# YAADHUM OORAE GLOBAL CONCLAVE HACKATHON

## (An Initiative by Chief Minister of Tamil Nadu, India)

TEAM NAME: Brain Bucket

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TEAM ID: STM008

TRACK NAME: Smart Transportation & Mobility

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## PROBLEM STATEMENT:

The Challenge is to develop a mode to acquire and display data of people's movement in a City. An analysis of mass movement/ mobility across different distances from source to destination is to be made.

## MOTIVATION:

With the rapid increase in the number of cars and the mercilessly congested roads, road safety has turned into a factor of utmost importance for the country's citizens. The paucity of a proper navigation system for a two wheeler vehicle leaves the driver distracted. As Two-wheeler sales had grown tremendously in recent years, congested traffic has become predominant, which leads to the difficulty to navigate Indian roads. With numerous of these helmets acting as nodes, that would help us with the Clustering Model to help us in analysis of mass movement/ mobility.

# INTRODUCTION

There has also been an increase in the demand for higher volume engine bikes. The market is maturing fast, with both domestic as well as international manufacturers launching faster variants at continuous intervals.The number of road accidents across India amounted to around 467 thousand in 2018. Each year, about three to five percent of the GDP of the country was invested in road accidents. About 70 percent of accidents involved young Indians. The country has about one percent of the global vehicle population but it accounted for six percent of the world's road traffic accidents. Driving navigation significantly mitigates driver's anxieties induced due to not knowing or not familiar with routes. It has shown that high stress level of drivers is one of the leading causes of car accidents, along with fatigue, intoxication, and aggressive driving , because high mental stress may affect driver's judgement and reaction under critical situations. Thus the need for an efficient system ensuring navigation, discipline, and safety, is very clear.



Transportation & Logistics › Vehicles & Road Traffic
**Number of road accidents in India from 2005 to 2018**
*(in 1,000s)*

Details: India; 2005 to 2018

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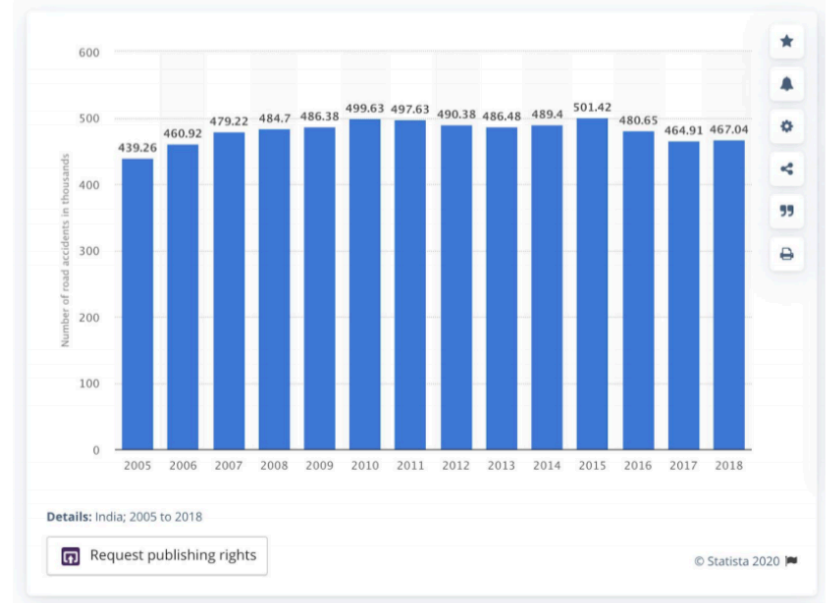
# NOVELTY

1. A Voice assisted Navigation System uniquely designed for a two wheeler. Vocal as well as visual assistance is provided.
2. To ensure Traffic rules and protocols abidance, the Traffic sign detection system based on OpenCV model is installed.
3. A cost efficient model. Mass Scale Production would result in an inexpensive model.
Valuable GDP allocation towards Road safety.
4. Prediction of possible health hazards through a Robust IoT system and a Machine Learning Model.
5. Recreational system along with the safety system.
6. Bikers and Cycles Friendly

# PROPOSED MODEL

The Brain Bucket (Smart Helmet) is designed to ensure a proper navigation, discipline, safety and recreation. The helmet has a Voice assisted navigation system uniquely designed for a two wheeler ensuring vocal and visual assistance. A specially designed Traffic sign Detection System will make sure that the driver is aware of his environment. To predict the possibility of any health hazard during the travel, IoT based health monitoring system is included. As an additional feature, the users can connect their mobile to the model through bluetooth, for any recreational purposes like listening to music.

Technical Description:

● The Brain Bucket is a smart helmet centered on a Raspberry Pi. The model has a camera module mounted on the helmet, a Neo 6m GPS Module, a pulse sensor in the helmet, Micro-speakers in the helmet and a small inward facing led screen.

● A Python based Voice enabled Navigation System, is programmed to ensure a hassle free navigation system. An IoT based android app connected to the Helmet will ensure Routing services and Smart Monitoring through Visual data.

● An OpenCV Model is programmed to the Raspberry Pi to analyse and interpret the environment visually. This model detects the Traffic Signs and Symbols, road lanes and road boundaries which are alerted to the driver vocally through the speakers and the same is displayed on the screen.

● An Iot based sensory system which includes the Pulse sensor and a speed sensing system to predict, using a ML Model, the possibility of any health hazard during the travel.

● A Bluetooth enabled recreational system connected to the speaker will allow the user to listen to music, podcasts, etc.
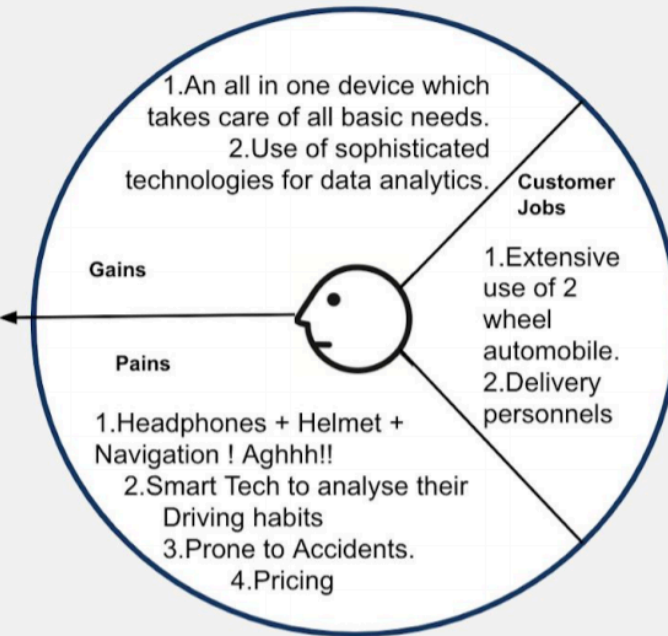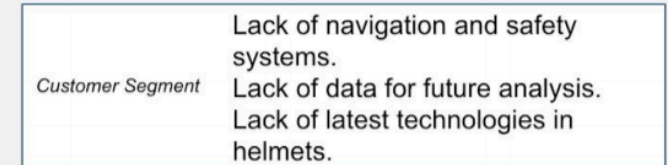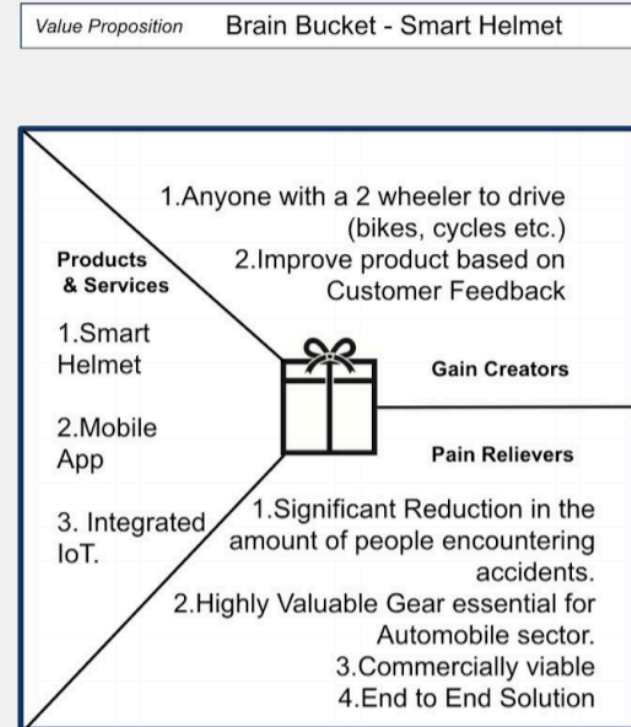
# LIVE WORKING SESSION

## SmartHelmet.mp4

Click on this link if the above doesn't work

https://drive.google.com/file/d/1Qxi24upoP4PwJDbfFzLTfTQz5TK3UM-E/view?usp=sharing

Drive Link for Code & Documentation

https://drive.google.com/drive/folders/1ElFIquwBSclCbn5ix9Ya75q46Mp9_5aR?usp=sharing



Value Proposition Canvas : Brain Bucket

**The Value Proposition Canvas**

Value Proposition — Brain Bucket - Smart Helmet

Customer Segment — Lack of navigation and safety systems. Lack of data for future analysis. Lack of latest technologies in helmets.

**Products & Services**
1. Smart Helmet
2. Mobile App
3. Integrated IoT.

1. Anyone with a 2 wheeler to drive (bikes, cycles etc.)
2. Improve product based on Customer Feedback

**Gain Creators**

**Pain Relievers**
1. Significant Reduction in the amount of people encountering accidents.
2. Highly Valuable Gear essential for Automobile sector.
3. Commercially viable
4. End to End Solution

1. An all in one device which takes care of all basic needs.
2. Use of sophisticated technologies for data analytics.

**Gains**

**Customer Jobs**
1. Extensive use of 2 wheel automobile.
2. Delivery personnels

**Pains**
1. Headphones + Helmet + Navigation ! Aghhh!!
2. Smart Tech to analyse their Driving habits
3. Prone to Accidents.
4. Pricing

# PROS & CONS OF PROPOSED MODEL:

Pros :

Different Model based on Requirements

For Mid Range 2 wheeler Drivers - Budget Friendly System focusing more on the functionalities and helping them by catering to their needs based on Customer Feedback.

For Max Range 2 wheeler Drivers - High end systems will be provided to cater the needs of the customer with best in class industry technology in mind.

For Cyclist/Bikers - A more lite version of the product focusing more on the Safety Protocols and Smart Monitoring of their Cardio activities.

Long Term Goal - An All in One module and an App ! Literally..

With good R&D, Our team can deliver way beyond expectations.

Cons :

Data Management & warehousing legacy data

With areas of low internet coverage or network this system would not be as effective as it is proposed to be.

◆IEEE

# REFERENCES:

[Traffic Sign Classification with Keras and Deep Learning](#)

[Research on the In-Vehicle Routing and Navigation System Field Test based on Big Data - IEEE Conference Publication](#)

[An analysis of route optimization techniques for navigation and guidance systems - IEEE Conference Publication](#)