Coffee for Everyone

By: Chris Murphy, Shifali Bose, Safkath Faruk, and Dan Spillane

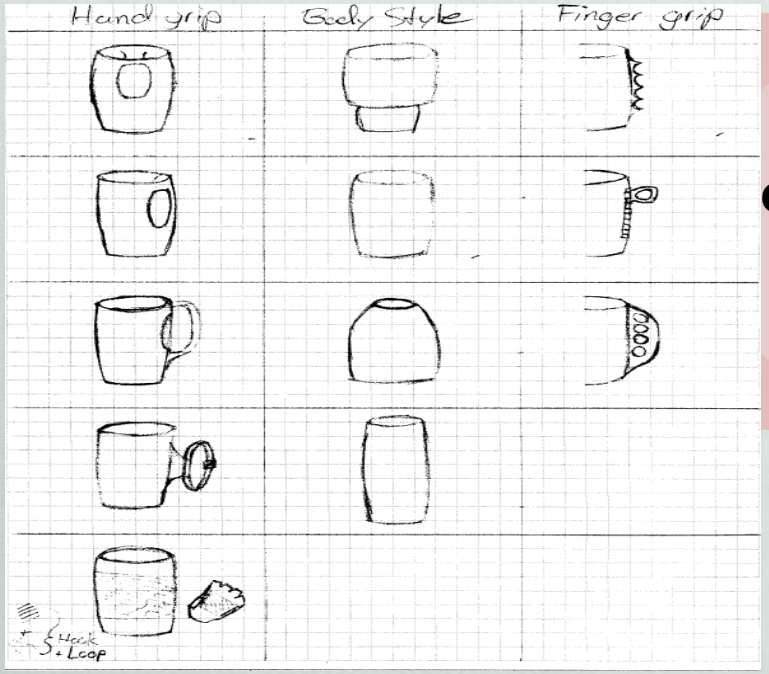
Background

- Disabled people all around the world have difficulties with the simplest tasks such as drinking coffee
- In order to solve this problem for them, our task was to create a disability-friendly coffee cup that only required one finger

Why We Care & Mission Statement

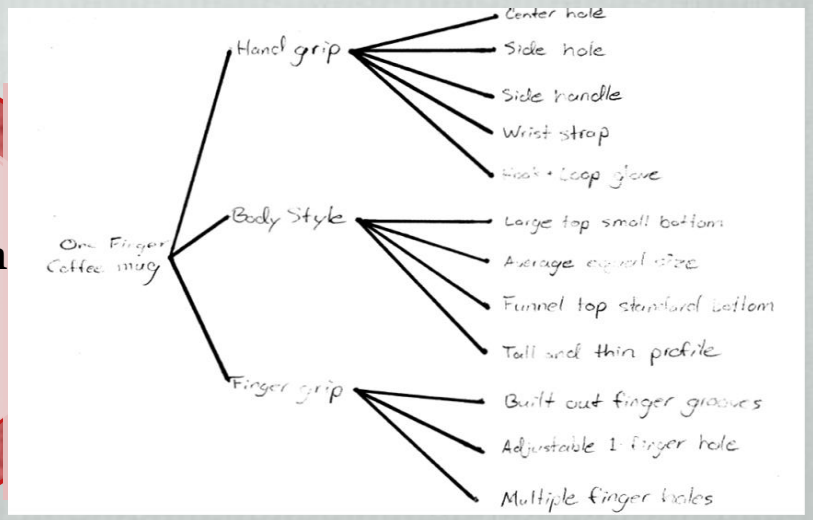
- Our responsibility as engineers is to create and redesign objects that can help people in their everyday lives and simplify tedious tasks.
- Our mission with our coffee cup is to provide every person, regardless of disability, with the ability to start his or her day with a great cup of coffee.

Design Process



Combination Table

Classification Tree

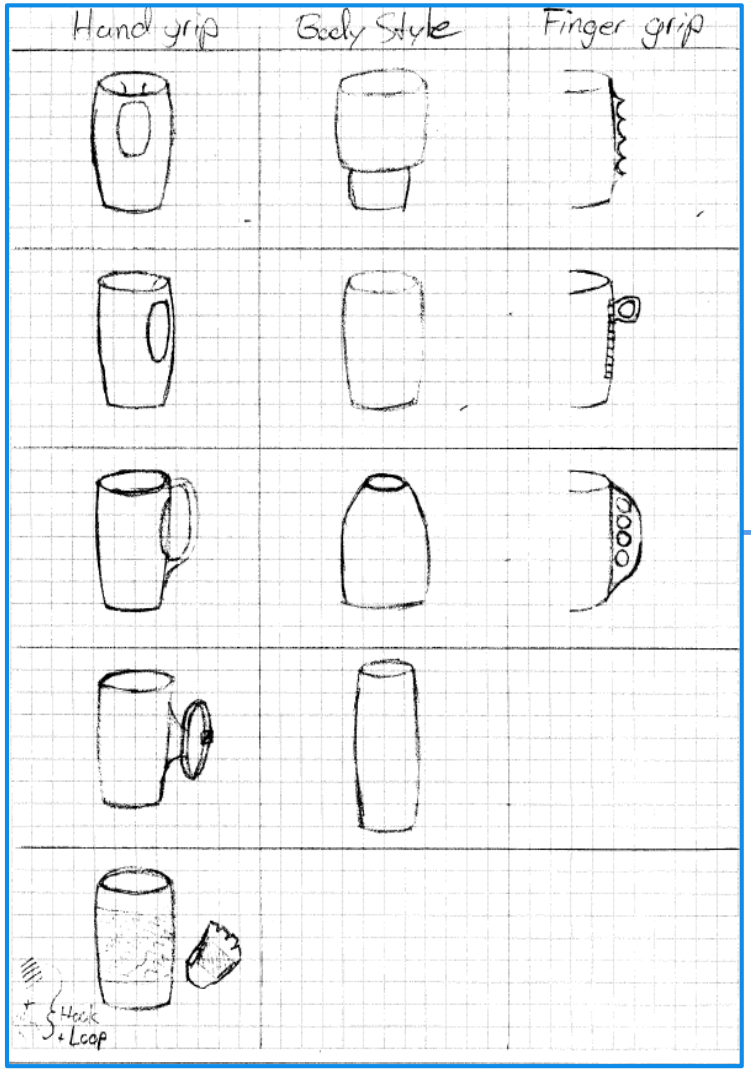


Customer Needs & Ranking

	Portable				Comfort					Convenience						Durable			total	weight
	lightweight	fits in cup holder	handheld	balanced	Insulated	smooth edges	fits hand	grippy texture	easy to grip	standard liquid amounts	easy to drink from	easy to fill	easy to clean	can be handled correctly	stain resistant	micro safe	Dishwasher safe	shatter resistant		
lightweight	1	3	.33	.33	5	5	.2	7	3	5	7	3	5	3	9	3	3	5	67.86	0.084
fits in cup holder	.33	1	.2	.2	3	.33	.14	3	.14	3	.33	5	1	.11	3	.33	.33	.33	21.77	0.027
handheld	3	5	1	5	9	7	1	9	5	9	5	7	7	1	9	7	7	7	104	0.130
balanced	3	5	.2	1	.33	1	.2	9	.33	3	1	1	7	.2	7	3	3	3	48.26	0.060
insulated	.2	.33	.11	3	1	3	5	5	.2	3	.2	.33	3	.11	5	.2	.2	.14	30.02	0.037
smooth edges	.2	3	.14	1	.33	1	.2	1	.33	3	.2	.33	.33	.14	3	.2	.2	.14	14.74	0.018
fits hand	5	7	1	5	.2	5	1	7	1	7	5	5	7	1	9	5	5	5	81.2	0.101
grippy texture	.14	.33	.11	.11	.2	1	.14	1	.14	.2	.2	.33	.33	.14	3	.2	.2	.14	7.91	0.010
easy to grip	.33	7	.2	3	5	3	7	7	1	5	3	7	7	1	9	5	5	1	76.53	0.095
standard liquid amounts	.2	.33	.11	.33	.33	.33	.14	5	.2	1	.14	.33	.33	.11	3	.2	.2	.14	12.42	0.015
easy to drink from	.14	3	.2	1	5	5	.2	5	.33	7	1	3	5	.2	7	1	1	.2	45.27	0.056
easy to fill	.33	.2	.14	1	3	3	.2	3	.14	3	.33	1	3	.14	.11	.33	.33	.14	19.39	0.024
easy to clean	.2	1	.14	.14	.33	3	.14	3	.14	3	.2	.33	1	.14	3	.33	.33	.14	15.66	0.020
can be handled correctly	.33	9	1	5	9	7	1	7	1	9	5	7	7	1	9	7	7	5	97.33	0.123
stain resistant	.11	.33	.11	.14	.2	.33	.11	.33	.11	.33	.14	9	.33	.11	1	.14	.14	.11	13.07	0.016
micro safe	.33	3	.14	.33	5	5	.2	5	.2	5	1	3	3	.14	7	1	1	1	41.34	0.052
dishwasher safe	.33	3	.14	.33	5	5	.2	5	.2	5	1	3	3	.14	7	1	1	1	41.34	0.052
shatter resistant	.2	3	.14	.33	7	7	.2	7	1	7	5	7	7	.2	9	1	1	1	64.07	0.080

Customers needs and other important design elements were compiled and ranked based on their importance from one another

Generation of Concepts



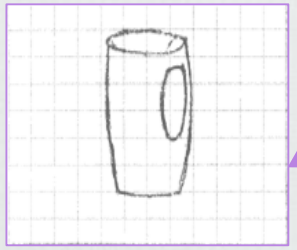
Hand Grip

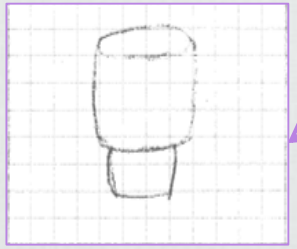
Body Style

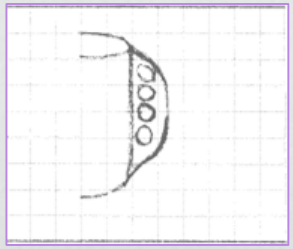
Finger Grip

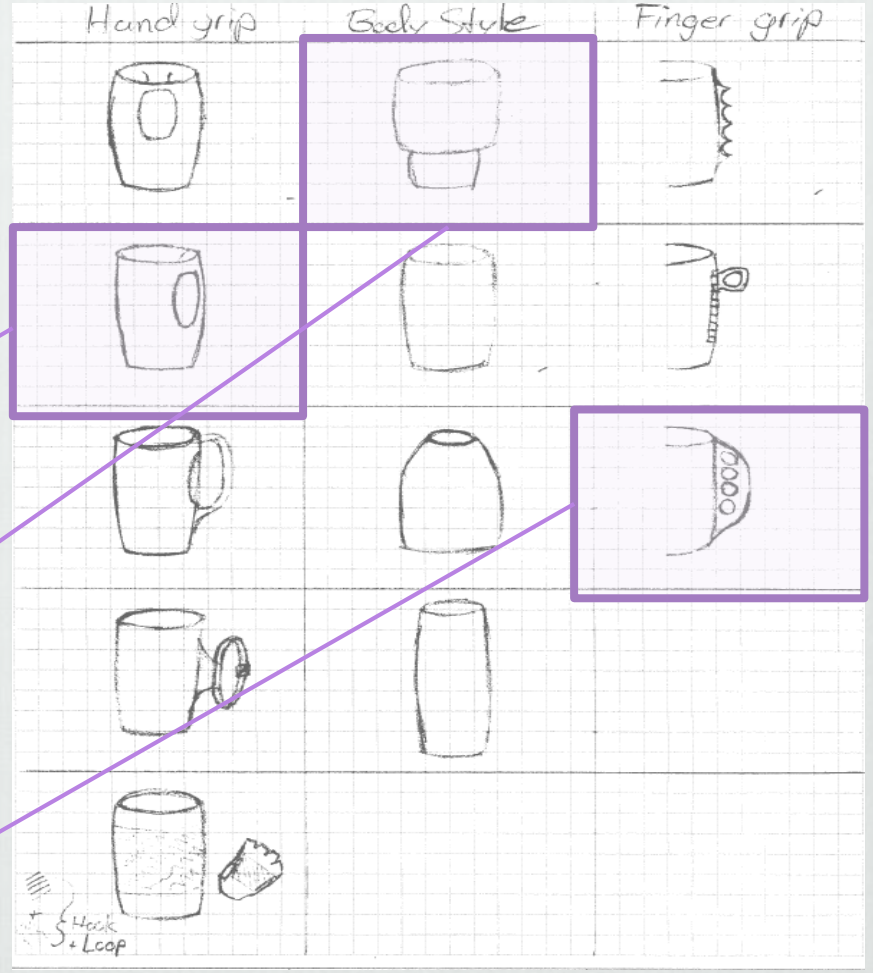
Concept Selection

From the concepts that were generated, 20 possible designs were created by taking a concept from each column and assembling a possible final product.









Concept Ratio

Selection Criteria	Center Standard Grooved	Center Standard Railed	Center Standard Holes	Center Staggered Groove	Side Standard Groove	Side Standard Railed	Side Funnel Groove	Side Tall Holes	Handle Standard Groove	Handle Standard Railed
Handheld	+	+	+	+	+	+	+	+	+	+
Can be Used Correctly	+	+	+	+	+	+	+	+	0	0
Fits Hand	0	0	-	-	0	0	0	0	0	0
Easy to Grip	+	0	+	+	+	+	+	0	-	-
Balanced	+	+	+	+	-	-	-	-	-	-
Sum +'s	4	3	4	4	4	3	3	2	2	1
Sum 0's	1	2	1	0	1	1	1	2	1	2
Sum -'s	0	0	1	1	0	1	1	1	2	2
Net Score	4	3	3	3	4	2	2	1	0	-1
Rank	1	3	3	3	1	6	6	12	15	19

Selection Criteria	Handle Tall Groove	Handle Funnel Railed	Strap Standard Groove	Strap Standard Railed	Strap Tall Holes	Strap Funnel Groove	Velcro Standard Railed	Velcro Standard Holes	Velcro Funnel Holes	Velcro Tall Holes
Handheld	+	+	+	+	+	+	+	+	+	+
Can be Used Correctly	+	0	0	0	+	0	0	0	0	0
Fits Hand	0	0	0	0	0	0	0	0	0	0
Easy to Grip	-	-	+	0	0	0	+	+	0	+
Balanced	-	-	-	-	0	-	0	0	0	0
Sum +'s	2	1	2	1	2	1	2	2	1	2
Sum 0's	1	2	2	3	3	3	3	3	4	3
Sum -'s	2	2	1	1	0	1	0	0	0	0
Net Score	0	-1	1	0	2	0	2	2	1	2
Rank	15	19	12	15	6	15	6	6	12	6

The 20 concepts that were formed were then analyzed using the highest valued customer needs. Each concept was considered in a real life scenario where we determined if the design satisfied each of the customers needs.

Prototype & Testing

- Look at clay prototype and its features

Difficulties & Project Reflections

Difficulties

- The main challenge our group faced throughout this project was satisfying as many customer needs as possible while still maintaining a cohesive design that can be operated with one finger
- Giving each design aspect a value while maintaining other design features was also another challenge we struggled with

Reflections from the project

- We learned that designing a product to satisfy the customer needs is harder than expected because some needs conflict with others, yet you have to compromise in order to achieve an acceptable result.
- We also learned that not every customer need will be met so you will have to narrow down the options of these needs in order to produce a product that would be most ideal for the consumer.

Thanks & Questions?