RE-DESIGN OF MOTORCYCLE HELMET

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WHY A MOTORCYCLE HELMET

STATISTICS

Approx 32318 people killed (in 2012)

23.2% of road accidents death - two wheelers

76% of accidents sustain head injury

Approx half are motorcycle users *

ME

Passion to ride

First hand user

Motorbike accident

Long distance touring

DESIGN

Functional value

Constraint of safety

Styling oppourtunity

Active engaging of senses

* http:/medind.nic.in/jal/t09/i1/jalt09i1p6.pdf

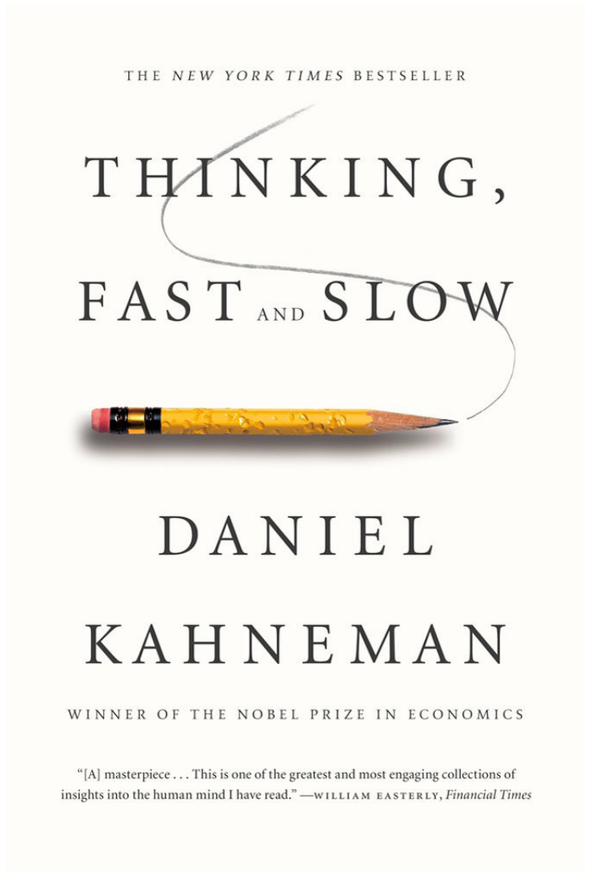
RESEARCH

PRIMARY RESEARCH GROUNDWORK

Thinking fast and Slow - Daniel Kahneman

- How people make choices
- System I & System II thinking
- Cognitive bias & Heuristics





PRIMARY RESEARCH

Why aren't motorcyclists using one?

Traits which please people who use it regularly

Riding behaviour on roads

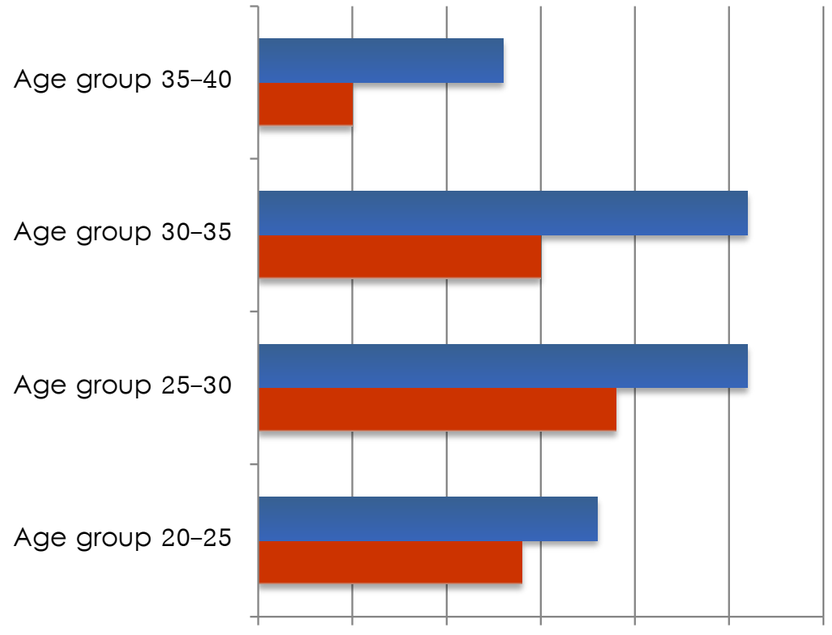
Rating of different purchasing factors

Patterns of use - correlated with motorcycle use



Street racers
Enduro racers
City commuters
Office commuters
Long distance tourers

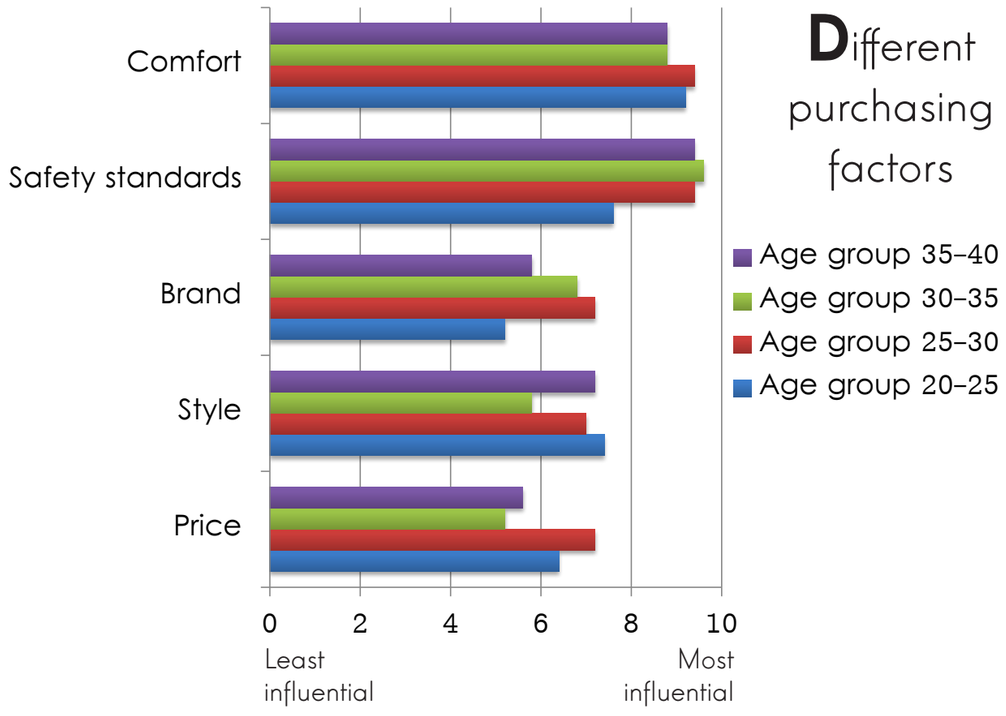
PRIMARY RESEARCH



Behaviour in roads

Threading becomes a necessity in cities

Overtaking through left prominent during 20s



Different purchasing factors

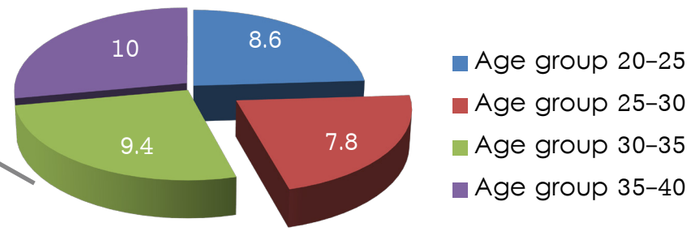
Safety & Comfort rated most important

Safety taken for granted

Styling comes next

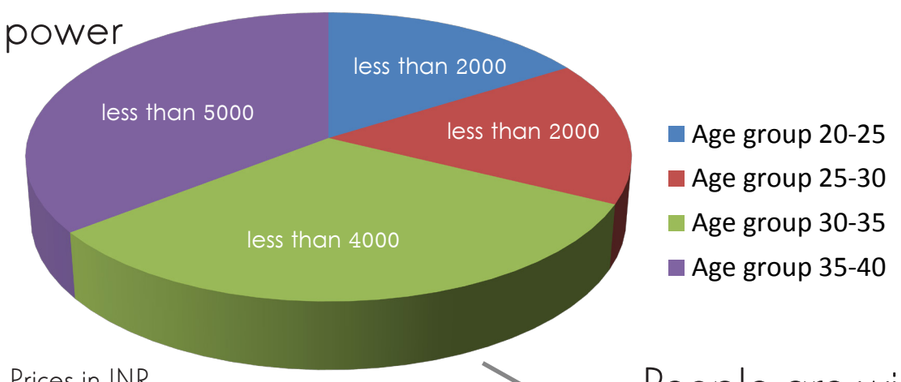
PRIMARY RESEARCH

Helmet usage



Usage of helmet is comparitively less in 20s

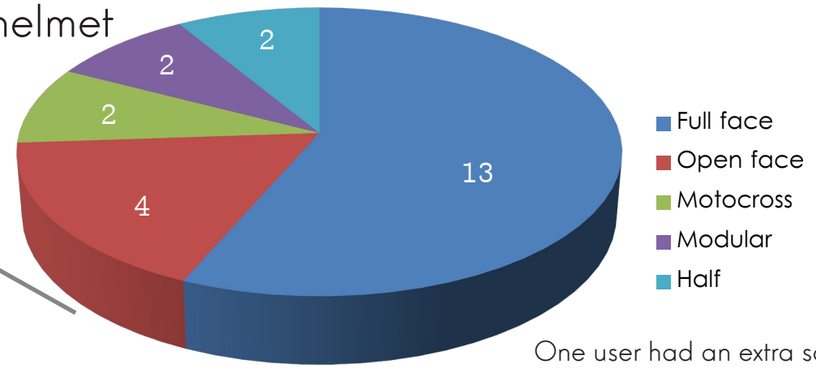
Purchasing power



Prices in INR

People are willing to spend from 2 - 5 thousand INR

Choice of helmet



Majority prefer Full face helmets

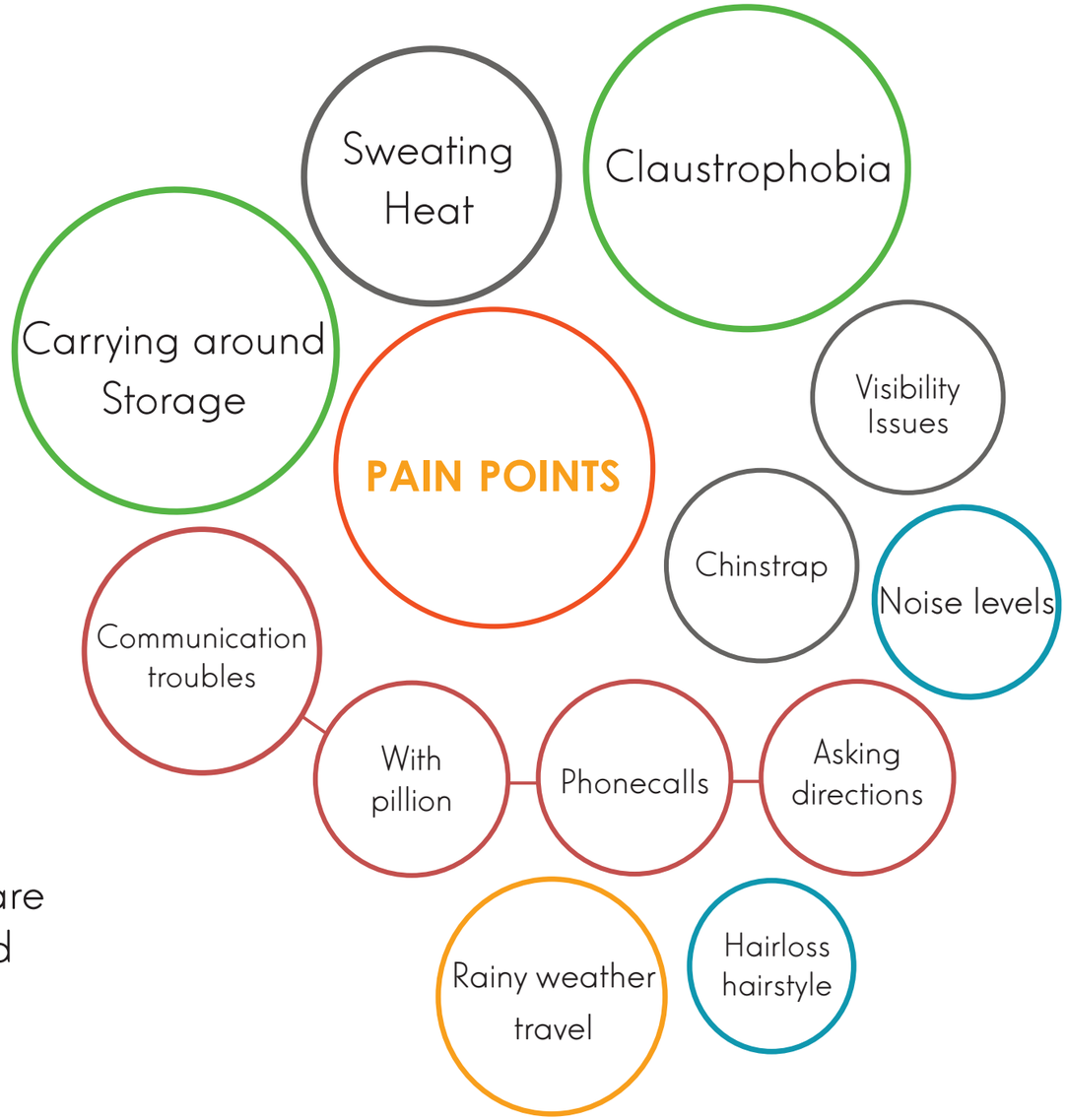
One user had an extra say

PRIMARY RESEARCH INSIGHTS

Pressing problems considering Indian context

- Comfort
- Storage

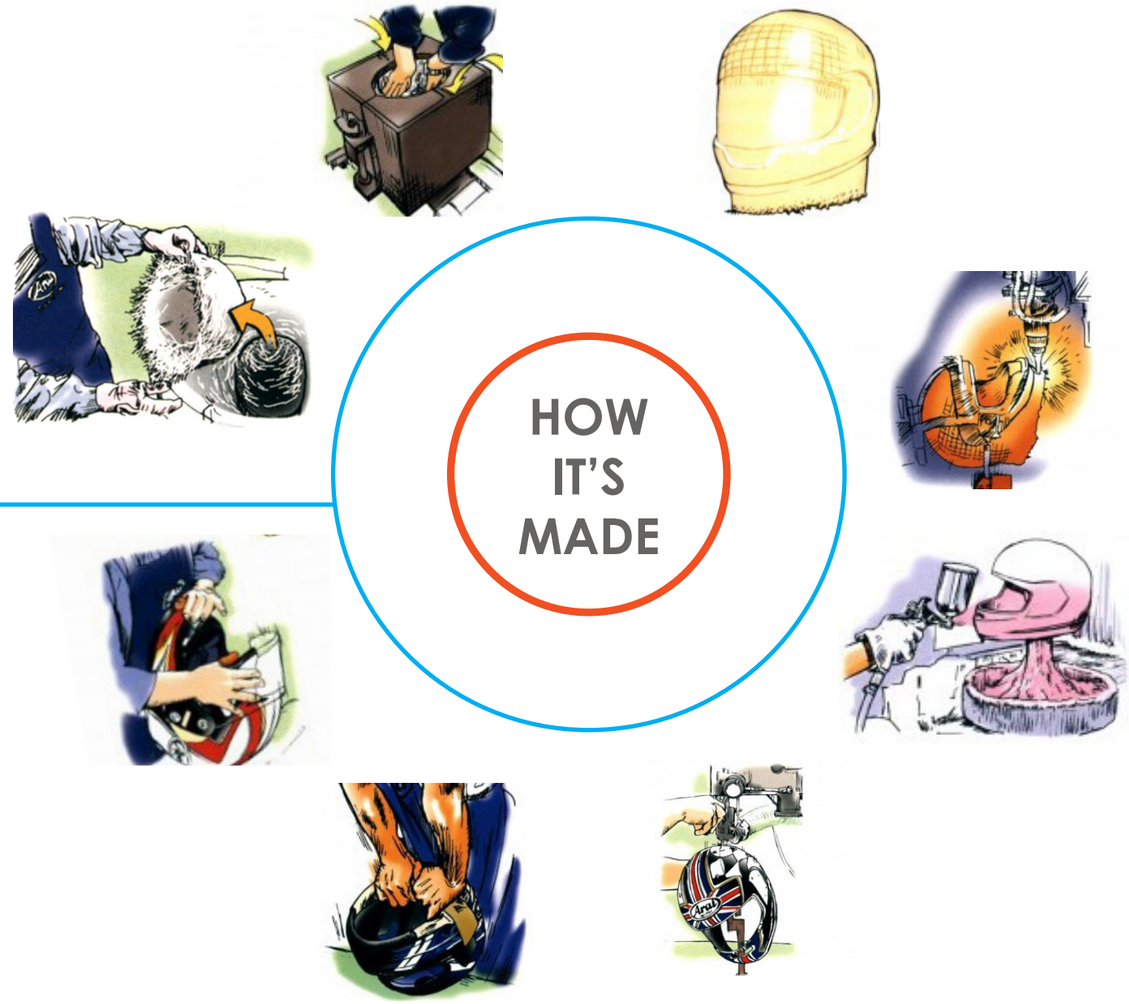
" Advanced facilities are present in high end helmets which are expensive. Even if you manage to get one, you'll be worried carrying it around "

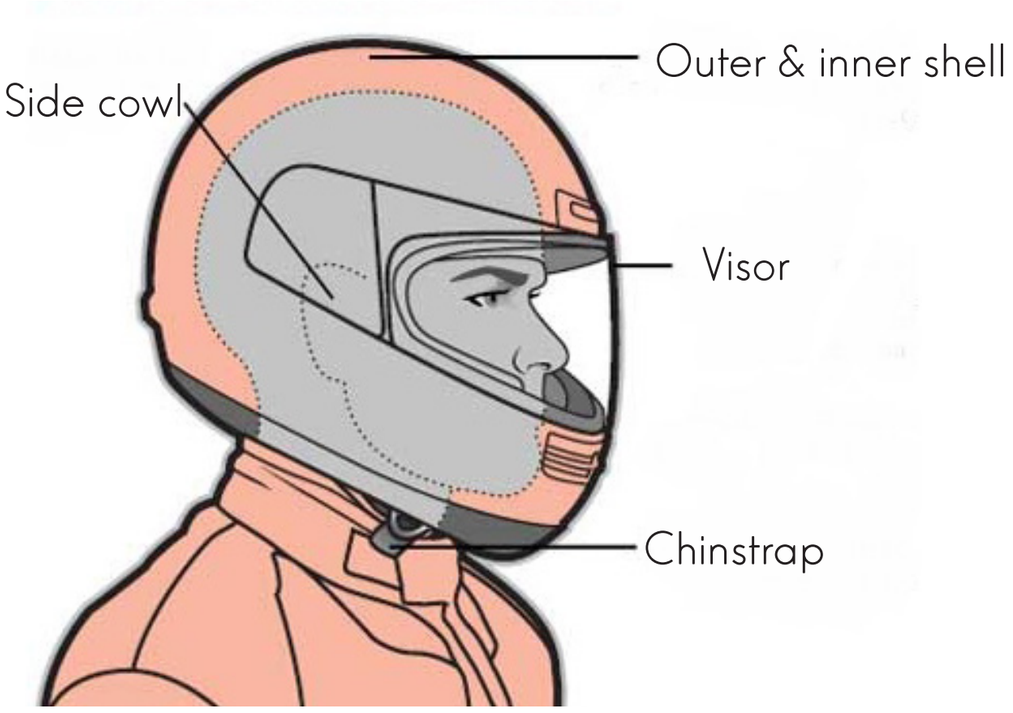


SECONDARY RESEARCH

SHOEI , ARAI , STUDDS , STEELBIRD , VEGA

Composite shell manufacturing





Basic full face helmet

Previous IDC project





SECONDARY RESEARCH

Direct trauma

Indirect trauma

Post traumatic injuries

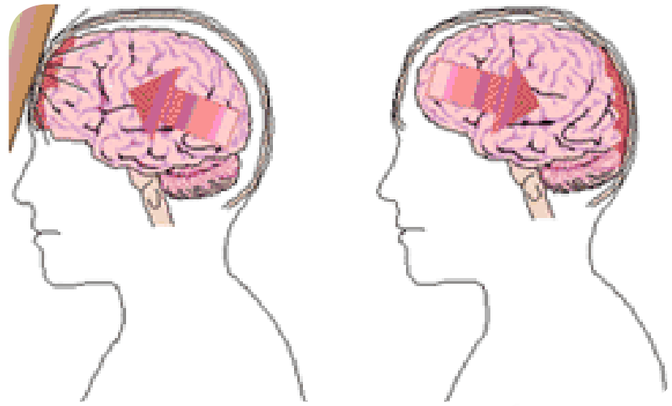
Injury by lack of Oxygen

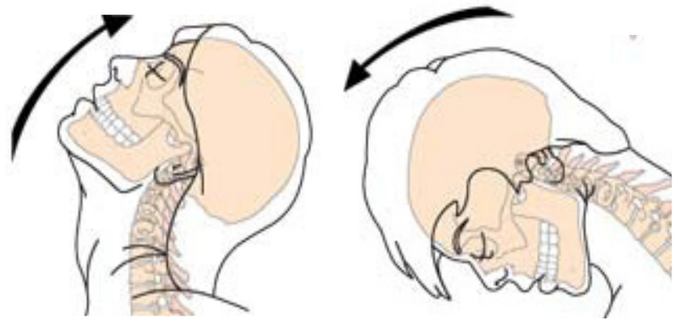
Concussion , Edema

Secondary cell death

TBI

- Coup - Contrecoup injury
- Whiplash injury & Diffuse Axonal injury
- Intracerebral hemorrhage
- Epidural hematoma
- Subdural hematoma







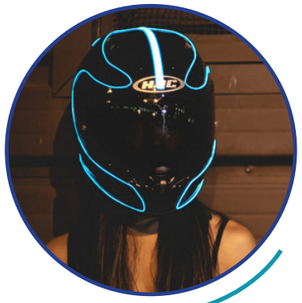
DRABC action plan

Danger **R**esponse **A**irways
Breathing **C**irculation

TRENDING INNOVATIONS

HELMET INNOVATIONS





LIGHTMODE

Electroluminescent / 2 AA batteries / 13 hours

APC

Integrated airbag

Stabilizes neck











SKULLY AR 1

HUD / Rear camera / Power assisted







REEVU MSX1

Integrated rear view mirror / Mechanical / Non power assisted

LAZER HELMET



SUPERSKIN TECH

HELMET INNOVATIONS



NEXX SWITX

Interchangable covers / 5 air vents control



BMW AIRFLOW 2

Aerodynamics / Aero-acoustics / Effective vents

Inflatable bicycle helmet / Deploys before impact

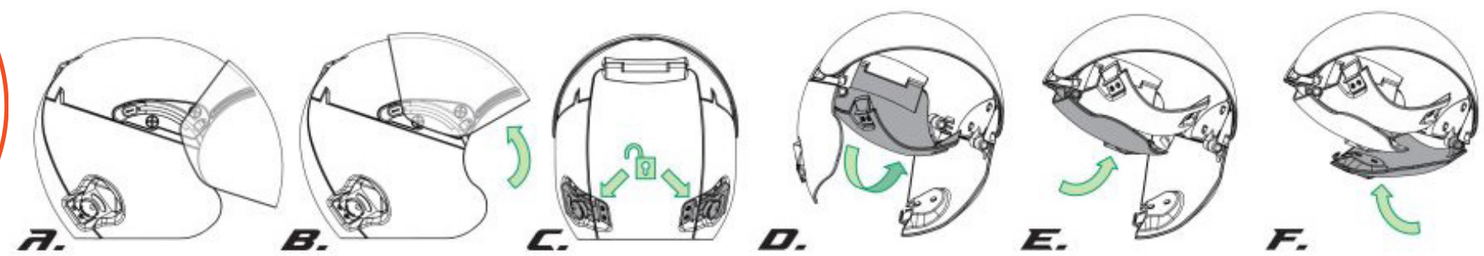
HOVDING



20% volume reduction / Can be carried in a backpack

PROTEUS





DESIGN BRIEF

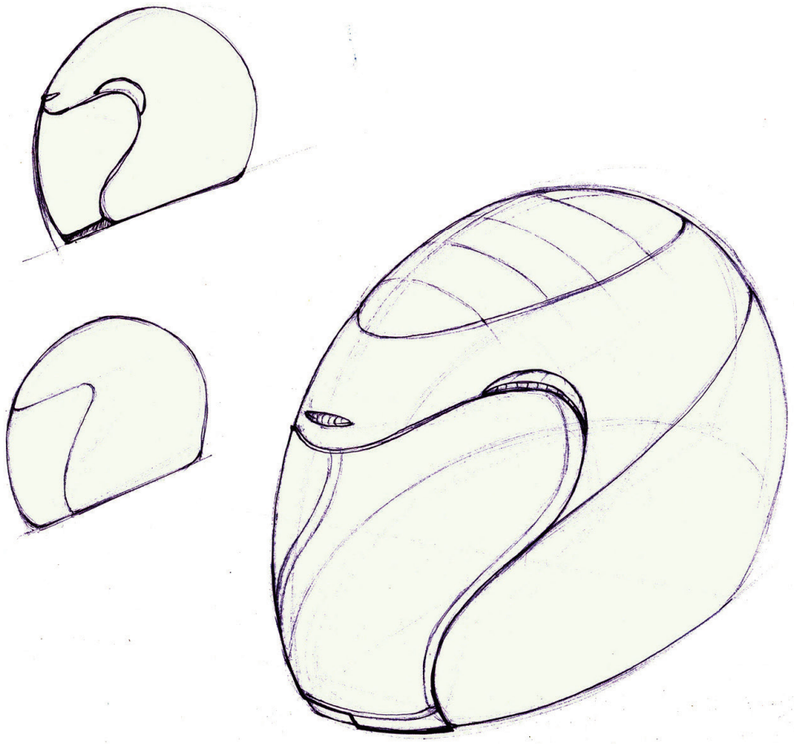
“ TO DESIGN A FULL FACE MOTORCYCLE HELMET PROMOTING REGULAR USAGE BY ADDRESSING COMFORT & ACCESSIBILITY ”

Target users

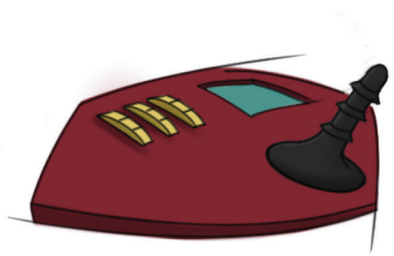
- Age group of 20 - 30
- Working professionals

EXPLORATIONS - FUNCTION

IDEATION



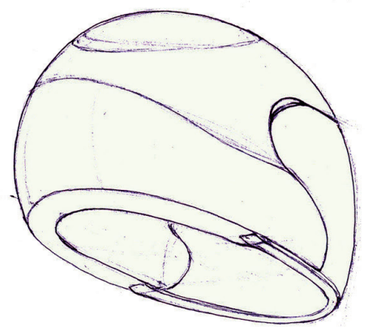
HUD and Overhead air intake

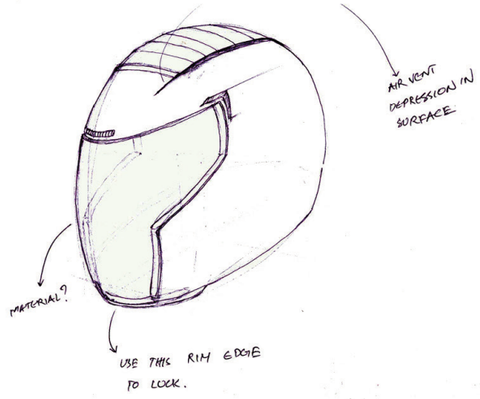


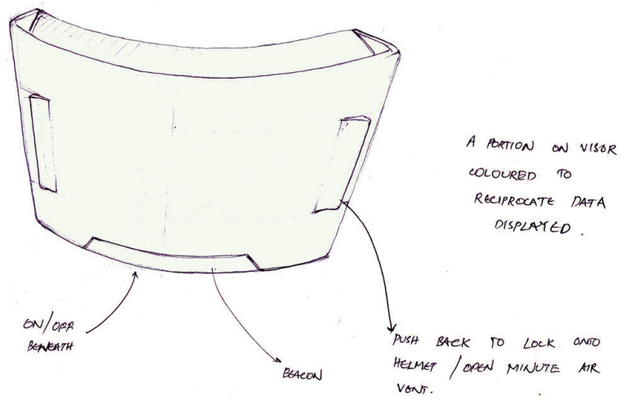




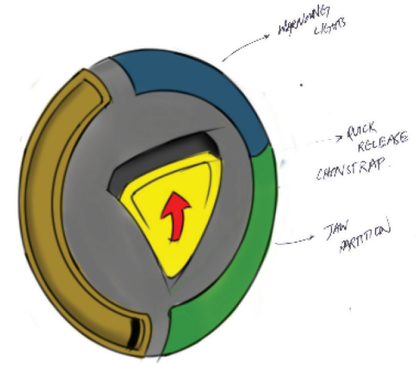
Tank mount storage



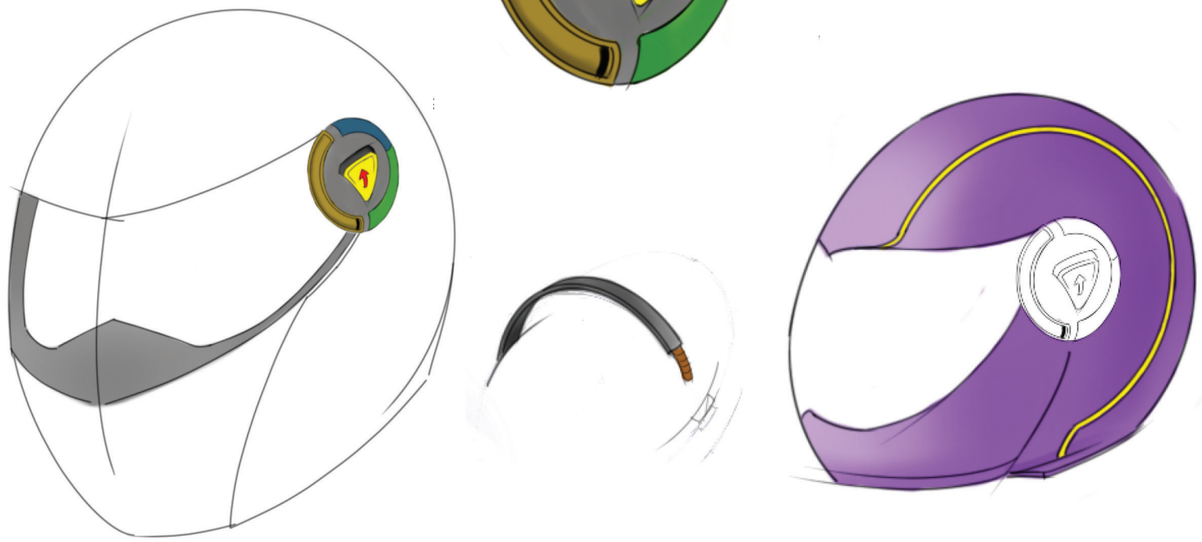




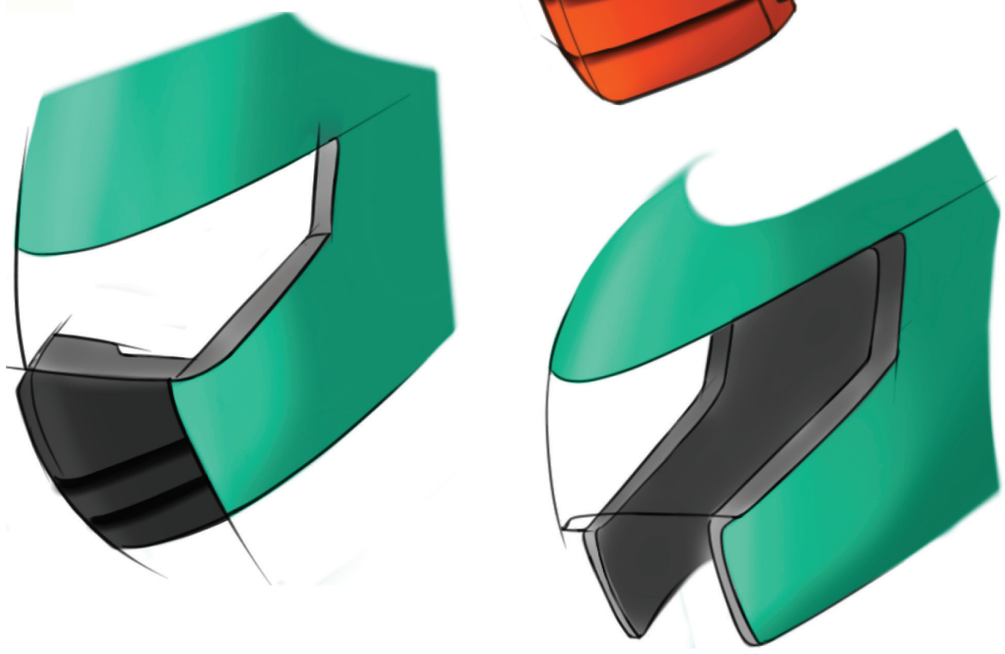
IDEATION



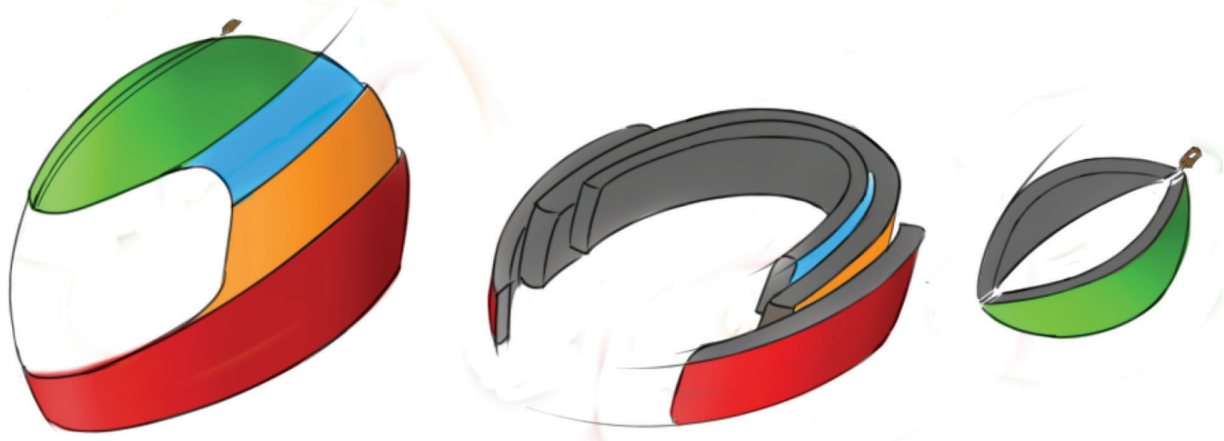




Integrated controller for operations

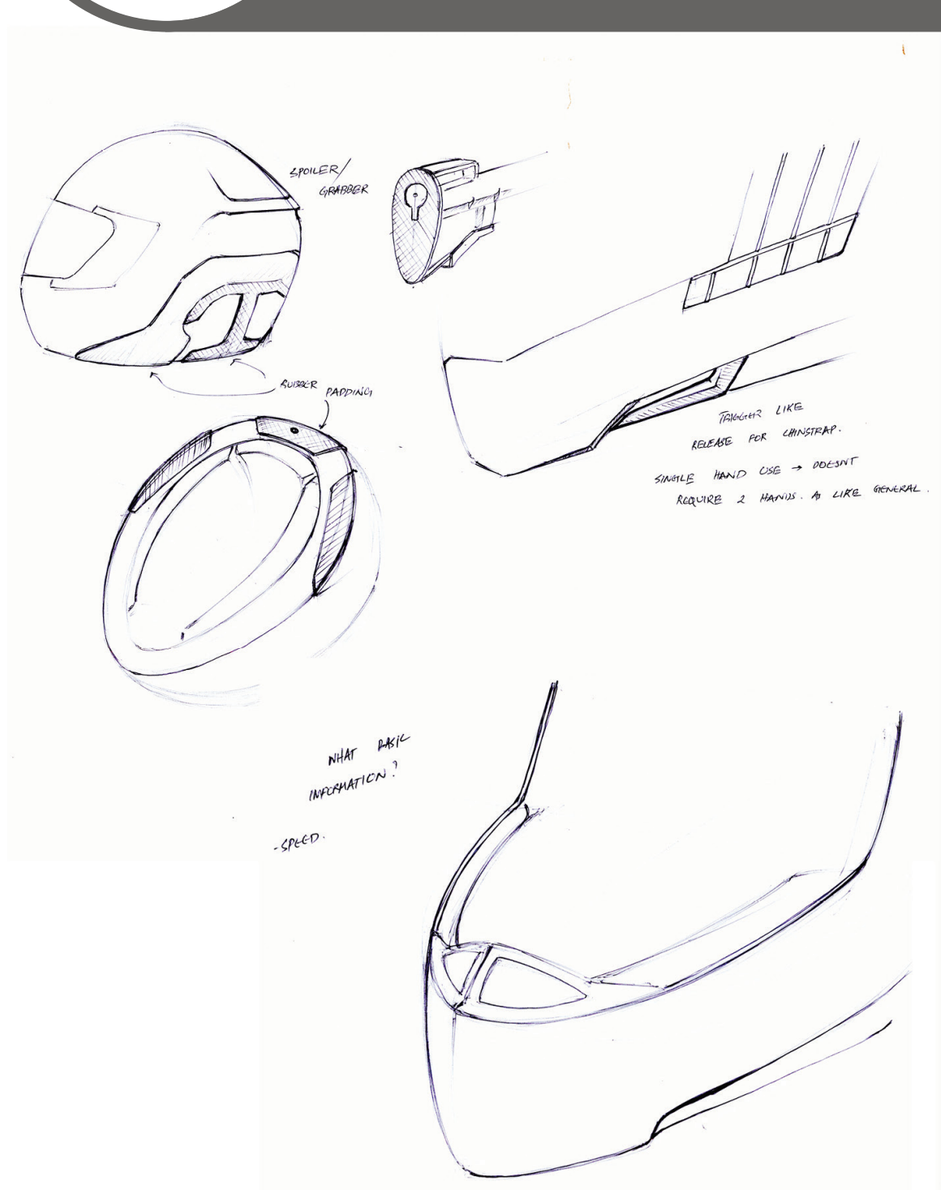


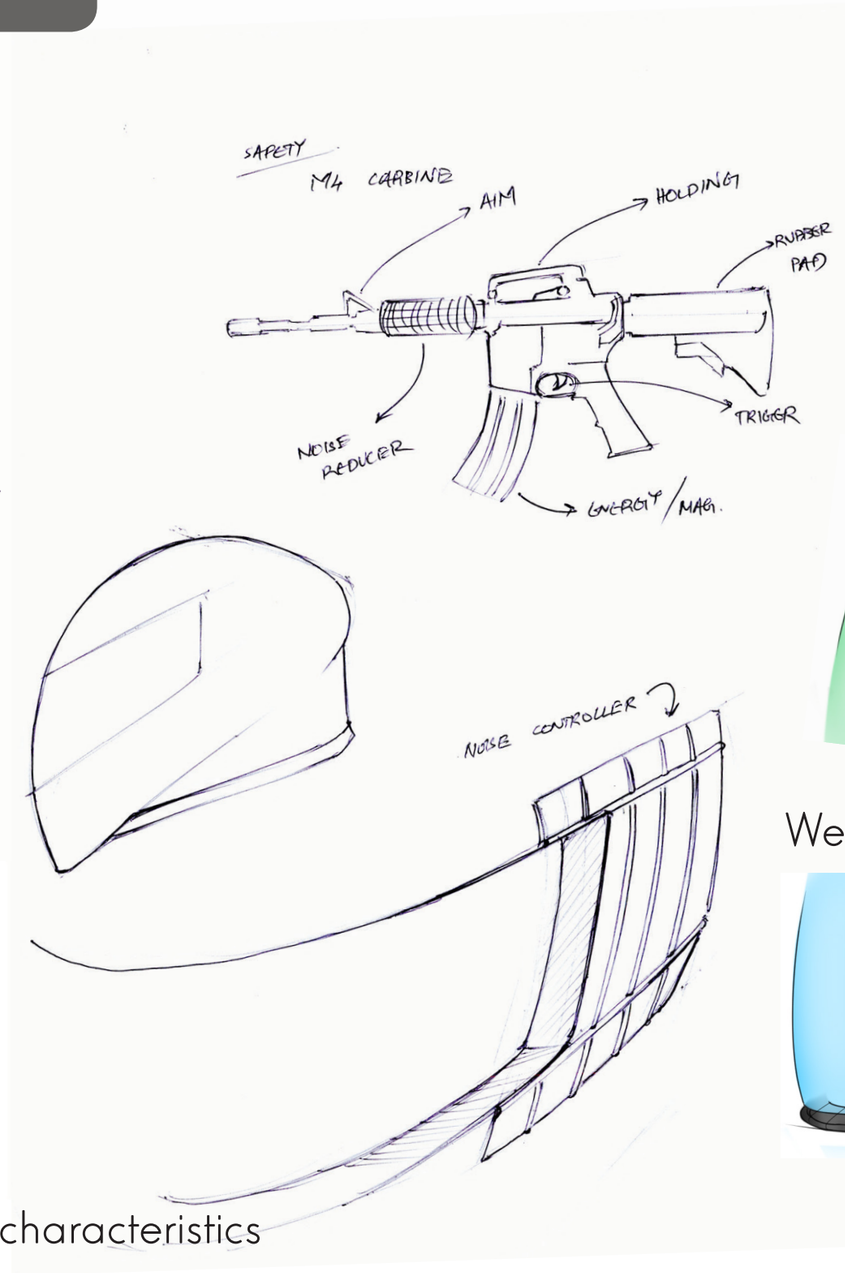
Dragonfly inspired mouth area attachment

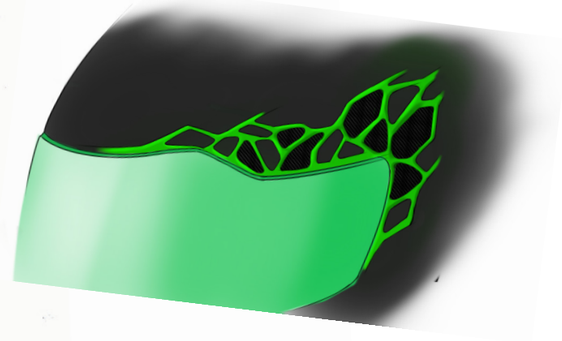


Collapsible helmet

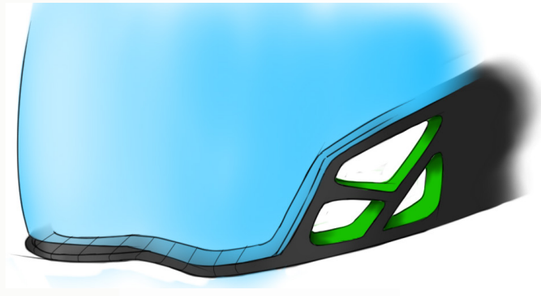
IDEATION





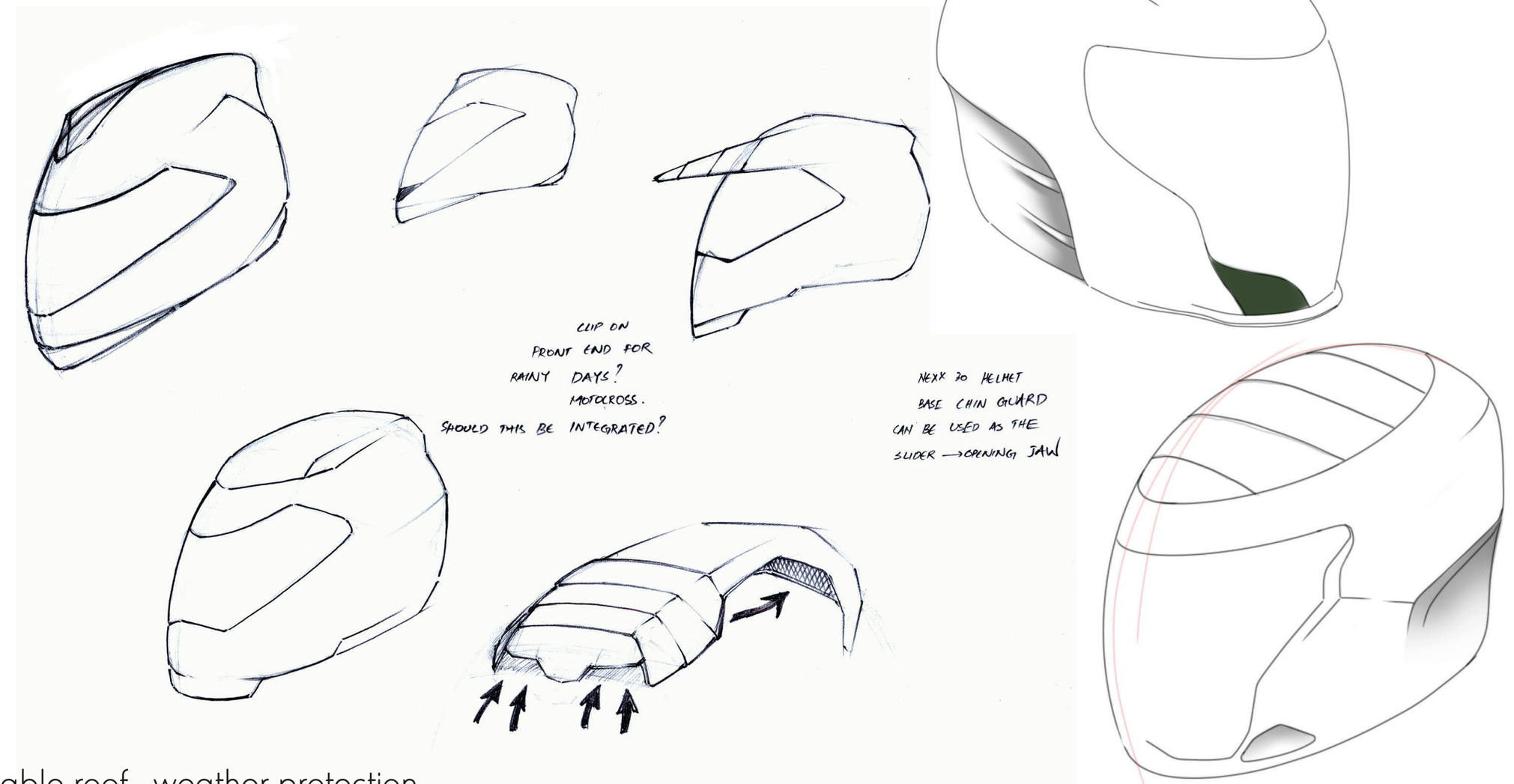


Weight reduction & vent pattern



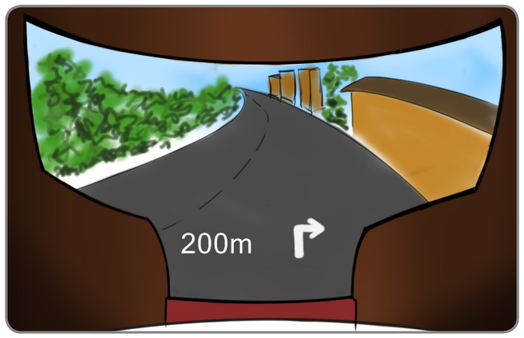
Assault rifle (metaphor - self protection) inspired characteristics

IDEATION



Retractable roof - weather protection

IDEA CLUSTER I



HUD info

- Distance
- Direction





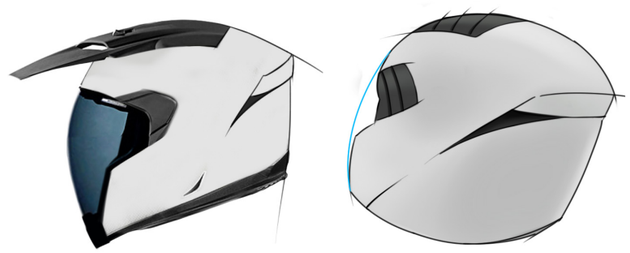
HUD unit

- Optional attachment
- Chinline supports the clip on

Wider visor - less obstruction

Air vents & retactable shade of same language

Retractable motocross shade



Variable audio levels

Adjustable air intake



IDEA CLUSTER I

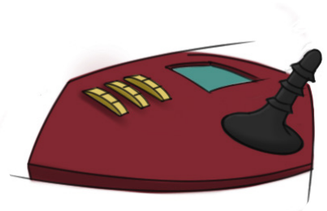




Tank mounts

Any flat surface

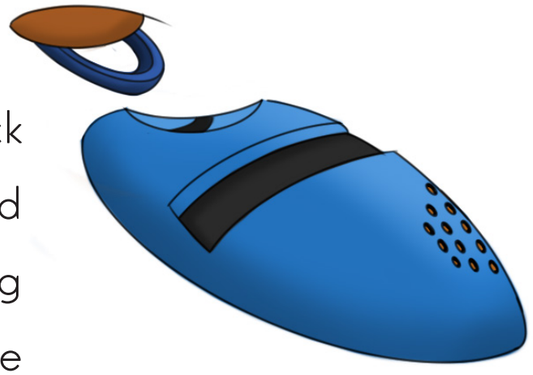
Adhesive based





Dual purpose - phone & helmet

Push lock security

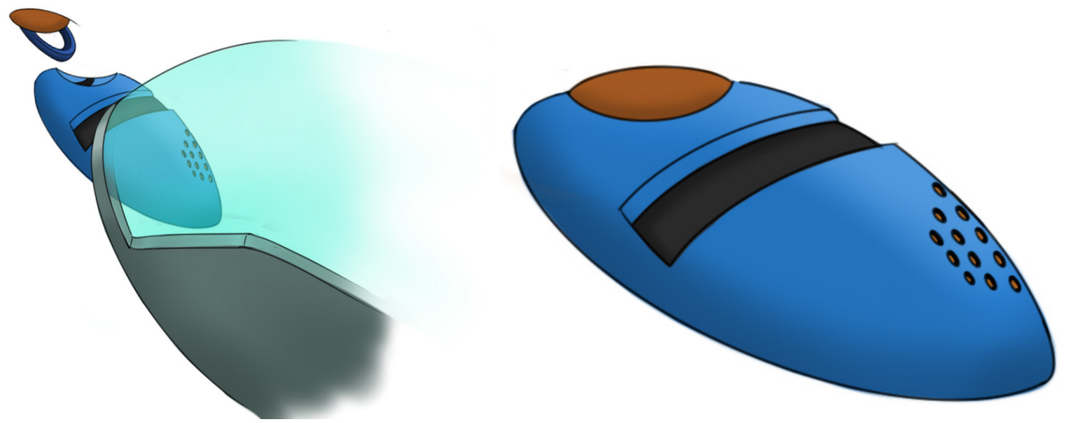


Push lock

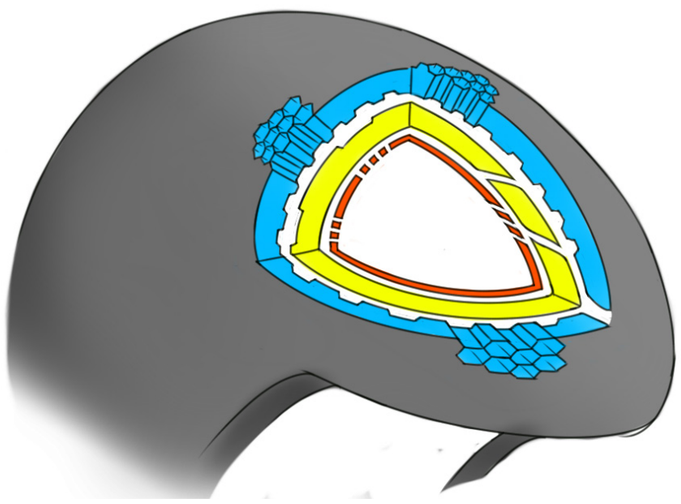
Key is released

Key worn as ring

Each push releases fragrance



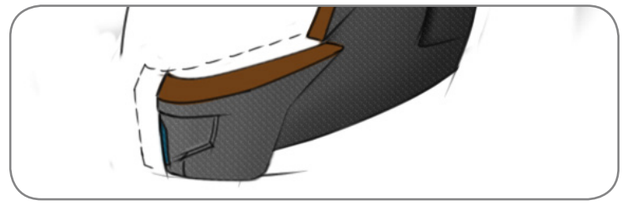
IDEA CLUSTER II

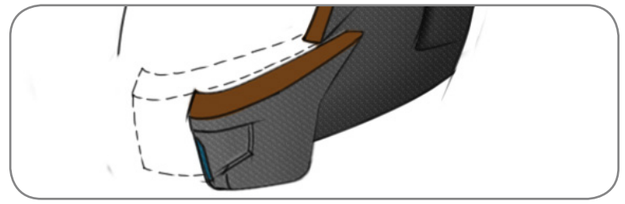


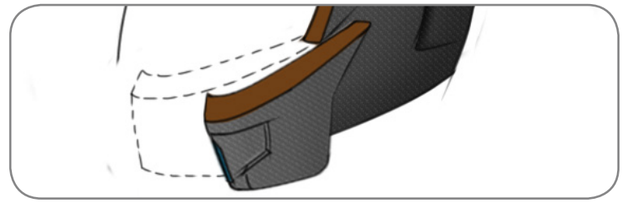


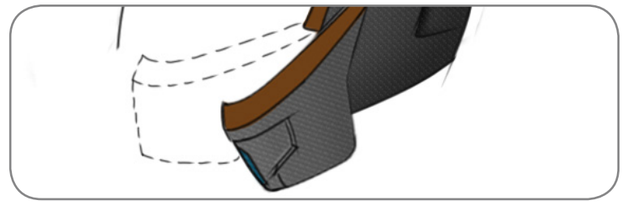
Memory foam

Jawline parting



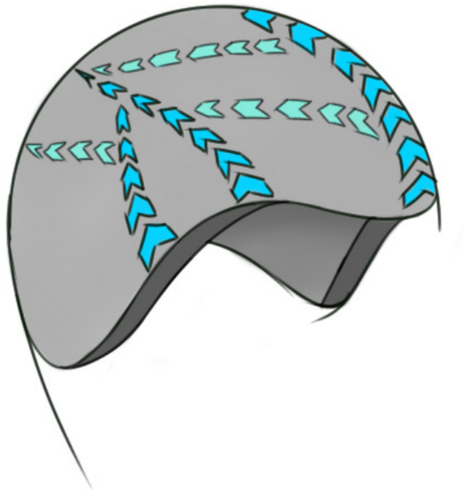






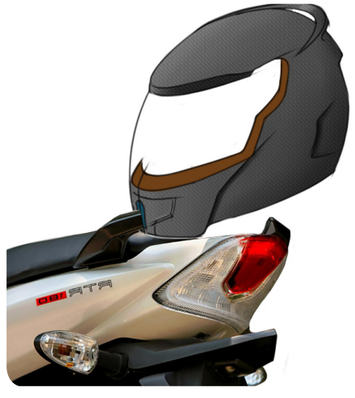
Rear spoiler / Grab area

Honeycomb > EPS liner > Clothing liner



Primary & seondary

air channels



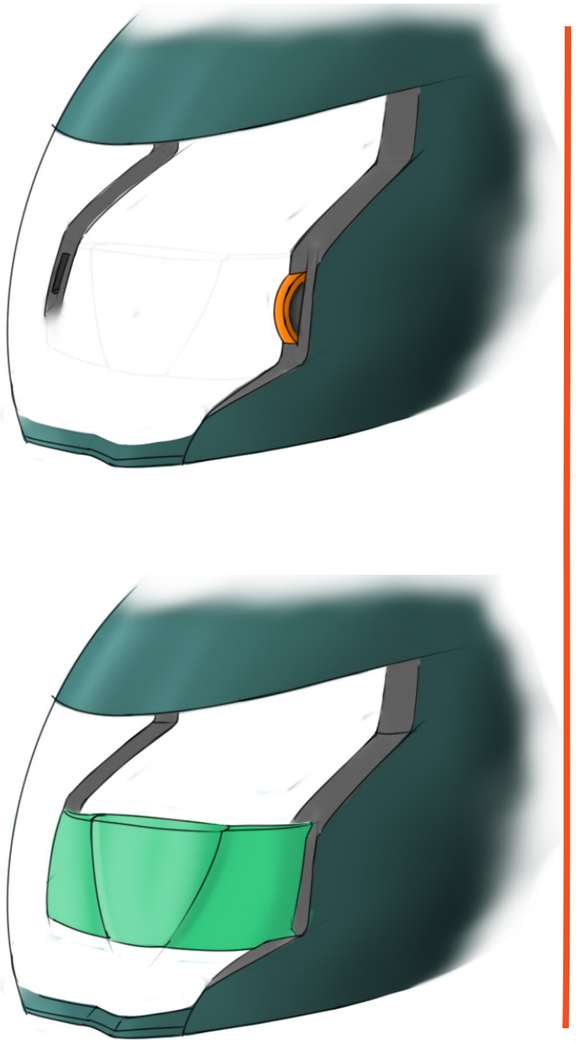


Different locking positions

IDEA CLUSTER III



Kranium with EPS liner



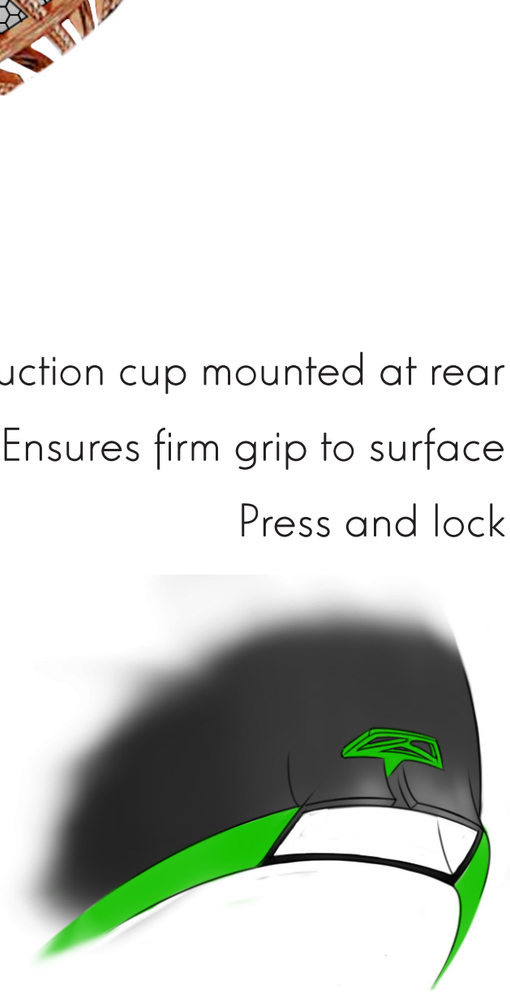
Pull out and clip unit

Changable / Washable air filter

Suction cup mounted at rear

Ensures firm grip to surface

Press and lock





FINALIZED IDEA AHEAD



Kranium with EPS liner

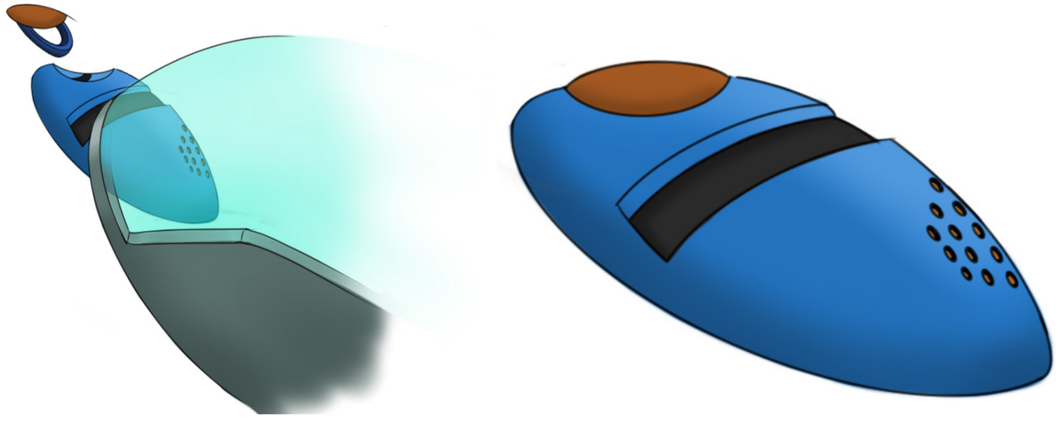


Push lock

Key is released

Key worn as ring

Each push releases fragrance

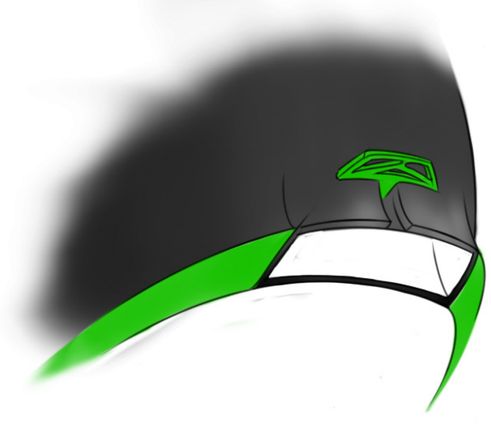




Suction cup mounted at rear

Ensures firm grip to surface

Press and lock



EXPLORATIONS - STYLING

IMBIBING CHARACTER TO FINALIZED FUNCTIONAL IDEA

IMAGE BOARD – GT



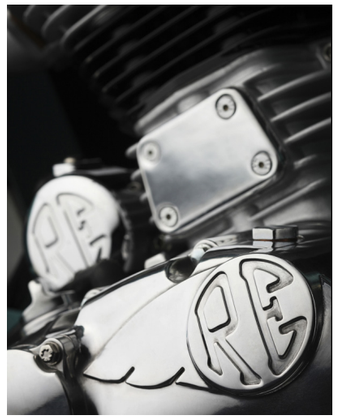














IMAGE BOARD – KTM

















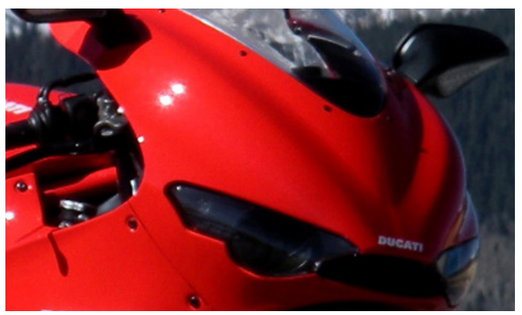




IMAGE BOARD – AUTOMOTIVE







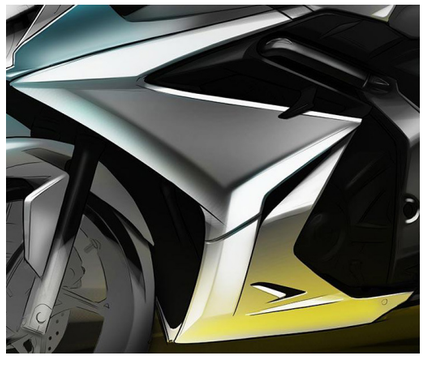




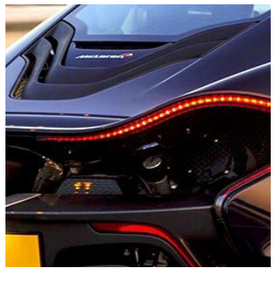


















STYLING IDEA I



Cafe racer subtle form

Dual odometer inspired air intake

RE Branding on forehead









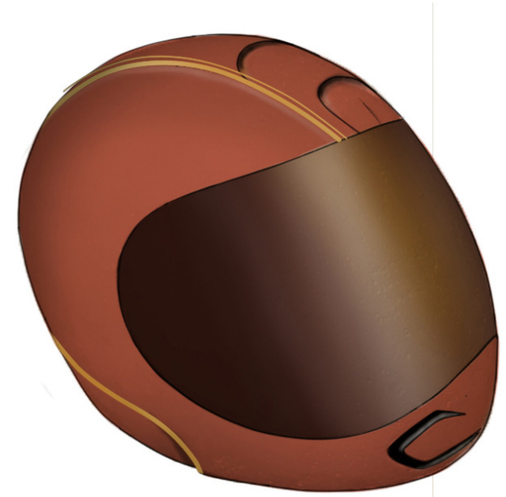


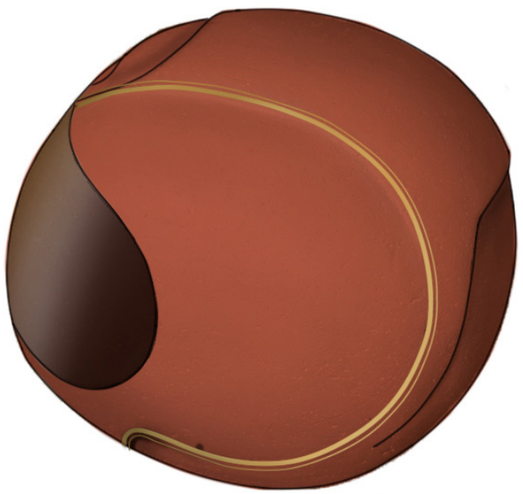


RE characteristic pinstripes

Fuel tank inspired recess providing grip

Wide rear vent continuing overall form





STYLING IDEA II





Dual air intake

Rectangular visor

RE logo as side cowls











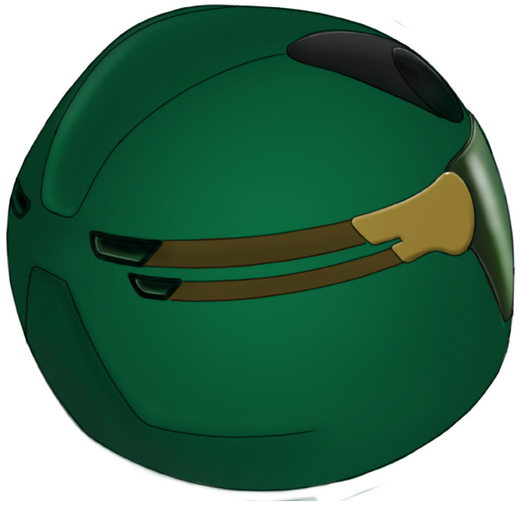
Pinstripes along sides

Rear canopy of GT inspired form

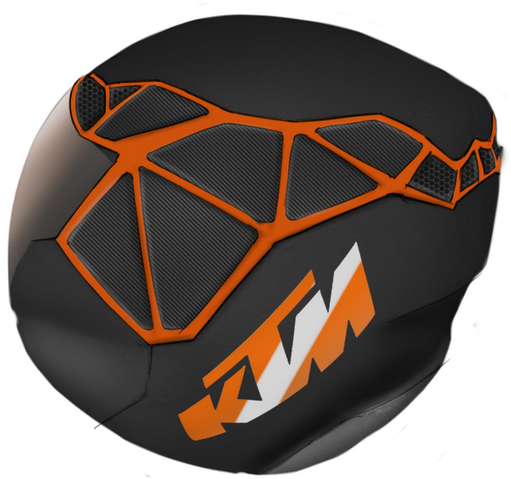
Chin & rear vent from truangular frame







STYLING IDEA III

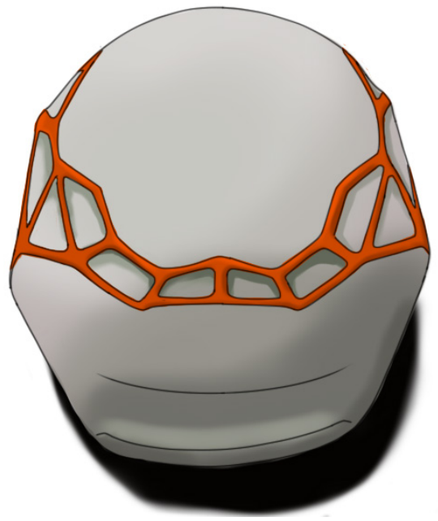


Trellis frame inspired pattern

Play of different surfaces

Depression along chin line









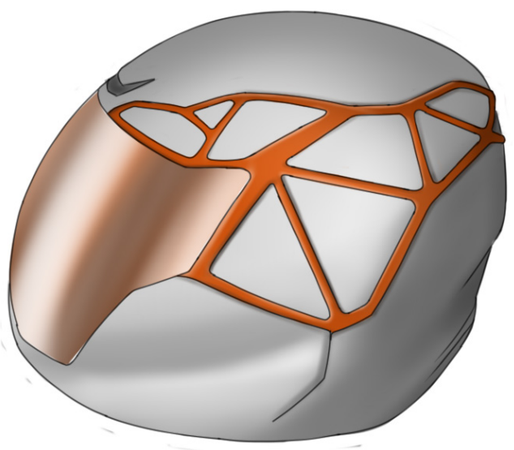




Swing arm model chin area

Rear end denoting overall KTM contour

Fuel tank inspired visor outline



FINAL CONCEPT

KTM CHARACTERISTICS TO FINALIZED FUNCTIONAL IDEA

FINAL CONCEPT

Trellis frame denoted towards rear end

Recess inwards for frame to be placed

Frame consist of chamfered surface

Dirtguard derived forehead air vents & side cowls

V shaped forehead vents

Visor with prominent inflence of headlamp

Jawline vents denoting protective edges of headlamp











FINAL CONCEPT

Suction mount cavity at rear end - sharp & aggressive tone

Rear air vent inspired from the tail lamp

Side vents denoting forward motion

Play of surfaces











FINAL CONCEPT



Top view



Side view

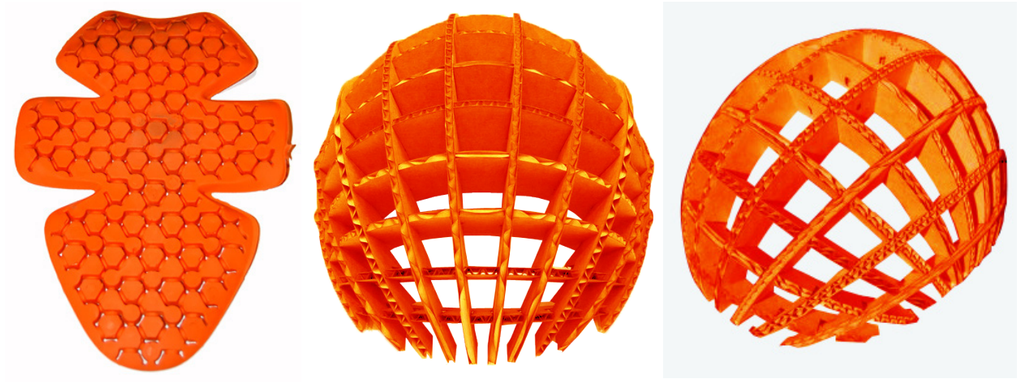


Rear view

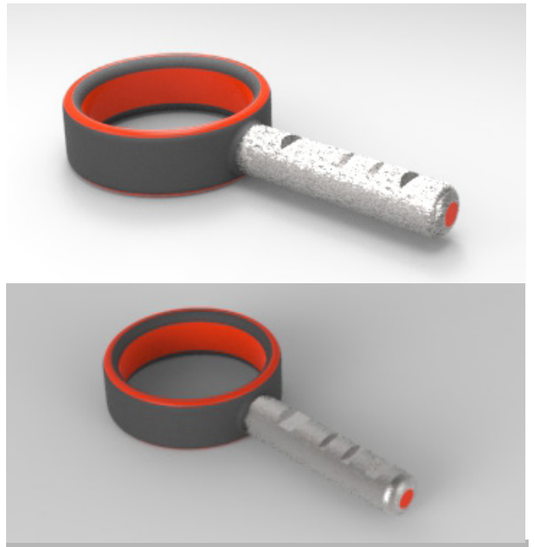
FINAL CONCEPT

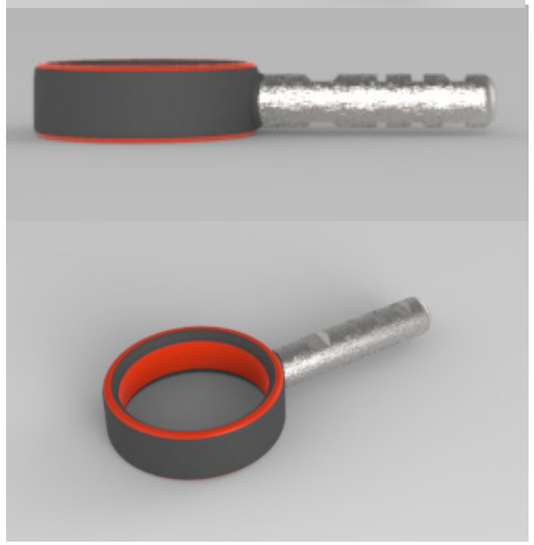


Coval Suction Cup



Kranium with D3O





Adhesive mount key



Adhesive mount to lock helmet jawline

FINAL CONCEPT CLAY MODEL

Tools used -

- Rake
- Hacksaw blade
- Chokkaki
- Finisher
- Steel sheet



Clay billet & first surface



Applying clay



Rough scraping



Shaping clay



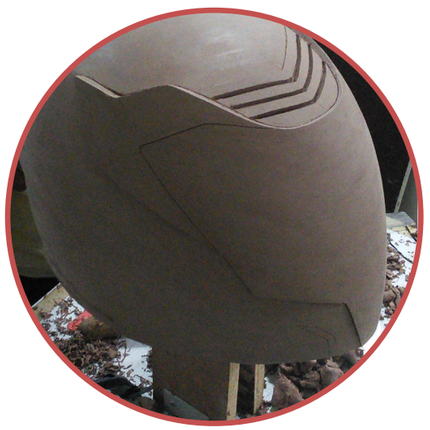
Rough form



Creating frame



Using template



Finished surface

FINAL CONCEPT CLAY MODEL

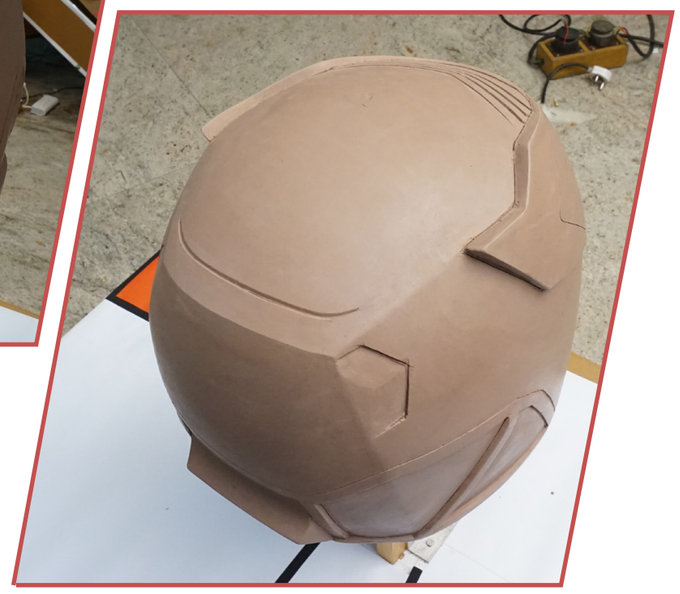








Clay model exhibited
during DDS 2015



PRODUCT VISUALIZATION



Stationary posture



Negotiating turn

PRODUCT VISUALIZATION







Alternative color schemes

WAY FORWARD

AERON - ‘ Mountain of Strength‘

USP of self locking and lightweight

Exclusively catering to KTM

Tier 1 & Tier 2 cities

Skimming price strategy

Promotion through stunt shows / above the line advertising

Technology can be utilized for other models too

Potential international market

AERON

END