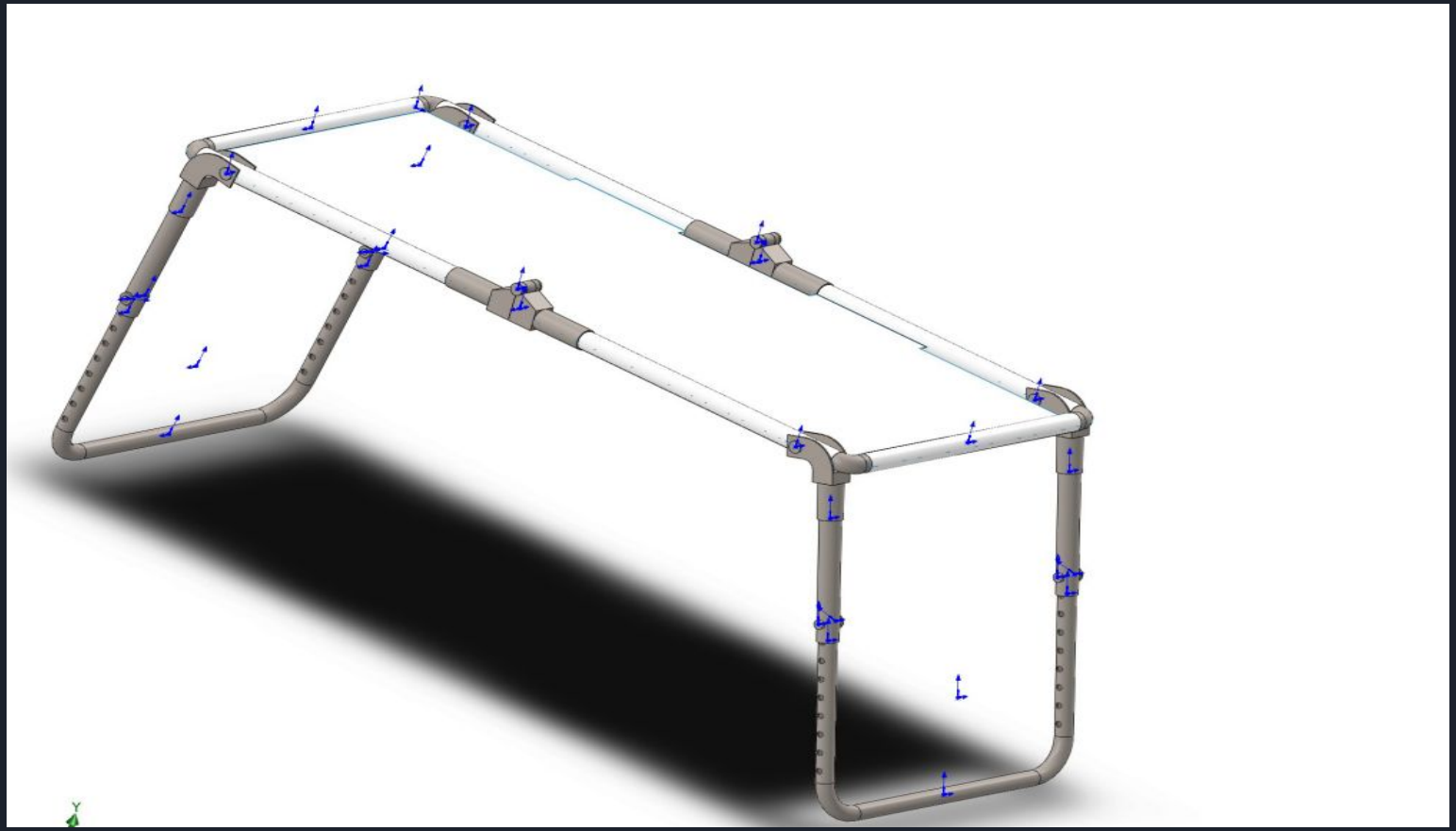
Prototype I

Prototype I

- Didn't want to build anything physical yet as if she doesn't like design, easy to change
- Therefore a solidworks drawing was made
- The prototype is low-fidelity analytical prototype. This prototype was focused on the table itself rather than the other subsystems.

Testing Goals

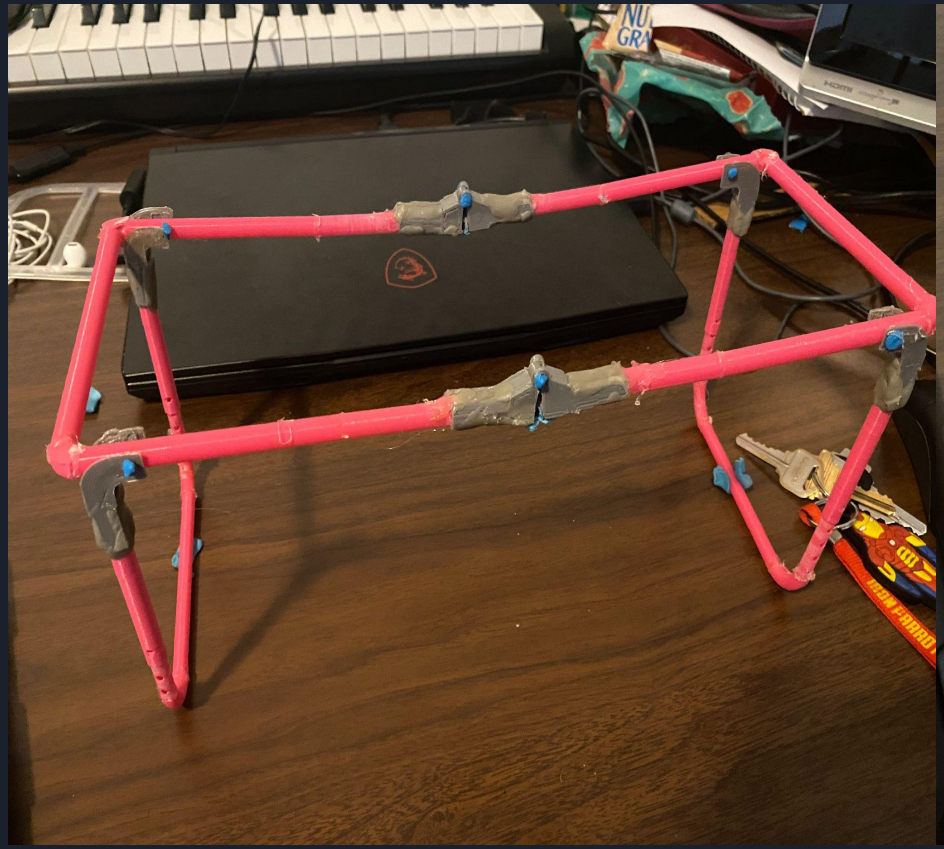
1. Test the feasibility of the design using the analytical CAD tools.
2. Make sure that the device won't weigh too much
3. Test the look of the design.

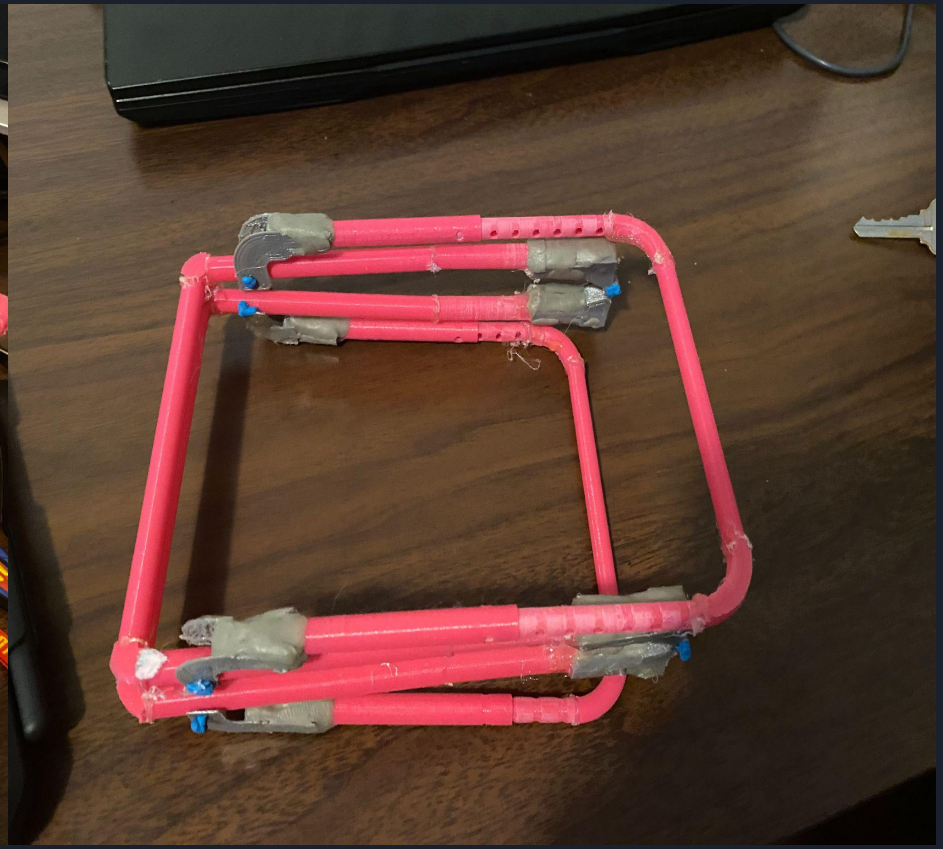


Solidworks drawings of prototype I

Prototype II

- Once our design was okayed by client, we decided to build a small scale model to identify any potential issues with the manufacturing
- To do this, the design was 3D printed and put together





Pictures of our Prototype II

Bill of Materials

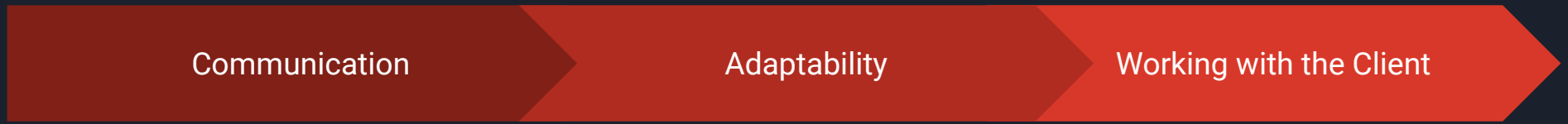
Material	Cost	Reasoning
20 ft Aluminum piping	$55.86	For table top and legs
Paracord	$7.77	Attaching the cloth to the table
Bolts	$5.88	For attachments
18.8 Nuts	$5.88	For attachments
18.8 Wing nuts	$3.26	For attachments
Total Cost	$78.65	
Total Cost with Tax	$88.87	

Prototype III

- Finally after learning a lot of lessons from prototype II, this was the final build of our prototype for design day.

Pictures of Prototype III

Lessons Learned



What's Next?