PORTFOLIO
INDUSTRIAL DESIGN

2	0	2	6

rishikesh sonawane

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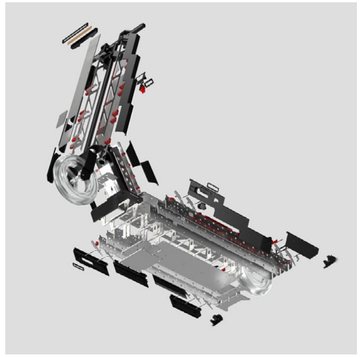
All projects shown in this document are individual work and do not involve any teamwork.

Portfolio 2026
Projects

01
Electric Tandoor Grill

Innovation Design



02
Micro Mobility

Transportation Design
Decentralised Design Systems

03
Hybrid Kitchen Aid

Innovation Design
Design for Multi-utility

04
Smart HUD Glasses

Eyewear Design
Wearable Tech

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UV Thermometer

Healthcare Devices
Design for E-Waste

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Smart Hydroponics

Design Futures
Sustainable Trends

All Projects
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Electric Tandoor Grill

Project 01

Category: Innovation Design

Description: Tandoors are large clay ovens used for cooking throughout cuisines across Western & Southern Asia, and even Africa. Mainly a commercial cooking device, its size and skill based approach makes it difficult to deploy domestically. This Innovation Design project breaks those barriers and overcomes problems such as size, cleanability, home safety, health hazards and implements a safe to use tandoor grill into a domestic scenario. This project was curated by me in collaboration with Havells India, a leading FMEG with global presence. The brief aimed towards envisioning an electric tandoor grill for Indian homes. The design had to focus on user interaction with a strongly emphasise on design for manufacturability.

Direction 01 - Designed for efficient manufacturability/assembly for cost effectiveness.
Direction 02 - Designed for unique user experiences and elevated kitchen aesthetics.

Duration: 04 months [16 weeks] Semester 08 Thesis Project.

Individual Personal Project
All content presented in this project is original and has been independently created by me.

View Detailed Project
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Defining Product Use Cases

Identifying product use case scenarios to efficiently design for multiple consumer groups. This visualisation technique directs innovation towards popular consumer lifestyle/trends in-turn creating a well received product.

- **Big families**. Provides the user with hot food directly off the grill. Kids under adult supervision learning how to cook.
- **Bachelors** enjoying exotic meals with close friends or colleagues. Interacting over leisure time using a portable grill, it takes cooking directly to the entertainment zone eliminating the need to cook or heat food in the kitchen.
- **Couples** can cook effortlessly by saving cooking and cleaning time. Individuals can spend more personal time and make cooking more inclusive.
- Cooking could be a form of interaction, the portable form can help users cook directly onto the dinning table. It can be used for indoor/outdoor gatherings such as terrace or backyard meals. It can also be used for camping with access to a power source/ small generator.

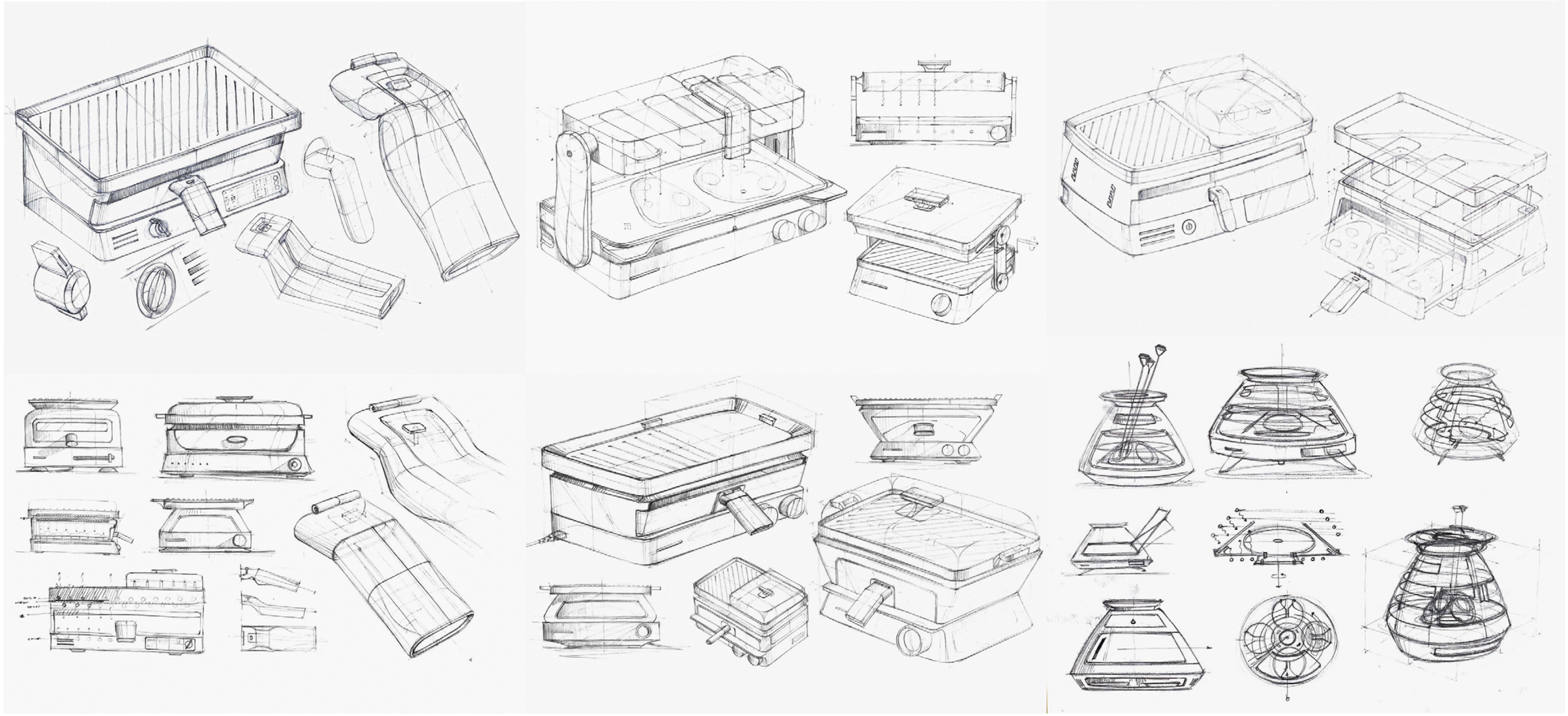
Analysing Research

Key Touch-Points

- Size and Capacity
- Power Consumption
- Temperature Control
- Safety Features
- Cleanability
- Multifunctionality
- Portability
- Aesthetics & Ergonomics
- Durability
- Cost

Concept Ideation

Freehand Paper Sketches

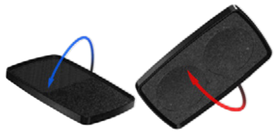


Concept 01

Designed for Efficient Manufacturability/Assembly for Cost Effectiveness and High Volumes.

Light indicators
Each bar represents one of three heating coils

Foldable Handle
Lowers product depth for storage by almost 30%



Two sided Grill Plate
Easy to flip and clean

Heating Coil
Grill Plate Heating Element

UI panel
Easy to Clean, Flushed Glass Touch Panel

Concept 01

Product Use Case Representations

Grill Plate

Grill Marks mimic the charring effect commonly seen on charcoal grills. As indicated by the LED lights, only the grill plate is currently under use hence the top coil is represented as red.

Roti Oven

Following an already tried and tested architecture, the roti oven acts very similar to that of an electric pizza oven. With a stainless mesh elevated over the drip tray, it enables hot air to circulate from under the roti & allows for easy cleaning respectively.

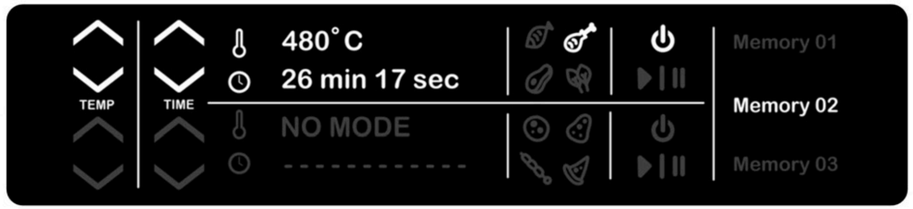
The Tray capacity is ideal for cooking 02 medium sized Rotis at 04 to 06 minute intervals. Items such as falafels could use a combination of the oven and the grill top; oven to cook the falafels and the grill to give those iconic charr grill marks.

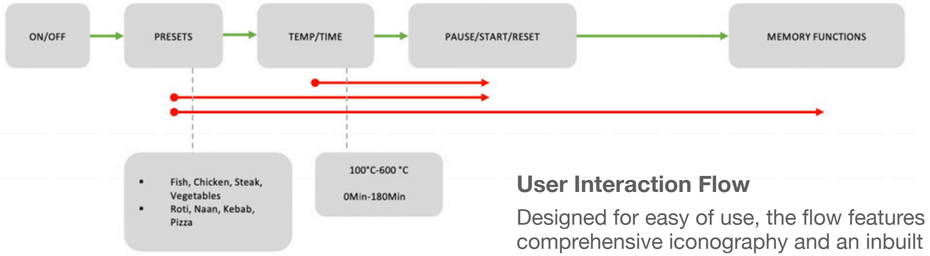
Steaming Lid

A glass steam lid enables users to grill and partially steam food side by side. Since grill tops cook food at high temperatures, its difficult to maintain a cook through a food item, a few splashes of water and the lid helps steam the food which is ideal of big pieces of meat or veg.

Concept 01

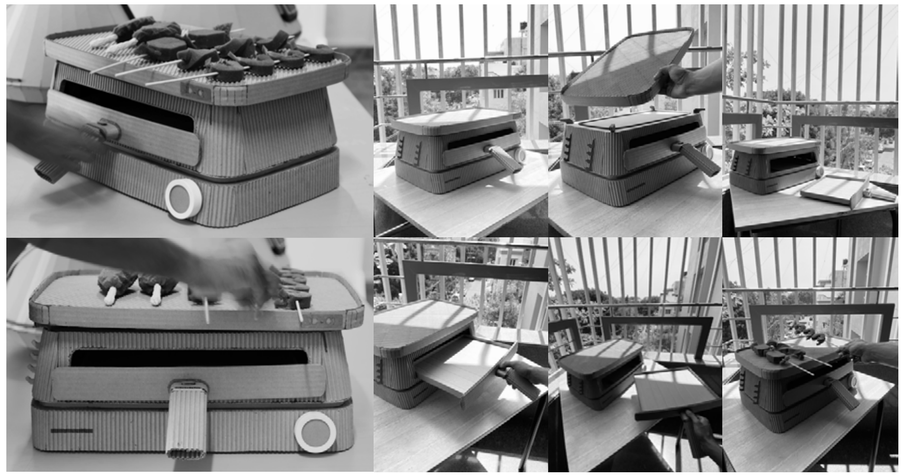
User Interaction Flow, 1:1 Low Fidelity Mockup & Detailed Exploded View

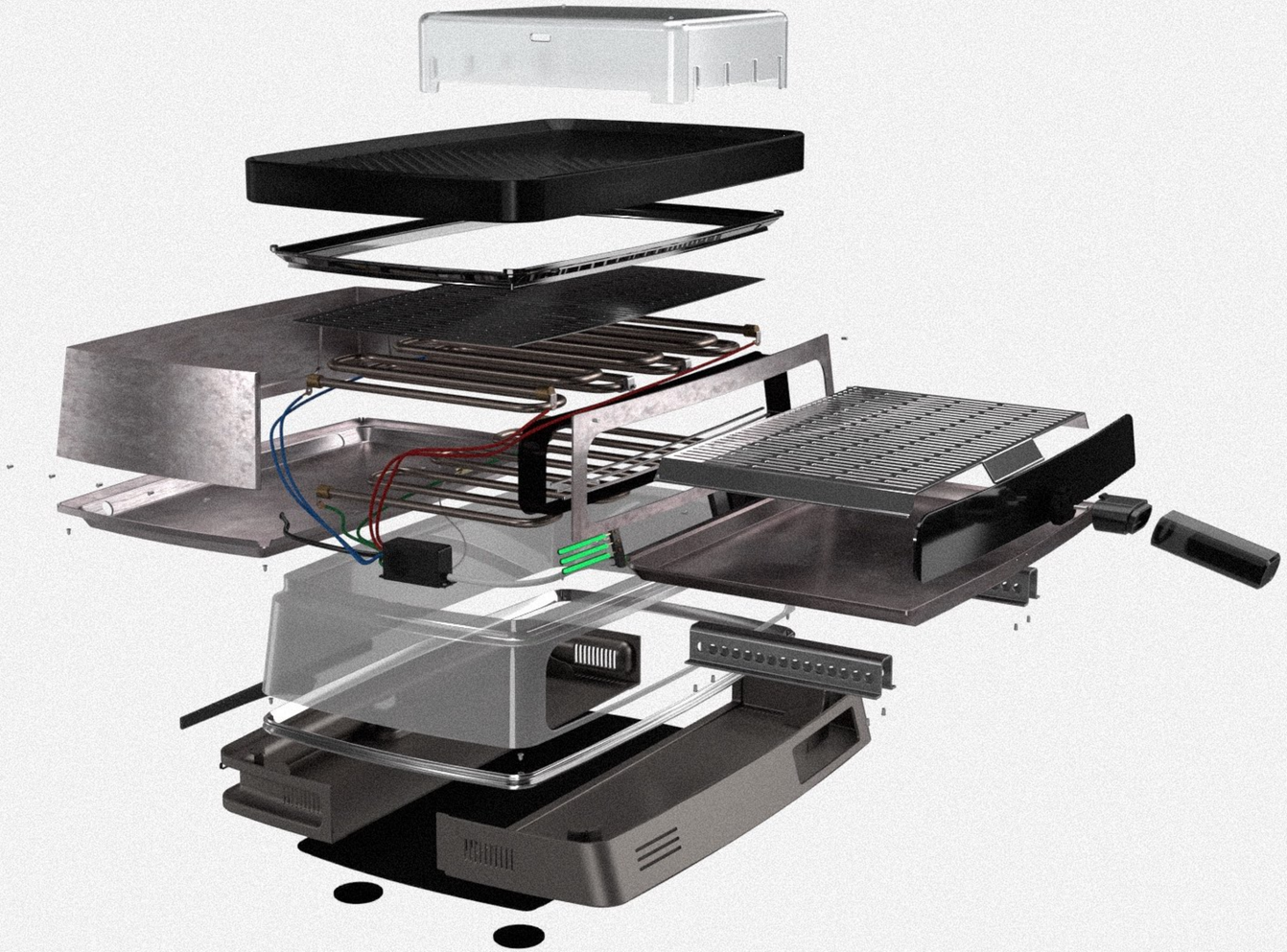




User Interaction Flow

Designed for easy of use, the flow features comprehensive iconography and an inbuilt memory setting.





Exploded View

All assembly components

Concept 02

Designed for innovative user experiences and elevating kitchen aesthetics.

Ambient LED Ring
Indicates Product Status

Iconic Silouhette
Mimicking a traditional earthen tandoor

Flat Top
Acts as a stable base to keep garnishing for quick access or to keep cooked naans.

UI Panel
Flushed Glass Touch Panel

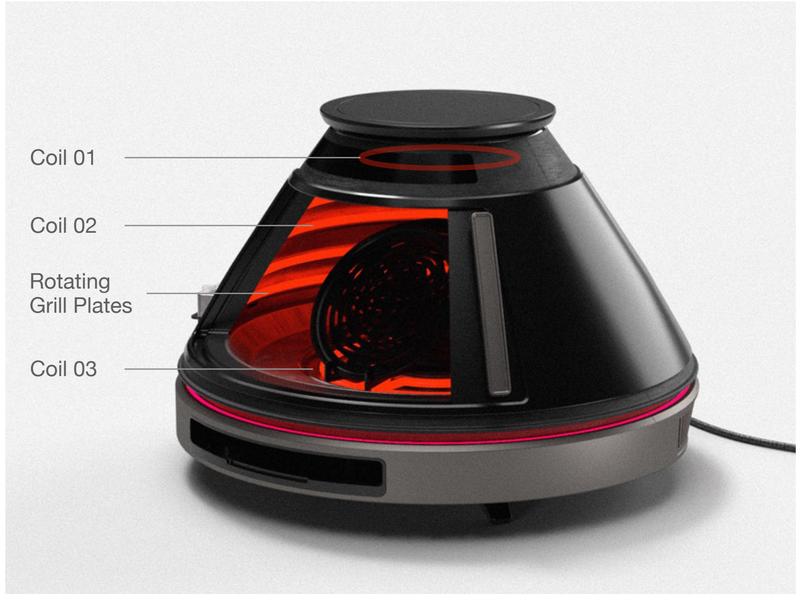
Rotating Mount
Securely rotates Grill plate Assembly.

Storage Shelf
For all grill plates and attachments

Grill Plates & Mount
Cast Iron plates; Inclined plates for roti and 2 semi circular plates for kebabs.

Sliding Door
Door rotates into a pocket completely flushing with the exterior surface.

Concept 02
Product Details



Heating

03 sets of coils cover the inner walls of the electric tandoor, evenly distributing heat for cooking. Each coil set can individually be operated to suite the user. With builtin presets, the user can directly add details of food that needs to be cooked using the UI touch panel, and the tandoor will analyse the food weight and type and systematically heat the coils to the desired temperature.

Smoke Box

What gives traditional tandoor food its distinct flavour and aroma is the presence of charcoal. Although cooking with charcoal very often has links to health risks such as cancer, it is also unsafe to be used domestically due to its high temperature and smoke.

The addition of a smoke box enables the user to use various kinds of wood chips and give food a smoky aroma and flavour mimicking a traditional tandoor. The wood chips electrically ignite using a sleek coil recessed inside the chamber. Using a small fan, it sucks in smoke trapping it inside the tandoor.

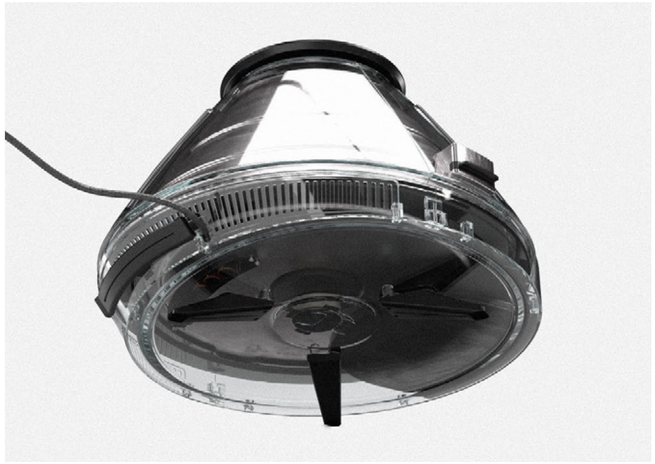
Cleanability

A hinged bottom coil enables the user to clean the inner chamber base with ease. Spraying the other coils with water while the device is turned off collects the residue on the base which can then be wiped off completely by lifting the coil. The central rotating disk that carries the grill plate housing also detaches for ease of cleaning.

Concept 02
Product Details

DFMA

A closer look at the joineries and fitment details resting on the inside, *Designed For Manufacturability & Assembly*, all components comply with traditional manufacturing techniques such as injection moulding, sheet metal moulding/bending and die casting.



DFMA

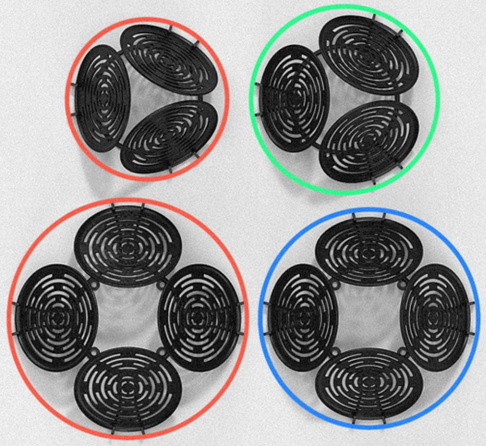
Under the heavily insulated plastic jacket sits a sheet metal enclosure similar to microwaves and OTGs. The ridged pattern in the metal sheet not only encompass the coils inside but also adds strength/rigidity to the structure.

Product Setting

Designed for countertop use, Its unique silhouette adds appeal to modern kitchens and is certainly a head turner.

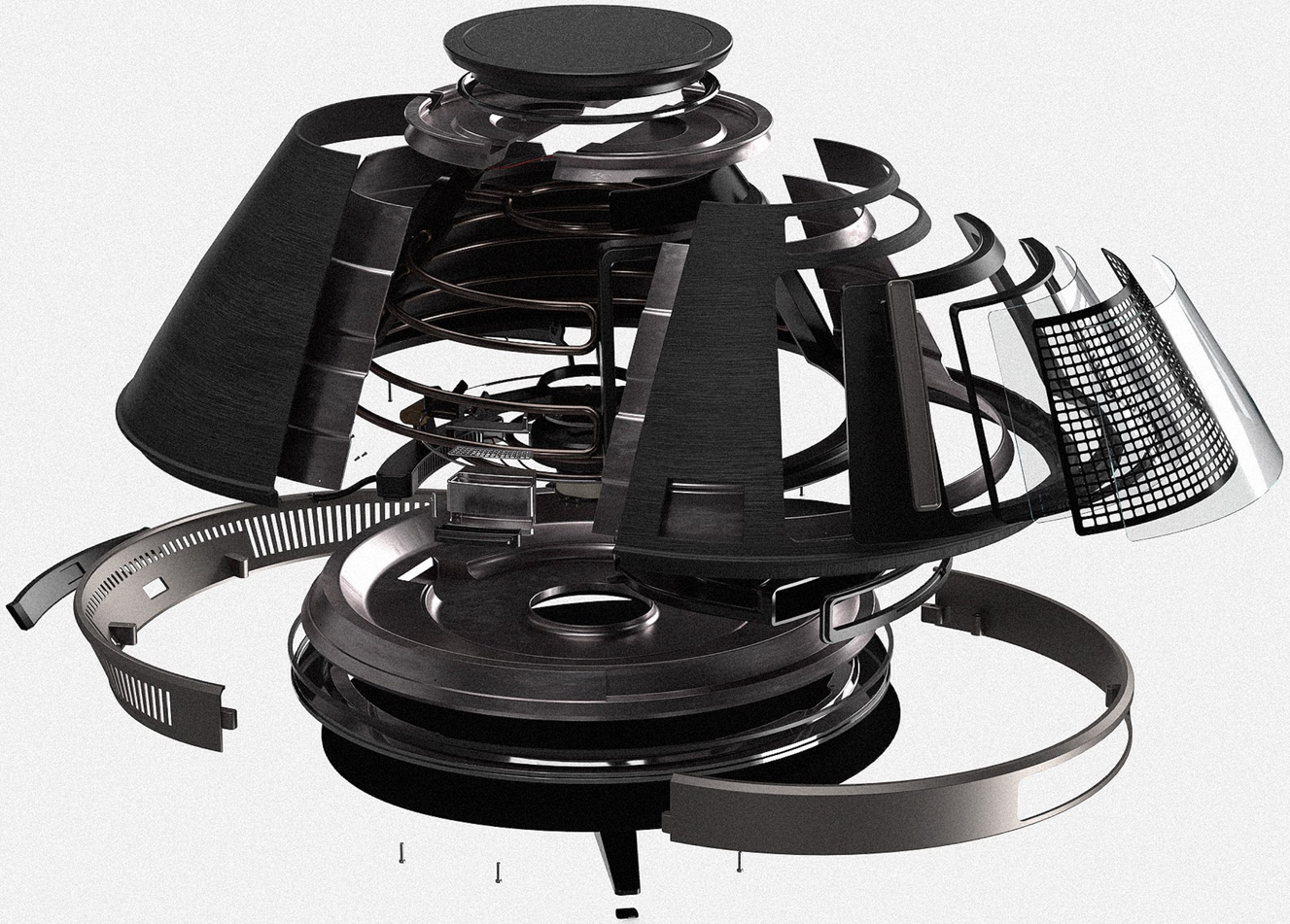
Concept 03

User Interaction Flow, 1:1 Low Fidelity Mockup & Detailed Exploded View



Scale & Efficacy

The Number of Roti hot plates and their angle of inclination exponentially affects product size. Identifying strengths and drawbacks for various schematics by reflecting on initial research aids in the selection of a scale that caters to the users needs and size for median Indian home kitchens.



Exploded View

Displays all assembly components

Micro Mobile Electric Vehicle

Project 02

Category: Transportation Design

Description: Ward 110, a lively commercial marketplace in the heart of Bengaluru City - India, houses a variety of small business such as manufacturers, import/exporters, repair centres and spare part suppliers. With growing e-commerce, these market places fail to be discovered by newer customers. The brief was to design and develop an intervention for small business communities of ward 110 that would help generate additional revenue. The intervention should have a broader purpose from the perspective of benefitting not just the business community but also the city of Bengaluru.

Cities are getting densely populated unable to house the sheer mass of people. Mobility for solo travellers in India has hardly seen advancement, with saturated public transports, last mile connectivity is scarce, less available and not cost effective. This is one of the reasons why most market places in ward 110 lack accessibility affecting employability and eventually affecting businesses. The aim was to design a mobility intervention keeping income generation for small businesses in mind, and to aid last mile commute in and around Bengaluru City.

Duration: 04 months [16 weeks] Semester 07 Pre - Thesis Project (Individual Personal Project)
Displayed & Featured at Bengaluru Design Festival 2022

Individual Personal Project
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View Detailed Project
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Defining Design Approach

Value Proposition Mapping & Business Model Canvas

Aim

To design & develop a product system that benefits the Ward 110 Bengaluru (India) small business community along with creating mobility solutions in and around Bengaluru city.

Opportunity Areas

- Last Mile Connectivity
- Value Addition
- Manufacturing & Supply Chain
- Revenue Streams
- Consumer Segments

Identified Gaps

- Availability
- Safety Compliance
- Maintenance Logistics
- Infrastructure
- User Interaction

Stakeholders

In order create a product value chain, it is important to map existing interventions in society related to the chosen category; such as micro mobility case studies & pain-points related to last mile connectivity. Identifying potential stakeholders enables one to design for existing markets that lack intervention. Designing around identified gaps present in the mobility space, helps define the product and prioritise consumer needs.

- Students/Universities
- Tourists
- Delivery Executives
- Business/ Leisure Parks
- Public Spaces
- Metro Stations

Bussiness Model Canvas

Key Partners
- Government
- Investors
- Vendors
- Distributors
- Manufacturers
- Service Providers
- EV Showrooms
- Automobile Dealers
- Marketers

Key Activities
- Production
- Manufacturing
- Component Sourcing
- Assembly
- Distribution

Key Activities
- Production
- Manufacturing
- Component Sourcing
- Assembly
- Distribution

Value Proposition
- Maintainence
- Locally Sourced Parts
- High Performance
- Availibility
- Customisation
- Recreation

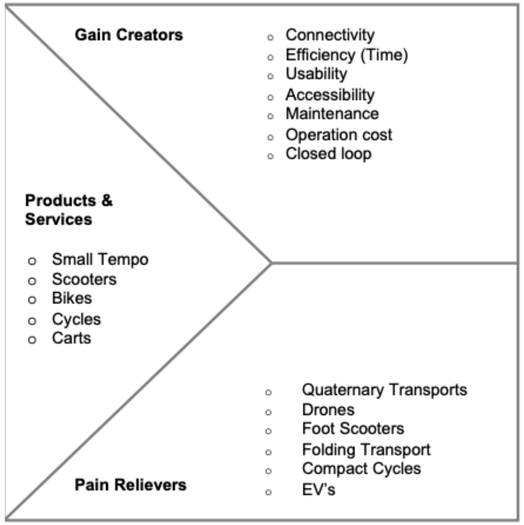
Consumer Relationships
- Information Exchange
- Awareness
- Inclusivity
- Customization
- Customer Service

Channels
- Online Portals
- Automotive Stores
- Distributors/ dealers

Customer Segments
- Students
- Tourists
- Delivery Executives
- Bussiness Parks
- Parks
- Public Spaces
- Metro Stations

Cost Stucturing
- Raw Materials
- Component Inventory
- Marketing and Sales
- Maintainence

Revenue Streams
- Sale of Product - Located Clients, Self Sustaining Housing Communities, Educational Spaces, Recreation, Bussiness Centers, Public Spaces, Tourism, Rental



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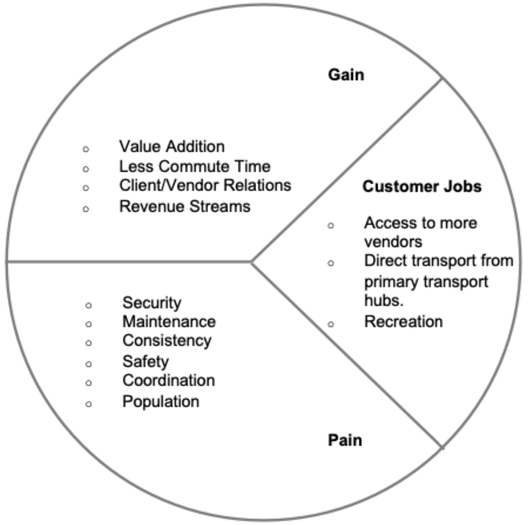
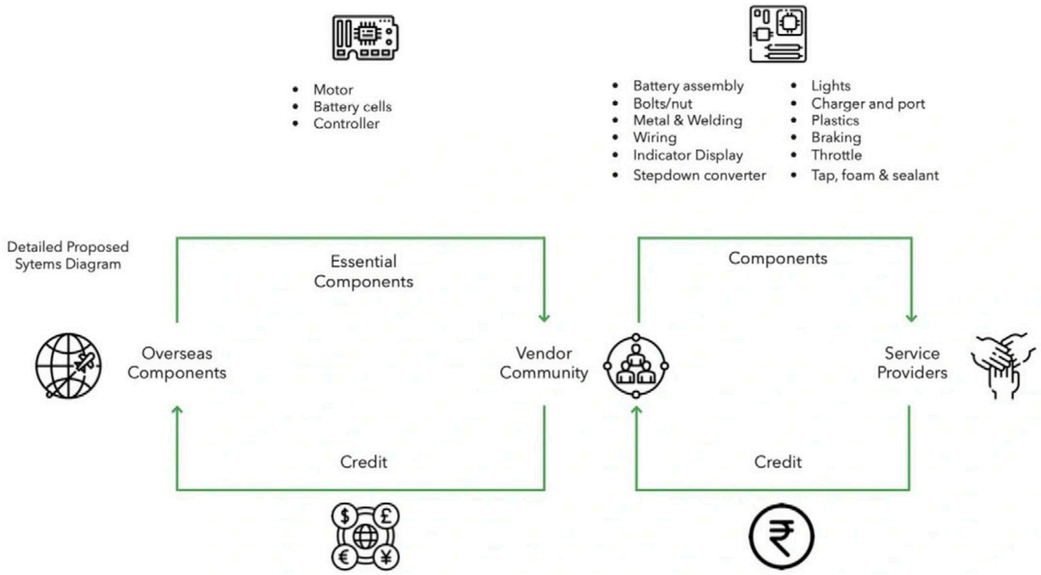


Insights

Business Model Insights, Case Study & Design Details

Business Model Key Insights

- A feasible quaternary transport for consumers making smaller businesses more accessible.
- Focusing on manufacturing systems and affordable connectivity.
- Creating business opportunities/revenue streams for small communities.
- Closed loop product service/system.
- Up-cycling waste.
- Aids small business owners and small skilled workers.
- Economical: Manufacturing & Serviceability.
- Configurable.
- Easy of deployment
- Designed for Indian roads.



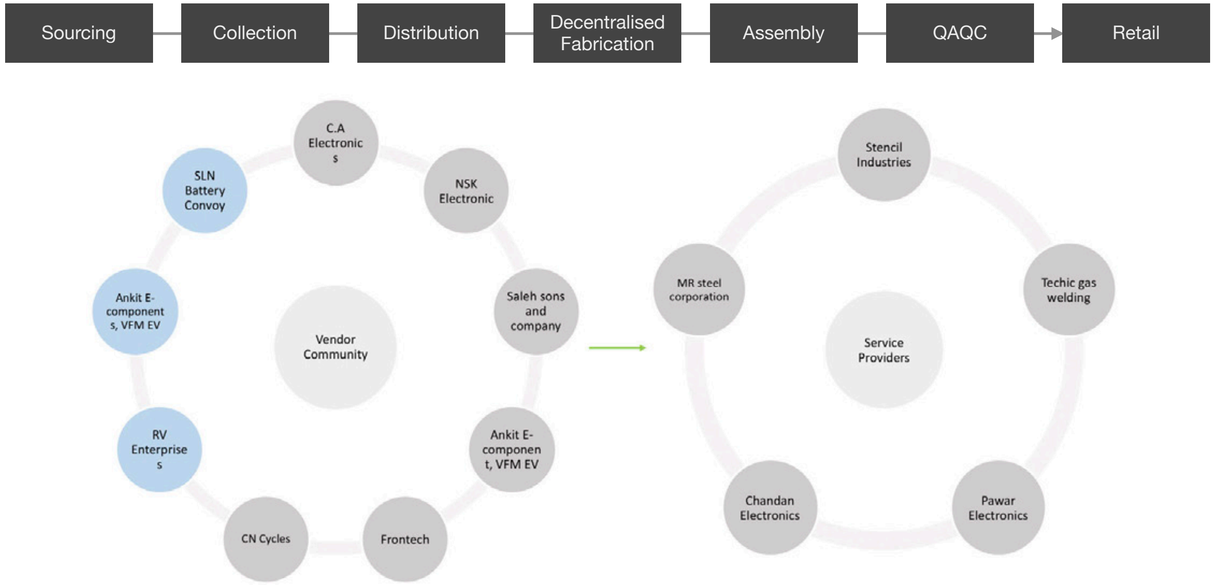
Case Study Insights

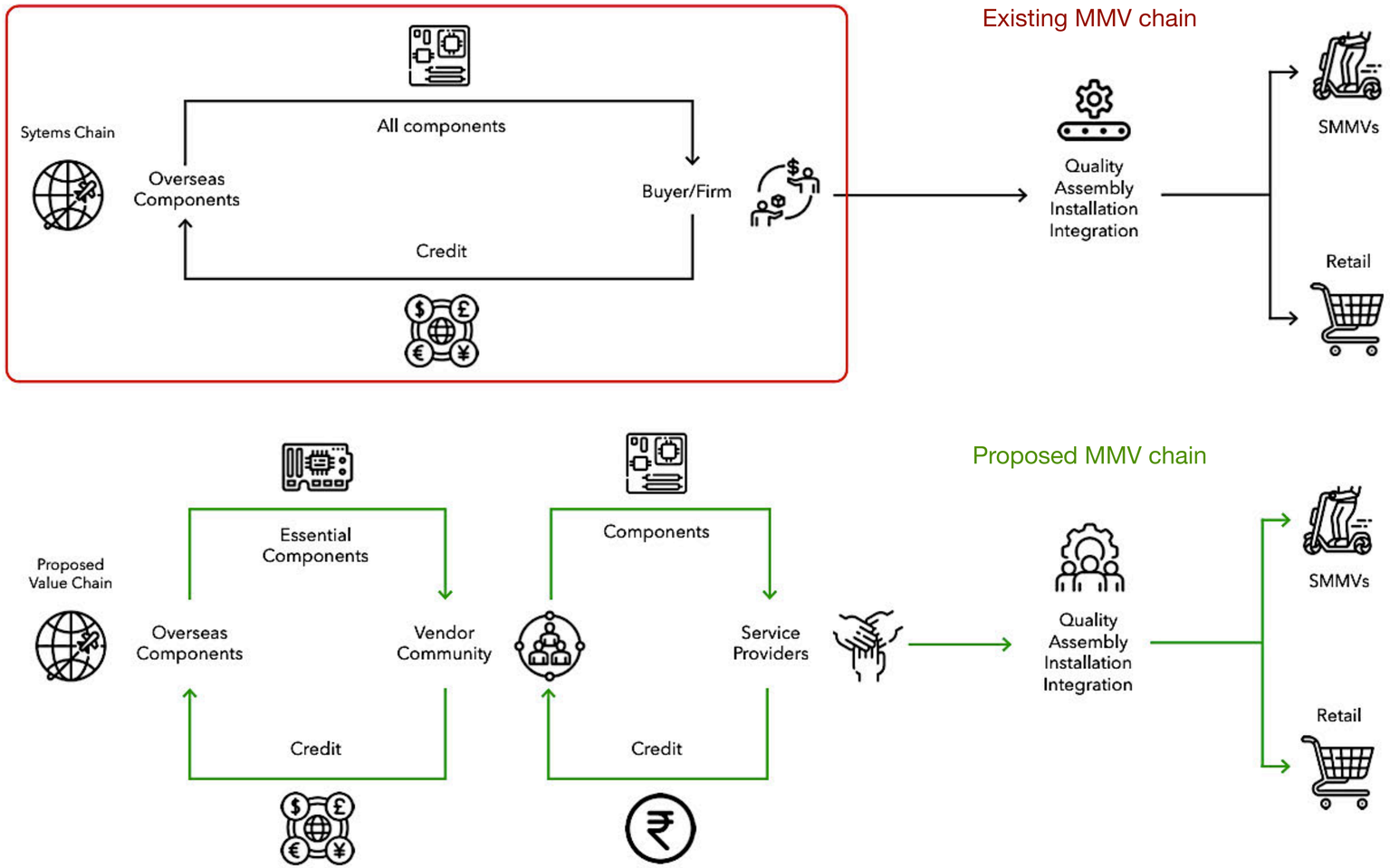
Yulu India, Dott, Helbiz

- Seem-less Share-ability
- Urban Commute
- User Friendly App
- Availability
- Product Range
- Safety & Performance
- Reliability
- Carbon Neutrality
- Eco - Design
- Recyclability
- Leisure
- Functional
- Service Sector
- Endurance
- Inclusivity

Ward 110 Stakeholders

Identifying Small Business in ward 110 that are equipped and ready to contribute to the product system.





System Mapping

Value Creation for Small Businesses

Proposing a new system map for accommodating small business present in ward 110. Following a decentralised manufacturing process, the system is designed to benefit the process holders with revenue gained circling back into the system.

Sustainable Development Goals

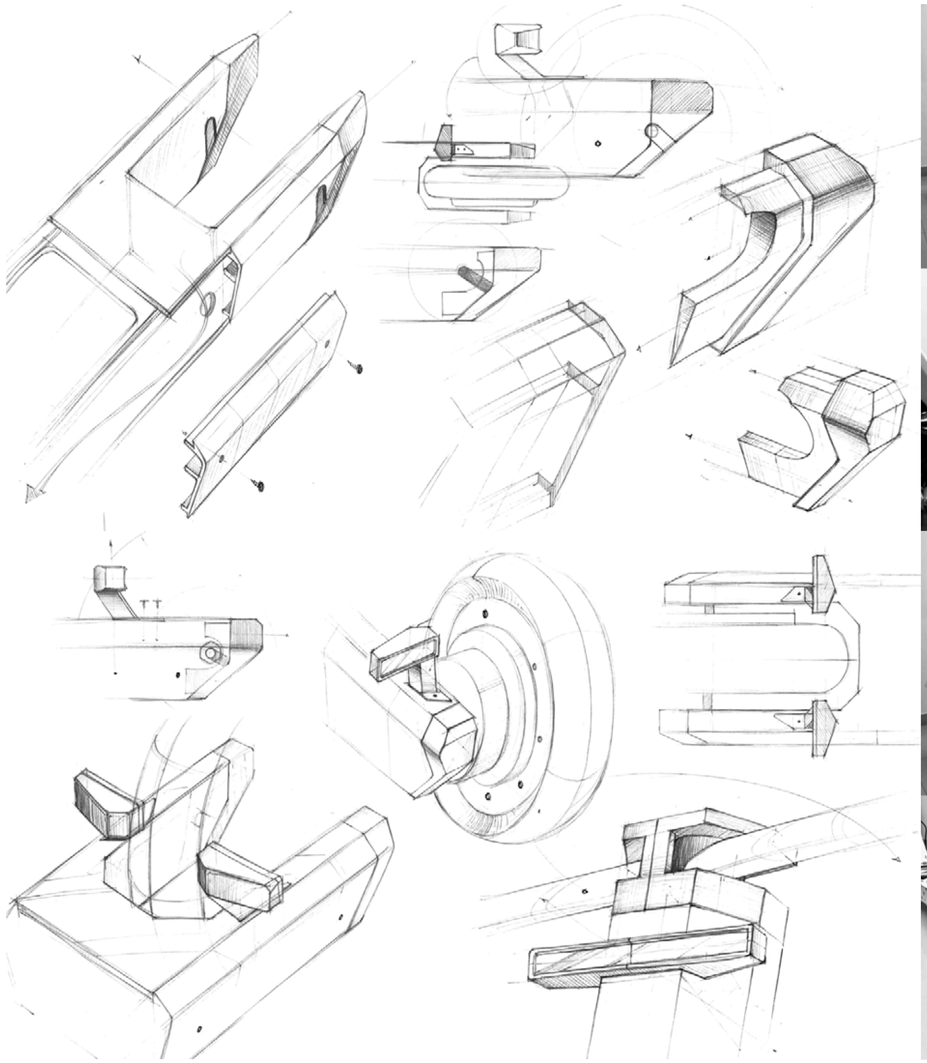
The project targets to address three United Nations Sustainable Development goals.

[09] INDUSTRY, INNOVATION & INFRASTRUCTURE
[11] SUSTAINABLE CITIES & COMMUNITIES
[12] RESPONSIBLE CONSUMPTION & PRODUCTION

- Inclusivity for small scale business to carry out tasks responsible for the intervention.
- Co creation: business opportunities that are mere extensions of their daily service.

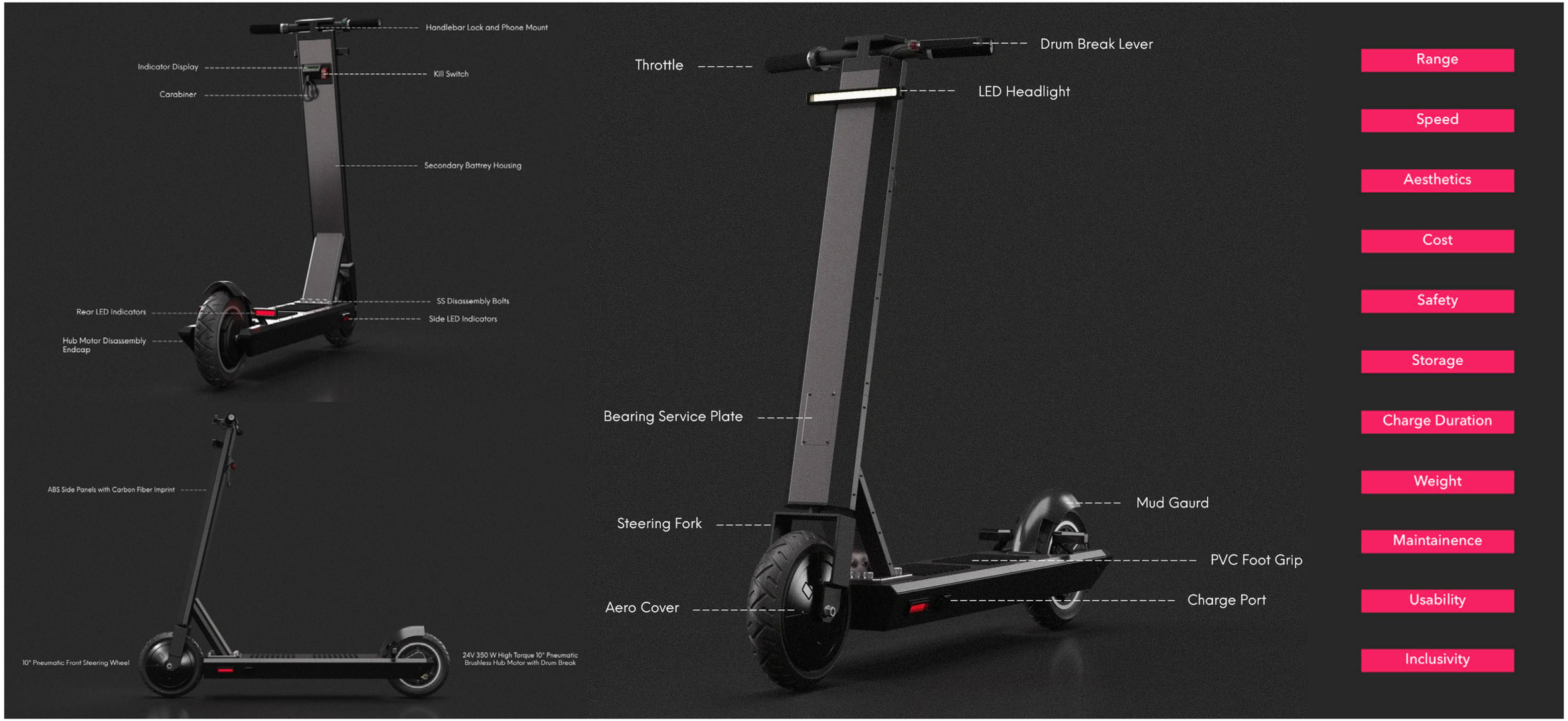
Concept Ideation & Fabrication

Freehand Paper Sketches, Low-Fidelity Foam Board Prototype for Fitment and Circuit Layout & High-Fidelity Prototype Fabrication.



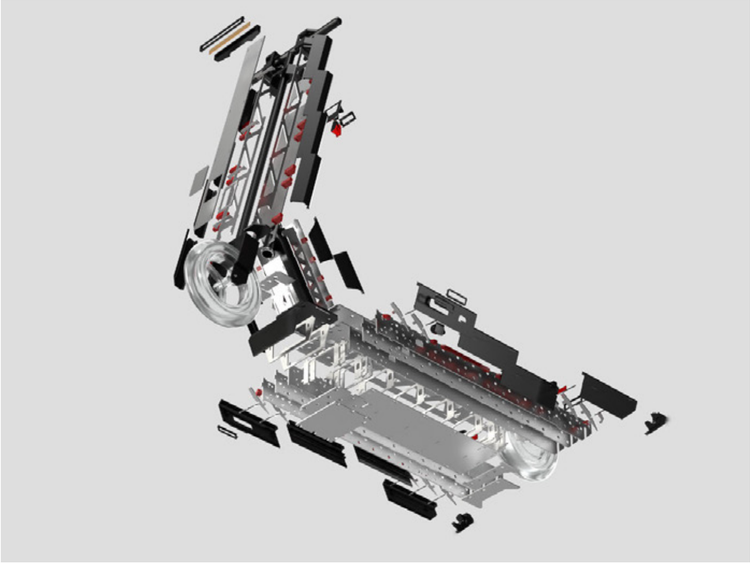
Product

Specifications and Key Touch-Points



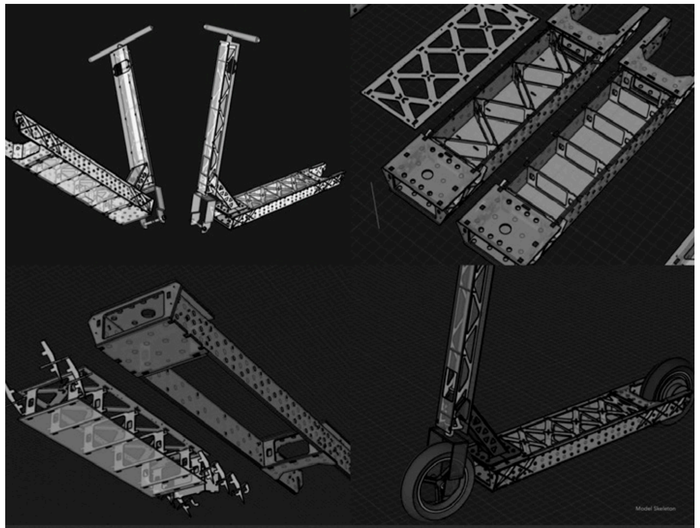
Micro Mobile Vehicle

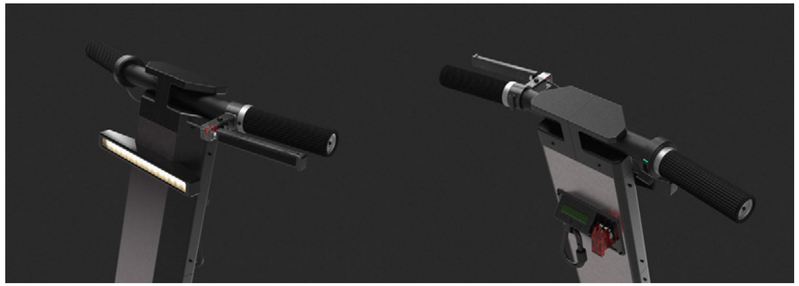
Product Details



Exploded View

Above is a representation of all chassis and plastic parts. The chassis was designed to be laser cut and assembled like a puzzle, making it easy for the service providers to commence the welding process.





Exploded View

The chassis and plastic component layout was not just designed for easy assembly but also ease of serviceability and replacement of damaged components.

Finished Product

High Fidelity Prototype & Bengaluru Design Week Feature

Use Case
Field Testing, Performance Analysis & Validation

Hybrid Kitchen Aid

Project 03

Category: Innovation Design, Design for Multi-Utility

Description: This HYBRI*D* kitchen aid is designed to execute functions equivalent to multiple kitchen appliances. Its unique configuration helps it adapt to several needs, and acts as an all in one device capable of blending, grinding and kneading. It is inspired by the classic French press; designed for disassembly, this product takes it a step higher by incorporating design for utility, introducing an elegant and productive kitchenware.

Duration: 02 weeks

Individual Personal Project
All content presented in this project is original and has been independently created by me.

Featured in **YANKO DESIGN**
https://www.yankodesign.com/2024/01/01/save-your-kitchen-space-with-the-all-in-one-kitchen-aid-that-replaces-other-kitchen-appliances/

Featured in **design burger™**
https://www.design-burger.com/h-y-b-r-i-d-kitchen-aid

Featured in **TRENDHUNTER™**
https://www.trendhunter.com/trends/hybrid-kitchen-aid

Featured in **Product Notion**
https://www.instagram.com/p/C19o-ZWtbGr/?igsh=MWZncTRheW4xOWZlbg==

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Defining Design Approach

Value Proposition Mapping & Business Model Canvas

Problem Areas & Insights

Kitchen appliances come in various capacities, sizes and shapes, catering to specific functions in their domain. How viable is it to buy multiple appliances? Majority of individuals who prepare food frequently notice how appliances are left unused over long periods of time. Most appliances purchased are overpowered, bulky and incur storage problems.

- Do people really need so many appliances?
- Are appliances used to the fullest?
- What about individuals who need appliances for moderate use.
- Storage
- Cost of buying multiple appliances

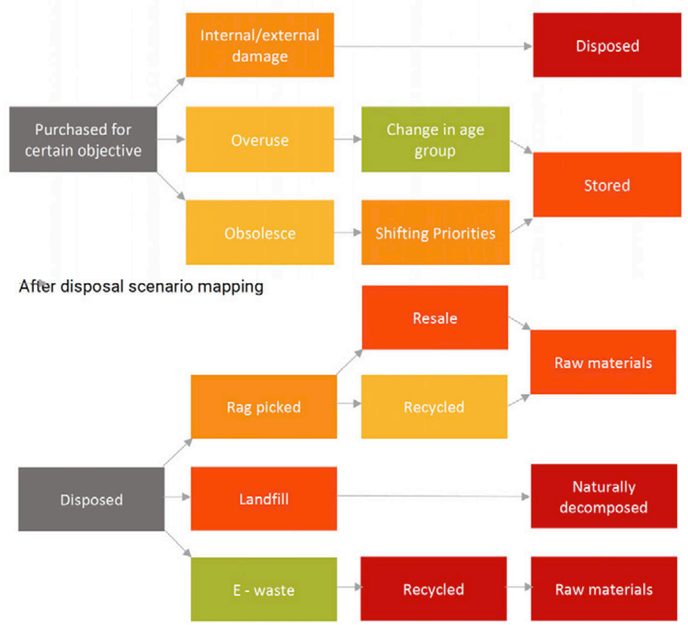
Solution Set

Individuals who do not purchase multiple appliances because of its scarce need, require a multifaceted appliance that can multitask, and sufficiently perform for day to day cooking needs. An optimised performance for general kitchen needs. The aim is to design an appliance that combines multiple kitchen equipment applications into one simplified machine who's performance is optimised for essential day to day use.

- Multiutility
- Adaptative
- Resilient
- Economical
- Cleanability
- Space Saving
- Economical
- Power Consumption
- Adaptability
- Improves Cooking Flow

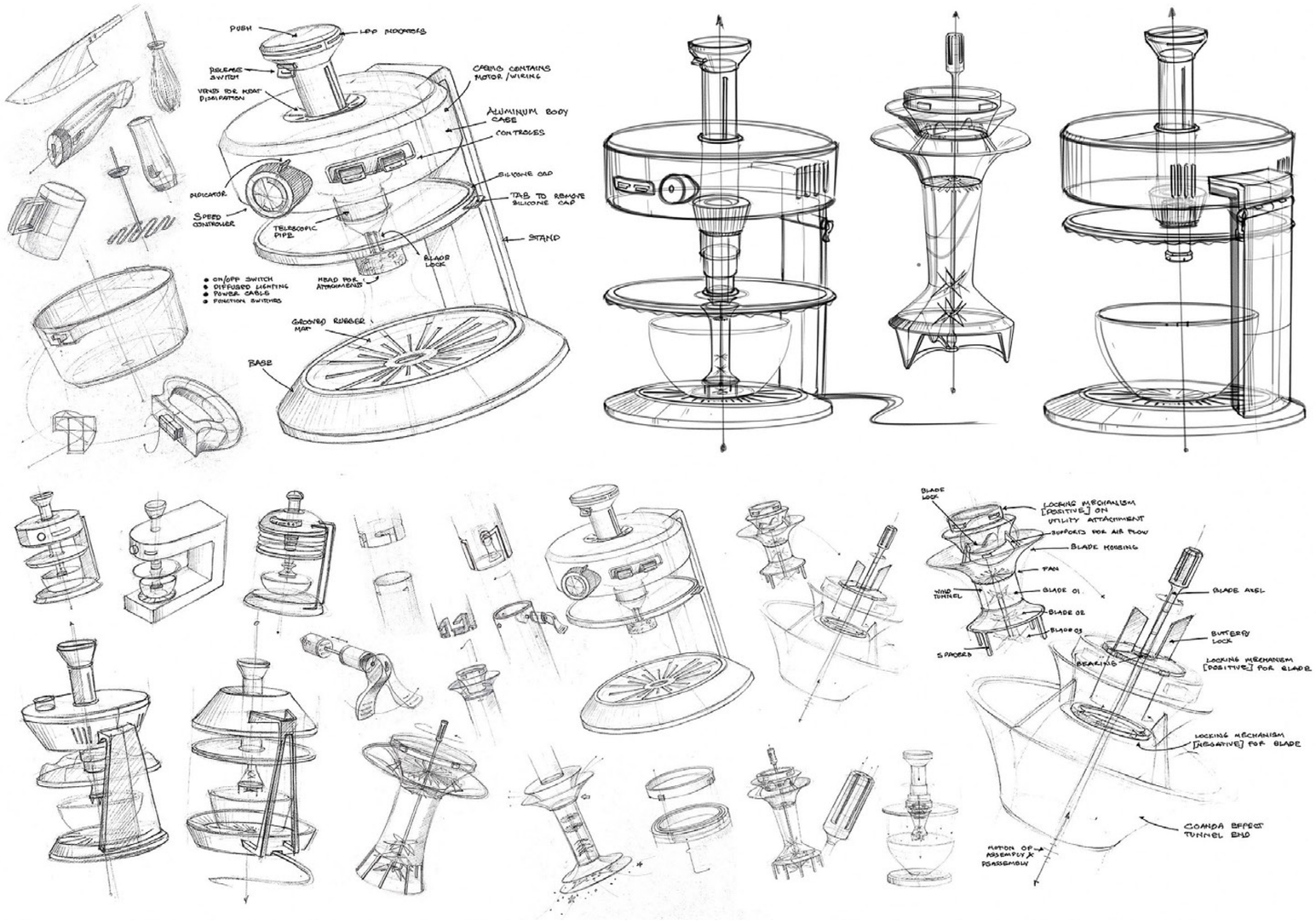
Value Addition

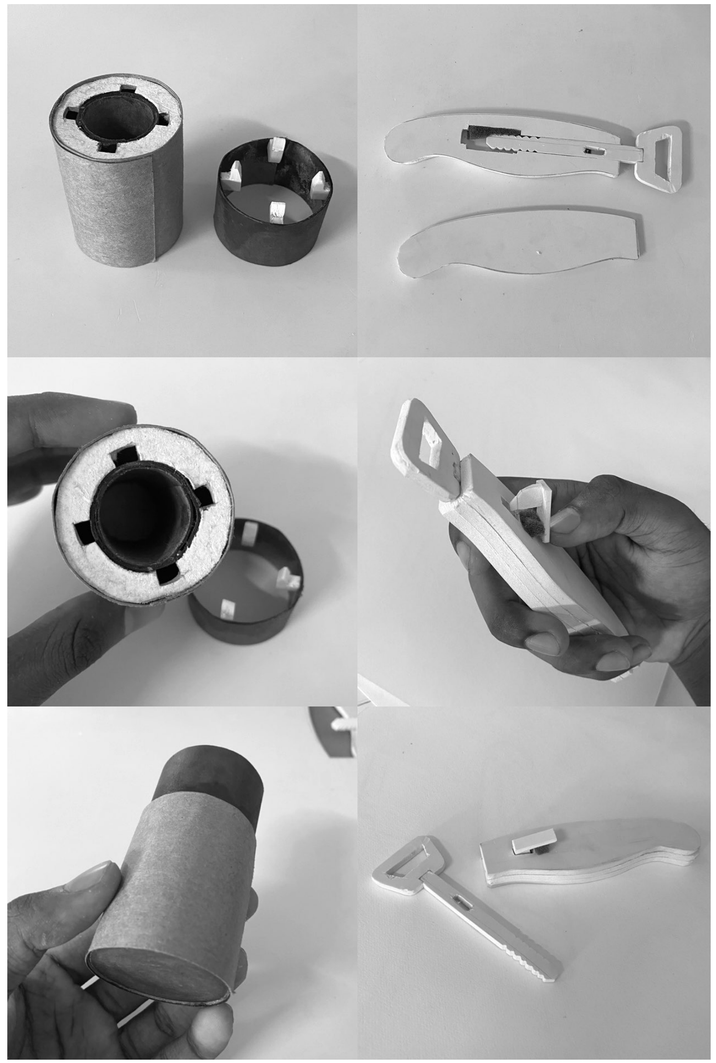
This is a scenario map of the products intent for design. The points in green would be specifically addressed through form and function. The points in yellow would take certain aspects from the overall form to focus on disassembly, as a whole this would include both visual and tactile characteristics. The points in red are tertiary objectives that would eventually be achieved during the ideation process.



Concept Ideation

Freehand Paper Sketches, Product Attributes - Indicators & Signifiers, Low Fidelity Mocks





Product Details

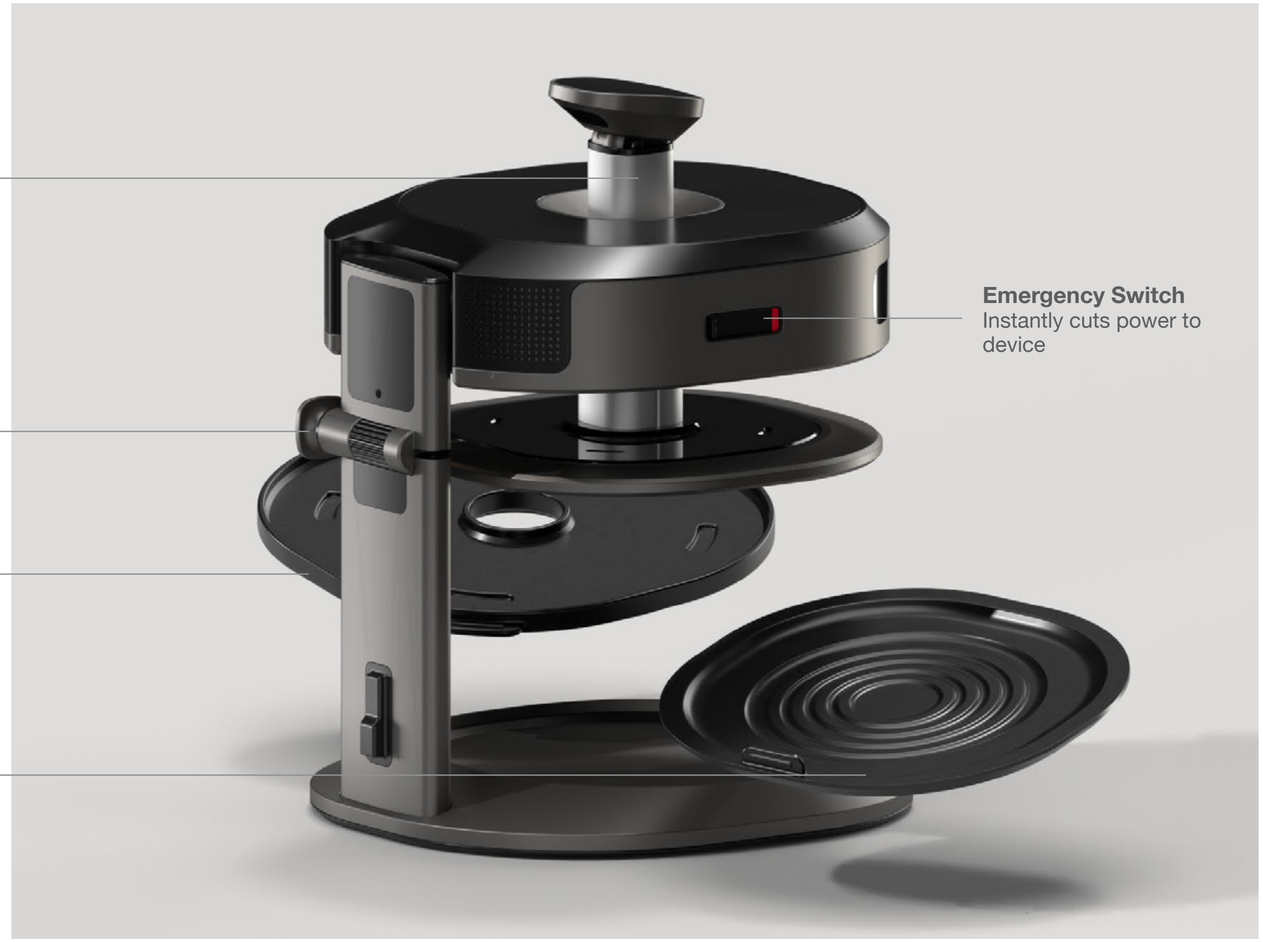
Innovation Design

Telescopic Arm
Lockable arm that controls telescopic lid level

Lockable Hinge
Helps lift motor housing for placement/removal of vessel

Removable Cover
Removable silicone cover for cleanability

Removable Drip Tray
Removable silicone drip tray



Emergency Switch
Instantly cuts power to device

Product Details

Product Use Case Representations

Multi-Utility

Designed to adapt, it enables users to use multiple bowls of different sizes on after another. With multiple attachments, the device is capable of executing various tasks such as kneading, whisking, slow mixing and also wet/dry grinding.

Telescopic Cap

A telescopic cap helps shut round vessels of various sizes. This innovation is key to the products adaptive feature. The user can shuffle between multiple attachments and vessels to execute various functions. The cap not only seals all food contents within the vessel but also pushes down on the vessel securing it onto the drip tray.

Product Details

Product Use Case Representations

Grinding Attachments

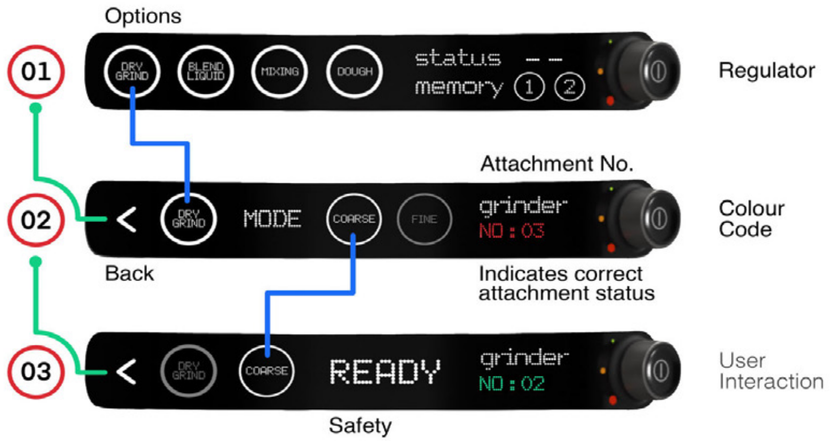
An over the vessel motor arrangement is commonly seen in baking appliances but not in traditional mixer grinders. These special grinding attachments help the user blend/grind both dry and wet food. Designed for disassembly the are easy to clean and install onto the telescopic arm.

Use Case Representation

Above represents the product in a ready to use scenario. The cap has two telescopic arms one inside another that move separately but in sync to simultaneously lock the vessel in place and to position the attachment in an appropriate orientation. The product recognises each attachment and electronically adjusts the positioning of attachments.

Product Details

User Interaction & Use Case Representation



User Interaction Flow

The UI displays a futuristic dot matrix font and syncs with a physical button & dial.

O N E R A - Smart HUD Glasses

Project 04

Category: Eyewear Design, Wearable Tech

Description: ONERA is a professional eyewear tech device designed for cyclists and runners, integrating a heads-up display (HUD) to provide real-time telemetry without disrupting focus. Engineered for modularity, its heads-up optics (HUO) module functions independently of the lens, temples, and nose pads, enabling easy customization, disassembly for replacement & recyclability. ONERA's adaptive interface wirelessly syncs with smartwatches and cycling computers, ensuring seamless data visualization tailored to user preferences. Its uniquely curved lens design minimizes peripheral glare, addressing a common challenge faced by professional cyclists and enhancing visual clarity in dynamic riding conditions.

Duration: 02 weeks

Individual Personal Project
All content presented in this project is original and has been independently created by me.

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Design Approach

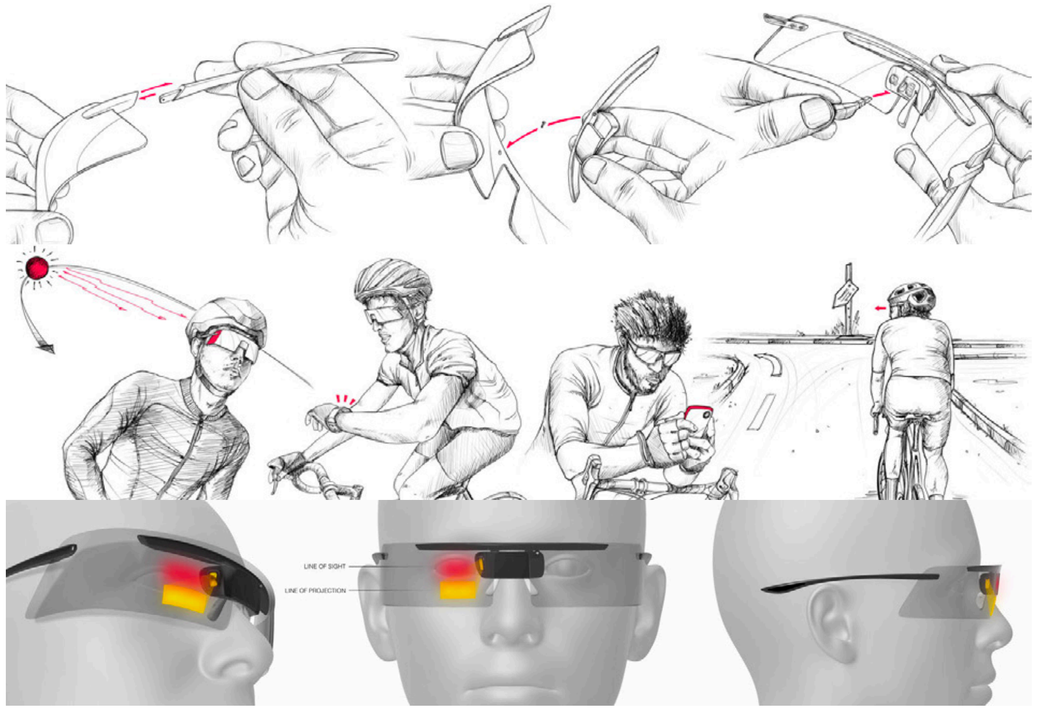
Intent, Story Board, Morphs

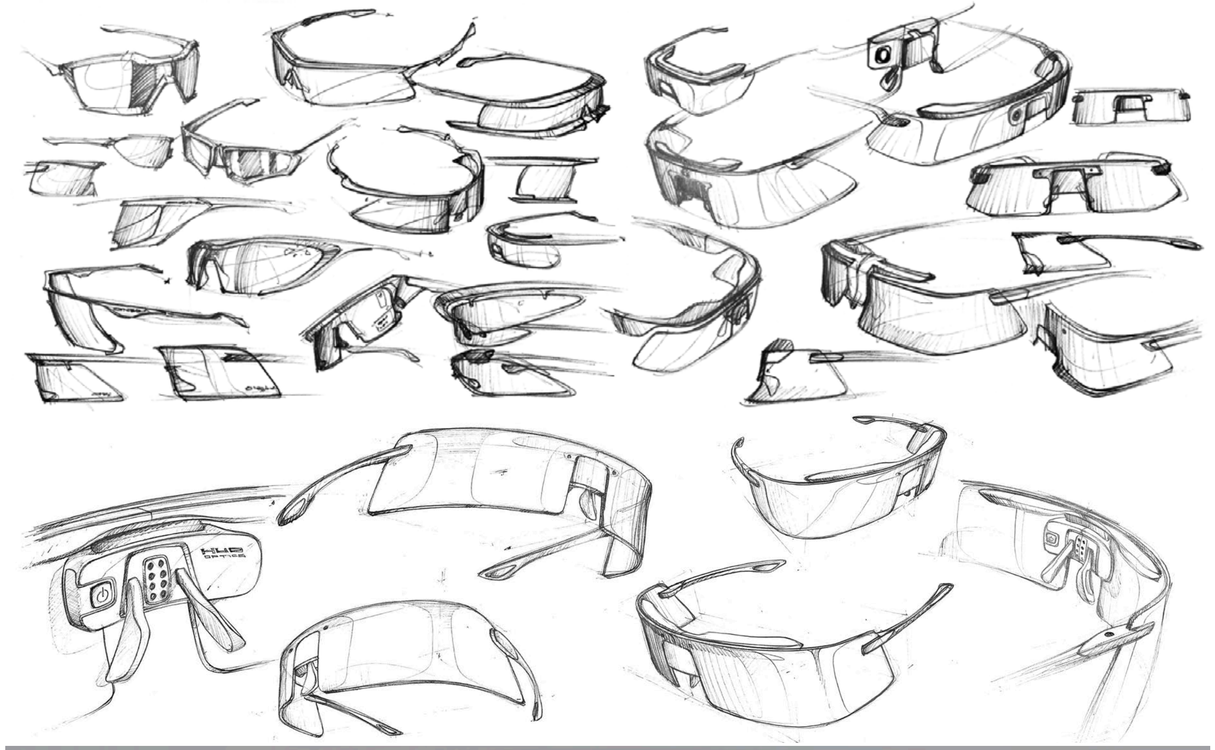
Brief

By identifying gaps such as peripheral glare, customization, recyclability & enhanced access to live telemetry without disrupting focus, ONERA takes a progressive step towards specialized wearable tech. With key focus on scale, the design process prioritizes ergonomics and revolves around a through study of human facial attributes & volume. The intent revolves around integrating tech with wearable goods, key factors in IOT integration & design for usability.

Peripheral Glare I Tech Distractions I Navigation

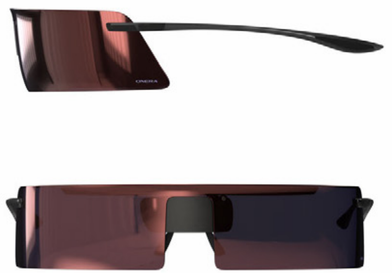
ONERA's uniquely extended curved lens is designed to minimize peripheral glare, enhancing visibility in dynamic riding conditions. The integrated heads-up display (HUD) provides real-time telemetry, reducing reliance on external devices like smartwatches and smartphones that can compromise performance and safety. Seamlessly connected to secondary devices, ONERA's customizable HUD dash enables intuitive navigation, ensuring a distraction-free riding experience.





Product Details

Eyewear Design

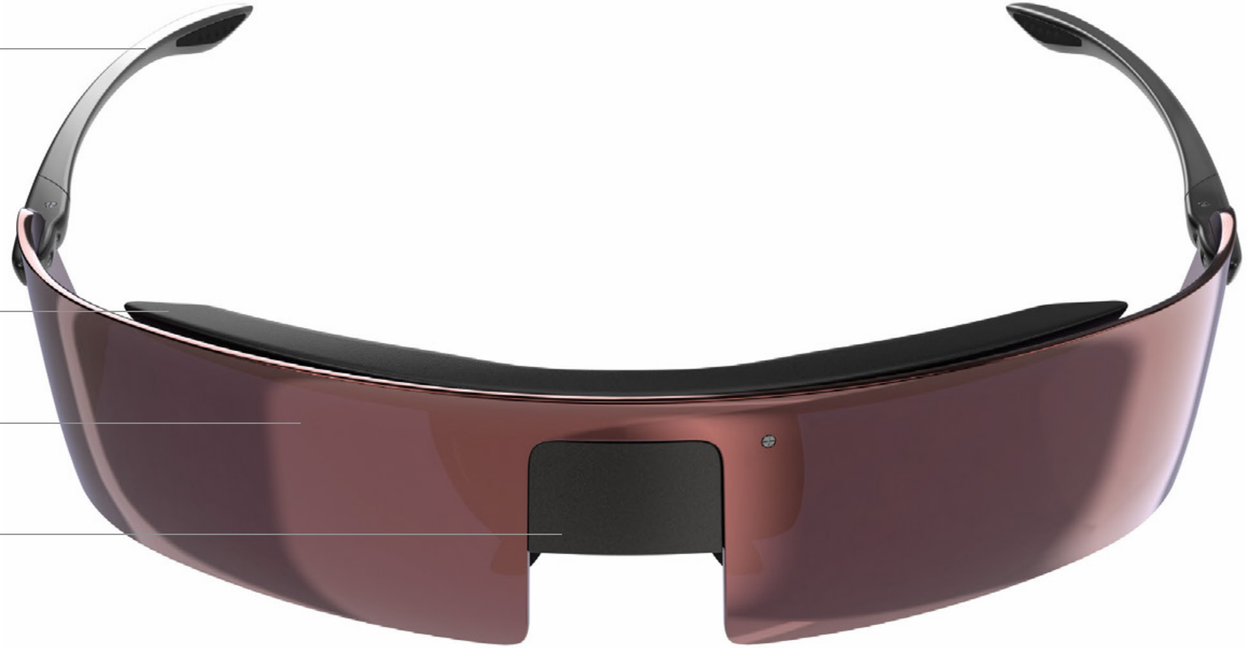


Temple
Ergonomic Comfort

Battrey Module
800 mAh Lithium Polymer

Lens
Anti - Reflective
Polorization

HUO Module
Holds sensors and nose pieces



Product Details

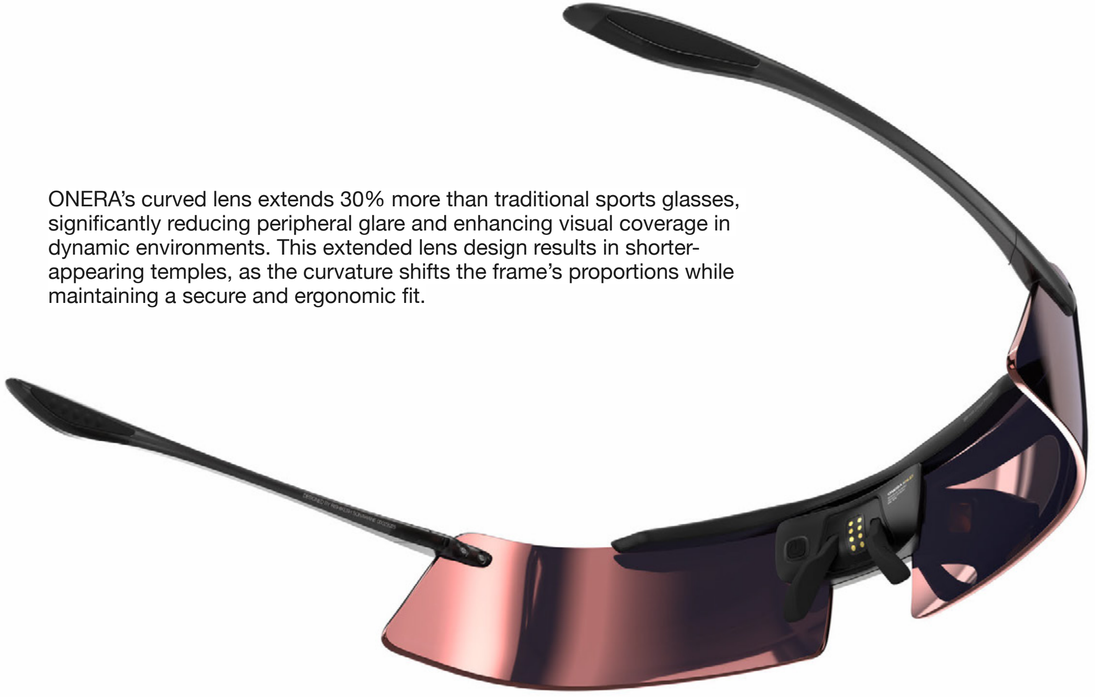
Eyewear Design

HUO

Positioned just below the user's line of sight, the HUD module projects information without obstructing direct vision. Equipped with an electronically vectored lens, it allows users to adjust the projection orientation by up to 10 degrees in any direction for a customisable viewing experience.

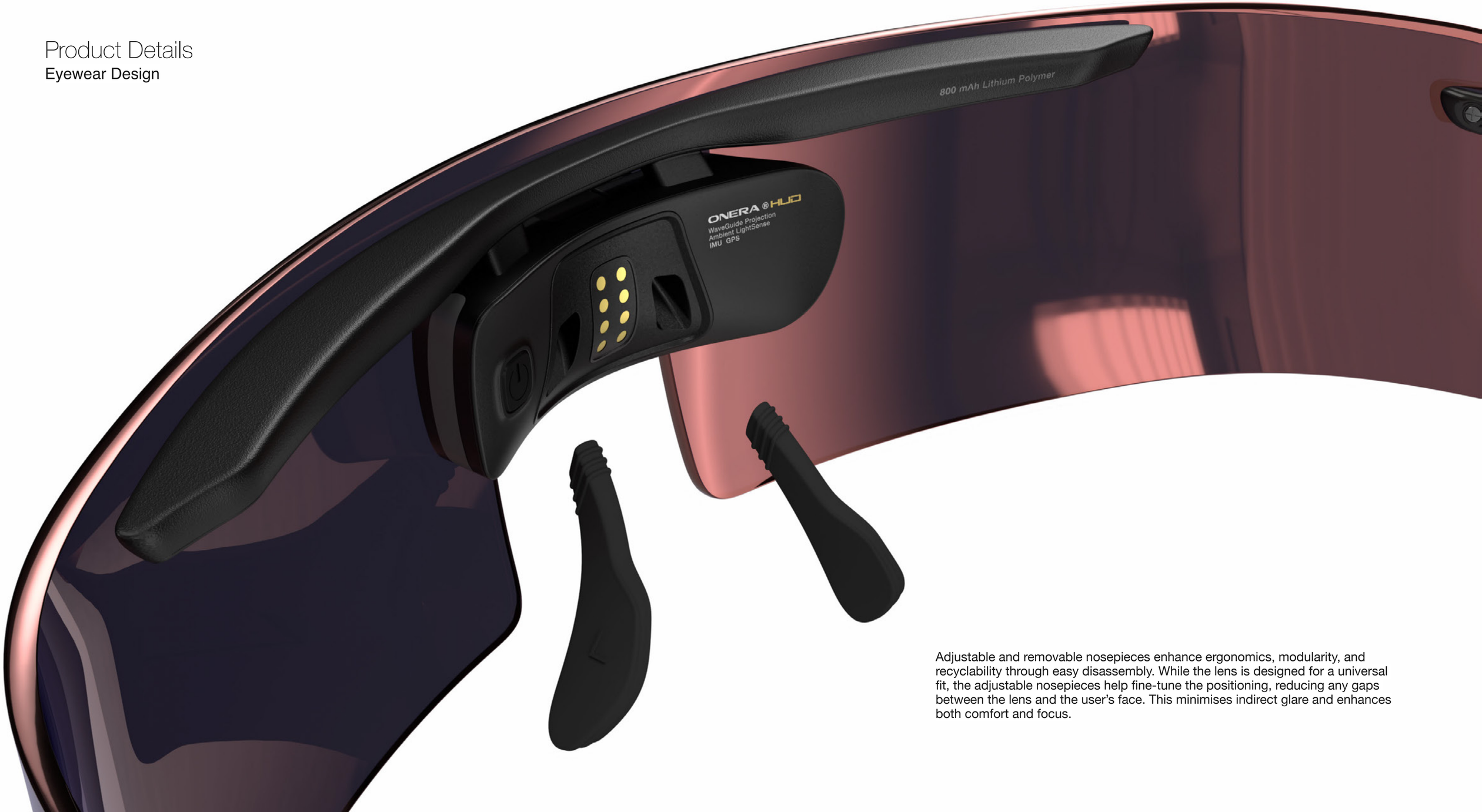
ONERA's flexible temples are designed to securely grip both the ears and the head, ensuring a stable fit. This prevents slippage caused by its front-heavy design, providing a secure and comfortable experience even during intense movement.

ONERA's curved lens extends 30% more than traditional sports glasses, significantly reducing peripheral glare and enhancing visual coverage in dynamic environments. This extended lens design results in shorter-appearing temples, as the curvature shifts the frame's proportions while maintaining a secure and ergonomic fit.



Product Details

Eyewear Design



Adjustable and removable nosepieces enhance ergonomics, modularity, and recyclability through easy disassembly. While the lens is designed for a universal fit, the adjustable nosepieces help fine-tune the positioning, reducing any gaps between the lens and the user's face. This minimises indirect glare and enhances both comfort and focus.

Product Details

Eyewear Design

The HUD module in ONERA is positioned above the users nose, optimizing balance and minimizing peripheral obstruction. Key technical features include display & optics, connectivity, battery & ergonomics.

Display & Optics: ONERA uses Micro-OLED projection for high contrast and low power consumption. A beam-splitting waveguide helps overlay data seamlessly onto the user's field of view. Adjustable focal length reduces eye strain and ensure sharp image projection for the user greatly contributing to the customisable dash domain.

Product Details

Wearable Tech

Rapid Prototype

Creating mockups to refine scale, fitment, and ergonomics, leveraging FDM, SLA, and SLS 3D printing for precise joinery analysis. SLA prints in transparent resin are dyed with hot water-based inks for colour variation, with some coloured using alcohol-based inks. SLS prints in Polyamide (Nylon 12) have undergone a black acid dye bath treatment, ensuring deep, uniform coloration.

Charging

ONERA seamlessly aligns with the dock using built-in magnetic guides within the HUD module, ensuring precise positioning every time. A dynamically illuminated indicator on the dock visually represents the HUD's battery status through a refined chromatic spectrum, transitioning smoothly from red to green.

Smart UV Sterilisation Thermometer

Project 05

Category: HealthCare Devices, Design for E-Waste, Design for Longevity

Description: E-Waste is a major global problem often shadowed by the established recycling processes of valuable electronic products such as computers, air conditioners, washing machines, etc. Recycling all electronics is not viable due to poor disposal & low value addition for smaller devices. Hundreds of thermometers are disposed from hospitals as and when patients change. Its un-reusable and inexpensive nature holds little value to its existence.

This project was curated to tap into unthought e-waste categories of invaluable electronics that are discarded at great masses ending up in landfills leaching out harmful contaminants throughout their everlasting decomposition. The aim was to design and develop an intervention in the healthcare e-waste sector regulating the disposal of inexpensive electronics.

Duration: 02 weeks

Individual Personal Project
All content presented in this project is original and has been independently created by me.

View Detailed Project
www.rishikeshsonawane.com

Defining Design Approach

Value Proposition Mapping & Business Model Canvas

Problem & Opportunity Area Delineation

Only **10%** of e-waste is recycled each year out of which **92%** is computer waste.

Mercury Thermometers: Banned due to hazardous element.

- Toxic
- Fragile
- Inaccurate
- Time consuming

The Lotus Blossom Product Research Chart below, helps get a more holistic view over the topic ensuring all problem areas are identified.

Opportunity Areas

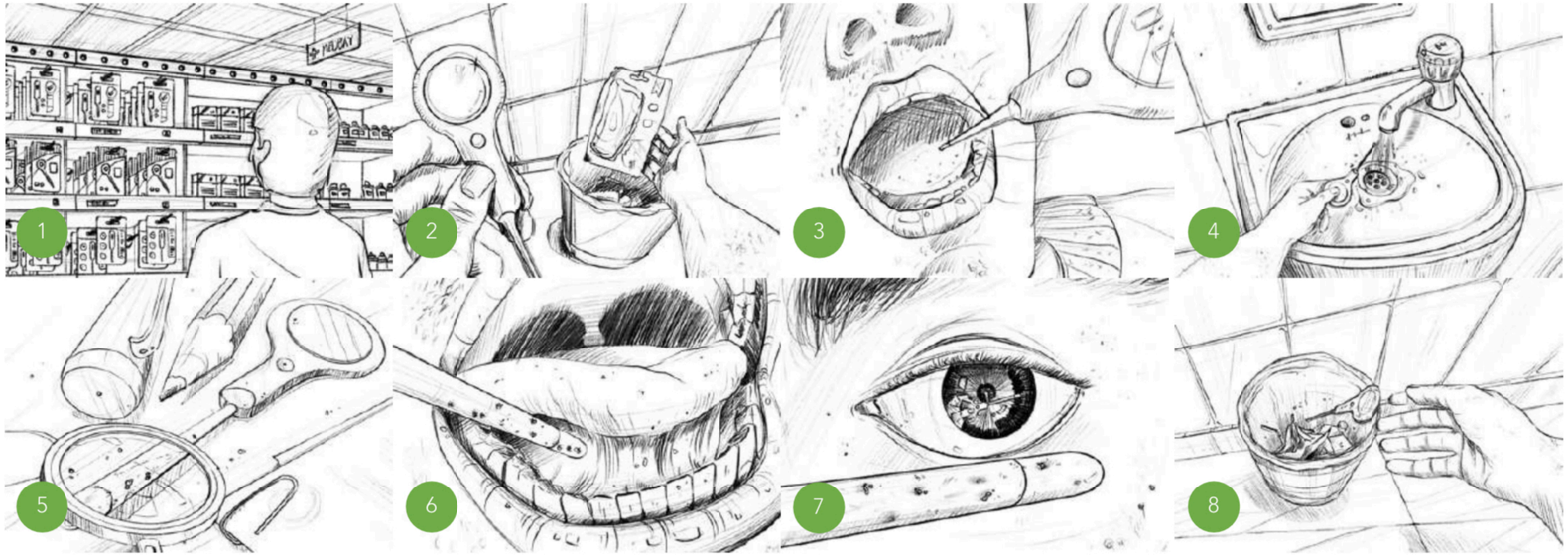
- How can I increase resilience?
- How can I increase usability?
- How can the product maintain sterile conditions?
- Should it elevate usability despite its simple function?
- How can I include Inclusivity?

Key Focus Areas

- Sterility
- Longevity
- End life cycle

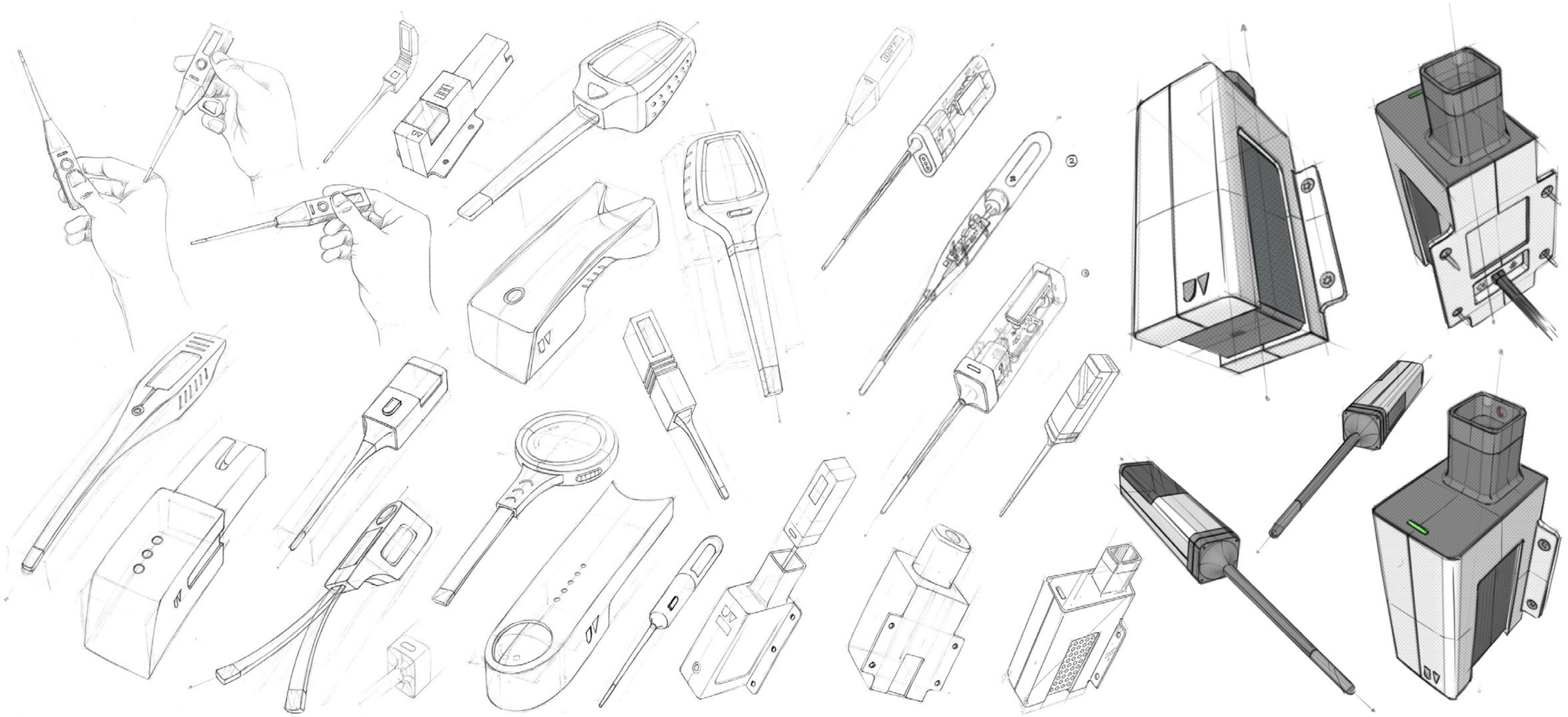
Storyboarding

The above story board gives an understanding of how thermometers are purchased, used and then discarded due to unsterile conditions. This depiction gives a clear idea of the problem statement such as improper sterilisation & disposal. For a hospital setting, each patient admitted uses one or more thermometers during their term. These thermometers are disposed each time, creating a consistent flow of e-waste that is left unnoticed.



Concept Ideation

Freehand Paper Sketches



Product Details

Innovation Design

Modularity
Adds to portability and usability

Standard Medical Sterilisation EtO
Water Resistant IP66

Wall Mount
Secures the thermometer and simultaneously powers the device.

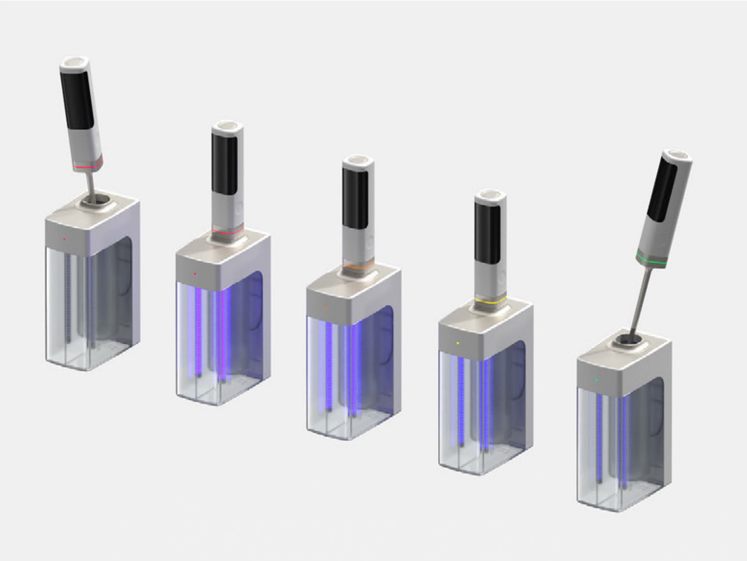
Thermometer Sleeve
Keeps the thermometer sterile while portable, magnetically attaches to both the thermometer and module.

UV Module
Equipped with UV light

Thermometer
Smart display and RGB light bar helps reading body temperatures with ease.

Product Details

Product Use Case Representations



Sterilisation Flow

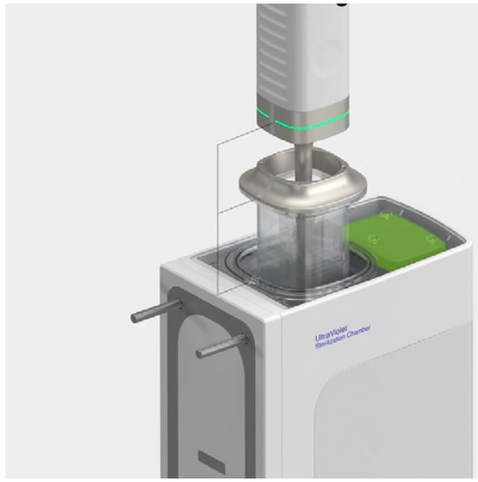
Above is a representation of the sterilisation process. After use, the patient can wipe the thermometer and place it into the sleeve. The thermometer syncs with the module and changes colour from red to green showing safe to use. The UV light stays on for 05 minutes, incase of accidental removal of the thermometer during sterilisation, it turns off to avoid UV exposure to the patients hand.

Dynamic Light Indicator

A bright display clearly indicates the patients body temperature. The thermometer light ring depicts temperature ranges using a green to red colour gradient, enabling the patient to estimate his/her body temperature state. The RGB light

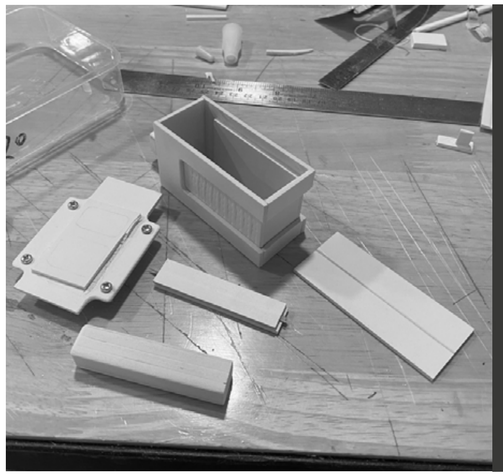
Product Details

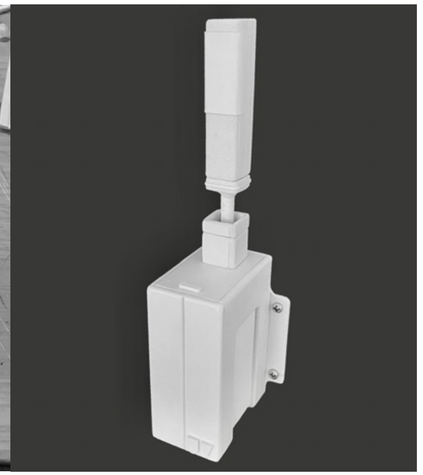
1:1 Low Fidelity Mockup & Detailed Exploded View

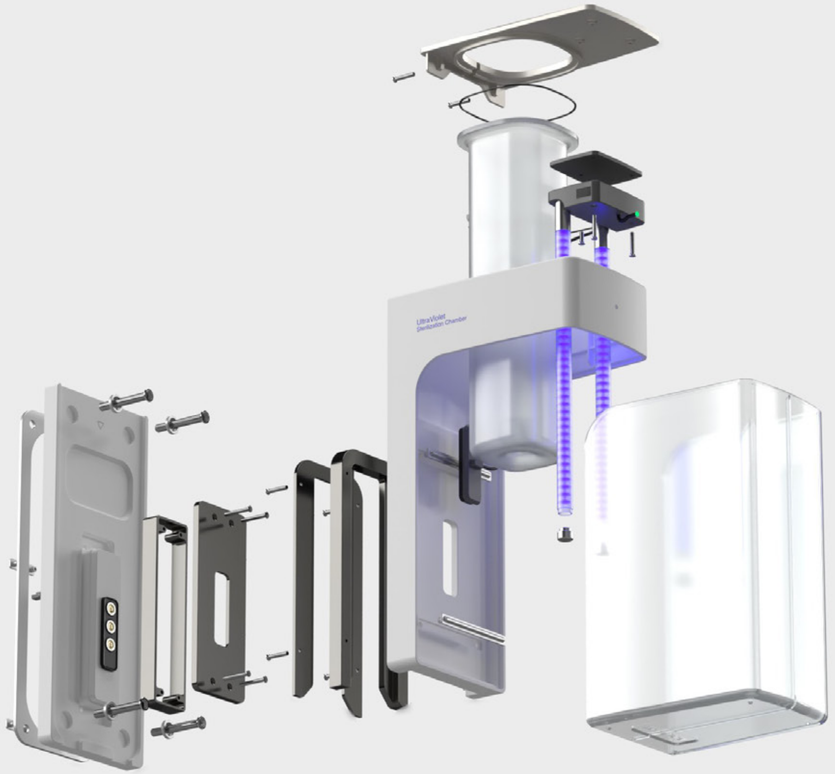


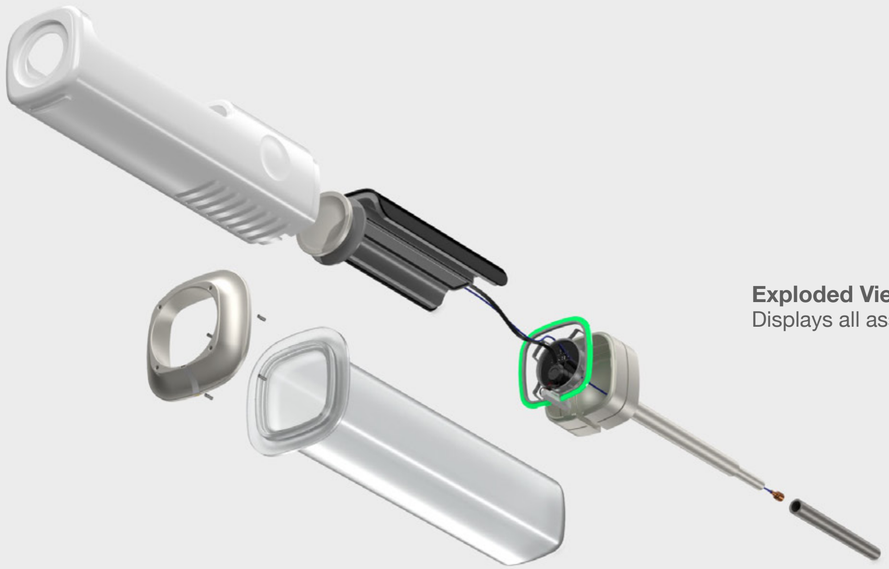
Power Train
A seamless connector pins network transfers power throughout the product system and also detects missing components.

Initial Mockup
A scaled mockup helps validate touch-points such as portability and ergonomics









Exploded View
Displays all assembly components

fog : Smart+ Hydroponic Planter

Project 06

Category: Design Futures, Sustainable Lifestyle Trends

Description: Fog is a Hydroponic Planter designed to incorporate a Fog Basking beetle's ability to trap moisture from the atmosphere. This studio project takes a futuristic approach towards biomimicry going beyond colour and form. It showcases a remarkable organisms mystery ability superimposing it into a potential product of the future. The aim was to design a concept that not only dives deeper into biomimicry but also shows how high end technological advancement in the future would seamlessly blend with emerging human lifestyle trends.

Duration: 04 weeks

Individual Personal Project
All content presented in this project is original and has been independently created by me.

Featured in **YANKO DESIGN**
https://www.yankodesign.com/2024/01/03/combining-nature-and-technology-for-sustainable-plant-care/

Featured in **TRENDHUNTER™**
https://www.trendhunter.com/trends/fog-smart

Featured in **Designlab**
https://designlab.gr/newsite/2024/03/22/industrial-product-design-trends-for-2024/

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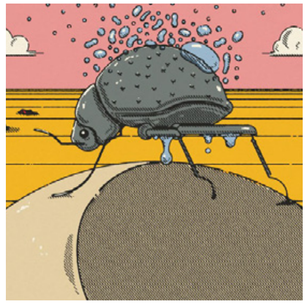
Defining Design Approach

Value Proposition Mapping & Business Model Canvas



Biomimicry

The fog basking beetle is a remarkable insect native to the Namibia desserts. It has a mysterious ability to condense fog onto its exterior shell and redirect the trapped moisture into its mouth.

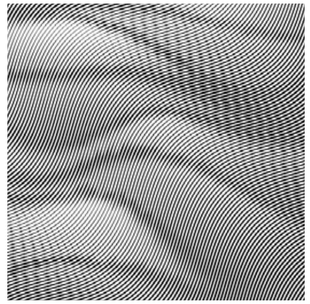
Fog Basking Beetle

With ridges and bumps on their shell, all fog basking beetles are build differently. The beetle redirects large volumes of condensed moisture from its back into its mouth by tilting forward. What's interesting is that it is able to trap high amounts of moisture with very little surface area.

Fog Basking Nets

Determining exactly how the beetle achieves this feat can be vital to solving water crisis throughout dessert regions. Fog basking nets are widely used across areas with little to no water supply and are ideal for humid weather conditions.

Although a full size net can generate upto 200 - 400 litres of drinking water a day, it is expensive and prone to damage.



Which Future?

Janine Benyus, an American innovator, in a 2017 TED talk speaks about the effect of nano-structures over colour. Colour is not a substance but is rather perceived visually due to light reacting with a surface. Molecular arrangements at a nanometer scale can observably affect the colour of a surface. She speaks about how nano fabrication could help man kind embed colour instead of applying it, which could open several possibilities in technology and sustainability

The same way, in a distant future, nano fabrication can achieve the same texture as that on a fog basking beetles shell helping replicate and implement its ability in various scenarios.

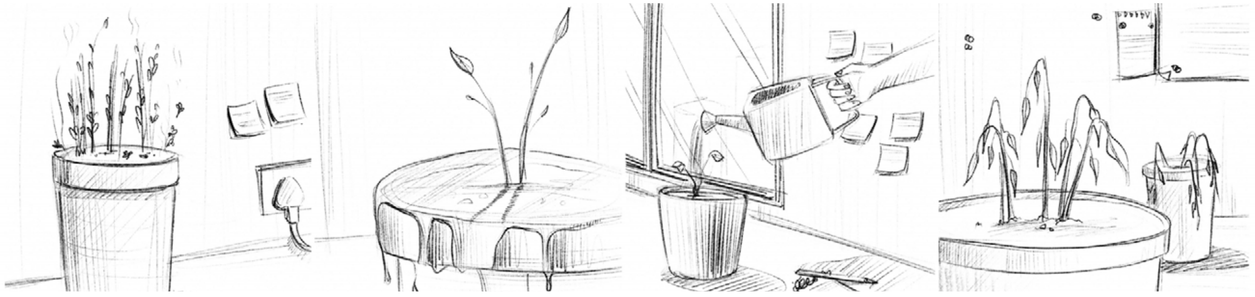
Opportunity Areas

- What type of Sustainability?
- Why Hydroponics?
- What does it not exist today?
- Gain for the user?

Key Focus Areas

- Hydroponics
- Electromechanical's
- Manufacturability
- Sustainability & Lifestyle

Improper care, over/under watering, bad soil quality are just a few reasons why plants die. Green architecture lately has taken a drastic step, people have started placing more plants indoors and have switched to a more green lifestyle as seen even in the food industry. This product is designed to convey the emotion of having nature close to a user, specially in densely populated cities.



Concept Ideation

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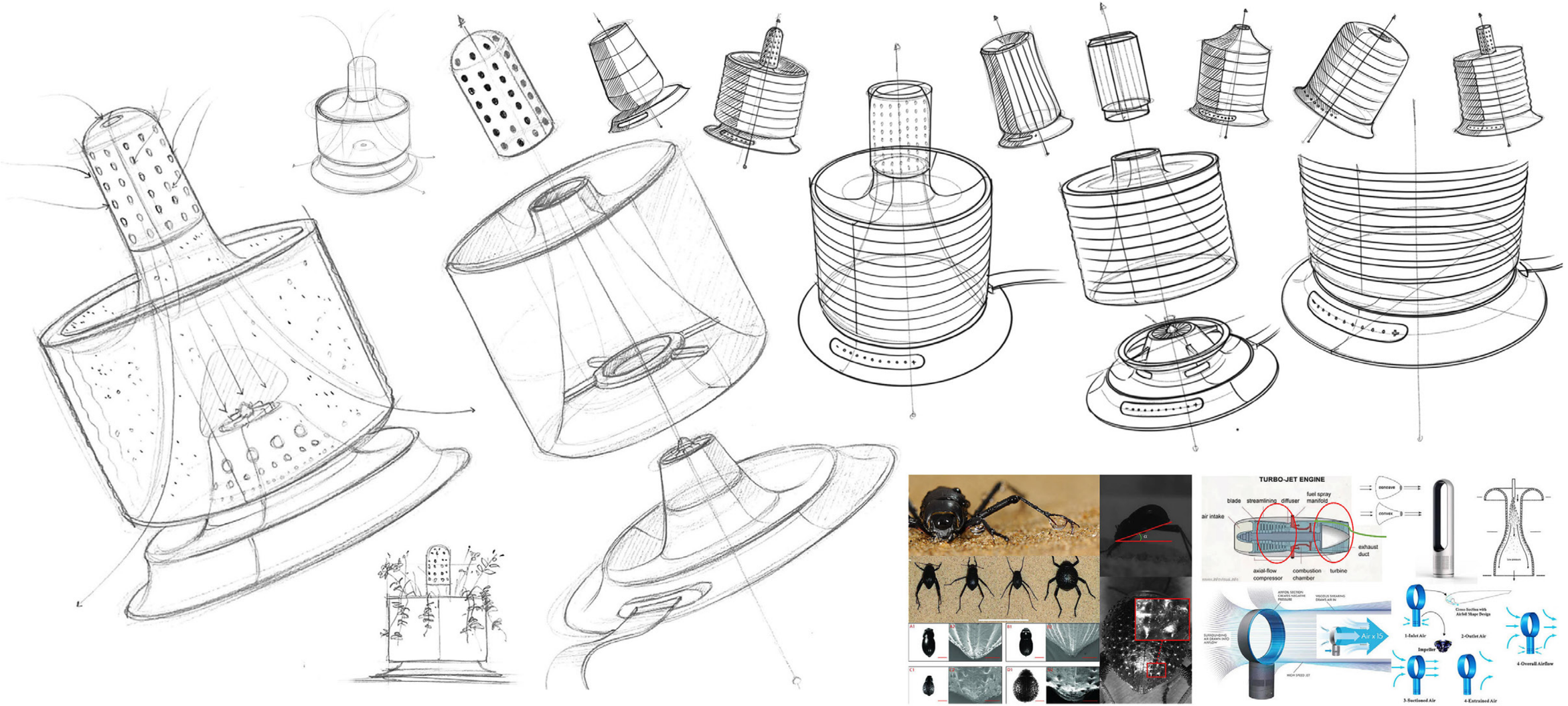


Concept 02
Innovation Design

Air Inlet Cap
Perforated cap allows air to enter the LECA tunnel

LECA Planter
Lightweight Expanded Clay Aggregate.

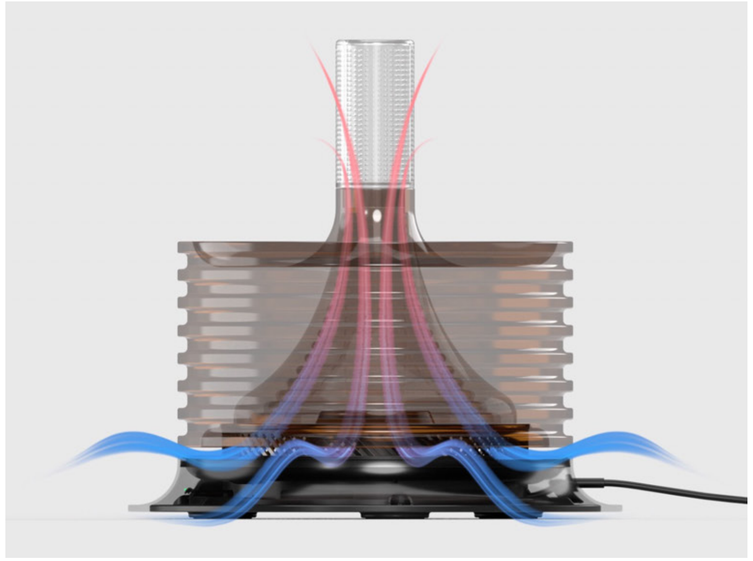
Base
Encloses a silent fan and a drip tray

Solar Strip
Lowers power consumption

Planter stand
Keeps the planter elevated at a fixed position

Concept 02

Product Use Case Representations



Coanda Effect

Increases airflow efficiency and reduces power consumption. Humid air transfers moisture onto the inner walls of the LECA planter. The planters porous nature absorbs water into the structure dispersing it using capillary action, which can then be absorbed by the plant roots.

Temperature and Humidity Sensor

Sensors in sync with the MCU regulate fan speed intern controlling the airflow through the tunnel. During high humidity, the fan speed increases to help the LECA absorb maximum moisture, during low humidity levels, the fan shuts or reduces speed.

Concept 01

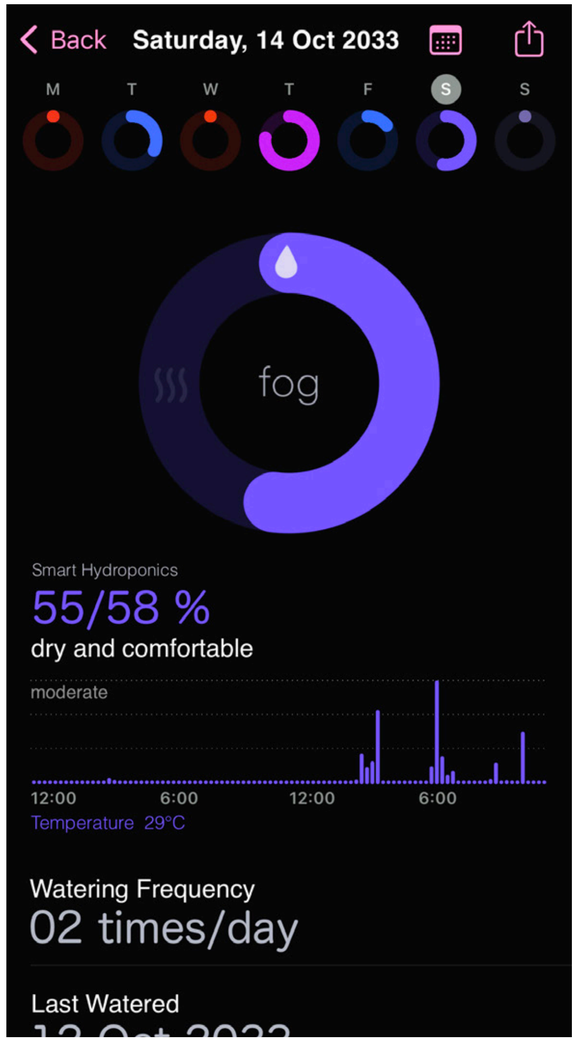
User Interaction Flow, 1:1 Low Fidelity Mockup & Detailed Exploded View

Internals
Designed for manufacturability, all components are designed for ease of assembly.

Exploded View
Displays all assembly components

Concept 01

User Interaction Flow, 1:1 Low Fidelity Mockup & Detailed Exploded View



User Interaction Flow
A representation of how the user tracks its plants health remotely.

Product Setting
Real time representation of product