Portfolio

PRODUCT DESIGN ENGINEER

Vinayak Arora

Vinayak Arora, 26

Hello | Namaste | Hola, I am a passionate Product Design Engineer from the United Kingdom. My passion lies in both technology and innovation, I enjoy staying up-to-date with the latest developments in these fields. Actively seeking out new ideas. My ultimate goal is to inspire the world through impactful designs that aim to solve problems and are focussed on user experience.

Analogue Skills

- Sketching
- 3D Modelling
- Design Research
- Prototyping
- Material Handling
- Concept Development
- Product Visualisation
- Design Thinking
- Sustainability Design
- Insight Mining
- Graphic Designing

Software Skills

- Inventor
- Fusion 360
- Blender
- Adobe Photoshop
- Adobe Illustrator
- Adobe InDesign
- Lightroom Classic
- Procreate
- Figma
- MS Office
- Solidworks

Soft Skills

- Detail-Oriented
- Adaptable
- Team Working
- Creative
- Curious
- Problem Solving
- Resilient
- Friendly

Education

University of Glasgow & Glasgow School of Art, Faculty of Design, **Product Design Engineering** — 2021-2022

Manipal University Jaipur, Faculty of Engineering, **Mechanical Engineering** — 2016-2020

Amity International School — 2016

Work Experience

Glazing Vision Ltd., Design & Development Engineer, — **July 2023 - June 2024**

HUSH, Dissertation Project, Product Design Engineering, — **2022**

Re-Design for Human Factors, Product Design Engineering, Glasgow School of Art — 2022

Sustainability Design Project, Product Design Engineering, Glasgow School of Art — 2021

Case New Holland India, R&D Department, Intern — **Jan 2020 - June 2020**

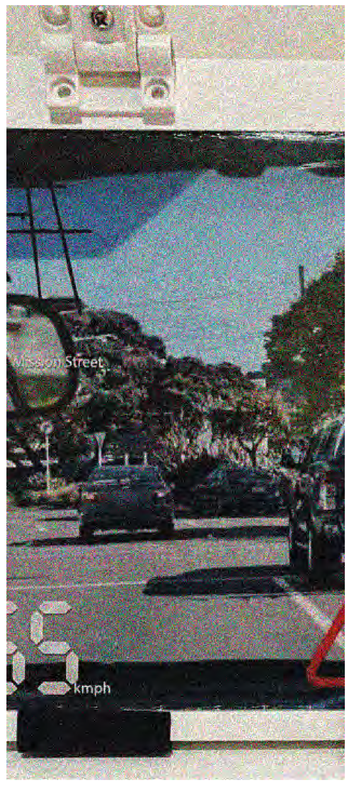
Honda Cars Pvt. Ltd., Quality Department, Intern — **June 2019 - July 2019**

Contact

+44 7951-656307
vinayakarora01@outlook.com
LinkedIn

In this portfolio...

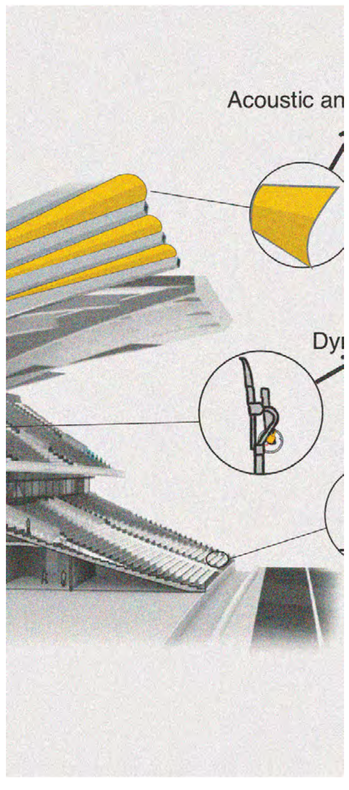
1 HUSH
A modern day Head-Up Display (HUD)



2 Mini Food Processor
Human Centric approach to Re-Design

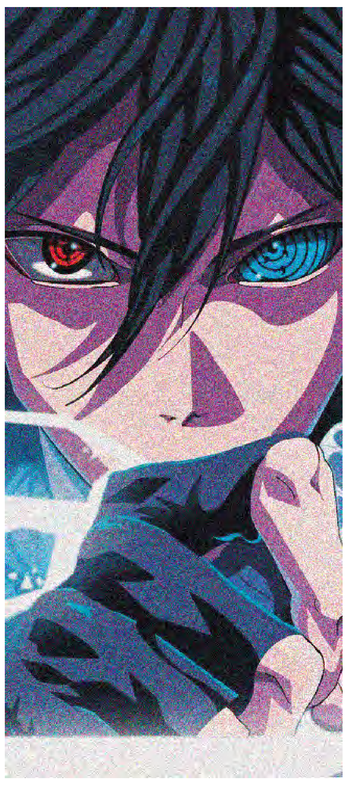
3 Portable Tyre-Inflator
Applying concepts of Integrated Engineering Design

4 Crowd Wave
Circular Design Economy and Sustainability Design



5 Superfood
Food as a superhero for homeless people easily and comfortably

6 Extras
Digital Artworks and CAD skills



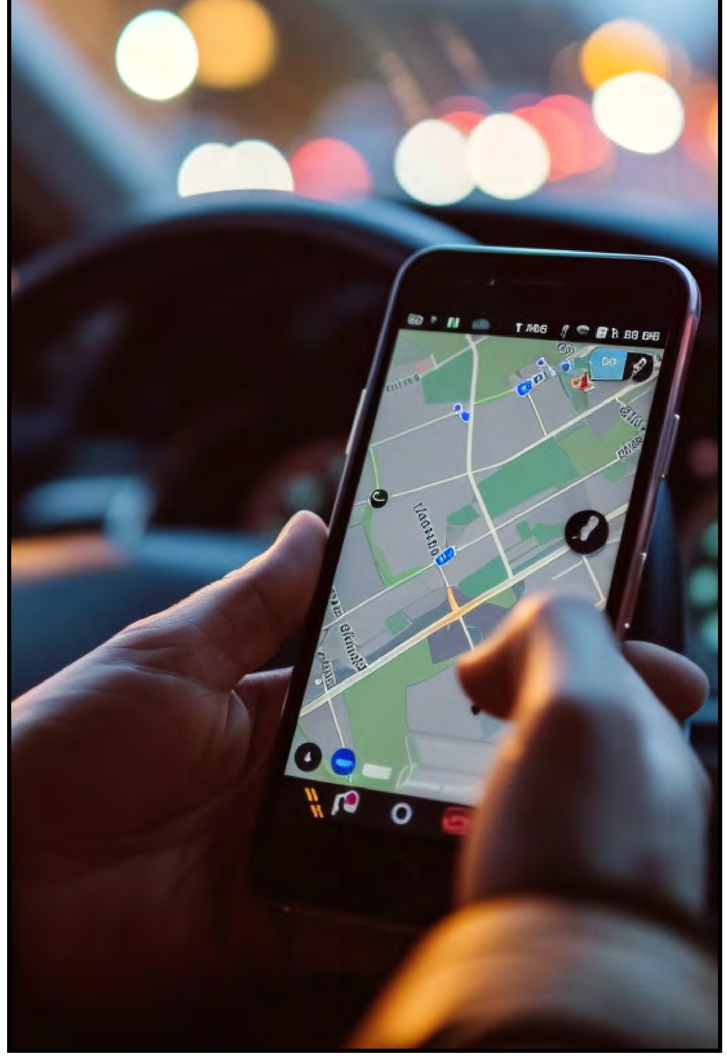
HUSH

Heads-Up Show Hielaman

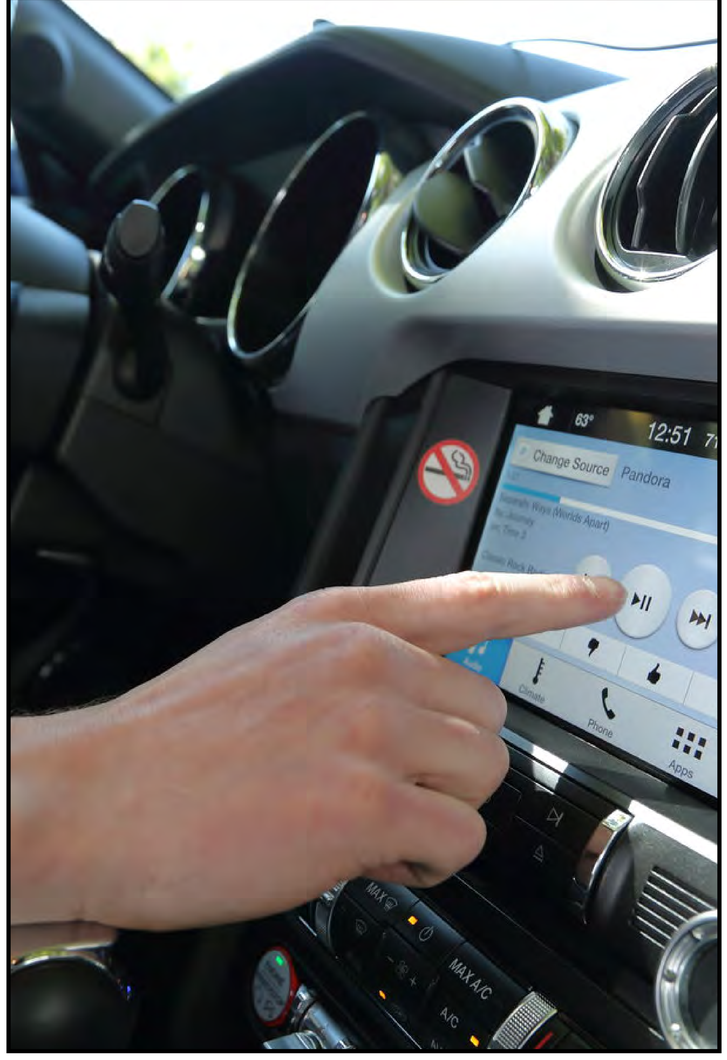
01.
02.
03.
04.
05.
06.

Heads-Up Display (HUD)

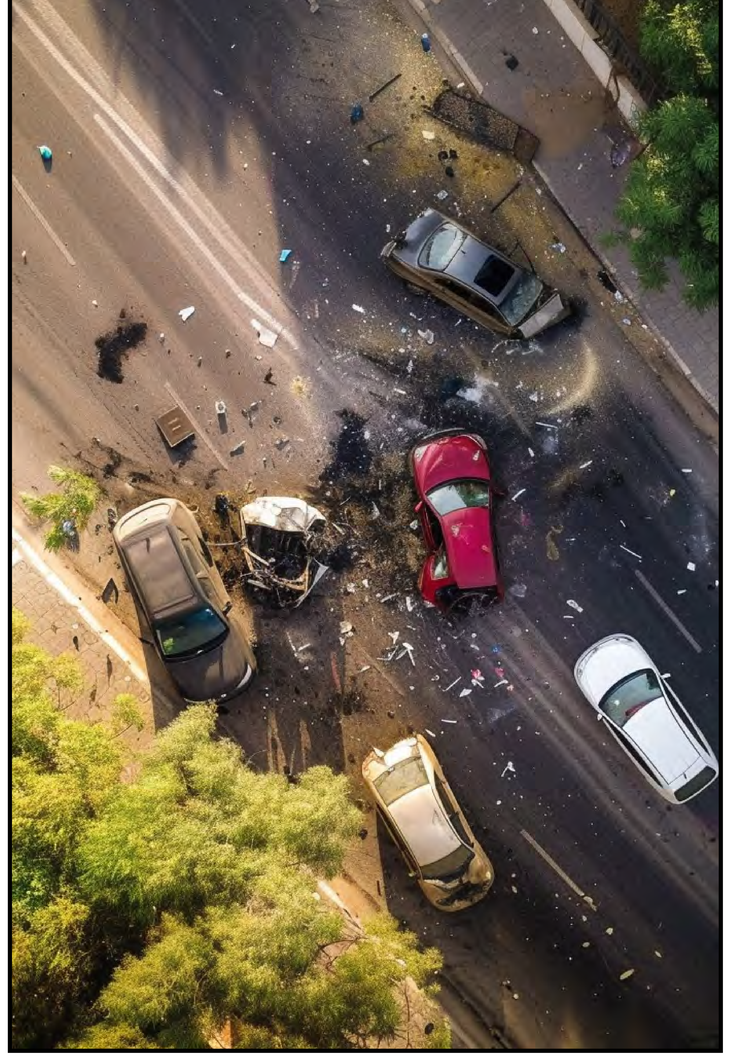
An innovative project to design and develop a cutting-edge heads-up displayforautomobilesthathelpsreduce distractions and increases safety of the driver and passengers.



There are multiple distractions inside the car - mobile phones, passengers, and other things.



Latest technological updates inside the car are also adding to the list of distractions for the driver.



Distractions inside the vehicle can be of different types - visual, cognitive, and manual.

~ 2,563 Road Accidents (2019).
~ 78% Crashes & 65% Near-crashes.

~ 90% Motor Vehicle Collisions.
~ Distractions / Inattention / Fatigue.

OBSERVATIONS

FORM
EXPLORATION

What’s HUSH?

The opportunity here was to design a product that can collate all the information that are deemed necessary, and to display this information in the line-of-sight of the driver. This will not only encourage the driver to keep his focus on the road, but also avoid looking in multiple directions to look for information.

HUSH is a modern take on heads-up displays for cars. It can be retrofitted in all types of cars, replacing the sun visor inside the cars and displaying all the information a driver requires while driving, helping avoid distraction from the road up-ahead.

Storyboard without HUSH

A normal car without incorporating my product HUSH.

Types of distractions:
1. Looking at HUD / Speedometer

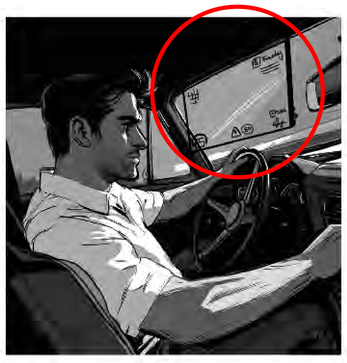
2. Infotainment: Notifications & Alerts. Temp. / Climate Control

3. Distractions outside: Person / Thing. Mobile Phone, Changing Settings

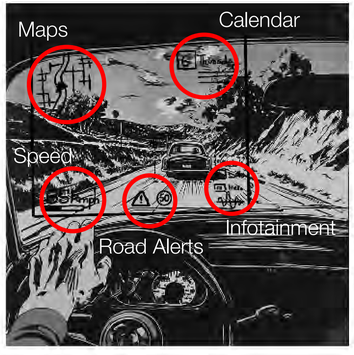
4. They may lead to fatal accidents. One of the biggest cause.

HUSH

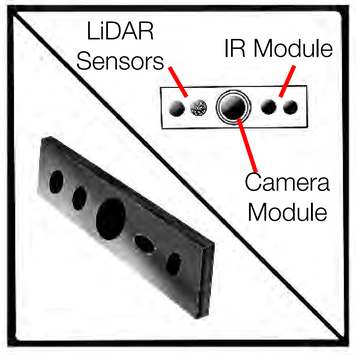
Car with retrofitted HUSH. Smart sun visor instead of a normal.



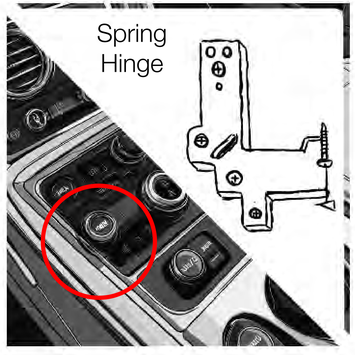
1. Working of HUSH. How it's supposed to work and look like.



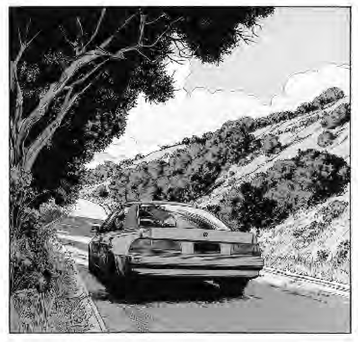
2. Camera module & sensors: IR sensor & Night Vision, LiDAR sensor for depth.



3. Buttons to help control and adjust the HUSH display. Hinge option: Laptop.



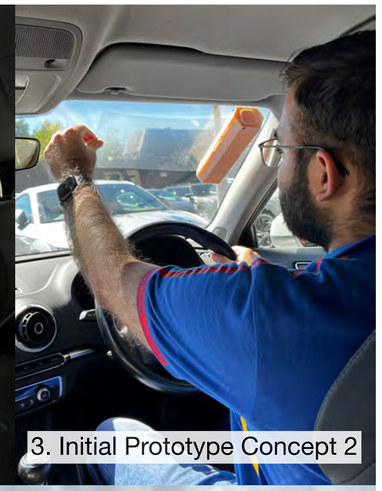
4. It helps deal with visual distractions inside & outside the car.



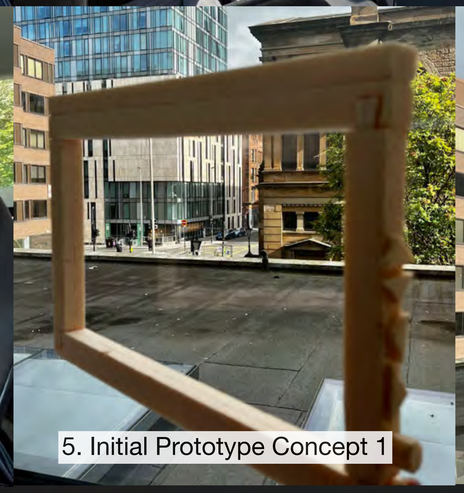
PROTOTYPING
& TESTING

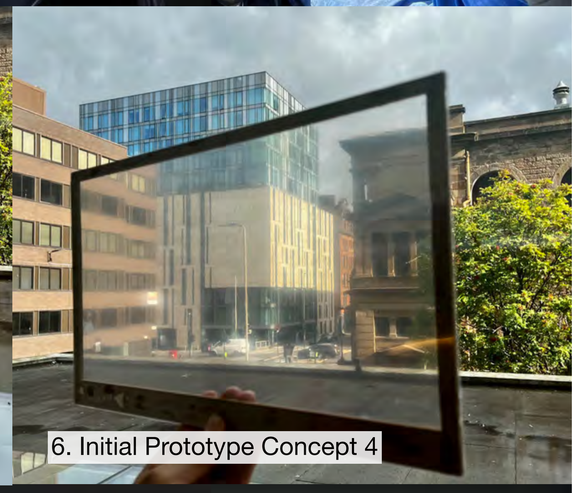

1. Initial Prototype Concept 4

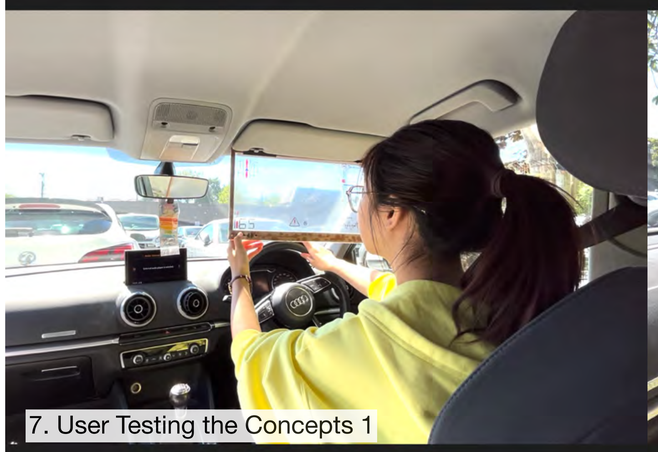

2. Initial Prototype Concept 3


3. Initial Prototype Concept 2


4. Initial Prototype Concept 1


5. Initial Prototype Concept 1


6. Initial Prototype Concept 4

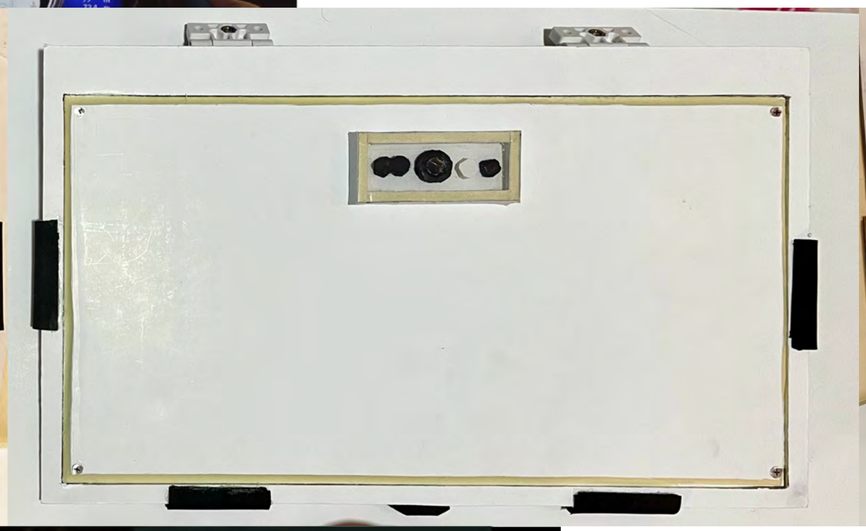

7. User Testing the Concepts 1

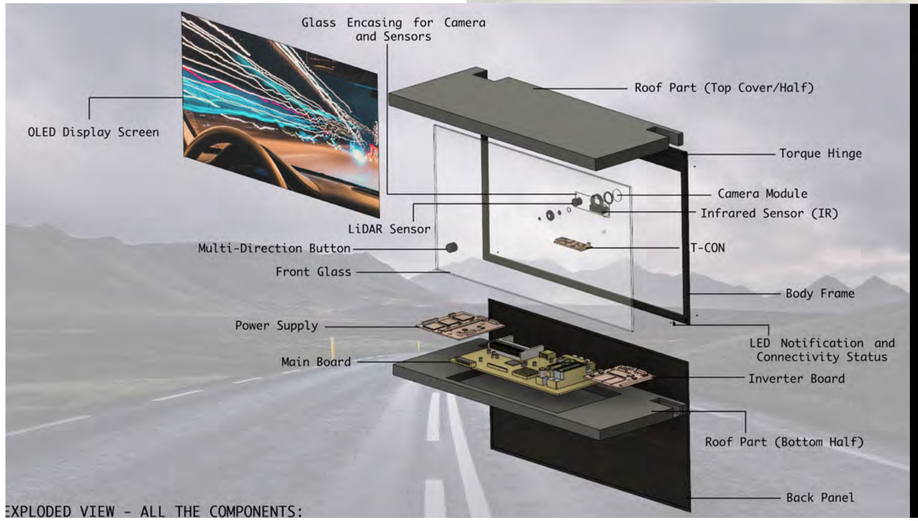

8. User Testing final Concept

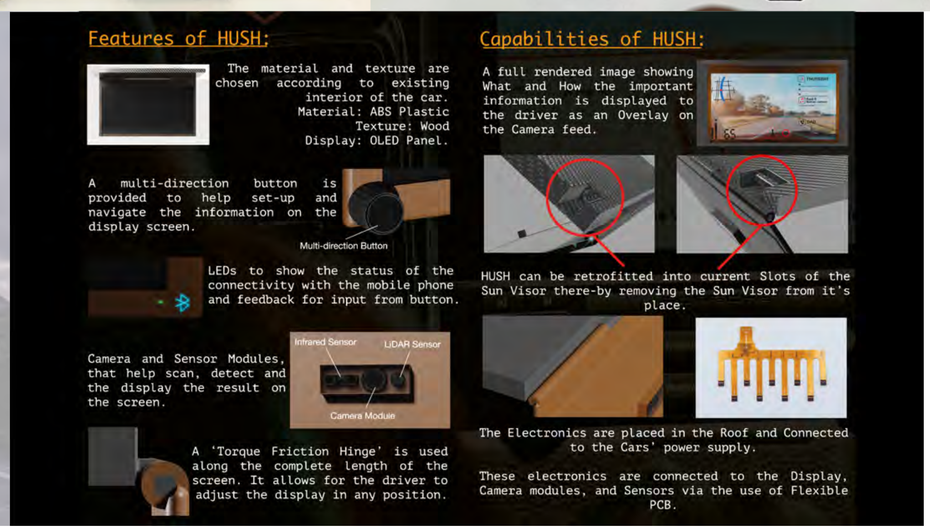

9. Ideal Prototype in environment

Finished
CAD Model

Showcase
Prototype







Features &
Technical
Specifications

Future Scope

- Augmented Reality Integration
- Artificial Intelligence Capabilities
- Enhanced Navigation & Route Guidance
- Integration with Vehicle Diagnostics & Controls
- Hardware Integration
- Customisable Display & Interface
- Hands-free Voice Control & Commands
- Data Privacy & Security Considerations

01.
02.
03.
04.
05.
06.

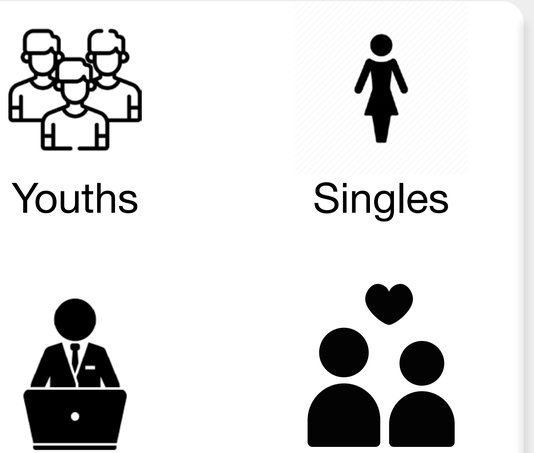
Mini-Food Processor

Human Factors Project

Identifying Human Factor Challenges users face & redesigning the product to address them, delivering a solution that fully meets users' needs and expectations.

TARGET GROUP

"The context within which people interact with products can help designers identify the task & goal." ~ Bailey, 2017



This target / focus / user group helps focus on the basic required specifications for the product.

User interviews were carried out after they tested the product out to get a better understanding of their requirements, hopes from the product, and usability feedback.

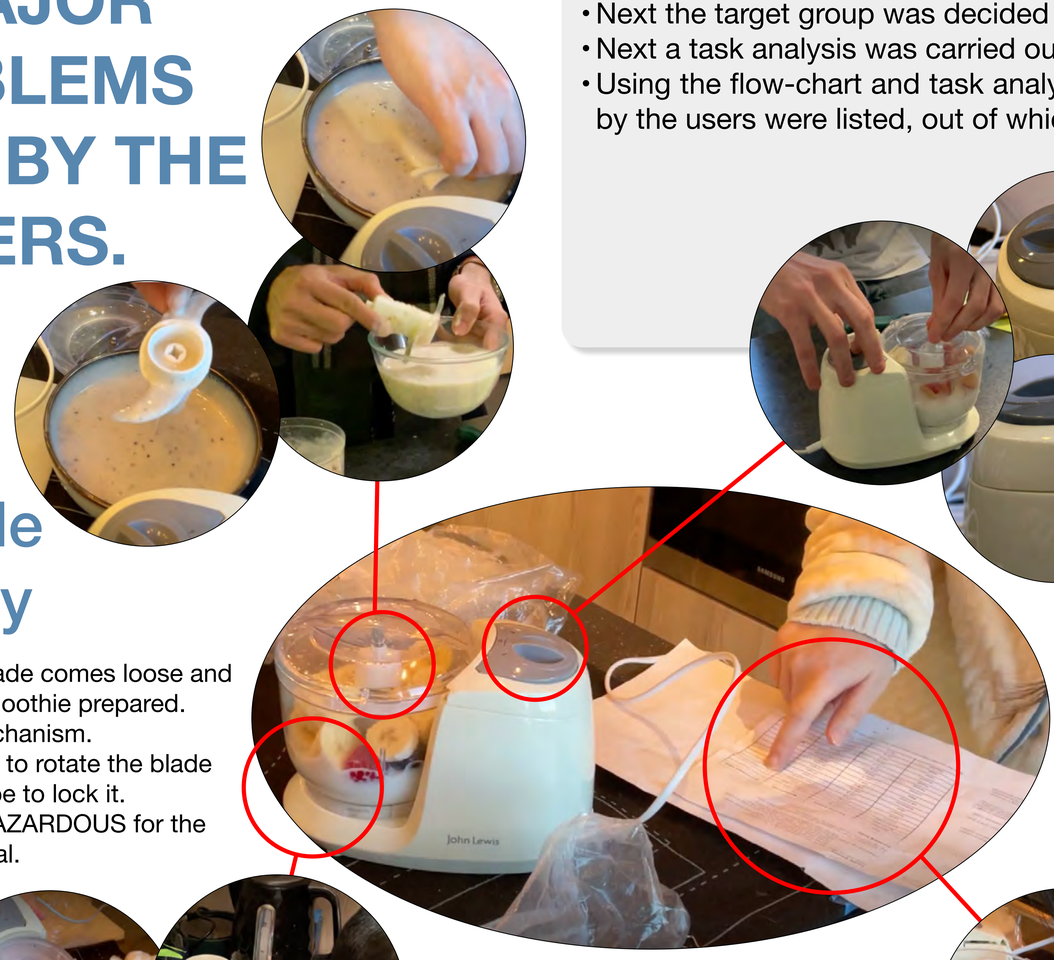
S.No.	Method	Preference ranking by Users during Test						
1	Simple Turn counter clock-wise to Lock	1	3	3	2	1	3	1
2	Twist to lock	4	2	2	4	3	4	3
3	Screw-Thread Mechanism	3	4	4	3	4	2	4
4	Twist-Feedback Mechanism	2	1	1	1	2	1	2

User performance chart for the locking mechanism based on the feedback and suggestions from the target group.

4 MAJOR PROBLEMS FACED BY THE USERS.

- Started with testing and understanding the product given to us.
- Next the target group was decided and a user profile was developed.
- Next a task analysis was carried out and a action flow-chart was made.
- Using the flow-chart and task analysis, all the problems or issues faced by the users were listed, out of which 4 major problems are mentioned.

The solutions to these mentioned challenges were developed using and understanding Anthropometric Data.



1. The Blade Assembly

- While pouring the Blade comes loose and falls into the food/smoothie prepared.
- It has no locking mechanism.
- Users intuitively tend to rotate the blade while inserting in hope to lock it.
- This can be VERY HAZARDOUS for the users and can be fatal.

2. The Button

- The button is too SMALL to rotate.
- The Users don't tend to know that the button is supposed to be pressed down and held for the processor to work.
- Users tend to press and hold the button for longer duration than allowed.

3. Bowl Safety Lock

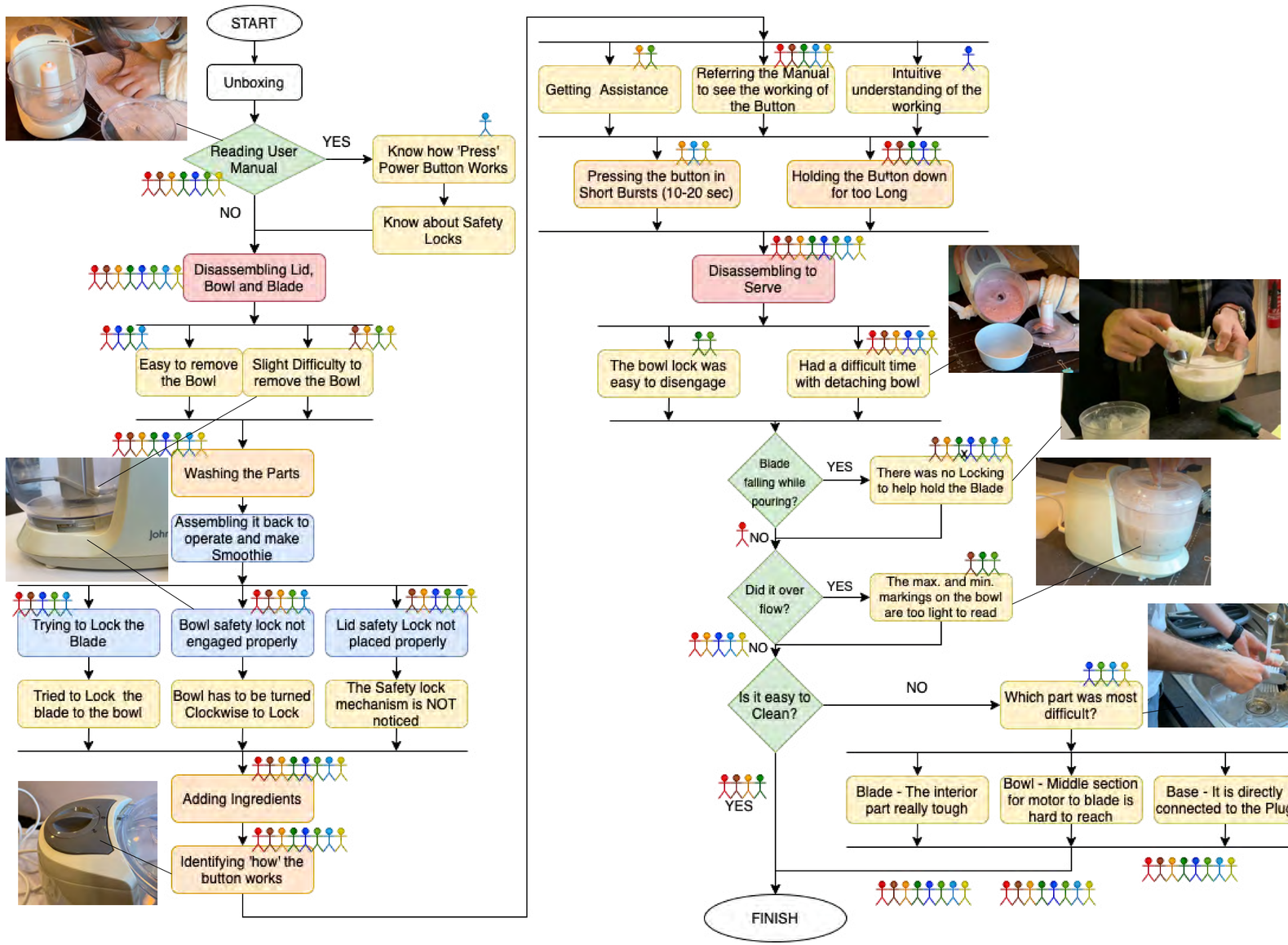
- The safety lock mechanism is too CONFUSING. The bowl is to be turned in the opposite direction than the lid for engaging safety lock.
- The hook on the lid for locking is confused with lids natural locking mechanism with the bowl.
- Their make is too difficult to rotate and take out the bowl and lid for pouring / cleaning.

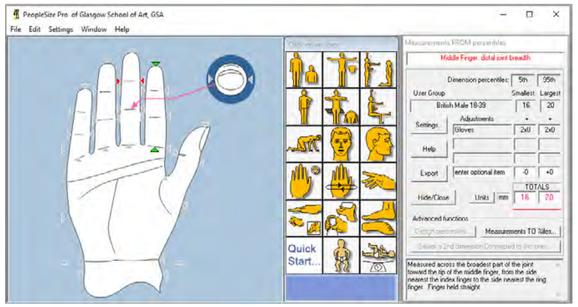
4. The Manual

- The manual is very WORD HEAVY.
- The users have to read very CLOSELY for searching.
- The font size is too small to read.
- No pictorial representations.
- The safety guidelines are very monotonous to read.
- The probable issues are not very well highlighted.

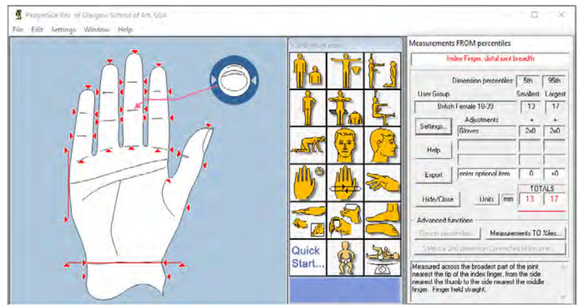
Action Flowchart

Action flowchart was drawn on the basis of task analysis to understand the issues, their occurrences, and possible reasons.

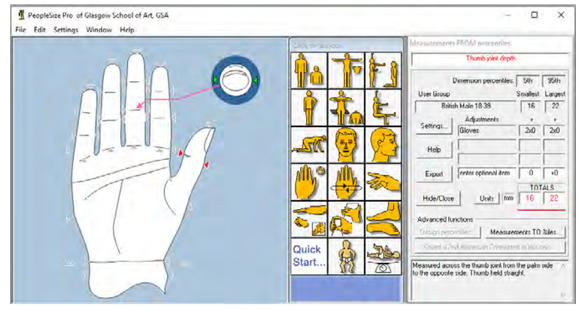




British Male
18 - 39



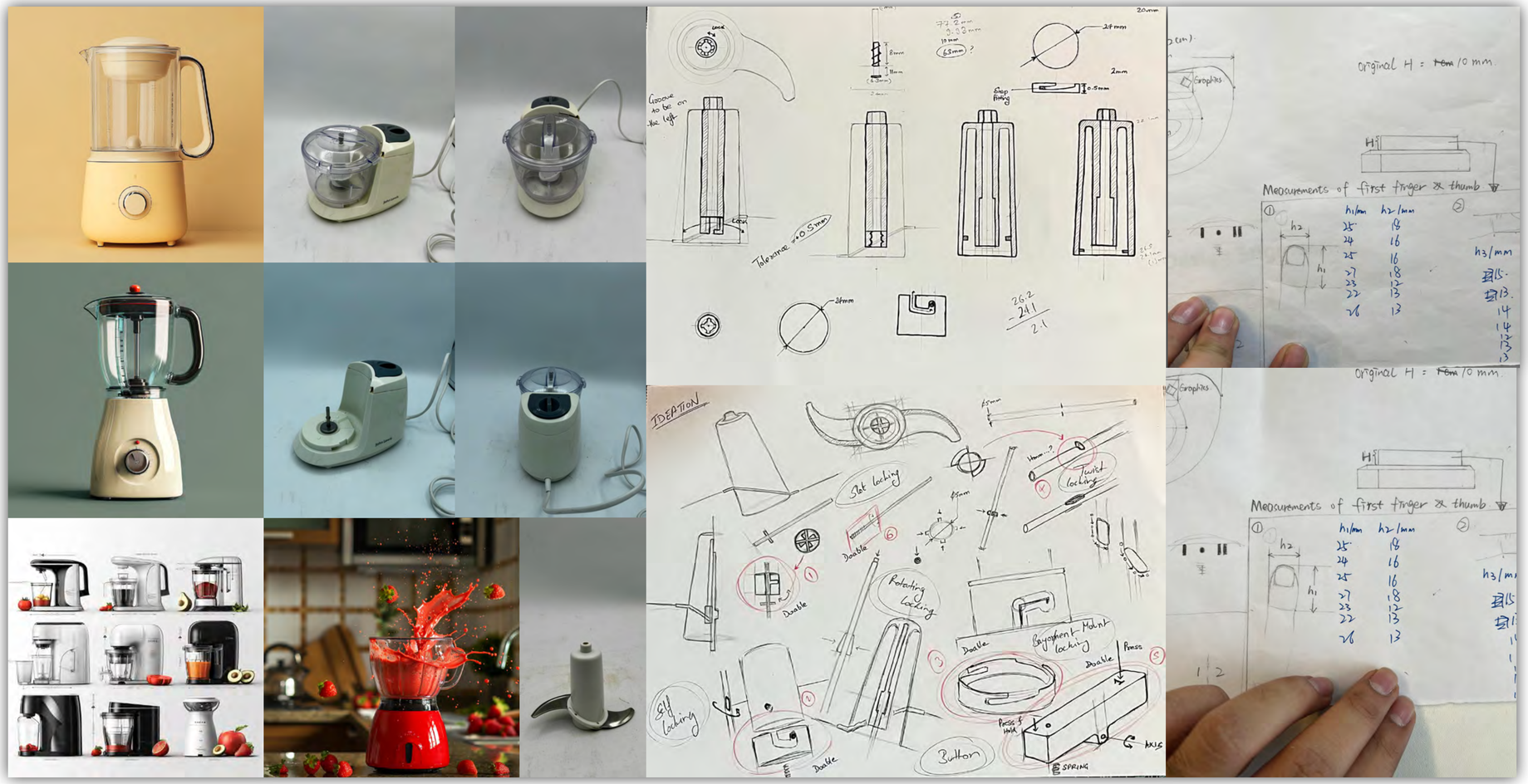
British Female
18 - 39

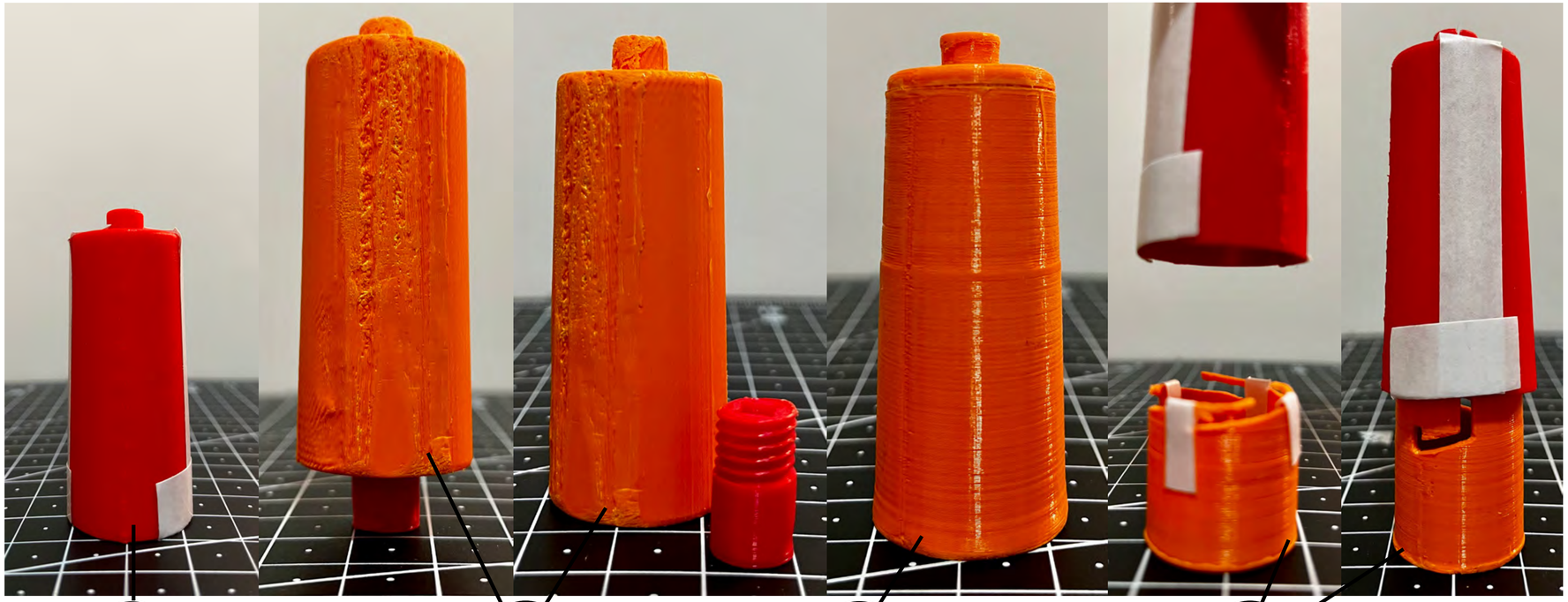


British Male
18 - 39
(Thumb)

Anthropometric Analysis - Sample Set

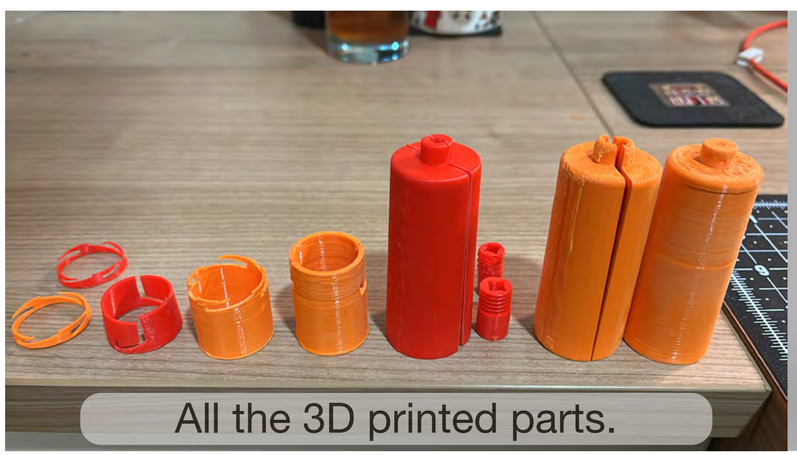
FORM
EXPLORATION





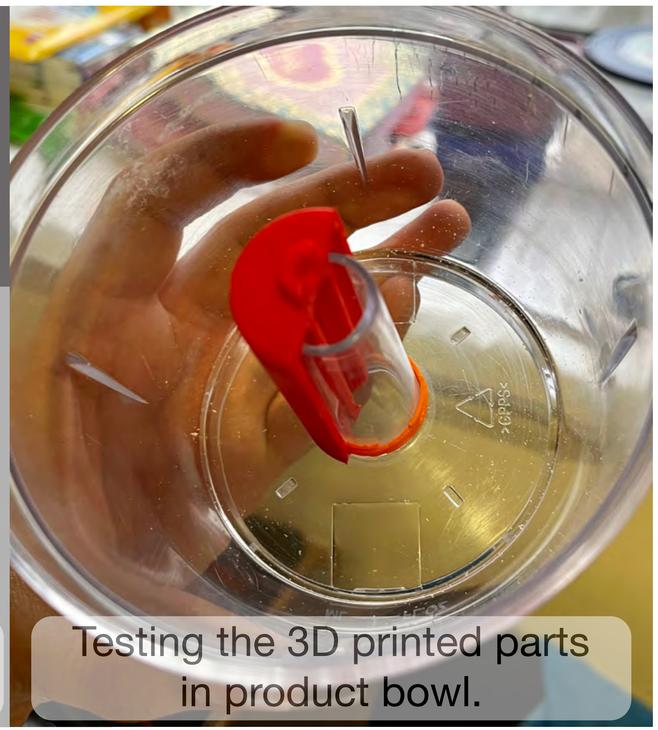
PROTOTYPING
& TESTING

All the prototypes were 3D printed, and tested out in actual (real-test) environments and situations to understand the pros and cons along with the feedback of the test users.



All the 3D printed parts.

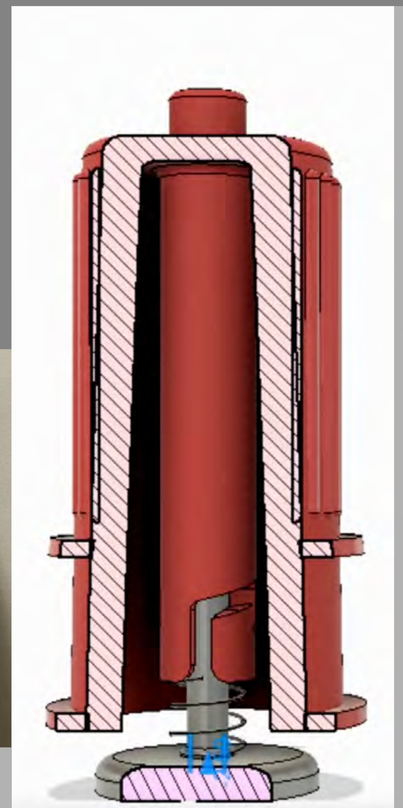
CAD models to 3D print and carry out testing and check fitting.



Testing the 3D printed parts in product bowl.

EMBODIMENT DESIGN

New Button Design



Section Analysis of Assembly

WORKING:
- Push down on spring.
- Twist until a contact is felt.
- Leave it, the spring does the rest.

The protrusions on the shaft were changed to accommodate the new design.

Final Blade Assembly with the Blade, Spring, and the new Shaft

The surface was ribbed to add more grip ability for finger tips.

The blades are now easily replaceable if damaged.

There will be spring on the shaft to lift the Blade Assembly into locking position.

NEW

OLD

Comparing the Old Design vs the New Design


LE CREUSET
CHIANTI

Cordless Tyre Inflater

01.
02.
03.
04.
05.
06.

The project focuses on ‘Connecting Rod’ when designing a portable tyre inflater.

The project is based on research, calculations, and mechanical analysis for designing.

DFMEA, Material Selection, and DFMA along with probabilistic design techniques are implemented to understand and design the connecting rod used in the ‘Cordless Tyre Inflater’.

Our Goal

Design a very compact and powerful tyre inflater that can fit the palm of our hands and is still able to fill-up all the tyres of an SUV class vehicle (biggest tyre sizes in the industry).

Our inspiration for a compact tyre inflater.

Understanding tyre sizing and selecting the range.

Initially a group project, where we researched, calculated and figured out the finer details and specifications for our ‘Cordless Tyre Inflater’.

The next part of the project was to select one specific component and carry out mechanical design for that component. I chose the Connecting Rod from our mechanism.

Requirements

Should be able to fill all 4 tyres, from a small car to a big SUV.

A battery, big enough to back up the requirements.

The size of an air-compressor cylinder to make sure it is quick and easy.

An efficient and effective motor to meet the requirements.

Selecting the right mechanism for a portable size and required capacity.

DFMEA - Design Failure Mode and Effect Analysis

Product Title:	Connecting Rod				Max. RPN	144
Function:	Reciprocating Motion - from Gear to Piston Head				Date:	Apr-22
Failure Mode:	Throwing a Rod (Connecting Rod breaking)				Student:	Vinayak Arora
Effect of Failure	**Potential Cause of Failure**		**Detection Method**		**RPN**	**Recommended Actions**
Reciprocating Motion Stops	Fatigue	3	Fatigue Test on material sample, and Maximum User Load	3	72	Re-consider the endurance limit factor and set allowable stress
Connecting Rod goes through the cylinder wall or damages the Piston Head						Change the composition/material of the Connecting Rod
	Over-Revving	1	Using RPM sensors	2	16	Re-program the motor controller
	Pin (Piston or Crank) Failure	2	Shear Test on material sample	3	48	No action
	No proper lubrication	6	Increase in Vibration and 'Burrs' can be. Checked visually on the bearing surface.	3	144	Add Lubrication
	Wearing out (galling) of the Journal surface - where the connecting rod rotates	6	Vibrations and Visually checking for wear	4	192	Avoid and clean dust (that might be there because of environment)
						Use of senior grade lubrication
						Attention to filtration and purification of Lubrication
	Journal surface not properly ground and polished - Ferrite Caps	2	Surface Testing	3	48	Improve the design and, grinding and polishing
	Passage or Air locking in cylinder	1	No testing	9	72	No action
	Rusting of exposed areas	5	Corrosion Test	4	160	Change Materials Specification

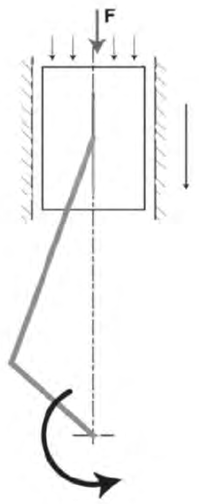
Product Title:	Connecting Rod				Max. RPN	96
Function:	Reciprocating Motion - from Gear to Piston Head				Date:	Apr-22
Failure Mode:	Circlip' Failure				Staff:	Vinayak Arora
Effect of Failure	**Potential Cause of Failure**		**Detection Method**		**RPN**	**Recommended Actions**
Vibrations and Noise while working	The material fails	2	Material Testing	3	36	Change the material specification
	Screws / Ring gets rusted	5	Corrosion Test	4	120	Change material specification
	It deforms after tightening it too much	4	Deformation Testing	4	96	Improve the design or material choice

Calculations - Tyre, Air Cylinder, and RPM Required

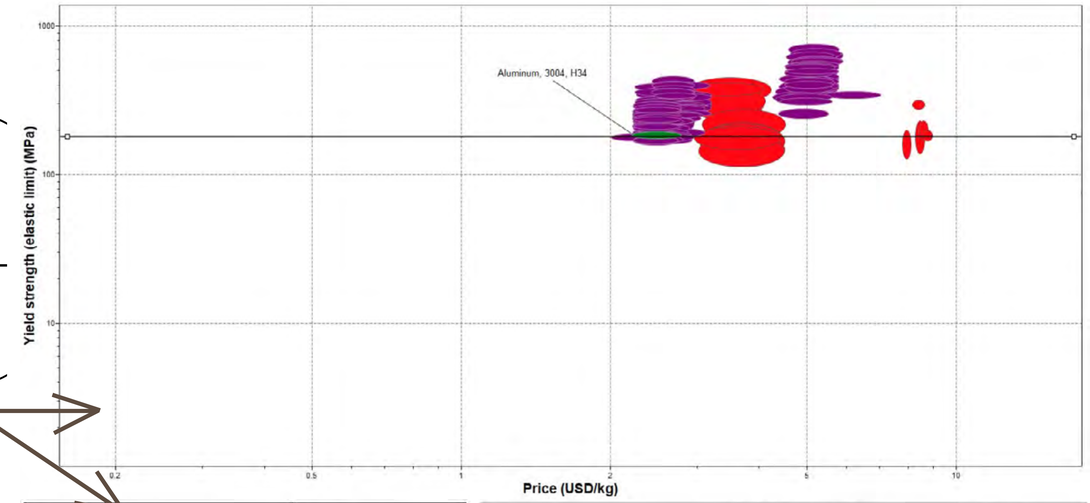
Example: 275/40R20
- Width = 275 mm
- Section Height = 40% of 275 = 110 mm
- Rim diameter = 20 inches = 508 mm
- => Rim radius = 254 mm
- This gives us Inner Radius = 254 mm and Outer Radius = 364 mm

Therefore, Volume = Pi x Radius^2 x Width
= Pi x ((Outer Radius)^2 - (Inner Radius)^2) x Width
= Pi x (364^2 - 254^2) x 275
= 58730503.86 mm^3 = **0.0587 m^3** = **58.73L**

W(a -> b) = [P(b) x V(b) x ln{P(a)/P(b)}] + [(P(b) - P(a)) x V(b)]
= [316325 x 0.0587 x ln(101325/316325)] + [(316325 - 101325) x 0.0587]
= -8518.31402 J
= **-8.52 kJ**



Material Selection (Edupack)



Limiting Properties	Value
Yield Strength	205.714
Price Range	2 - 4 USD
Fresh Water resistivity	EXCELLENT
Weak Acid resistivity	EXCELLENT
Weak Alkali resistivity	EXCELLENT

Material	Yield Strength	Units
Aluminum 3003-H14	144.8	MPa
Aluminum 3003-H16	172.4	MPa
Aluminum 3004-H32	213.7	MPa
Aluminum 3004-H34	199.9	MPa
Aluminum 3004-H38	282.7	MPa
	1 MPa =	1 N/mm^2

W_B = Buckling load = $\frac{\sigma_c \cdot A}{1 + a\,(L/K)^2}$

where, σ_c = Compressive Strength of material
A = Area of cross-section of Connecting Rod
L = Length of connecting rod.
K = Radius of Gyration = $\sqrt{I/A}$
I = Moment of Inertia
a = Rankine's constant, depends on material

=> maximum force (F, on Piston) = Pressure x Area (Base/Cylinder)
= $0.248 \times \frac{\pi}{4} \times 30^2$
= 0.248×706.86
= 175.3 N

Allowable Tensile Strength = $\sigma_t = F/A$
= $\frac{180}{3.8}$ = 51.43 N/mm^2

Material Yield Strength = $\sigma_t \times FoS$ (Factor of Safety = 4)
= 51.43 x 4
= 205.714 N/mm^2
or 205.714 MPa

Calculations - Force on the Connecting Rod

Absolute Pressure = Gauge Pressure + Atmospheric Pressure
Gauge Pressure = Ideal Tyre Pressure = P(i) = 2.15 bar
Atmospheric Pressure = 1.01325 bar
Ex: P(b) = P(i) + P(a) = (2.15 x 10^5) + (1.01325 x 10^5)
= 3.16325 x 10^5 = **316325 Pa**

Volume = (Pi x (0.03/2)^2) x 0.04
= 0.000028274 m^3
= 0.0283 L

Total Number of Strokes Required = 60 L / 0.0283 L
= 2122 Strokes (Approx.)

RPM (fill up in 3.5 min) = 2122 / 3.5
= 606.286 rpm
= approx. 607 rpm

Calculations - Battery Size

W - Work Done for 1 tyre
J - Energy to be stored in the battery
s - Time (in seconds) taken for 1 tyre

W = J/s
Therefore, J = W x sec = W x time
= 41.3 x (3.5 x 60) x 10
= 41.3 x 2100
= 86730 J = **86.73 kJ**

V - Voltage rating for the battery, 12 V
I - Current rating for battery
J - Energy stored in Battery

V x I x time = J
12 x A x 3600 = 86730
I = 86730 / (12 x 3600)
= 86730 / 43200
= 2.007 A

That is approximately **2.5 Ah**.

Therefore, the required battery specifications are:
12 V, 2.5 Ah, 86.43 kJ

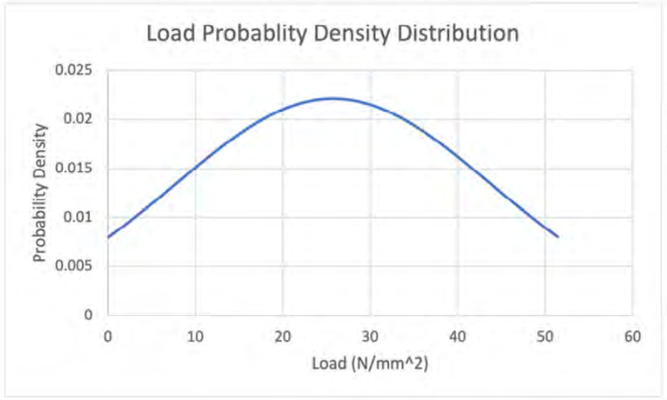
Load - Connecting Rod

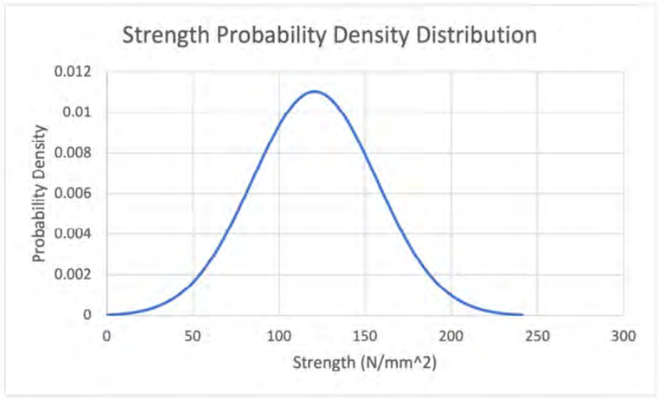
LOAD ESTIMATE		
Area	3.5	mm^2
Minimum Force	0.35	N
Maximum Force	180	N
Mean Force	90.175	N
Minimum Load	0.0999936	N/mm^2
Maximum Load	51.42857	N/mm^2
Mean Load	25.7642818	N/mm^2
Standard Deviation	18.03499726	N/mm^2

Strength - Connecting Rod

STRENGTH ESTIMATE		
Minimum Strength	0	N/mm^2
Maximum Strength	241.3	N/mm^2
Mean Strength	120.65	N/mm^2
Standard Deviation	36.195	N/mm^2

Load & Strength - Plots

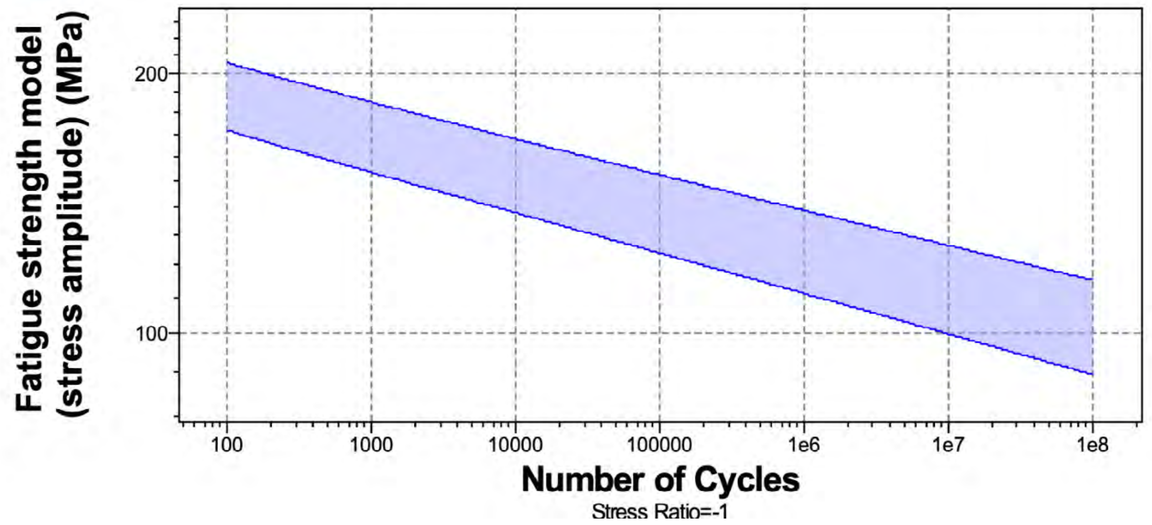




Fatigue Testing - Cycle Plots

Fatigue strength at 10^7 cycles	105	-	120	MPa
Fatigue strength model (stress amplitude)	99.7	-	126	MPa

Parameters: Stress Ratio = -1, Number of Cycles = 1e7cycles



Manufacturing - Process & Costs

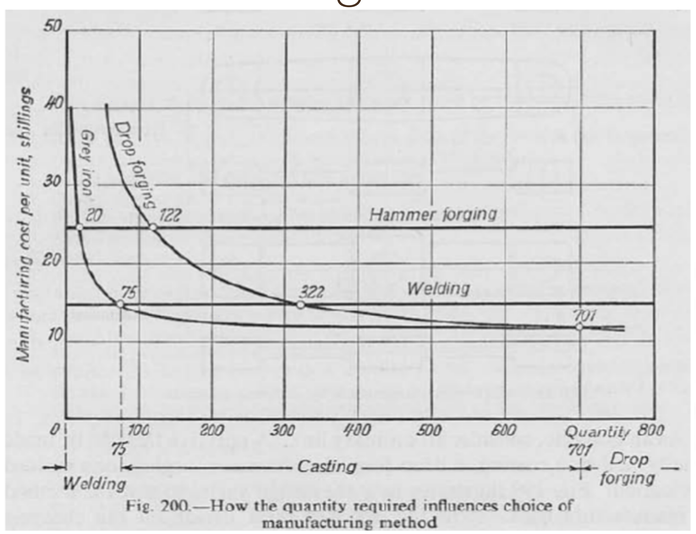
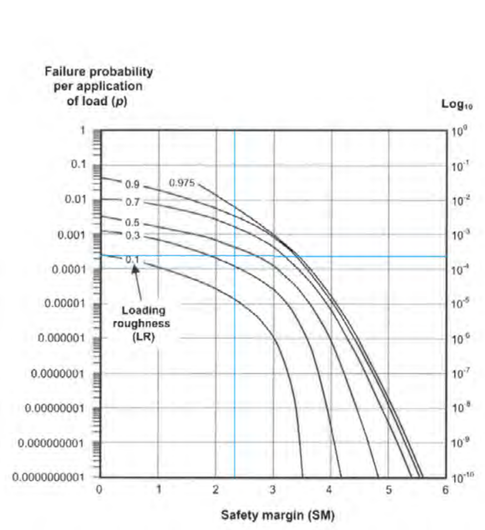
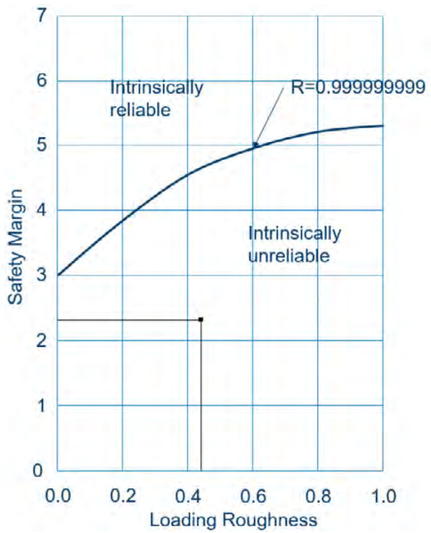


Fig. 200.—How the quantity required influences choice of manufacturing method



Safety Margin & Loading Roughness - Plots



Calculations - Reliability, Loading Roughness, and Safety Margin

$$R = \phi\left[\frac{S-L}{\sqrt{\sigma_S^2+\sigma_L^2}}\right] = \phi\left[\frac{120.65-25.764}{\sqrt{(36.195)^2+(51.429)^2}}\right] = \phi[2.34] = 0.99036$$

The reliability of the connecting rod is calculated to be 0.99.

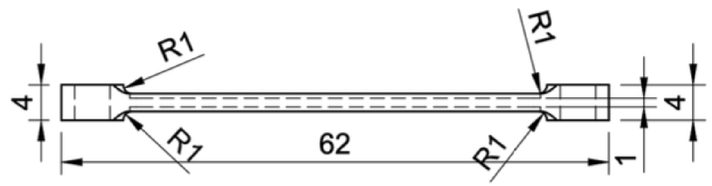
$$LR = \frac{\sigma_L}{\sqrt{(\sigma_S^2+\sigma_L^2)}}$$

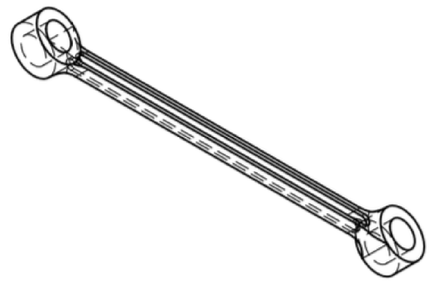
For the connecting rod, LR = 0.446. This implies that the

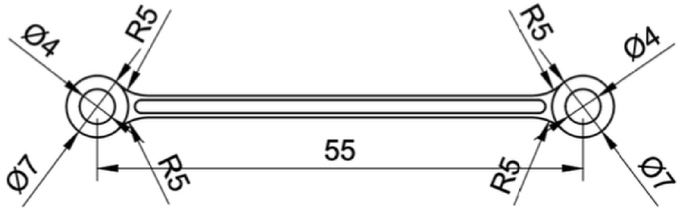
The Safety Margin had the following formula:

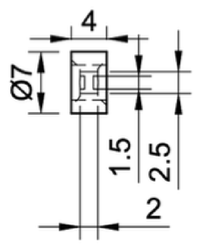
$$SM = \frac{S-L}{\sqrt{(\sigma_S^2+\sigma_L^2)}}$$

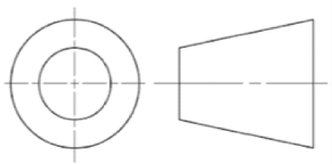
For connecting rod, SM = 2.34.





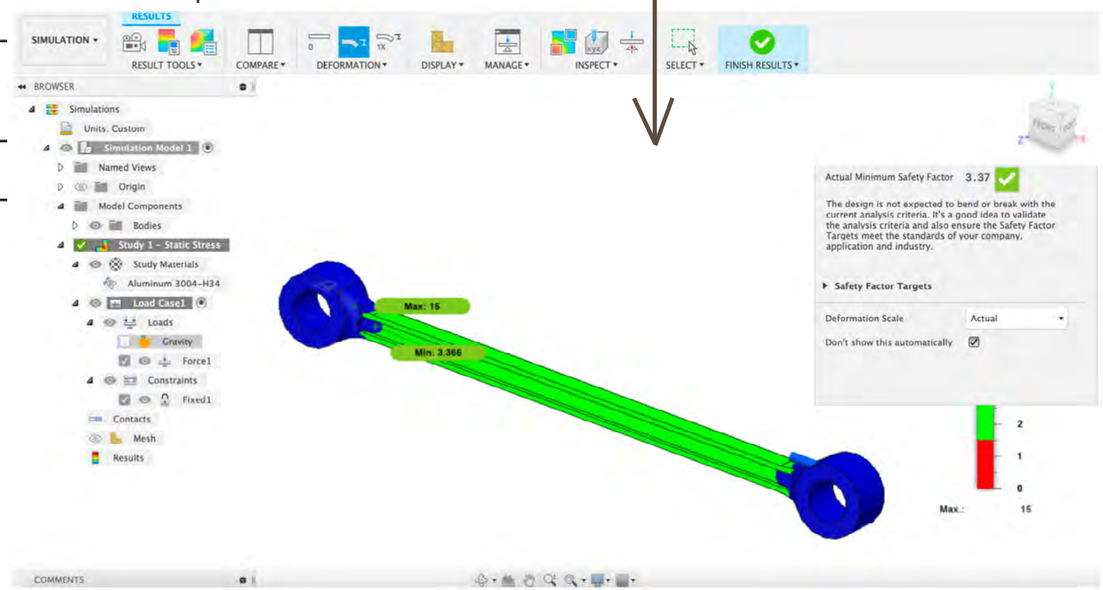




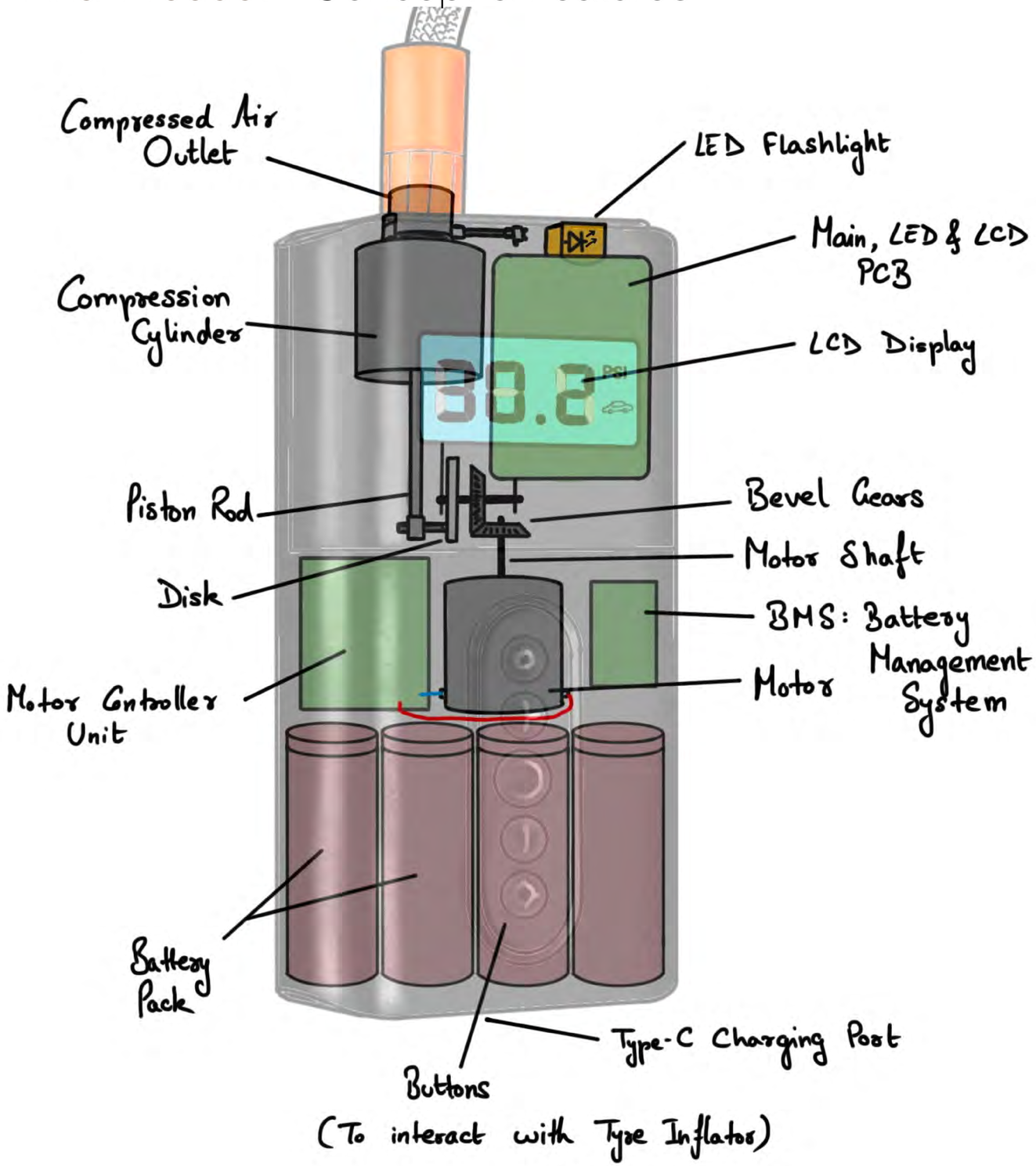
Dept.	Technical reference	Created by Vinayak Arora 19/04/2022	Approved by
		Document type	Document status
		Title IED - Connecting Rod	DWG No. 1
			Rev. / Date of issue

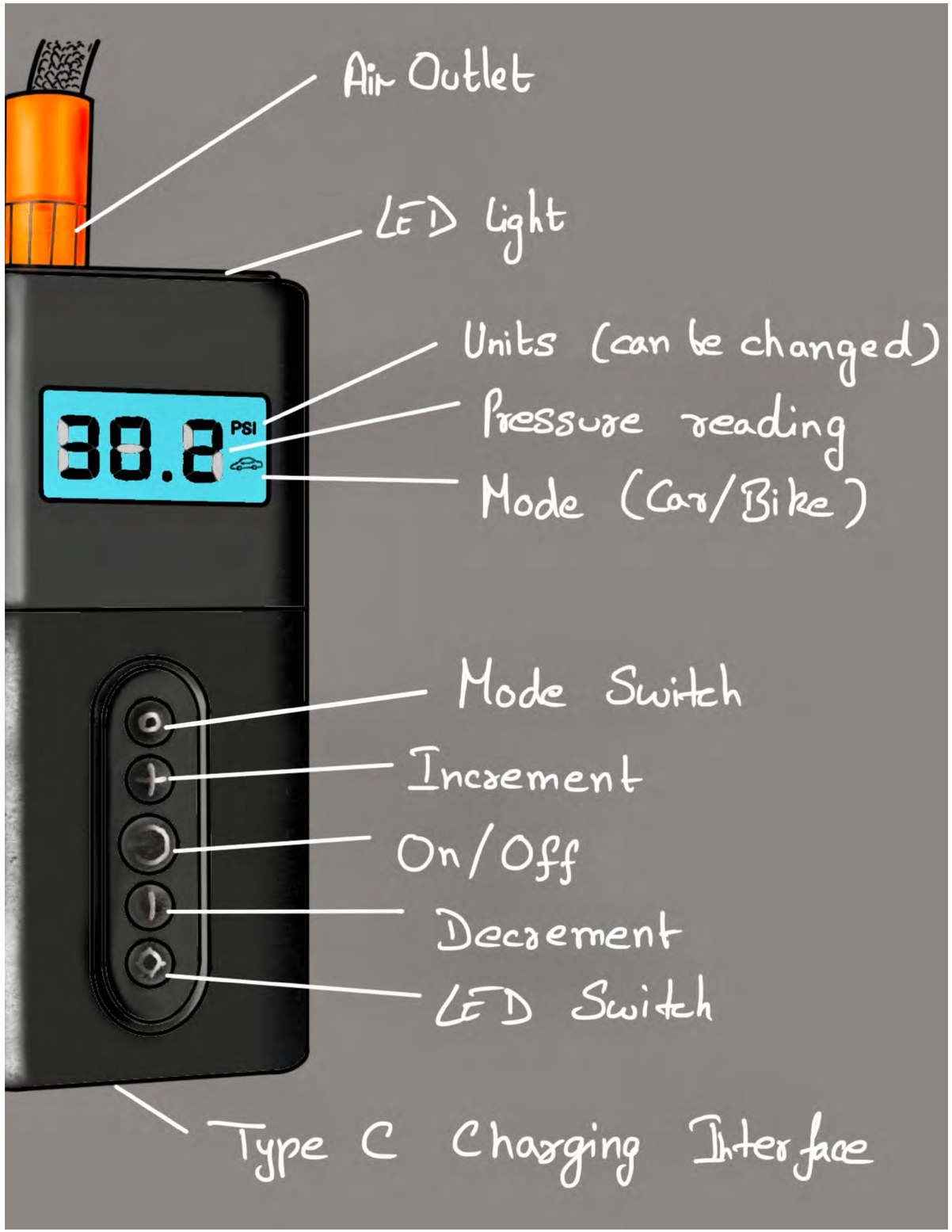
Mechanical Manufacturing Drawing - Connecting Rod

CAD Simulation - Under Maximum Working Forces



Final Product - Concept & Features



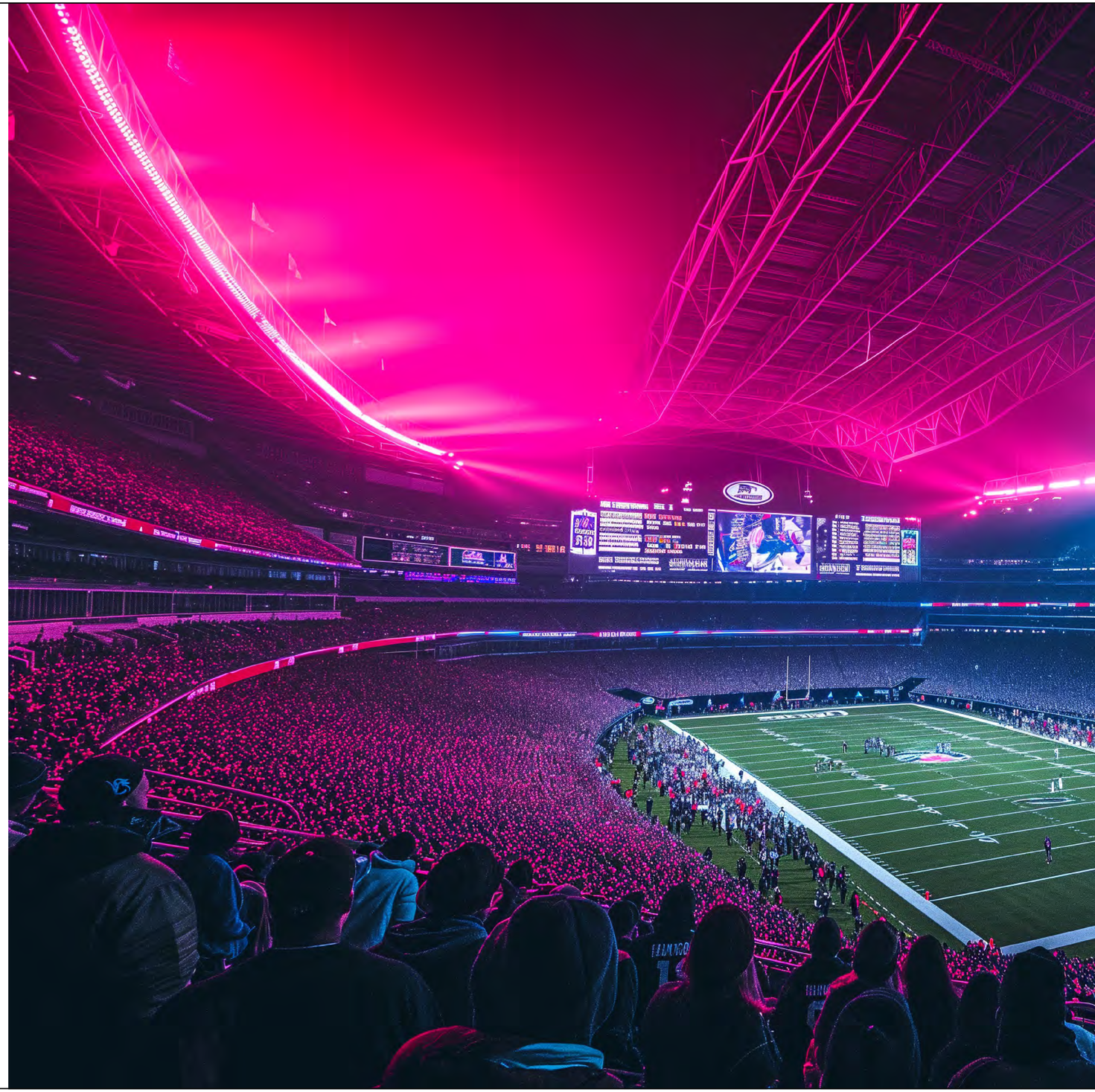


01.
02.
03.
04.
05.
06.

Crowd Wave

Gathering Untapped Crowd Energy

A large scale multi-product project that aims to harness the unused/waste energy from our surroundings at public events and convert it into electricity for use.



Objective

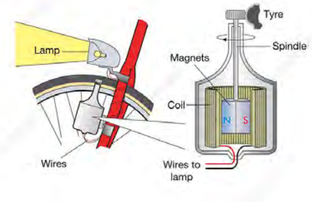
To implement Circular Economy principles in public spaces by capturing and reusing wasted energy from venues like stadiums, concerts, stations, airports, nightclubs, and pubs.

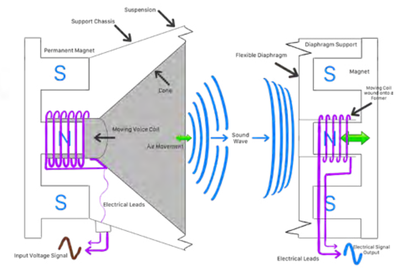
This project aims to harness and conserve this energy, improve existing technologies, and develop products that convert waste energy into electricity, contributing to sustainable energy solutions.

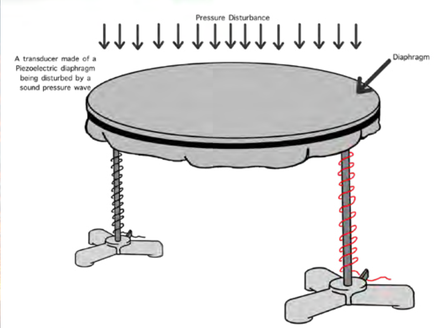
Challenges

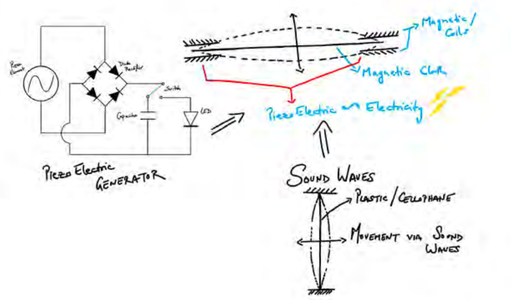
- Complicated User Experience
- Finding Target Area and Users
- Harnessing Waste Energy
- Understanding Existing Technologies

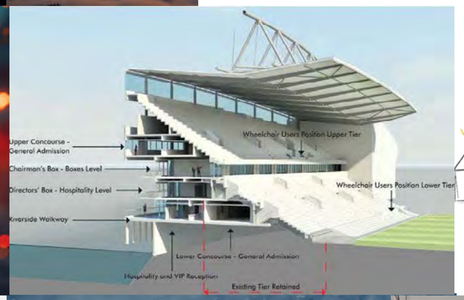
INITIAL
IDEATION

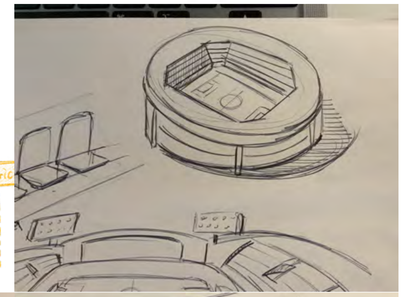


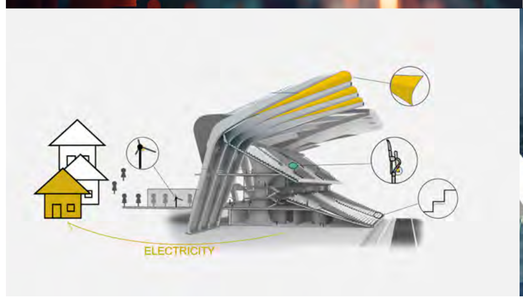


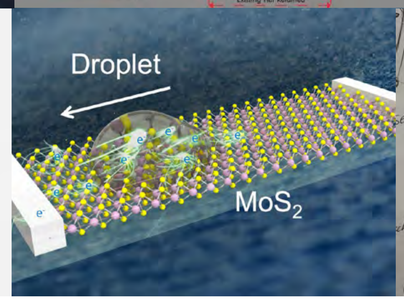


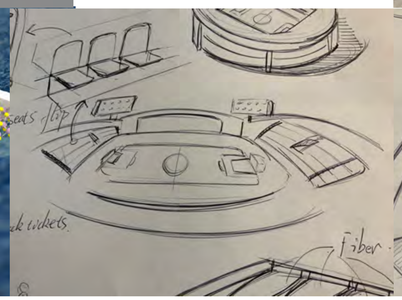


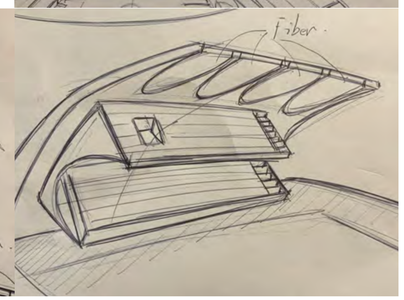


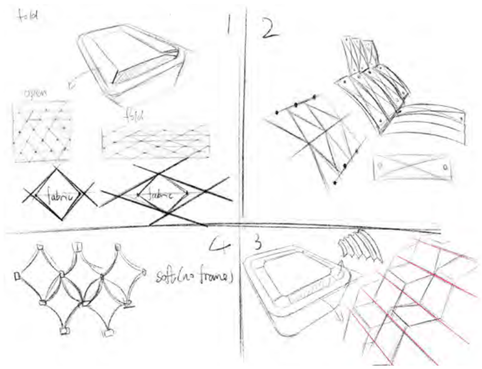


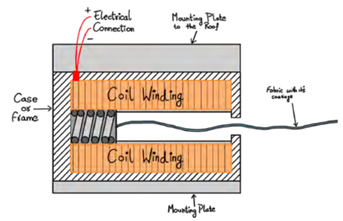


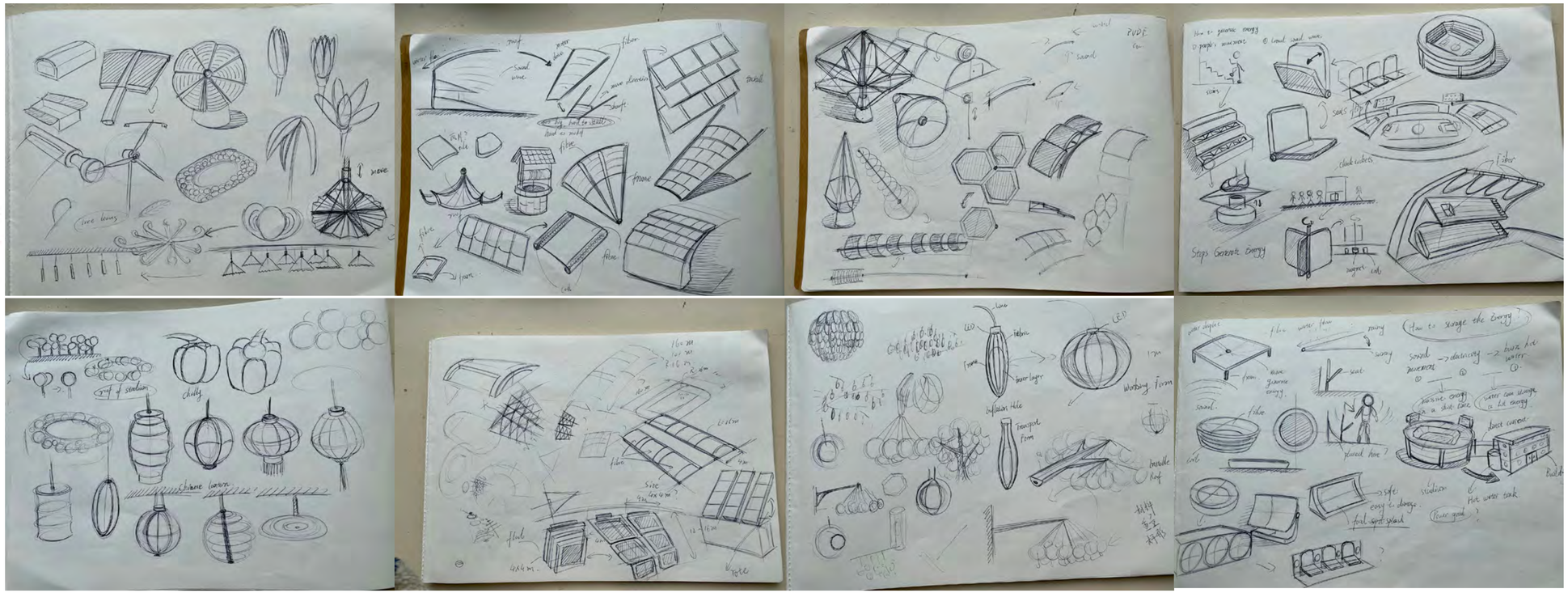








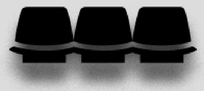




IDEATION

OPPORTUNITIES

Everybody has to use TURNSTILES to get into stadiums, stations, & concerts.



Attendees use flipping/folding chairs to sit, these chairs flip every time someone sits or gets up.

Everyone has to walk through the entrance.

A lot of sound is created at these events. All of it goes to waste & can be a huge problem for neighbourhoods.

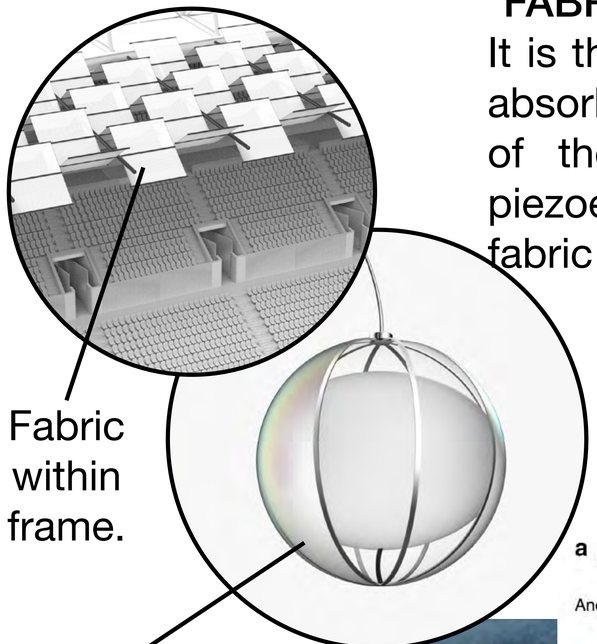
What is Crowd Wave?

The project Crowd Wave makes use of:

a. Sound Waves generated during large scale public events.
b. Make use of dynamos in Turnstiles and Flipping Chairs.
c. Kinetic Tiles with piezoelectric elements at places which see large footfall.

to generate electricity from the energy going to waste during events, and then providing the electricity to the communities around.

SOLUTIONS



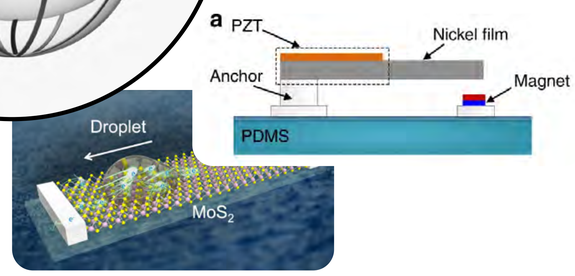
Fabric within frame.

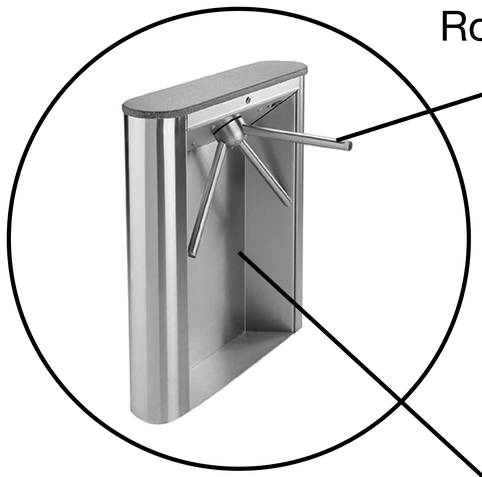
Unique housing for fabric.

FABRIC

It is the main product. The fabric absorbs & vibrates because of the sound waves. Multiple piezoelectric elements on the fabric generates electricity.

The wind & rain also generateelectricityfrom the linear alternators attached to the fabric.



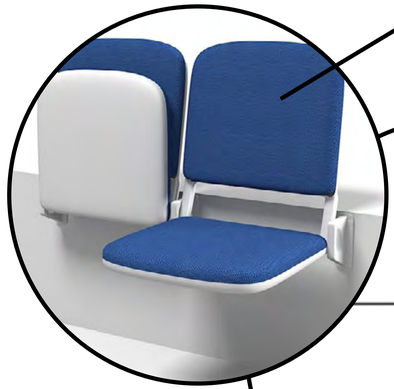


Rotating turnstiles.

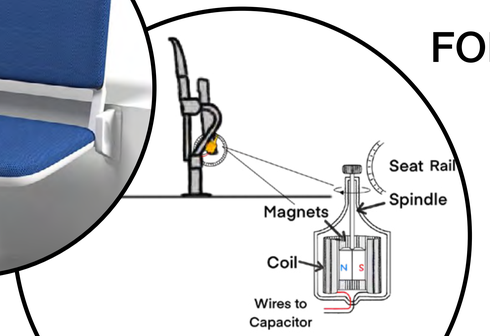
Dynamo can be housed.

TURNSTILES

A dynamo attached to the turnstile generates electricity every time a person passes through it.

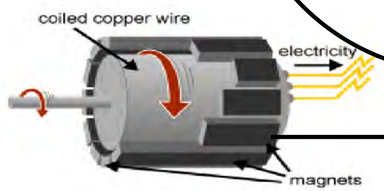


The flipping chair folds up automatically.

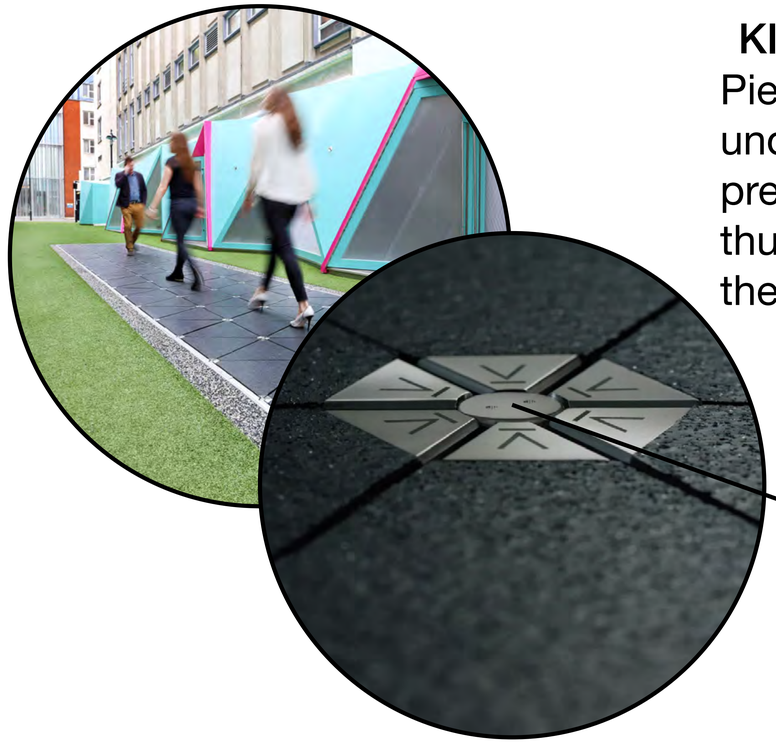


FOLDING/FLIPPING CHAIRS

Flipping the chairs, turns the dynamo which in turn converts the rotation into electricity.



Dynamo.

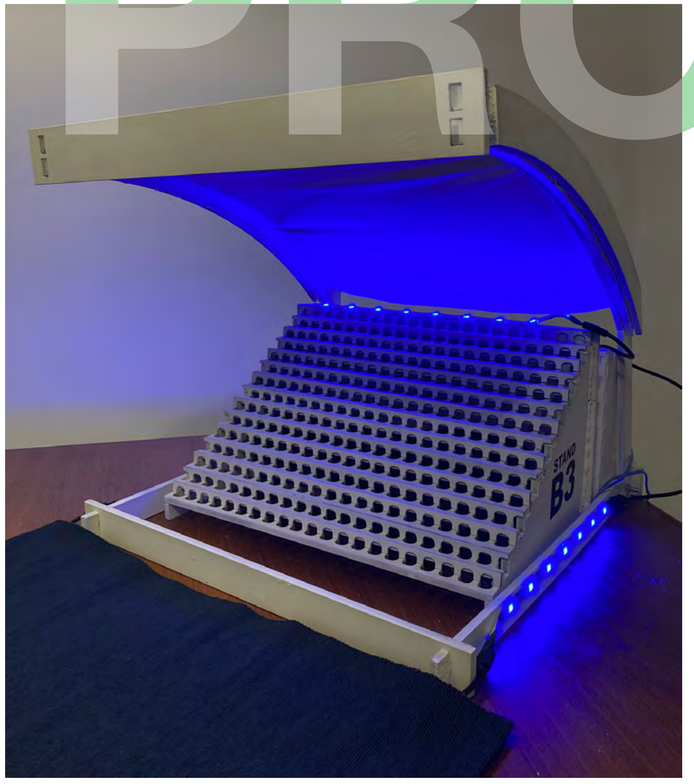


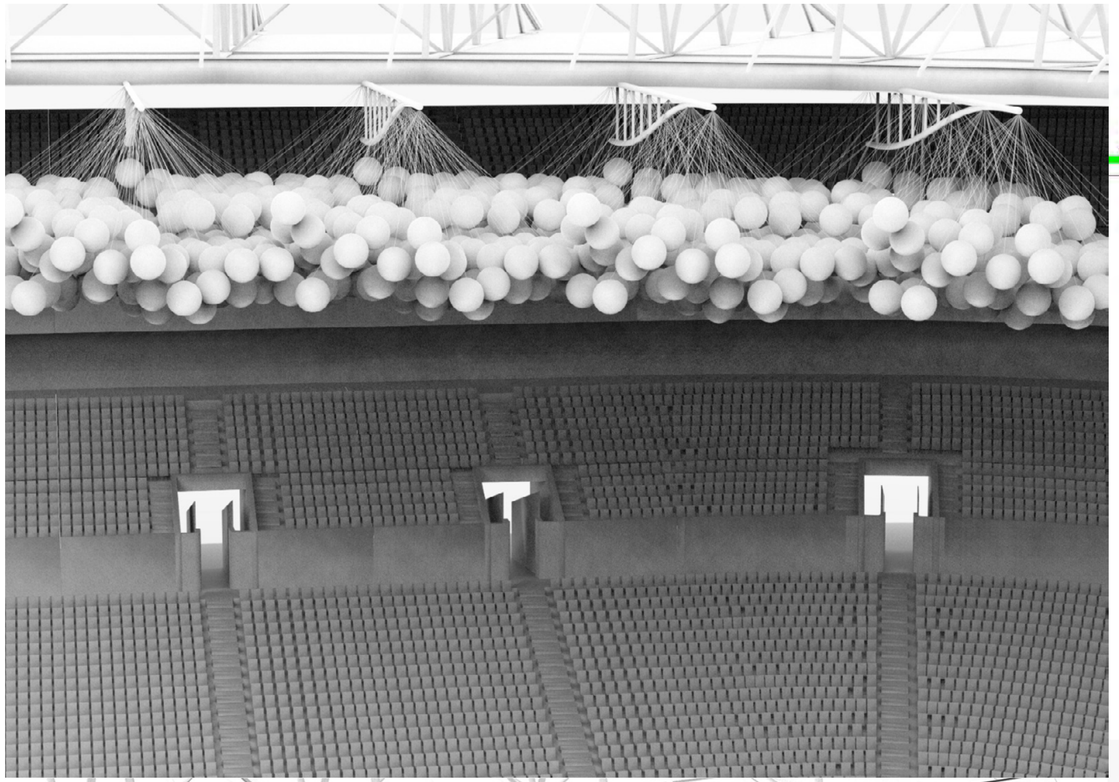
KINETIC TILES

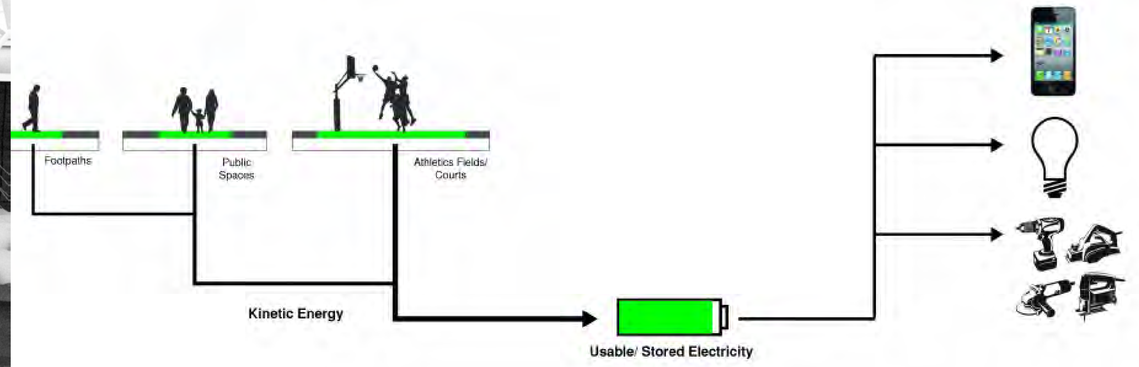
Piezoelectric element underneath the tiles is pressed by people walking, thus generating electricity in the process.

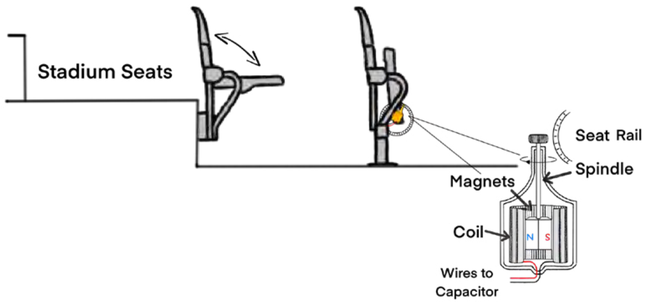
Piezoelectric element is based underneath these tiles (corners).

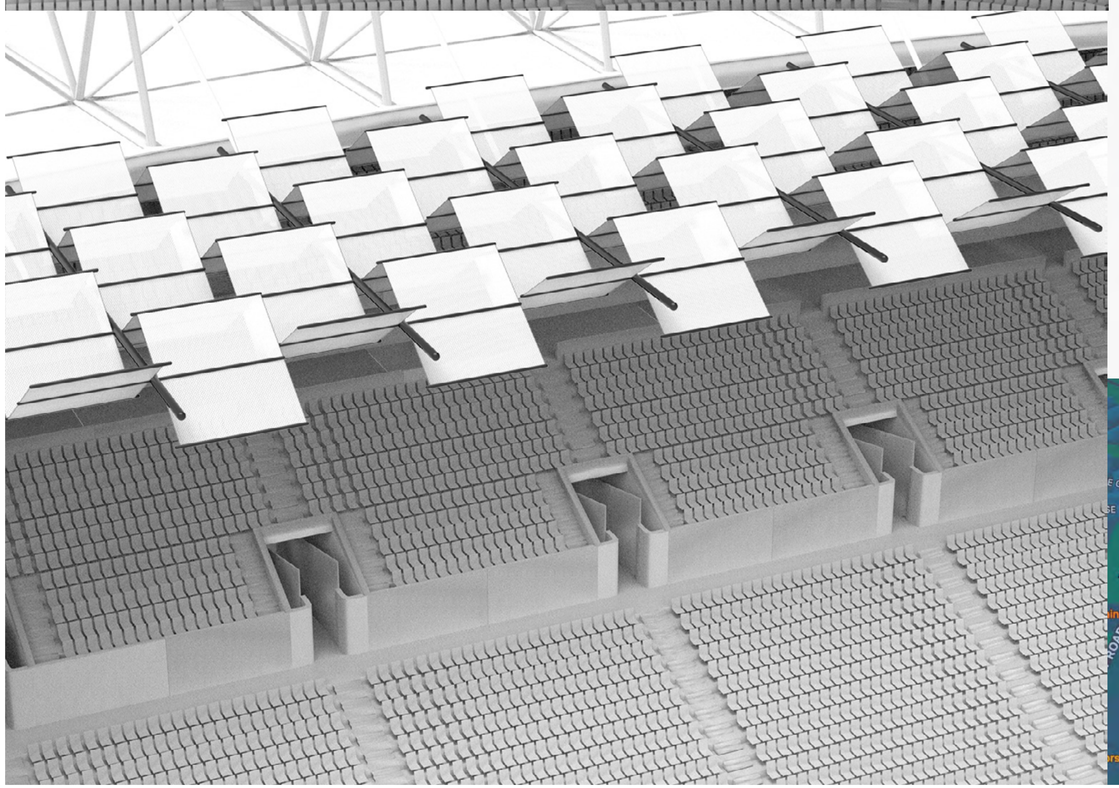
PROTOTYPING

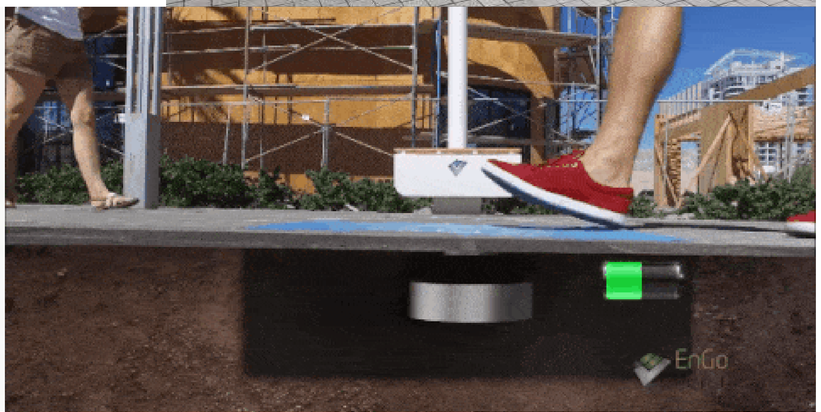


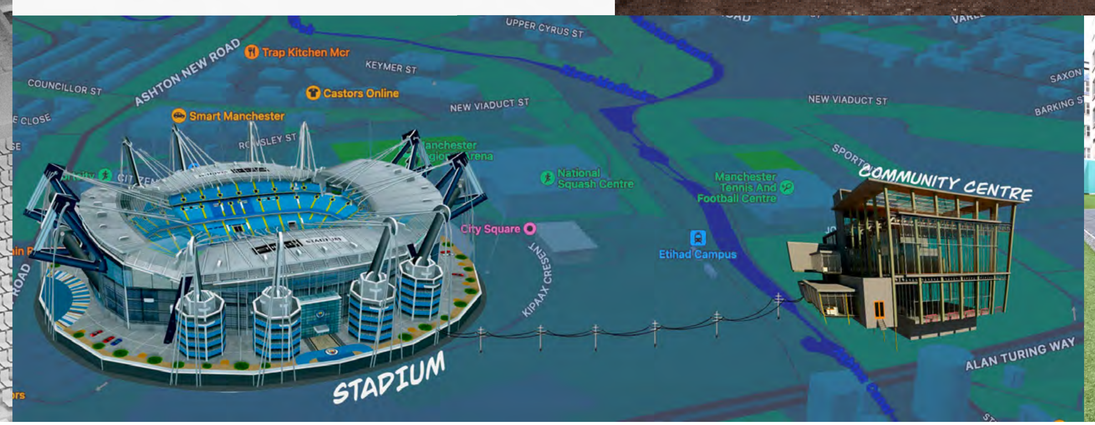



Footpaths
Public Spaces
Athletics Fields/ Courts
Kinetic Energy
Usable/ Stored Electricity


Stadium Seats
Seat Rail
Spindle
Magnets
Coil
N
S
Wires to Capacitor




EnGo


ASHTON NEW ROAD
Trap Kitchen Mcr
Castors Online
Smart Manchester
KEYMER ST
NEW VIADUCT ST
National Squash Centre
City Square
Etihad Campus
Manchester Tennis And Football Centre
COMMUNITY CENTRE
ALAN TURING WAY
STADIUM

01.
02.
03.
04.
05.
06.

Super Food

Service Design

A ‘Service Design’ project, where food was identified as a Super-Hero.

The project was divided into two parts, i.e.:
(a) Research & Critique of current situation.
(b) Ideation & Proposal for a better solution.

Challenges

Lack of food available for Hostles.

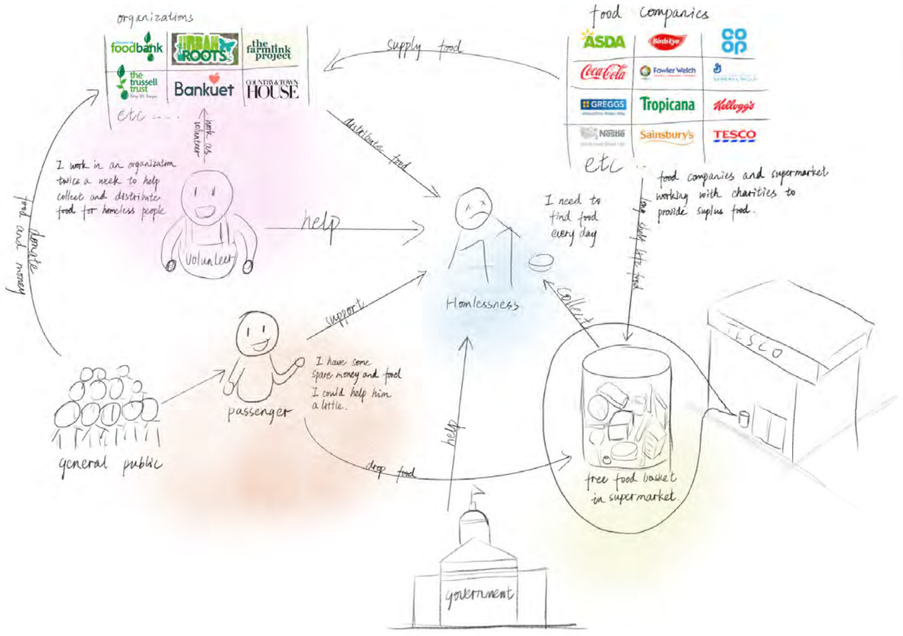
Lack of food available for Homeless.

Lack of food available for Respect from local councils, police, and daily passer-bys.

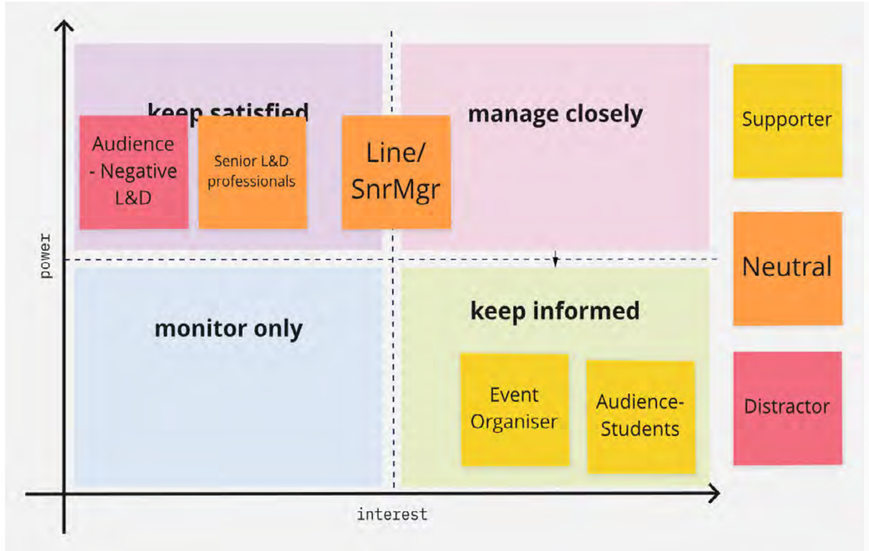
Lack of food available for Sympathy.

Inspirations

Stakeholder Mapping



Power v/s Interest Plot



Stakeholder Relation

User Persona

A couple of persona, based on fictional characters were developed to aid story-telling and communicating the end concept.

These were created by understanding exactly what is required from the service, and by building empathy with target users - the Homeless people.

Tommy

Volunteers

Age	36
Gender	Male
Occupation	Volunteers
Marital status	Getting married
Location	London
Online location	Work and mobile
Computers	iPhones
internet usage	4-8 hours

Cheerful — Negative

Confidence — Unconfident

Security — Insecure

Tommy story

TOMMY is a volunteer under a corporate umbrella. The business wants to provide food for the homeless through a venue. By setting up this space. To raise the profile of his business. And TOMMY as a volunteer also wants to help the homeless.

Tommy situation

Goals and motivations

- Increase corporate visibility
- Helping the homeless
- Provide a safe and secure environment.
- Provide food to the homeless

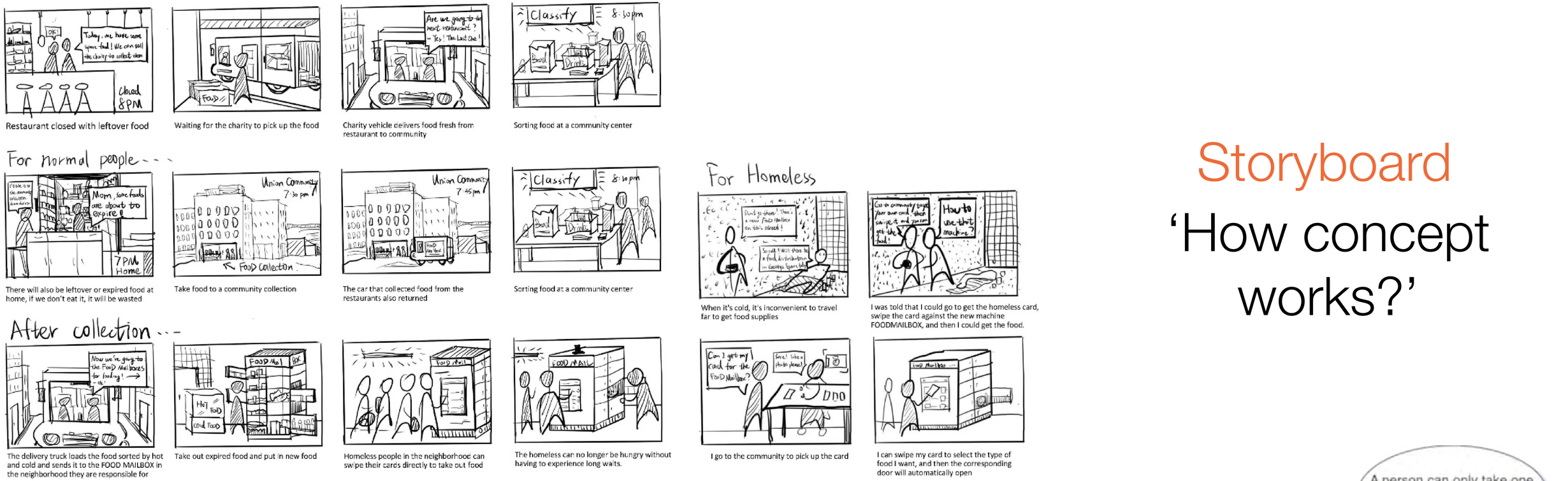
What affects Tommy ?

Journey Mapping

	Stage 1: Getting information			Stage 2: collecting food					
user activities	meet a machine on the road, realize this machine provide free food	read information on the machine about the organization	get a card from organization	walk to machine whenever feel hungry	open the door of machine with the card	choose and grab the food they need	Ensure that the weight of the food taken is not excessive	close the door	eating
touchpoints	machine	machine	service from volunteers	machine	machine	machine	screen	machine	meal
user thought	wow, free food! That's cool.	How to open this machine? Need a card? How to get a card? Oh need to visit this organization.	Great! Get the card. But maybe need to wait long?	Hungry! Maybe I can use that machine.	Cool. It's convnient.	Many options! I can choose what I want.	Yeah I didn't take too much so that other people also can enjoy these food.	It locked. Looks safe.	Enjoy!
user feeling	😯	🤯	😯	💡	😃	😄	😳	🤗	🤩
Review from users & charities	Machine around the city is a good way to know this service 👍	Understanding the process of how to get the cards is a bit tricky. 👎	- It is not easy to find the service provider. 👎 - Volunteers cannot be on duty all the time. 👎 - How charities identify homeless people is problematic. 👎	- It's much easier to reach than soup kitchen 👍 - Reduce the manpower to distribute food. 👍	What happens if people lose the card? 👎		It is not mandatory enough and there is still a risk of one person taking too much food. 👎	What if there isn't enough food in this machine? 👎	

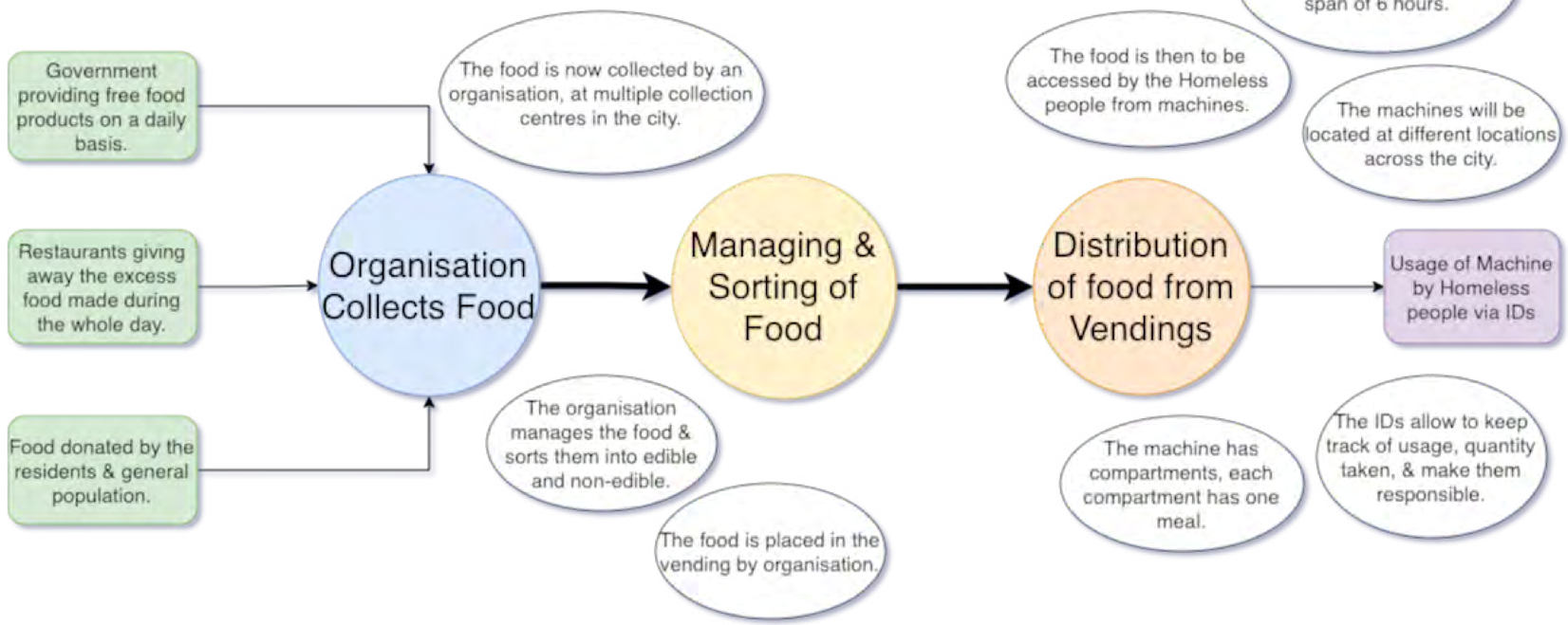
Storyboard

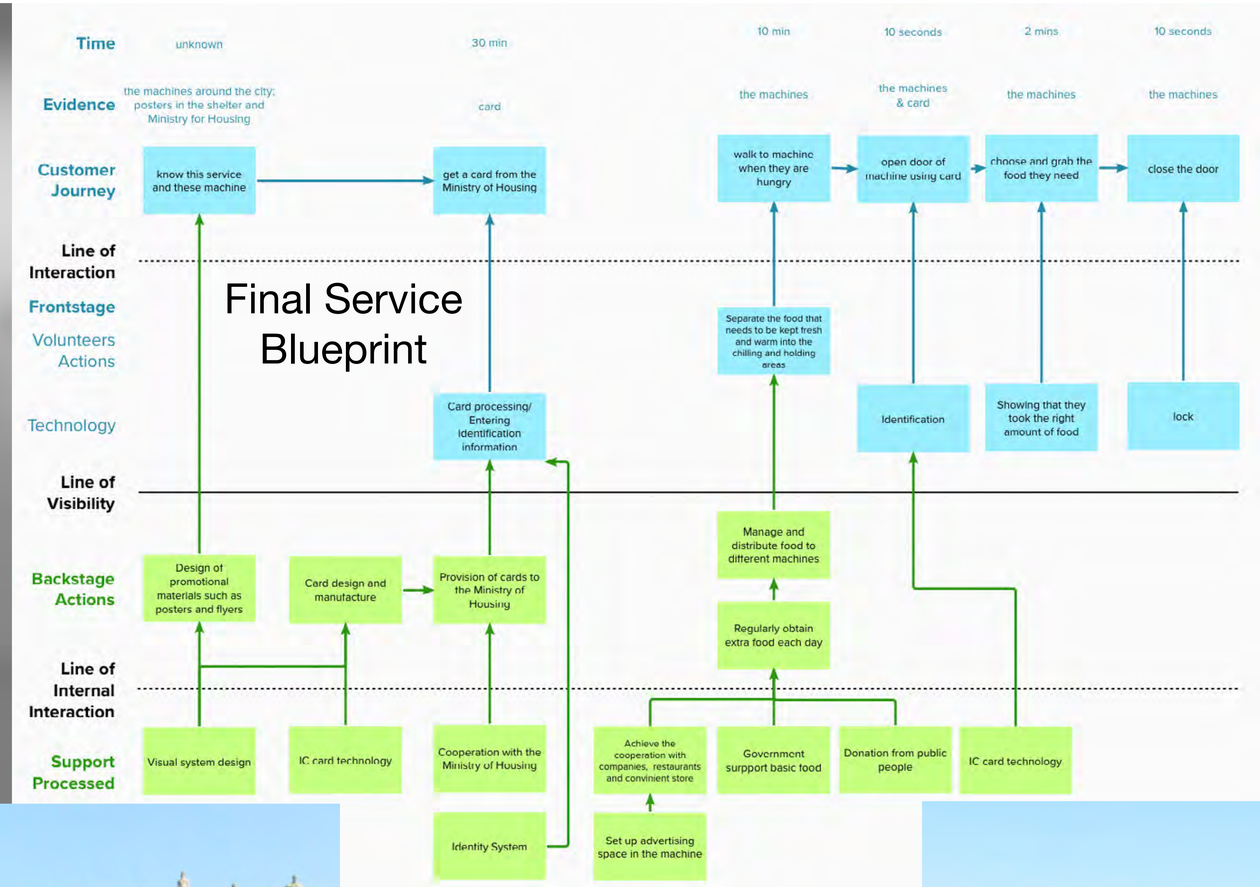
‘How concept works?’



Proposed Blueprint

for the Service

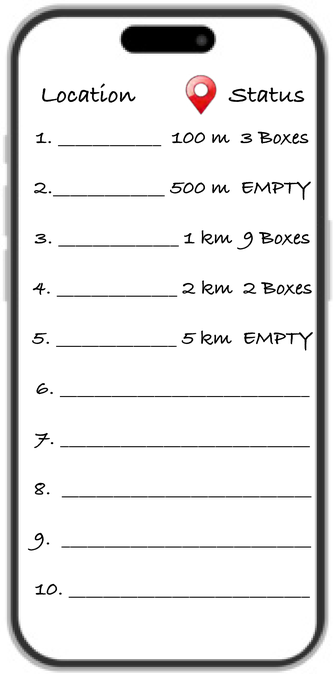


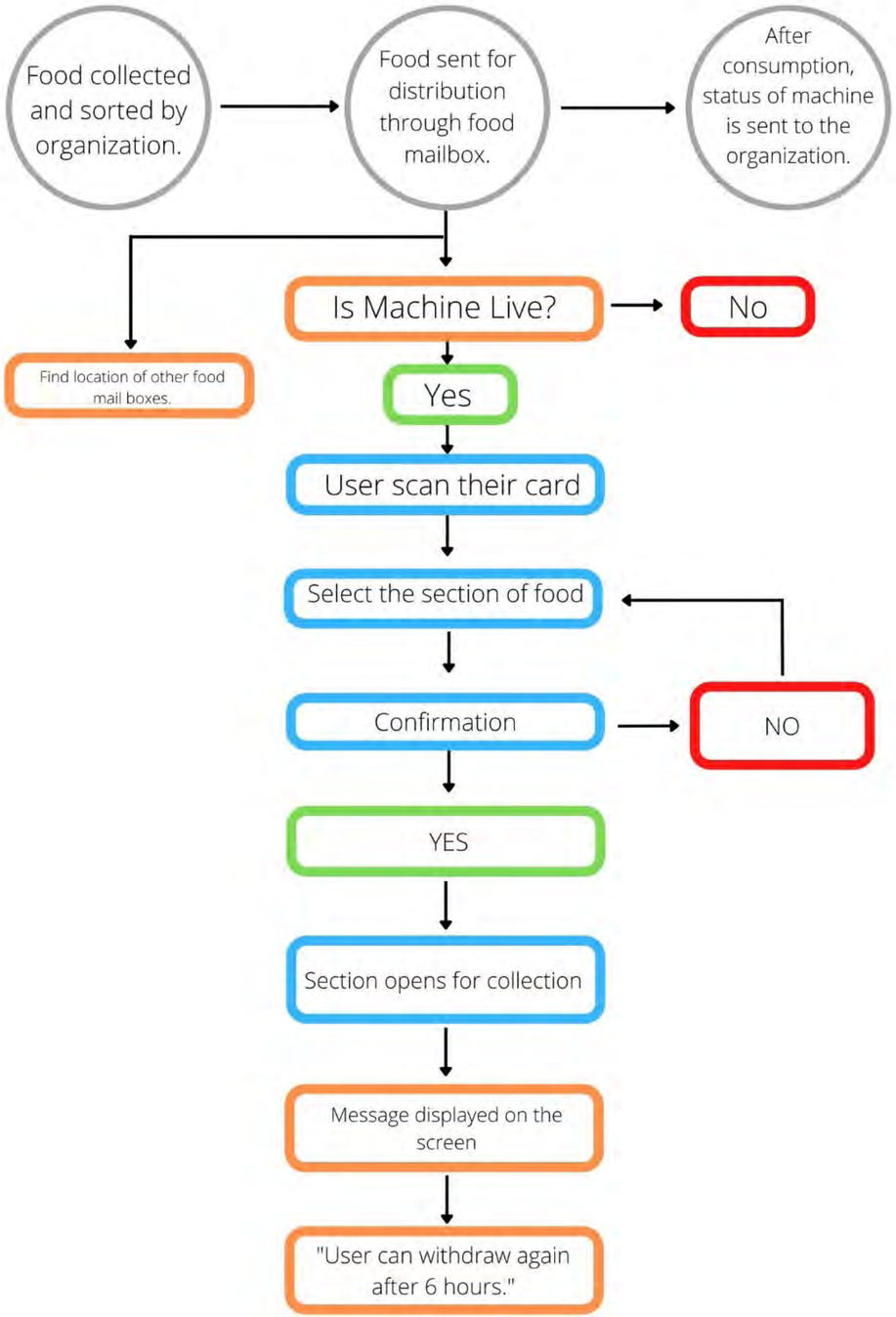


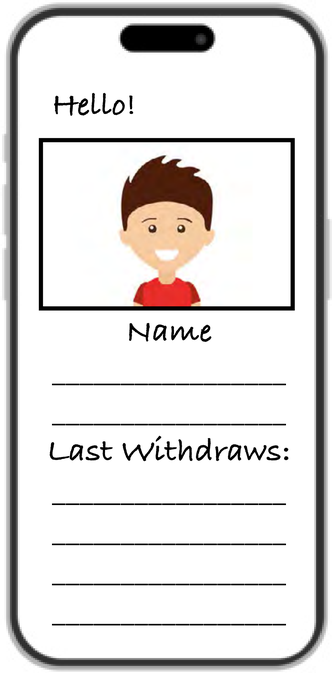
Cards used by Homeless people to gain access to the food.

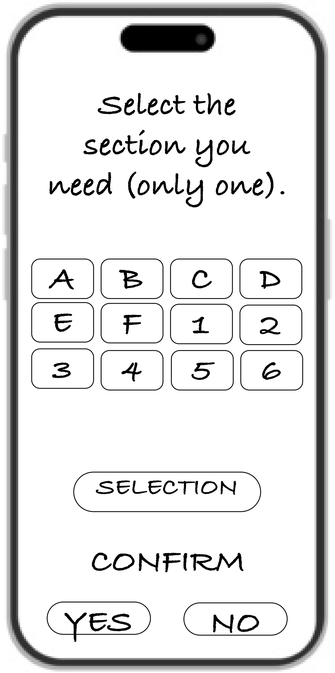
Vending Machine

User Experience Interface









Interface Working

01.
02.
03.
04.
05.
06.

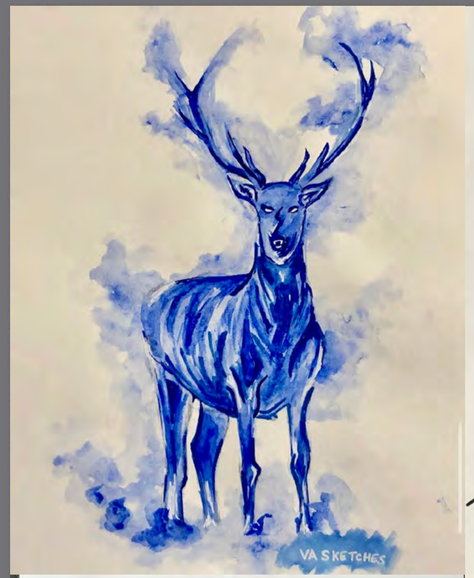
Sketches & Art

"Design is the art of planning, and it is the art of making things possible."

- Paula Scher

Here are some on my sketches & paintings that I like to work on during my free times.

I also post them on my instagram: @vasketches


VA SKETCHES


GT3 RS
VA Sketches.
Pirayak


Lamborghini
AVENTADOR SVJ
LAMBORGHINI
VA Sketches.
Pirayak


"THE STRONGER ONE WINS,
THAT'S ALL." - ZORO.


VA SKETCHES

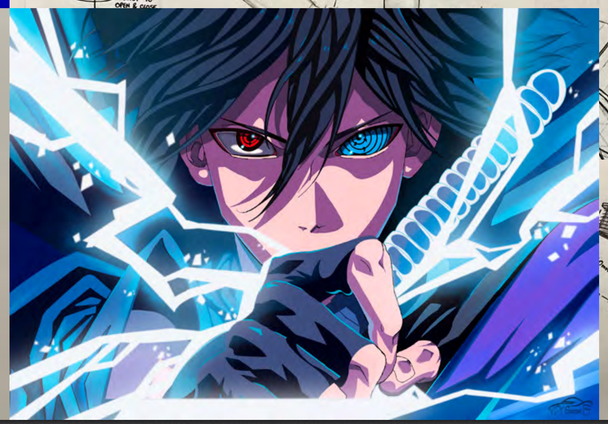

AMG
PETRONAS
FORMULA ONE TEAM
VA SKETCHES
Shot on OnePlus

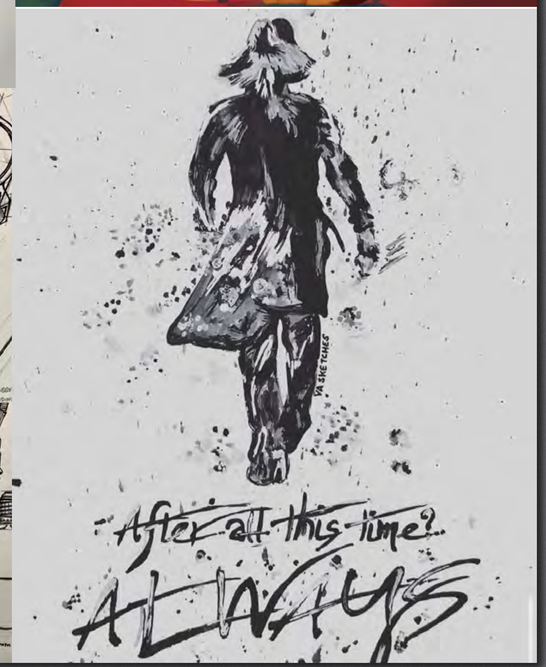

VA Sketches


Lock
Base / Cap
Head
TWIST TO
OPEN & CLOSE


"I couldn't repair your brakes,
so I made your horn louder."
- Mater.
HR 26 NA 85
VA Sketches.


'68
YTA 488E
VA Sketches.




VA SKETCHES
After all this time?
ALWAYS

Thank You!

vinayakarora01@outlook.com

@vasketches | LinkedIn

+44 7951-656307