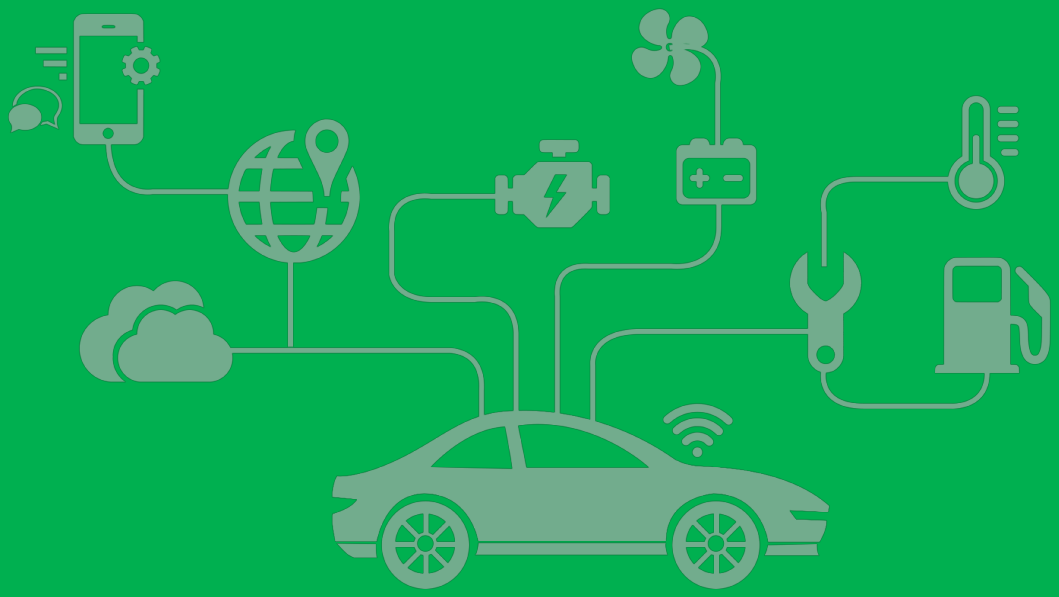
www.igloble.com



# IoT Based CONNECTED VEHICLES PLATFORM

## A Predictive and Prescriptive Analytics Solution

# ABOUT iGloble

## PROVIDING A MEANS OF OPTIMIZATION THROUGH PREDICTIVE ANALYTICS

**WHO**

- A global company focused on providing cloud based machine learning enables analytics solutions for fleet owners using the iotaSmart platform www.iotasmart.com.

**THE MISSION**

- To provide drivers and fleet owners with comprehensive machine learning enabled analytics of their vehicles, driving behavior and vehicle diagnostics for safer, more efficient and healthy vehicles for optimal, unhindered, cost effective operations.

**THE VERTICALS**

- Land Transport solutions & Automotive Industry, Aviation, Shipping and Insurance.

**THE TEAM**

- A motivated team of domain experts, data scientists and engineers

**CURRENT PRESENCE**

- Offices in India (New Delhi & Pune), USA (New Jersey), and Hong Kong

# A FLEET OPERATOR'S CHALLENGES

- Driver and vehicle safety (10%)
- Higher maintenance cost and sub-optimal utilization (14%)
- Excessive spend on fuel (12%)
- Faster wear and tear
- Non compliance to emission norms, safety, and accountability
- Disconnected design modifications of components leading to recalls

1. Unscheduled break downs
2. Higher Maintenance and Fuel Costs
3. Higher Claims because of Accidents and Failures
4. Inaccurate Supply Chain Visibility
5. Production slow-down

1. Studies have estimated that the economic loss due to damages on the road, vehicle and cargo amounts to 2% of GDP
2. Top worldwide automakers warranty claims are $48B (2016) up from $42.2B (2015)

# OPTIMIZING VEHICLE PERFORMANCE

Unhindered haulage

- Minimal idling
- Zero accidents
- Preventive maintenance
- Optimal scheduled maintenance

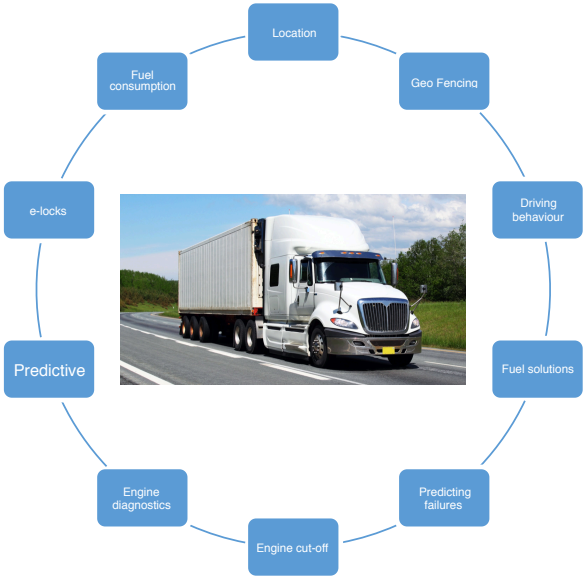
Maximize production

Cost reduction

- Fuel
- Spares
- Maintenance
- Time
- Prolonged life

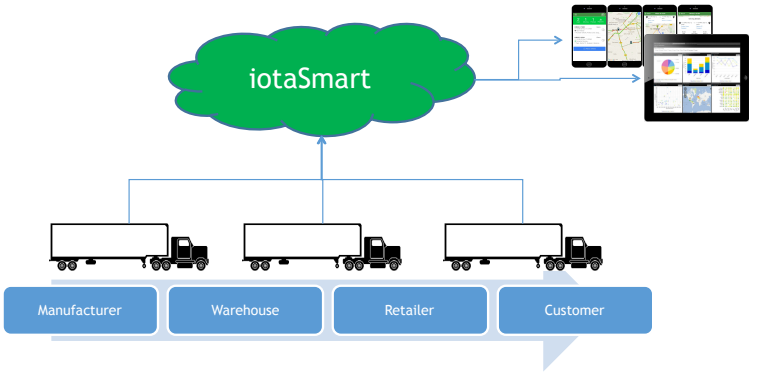
Lower cost of production

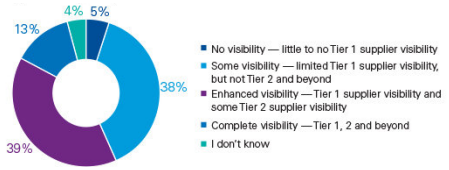
# IoT based Real Time Supply Chain Visibility




- ✓ Real time location
- ✓ Fuel spend
- ✓ Trip analysis
- ✓ Driving behaviour
- ✓ Unscheduled stops; Idling
- ✓ Immobilisation
- ✓ Machine Learning based predictive maintenance for lower spend
- ✓ Increase performance per km
- ✓ Higher utilisation

Reduced cost, increased profitability




Note: Percentages may not add up to 100 percent due to rounding.
Source: Global Manufacturing Outlook, Forbes, 2016

"Real time pulse check of vehicles for an early failure detection leading to healthier vehicles, optimised operations, and higher revenue creation and higher real time supply chain visibility"

# PORPOSED VALUE PROPOSITION

## FOR FLEET OPERATORS

- **Operational efficiency for fleets using REAL TIME prognostics** of component failure **including but not limited to** brakes, tires that can potentially save 5-7% of the operational expense for fleet
- Savings for a fleet of 500 trucks
  - Spend of about $30 mil. per year
  - About $2.5 mil. of maintenance spend
  - Spend of $100k on iotasmart solutions yields a saving of about $150k on maintenance per year
- Higher utilisation of vehicles along with lower emissions

## FOR OEM MANUFACTURERS

- **Connected Design** for reducing the component testing cycle leading to faster and effective design modifications
- OEM Savings
  - 3x2x176x$50= $79,200 = 4 designs per year means spend of $320k
  - iotaSmart based Spend of $200k leading to savings of $120k per component per year
  - Real time data based simulations for faster time to market
- Evaluation of product performance in real conditions

iotaSmart Predicts can be a **bolt-on solution** for an existing connected platform

# iGLOBLE'S CONNECTED VEHICLE SOLUTION

A **cloud based platform** **that can connect to any** vehicle via an OBD

**SMART CONNECTED DESIGN**

Using Artificial Intelligence & Machine Learning

**LOWER OPERATIONAL COSTS**

by Early Diagnosis & Predictive Maintenance

**REDUCE RISKS & IMPROVE SAFETY**

by Smart & Prescriptive Driving

**UNHINDERED OPERATIONS**

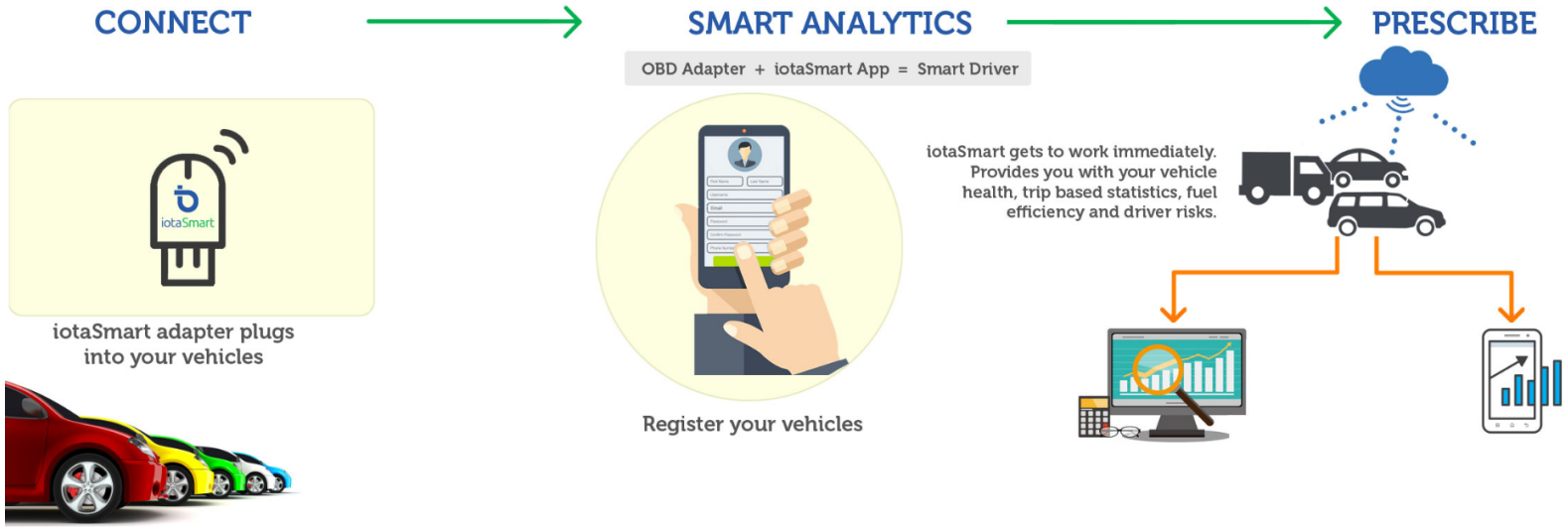
by optimization of the fleet operations

**UNIQUE REALTIME MONITORING**

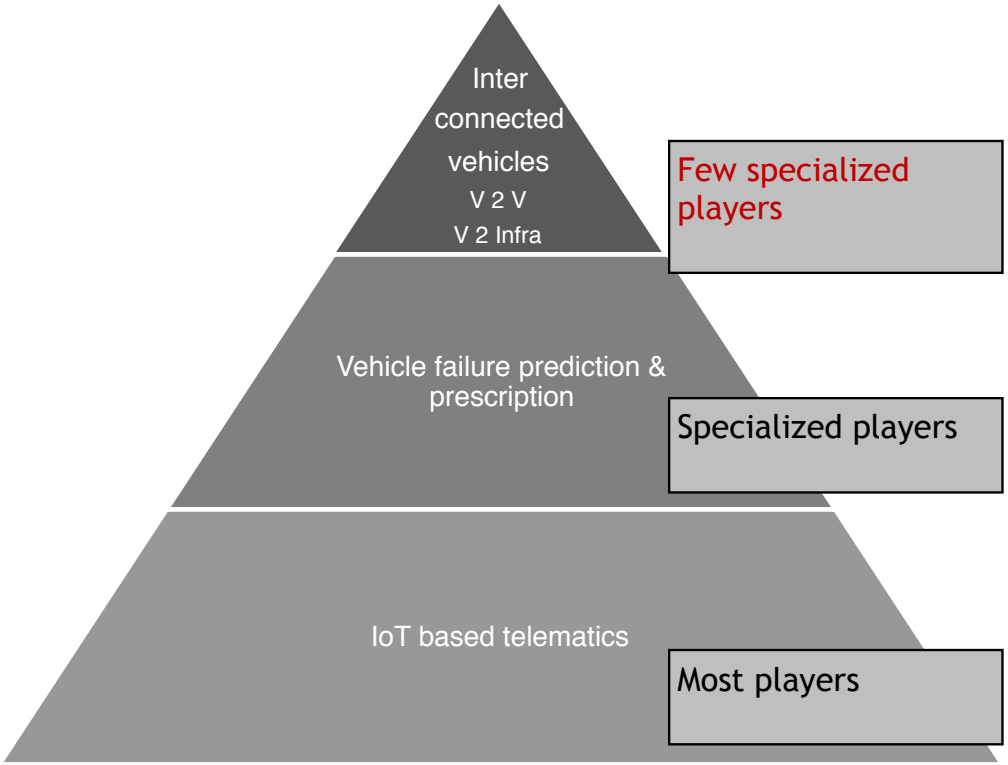
by Connecting to iotaSmart App

# WHAT IS iotaSmart?

A ***machine learning*** *based* ***product platform*** for fleet operators and OEMS to optimize **operations** and **component systems** by providing real-time predictive analysis for greater efficiency, safety and inventory management.



# iotaSmart PLATFORM

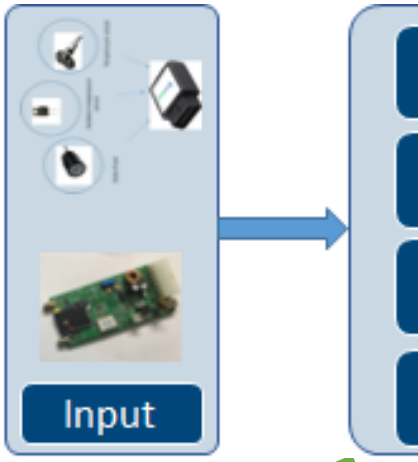



iGloble

- An **open architecture** based platform
- **Artificial Neural Network** based **real time vehicle diagnostics**
- **Connected Designs** for reduced design to manufacture time
- Connecting the vehicle networks for **accuracy, interventions, & safety**

**Over 1200 Vehicles with 7 million miles of data…. growing at 20% Q-o-Q.**

# iotaSmart PLATFORM



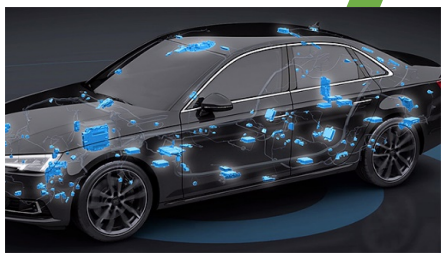

User Management

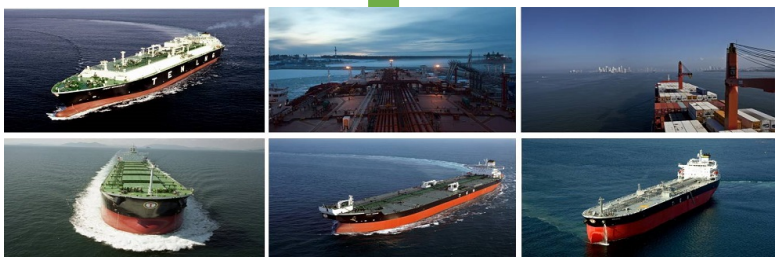
Machine Learning based Analytics

Data Security

Date Acquisition

Data Transformation





# ROADMAP


IotaSmart device V1. Telematics, Vehicle health and reporting

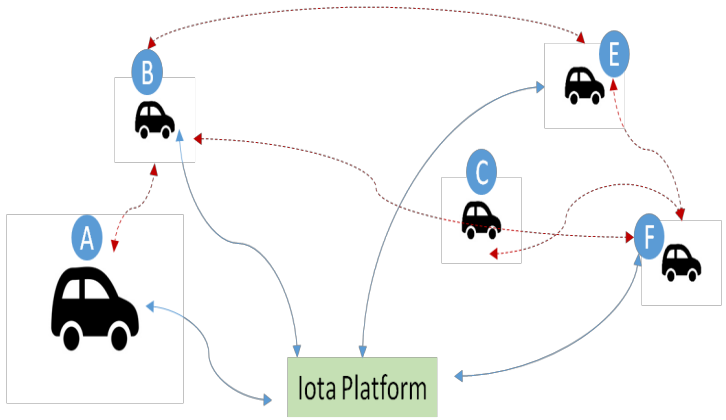
iotaSmart platform as a service

Prediction and Prescription platform

IotaSmart device V2

Integration with vehicle infotainment P3 dashboard

Inter-connected vehicle platform




# iotaSmart DELIVERS


- Intelligent Real Time Analytics
- Dynamic Dashboard for Prediction and Prescription
- KPI's based Analytics for Web and Mobile App
- Advance Engine Diagnostics
- Accurate Driving Log, Trip Tracking and Playback
- Driving Behaviour Alerts and Recommendations
- Fuel Efficiency Tracking Reports
- Anti Theft Solution
- Idling Alerts and Trends

# OUR PRODUCTS

**iotaSmart 301**: OBD with RFID card for Driver based Analytics


**iotaSmart 201**: OBD for vehicle diagnostics and driving behaviour


**iotaSmart 401**: OBD for vehicle diagnostics, wifi hot spot, driving behaviour, and fuel sensor solutions


**iotaSmart 101**: Blue Tooth based OBD for vehicle diagnostics and driving behaviour


**iotaSmart 251**: GPS for location and driving behaviour with extension for fuel sensor solutions


**iotaSmart 551**: Sim based GPS for location and driving behaviour with extension for multi Camera & fuel sensor

# CREATING A UNIQUE USER EXPERIENCE

iotaSmart

## Connected Vehicles

Connecting vehicles into one smart network for Driver Analytics, Vehicle Location, Trip Analysis, Fuel wastage, Emission, Infotainment

## Vehicle Health Monitoring

Real time monitoring of the various critical vehicle components such as engine, tires, brakes, etc & Diagnosis for predicting the Time to Failure

## Service Integration

Integration with right service station for maintenance & alerts. Also, creating a Predictive Supply and Demand Mapping

## Safety & Security

eCall and bCall integration for driver and family safety, sharing location with family, fence alerts

## Design by Driving

Vehicle design transformation using live vehicle and driver behaviour and analytics based on historical information

## Connected Insurance

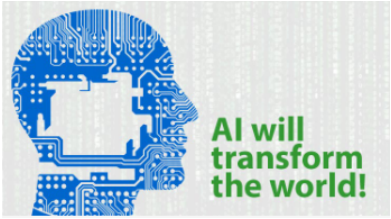
Providing the Right priced insurance based on driving behaviour leading to lower claims

# YOUR iotaSmart ADVANTAGE

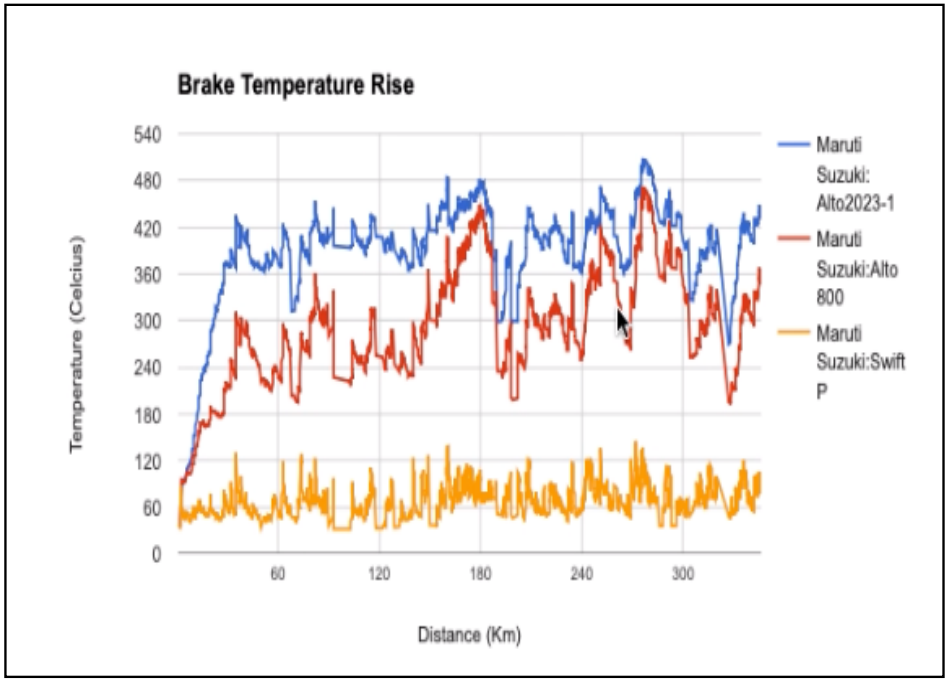
## A REAL COMPETITIVE EDGE

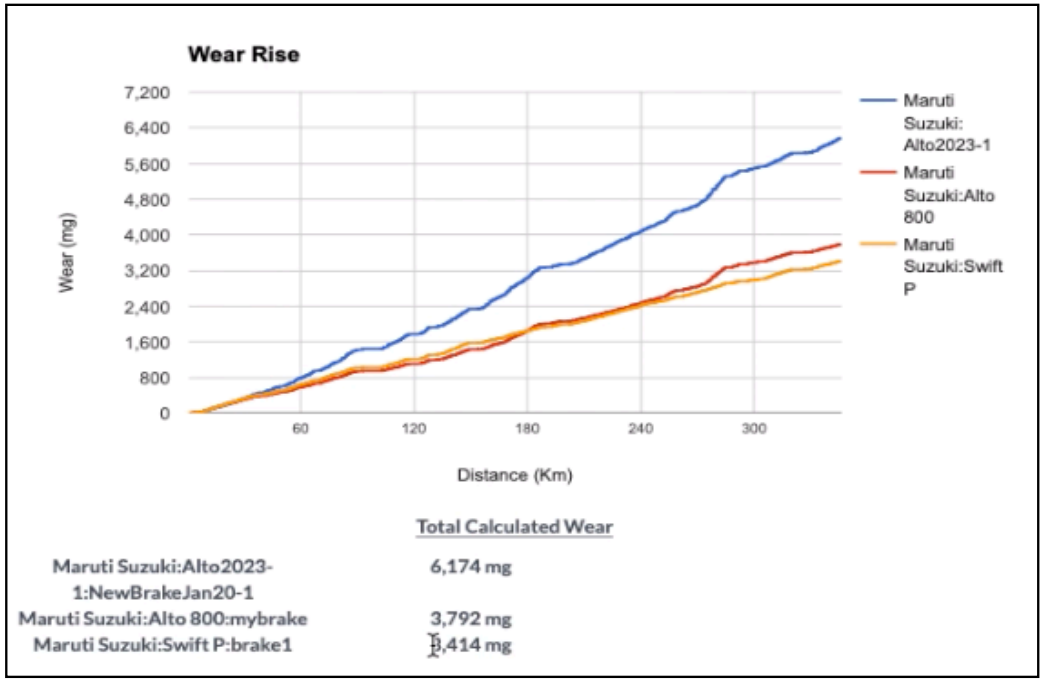
- *Operational efficiency and reduction in maintenance spend by **5-7%** using Machine Learning and AI (more than **JUST a MAINTENANCE SOLUTION**)*
- *Competitive Performance (more than **JUST a TELEMATICS SOLUTION**)*
- *Real Time Customer Connect (more than **JUST a CUSTOMER CARE APP**)*
- *Real Time System Design and Testing (more than **JUST a SIMULATION TESTING**)*

# MACHINE LEARNING BASED VIRTUAL TESTING




## ANALYTCS FOR PREDITING BRAKE LIFE

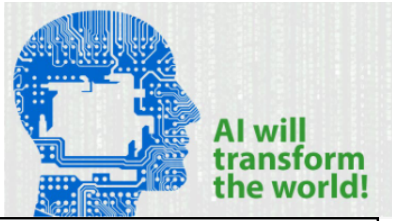


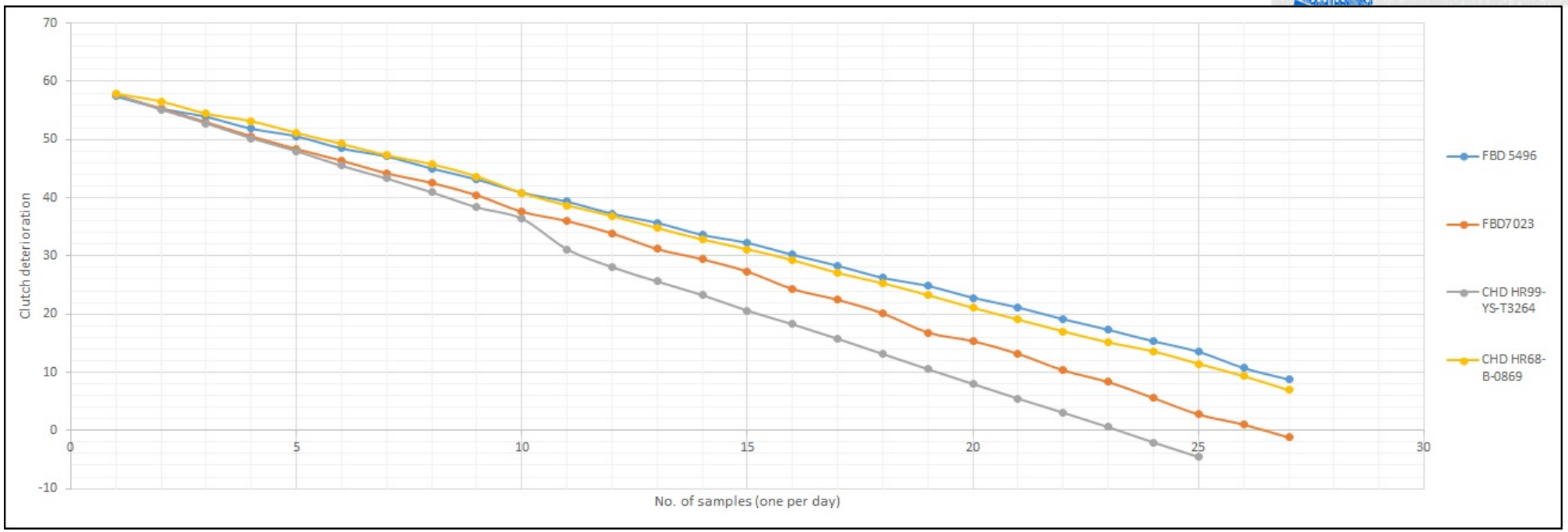

| | Total Calculated Wear |
|---|---|
| Maruti Suzuki:Alto2023-1:NewBrakeJan20-1 | 6,174 mg |
| Maruti Suzuki:Alto 800:mybrake | 3,792 mg |
| Maruti Suzuki:Swift P:brake1 | 3,414 mg |

View the Solution on YouTube : https://www.youtube.com/watch?v=M3TJb7tp56s&t=62s

# MACHINE LEARNING BASED VIRTUAL TESTING




## ANALYTCS FOR PREDICTING GEAR LIFE

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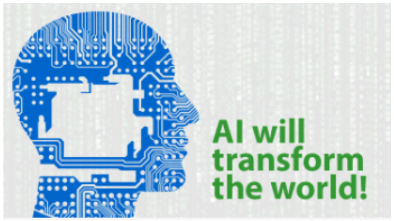
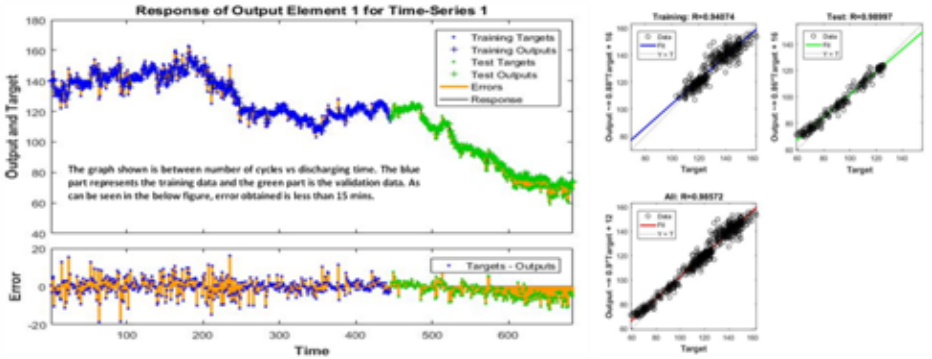
# MACHINE LEARNING BASED VIRTUAL TESTING




## ANALYTCS FOR PREDICTING GEAR LIFE

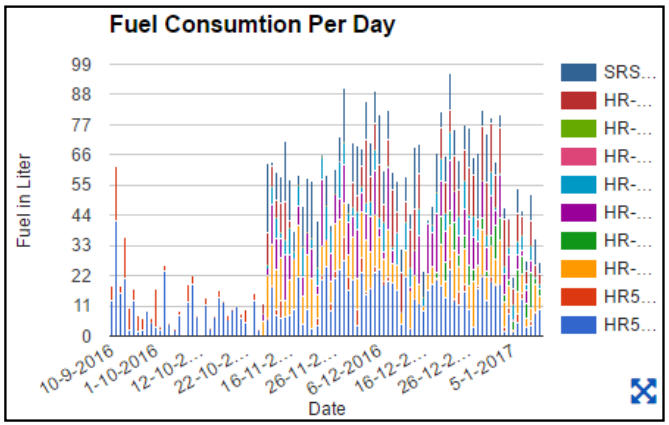
- The **time to discharge (in minutes)** of the **Lead-Acid** battery for the **End of Life (EOL)** was taken as an output of the model. Different training parameters were tried out on the available dataset.
- 70% of the dataset was considered for training the ANN model and 30 % of the dataset was considered for testing the same.
- Various pre-processing techniques were used to eliminate the garbage data.

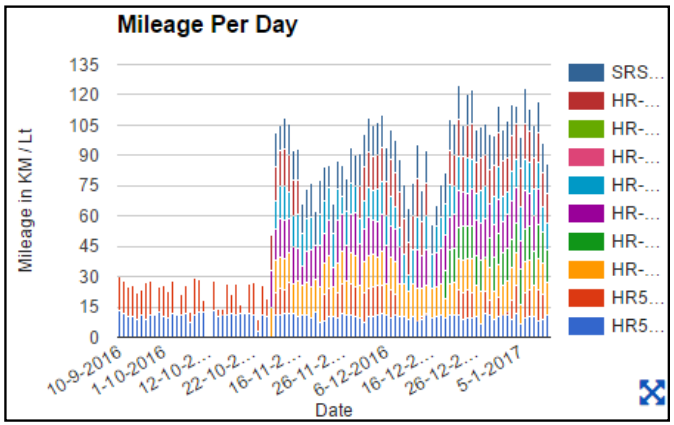


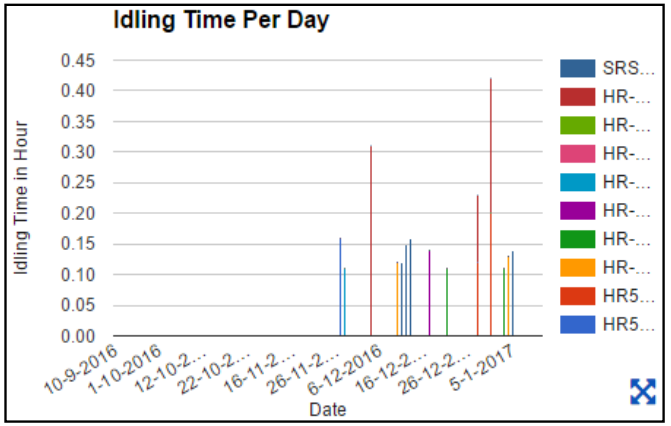

iotaSmart can predict with high degree of accuracy the remaining useful life of a battery

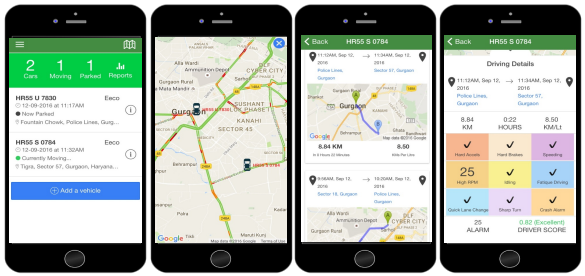
View the Solution on YouTube : https://www.youtube.com/watch?v=M3TJb7tp56s&t=62s

# iotaSmart ANALYTICS

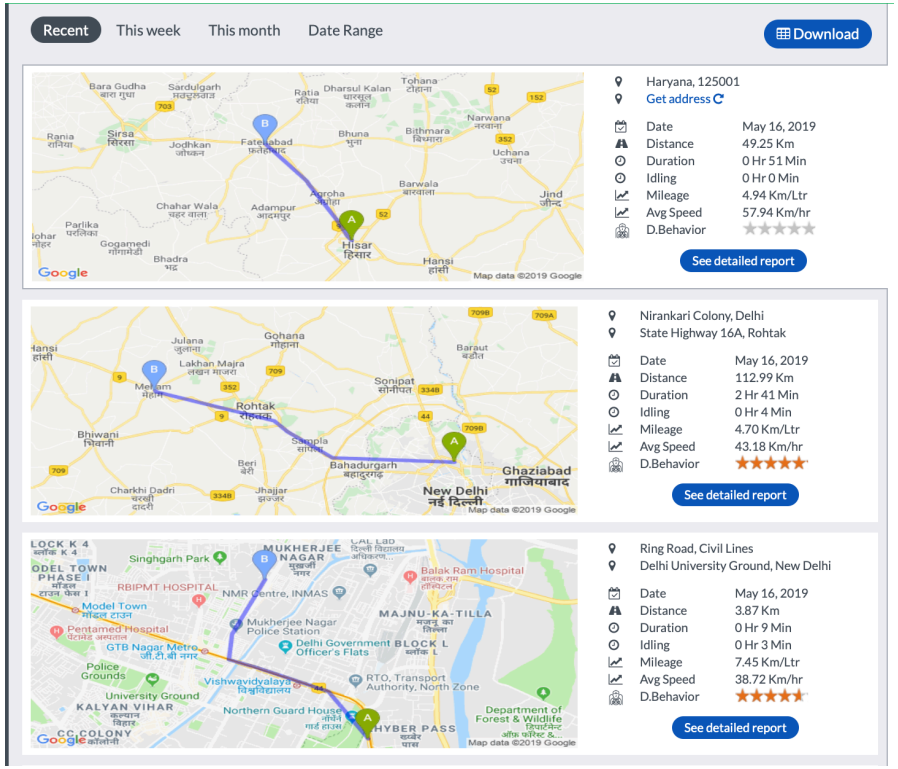


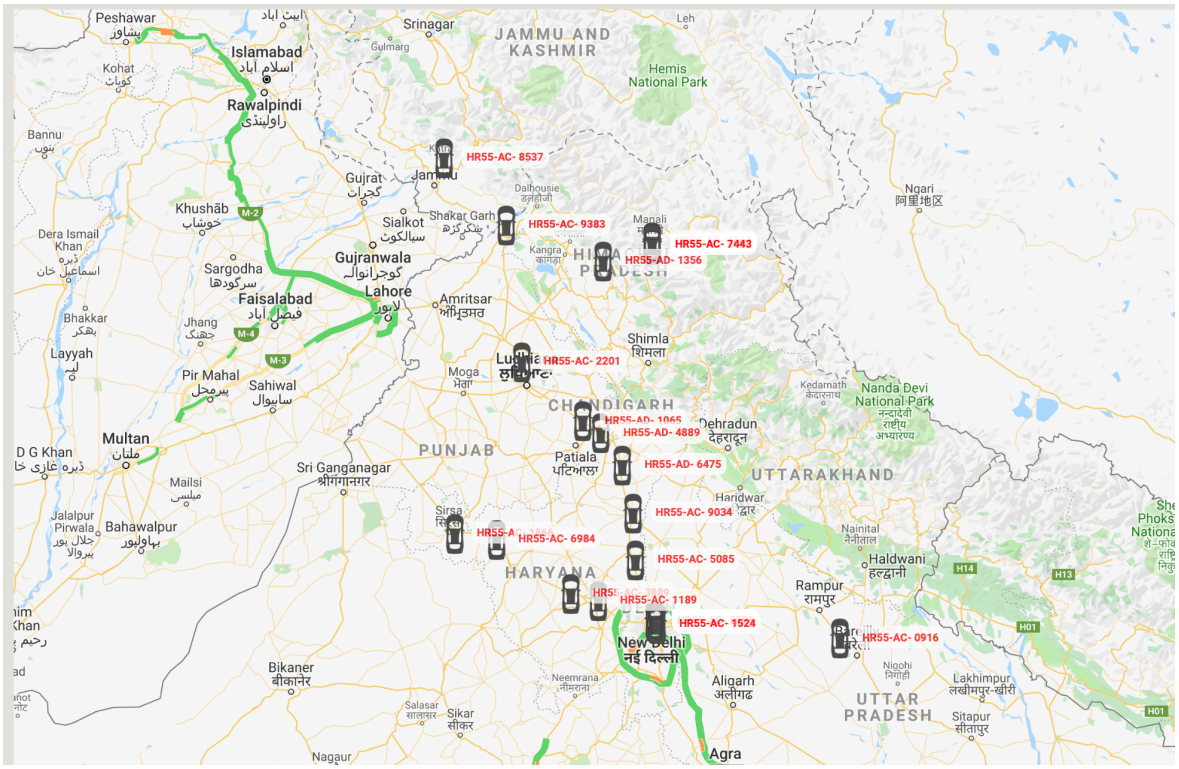



# iotaSmart ANALYTICS




TRIP REPORT

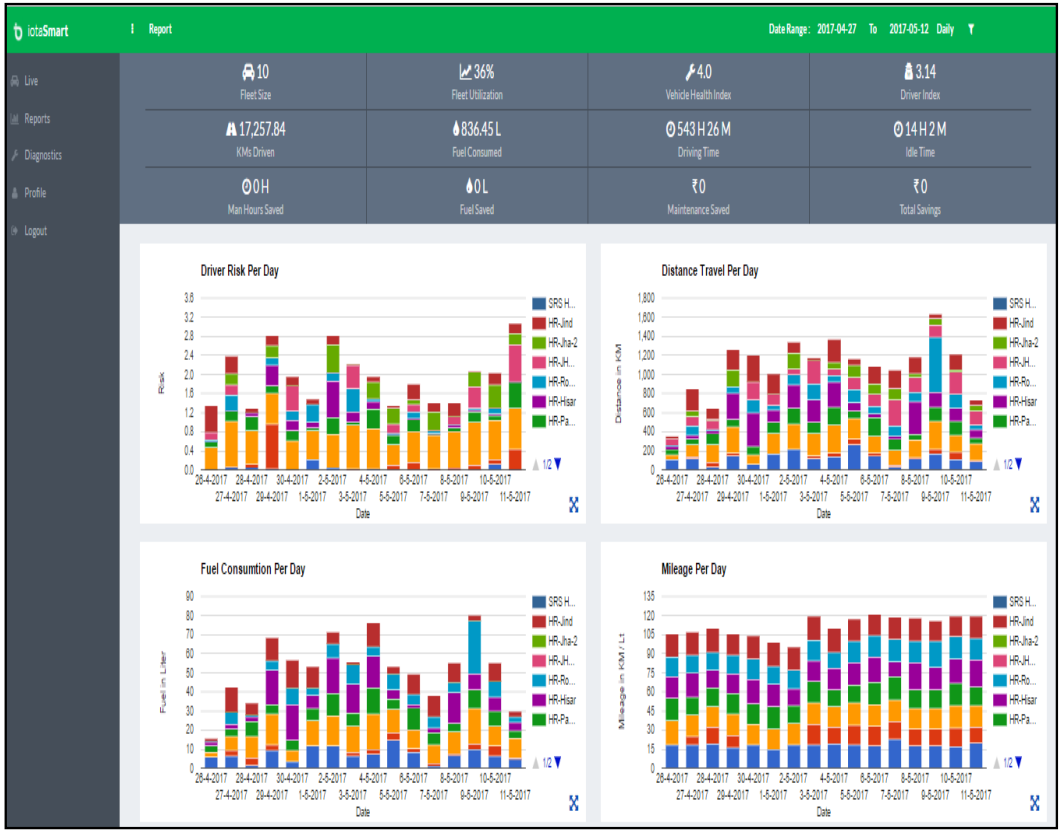



MAP VIEW OF THE FLEET

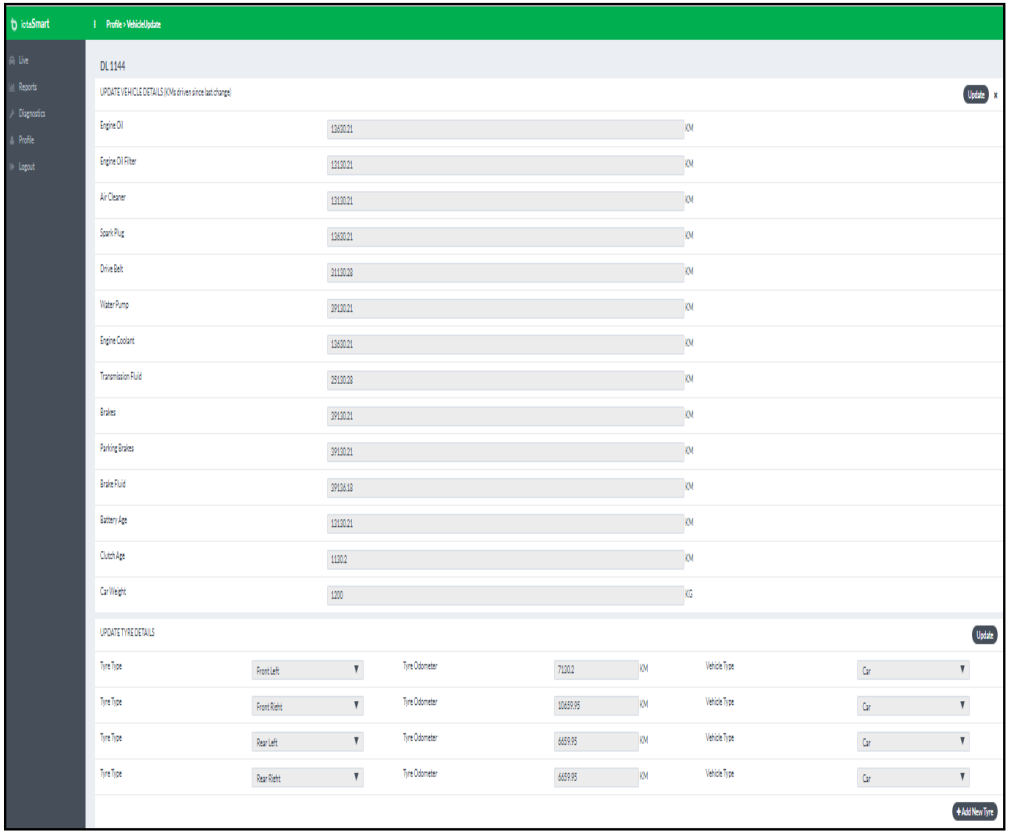
# iotaSmart ANALYTICS


VISUAL DATA ANALYTICS

# iotaSmart PREDICTIVE ANALYSIS

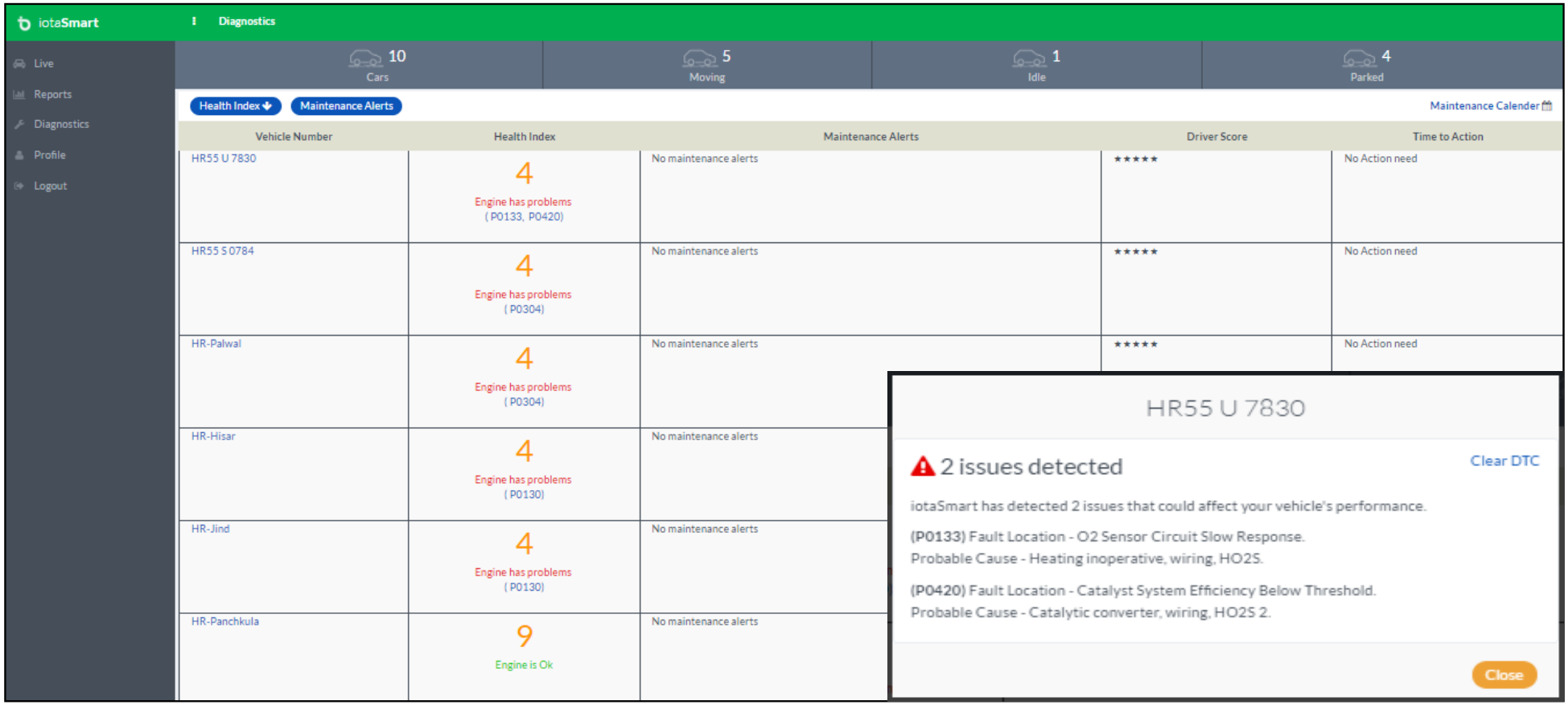



FLEET DASHBOARD



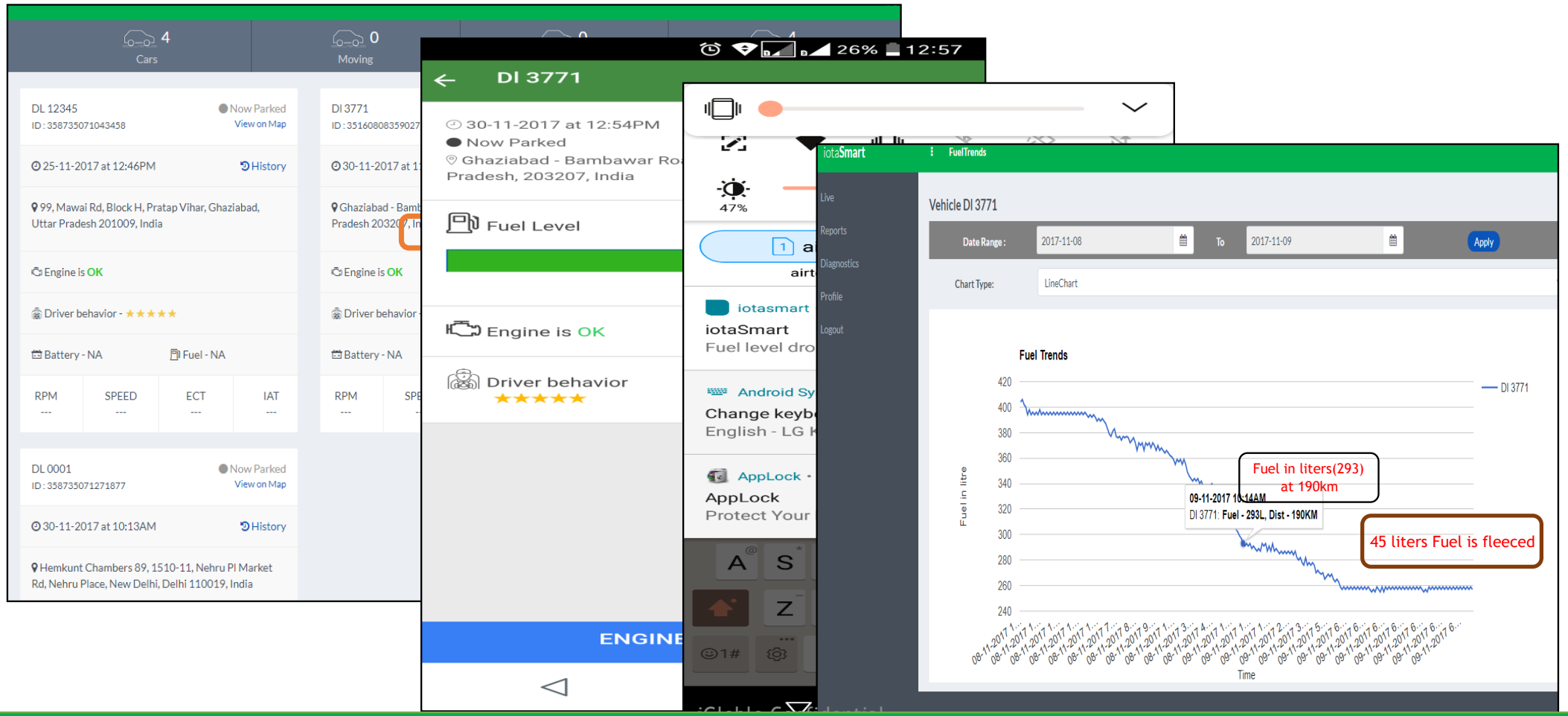

VEHICLE CONFIGURATION FOR PREDICTIVE MAINTENANCE

# iotaSmart PREDICTIVE ANALYSIS




ENGINE DIAGNOSTICS

# iotaSmart FUEL SOLUTIONS



# THE JOURNEY BEGINS…..


- Over 1200 Connected Devices with more than 7 Million miles of network
- Over 100 GB of Vehicle data

## CITATIONS

MJETS BESPOKE AVIATION

Su-Kam

National Health Mission राष्ट्रीय स्वास्थ्य मिशन

MTC PAMP

BOSCH Invented for life

HR Haryana Roadways

# CASE STUDY 1 – HARYANA STATE TRANSPORT

**Business Problem**

- Losing $83m yearly
- Load factor (70%) is low
- Staff bus ratio is high
- Staff productivity is low
- Low vehicle productivity
- Inefficient in fuel consumption

**Solution Deployed**

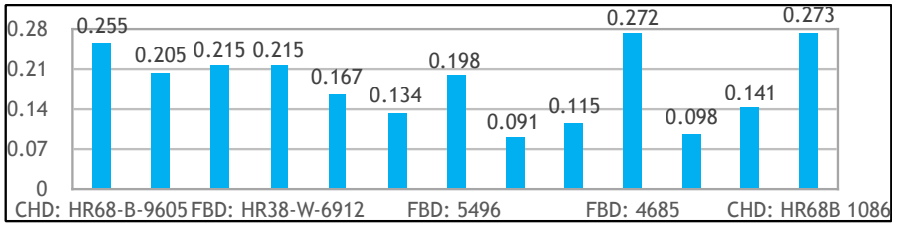
**iotaSmart Platform**

- Studied last 2 year operational spend
- Compared with best in class state transport systems
- Identified the gaps in kmpl, vehicle utilization, staff productivity, and route optimization,
- Developed a 3 year roadmap to turn around the organization
- Connected OBD devices to BS IV buses for operational efficiency and connected maintenance

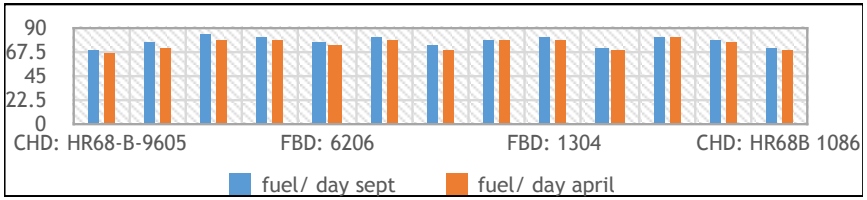
**Business Impact**

- Target to turn the organization into a profitable one
- Improve vehicle utilization by 5% across the fleet (increased the revenue of $600K per year)
- Improve kmpl by 8.5%. ( Savings of $450K per year)
- Decrease 2.7 litres per Bus per Day
- High value driven for customer satisfaction.

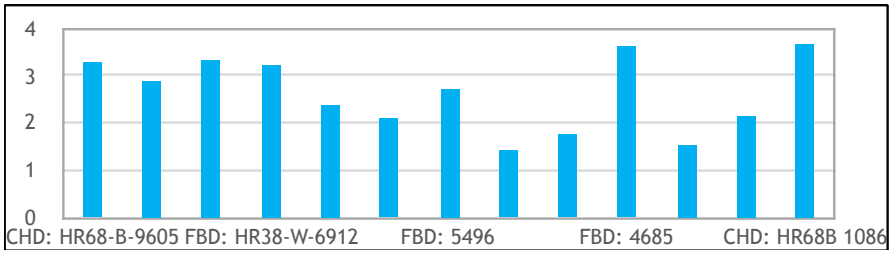
INCREASE IN km/l




FUEL CONSUMPTION / DAY




REDUCTION IN FUEL CONSUMPTION



# CASE STUDY 2 - STATE AMBULANCE FLEET NETWORK

**Business Problem**

- High maintenance spends and is trending up
- Low fleet utilization (less than 80%)
- 2.5 patient calls per vehicle per day (Target is 4 calls)
- High fuel consumption
- Unknown driver behaviour which cause high risk
- Real-Time Live location tracking of all vehicles

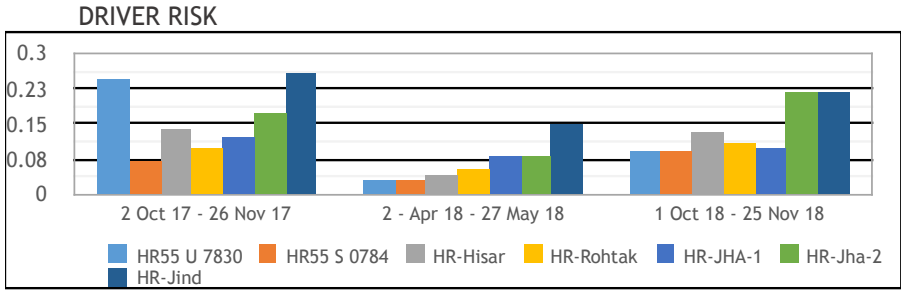
**Solution Deployed**

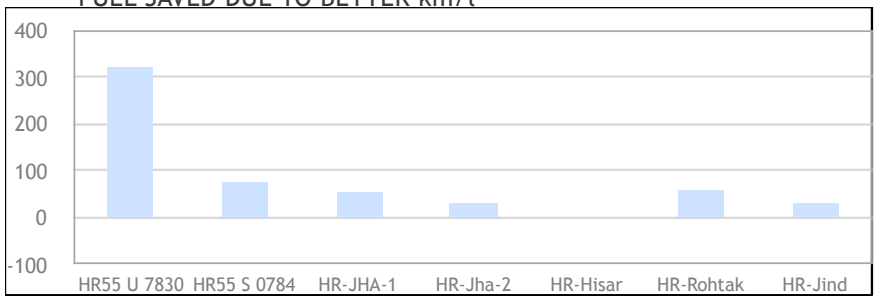
**iotaSmart Platform**

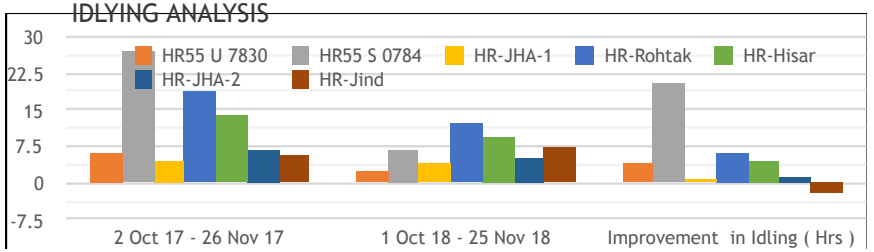
- Connected OBD devices to the vehicles
- Came up with a statistical model with empirical relations and transfer functions
- Analysis was conducted across several models of membranes
- Tracking and analysis the driver's behavior to improve the maintenance spend and customer experience

**Business Impact**

- Improve vehicle utilization by 7.5% for selected vehicles.
- The Vehicle utilization is increased to 90%
- Lower the fuel consumption by 5.6% for selected vehicles
- Improvement in KMPL from 9.7 to11.05 respectively over the last one year(potentially saving $200K per year)
- Published weekly driver behaviour to reduce the risk
- Published Predictive maintenance of vehicle



# CASE STUDY 3 - PRIVATE LOGISTICS COMPANY

## Business Problem

- Loss due to inappropriately managed dispatching and routing
- Unofficial usage of vehicles in between assigned duties
- Unexpected vehicle breakdowns over long routes
- Low quality customer service
- Low vehicle utilisation ( less than 50%)
- Inefficient in fuel consumption ( mileage 2 kmpl)

## Solution Deployed

**iotaSmart Platform**

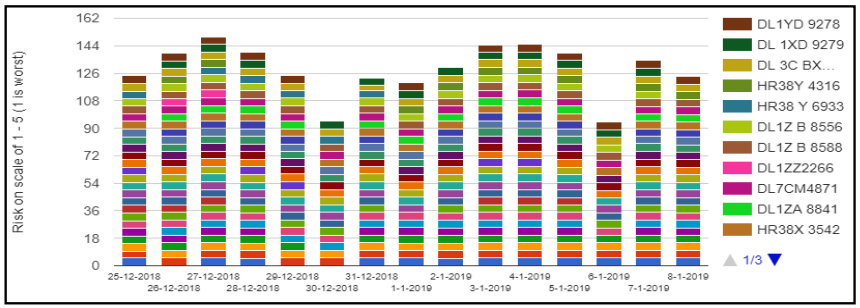
- Made GUI for assigning duties for proper dispatching and routing with real-time update
- Published maintenance calendar to be proactive about maintenance
- Real time location update of all fleet in one platform to see and assigning duties effectively and efficiently
- Developed alert system to check unofficial usage
- Cost analysis/assessment and Data-Driven Decisions

## Business Impact

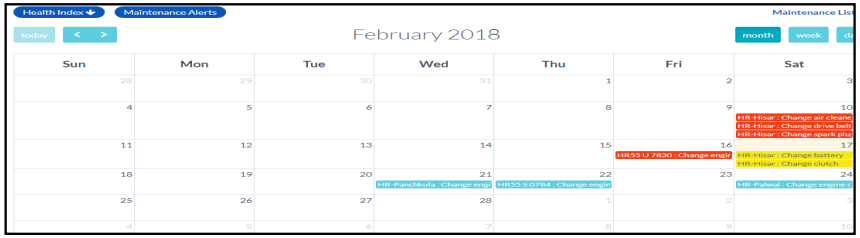
- Improved vehicle utilization by more than 65% across the fleet(increased revenue by $275K per year)
- Improved kmpl by 8-10%. (Saving 45 litres of fuel per month )
- Improved staff productivity by 25%
- Minimized accidents by identifying risky driver behavior
- Maintenance Savings of over $120k per year
- Saved more than $150K per year by Better Record-Keeping, reducing paperwork and administrative resources

FLEET REPORT


DRIVER RISK PER DAY




MAINTENANCE CALENDAR



# Thank you.

iotaSmart

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amit@igloble.com