IOT

The Internet of Things (IoT) describes the network of physical objects—"things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

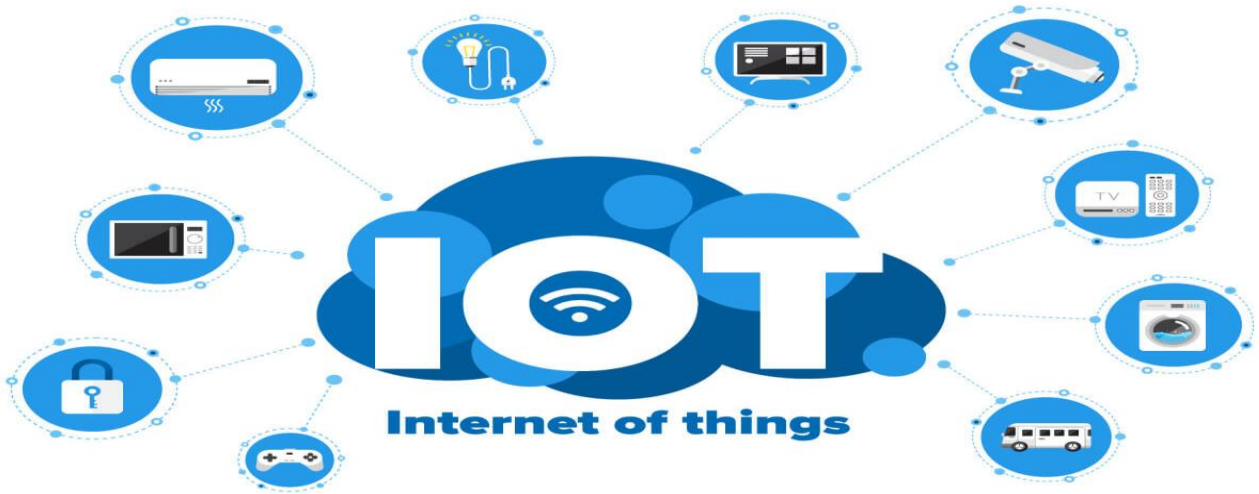

Fig (1) – IOT

TESLA OVER THE AIR(OTA)

- Tesla's over-the-air (OTA) update is like magic for cars…..!
- advanced software and hardware
- These updates can include improvements to performance, new features, bug fixes, and even changes to the user interface.
- digital makeover.
- no visits to the mechanic or manual installations.
- The updates are seamlessly downloaded and installed, making the whole process super convenient for Tesla owners.
- It's a great example of how technology is transforming the automotive industry.

Fig (2) – over the air (OTA)

IOT Based Battery Management System

- Eco -friendly , non-polluting and cost effective.
- When we think of a solution which matches these criteria is non-other than an EV (electric vehicle).
- The main component which makes a vehicle Electric is the battery.
- Lithium-Ion batteries.
- under-charge or over discharge
- over charging which might lead to fire accidents.
- Battery Management System abbreviated as BMS.
- propose to build a better BMS.
- The present BMS is inefficient and inadequate as far as technological implementations are done.

WHAT TECHNOLOGY INTERVENTION IS BEING PROPOSED BY YOU TO ADDRESS THE PROBLEM DEFINED

- The BMS proposed by us deals with:

a. The over charging of the batteries.

b. Under-charge or also call over discharge of the batteries

c. Rise in temperature of the batteries.

d. Based on the measured values, it is possible to find the anomalies in each individual cell. If required, that cell can be disabled and the accident can be avoided.

- And most importantly,

a. The real time data like present charge percentage, current consumption, temperature can be visualised on a display or dashboard using the latest IoT technology.

- This will enable us to monitor the battery health in real time and generate alerts in real time before the catastrophe can occur. And as the data is recorded and stored on a Cloud using IoT modules.

New BMS

- In simple words we can reduce the hazards that are occurring due to electric vehicles.
- We will reduce the battery replacement cost in long run and reduce battery over charging and under charging.
- The user will be able to monitor parameters like battery health, battery efficiency, and temperature of the battery before any accidents.
- All these data will be monitored using IoT and will be stored in cloud for user purpose

Usage of hydrogen oriented batteries

- We can save the lithium metal that is present in very limited quantity on the earth.
- And also we can uplift the EV technology and go eco-friendly by saving huge amounts of petrol and diesel.
- We can also reduce the cost of vehicles in the long run and also contribute to the development of the country.
- Hydrogen batteries offer innovative zero-emission solutions for electric vehicles.

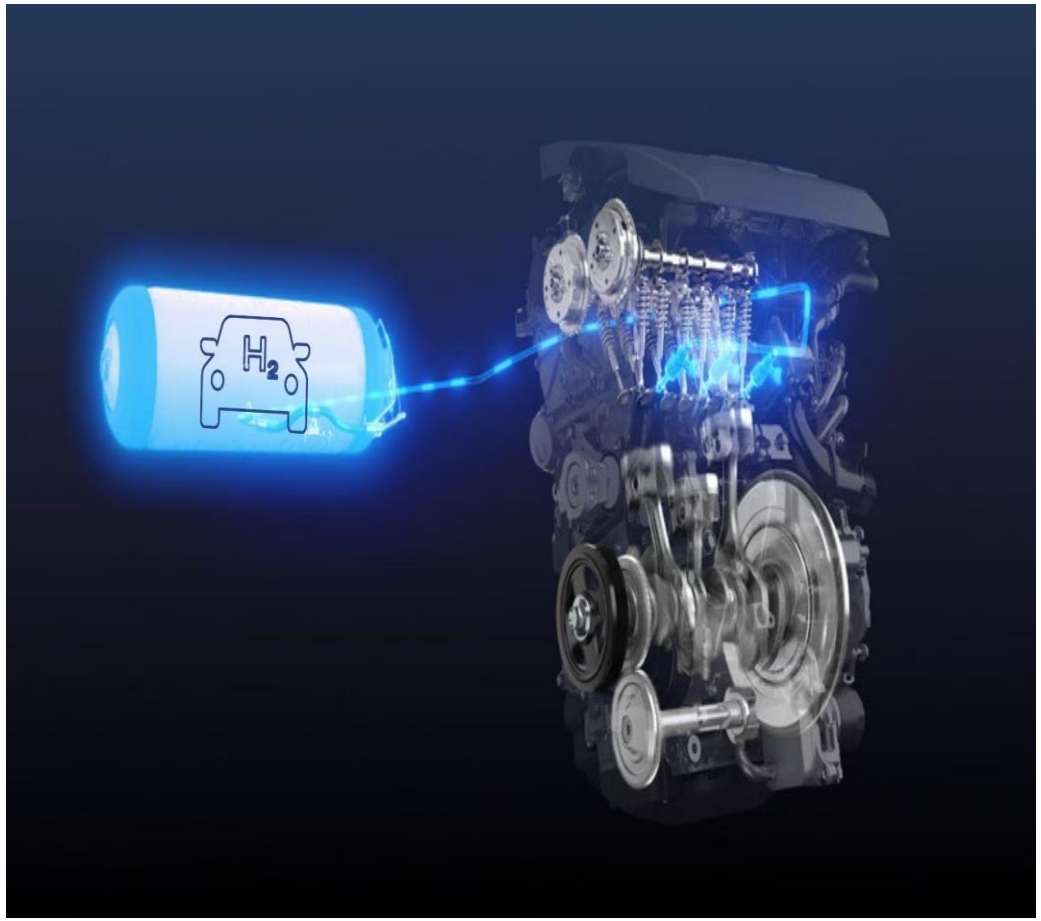

Fig (3) – hydrogen oriented batteries

Reducing Driving Range

1. **Battery Degradation:** In the case of electric vehicles, the battery's capacity can degrade over time due to various factors such as temperature, charging habits, and the number of charge-discharge cycles.
2. **Extreme Weather:** Extreme cold or hot weather can have a significant impact on an EV's range. Cold temperatures can reduce battery efficiency, while hot temperatures can cause batteries to overheat, reducing their capacity.
3. **Charging Infrastructure:** The availability and type of charging infrastructure can affect the practical driving range of an electric vehicle. Limited charging options may require more conservative driving to ensure you can reach your destination.
4. **Driving Habits:** Aggressive driving, high speeds, and frequent acceleration and braking can decrease the driving range of any vehicle, not just EVs.

Security

1. Double verification authentication and similar to that of social media accounts keep changing the password continually and should have strong account and unique password and keep changing the password alternatively in order to prevent hacking
2. Ethical Hacking and Security Research: Tesla actively engages with the security research community and encourages ethical hacking. This helps identify potential vulnerabilities and safety issues, which can be addressed before they become significant concerns.