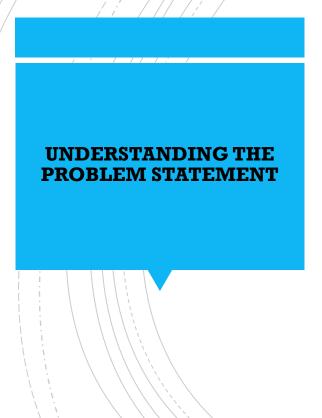
# Problem Statement

Smart driver training problem for attitudinal change

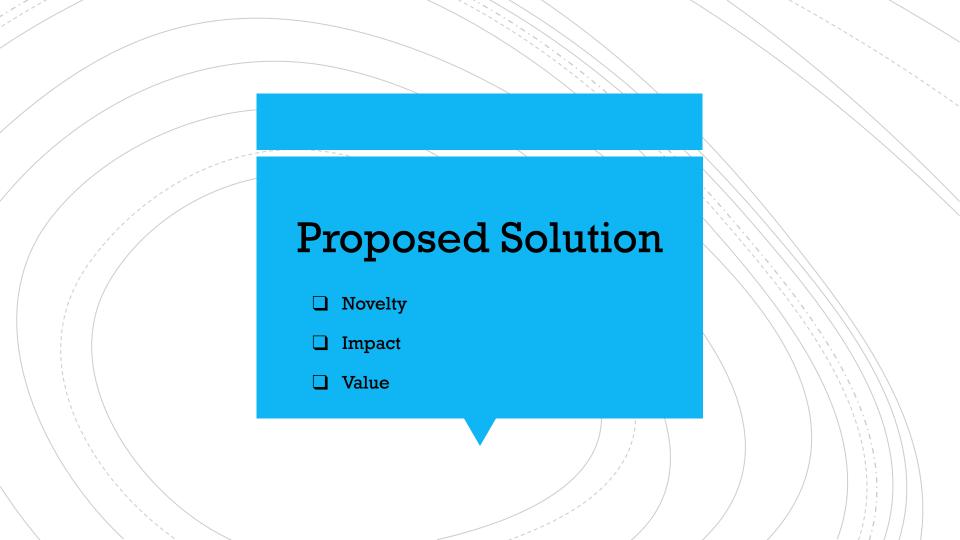


- As predicted by the principle of attitude consistency, if we engage in an unexpected behaviour, our thoughts and attitude toward that behaviour are likely to change.
- Thus ,one's attitude and behaviour are closely related to each other. Behaviour actually influences one's attitude.
- In order to change attitude of driver towards traffic rules in our solution we focused on changing his behaviour.
- Behaviour change can be achieved either by forcing him or make him responsible.
- Thus we proposed a solution in two parts where each part focused on each of the above mentioned factors for behavior change.

#### **Behavior change**

- First part of solution focuses on forcing him to change his behaviour
- Here we proposed an incentive approach on forcing the driver to follow the traffic rules while driving on road by giving him/her points or rating according to his driving behavior on an mobile application.
- Insurance companies on basis of these points can reduce the amount of premium for an individual on basis of his/ her points.
- This approach forces the driver to improve his driving for his benefits.

- ☐ Second part of solution focuses on making him responsible.
  - In this we focuses on making the driver aware of the consequences of not following traffics rules on a particular road. Thus making him responsible for his own safety.
- ☐ To implement the above we will provide the driver with the death rate or casualties which has happened on the particular road in the past on our android application, therefore making him more cautious while driving on the road.



# Novelty

- For the the given problem statement we propose an indigenous solution under Digital INDIA program
- The Database made for individual driver will be secured and names of the driver will be scripted
- Therefore the privacy of a driver is not hampered.



# Summary

- In the proposed solution we use an android application which records the driving behavior of the driver while driving and rate him/her according to the driving behaviour
- As the smartphone is attached to a smartphone holder and the android application is switched on, The android application marks the start of driving.
- At the start of driving the android application ask the details of the driver.
- The driving behavior is then monitored by the recording the orientation of smartphone (on the mobile holder) using the motion sensors which are inbuilt in the smartphones.
- These records are stored in a database where it is compared with the standard results (which should be obtained when safely driving) and an approximate prediction is made using machine learning to tell whether the driver is rash driving or not.

# Summary

- Based on the approximate prediction we rate the driver and give him/her score.
- For making the driver aware of the dangers while driving on a particular road we will also provide the driver the death rates and casualties on that particular roads according to the past records.
- This will make the driver more cautious towards his driving behaviour.

# Value & Impact

- Insurance company can use the scores from our android application to decide the amount of premium to be paid by driver.
- In case of any penalty or challans, on basis of the scores driver can get concession.
- On basis of scores we can also shortlist the best drivers in our android application, thus giving them appreciation for their safe driving.
- The above rewards will encourage the driver to improve his driving behaviour.
- As before driving driver has to enter his/ her details in the android application, thus in cases of accidents we can identify the driver efficiently.
- The android application will also provide the danger level of a particular road to a driver by calculating the past casualty rate on it.
- This also make the driver cautious about the manner of his driving.

# Proposed Solution Scalability & Environmental **Impact**

#### **Proposed Solution Impact**

# Scalability/ Improvement

- The proposed solution can be scaled to majority of people as the key component of our proposed solution is android application which can be installed from play store or apple store
- The application of proposed solution not only be limited to monitoring the driving behaviour of the driver but can also be extended to other applications.
- We can also detect potholes and other road cracks by feeding the data of the motion of smartphone corresponding to a pothole, and comparing data from many vehicles we can estimate the position of potholes in an area.
- Through the android application we can get the driving data of the driver which can be used by the policeman at the checkpoint to check for overspeeding on roads and other penalties of that driver.
- In case of roads accidents sometimes we don't know the culprit driver, from our proposed solution we can identify the culprit driver as before driving the vehicle, the driver has to add his details in the app.

**Proposed Solution Impact** 

Environmental Impact

As in our proposed solution the main key components are use of an android application and cloud service.

Therefore our solution is environmental friendly

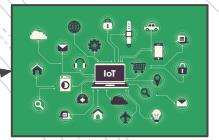






- Phone stand
- Smart phone
- Android App Development
- ☐ IOT (Internet of Things)
- Machine Learning

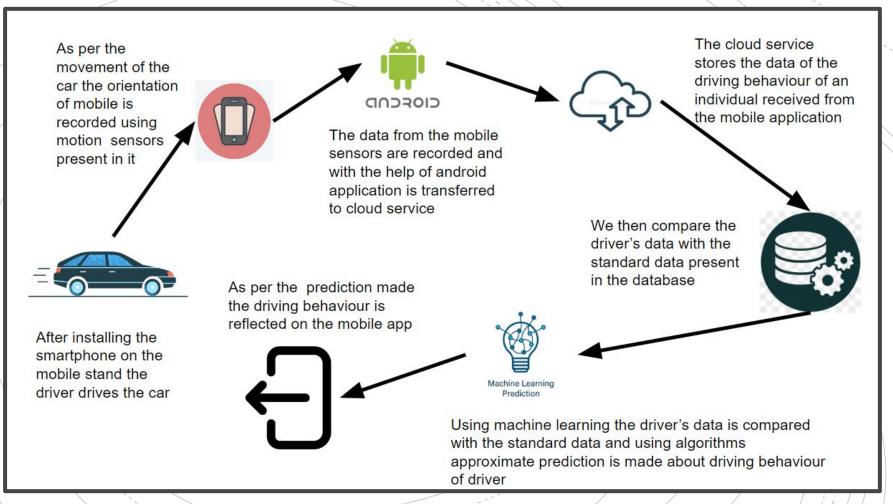








#### Diagramatic flow of technology involved



# Technology Involved

- Our goal is to develop a flexible phone stand.
- The stand has orientation in all the coordinate axis.
- Motion sensors in the mobile are used to detect the movement of the vehicle.
- The data of the individual is collected using App.
- From the app the data is sent to the server where it is stored in a database.
- In this manner we collect data from these motion sensors corresponding to safe driving of a vehicle and store it in a database.
- After this when a driver is driving a vehicle we record driving behaviour data of the driver by detecting the movement of the vehicle through the motion sensors in the smartphone.
- Now this data is compared with the standard data present in the database.
- ☐ ML is used to make an approximate prediction of the driving behaviour of an individual.
- ☐ This prediction is used to provide the rating to the driver

# Technology Involved

- In our android app there will be a feature which informs the driver about the casualties rate on that particular roads.
- This casualty rate will be calculated from the previous death records on that road.
- This feature will make the driver aware of his driving so that it may lead to no casualty.





The major cost in our proposed solution will be in making of mobile application and server database cost.

# Cost In developing the solution

□ For the development of the mobile application a maximum amount of about Rs 89,75,505 will be used.
 □ This is a one time

investment

Note: The present cost are approximation as we were not having sufficient data and the cost of cloud storage can get reduced when applied on large scales driving of car done by a person = 4 hrs/day

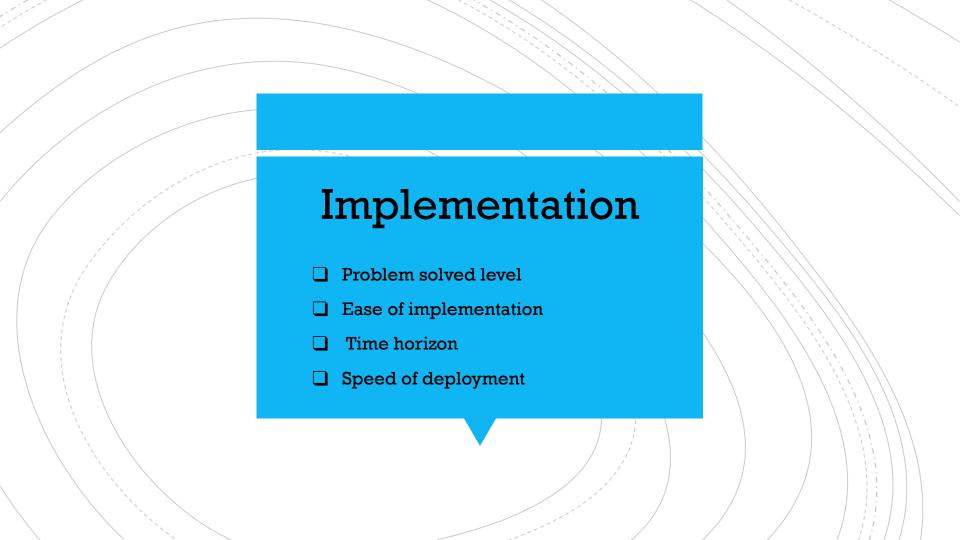
If the sampling rate for our mobile application is calculated per minutes and each hour we get approximate size of data of 0.5GB thus monthly charge for cloud storage of each user is approx Rs 750

On average, hours of

For cloud storage



- For our proposed solution to start functioning we have to first collect a database corresponding to safe driving-behaviour, this data will serve as standard for comparing datas from other people driving pattern.
- As per the study by Bosch India, India's socio-economic cost of road traffic accidents for the year 2019 was in the range of \$15.71 billion to \$38.81 billion, which amount to 0.55-1.35% of the GDP.
- Thus by implementing the proposed solution we can greatly reduce the number of road traffic accidents.
- As per the *TheNewsNow* in the year of 2020 about **7.27** crores of revenue generated from traffic rules violation by **1.29 lakhs** people.
- Due to absence of sufficient amount of traffic datas we were not able to provide ROI ,Break Even Period, EBIDTA etc.



# Problem solved level

- To change the attitude of the driver towards traffic rules we found out that we have to first change his behaviour.
- ☐ In the proposed solution by providing score system in our app which can be used for multiple rewards Eg less premium for insurance, concession in road penalty challan etc. We force the driver to change his driving behaviour to take advantage of the rewards.
- Thus as the driver drives safely to score more in order to access the rewards, in the long run it will become a habit of his/her.
- Therefore we achieved our goal to change the attitude of driver.

# Ease of implementation

- To implement the proposed solution we need
  - 1. Smartphone holder for vehicle which allow motion of smartphone in all axis.
  - 2. Smartphone with motion sensor feature inbuilt in it.
  - 3. Android application.
  - 4. Cloud service
- App can easily be available to majority of people through playstore/apple store.

Time horizon

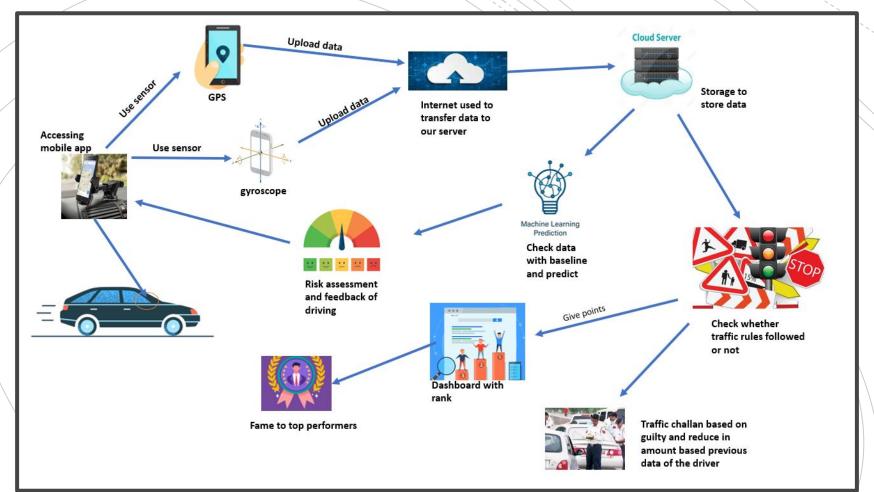
- For the proposed solution to function we need database corresponding to safe driving which will act as a standard of comparison with other data recorded from the drivers. Therefore creation of standard database done by recording the motion of smartphone corresponding to safe driving can take time of 6 months to 9 months.
- After creation of the standard database the app can be given to some users for testing.
- When certain amount of driver data is taken through the app and tested then it can be available for masses.

# Speed of deployment

- Once the android application become accessible on playstore/appstore there will be no difficulty for user to install and use it.
- After installing it should be made mandatory for the user to install the android application whenever he/she starts driving
  - Officer at checkpoint should check for the functioning of the application in the driver's vehicle. This will prevent the driver from doing fraud.



#### Flow chart of execution strategy



# Meet our team : Yatayat Guardians









**UTKARSH JAISWAL** 



**ANKIT KUMAR** 



VAIBHAV PALLIWAL



ADITYA
VIKRAM SINGH