

Go Baby Go-D

Sponsor/Client: Dr. Sarah Oman



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Go baby Go

What is Go baby GO?

Who is the sponsor?

Why is it important?



Go Baby Go

- Aims in helping Disabled children.
- Make children feel normal.
- Help build a better prototype for the child in need.



Figure 1: [3]

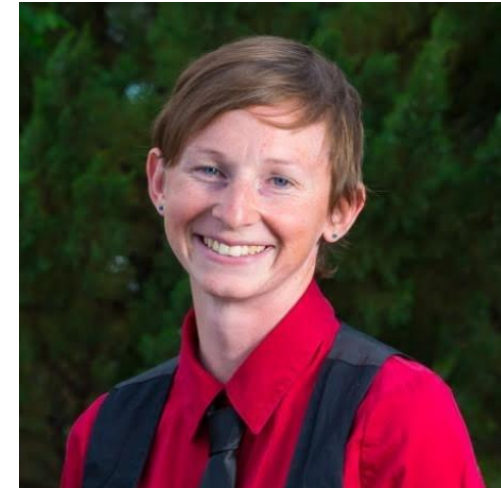
Sponsor

- Sponsor:

Dr. Sarah Oman

Mechanical Engineering

sarah.oman@nau.edu



Why Go baby Go is important?

- Children of special needs are a part of this community.
- Kids with special needs need to feel normal.
- Children need to explore what's around them.



Figure 2: [3]

Design requirements

- Low cost (Budget \$1,500)
- Obtainable parts
- No jerking motion
- New design

Customer Requirements

1. Power system

- a. Control acceleration
- b. cruise controller
- c. Brakes

2. Physical

- a. comfortable seats
- b. trunk mobility
- c. legs support

3. Operating system

- a. easy to operate

4. Financial

5. Safety

- a. seatbelt harness
- b. bars

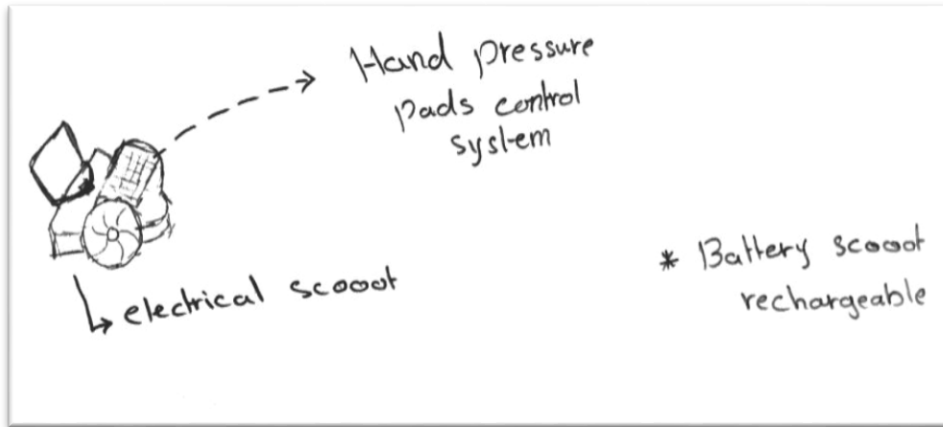
Engineering Requirements

- Weight
- Cost
- Smooth Sides
- Suspension
- Store Energy
- Multiple Speeds
- Steering Options
- OSHA Standards

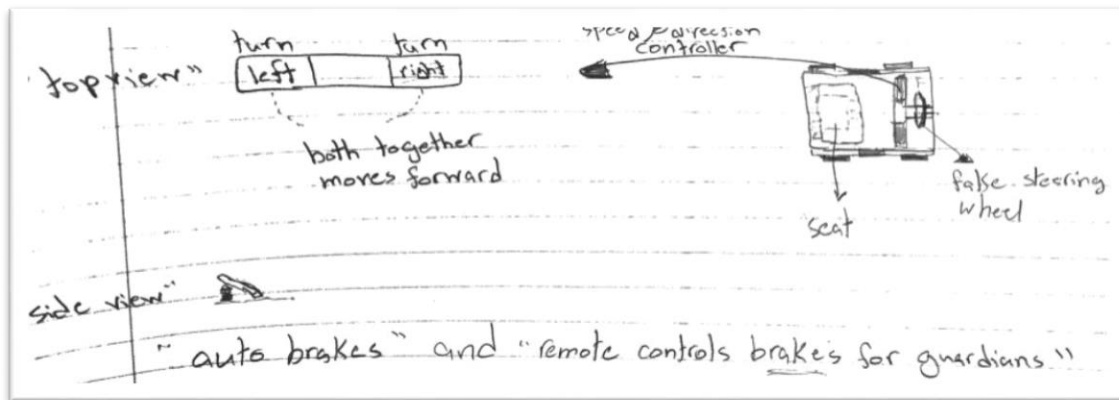
Customer Requirement	Weight	Engineering Requirement	Weight <<	Price/cost <<	smooth sides >>	suspension >>	Store energy >>	Multiple speeds >>	steering options >>	OSHA Standards >>
1. Power system										
a. Control acceleration	5		9	5	0	0	9	9	9	9
b. Cruise controller	3		9	5	0	0	9	5	5	9
c. brakes	5		5	0	5	5	5	9	5	9
2. Physical										
a. Comfortable seats	5		1	5	9	5	0	0	0	9
b. trunk mobility	4		9	0	0	0	0	0	0	0
c. legs support	3		0	9	9	0	0	0	5	9
3. Operating system										
a. easy to operate	5		0	0	5	1	0	9	9	9
4. Financial	5		0	9	0	0	9	0	0	0
5. Safety										
a. Seatbelt harness	5		0	0	0	0	0	0	0	9
b. bars	3		9	5	9	0	0	0	0	9
	Units		lb	\$	rad	lbf/in^2	W	m/s	N/A	N/A

Figure 3: House of Quality

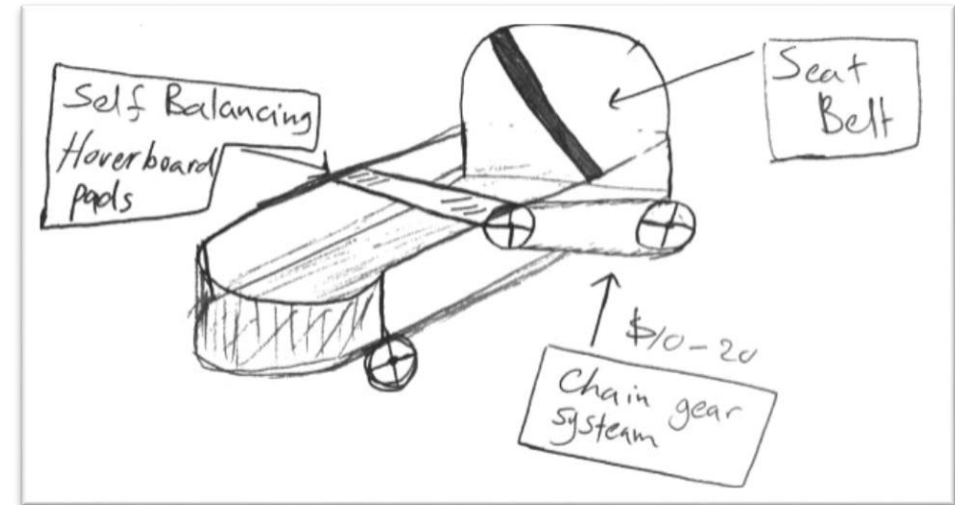
Designs Considered



CV4

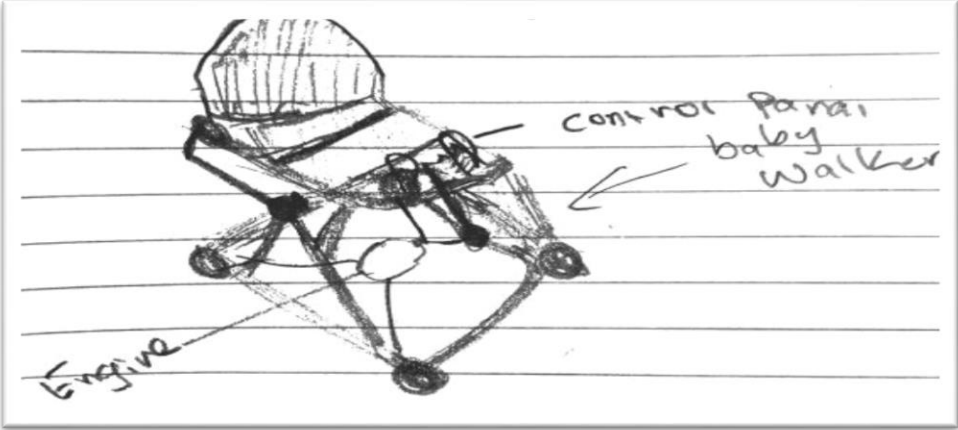


CV7

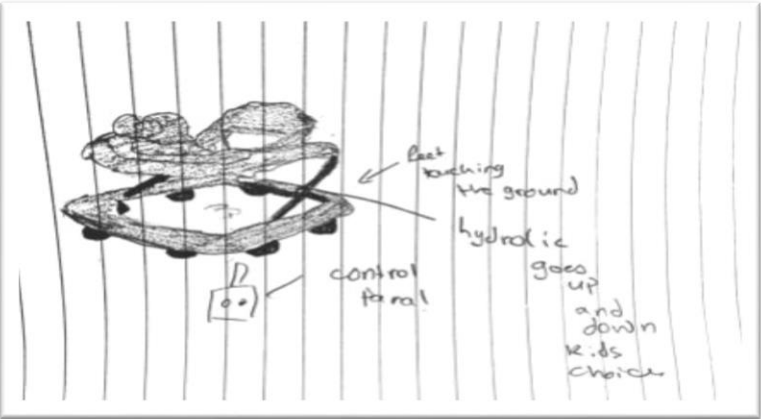


CV2

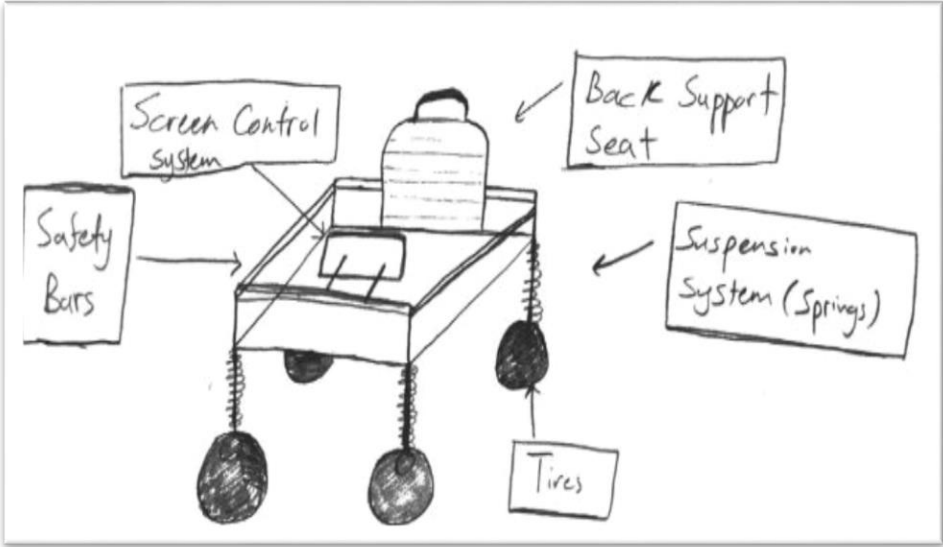
Designs Considered



CV1

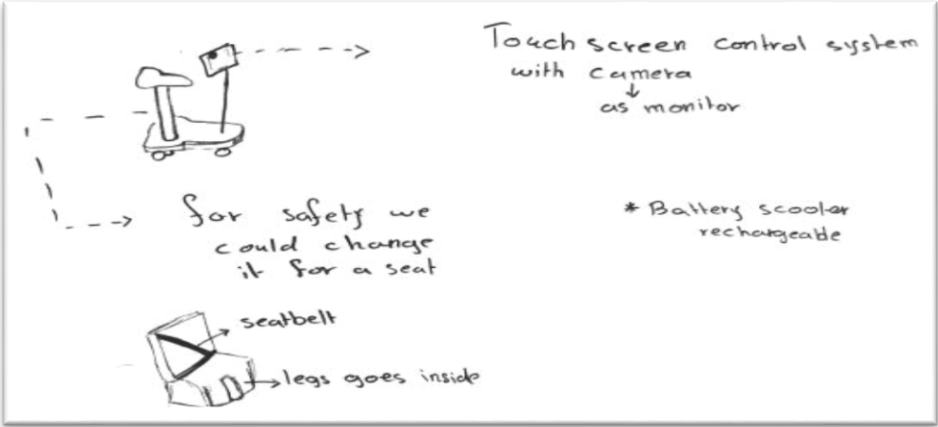


CV5

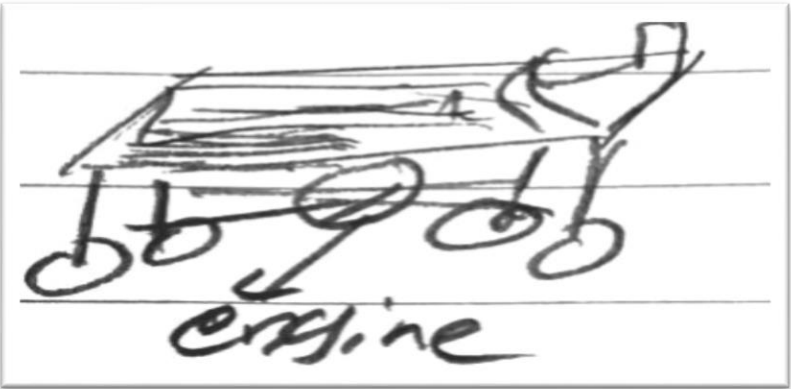


CV6

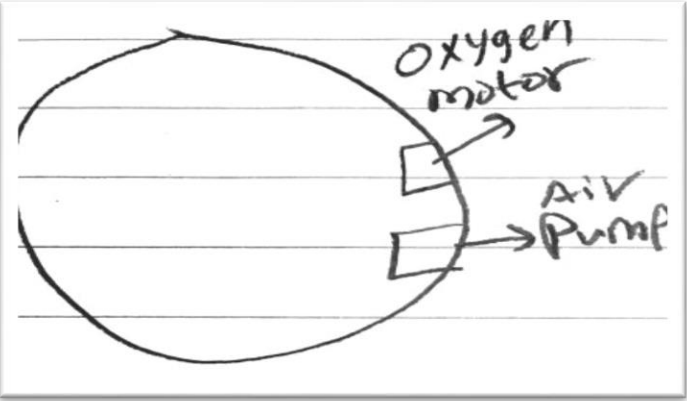
Designs Considered



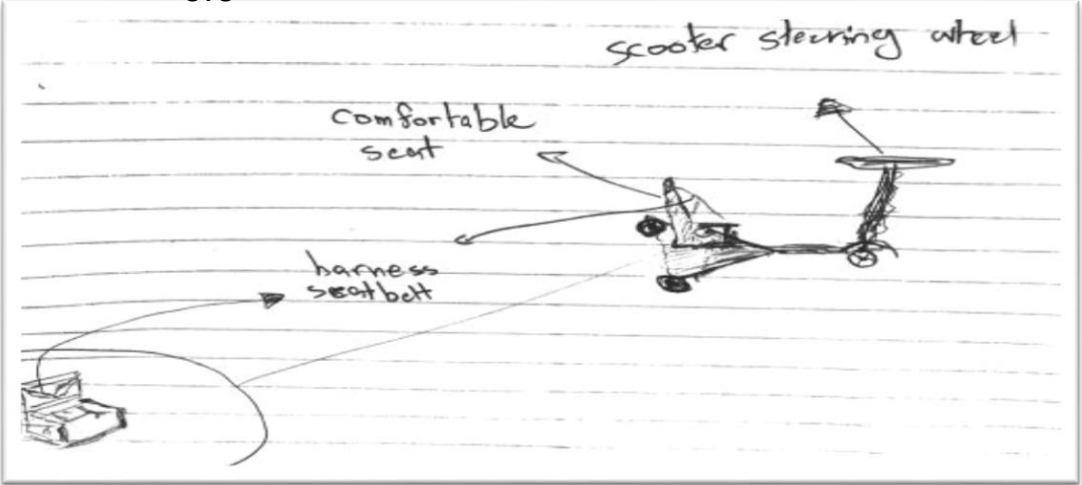
CV3



CV8



CV9



CV10

Designs Selected

Criteria

- A. All materials and construction cost must be under \$1500
- B. Development risk
- C. Technical difficulty
- D. Schedule risk
- E. Does it meet the customer requirements?
- F. Does it have jerking motion?
- G. Is it accurate?
- H. Is it made of standard components?

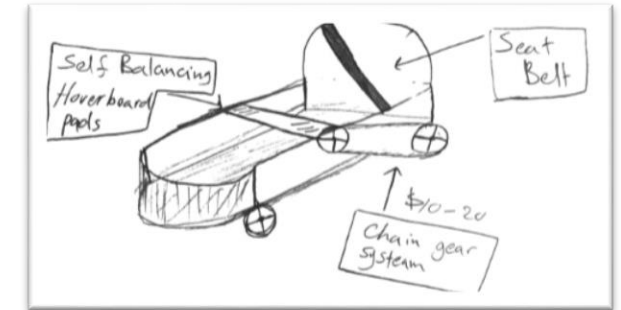
	CV1	CV2	CV3	CV4	CV5	CV6	CV7	CV8	CV9	CV10
A	+	+	+	+	+	+	-	+	D	+
B	-	S	-	-	+	-	-	-	A	-
C	-	+	-	-	+	+	-	+	T	+
D	S	S	S	S	S	S	S	S	U	S
E	+	+	+	+	+	+	S	-	M	S
F	+	+	-	+	S	S	+	S		+
G	+	+	+	+	+	-	+	-		-
H	-	+	+	+	+	+	+	+		-
Σ +	4	6	4	5	6	4	3	3		3
Σ -	3	0	3	2	0	2	3	3		3
ΣS	1	2	1	1	2	2	2	2		2

Figure 4: Pugh Chart

Designs Selected

		CV 2		CV 4		CV 5	
Weight		Raw	Weight	Raw	Weight	Raw	Weight
All cost must be under \$1500	0.1	80	8	85	8.5	40	4
Development risk	0.2	80	16	90	18	40	8
Technical difficulty	0.25	80	20	80	20	60	15
Schedule risk	0.15	90	13.5	100	15	75	11.25
Does it meet the customer requirements?	0.1	85	8.5	85	8.5	70	7
Does it have jerking motion?	0.05	100	5	100	5	80	4
Is it accurate?	0.1	70	7	75	7.5	30	3
Is it made of standard components?	0.05	85	4.25	85	4.25	100	5
Total	1		82.25		86.75		57.25
Relative Rank			2		1		3

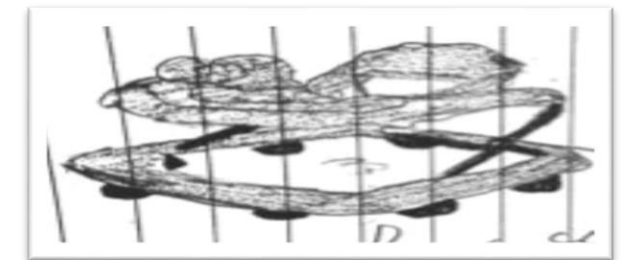
Figure 5: Decision Matrix



CV2



CV4



CV5

Functional Model & Black Box

Functional Model

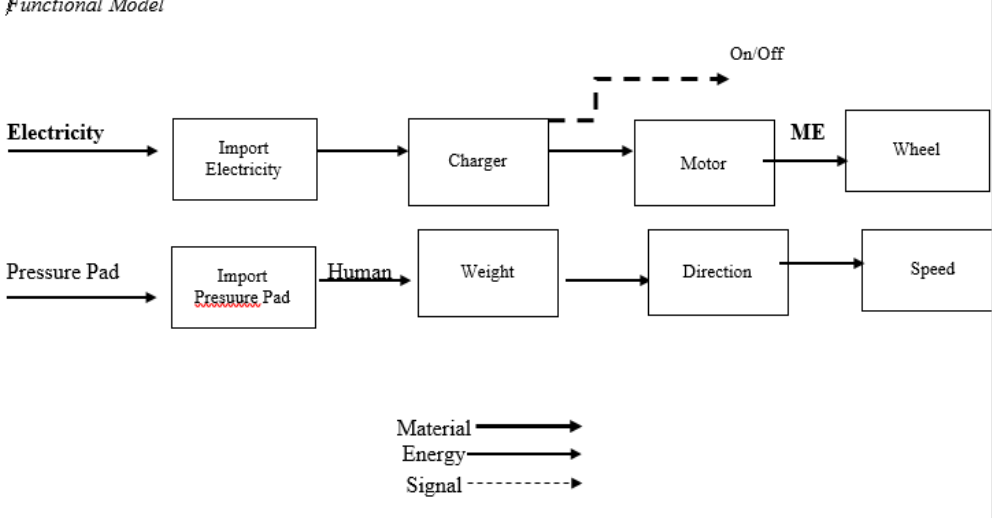


Figure 6: Functional Model

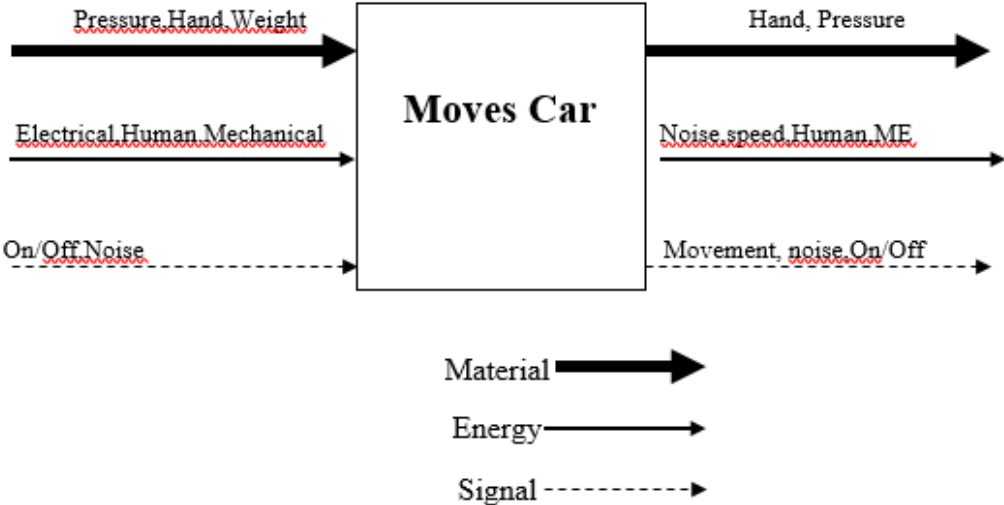


Figure 7: Black Box

Budget

Parts	Market	Cost
Graco Affix No Back Booster - Davenport	Walmart	\$54.97
6.5" Classic Hoverboard - Smart Balance Scooter (WHITE)	Hoverboard	\$199.99
Schwinn Unisex Training wheels (12 x 20-Inch) x2	Amazon	\$21.60
Battery (E100 Series)	Razor	\$49.99
16 * CREE 80W LED Motor Bike/Moped/Scooter/ATV Headlight Bulb BA20D H6 Car LEDs Lamp Lighting	Aliexpress	\$36.88
Lap Seat Belt, Chrome Lift Latch, 60 Inch Length	Seats belt plus	\$16.96
Total		\$380.39

Figure 8: Parts

Gantt Chart

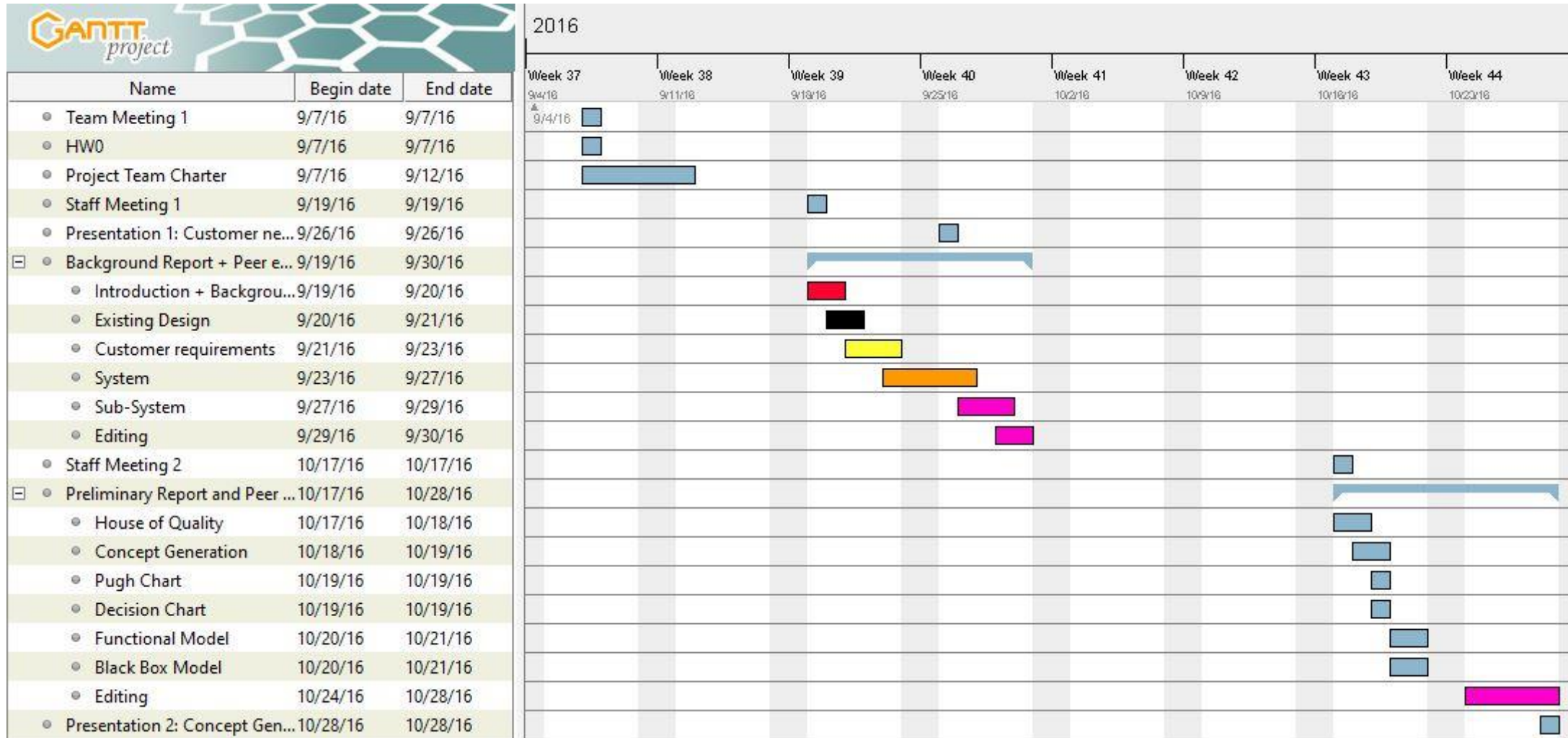


Figure 9: Gantt Chart

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[2]2016. [Online]. Available: <http://www1.udel.edu/V2G/docs/Kempton-Letendre-97.pdf>. [Accessed: 26- Sep- 2016].

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Thank You

