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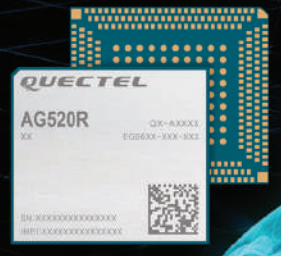

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World Environment Day "#OnlyOneEarth"

Log9 Materials is advanced battery technology and deep-technology startup headquartered in Bengaluru that is raising the EV industry's standards in the fight against climate change with its cutting edge and environment-friendly batteries, cells and advanced energy storage solutions. Log9's sole purpose is to Pioneer Responsible Energy, and through its initiative, the Responsible Delivery Movement, Log9 is leading an industrywide consortium of OEMs, aggregators, end-users, and other stakeholders to raise awareness about the threats of climate change and mobilizing the first and last-mile delivery ecosystems to combat it. Notably, Log9 has recently launched India's first cell manufacturing line that is indigenously developed and has alongside launched its TiB cells made in India – which will be the fundamental pillar for the mobility ecosystem in India and the world in terms of exerting a positive influence on the Planet in the times to come. On World Environment Day 2022, Log9 Materials has launched a campaign named "Made for them as well", aimed at showcasing how grassroots changes to the sustainable energy ecosystem cascade into widespread impacts on the environment and the planet as a whole.

Etrio is a Hyderabad-headquartered renowned EV-maker, is working with a mission to electrify cargo vehicles used in logistics and transportation. As the entire world is now transitioning to cleaner and greener forms of mobility, India cannot lag behind. To this end, electric vehicles are a cleaner alternative that produces significantly lower carbon emissions over its lifetime as compared to conventional ICE vehicles. In making India at par with its global counterparts when it comes to e-mobility transition, Etrio has developed a product portfolio of electric three-wheeler vehicles and industry-first electric four-wheeler light commercial vehicles; till date, Etrio's zero-emission vehicles have accumulated cumulative mileage of over 4 million kilometres on Indian roads. Over the years, Etrio has gained the trust of several leading e-commerce and logistics players such as Amazon, Flipkart, IKEA, Big Basket, Delhivery, LetsTransport, Gati, and many others, supporting them in electrifying their fleets across India.

Zyngo EV Mobility is a hyperlocal tech-enabled third-party logistics service provider (3PL) headquartered in Delhi-NCR that is committed to bring clean mobility solutions for the nation's last-mile delivery. Zyngo plays a pivotal role in catering to the needs of B2B to B2C consumers, uses electric two-wheelers and three-wheelers, and is looking to serve their daily logistics needs. It meets the demand requirements of the country's last-mile delivery space using new-age technology and fleet management. The platform ensures on-time deliveries using Zyngo MIS app, an IoT- controlled and GPS- driven fleet. With its delivery fleets, Zyngo provides cost efficiency of upto 35 per cent to end-users and leaves zero carbon footprint. Zyngo has already saved over 10,504 tons of carbon emission using its EV fleet since 2020, and plans to deploy over 18,000 EVs across India in the current fiscal year. Committed to drive forward the green movement in logistics, Zyngo is pioneering the concept and implementation of 'Green-Mile Delivery' in India using electric mobility. Notably, Green-Mile Delivery is a novel idea spearheaded for the first time in India by Zyngo, wherein the company's skilled and trained gig workers (drivers/riders) are consistently making on-time grocery and food deliveries by optimally using Zyngo's advanced logistics-tech platform and its fleet of EVs; but in doing so, they are completely carbon-neutral and have zero harmful tailpipe emissions.

Trends in Connected Mobility

VINAYAKA NAGARAJA
Continental Automotive India

The automotive industry is undergoing significant digital transformation, which will affect both in-vehicle technologies and how the vehicle interacts with passengers, the environment, infrastructure, and other vehicles on the road. Vehicles are now much more than just a way to get from one place to another.

Connectivity and smart mobility are thus critical components of this transformation. Connected and smart mobility technologies such as navigation, GPS, and smart access are already standard features in modern automobiles. However, this is only the beginning of the transformation. Connectivity is important for cars to perform complex tasks and on-demand information that improves the overall experience of drivers. Integration of smartphones has become one of the most demanding features for consumers today. As connected technologies in vehicles become more prevalent, so will software in vehicles.

A connected car has the potential to dramatically transform how we interact with our vehicles and how they communicate with the rest of the world. With the deployment of 5G technologies, according to the Ericsson Mobility Report*, the automobile industry will be among the top four industries for 5G enabled service provider opportunities by 2030.

5G will be a crucial enabler technology for future mobility, providing significant network enhancements and benefits. Real-time communication between vehicles, infrastructure, and an ever-growing number of connected devices will be possible because of increased data speed, improved dependability, and ultra-fast reaction times. As a result, 5G will assist to improve driving safety, comfort, and efficiency even more.

One example of how this will work effectively is CoSmA with Ultra-Wideband technology, which has already proven its success in 5G and Vehicle-to-Everything (V2X).

CoSmA makes the smartphone a digital vehicle key, effectively replacing conventional key fobs. It allows the user to access, unlock and start the car using his or her smartphone. The onboard architecture of the CoSmA solution also features a central electronic computer unit with a state-of-the-art secure element as certified secure storage for any digital vehicle key application. The vehicle owner can generate and manage multiple digital keys, and share them with friends or family.

Transformation of Vehicles as Moving Data Centers

Modern cars resemble a moving data center. Currently, the electrical/electronic (E/E) architecture of vehicles is transforming. Instead of the complex network of a growing number of Electronic Control Units (ECUs) and microcontrollers, a powerful server architecture provides all the electronic vehicle functions. Earlier, almost every single function or functional area was integrated into the network with a dedicated ECU. This has led to a very heterogeneous and complex architecture of embedded systems, which was no longer suitable for further innovations such as the connection of the car to the Internet of Things (IoT).

As long as the vehicle had been an "island network on wheels", the complex network of individual ECUs was not a problem. But for the car to be able to provide its occupants with digital services, communication tools, and infotainment, it requires a new E/E architecture. With the existing network structures, it is difficult to connect functions across domains and via a wireless interface to the Internet or the Cloud. Updates over-the-air (OTA) are limited to specific functional areas, while a significant increase in the functional scope of the complete vehicle usually comes with a facelift or even a new vehicle generation. Current E/E architectures cannot fulfill the

customer's wish to personalize and adapt the car to their convenience. This illustrates that the "one ECU – one function" approach has probably had its day.

Software plays a crucial role

To enable the foreseeable trends, future E/E architectures must be centered around powerful software architectures to drive a strong function and service-oriented set-up, whereas a limited number of high-performance computers (HPCs) or servers provide the capabilities for the necessary functional centralization. HPCs, supported by zone controllers, further form essential elements in new E/E architectures to handle the input/output (I/O) logic to the sensors and actuators, as well as for time-critical functions. One example of such a server is our Body High-Performance Computer, which combines gateway functionalities with the functional scope of a body controller.

On the hardware side, the HPC includes a microprocessor with external memory and multi-core technology. It provides high-speed data interfaces and uses hypervisor technology to support virtualization. The middleware also supports Gigabit Automotive Ethernet, providing the necessary data throughput for the applications. The high-performance computer fulfills central requirements such as consistent hardware-software separation using the basic software developed by Elektrobit based on AUTOSAR adaptive, virtualization (multiple operating systems on four virtual ECUs), functional safety (ASIL, non-ASIL), the requirement for new business models and the integration of numerous software sources.

Zone Control Units – Essential elements for tomorrow's vehicle architectures

A central driver of the transformation of the E/E architecture from multiple ECUs to an HPC server infrastructure is the introduction of a new intermediate layer with zone control units (ZCUs). ZCUs can be used to "clean up" existing E/E architectures, to reduce the number of ECUs and the weight of the wiring harness. It must be managed by an HPC. The more the central computing power of the vehicle is being concentrated in a few HPCs, the more important become zone controllers that ensure the reliable execution of the vehicle functions. ZCUs serve as intermediaries between high-performance computers and sensors or actuators. Thereby, each ZCU integrates functions from different domains in a specific zone and serves as a hub for the power distribution and data connection requirements for the connected devices.

Instead of connecting every sensor, peripheral, and actuator directly to a domain controller, they are linked to a local zone controller. The ZCU takes over functions for the respective area of the vehicle for which it is responsible. In this way, the ZCU relieves the HPC of functional surgical effort so that it can concentrate on its actual task, acting as the "electronic brain" for data and functions management in the vehicle and beyond. In addition, the ZCU performs local data transformation, aggregates the data, and forwards it to the HPC via Ethernet network. This setup allows the ZCU to take over the control of the connected devices cross-domain, whereas the HPC can concentrate on the processing of the information. The introduction of ZCUs "frees" the software from the hardware and creates the prerequisite for continuous updates and improvements to the "lifelong learning" vehicle. Continental offers a scalable platform to meet all market requirements.

Automotive Cybersecurity: Beyond Mobility

As we move towards connected plants and advanced technologies, it opens us to new threats and vulnerabilities. Any information that travels through the internet is susceptible to a cyber-attack. For example, when manufacturing data migrates from Operational Technology (OT) systems on the factory floor to interconnected Information Technology (IT) systems in the corporate network, new risks evolve. This data is now more vulnerable at this stage. Cybercriminals could potentially gain access to intellectual property, shut down systems, disrupt production timetables, and affect product quality.

The manufacturing setting needs to be considered a fully integrated setting, even if some processes are not integrated into the Internet. Although many breaches start in IT networks, the hackers or attackers may jump into other parts of the setting through connected devices. Furthermore, some connected devices may include information about the non-connected process.

A secure supply chain ecosystem also requires diligence toward proper vendor management. Any third parties that have authorized access to the company's network can become unwitting avenues of attack. A bad actor who steals any login credentials of a third party could potentially gain access to the company's network by pretending to be an authorized user.

The rise of EV

The pollution levels in the country are rising at an alarming rate, especially in developing countries. Switching from traditional fuels has become an important step and this transition is gradually taking place. Electric vehicles (EVs) are the way forward. While it may take some time to transition to a zero-emission vehicle, EVs are unquestionably the more sustainable option with lower lifecycle emissions. Furthermore, the operating costs of EVs are significantly lower than those of ICE engines. To accelerate the transition to EVs, India has launched programs such as FAME I, FAME II, and various tax breaks to encourage the use of electric vehicles. The benefits and government push have sparked some interest among consumers in adopting electric mobility. ❑

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Enabling business efficiency across industries with fleet technology including video telematics

SHRIDHAR GUPTA & VIDIT JAIN
LocoNav

Emerging technologies today have a transformative impact on businesses across the globe. Be it enterprise or consumer facing landscapes, these technologies have transformed our product, service, and information consumption pattern. With trillions of bytes of data floating in the virtual world every second, businesses have started to maximise their operations by building and adopting new technology architectures that have a positive impact on the bottom line. For businesses that depend on commodities, products, raw materials, services, and even people, fleets are the beating heart of its operation and in this domain. Fleet tracking technology coupled with video telematics is catalyzing positive disruptions across industries worldwide. It is not surprising that the global fleet management software market is expected to grow by 3.7X between 2022 and 2029 at a CAGR of 18.3% (Fortune Business Insights).

The concept of fleet management has existed for many years to manage the delivery of goods from one place to another, manage the movement of public transportation such as buses, taxis, school buses, etc; vehicles employed in construction, mining, and agriculture, as well public services vehicles like ambulances, police vehicles, cash vans and more. Businesses in the earlier days used conventional methods like relying on fleet managers to perform all the tasks manually using pen-paper-phone. For several years, the fleet management business was run with the same rudimentary coordination system, making fleet tracking and driver management difficult and inefficient. With Internet of Things (IoT) and Artificial Intelligence (AI) driven fleet technology, businesses are moving towards addressing every aspect of fleet management enabling efficiency, safety and sustainability.

Gaps in the fleet management industry

In the last decade, industries dealing in movement of goods for long distances have been very sub-optimal as their fleet owners and operators had a difficult time tracking vehicles. The only ways of staying in touch with the driver was by calling them or using hardware that they had to view on different platforms for different types of visibility. What did this mean beyond lack of real-time information? It meant limited to no support for drivers in any untoward incident while in transit, potential for pilferage, damage of consignment, vehicle and driver safety challenges, and so on. All of this would tantamount to a major impact on business, with companies incurring extra costs and time losses. There was a huge gap that needed to be filled in the fleet industry as fleet owners were actively looking for simple yet powerful technology solutions to manage and improve their business.

Softwares available in 2015-16 were actually built in the 90s, hence the efficacy was limited, leading to business inefficiencies. These were largely disconnected systems, which led to fleet operators spending a lot of time figuring business on pen and paper while trying to integrate inputs from various places manually. Across global emerging markets, owners and drivers of over 250M commercial vehicles are faced with these challenges. For an industry that serves as the backbone of the global economy such challenges have an impact on end users and customers.

The new-age fleet tech product developed in western markets were beyond the reach of fleet operators in emerging markets owing to prohibitive pricing, hardware needs of the software, and network limitations. Hence, there is a growing need to democratize access to modern fleet tech in emerging market by addressing the aforementioned limitations.

Role of IoT in fleet technology

Today, IoT is not just another abbreviation we are aware of, it has now become an integral part of our day-to-day lives. A decade ago, most of us only knew about the concept of IoT and here we are in 2022, where IoT is involved in almost everything right from controlling your home appliances from outside your home to building smarter cities, improving public health, and combating climate change. The potential of IoT is limitless! According to Zion Market Research report on "IoT Fleet Management Market - Global Industry Analysis", the IoT-driven fleet management market is set to reach a market cap of $15,500 Million by 2024.

IoT has now become a necessity for every business - be it manufacturing, supply chain, banking, travel, logistics, or any other industry. IoT makes machines discoverable even from thousands of miles away, and combined with AI, businesses can take necessary action based on real-time data and insights. One of the biggest challenges faced

by fleet-driven businesses is to monitor the location, fitness, and performance of their vehicle, goods, and drivers. Technology-driven solutions, smart devices, sensors, and internet connectivity - these key elements help drive growth and opportunities for fleet operators. IoT enables interconnectivity between these devices and ground assets via cloud networks.

Integration of IoT and Telematics leading the way for fleet management

Telematics and IoT are together elevating the fleet technology offering for industries across the board. Video telematics has become an integral part of the fleet management ecosystem, providing fleet managers with detailed insights into how their drivers and vehicles perform. In combination with IoT, video telematics is enabling the development of new digital supply chains. By enabling the exchange of data, IoT is helping to ensure better road safety by reducing the risk of accidents, improving the flow of traffic, and reducing congestion. It also helps in cutting down CO2 emissions and improving urban air quality.

IoT can also help fleet owners gain a better understanding of telematics data, and put it to new uses. Coupling telematics with sensors and other AI-driven technologies can help in expanding the technological capacities of the fleet, delivering a wide range of benefits to fleet owners and their customers like weather prediction, extending the life of perishable goods by monitoring the temperature of the vehicle, and enhancing the efficiency of the vehicle in making deliveries.

Video Telematics improving the safety of drivers

Road safety concerns have been on the rise globally with the increasing number of vehicles on the road. As per a report by the World Health Organization (WHO), there are approximately 1.3 million reported deaths globally due to road accidents. Commercial vehicle drivers have to face many levels of challenges while on the road including the safety of the cargo, vehicle, and themselves. Road accidents by commercial drivers can take place due to different reasons, such as overspeeding, distracted driving, violation of traffic rules, flawed vehicle conditions, poor road infrastructure and more.

The role of telematics solutions has brought a huge change in the fleet management industry, with fleet owners and operators not having to rely on assumptions while making decisions in case of any incident or accident. With video telematics, fleet managers can get real-time video footage of road-facing events (such as tailgating, overspeeding, etc.) and driver-facing events (such as distracted driving, face ID, etc.). This enables fleet owners to design and implement training programs focusing on specific needs for improving the driver's performance. Moreover, constant reviewing & monitoring helps in building a sense of accountability among drivers. AI-powered sensors help fleet managers & operators to identify unsafe driving patterns, further reducing the risk against collision, vehicle speeding, etc. These solutions play a crucial role in securing the safety needs of a vehicle driver in a better manner.

Criticality of fleet technology especially in the emerging world

In developed nations, the industry has become very large over the past decade and several players offer sophisticated tech catering to drivers and fleet owners who are tech-savvy, enjoying better roads and networks, and overall are more organized.

In emerging markets, the industry is fragmented and spans a spectrum. It includes large enterprises which hope to get efficiencies of tens of millions of dollars by using the right fleet management solutions, and small business owners for whom their commercial vehicle is their sole livelihood. Fleet management to them can mean a better quality of life for their families and future generations. Combining this with the complexity of varied hardware, software, and telecom networks, fleet management companies of any kind vary in each market by type of solution provided and by scale. The focus should always be on bringing the fleet owners resorting to old-school devices and software to the world of accessible & affordable world-class technology-led solutions.

Future of fleet management industry

The key factors responsible for the growth of the fleet management industry are the increased government regulations, the need for optimization of fleet operating expenses, cost benefits from the decreasing hardware and software prices. Closer home, in India for example, the Government's progressive push for better connectivity and vehicle tracking through mandates encourages the use of telematics devices and fleet management solutions. As of today, more and more fleet owners & operators in emerging markets are beginning to understand the importance of IoT and AI-driven fleet management solutions. Additionally, with IoT & AI at its core, streamlining logistics operations will be predominantly SaaS-based. The core components of SaaS such as quick implementation, pay-as-you-go models, scalability, and Cloud security will allow businesses to grow without spending excessively on software.❑

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AI Transforms Driver Safety and Comfort: 4 Things that will Never be the Same

ABEL DAVID
Ignitarium

Introduction

AI is increasingly becoming a part of our everyday lives, across different domains. Have you ever thought about the possibility of a custom driver and passenger experience based on your unique and personal needs? Will AI eliminate the need for us to drive altogether? Would it provide a convenient alternative to all our 'on road woes'?

Right from prompts in the form of driver alerts on rash / distracted driving and driver drowsiness, to ensuring dynamic personalization of in-cabin preferences during the drive, to foreseeing system inconsistencies, AI is taking over multiple aspects of the experience of owning a car, from the basics of driving to the comfort of passengers in the vehicle. It all started with providing driver assistance for passenger and commercial vehicle segments, and then progressed into other areas, as we will see in this blog.

Let us close our eyes and imagine ourselves to be in a common driving scenario. You are changing lanes on the freeway, and suddenly, a blinking orange light on your side-view mirror and a loud beep alert you to a car coming alongside. This is an example of a blind spot detection feature, which is standard in vehicles with higher trim levels.

The automotive industry has started to incorporate more of such technology to keep drivers alert and accident-free. Multiple sensors and alert systems are used to help drivers prevent car accidents by alerting them about possible dangers, since most accidents result from human error. SAE's Levels of Driving Automation, Level 01 & Level 02 – the global standard for driving automation lists out other features such as parking-assistance, lane-keep assistance, and Adaptive Cruise Control.

However, AI technology has not yet evolved to levels of full automation here. Instead, the driver is responsible for monitoring and reacting to their environment and therefore we require a system that checks the driver for high self-awareness levels. Let us take up a few AI and Deep Learning based automotive applications that enable these.

Driver drowsiness and distraction detection

What about all those driver distraction activities that are now becoming increasingly common, because of the devices in our hands and the added entertainment systems in the car? Often, we see drivers texting, speaking on calls, talking to passengers or busy shuffling music. While paying

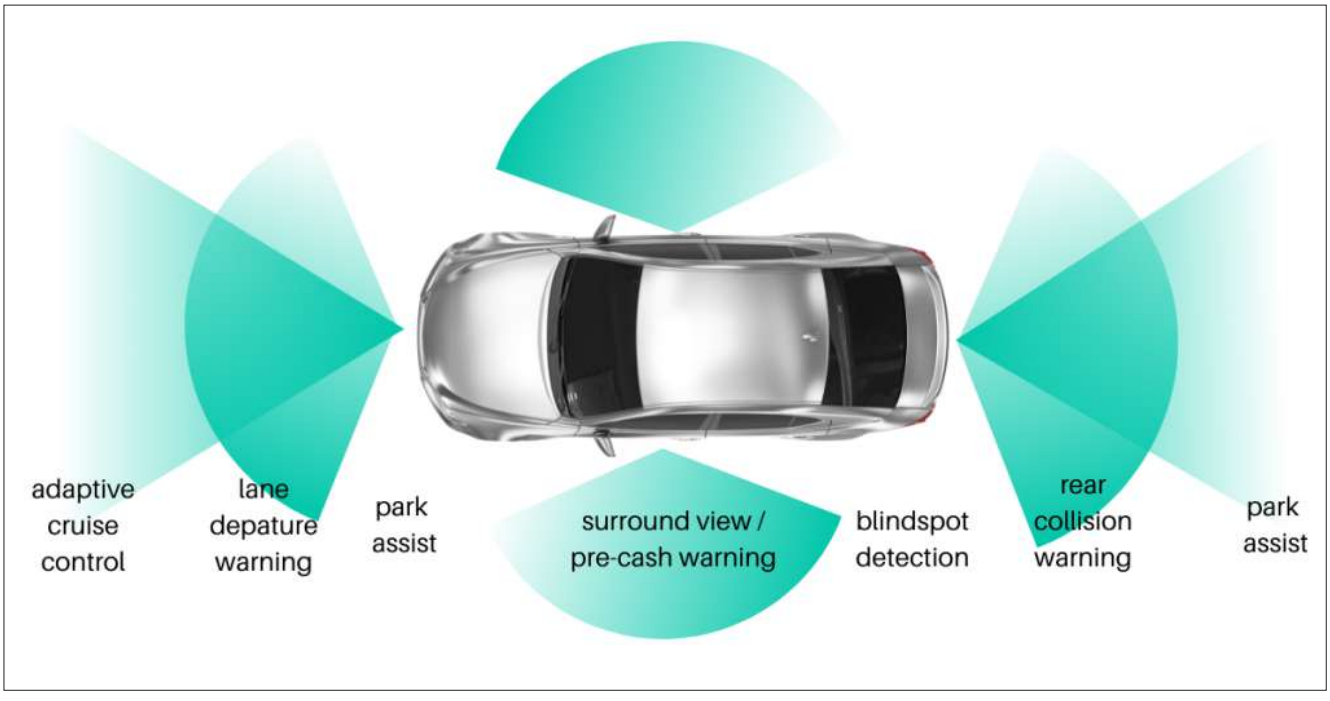

Figure 1: Features enabled with Advanced Driver Assistance Systems (ADAS)

attention to these tasks, their attention tends to shift off the road. Here is where machine learning-based Driver Monitoring System (DMS) apps can be used to trigger alerts to the driver in case of drowsiness detection and other distractions as above.

This is achieved with a mono camera facing the driver that streams video onto an AI-edge device that runs multiple convolutional neural networks (CNNs) for Face detection, Head pose estimation, Gaze estimation and Eye state analysis.

With the onset of Autonomous Driving (AD) features that are available in most of the higher-end trims, the car can cruise autonomously on the highway with a click of a button.

Once activated, the driver's hands are off the steering wheel. In this autonomous driving mode, Facial expression features alone cannot determine the inability of the driver to control the vehicle, when a sudden need arises. Moreover, the use of driver's steering behavior over the course of long trips is also an indicator of the driver's fatigue level and the onset of drowsiness.

In the above case, CNN models for Body Keypoint tracking are also considered to keep an eye on how the driver interacts with objects or the interfaces of the vehicle.

Late fusion on multi-modal data streams from Forward Collision Warning (FCW) Radar with the in-cabin DMS camera is a more effective solution to increase the reaction time of the driver for different danger levels, compared to a scenario where there is only DMS detection in the absence of FCW.

Embedding mmwave radars in the driver seats also helps with detecting vital signs such as Respiration rate (RR), Heart rate (HR) and Heart rate variability (HRV). If the system identifies signs of unconsciousness from the heart rate variations of the driver, it alerts the vehicle occupants, and the AD features kick in to bring the vehicle to safety.

In-cabin Occupancy Detection

With increasing automation and better connectivity, safety systems will continue to play a major role in the future. One way to improve safety in automobile and commercial vehicles is to install radar systems in the cabin that can detect even the faintest breathing movement of humans.

Figure 2: Camera & Radar Sensors are used to help with Driver Drowsiness Detection. Source https://images.app.goo.gl/1jrx6tTTMs3RQ3Jp6

Figure 3: Driver's hands are off the steering wheel once AD features are activated

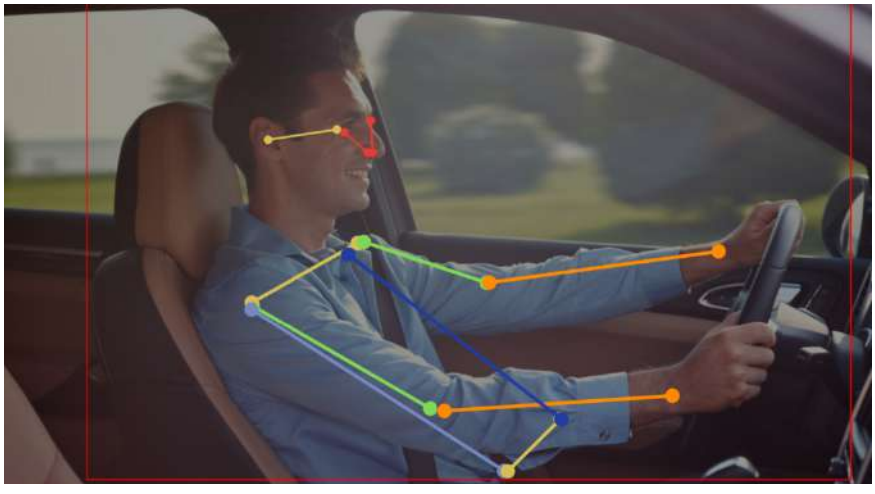

Figure 4: Body Keypoint tracking of the driver

Figure 5: In-cabin Occupancy Detectio

One critical use case is child occupancy detection, where children are inadvertently trapped or left unattended in vehicles, which can lead to heatstroke and other such casualties. With a proper safety system in place, if the child is left behind, the system notifies the vehicle, which then sends out warning signals, to get the attention of the car owner to act on time, and with urgency.

Another area of use is to extend occupancy detection to optimizing occupants against injuries in collisions including vehicle roll overs where, the signals from the sensors detect the strength and direction of a collision and can activate the restraint mechanisms in the vehicle, for example seatbelt pretensioners and airbags, as required for maximum occupant protection. These systems save lives and protect vehicle occupants from injury in case of a collision as it keeps the accelerations and forces in the event of an accident as low as possible.

In-cabin Noise Suppression

In fleet vehicles, where driver's speech must be recorded or used to control devices, the ambient noise (from ICE engine or HVAC or wind) can result in degraded speech. For real-time noise suppression that counter stationary and non-stationary noises, traditional ANC methods which rely on generating anti-noise, do not fit the bill.

Here, use of AI in audio processing helps in creating a solution which significantly improves the Speech to Noise Ratio (SNR). The deep learning model is trained on multiple noise profiles with a variety of conditions and the resulting model can provide good results in suppressing noise and increasing the speech quality in varying environments.

Analyzing Road Conditions for Road Safety with the help of Smart Public Infrastructures

Connectivity has transformed the way in which human beings interact. The Internet has also enabled closer collaboration with machines, and smart public infrastructure systems are here to help achieve the overall goal of efficient, smarter, and safer cities.

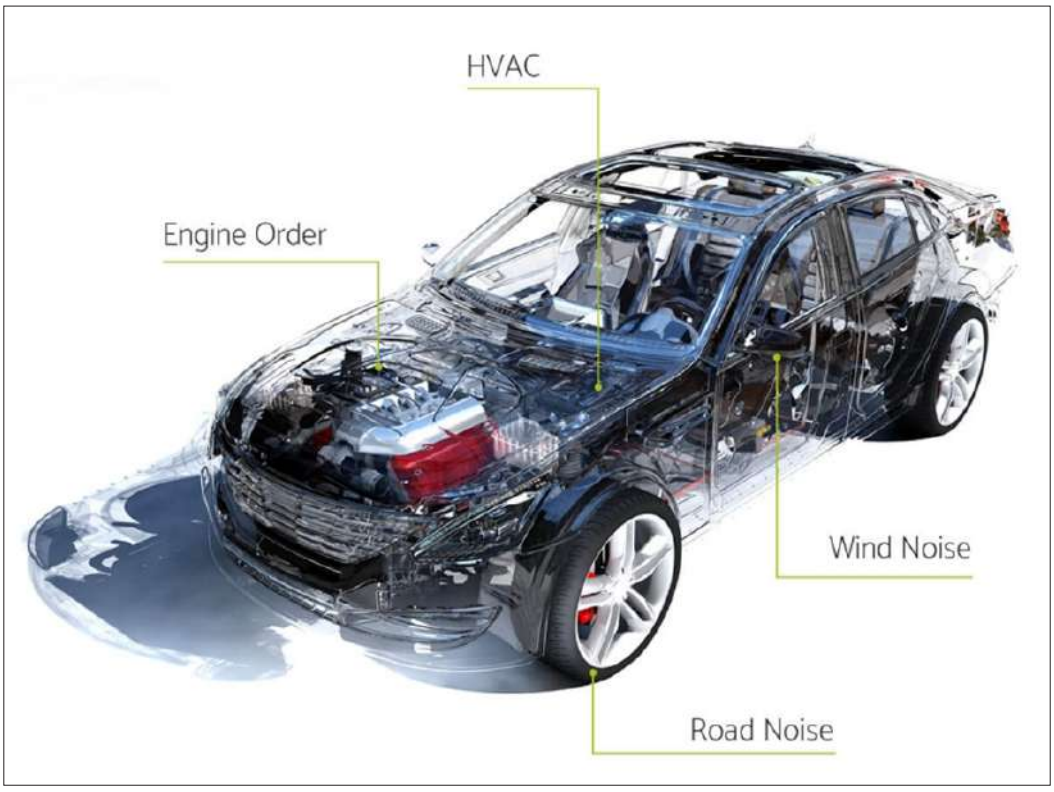

Figure 6: Type of noise that determines in-cabin noise. Source

To make cities smarter, vehicles and infrastructure have intelligent systems that can monitor, measure, and analyze data in a highly dynamic environment. Such data is used to achieve smooth traffic flow, infrastructure management (example parking), pedestrian safety, people security etc. 3D Lidars are being tested instead of cameras, to sense traffic flow and send data to the cloud for multiple sink points, to help improve overall accuracy. Some examples are dynamic traffic signal

management for smooth traffic flow and predictive road conditions as a service streamed to vehicles as an early warning which can then help the car/driver to anticipate road conditions and reroute their journey.

Expanding on the above, data from the cloud is streamed to the vehicle via cellular V2X (vehicle-to-everything) and is currently being tested with 5G connectivity due to its low latency. This enables Analyzing Road Conditions in real time mode.

Real-time detection of road conditions offers continuous updates to drivers on road construction, vehicle crashes, monitoring speed limits and road closures prior to their journey. This is another area where AI-based predictive technology may prove to be extremely crucial for drivers to be able to gauge their routes and plan to avoid congestion or hazards.

Also, as the number of networked vehicles in the market increases, the vehicle data is streamed to the cloud and consumed by the car manufacturer for various purposes including data-set collection and predictive maintenance.

Conclusion:

It is clear from the use cases, some of which are listed above, that AI in Automobiles related to safe transportation, safety, and breakdown warnings, is mature and is here to stay. European New Car Assessment Programme (Euro NCAP)* has always rewarded Occupant Status Monitoring (OSM) under the Safety Assist protocol that helps in decreasing behaviors and states linked to driver impairment. To get a full score in the OSM area, Direct Driver Monitoring system (DMS) will be a requirement from 2023 onwards as per the Euro NCAP roadmap (read here). Surely, DMS is 'the next seatbelt'. And with the Euro NCAP's 5 star rating, the period from 'paid-for-optional-features' to standardized technologies is shortened. Hence the automotive industry has been encouraged to move into a higher gear when it comes to offering these features as standards. Driver assistance and other safety systems have already made driving safer and more relaxed. The vision of 'accident-free mobility' in the automotive industry is turning into reality assisted by AI.

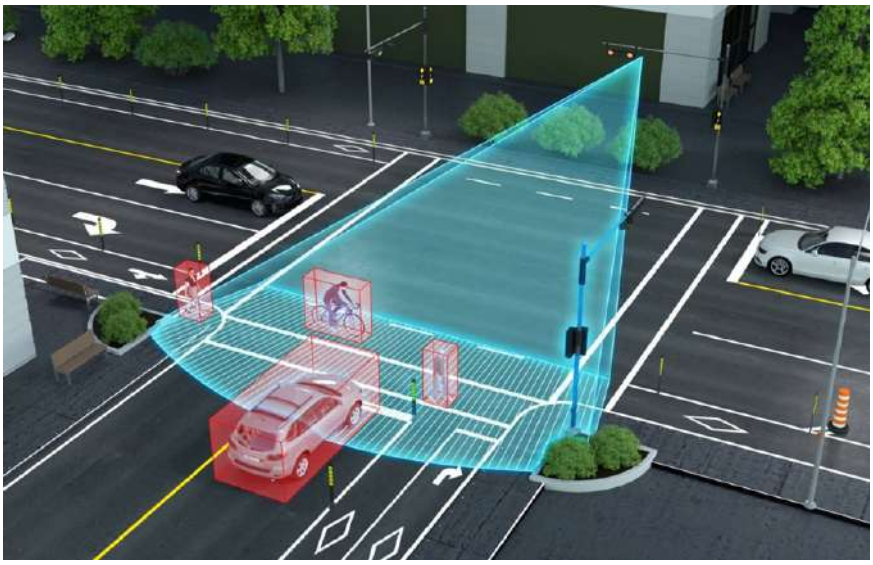

Figure 7: Smart Public Infrastructure. Source

Figure 8: Cellular V2X used to enable Analyzing Road Conditions in real time mode. Source

The deep footprint Ignitarium has in Product Engineering Services, and the current work that involves combining AI hardware, software, and services to create top-to-bottom automated mobility solutions, positions Ignitarium as a strong player and partner in this space.

*Euro NCAP's five-star safety rating system help consumers and businesses to compare vehicles more easily and to help them identify the safest choice for their needs hence promoting standard fitment across the car volume sold in the European Community in combination with good functionality for these systems, where this is possible.**

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As Technical Solutions Architect at Ignitarium, Abel David is driven by a mission to help solve challenging problems. He has spent much of his career in the Robotics industry, gaining experiences in areas such as the deployment of aerial, marine and ground robots.

The Normalisation of Data is an Essential Ingredient to Mass Market Electric Vehicles

ABHIJIT SENGUPTA
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With traffic congestion being a frequent pain point in India, electric vehicles (EVs) have become the solution to tackling congestion and pollution by offering environmental-friendly and sustainable modes of transportation.

As a result, interest in EVs has been growing across India in recent years. According to data from the Federation of Automobile Dealership Associations of India (FADA), sales of EVs have tripled in the last fiscal year .

The uptake in EVs has also been bolstered by an increase in charging infrastructure and government policies to encourage the adoption of EVs in the region. However, having the right infrastructure alone is not enough to achieve mass EV adoption. Automakers, technology solution providers and governments need to work more closely together to ensure that they are keeping up with EVs drivers' demands.

Feeding the appetite of EV drivers

A recent study done in the United States states that consumers purchase EVs for a variety of reasons such as environmental protection, cost savings and convenience. While environmental protection is a given and cost savings is relative to the type of EVs being purchased, let's dive deeper into what it means to be convenient of EV drivers.

EV drivers everywhere want to know (1) How far can my EV go with the amount of juice left in it, (2) Where can I charge up when I need to? (3) How much does it cost to charge up? and (4) How long does it take to charge up? Essentially, information data is what EV drivers want at their fingertips.

However, the different types of data are more often than not represented in different formats or on different platforms, making it inconvenient for an EV driver to have all the information in one plate. Moreover, the data can sometimes appear to be inaccurate or presented in a poor user interface, resulting in a poor EV driving experience.

For instance, incomplete location data could direct EV drivers to a charging station that is either not working, does not exist, or worst – not being able to navigate drivers accurately. Furthermore, the lack of or inaccurate information on how far an EV can go on a single charge often leads to EV range anxiety – the fear of running out of power while driving an EV and not being able to find a charging point.

These challenges call for the need to make data accessible for all, in a normalised, secure, intuitive and safe manner without distracting EV drivers from their driving. To do that, EV automotive OEMs (original equipment manufacturers), charging-technology providers, map providers, operators, utilities, and other players within the EV ecosystem must employ the same format of data to enhance the overall EV driving experience.

The taste of normalised data

The good thing is that automakers are already aware that this needs to be done and some have already started to do so by diversifying their portfolios through partnerships.

For instance, REVOS' peer-to-peer charging point, BOLT, will be integrated within the MyGate mobile app to provide sustainable EV charging solutions to Resident Welfare Associations (RWAs) and gated societies. RWAs will have the flexibility to choose from a wide range of EV charging options for community and private charging. This eliminates the need to install any other app and provides various affordable and seamless charging infrastructure options.

In another example, Reliance Industries Ltd (RIL) through its joint venture Reliance BP Mobility Ltd (RBML) has teamed up with BluSmart to set up EV charging infrastructure. Through this partnership, BluSmart is also expected to increase its EV fleet size and offer services outside the National Capital Region.

By consolidating data in a normalised format within a unified technology platform, EV adoption will be able to move to mainstream adoption at scale. In the same vein, different type of companies such as payment provides can also be involved to make the EV charging experience more seamless and convenient.

Serving a better EV driving experience

The shift towards electromobility has already begun within India. India's EV market size is expected to expand at a CAGR of 94.4% from 2021 to 2030, reaching USD 152.21 billion by 2030 .

The Indian government has a goal to transition from new sales of ICE (Petrol & Diesel) vehicles to 100% plug-in electric vehicles (EV) by 2030, as well as transforming India into a global hub for electric vehicles manufacturing . Efforts are also underway to roll out various demand and supply incentives to drive up EV adoption within the country.

For instance, India's Department of Heavy Industry, under the National Electric Mobility Mission Plan 2020, has formulated the Faster Adoption and Manufacturing of Electric Vehicles scheme to support the development of both Hybrid Vehicles and EV markets7.

However, for EVs to go mainstream in the region, the different technologies involved within the EV ecosystem need to 'talk' the same language. This starts from normalising and analysing disparate data sets for further analysis, ensuring that data can be easily consumed by others. ❑

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Premier Padmini Fiat 1100D interiors

The journey from 1980s Analog to 2025 Digital Life

SAMEER SHARMA
SWX, Stellantis

The first entertainment – conversations!

Remember the first car you ever sat in, in India - What was the entertainment system in there? The iconic Fiat licensed Premier Padminis, HM Ambassadors, Maruti 800s & Gypsys of the world all had analog systems, without any in-built entertainment systems. The entertainment – was conversations!

Cassettes and CD, DVD revolution:

1990s saw the introduction and major penetration of the 'single-din' radio sets, as they were popularly known as, with cassette player functionality. A technology that ran for nearly more than a decade, with all the popularity and craze for cassette collection. This soon was stormed over by CDs & DVD players in the 2000s. 2010s is when these radio sets got two major individual adds on – 'double-din' and Bluetooth compatibility to pair smartphones. This went on for almost around another decade plus, until mid-2010s in the large volume brands in India.

Digital age - the beginning:

Digital innovation and technology in vehicles have always been a late entrant (to put it polity), due to various issues in its own. What is interesting is to see the accelerating pace it is evolving lately. While there's no question of comparison with the smartphone tech, but it still has gained good pace in the last years and auto manufacturers.

The digital screen-based telematics offering started primarily by adding a screen to the Bluetooth calling and streaming functions. Additional functions were pretty much restricted around providing the vehicle information and manuals. This has been evolving now with more focus on the entertainment category.

2015 saw the luxury vehicle entertainment innovations dominating the automotive market, characterized by customization and interactivity. Standard driver engagement concepts were further enhanced by focusing on the high-end sound systems bringing in the luxury quotient of vehicle ownership. However,

the luxury industry innovations have a time cycle of 3-5 years, in general, before they are absorbed on a mass scale by the volume based automotive brands.

Fast forwarding further to touch screens evolution of cars – post luxury cars getting into the race of screen sizes, where every inch matter, for volume brands this started in the 2010s primarily as an aftermarket accessory and soon found its way into the ex-factory main-stream route towards the end of decade, starting around 2018-19.

Indian launch of the most awaited and talked about tech in cars - Connectivity:

It was early April 2019 when MG was the first one to announce the introduction of connected cars with an AI virtual voice assistant bot – Hello MG. The whole launch announcement was very aptly targeted by their Product & Marketing teams as 'the internet car', enabling the brand positioning as new age high tech cars. This captured the national auto industry media interest. Soon was the announcement by a heavy-weight industry player Hyundai Motors India. While the industry announcements were happening over the months, from the luxury space, Mercedes-Benz India was the first to introduce an entire eco-system backed, TCU based connected cars on 1st October 2019. Since then, there is no turning back. Suzuki and a lot of other brands joined the Connected cars game offering a variety of features.

Once introduced, important question that comes up is – are customers really using it?

When any new technology is launched, it takes a substantial time for the penetration of technology in customer's everyday lives. The acceptance of new tech, usefulness and benefits first need to sync up into the dealer network, sales, and after-sales consultants with a lot of educational training and practical hands-on experience. Once the sales army is convinced about the new tech and equipped with the knowledge, it is only then that the successful communication will happen to the end customer and the usage increases at a rapid pace. This is underrated but the most important ingredient to create the connected car success story.

The world today - 2022:

The infotainment systems are refined in some of the new age popular cars. When I say refinement, I mean high screen resolutions backed with good hardware, smooth functioning software, no lags, etc. Software updates to improvise functionality and bug fixing has also started, however, with limited frequency. Connectivity in India has slowly grown into majority of the brands after 2019-20. In-car voice assistants is the next big thing which only a few players have mastered today with quick fast response and multiple use-cases; rest are catching up in the game.

While companies have been putting in a lot of efforts on the communication, I still feel connected car feature usage is still more fad-driven, a cool tech show-off factor that lasts for first three to five months of new vehicle ownership. The regular users of connectivity features are still the 'early tech adopters' category of customers, amongst the majority customer base. This is true like any new technology that gets introduced – the first few years is primarily driven by the excitement, then slowly it finds its place in everyday, mainstream usage and becomes a must have. For connected cars tech, we are enroute.

The education focused customer communication is where the auto industry focus lies today, which will help create the utility driven usage for most customers, building the habit to use connectivity daily. This is slowly changing and will eventually bring in the subscription revenues for OEMs post the usually three-year free-of-cost connected car services. It won't be far that customers get habituated to the tech as everyday need and find higher utility.

While we all have been speaking and reading about implementation of Internet of Things (IoTs), connected cities, this penetration has been slow, especially in a diverse market like India.

Thanks to Tesla to act as a catalyst in this space, what we see as an offering today in vehicle infotainment system is just the tip of the iceberg of the future offering. The auto industry has been heavily focusing upon, investing time and efforts to revolutionize the entertainment space to the next level. An innovation faster and beyond smartphone mobile technology is the new race that we are going to benefit from.

Transition from 'just Connected cars' tech to the new concept of Digital Life:

We spend a considerable amount of time in our cars, daily. This makes our cars the next private space after home & office. Beyond a car's performance, space and luxury quotient - lies a plethora of tech-based ideas that can be offered. The market needs to move from offering only basic vehicle information and 'remote operations-based services' (like remote door lock-unlock, windows & sunroof open-close functionalities) to a new elevating experience.

When our customers 'live' in cars for few hours daily on average, the customer journey must be elevated to something the customer hasn't imagined. This driving time is the customers' space, where she/he has a substantial time to think, ponder, get entertained and rejuvenate. It is meant to be magnanimous just the way her/his life is – a celebration! Comfort, convenience, and new tech that shall keep your vehicle new forever, providing software enhancements and features that will keep users engaged and happy.

Jeep Compass interior

Jeep Compass interior

The Digital Life enrichments can be built on various avenues, some listed ahead, as a start -

Voice and virtual assistants:

Moving away from the standard android-based Google assistant which has limited use-cases inside vehicle, a lot of OEMs are working with Tier1 giants to bring in enhanced and efficient assistants that can offer on-board and off-board functionalities.

In future, it is likely that it won't be restricted to your car only but will also be with you on your smartphone OEM app, giving you a seamless experience even when you are outside your vehicle. IoT based home automation has already started for cars and is just going to increase further with better market penetration. With AI continuously learning on the go, the new voice assistants are soon to be the game changers. It is only a matter of short time, that these in-car voice assistants truly grow into full capacity of acting as 'personal assistants' with interactive voice, taking care of your mundane driving chores, offering unique personalization with calendar linked meetings, music and mood preferences.

Entertainment:

The in-car entertainment quotient is only going up from today's music integration to having a plethora of in-built applications like Spotify, Apple music, Amazon music and the likes with in-car internet connectivity. Like the way OTT penetrated in our mobile phones within a span of last 3+ years, OTT penetration inside vehicles is happening faster than we think. Although governed and restricted from a driving safety perspective in the front screens, the in-car data packs and Rear Seat Entertainment Systems are the future of entertainment, which will see a higher penetration in the coming time.

With the soon to be introduced 5G tech, cloud-based security and firmware updates will happen quietly and efficiently in the cars. The 5G network speed will make the voice interactions super smooth with quick error free voice engine processing and responses, enabling a humane touch. The ultra-smooth high-definition music and video streaming experience will become addictive hygiene factor in cars and a boon while doing long distance journeys with families!

With the excellent telecom infrastructure across geographies of India and good telematics hardware offerings by OEMs, more feature loading is going to happen soon, enriching cars. These ideas will extend the customer's digital lifestyle from home to cars and will find its way in our everyday lives in the next 3 years - 2025.

This article was written by the author while on a trek, in a remote village called Kalga, in Parvati Valley, Himachal Pradesh. ❑

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M2M IoT Solutions

SRIKANTH G N
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Are M2M and IoT the same?

Machine-to-Machine (M2M) and Internet of Things (IoT) in common parlance are used interchangeably. Both M2M and IoT can handle data acquisition and automation. However, traditionally M2M was not connected to the internet and dealt with non IoT protocols while IoT mostly dealt with IP protocols and involved the cloud.

M2M refers to interactions between devices where one device consumes the data generated by another device for making decisions and is often closed loop and serves one specific application. Examples of M2M communication in this case would be vending machines sending out inventory information or ATM machines getting authorization to dispense cash.

While M2M draws the foundations of connectivity, it's more focussed on machine to machine communication from where IoT acts like a successor, picks up from there and adds people dimension and makes it more interactive and collaborative that applies to consumers and enterprises. IoT examples can be smart home automation, fitness trackers, industrial automation, sensors, connected vehicles etc.

M2M devices adhere to the same protocol and deal with a smaller scale, while IoT platforms deal with larger scale, is to create an intelligent environment for the users. IoT steps it up by integrating device and sensor data with big data, analytics, and other enterprise mobile applications which M2M rarely does.

Below are few factors that can help you decide if your current project requires M2M or IoT

- Scale of the project: Unlike M2M, IoT deals with higher scale.
- Intelligence: IoT data is shared between applications and it leans more towards utilizing the data for decision making. M2M data is shared between the machines for communication and has a certain degree of decision making but more from a tracking and observation point of view.
- Data Delivery: In M2M, devices talk to each other and can be connected through a network while in IoT, it is dependent on the IP protocol.
- Business type: M2M deals mostly with B2B, while IoT deals with both B2B and B2C.

M2M and IoT protocols

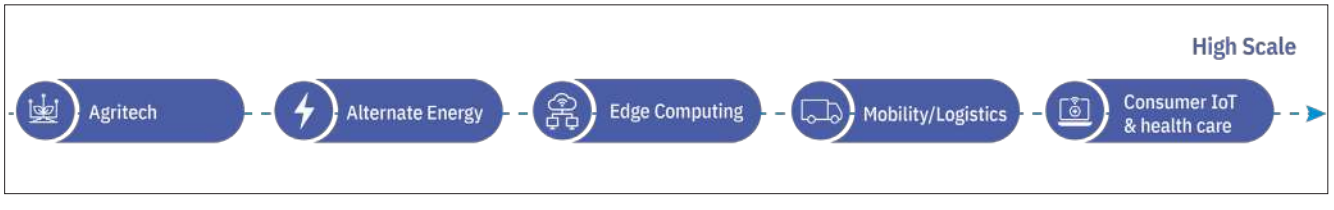
We need to understand that not all devices/ sensors have the ability to connect to the cloud directly. Also, devices can be low powered. Further several sensors can work in tandem to solve a use case for e.g. powered usually get connected to the cloud via a gateway. Communication between the devices/ sensors and the gateway can be over modbus, bluetooth, wifi, zigbee kind of protocols while the communication from gateway to the cloud can happen over MQTT, HTTP, COAP and TCP/IP protocols.

One of the foremost things in connectivity in M2M/ IoT is the need for supporting bidirectional abilities to cater to the wide range of use cases, for e.g remotely control the devices. HTTP does not bring real time bidirectional ability, but MQTT and TCP/IP brings bidirectional abilities inherently. The payload size in M2M/IoT is less but with a much higher frequency. IoT/M2M use cases demand a secure, bidirectional, lightweight, reliable and most importantly publish subscribe experience. **MQTT is one such protocol.**

MQTT : Message Queue Telemetry Transport (MQTT) is a publish-subscribe messaging protocol which resides on top of TCP/IP stack and is extremely lightweight, reliable and is designed to work in low bandwidth, high latency and unreliable environments.

Brief History

MQTT was invented in the late 1990s by Andy Stanford-Clark and Arlen Nipper to



multiple protocols and endless integrations. It appears M2M is a subset of IoT, but it's helpful to think of both M2M and IoT as separate layers. The primary purpose of IoT

water level, oxygen level and other sensors together are used to solve aquaculture use cases. Sensors or devices that are specialized for a purpose and that are low

monitor the pipelines in SCADA in the Oil and Gas industry where there was a need for lightweight and quality service guarantee. Later in 2014, it was submitted and released

as an OASIS standard and today we have multiple implementations and support in most of the popular programming languages.

Architecture

MQTT works with a Publish-Subscribe model, where the publisher and subscriber are loosely coupled unlike the traditional Client-Server model. The Publisher and the Subscribers do not have a direct physical connection and the messages are routed via a Broker.

MQTT is the choice

Smartphones, Wearables or Fitness devices (from the Consumer Electronics), Connected and Self Driving Vehicles (from Telematics and Mobility), Home Automation and Smart Offices (from Smart Infrastructure segment) and many more devices exchange data in real time and stay connected driving number of critical aspects of life and business. The very nature of MQTT, being an asynchronous protocol, decouples the sender and the receiver in terms of both storage and time. It keeps the message extremely light weight and ensures real time message transfer making it more efficient for mission critical systems. Thus MQTT becomes an excellent choice to unleash the power of connectivity across devices.

M2M and IoT solutions

Below are key modules or frameworks the IoT solution must support on the cloud side.

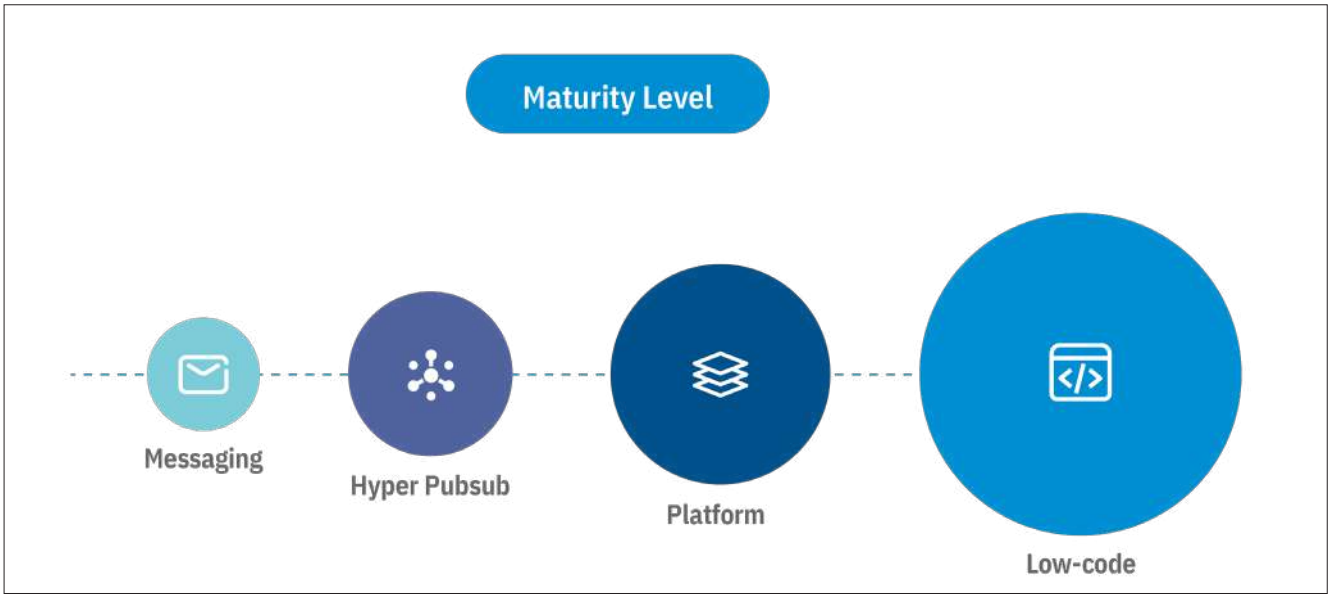
- ***Cloud Connectivity :*** This module must support a heterogeneous device ecosystem by offering one or more endpoints and connect the device to the cloud messaging broker or service . It typically supports HTTP, MQTT, TCP/IP and similar IP based protocols.
- ***Device Lifecycle :*** This includes onboarding of device, provisioning, configuration, monitoring and decommissioning of device. Provisioning includes registering, generating identity, managing credentials via API or offline as in the case of bulk provisioning.
- ***Device upgrades :*** This includes remotely updating the firmware and applications on the IoT devices. We can broadly categorize them as below.
  - OTA Updates to Edge/Device : Here the device is connected to the Internet and receives the update via server.
  - OTA updates via Gateway : Here the gateway receives the upgrade which in turn ensures the end device's firmware is updated.
- ***Realtime tracking, monitoring & Alerts :*** Tracking the assets, monitoring the health and generating alerts in realtime is very important. This module brings the ability to monitor assets at any time of day or night and remotely through an asset tracking software tool. Alert generation typically involves a complex rules engine that can process incoming device data in realtime, act on the rules and generate an event.
- ***Analytics :*** It involves handling huge volumes of data from multiple sources and devices. The objective is to process, store and extract insights from the data. Further, analytics has to support both realtime and batch analytics. Reporting & Visualization and Decision making shall be the end goals of this module.

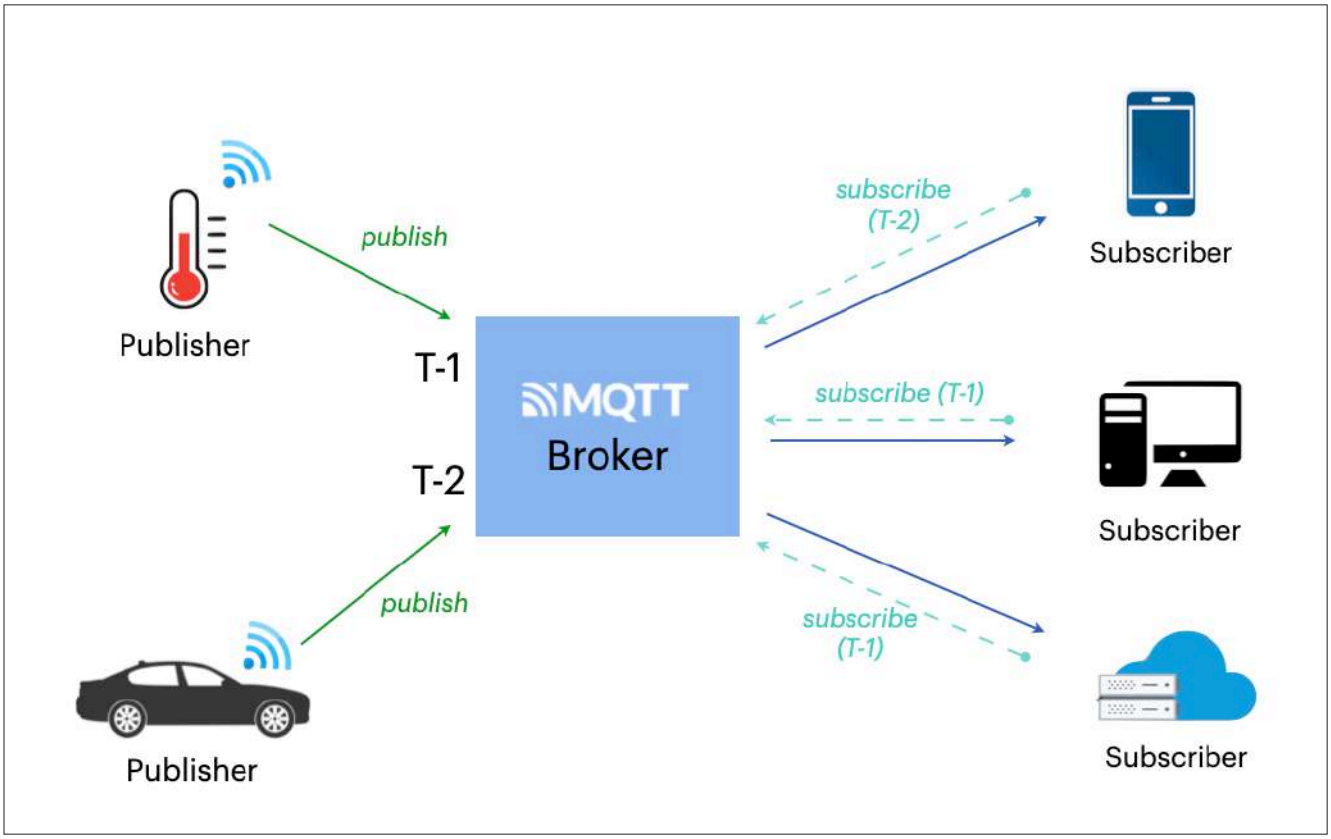
IoT Solution examples :

Consumer facing IoT solutions and Healthcare : You will see the highest number of devices in this category that any application has to deal with. For e.g. millions of water purifiers, millions of smart switches. Healthcare needs to address remote patient monitoring etc.

Mobility/Logistics : Here the scale of devices is slightly lesser than the previous category. E.g. could be FFT, connected & autonomous vehicle tracking, location and route management, supply chain Monitoring Systems and inventory tracking and warehousing solutions.

Edge computing IoT solutions : In these solutions, we see that processing of data which may be bulkier in nature like in the case of camera feed, etc happens at the edge. The processed output for e.g metadata generated from the computer vision algorithms is only sent to the cloud for further reporting, visualization and deeper analytics. This saves a lot of bandwidth and load on the network. E.g. could be improving the worker safety in a factory





environment.

Energy and Utility: In the utility solutions, the device might be inside a local wifi or bluetooth network and then connected to the cloud via a gateway. Smart energy metering solutions need to support both pull (based on demand) and push use cases and support bidirectional protocols like TCP/IP and MQTT.

Alternate Energy : Here the solutions deal with EV ecosystem, smart EV batteries, EV charging stations and end goals is to provide a sustainable platform.

Agritech : IoT solutions in this space deals with Optimizing usage of water, energy, land. Agri IoT is a very vast use case as it can employ technology, soil and crop sensors, aerial drone monitoring and farm mapping futuristic robot pollinators, camera sensors and computer vision,GPS and machine learning to enable precision farming capabilities.

Factors affecting the solution cost

- Number of devices
- Payload size and how frequently data is pushed
- How long the data is stored on the cloud.

Today's Solution category

Data acquisition only : Focus on acquiring the data and offer pub sub architecture supporting high scale.. E.g. HiveMq, VerneMq, Akiro messaging core.

Hyper pub sub : They not only facilitate data acquisition but also allow you to integrate or store data into databases, cloud services etc. E.g. Solace offers hyper pub sub solutions.

IoT Platforms and solutions : E.g. AWS IoT core and Azure IoT Hub offer PaaS/ SaaS capabilities, still a lot has to be stitched to arrive at an end solution. While Ayla networks kind of companies offer specific platform solutions.

Low code/No code platforms : Losant and Akiro can be mentioned here, the strength lies in a wide variety of workflows and capabilities using which the customers can quickly build customer solutions.

Nextgen IoT Challenges

- With 5G huge data is generated
  - That demands a scalable and Reliable IoT messaging and unified low code platform
  - Handle ~10X the current scale
- There is a need for convergence of AI, 5G and IoT
- The next big investment in IoT shall be hybrid cloud systems which are both data centric and action centric at internet scale. ❑

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Artificial Intelligence and its use cases in Automotive Industry

VATSAL GHIYA
Shaip

Artificial Intelligence has been a blessing for multiple industries, hence automotive industry is no exception. To accelerate automotive operations, AI is the key to unlock a sustainable future and enhancing productive customer experience.

Driverless cars around the nook and corner of the city might seem like a fool's paradise in the past, but the advancement in technology and widespread use of AI all across the world have made it possible somehow. For instance, the biggest automotive leaders including Tesla, Volvo, BMW, Volkswagen, and others are including AI to change the automotive workforce and make driving more convenient for users. Do you know, why?

In the hyper-digital era, customers' convenience and experience are the top priority to scale, And if your organization lags behind in the same, it's high time to reimagine the automotive industry.

And advancements in AI have made a huge contribution to the growth of the automotive industry.

As per Statista report,

"The global automotive intelligence market expected to reach at the size of 74.5 Billion US dollars in 2030"

Despite the revolution, artificial intelligence is bringing across the automotive industry, the automotive workforce needs to be tech-savvy within 5–50 years which is quite a challenge for the automotive industry in terms of upskilling the workforce.

To add more to the figure, Elon Musk 2017 stated that "There will be an autonomous vehicle in the next 10 years without any steering wheel". If believe the prediction, we are pretty much closer to the future of autonomous vehicles in the time frame of 5 more years.

Let's get rolled and understand where we can use AI in the automotive business operations and processes for a better driving

experience and improved quality control.

Top 7 Use Cases of AI and Machine Learning in the Automotive Industry

1. Manufacturing

Manufacturing is the core part of an automotive industry supply chain. A single error in the system can make or break the production process. But, using AI and Machine Learning algorithms can help automotive manufacturers to make the car-making process better and more efficient. For example, manual labour would pick parts from conveyer belts to complete the car-making process which leads to higher turnaround time and inefficiency. With AI-based systems and machine learning algorithms, robots can autonomously determine which part to pick, how to pick, and in which sequence, that's makes the manufacturing process faster and better. Also, it reduces the amount of workforce required to complete the car-making process, And if there is any unexpected machine failure happen, robots can keep the humans in the loop for assistance and save any mishappening.

2. Design

To make the car driving experience user-friendly, manufacturers have to handle a lot of work right from brainstorming the car model to designing it exactly in the same way. With AI in space and computer modeling, automotive architects can perform real-time tracking, and programmable shading to transform the traditional design process. With faster real-time tracing and better design workflow, AI reduces the time spent on design approval and sanction. Also, Machine learning and AI image datasets help architects to generate hundreds of potential designs for better workflow and product ideas for autonomous vehicles.

3. Quality Control

Manually done the vehicle inspection leads to higher turnaround time, slow error-prone, and sluggish process. And maintaining quality control is the topmost priority for keeping a higher customer count. AI-based data annotation and object detection help manufacturers keep an eye to detect the defect in the vehicles. By generating data collected from the AI sensors, the AI system can tell users and architects both which part requires maintenance and which part needs to be changed with immediate effect. In addition, AI-powered quality control systems also detect the possible flaws in parts before they get installed in vehicles. Isn't it amazing like the future in hand?

4. Supply Chain

When it comes to the supply chain, the automotive industry is one of the most complex to handle with. Want to know why? On average, a single vehicle has almost 30000 distinct parts that arrive from different parts of the world across the globe. That makes the whole supply chain disruptive and the car-making process a struggle. Moreover, it's vital for automotive manufacturers to monitor every stage of a component's journey, and know exactly when to expect its arrival at the destination point. In this scenario, using an AI and Machine Learning powered supply chain can help manufacturers to create a fully automated system to make supply chain management decisions, adjusting routes and volumes to the predicted demand spikes for parts.

5. Driver Experience

To stay competitive on the edge, automotive manufacturers are highly focused on the driving experience of a user. And to make it more effective, AI and training data can be a great help. Using an AI-powered **Advanced Driver Assistance System (ADAS)** gives a major boost to the driving experience by helping with car locks, auto door locks, hands-free calls, and others. The benefits are not just stopped her. Using the ADAS system also helps drivers to gain insights on traffic and weather changes, the best routes on maps, and so much more. And all these benefits are highly possible by using object detection, training data models, and natural language processing techniques. With the ADAS system, an exciting time is ahead for autonomous vehicles.

6.Automotive Insurance

AI has a huge potential in the automotive industry for both insurers and drivers side together in case of an accident. The application of AI algorithms can speed up the process of insurance claims during an accident and mishap. On the driver's side, AI capabilities like image datasets, and object detection can help drivers to gather incident data and fill out claims efficiently. On the other hand, insurers can use image processing and AI capability to do the vehicle damage analysis better to get rid of discrepancies and process the claims faster.

7. Passenger Experience

In the digital era, customers today expect convenience in whatever they put their hand to. Considering passenger safety on road, automotive manufacturers are enhancing their vehicles with all kinds of AI-powered capabilities like image data, object identification, and NLP to upgrade their experience. With the image recognition model, drivers can easily scan the state of the driver and get their full information with a click. Also, by using speck commands passengers can easily listen to music, watch movies, order food, and others while being on the road.

Benefits of AI in the Automotive Industry

Implementation of Artificial Intelligence in the automotive industry benefits not only the vehicle manufacturers but gives a boost to vehicle part suppliers, vehicle rental enterprises, and all the businesses that are related to the automotive and supply chain domain. Some of Ai's benefits are listed below, have a look-

Predictive maintenance is accelerated

Using AI-based systems automotive industry can use the full potential of AI and collect data from multiple resources, and sensors

AUTHOR

VATSAL GHIYA
Co-Founder
Shaip

Vatsal Ghiya is a serial entrepreneur with more than 20 years of experience in healthcare AI software and services. He is the CEO and co-founder of Shaip, which enables the on-demand scaling of our platform, processes, and people for companies with the most demanding machine learning and artificial intelligence initiatives.

to cover workforce management, inventory management, operational planning, and safe driving assistance to users. By leveraging Machine Learning technologies, automotive industries can also predict malfunctions in autonomous vehicles and take corrective action before any casualty and mishap. All in all, this helps the automotive industry to work at prime performance levels, and save time & money both together.

Vehicle maintenance recommendations get improved

On average, a person takes the vehicle maintenance in an emergency or when an issue erupts. But, what if they get an early sign of a predictive issue. The machine learning algorithms collect data from the AI sensors in-built into the vehicle and keep track of a vehicle's part health and raise a concern when it requires maintenance. This way driver can take precautionary measures by getting the vehicle maintained and inspected to avoid a breakdown.

Driver Behavior Analytics is accelerated

AI and deep learning models based on automotive applications offer a plethora of valuable insights and analytics to detect driver's behavior accurately. Using these AI sensors and systems can easily detect drive behavior and provide warning signals to avoid accidents. In addition, if the driver is distracted by any circumstances, AI signals can also alert drivers and give them early signs for protection by leveraging real-time driver distraction detection techniques.

High Time to give AI a front seat in Automotive Industry

The automotive industry is seeing increased competition, cost pressure, and volatility, Evan a small disruption can make or break an enterprise's image. The inclusion of AI and machine learning capabilities can be a game-changer for the automotive industry. It is possible for automotive manufacturers to deploy AI technologies for designing and building new prototypes, improving supply chain efficiency, and enabling efficient maintenance of both factory equipment and vehicles on the road. And the high time to adopt these AI technologies is now. If you have an opportunity to leverage the same, act on it before it's too late. ❑

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Ushering in Fleet Management 2.0 with the next generation of connected mobility with Cavli Wireless

SURENDAR KANNAN
Cavli Wireless

A connected car refers to a technology in vehicles that allows them to communicate with systems outside the vehicle using the internet. Cars need to stay connected to the internet to exhibit all the characteristics of a connected car. Connecting to the internet can be done in two ways, satellite connectivity, and cellular connectivity.

An Embedded connected car system enables a chipset containing a SIM card to get connected to the internet directly. This connectivity enables it to become a full-fletched IoT ecosystem. The IoT ecosystem enables various smart features and applications inside the car to improve customer experience and incorporate safety features.

A connected car provides many features: Vehicle to Vehicle connectivity, entertainment, app-to-car connectivity, navigation system, parking assistance, remote parking, and accident and fault assistance.

Fleet Management System

E-commerce has rapidly changed the freight and package-handling capabilities of businesses globally. As consumers become accustomed to faster deliveries, carriers and shippers are forced to develop a more time-bound supply chain. From fleet makeup to truck manufacturers' distribution networks and even traffic monitoring for quicker delivery route prediction, the rise of the e-commerce industry is affecting more than many realize.

The main challenges in fleet management include a shortage of skilled drivers. Monitoring drivers' activities and behavior were never possible before. Increasing fuel consumption and cost has been a big challenge to a Company's cost-cutting measures. Monitoring the movement of vehicles and assets across the supply chain, especially through hard geographical regions, is critical. Optimum speed limit, route optimization, and checking the overall safety is a tough job for businesses and transporters alike.

Fleet Management systems were introduced to handle vehicle maintenance such as driver management, fuel consumption, and health and safety regulations and significantly reduce the associated risks. The increasing focus

on energy consumption and vehicular emissions also emphasized the need for an evolved system. This led to a massive switch to Smart Fleet Management. Earlier traffic delays and hours of vehicle diagnostics were the major cause of latency and waste of time in the system. Fleet management has tried to reduce traffic time and make sure vehicles are in top condition even before it is loaded.

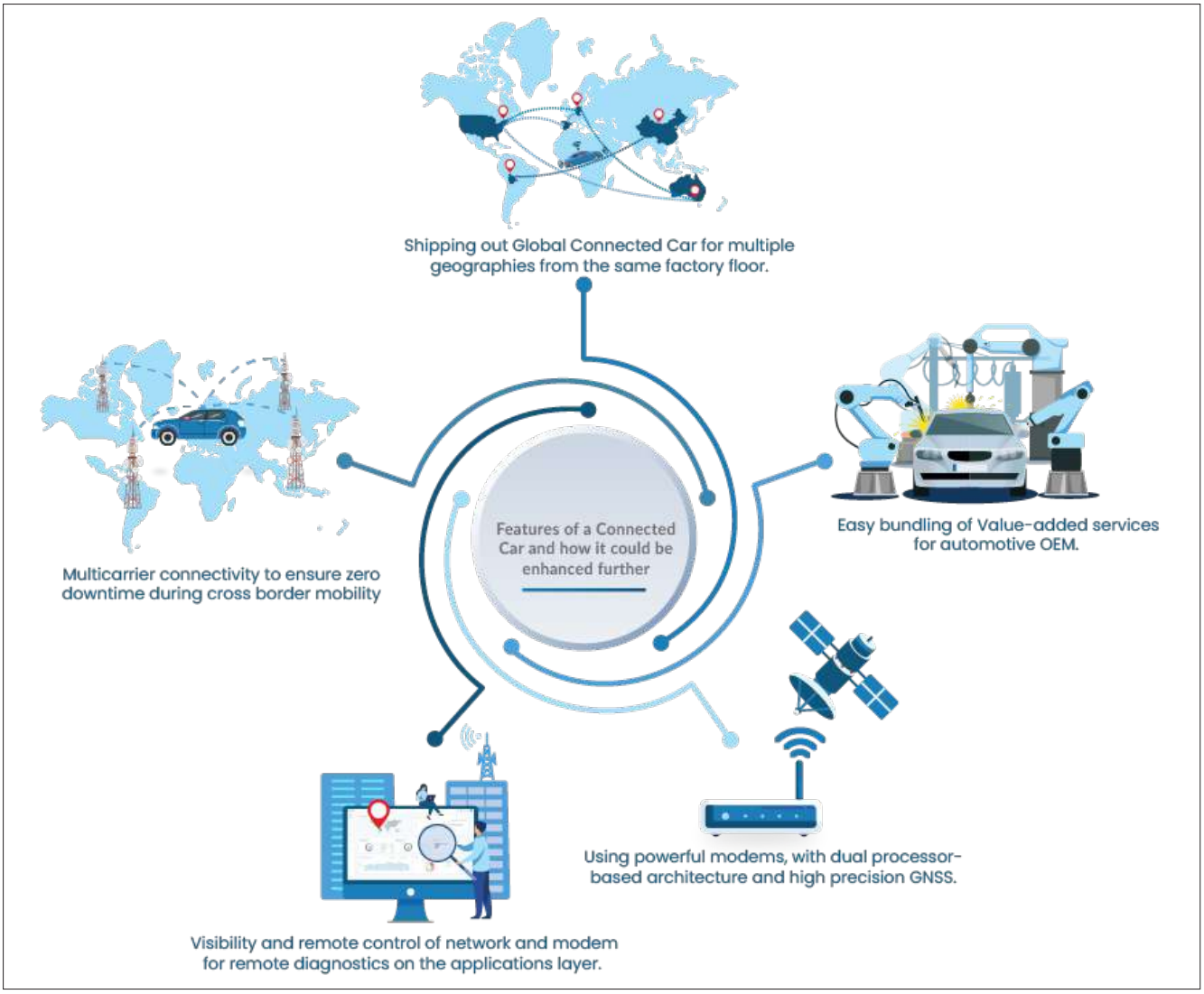
As the competition increased in fleet management, the solutions were upgraded by adopting AI and IoT capabilities such as LiDAR, ultrasonic, and cloud-based communication tools to detect obstacles and resolve them appropriately. With the adoption of Smart Fleet Management solutions across geography, the market is expected to reach around USD 900 billion by 2026. Integrating commercial, technical, and operational requirements, Smart Fleet Management helped the business decision-making process through automation and real-time data monitoring. Consequently, globally governments have extended their support to SFM by regulating the safety standards for vehicle maintenance.

Transition to Smart Fleet Management using IoT

The transition from traditional Fleet Management to Smart IoT-based solutions is triggered by the need to handle and leverage a large volume of data readily available. While the technology helped improve connected mobility, the transition to IoT allowed its users to become proactive. Beyond its ability to manage vehicles across ports, IoT enabled ground staff in fleet hubs to run quick diagnostics, quickly dispatch vehicles, and, most importantly, keep up with the increasing demands. Nonetheless, OEMs attribute the switch to Smart fleet solutions to reducing ownership costs. The global Smart Fleet Management market is driven by the increasing need to adopt Fleet Management analytics to access real-time data. Interestingly, in 2018 with a revenue share of 36%, the Asia Pacific was projected as one of the leading Smart Fleet Management markets due to the regulations regarding transport safety.

Predominantly, operators with a significant fleet focus on implementing Smart devices using three main technologies — GPS, RFID, and OBD IIs. As the IoT-based Smart solution gives the ability to reduce idle time and transportation costs, businesses are driven towards Smart Fleet Management solutions for the following reasons —

- Integration of real-time fleet monitoring devices such as sensors improves productivity and efficiency.
- An increase in the use of cloud-based technology such as AI, Big Data, and IoT for Smart Fleet Management solutions enhances the backup and recovery of data.
- Advanced driver assistance systems and geo-fencing in railways, automotive, and marine transport offer better driver and vehicle safety.
- The rise in need for an intelligent transportation system in both the private and commercial sectors to handle multiple consignments across regions remotely



The Drivers of Smart Fleet Management

The need for Smart solutions is constantly increasing as fleet operators are looking to improve their business decisions with meaningful insights using data. In the UK, the Corporate Manslaughter Act was passed in 2008, holding companies responsible for the death of drivers on the road. Which meant companies needed to be more vigilant about the fleet and take appropriate action according to it. European Union also has very strong laws and regulations on road safety and transportation. These policies have given rise to solutions in which companies can directly engage with the fleet even after leaving the yard for delivery.

Primarily used to manage, maintain and optimize operational efficiency, Smart Fleet Management uses digital technology applications judiciously. Segmented based on transportation, operation, connectivity, application, and region, the global Smart Fleet Management market is dominated by several players such as Cisco Systems, IBM, Denso Corporation, Globecomm, Robert Bosch GmbH, and others. Some of the prominent applications of Fleet Management include location tracking, vehicle identification, and fuel consumption.

Why Companies should shift to Smart Fleet Management

The cloud-based Fleet Management solutions acquired as Software-as-a-Service (SaaS) have been imperative to the global Fleet Management solution. With the evolution of the 5G network and the growing importance of improved driver safety measures, the functions of a Fleet Management system have become expendable. Some of the primary benefits of Smart Fleet Management solutions include

- Asset and customer management - Automation of reports and insights that eliminates the need for human intervention. The solutions offer customizable dashboards that allow the asset management team to have 360-degree access to inventory and incoming orders. Companies can create a plan for vehicle maintenance, and fleet audits through automated Fleet Management. This helps increase ROI, improve customer service and retention, and improve the fleet's performance.
- Real-time vehicle location tracking with better fleet fraud prevention - Using automation software, managers can track, prevent, and analyze anomalies and the possibility of frauds such as false fuel claims. The AI-powered software offers geofencing that helps track the vehicle in real-time and create supply chain improvements when necessary.

For fleet businesses that handle multiple consignments simultaneously, the reporting tools available in the software offer higher-level visibility that can be leveraged to analyze the data from each vehicle.

- Monitor driver behavior and fuel consumption - Telematics and GPS fleet tracking can be used for driver management while ensuring they follow safety practices. Smart Fleet Management offered better fuel management using data analytics and enhanced AI. Fuel management becomes a contributing factor to reducing costs as fleet managers can estimate the fuel consumption needed for a specific route, thus reducing fuel wastage.
- Track delivery schedules and route compliance - One of the most significant advantages of Smart Fleet Management is analyzing patterns from multiple data points. Fleet managers can study traffic patterns to prevent transit delays affecting customer service. With predictive ML algorithms, the driver can also get route updates to avoid certain roads based on weather or lane monitoring.

Connected Car and Smart Fleet performance

One of the trends that can help the future of Smart Fleet Management is the growth of Mobility-as-a-Service (MaaS). The demand for MaaS can be attributed to the need to improve the end-to-end journey and meet on-demand transport needs. Similarly, the growing potential of autonomous vehicles (AV) using GPS, 5G, and other technology requires a Smart fleet to connect over the cloud for data sharing and communication. Thirdly, telematics. Although the term dates back to the 1960s, telematics will also play an important role in the future of Smart Fleet Management. Driving efficiency, safety, compliance, telematics, and advanced analytics will be crucial to adopting Smart Fleet Management solutions on a large scale. Supply Chain is the heart and soul of any economy. Smart Fleet Management and efficient Supply Chain Management are key to any company's success in the market.

Features of a Connected Car and how it could be enhanced further

- Multicarrier connectivity to ensure zero downtime during cross border mobility
- Multicarrier connectivity ensures a robust cellular connection no matter what. The automobile is located without being locked into a single carrier roaming coverage. IoT is an inevitable part of the connected car system, and thus, for its uninterrupted function, it needs a constant connection. Multicarrier connectivity will mean wide network coverage, scalability, and reduced costs.
- Visibility and remote control of network and modem for remote diagnostics on the applications layer.
- Real-time visibility of IoT connectivity real estate helps proactively understand the network-related factors and understand what causes outages. Visibility and control over connectivity and infrastructure are prerequisites for a truly connected automobile.
- Shipping out Global Connected Car for multiple geographies from the same factory floor.
- Cavli tech, including smart modules and Cavli Hubble, can be integrated from the shop floor, allowing the finished vehicle to be shipped anywhere. The ECU has Cavli e-SIM integrated modules which can latch on to preferred network partners around the globe. Beyond geographical boundaries, we can see how cars need to get connections. The ECU is key to the performance and utility of the connected car concept. Irrespective of the car's location on the earth, the eSIM technology helps the car get connected to any carrier and thus ensures no breakage in the car's connection to the internet, i.e., a zero-downtime. The automotive OEM can manage and control all the connectivity parameters through their enterprise-connected car application platform under APIs. Cavli Hubble is a device management platform developed by Cavli Wireless to effectively manage the deployed devices. Customers need not worry about the internet connection, even in the most remote part of the world.
- It bundles the entire value-added service as a package for automotive OEM.
- Cavli Hubble is not just a platform that is meant for device management but also subscriber management. It provides features and services to the user through subscription plans. With subscriber management through Cavli Hubble, automotive OEMs can now bundle other value-added services like infotainment packs, direct service calls, etc., by designing custom data plans through Cavli Hubble. The Hubble adds more features to the car than just restricting it to the driver's space.
- The cellular IoT module uses powerful modems with dual processor-based architecture and high precision GNSS.
- Powerful dual-processor architecture-based modems to withstand the pressure of edge computing to eliminate latency between the vehicle and the data center. Cavli's automotive-grade e-SIM integrated CAT1 smart cellular module C10GS comes with high precision GNSS with 132 tracking channels. C10GS is a hardware module that enables various applications and utilities of the connected car. Irrespective of the location of the connected car, it can utilize data from GPS, Beidou, Galileo, etc.

The bright future of Smart Fleet Management

The connected car is a revolution in the automotive industry, and it has led to safe, sustainable, and economical driving on the roads. Smart fleet management is another field closely related to connected car systems but instead deals with logistics. Thus, these single-handled systems will make a great system for telematics and IoT automation. ❑

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Surendar Kannan is the Vice President of Sales - APAC for Cavli Wireless. He is a business leader with 30 years of proven track record and a strong growth-oriented mindset with expertise in Telecom, Cloud, IoT, and IP technologies He possesses an extensive experience in Sales, Business Development, and Product Management with strong client associations across India and APAC regions.

Jeep Meridian

The Jeep Meridian has been launched in India at ₹29.90 lakh for the base Jeep Meridian Limited Manual Front Wheel Drive (FWD) variant and going all the way up to ₹36.95 lakh for the range-topping Jeep Meridian Limited (O) Automatic Four-Wheel-Drive (FWD) variant

SPECIFICATIONS

Safety Features:

- Overspeed Warning - 1 beep over 80kmph, Continuous beeps over 120kmph
- 6 Airbags (Driver, Front Passenger, 2 Curtain, Driver Side, Front Passenger Side))
- Middle Rear Head Rest
- Tyre Pressure Monitoring System (TPMS)
- Child Seat Anchor Points
- Seat Belt Warning

Engine & Transmission:

- Fuel Type – Diesel
- Max Power - 168 bhp @ 3750 rpm
- Max Torque - 350 Nm @ 1750 rpm
- Drivetrain – AWD
- Transmission - Automatic (TC) - 9 Gears, Sport Mode
- Emission Standard – BS6
- Turbocharged
- Battery - 77.4 kWh, Lithium Ion, Battery Placed Under Floor Pan
- Electric Motor - 2 Permanent magnet synchronous Placed At One motor each on front and rear axle
- Idle Start/Stop

Braking & Traction:

- Anti-Lock Braking System (ABS)
- Electronic Brake-force Distribution (EBD)
- Brake Assist (BA)
- Electronic Stability Program (ESP)
- Four-Wheel-Drive - Manual Shift - Electronic
- Hill Hold Control
- Traction Control System (TC/TCS)
- Hill Descent Control
- Limited Slip Differential (LSD)
- Differential Lock - Electronic

Locks & Security Features:

- Engine immobilizer
- Central Locking - Keyless
- Speed Sensing Door Lock
- Child Safety Lock

Telematics Features:

- Find My Car
- Check Vehicle Status Via App
- Geo-Fence
- Emergency Call
- Over The Air (OTA) Updates
- Remote AC On/Off Via app
- Remote Car Lock/Unlock Via app
- Remote Car Light Flashing & Honking Via app
- Alexa Compatiability

Entertainment, Information & Communication Features:

- Smart Connectivity - Android Auto (Wireless), Apple Car Play (Wireless)
- Touch-screen Display
- Integrated (in-dash) Music System
- 6+ Speakers
- Steering mounted controls
- GPS Navigation System
- Bluetooth Compatibility (Audio Streaming)
- USB Compatibility
- Aux Compatibility
- AM/FM Radio
- Wireless Charger
- DVD Playback
- iPod Compatibility
- Internal Hard-drive
- Voice Command

Instrumentation:

- Instantaneous Consumption
- Digital Instrument Cluster
- Electronic 2 Trips Meter
- Average Fuel Consumption
- Average Speed
- Distance to Empty
- Digital Clock
- Low Fuel Level Warning
- Door Ajar Warning
- Adjustable Cluster Brightness
- Gear Indicator
- Shift Indicator
- Heads Up Display (HUD)
- Digital Techometer

Kia EV6
GT Line AWD

The South Korean automaker Kia Corporation has launched its newest electric crossover EV6. The company officially launched the vehicle on the 2nd June. The EV6 crossover is being offered in two variants. There is GT Line which is priced at Rs. 59.95 lakhs ex-showroom and GT Line AWD which is priced at Rs. 64.95 lakhs ex-showroom.

SPECIFICATIONS

Safety Features:

- Overspeed Warning - 1 beep over 80kmph, Continuous beeps over 120kmph
- Lane Departure Warning
- Emergency Brake Light Flashing
- Forward Collision Warning (FCW)
- Automatic Emergency Braking (AEB)
- High-beam Assist
- Blind Spot Detection
- Lane Departure Prevention
- 8 Airbags (Driver, Front Passenger, 2 Curtain, Driver Knee, Driver Side, Front Passenger Side)
- Middle rear three-point seatbelt
- Middle Rear Head Rest
- Tyre Pressure Monitoring System (TPMS)
- Child Seat Anchor Points
- Seat Belt Warning

Engine & Transmission:

- Fuel Type – Electric
- Max Motor Performance - 321 bhp
- Drivetrain – AWD
- Transmission - Automatic - Not Applicable Gears, Paddle Shift, Sport Mode
- Emission Standard – BS6
- Battery - 77.4 kWh, Lithium Ion,Battery Placed Under Floor Pan
- Electric Motor - 2 Permanent magnet synchronous Placed At One motor each on front and rear axle
- Regenerative Braking, Idle Start/Stop, Pure Electric Driving Mode

Braking & Traction:

- Anti-Lock Braking System (ABS)
- Electronic Brake-force Distribution (EBD)
- Brake Assist (BA)
- Electronic Stability Program (ESP)
- Four-Wheel-Drive - Torque-On-Demand
- Hill Hold Control
- Traction Control System (TC/TCS)
- Hill Descent Control

Locks & Security Features:

- Engine immobilizer
- Central Locking - Keyless
- Speed Sensing Door Lock
- Child Safety Lock

Telematics Features:

- Find My Car
- Check Vehicle Status Via App
- Geo-Fence
- Emergency Call
- Over The Air (OTA) Updates
- Remote AC On/Off Via app
- Remote Car Lock/Unlock Via app
- Alexa Compatiability

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- Smart Connectivity - Android Auto, Apple Car Play
- Touch-screen Display
- Integrated (in-dash) Music System
- 6+ Speakers
- Steering mounted controls
- GPS Navigation System
- Bluetooth Compatibility (Phone & Audio Streaming)
- USB Compatibility
- Aux Compatibility
- AM/FM Radio
- Wireless Charger
- iPod Compatibility
- Voice Command

Instrumentation:

- Instantaneous Consumption
- Digital Instrument Cluster
- Electronic 2 Trips Meter
- Average Fuel Consumption
- Average Speed
- Distance to Empty
- Digital Clock
- Low Fuel Level Warning
- Door Ajar Warning
- Adjustable Cluster Brightness
- Gear Indicator
- Heads Up Display (HUD)

How can IoT revolutionize fleet operations?

TUSHAR BHAGAT
Uffizio India Pvt. Ltd.

Introduction

Commercial fleets are the backbone of global commerce. A well-thought commercial fleet management strategy can make or break your business. All types of businesses, big and small, need telematics data to manage their fleets better. In fact, accurate fleet data helps businesses make better decisions. For example, knowing the real-time fleet location assists with dispatch and routing. Access to a vehicle's odometer readings can help you plan maintenance schedules.

Fleet management businesses are always seeking ways to reduce operational costs. That's why there is a growing need for remote monitoring of fleets and telemetry data. According to the Fortune Business, the telematics industry is expected to grow 3.7 times between 2022 and 2029. Large-scale integration of telematics will eliminate paperwork and pave way for profits.

And yet this is just the beginning. Fleet management technologies have undergone an unprecedented transformation in the past few years. Integrating smart devices, sensors, and actuators onto fleet management platforms has several benefits. Such IoT technology simply amplifies the potential of fleet management systems.

What is the Internet Of Things (IoT)?

People say IoT is the future. Well, I say IoT is now! What exactly is the Internet of Things? You can think of it as a massive network to which physical devices are connected. These devices can share data with each other over the air. Hence, in an increasingly digital world, IoT enables the transfer of data between virtually connected devices. This device interconnectivity can be used for the remote monitoring of vehicle metrics.

Telematics and IoT are changing the course of fleet management. Telematics has allowed fleet managers to re-route vehicles, track them in real-time, and plan optimized routes. Thus, facilitating quicker and faster delivery to customers.

However, with IoT, fleet management systems can coordinate fully-fledged supply chains with very little intervention. IoT makes telemetry data practical by adding context. Businesses in many industries have benefitted by inexpensively connecting their assets via IoT. Thus, IoT is affecting various segments of the transportation industry. This includes traffic control, ticketing systems, toll collection, and driver surveillance systems.

How can IoT enhance fleet management?

IoT plays a pivotal role in the field of fleet management. It enables easier collection of telemetry data like fuel levels, vehicle speed, tire pressures, and hours of asset operation. With IoT, fleet managers can keep track of their fleet's productivity and gain valuable insights. It provides the fleet managers with unbeatable ease of access. Imagine being able to unlock your fleet even when it's parked half the world away. Or image being able to

detect low tire pressures and fix them before they ruin your fleet's mileage.

Automation and Productivity

With IoT, businesses can circumvent the traditional ways of handling fleet operations. No more piles of unwanted paperwork and no more losses due to delayed communication! Businesses can replace manual, time-consuming processes with automation. With seamless API integration and cloud storage, businesses can connect with their workforce in real-time. With active, on-site training, an increase in productivity is for sure.

For instance, fleets connected to the network will be able to identify congested or blocked roads. Integrated sensors relay notifications to drivers about driving hazards, weather, and more. If a vehicle breaks down, the system can send notifications to fleet managers and even initiate a request for a tow truck service.

Safeguarding the Driver Community

Long driving hours and night shifts make truck drivers vulnerable to fatal accidents. Such mishaps can cost lives. Hence, making the switch to IoT is vital for driver safety. Connected fleets are a safer choice of mobility because they are twice as likely to detect a collision and avert it. IoT makes fleet management safer by providing a comprehensive profile of driving behavior. They can see when drivers are idling, speeding, or using a mobile phone while driving.

Managers can use these metrics to issue alerts, warn, and coach drivers in real-time. Smart IoT dashcams can record snapshots of violation instances and save them on a single platform. These can be accessed by the managers as well as drivers. Video snapshots can be used for driver training and coaching.

Improving Fuel Efficiency

Fuel expenses continue to trouble fleet managers more than anything. Even today, fuel continues to be at the top of a fleet owner's expense list. As your transportation business grows, your fuel expenses will grow too. Here, integrating IoT sensors into an existing telematics platform can be advantageous. With it, fuel managers get vehicle fuel consumption analytics in real-time. They can compare fuel drains with refills and with their expenses to see where they're losing money.

Most importantly, device-to-device communication will reduce the chances of theft. Now, fleet managers will be able to identify and prevent theft from the comfort of their offices. They will also be able to distinguish thefts from tank leakage and take appropriate action. With IoT, they will be able to respond to any fuel-related issues in actual time. Hence, monitoring fuel levels will help businesses make profitable decisions.

Reduced maintenance costs

The efficiency of your fleet depends on its engine's performance. With engine health sensors, your fleets will report critical errors before it's too late. On-board diagnostics (OBD) works well with IoT technology, allowing fleet managers to remotely access key vehicle health information. Early malfunction alerts enable quicker responses. This type of predictive maintenance is so much more economical than after-repairs. Besides, it facilitates the smooth functioning of supply chains by preventing unexpected breakdowns.

With IoT, you can track the maintenance of individual vehicular parts. For instance, you'll learn everything about tire health with tire pressure monitoring sensors. You'll know about your fleet's coolant and oil condition with OBD and temperature sensors. With such data, you can also bifurcate maintenance into different categories like battery maintenance, coolant flush, oil change, tire servicing, or a car wash. Such exhaustive reports will help you identify which type of maintenance is costing you the most.

You can also customize your fleet maintenance schedules to maximize efficiency. Set reminders based on the distance or duration. In addition to getting reminders, you'll also see the maintenance history of each fleet along with their corresponding expenses.

Sustainability

Connected mobility is the first step to environmental sustainability. Make your fleet businesses more efficient by monitoring fuel economy and emissions. See how much fuel are you saving by picking optimized and well-planned routes. You can also connect your electric fleet to the IoT network and monitor their power consumption needs.

Monitoring driver behavior and getting alerts can serve more than one purpose. Strict driver monitoring improves efficiency. Minimize fuel-wasting behaviors like idling and harsh braking. In addition to maximizing fleet safety, driver monitoring can put you on the path to greener mobility.

Looking Ahead

IoT is an ecosystem of connectivity. Connected devices communicate to aid supply chains and everyday mobility. It is predicted that by 2025, 28 billion objects will be connected and become a part of the internet of things. This will generate a tremendous amount of big data and businesses will have exciting opportunities to capitalize on it. The hyper-connected network of IoT is going to determine the progress of the transport industry. The businesses that adapt to IoT technologies will have a better edge over their competitors. They'll have reliable data and an action plan to survive in a competitive market .❑

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Tushar Bhagat is the CEO of Uffizio. He has simmered 15 years worth of informatics knowledge & experience into a one-of-a-kind telematics platform. This fleet management system has been acclaimed and widely used by businesses in over 60 countries. He firmly believes in finding creative solutions to everyday challenges—so businesses can bloom into their full potential.

Marelli launches its Wireless Distributed Battery Management System

Marelli expands its range of battery management technologies for electric vehicles with a new Wireless Distributed Battery Management System (wBMS). This technology eliminates the wired physical connections typically needed in other Battery Management System (BMS) architectures, allowing for greater flexibility, increased efficiency, improved reliability and reduced costs, all crucial aspects in electric vehicles. Marelli is making available the solution starting from the second quarter of 2022, to support customer launches in 2024.

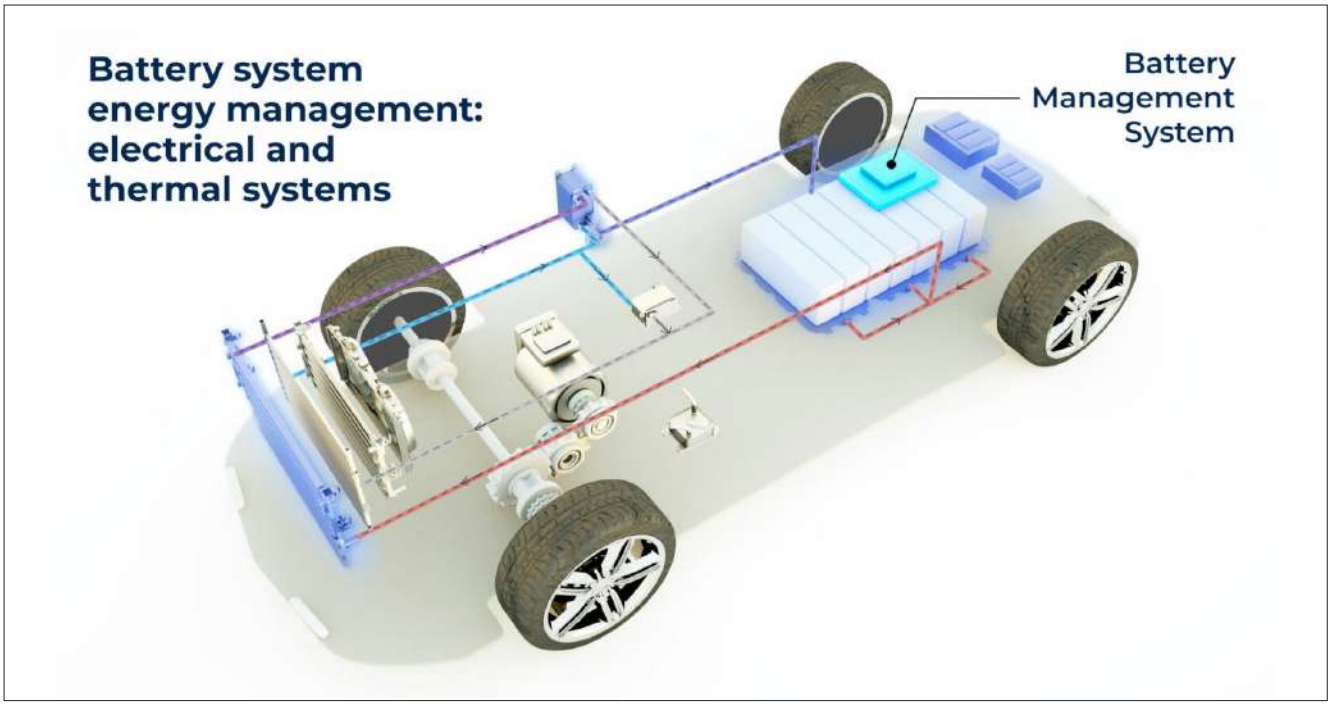
The solution eliminates the need of daisy-chain communication and wiring by using wireless technology to enable the communication between batteries and control unit. Compared to previous wired distributed solutions, the new wBMS developed by the company reduces the wiring harness by 90% and simplifies the battery cell construction and installation. In particular, the wBMS reduces complexity in the assembly and grants more flexibility for battery modules placement.

The reduced weight due to connectors removal allows for more energy efficiency, thus increasing the driving range of the vehicle with the same charge. The solution also opens up room in the battery pack to allow larger batteries to fit, guaranteeing versatility, scalability, optimization; ultimately, under the right circumstances, larger batteries also translate to enhanced power performance and again extended vehicle range.

The Marelli wBMS can be delivered with a highly sophisticated software application layer that uses advanced algorithms based on a proprietary technique so-called "Sensor Fusion". The algorithms estimate several crucial parameters of each battery cell – including State of Charge, State of Health, State of Power – to ensure a more accurate calculation of the battery overall status, and informs the other components of the powertrain accordingly.

Developing an advanced Battery Management System is a fundamental task for the Electric Vehicles design, since it is a core and smart component in the complex architecture of the EV energy management. The BMS represents the "brain" of the battery, manages the stored power and the capacity of the battery to deliver energy to the rest of the vehicle, checks and delivers information of the battery operating conditions and status, ultimately monitors, optimize and protects the battery.

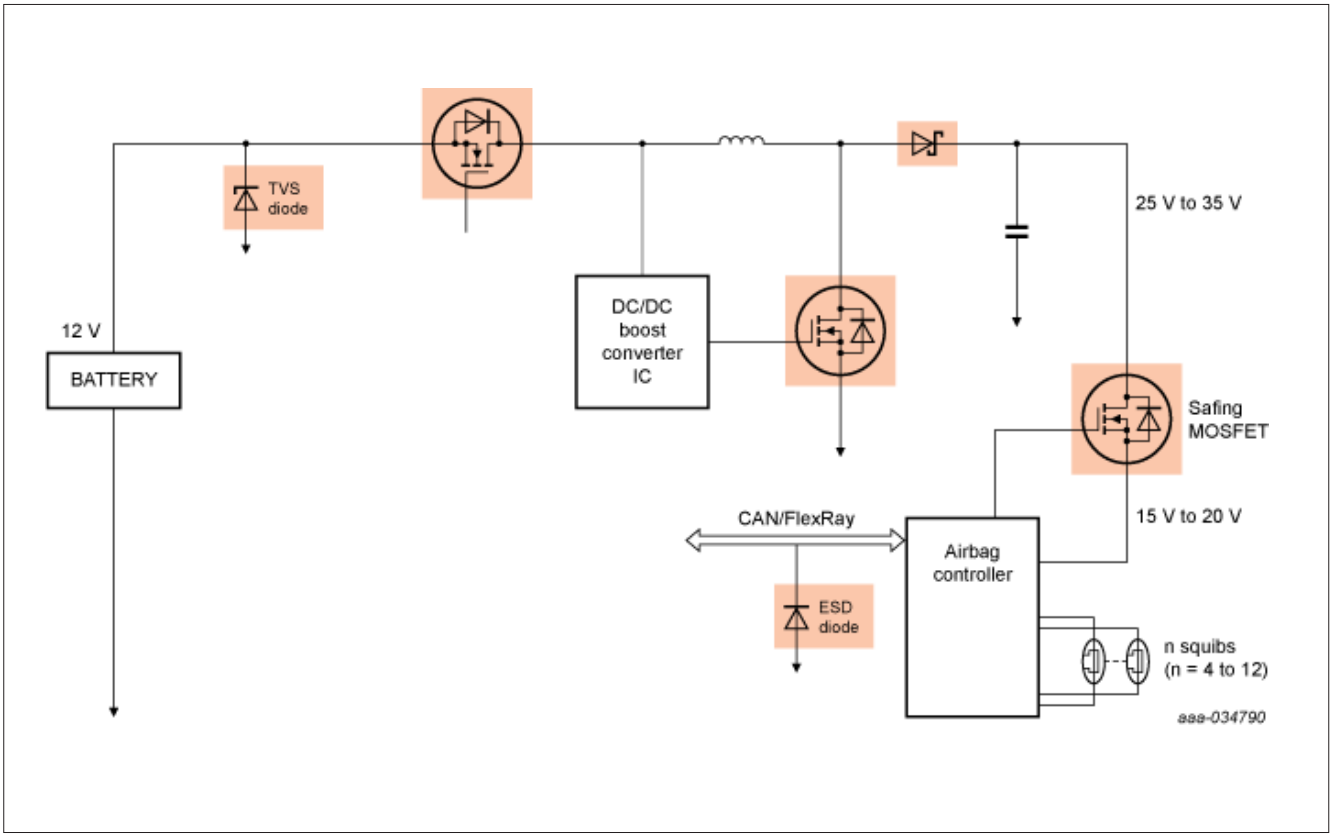
In addition to this new wireless solution, Marelli already has a consolidated experience in the development of integrated and distributed BMS architectures over the years. These solutions are part of Marelli's complete portfolio of modular technologies for vehicle energy management, that include a full selection of single components, as well as subsystems, up to solutions for the complete integrated vehicle energy management system. Complemented by proven e-powertrain and thermal design competencies, the battery management capabilities contribute to Marelli's integrated approach, aimed to assure flexible and customizable solutions to control, manage and optimise the energy balance in electric vehicles. ❑



Role of the Battery Management System, which is a core and smart component in the complex architecture of the EV energy management.

Source: Marelli

Nexperia launches new portfolio of application specific MOSFETs (ASFETs) for automotive airbags



Highlighted components are Nexperia focus products

Source: Nexperia

Nexperia launched a new portfolio of application specific MOSFETs (ASFETs) for automobile airbag applications, headlining with the release of the BUK9M20-60EL single N-channel 60 V, 13 mOhm logic level MOSFET in LFPAK33 packaging. ASFETs are MOSFETs that have been specifically designed and optimized for use in one application. This portfolio is the latest addition to a range of other ASFETs which Nexperia's provides for battery isolation, motor control, hot-swap, and Power-over-Ethernet (PoE) applications.

The BUK9M20-60EL uses Nexperia's new enhanced safe operating area (SOA) technology which has been tailored to provide exceptional transient linear mode performance, a key performance metric in airbag applications. The BUK9M20-60EL achieves this performance in new LFPAK33 packaging which uses 84% less board space when compared to older DPAK packaging, while still maintaining robustness.

ASFETs for Airbag Applications:

- Automotive ASFETs for Airbag are designed to meet the needs of linear mode operation
- Qualified to AEC-Q101
- Increased SOA for improved linear mode performance
- Reliable in airbag deployment conditions
- Modern trench alternative to older generations of silicon technology
- Space saving efficiency (53% for LFPAK56, 84% for LFPAK33) when comparing to traditional DPAK packages
- All copper-clip benefits such as low thermal resistance, low package resistance and high current capability
- Design considerations:
- Traditional solutions to Airbag applications are being withdrawn from the market due to unsustainability
- Enhanced SOA technology provides similar linear mode performance in a sustainable silicon technology
- For pulsed linear mode applications, such as the Safing MOSFET in airbags, Nexperia's ASFETs provide the required robustness while delivering significant board space savings (up to 84% with an LFPAK33 device) compared to traditional DPAK solutions
- Airbag firing circuits need a stable voltage of 15 to 20 V, requiring a boost converter to step up the standard 12 V battery voltage to 25–35 V ❑

Solera introduces SmartDrive Protect, a video-based exoneration solution, for small fleets

Solera Holdings, LLC unveiled SmartDrive Protect at Solera Outlook 2022 in New Orleans. SmartDrive Protect, the newest addition to the Solera SmartDrive product suite, is a video-based safety solution for small fleets that provides accident exoneration, rewards safe driving, and offers the tools to coach and correct unsafe driving habits.

Research studies show that car drivers are principally at-fault in approximately three-quarters (70-75%) of fatal car-truck crashes. With shrinking margins due to increasing fuel and labor costs, driver shortages, and the high costs associated with accident settlements, fleets are just one accident away from closing their doors. Video of driving events is critical not only for exoneration but also commendation when commercial drivers drive defensively and save lives.

SmartDrive Protect captures continuous video and leverages artificial intelligence (AI) technology to identify driver events such as harsh acceleration, braking, cornering, speed limit violations, lane drifting, tailgating, stop sign violations, and distracted driving. These events are then transferred into a coachable event workflow to ensure drivers receive feedback and complete coaching exercises to improve driving behaviors.

Key features of SmartDrive Protect include:

- AI for both road and driver-facing cameras: Artificial intelligence monitors factors such as driver head pose, allowing fleets to see when a driver exhibits distracted behavior and enforce policies around distractions.
- Continuous video recording: When the ignition is on, front-facing and driver-facing cameras are always on recording all events, allowing fleets to host a virtual ride along or pull video from a precise time and location of a specific event.
- Dashboard with centralized data: Data is compiled in an easy-to-consume dashboard format, allowing fleets to easily spot trends from a high-level down to individual trips and drivers.
- Driver coaching workflow: Identifies risky events or trends and supports personalized closed-loop coaching sessions for drivers. ❑

Protect by SmartDrive

Source: Solera

THE ITRIANGLE GAZETTE

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MARCH 03 - 2021
VOL 009
RS. 1.01

iTriangle

A DEVICE FOR ALL NEEDS
A ONE STOP SHOP

BASIC TELEMATICS

- Driving Behaviour
- Speed & Geo Fencing
- Supports Panic Button, Immobilizer, Fuel Sensor Integration
- Device based Configurable Alerts Module & Track & Trace

COMPLIANCE TELEMATICS

- All Telematics Features
- AIS 140 Certified
- Hassle Free Common Layer Activation
- Hassle Free E-Sim activation
- Empanelled in all AIS 140 active States
- Additional Advanced Features over and above AIS 140 Mandate
- Supports Panic Button, Fuel Sensor, Immobilizer, Integration

ADVANCED TELEMATICS

- Video Telematics
- Diagnostics
- Data Points for Prognostics of Vehicle/ Vehicle ECUs
- Vehicle ECU FOTA/COTA
- Live Diagnostics of Vehicle ECUs with J2534 standard CAN and Device based
- Configurable Alerts module

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- Device Issues
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- Subscription Renewals
- Vaahan Registration
- Common Layer Registration as per AIS 140 Mandate
- Sales Enquiries and Assistance

SO MUCH, FOR SO LESS

EV TELEMATICS

- Track & Trace
- All Telematics Features
- Support for CAN
- Battery Charge Status, SOC, Vehicle functional parameters on CAN etc
- Support for High voltage EV vehicle(9-90V)
- CAN and Device based Configurable Alerts module

INSURANCE TELEMATICS

- Accident Reconstruction using Video Telematics
- Driver Behaviour Analysis: Risk profiling of customers
- Data Points for Prognostics of Vehicle Consumables.
- Data points for Efficient Claims management

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Name: .....

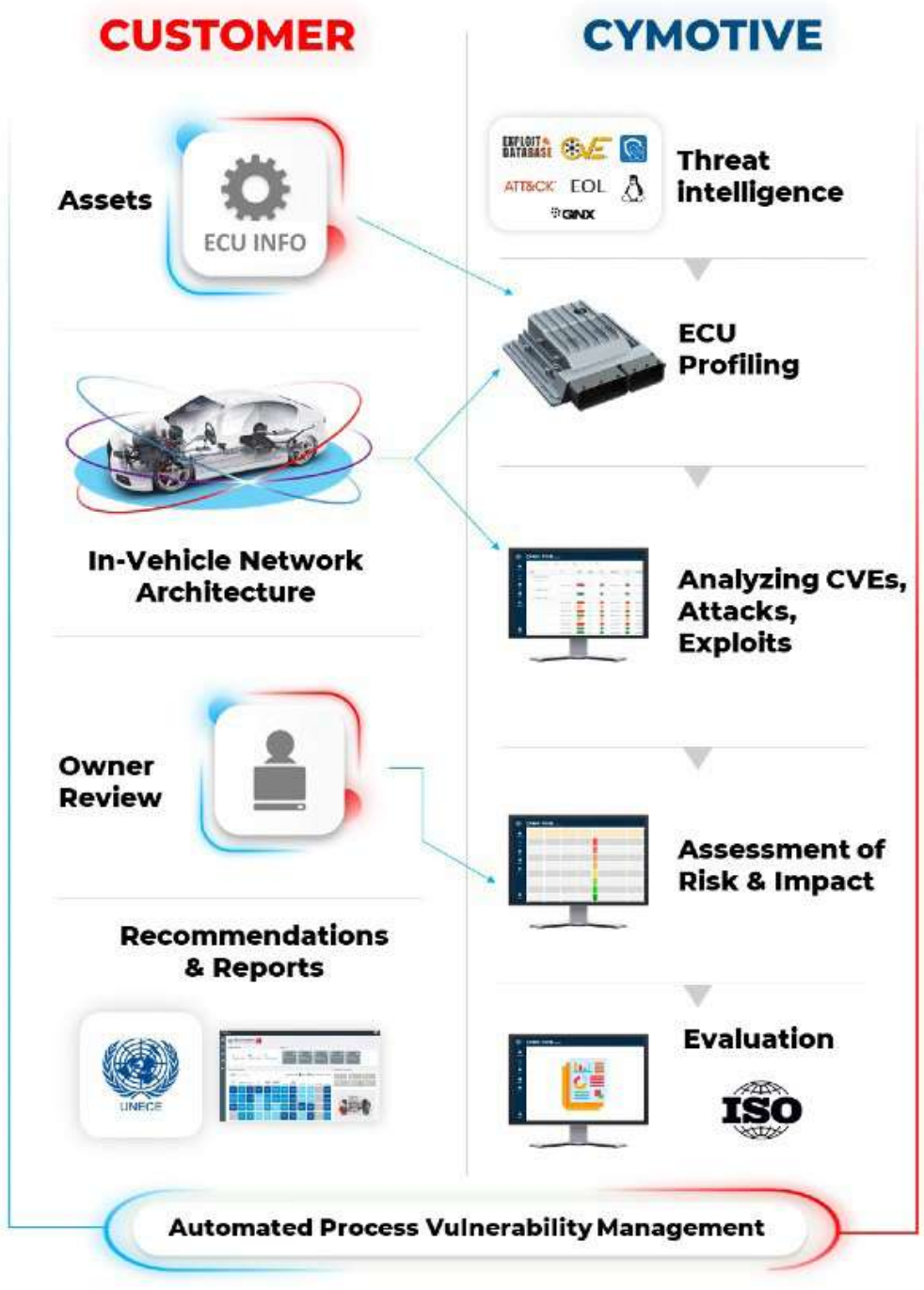
Street: ..... Town: ..... State: .....

CYMOTIVE Technologies launched Car Alert™

CYMOTIVE Technologies announced the commercial launch of its automated vulnerability management solution, Car Alert™, aimed at increasing vehicle fleet safety and security with assured regulatory compliance by minimizing the risks resulting from in-vehicle software and hardware component vulnerabilities.

The increasing software-supported amenities in today's connected vehicles are among the many reasons behind the frequency of vulnerabilities found during all stages of a vehicle lifecycle. CYMOTIVE's Car Alert solution has proven to manage these risks from the development stage and long after the vehicle's production stages. Results show that Car Alert's vulnerability management will lead to reduced costs, better brand protection, and greater customer satisfaction.

With the CYMOTIVE solution, car manufacturers and component suppliers add automation to their compliance process for cyber regulations, such as the UNR 155 following the ISO/SAE 21434 standard. Car Alert maps all software and hardware vulnerabilities to the electronic component units (ECUs), prioritizes them according to the risk of their potential impact and damage, and recommends the best path for risk minimization. For regulatory compliance, Car Alert generates all required artifacts, evidence and reports for audit submission leading to successful certification of the vehicle mode type.



Additional benefits for OEMs and tier one suppliers include:

- Continuous visibility of real-time cybersecurity posture
- Pre-emptive risk assessment of vehicle security and safety
- Insight to decide on optimal courses of action for increased security
- Generating the documentation required for regulatory vehicle type certification

Source: CYMOTIVE Technologies

LeddarTech releases its LeddarSteer automotive-grade, solid-state digital beam steering technology for LiDAR sensor developers

LeddarTech® announced the official release of LeddarSteer™, a digital beam steering solution designed for LiDAR smart sensor developers and Tier 1-2 automotive suppliers.

Digital beam steering refers to changing the direction of laser pulses in a LiDAR. Using a stack of alternating liquid crystal cells and polarization gratings enables to steer light at different angles at a specific wavelength in order to augment a LiDAR field of view while maximizing its performance, allowing digital beam steering for LiDAR to be achieved.

LeddarSteer digital beam steering offers a myriad of benefits to LiDAR smart sensor developers and Tier 1 and 2 customers, including:

- Software-controlled on-the-fly adjustment
- Frame-by-frame adjustment
- Preset or customized configuration
- Easy setup and interface
- Voltage-controlled steering
- Multiple LiDAR applications
- Compatible with a wide range of LiDAR architectures
- Enables one LiDAR to address multiple use cases
- Field of view adjustable for various actions, including turns, exits, lane changes and slopes
- Same LiDAR for highway and city driving
- Reduces the number of sensors, generating cost savings
- Automotive-grade solid-state technology, resulting in a significantly higher MTBF (mean time between failures)

LeddarSteer can be seamlessly integrated into an existing

LeddarSteer can be seamlessly integrated into an existing LiDAR to expand the field of view or integrated into new LiDAR development. The solution provides an enhanced signal-to-noise ratio by concentrating laser power on a small region of interest while reducing the size, cost and complexity of LiDAR components whilst maintaining or increasing the pixel count and resolution. ❑

Hindustan Motors is Planning Electric Comeback

Hindustan Motors is planning to return to the field of play with electric models that could include an electric scooter as well as an Ambassador 2.0 with an electric battery powering it. The company has collaborated with French automaker Peugeot to re-enter the automotive space in a bid to play to play a role in the electric mobility channels.

The vehicles would roll out of Hindustan Motors's Uttarpara plant in West Bengal, which announced a "suspension of work" in 2014. There has been no operation since then.

The company's notes for FY22 annual results noted that the management announced a "suspension of work" at the Uttarpara plant with effect from 24 May 2014 due to low productivity, increasing indiscipline, paucity of funds and lack of demand for the products; The Pithampur plant announced layoffs with effect from 4 December 2014.

The Uttarpara plant, which used to roll out the Ambassador, went downhill with the decline of the brand. Modeled on the Morris Oxford, it was a protracted slide for brand Ambassador.

Hindustan Motors, founded in 1942 by CK Birla's grandfather B M Birla, was the first indigenous car manufacturer. Ubiquitous in official use, it enjoyed a 75 percent market share by the 1970s.

The decline started when Maruti Suzuki launched the Maruti 800 in 1983. Between 1984 and 1991, reports suggested that Ambassador's market share fell to 20 percent. Then global automakers descended and hastened the decline. In 2017, the Ambassador brand was sold to Peugeot SA for Rs 80 crore.

The new Hindustan Motors joint venture will utilise the 295 acres at Uttarpara for the project that's left with the company. Originally the company had around 700 acres of land in Uttarpara. But in 2007 it struck a deal with Shriram Properties for 314 acres of land, which was surplus. Last year, the Hiranandani Group signed an MoU with Hindustan Motors to acquire 100 acres of land for logistics and a hyperscale data center park.

The company's notes for results mentioned that it was "practically" debt-free except for certain liabilities, which are primarily attributed to employee accounts, business payables and other liabilities.

The company realized that the accumulated loss as on March 31, 2022 stands at Rs 148.55 crore against share capital of Rs 104.41 crore and its current liabilities also exceeded its current assets indicating the existence of material uncertainty about the company's ability to continue as going concern, it was mentioned in the notes.

The initial investment would be Rs 300-400 crore. A greenfield project – that would have included land and infrastructure – would have cost Rs 1,000-1,200 crore. ❑

THE JOURNEY

1948 Hindustan Motors (HM) moved operations to Uttarpara in Hooghly, West Bengal, for manufacturing Ambassador cars

1970s By the end of the decade, Ambassador's market share was 75 per cent

1983–1991 Maruti Suzuki launched; Ambassador's market share drops to 20 per cent

2007 HM enters into a deal with Shriram Properties for surplus land at Uttarpara

2014 It suspends Uttarpara operations

2017 The firm executes agreement with Peugeot SA to sell the Ambassador brand

2021 MoU with Hiranandani group for 100 acres at Uttarpara

2022 HM initiates discussion with European auto company for EV

THE RETURN OF THE KING: The maker of iconic Ambassador cars is in talks with European auto firm for a JV

Image: Hindustan_Motors

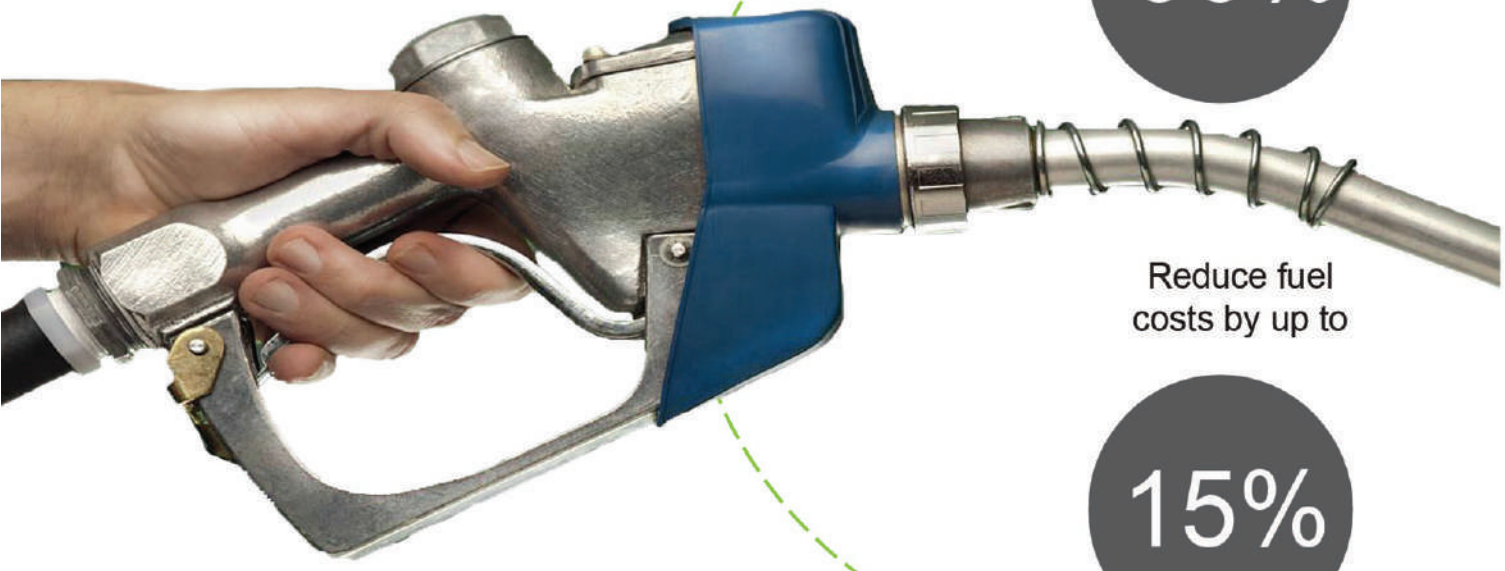
Source: Business Standard

Fuel

Tracking

Decrease fuel thefts by up to

90%



Reduce fuel costs by up to

15%

Optimize fleet efficiency by up to

30%

Discover where your fuel goes

Fuel is typically one of the largest fleet expenses. Finding ways to minimize fuel spent can substantially improve the bottom line.

Callcomm Ble fuel level sensors (Escort) provides intelligent tools to keep track of fuel consumption and easily detect fuel thefts.

www.callcomm.org

Callcomm

TRACK | ANALYZE | OPTIMIZE

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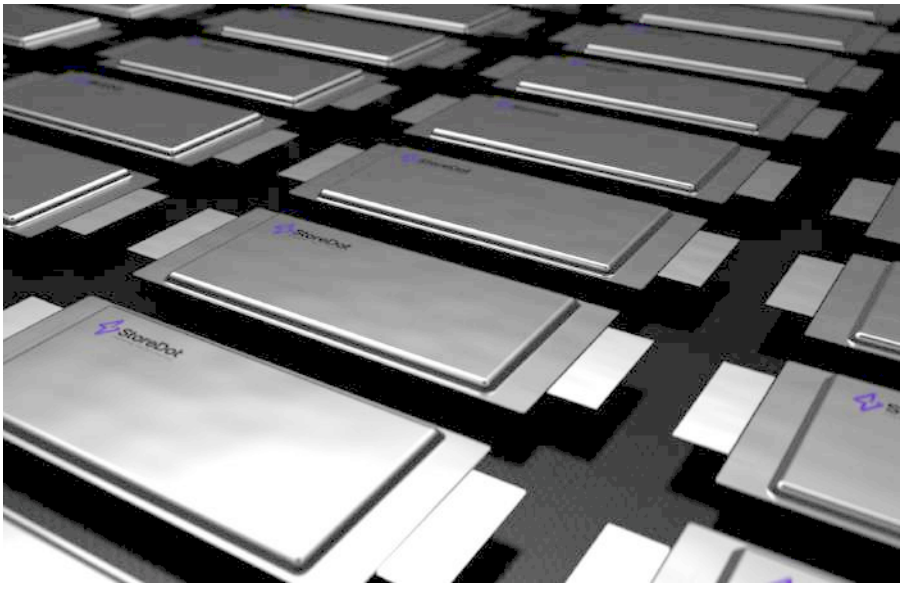
XCHARGE launches battery-integrated charger in cooperation with BYD

XCHARGE unveiled their latest product line the Net Zero Series which is aimed to drive the adoption of fast charging and energy storage solutions. XCHARGE collaborated with battery leader BYD to combine advanced battery technology with intelligent charging creating the next generation of EV infrastructure. The two companies agreed to collaborate on the new product based on their commitment to a carbon-free, sustainable transportation and a shared vision to foster a greener future.

The Net Zero Series enables 210kW max. output power, supports up to 2 vehicles simultaneously charging, and features a 19-inch HD touchscreen. It is equipped with liquid cooled Lithium-ion battery modules which come in two storage capacities, 233kWh in the base configuration and 466kWh in the Plus model. In addition, the net zero series is designed with a Battery2Grid function where applicable, so that in peak hours, the charger can sell energy back to the grid, if the battery is relatively full.

StoreDot completes live demonstration showcasing extreme fast-charging battery technology capable of delivering 100 miles in 5 minutes



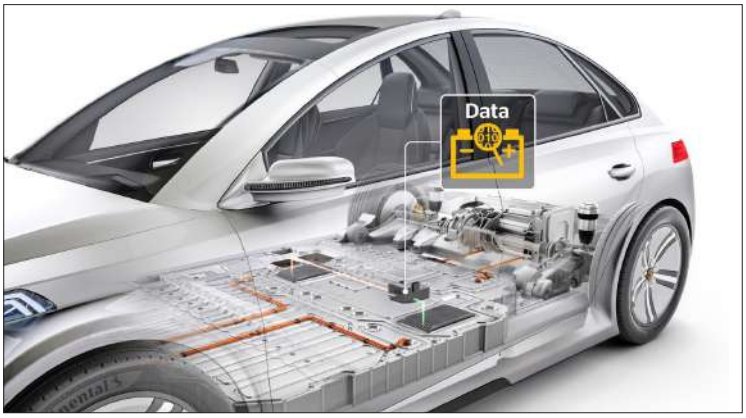
StoreDot has successfully, publicly demonstrated its ability to charge a full-scale electric vehicle (EV) battery cell with the energy for 100 miles in just 5 minutes live on stage.

The presentation took place at EcoMotion Week 2022 in Israel. It validates StoreDot's '100inX' strategic technology roadmap, which will transform automotive travel and facilitate the rapid transition to a more sustainable, zero-emissions future by delivering 100in5 by 2024, 100in3 by 2028 and 100in2 in by 2032. The demonstration featured a 300×100 mm pouch cell produced at EVE energy's manufacturing plant in China. The battery was charged under a 10-minute time limit, during which the cell charged to 20Ah, exceeding the 0% to 80% capacity target set for the demonstration.

Continental launches new sensors to protect the battery of electrified vehicles

Continental launched two new sensors for electrified vehicles: the Current Sensor Module (CSM) and the Battery Impact Detection (BID) system. Both new solutions focus on protecting the battery and/or on battery parameter retention. Within 2022, Continental will begin to manufacture the all-new high-voltage Current Sensor Module (CSM). This compact modular sensor design measures the current and simultaneously detects temperature. Both values are highly relevant as input for the battery management. Another innovative element of battery protection will be brought into the market by Continental: The Battery Impact Detection (BID) solution is a light-weight alternative to heavy underfloor "armoring" against damage.

Considering that the battery is the single most expensive component in an electric car, the CSM was not just developed to protect the battery from overcurrents, but it will also help to retain the battery parameters by limiting ageing effects. Integrated either in the battery disconnect unit or in the battery itself, the CSM will provide the two decisive bits of information for battery protection as well as reliable driving range monitoring. To support strict functional safety requirements, the CSM is available as a two-channel sensor, measuring current independently by integrating shunt technology and hall technology in a compact, single unit.



The high-voltage Current Sensor Module (CSM) provides the current and temperature information to keep the battery safe and ensure long-term durability.

Volvo to integrate charging and payment functions into its smartphone app

Volvo Cars has announced plans to integrate and consolidate a variety of charging and payment functions into its Volvo Cars smartphone app, available for iOS and Android devices. Through the move, the OEM hopes to make the app an easy-to-use, one-stop shop, for drivers of its electric vehicles.

With the app's new charging functionality, EV drivers will be able to carry out the charging process from their smartphone. Here, users can locate public charging stations offered by several charge point operators, receive real-time information on their availability and pay for charging sessions.

In-car app provides seamless charging in Volvo electric and plug-in hybrid cars with Google Android Automotive OS

HEADLINES

- **Ford Pro leading companies into electrified future with electric vehicles, charging solutions, in-vehicle software**
- **Major U.S. automaker selects TOYO Corporation's vehicle-in-the-loop simulator platform for next-gen electric and autonomous vehicle design and test**
- **ATLIS electric vehicles is inspiring a new generation of ambitious innovators**
- **BMW Group creates closed recycling loop for high-voltage batteries in China**

Basemark debuts Augmented Reality development tools for the automotive industry

Basemark has launched its Rocksolid AR SDK, a full suite of software development tools and runtime systems for the development of automotive in-cockpit AR applications. The Rocksolid AR SDK enables customers to develop and deploy AR solutions easier, faster, and more efficiently.

The Rocksolid AR SDK can be used as a standalone component integrated into existing automotive software and electronics architecture or as an integral part of the Rocksolid Core automotive OS and architecture by Basemark.

The solution supports both OpenGL ES and Vulkan APIs, providing options for the customer to deploy the AR applications on a wide variety of different processors. This is important for car manufacturers as, due to chip shortages, they need to be flexible on which chips they choose to build various different car models.

Vaisala provides Volkswagen Group with global infotainment weather service to enhance driver safety and experience worldwide

NovaCHARGE deploys ChargeUP™ network cloud-connected, future-proof electric vehicle (EV) charging stations at the University of Tampa

NovaCHARGE announced it has completed the first leg in a series of EV charger deployments at University of Tampa (UT). The first deployment involved removing four outdated charger ports and replacing those with a total of six NovaCHARGE NC8000 Level 2 chargers. UT selected NovaCHARGE as a partner in fulfilling its commitment to sustainability and its status as a "green university."

All six of the new EV chargers are interconnected with NovaCHARGE's cloud based ChargeUP Network that provides an online management dashboard for remote administrative control, efficient load management, robust reporting, and unrivaled scalability.

Basemark's Rocksolid Core adds over-the-air update capability with SyncShield

Basemark announced that SyncShield has joined the Rocksolid Ecosystem. SyncShield is a software enterprise offering over-the-air (OTA) tools for cyber-secure control over connected devices. The cooperation enables cloud-side over-the-air operations for Rocksolid Core and provides easy integration to backend services and business processes in a secure manner.

With these over-the-air and cloud capabilities, automotive OEMs can tap into new revenue streams and business models. Besides safety-critical system updates, it's now possible to offer customers new products and services, such as user interface upgrades and personalization, as well as enhanced features and functionality of the car, such as optimized battery loading for cold weather and new entertainment or navigation features.

MediaTek automotive portfolio powering innovative devices at Connected Vehicle 2022

MediaTek showcased its latest innovative solutions portfolio and in-vehicle technologies at the Connected Vehicle 2022 event in Bengaluru. MediaTek has leveraged its R&D capabilities and leadership position in the global semiconductor market to deliver innovative integrated solutions for the automotive market including in-vehicle communication systems, in-vehicle infotainment (IVI) systems, Vision Advanced Driver Assistance Systems (V-ADAS) and mmWave radar solutions.

MediaTek automotive solutions at the event include Kent CamEye, powered by MT8788, PV Technologies Smart Cockpit / In-Vehicle Infotainment (IVI) powered by MT8675 and Surround View Camera featuring MT8666 and Two-Wheeler Smart Instrument Cluster powered by MediaTek by New Age Tech.

Wind River Studio enabling Hyundai Mobis and Hyundai AutoEver to accelerate development of next-gen intelligent and connected vehicles

Wind River® announced that Hyundai Mobis and Hyundai AutoEver have signed an agreement to establish a strategic relationship that includes collaboration with Wind River Studio for the development of an automotive software framework and continuous test and test automation capabilities, as well as advanced software lifecycle management.

The collaboration will leverage each company's specialties and experiences to develop a best-in-class software development infrastructure for next-generation connected automobiles. The companies will work closely on methodologies to accelerate the development and delivery of automotive systems, including enhanced continuous test capabilities and test automation in both simulated and real hardware-based environments and new customer test infrastructures making use of virtual device management.

Wayve to scale deep learning for autonomous vehicles with Microsoft supercomputing technologies

Wayve announced it is working with Microsoft to leverage the supercomputing infrastructure needed to support the development of AI-based models for autonomous vehicles on a global scale. This announcement follows Microsoft's participation in Wayve's $200M Series B investment round. It also extends their existing collaboration, which commenced in 2020, when Wayve chose Microsoft Azure to help accelerate the development of its technology.

The companies are bringing together Wayve's expertise using deep neural networks and vast quantities of data to train AI models with Microsoft's engineering excellence in powering large-scale AI systems. Together, they aim to unlock the power of deep learning systems for autonomy, which holds the promise of being able to scale faster to new places than rules-based approaches. When designed around Wayve's unique approach, the power of Microsoft's supercomputing infrastructure will make it possible to bring self-driving technology to more places and customers sooner.

Motional and Uber Eats launch autonomous deliveries in Santa Monica

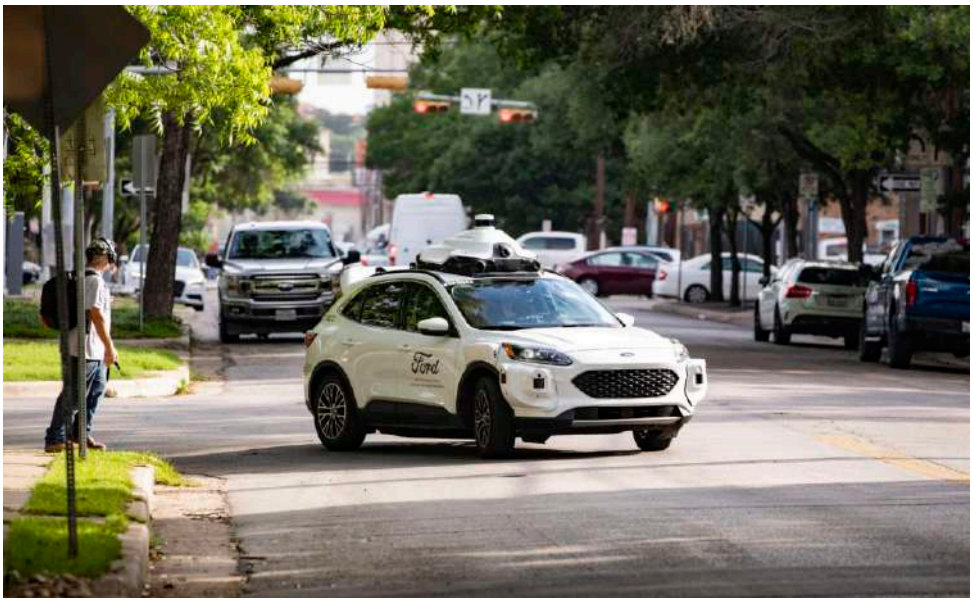
Motional and Uber Technologies Inc launched autonomous deliveries for Uber Eats customers in Santa Monica, California. Motional's all-electric IONIQ 5 vehicles, operating autonomously, are now conducting end-to-end food deliveries.

Motional and Uber announced their partnership in December of last year, signaling important firsts for both companies: the first on-road autonomous vehicle (AV) pilot on the Uber Eats network and Motional's entry into the autonomous delivery market. Motional and Uber see an opportunity for AVs to benefit the on-demand delivery space by providing safe, cost efficient, and reliable deliveries.

The companies look forward to learning from the service and receiving customer feedback, as they jointly develop an automated delivery model that could quickly scale to more areas across Los Angeles and in other cities. The goal of the pilot is to create the groundwork for future commercial activities between Motional and Uber.

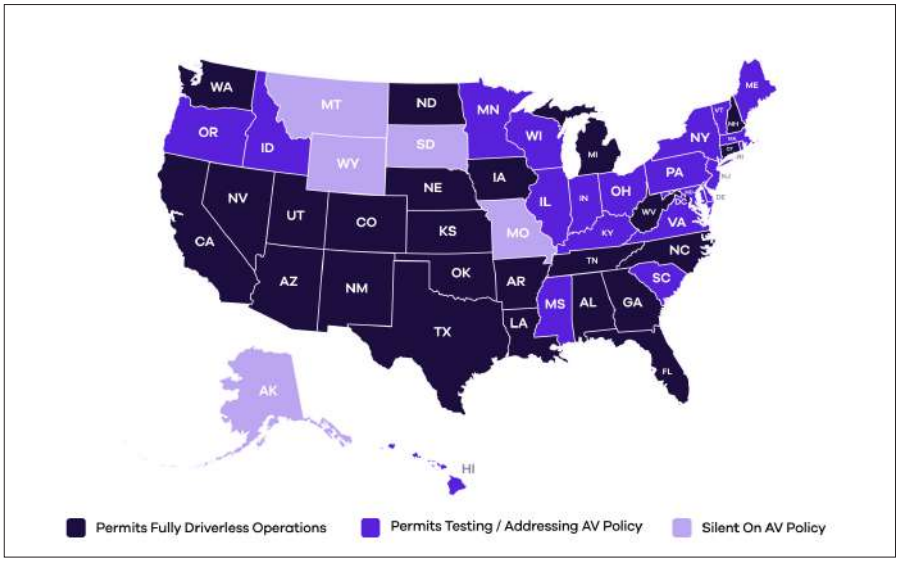
Motional IONIQ 5 robotaxi

Argo AI begins driverless vehicle operations in Miami & Austin



Argo AI commenced driverless operations in Miami and Austin, two of the eight global cities in which it is currently developing its technology.

Reaching the point to operate without a driver, during daytime business hours, while sharing the road with many others, is the result of more than five years of progress on the Argo Autonomy Platform. With multiple customer-facing pilot programs operating in Miami and Austin, this milestone marks an important step in the company's plan to bring together the technology, the operational footprint, and the commercial partners needed to achieve a scalable autonomy business.



States which permit driverless operations autonomous vehicle testing

Gatik to expand operations to Kansas following enactment of new legislation enabling autonomous vehicle deployment

Gatik announced that it will be expanding operations to Kansas following the signing of Senate Bill 313 into law by Governor Laura Kelly. The law enables the deployment of fully autonomous trucks on public roads in the state, paving the way for enhanced road safety, increased product flow, lower costs and higher asset utilization on the supply chain.

Gatik worked closely with Walmart and key stakeholders including the Kansas Department of Transportation, the Governor's office, leadership in the House and Senate and the Kansas Sheriffs' Association to develop and propose legislation that prioritizes the safe and structured introduction of autonomous vehicles in the state. Prior to commencing operations, Gatik will work closely with state and local authorities to provide education and training sessions to law enforcement and first responders as part of the company's industry-leading stakeholder engagement strategy.

OMNIVISION and Valens Semiconductor partner to offer automotive OEMs a MIPI A-PHY-Compliant camera solution for Advanced Driver-Assistance Systems applications

OMNIVISION and Valens Semiconductor have partnered to bring to market a MIPI A-PHY-compliant camera solution for the automotive industry. The companies will include Valens Semiconductor's new VA7000 A-PHY-compliant chipsets inside OMNIVISION's Automotive Reference Design System (ARDS) camera modules. The initial camera module will also include the OX08B40 image sensor from OMNIVISION.

The collaboration between Valens Semiconductor and OMNIVISION will pave the way for the development of A-PHY-compliant camera systems, allowing for smaller camera designs, reduced power consumption, lower camera cost, and interoperability with the wider A-PHY ecosystem. Both companies will demonstrate the A-PHY reference design at AutoSens Detroit.

Veoneer to supply cameras to BMW Group's next generation vision system for automated driving

The automotive technology company Veoneer has signed an agreement to equip BMW Group vehicles with camera heads for their next-generation vision system for Automated Driving. The camera heads support the cooperation between BMW Group, Qualcomm Technologies, and Arriver™.

The high-definition 8 MP camera, mounted behind the rear-view mirror, monitors the forward path of the vehicle to provide reliable and accurate information to the vehicle control system.

In BMW's next generation of Automated Driving Systems, BMW Group's current AD stack is combined with Arriver's Vision Perception and NCAP Drive Policy products on Qualcomm Technologies' system-on-chip, with the goal of designing best-in-class Automated Driving functions spanning NCAP, Level 2 and Level 3. Veoneer's camera heads are adapted to the current trend of a centralized and scalable software architecture and will be an essential part of the sensor set-up required for the next generation AD platform.

BlackBerry and Magna collaborate on next-generation Advanced Driver Assistance System solutions for global automakers

BlackBerry Limited and Magna International Inc. have entered into a multi-year agreement to collaborate on various integrated Advanced Driver Assistance Systems (ADAS) solutions.

With OEMs launching vehicles with ever expanded feature sets, the global ADAS market is set for significant growth over the next decade. As part of the agreement, BlackBerry will provide Magna with QNX software including the QNX Software Development Platform, QNX OS for Safety, QNX Platform for ADAS, as well as professional engineering services for system-level integration, performance optimization, and solution validation.

HEADLINES

- Piston Automotive and Our Next Energy to collaborate on future EV battery
- Ford joins First Movers Coalition, announces commitment to help commercialize zero-carbon technologies
- Stellantis and Samsung SDI to invest over $2.5 billion in joint venture for lithium-ion battery production plant in United States
- Hyundai Motor Group to strengthen US investment as the group targets innovation and mobility leadership
- VW Commercial Vehicles opts for premium tires from Continental as original equipment for the Caddy
- Nexperia and KYOCERA AVX Components Salzburg agree partnership for gallium nitride automotive power modules
- Renesas to invest and restart operation of Kofu Factory as 300mm wafer fab dedicated for power semiconductors
- ParkMobile launches in Richmond, Virginia, through a partnership with ParkHub's CurbTrac Platform
- Lordstown Motors and Foxconn close asset purchase agreement and enter into JV agreement for MIH based EV Development
- Toyota Motors acquired 2,753 patents in the U.S, recording a 2% drop from 2020
- Innoviz grabs $4 Billion deal with huge vehicle manufacturer
- Parkopedia and Uproad revolutionise in-car tolling payments for US drivers
- Lilium and Livent announce collaboration to advance research and development for high-performance lithium batteries
- Allego and Volkswagen Group France enters a strategic partnership with Groupe Bertrand

Nuvve and Power Electronics reach an agreement to expand high-powered V2G charging line-up in North America and Europe

Nuvve Holding Corp. and Power Electronics announced an agreement to integrate Nuvve's vehicle-to-grid (V2G) GIVe™ platform with Power Electronics charging station technology to help intelligently electrify vehicles and help achieve global decarbonization goals. Through the partnership, Power Electronics will add Nuvve V2G-certified capabilities to their existing bidirectional chargers.

Nuvve's cloud-based software allows Power Electronics to go beyond bidirectional charging – that is, allowing an electric vehicle (EV) to send energy back to the grid – by enabling EVs to provide capacity and services that help stabilize the grid and prevent blackouts. By allowing EVs to store energy, including that from intermittent sources such as solar and wind, Nuvve's system helps increase renewable energy integration, while always prioritizing the mobility needs of the driver.

Nuvve and Power Electronics to integrate Nuvve's V2G platform into Power Electronics charging stations

Cognata and Hancom MDS sign a key partnership agreement to accelerate ADAS and AV simulation adoption in the Korean market

Cognata, Ltd., announced the integration of Cognata's simulation authoring software into Hancom's advanced portfolio, to further accelerate AV and ADAS simulation adoption into the progressive Korean market. Cognata's extensive simulation platform solution is designed to test, train and validate perception and control challenges autonomous functions from all vertical markets – from Urban uses, warehouse robots, agriculture machinery, defense, construction, and more.

Along with Hancom MDS's extensive experience in the embedded solution segment, Cognata will be able to dramatically extend its reach and expand its offering to provide significant value to the Korean automotive landscape, on a nationwide scale.

Hyundai Mobis inks MoU to develop software platform

Hyundai Mobis and Vector have agreed to the joint development of automotive software platforms. Vector, a German premium partner of AUTOSAR, which endorses global standards for automotive software.

As software platforms have become a critical component in defining competitiveness in vehicle manufacturing, automakers are now requiring their suppliers to adopt AUTOSAR-based software platforms with proven quality and versatility. Through this MOU, the two companies are anticipating increased competitiveness of their automotive software in the global automotive industry.

The two companies will first install the co-developed software in core components related to parking systems, autonomous driving sensors, infotainment systems, and electrified parts. It is also expected that this list of core components installed with the platform will grow further.

Intelematics partners with Aeris to bring connected cars to ANZ

Intelematics, has announced a new partnership with global IoT solutions provider, Aeris. The partnership will enable Intelematics to bring Aeris' connected vehicle platform, the Aeris Mobility Suite (AMS), to local vehicle manufacturers and distributors in Australia and New Zealand.

The landmark partnership marks Aeris' first entry into the ANZ market. The Aeris AMS platform enables vehicle manufacturers and distributors, from commercial vehicles to cars to micromobility, to rapidly deploy connected services and functionality spanning vehicle health, safety and security, location and convenience.

This includes feature capabilities such as stolen vehicle tracking, accident notifications (eCall) services, and remote vehicle services such as lock/unlock and remote start, subscription and payment management and vehicle software updates. Intelematics will provide comprehensive support including interface design, application development and technology integration services for the AMS platform.

There will be 4.4 million EVs sold in UE by 2026

The European Union (EU) is the leading EV market globally. And according to a StockApps.com analysis, the EU will have sold 4.4 million EV units by 2026. The site suggests that a growing consciousness about the environment will propel that growth.

StockApps.com's Edith Reads has been discussing the data. She holds, "The European EV market is blooming and what's driving it isn't just the promise of cleaner air and lower emissions. It's also a matter of consumer choice as there's growing consumer concern about climate change throughout the region."

How does the European Climate law impact the EV market?

Market data shows that the European EV market will reach 11.9M units growing by a CAGR of 29.6% between 2021 and 2028. The growth is driven by several factors, primarily the EU's initiatives to curb emissions.

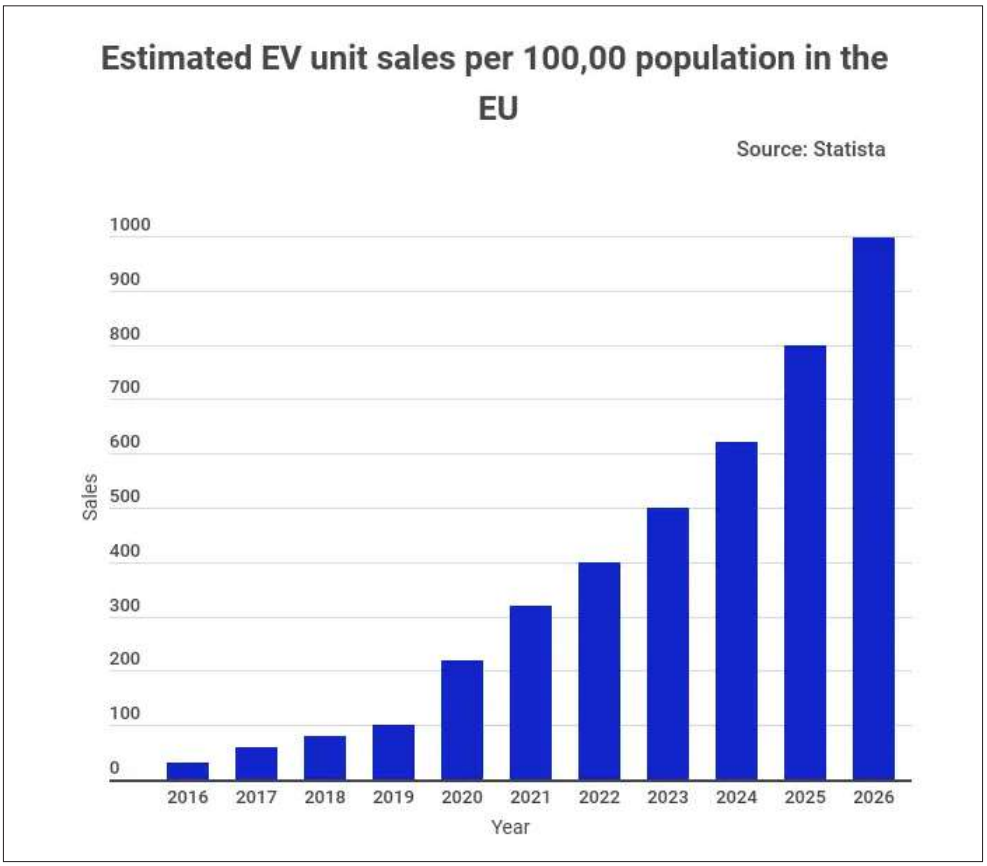
The EU has ratified the European Climate Law targeting climate neutrality before 2050. That law also seeks to bring GHG emissions 55% lower than 1990 levels by 2030. This move has seen countries implementing policies that encourage the use of EVs, including the introduction of stricter CO2 emissions standards.

These standards require automakers to produce more efficient vehicles. They will be phased in over several years in readiness for full implementation by 2030. As a result, automakers are investing heavily in R&D programs to develop more fuel-efficient engines and hybrid vehicles that can run on both gasoline and electricity.

Are there other reasons for the surge?

Besides the environmental laws, EU governments are also incentivizing EV production and adoption. Through subsidies, they're encouraging automakers to ditch ICEs in favor of electric ones. Similarly, they are offering tax breaks for people who buy them.

Further, there has been a rapid expansion of charging infrastructure and battery technology—which will make EVs more attractive to consumers and businesses too. Besides, EV battery costs have been declining with time, cutting production costs and making them affordable to many.



Estimated EV uptake in the EU

Guidehouse Insights estimates commercial light EV market will grow to nearly $10 billion in 2031

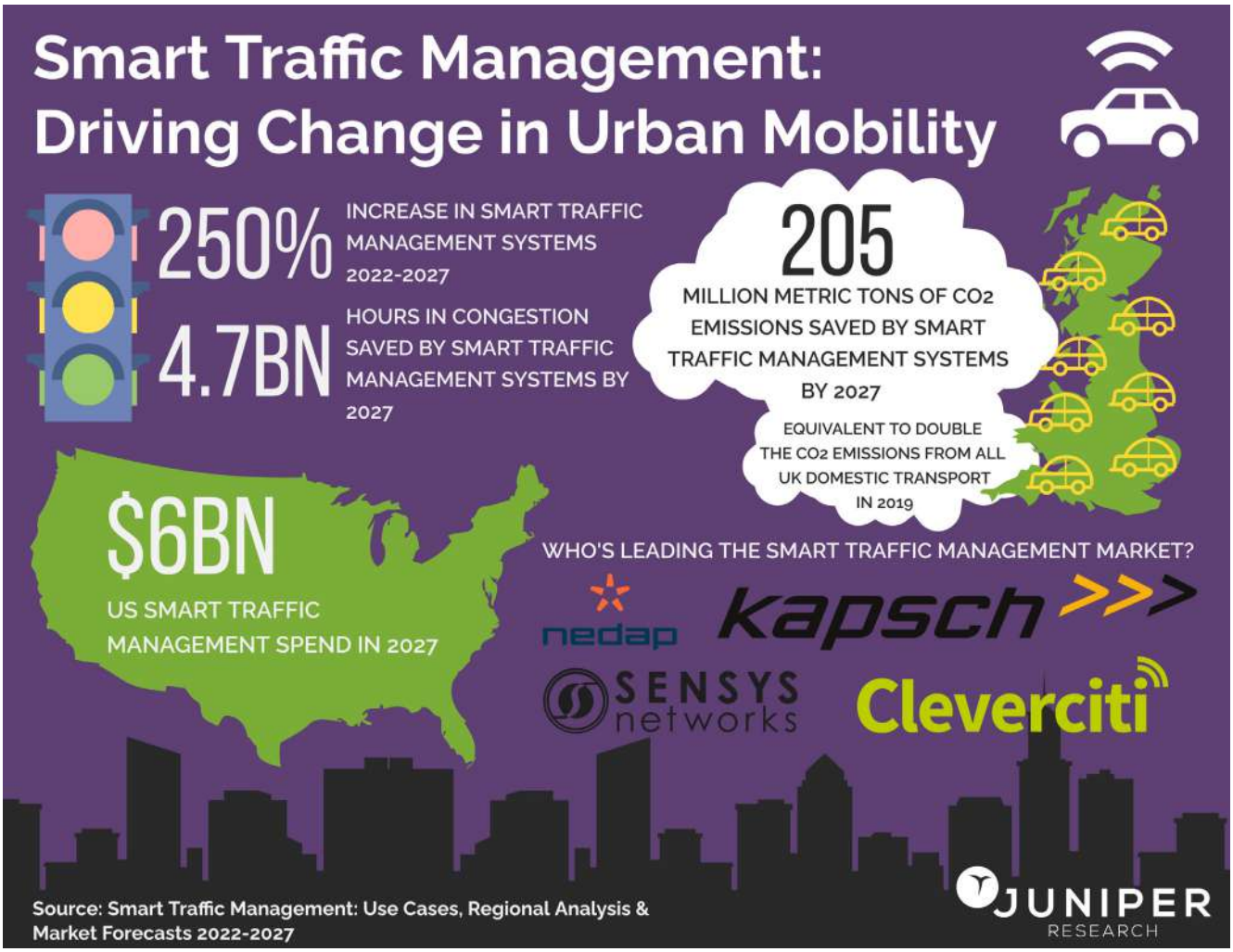
A new report from Guidehouse Insights analyzes the global market for commercial light EVs (CLEVs), including the outlook for commercial e-bikes, e-cargo bikes, seated e-scooters, and e-motorcycles. Electric three-wheelers (E3Ws) are also included in the analysis of the Indian market.

The increasing demand for last mile and food delivery services and the need for nimble, emission-free modes of transportation with low operating costs are driving the CLEV market. According to a new report from Guidehouse Insights, the CLEV market is forecast to show steady growth in annual sales revenues, rising from $3.4 billion in 2022 to $9.9 billion in 2031, representing a compound annual growth rate (CAGR) of 12.7%.

Increasing urbanization and congestion, combined with the proliferation of city access restrictions for ICE vehicles, is resulting in greater demand for CLEVs. Further increasing the demand, battery technology has advanced to help reduce prices and improve performance, resulting in CLEVs becoming an attractive proposition for applications such as transporting staff and goods on government fleets. Furthermore, police and military forces are seeing the benefits of CLEVs as agile and stealthy patrol vehicles, according to the report.

The installed base of aftermarket car telematics devices reached 87.4 million in 2021

According to a new research report from the IoT analyst firm Berg Insight, the number of active aftermarket car telematics units will grow at a compound annual growth rate (CAGR) of 11.6 percent from 87.4 million at the end of 2021 to 151.6 million at the end of 2026. Berg Insight's definition of an aftermarket car telematics solution in this report comprises both cellular/GNSS and RF-based solutions. Aftermarket car telematics solutions are useful in a number of application areas including stolen vehicle tracking and recovery (SVT/SVR), vehicle diagnostics, Wi-Fi hotspot, convenience applications and usage-based insurance. Vehicle diagnostics allows service providers such as dealers and workshops to improve service offerings to car owners. Dealers and finance companies can moreover leverage telematics for internal fleet management and manage the customer lifetime value. Examples of convenience applications enabled by aftermarket telematics devices include remote control of certain vehicle functions such as door lock/unlock and finding the last parking position.



Smart traffic management systems to save 205 Million Metric Tons of CO2 by 2027; Driven by congestion reduction

A new study from Juniper Research has predicted that global savings in CO2 emissions from smart traffic management systems will be 205 MMT (Million Metric Tons) by 2027; a growth of 41%, up from just 145.7 MMT in 2022. This significant saving will be equal to almost twice the CO2 emissions arising from UK domestic transport in 2019. Reducing congestion through optimised traffic control will be the main influencing factor. Smart traffic management uses digital technologies to manage traffic, based on real-time data to reduce congestion, and minimise emissions.

The new research, Smart Traffic Management: Use Cases, Regional Analysis & Marketing Forecasts 2022-2027, identified environmental benefits from smart traffic management systems as being highly compelling, including significant reductions in congestion, and prioritising greener transport modes. The report identified smart intersections as driving reductions, with hours of time spent in traffic set to decrease by 36 hours on average per annum per motorist globally by 2027.

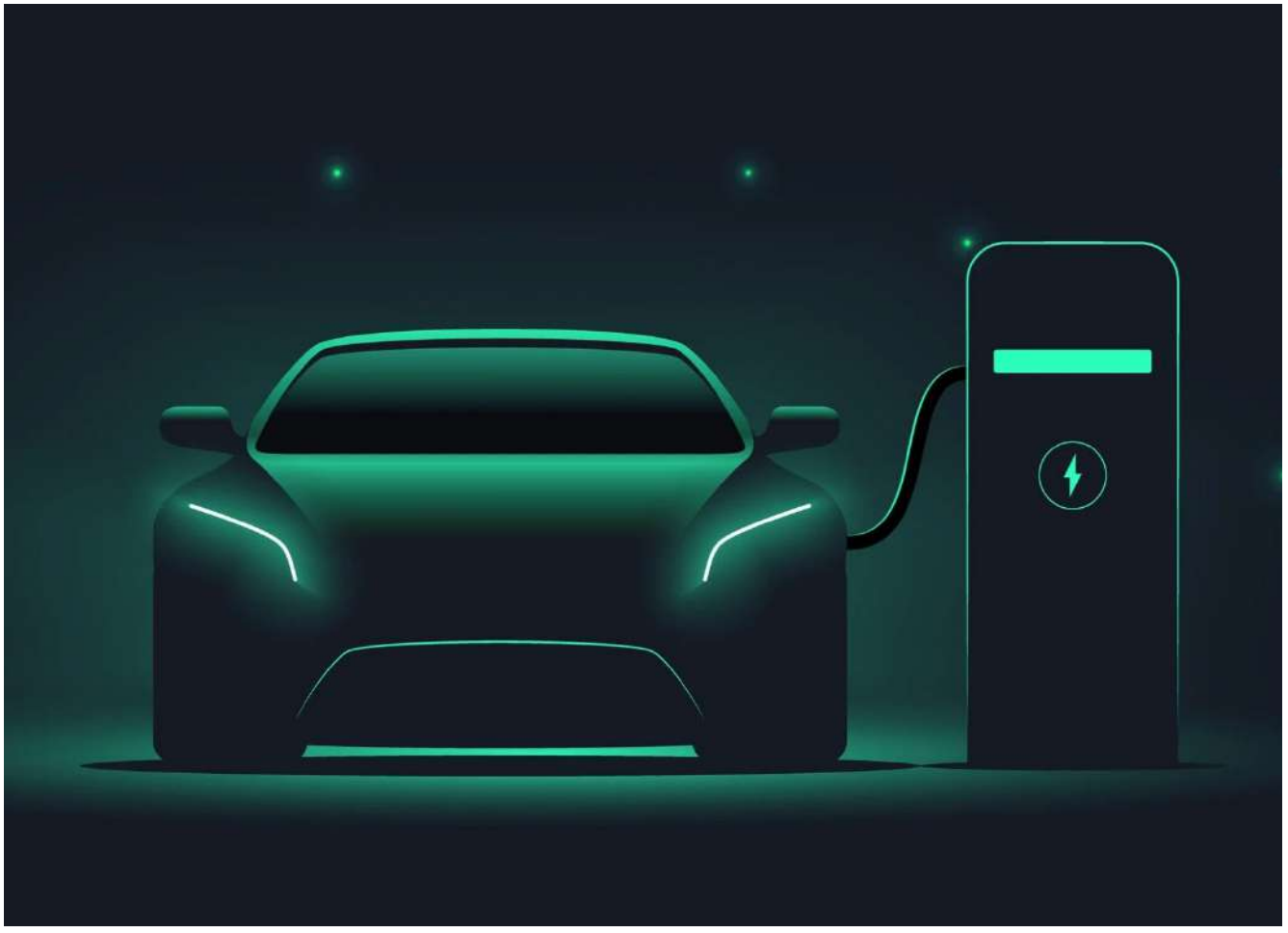
New ZETA report shows that electric vehicles are delivering vast cost savings to drivers, electric vehicle tax credits will ensure that all Americans benefit

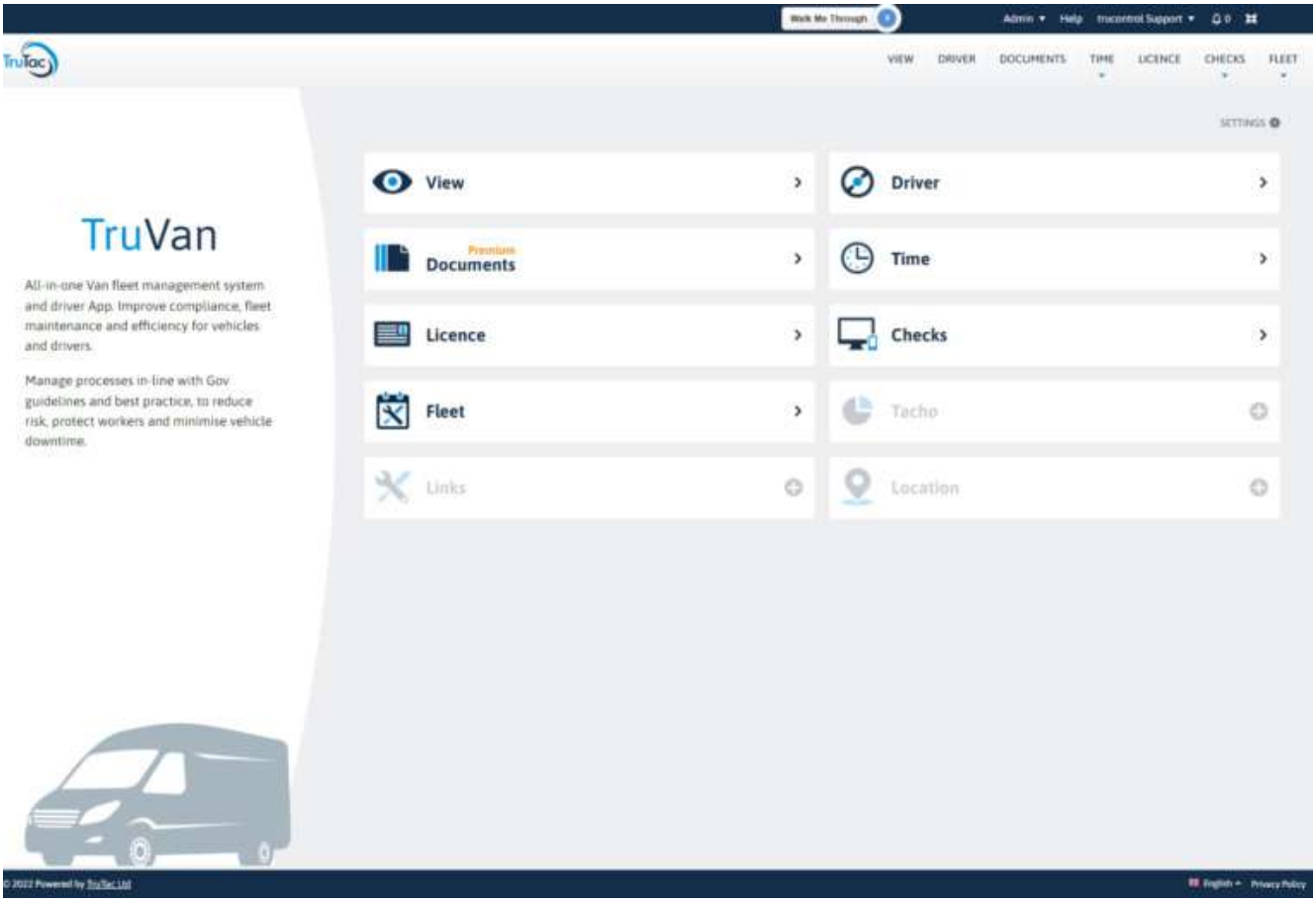
Zero Emission Transportation Association's (ZETA) released a new report showing that electric vehicles (EVs) are delivering vast cost savings to drivers. For the first time, ZETA's report includes data that illustrates the cost-per-mile trends for both EVs and gas-powered vehicles over the past six months. This report's publication comes as the May Consumer Price Index (CPI) is released.

A poll commissioned by ZETA earlier this year found that 71% of American drivers are considering an electric vehicle for their next car. The United States' domestic EV industry is growing, but American-made EVs sales still make up just a fraction of all auto sales.

Here are some key facts from the report:

- Gas prices are inherently volatile—and they always will be. EVs, on the other hand, operate independently of global oil markets, so their operating costs are not subject to the same fossil fuel price shocks, disruptions, and supply shortages. Instead, EVs run on electricity, which is cheaper than gasoline, is price-stable, and is domestically produced from increasingly renewable and local resources.
- EVs are far cheaper to drive than gas-powered vehicles. Nationally, gas-powered vehicles are 3-5 times more expensive to drive per mile than EVs. In several states (including Arizona, Nevada, North Carolina, Tennessee, Virginia, and West Virginia), EVs can be driven at just 15-20% of the cost of gas-powered cars per mile. In addition to examining this month's data, this ZETA report also looks back at the past six months, and the data confirms that over time, EVs are markedly cheaper to drive per mile—and experience far greater price stability—than gas-powered vehicles.
- The total cost of EVs is lower than that of gas-powered vehicles. In many cases, EVs are already comparable in price to similar new gas-powered models. And in addition to their fuel cost savings, EVs require less maintenance than gas-powered vehicles, too. EVs can save drivers between $1,800 and $2,600 on operating and maintenance costs per year, according to Consumer Reports.
- EVs will cost even less to buy if Congress passes strong EV tax credits. The proposed EV tax credit expansion in the clean energy tax plan will further reduce EV sticker prices, making it cost less to both buy and drive an EV. Furthermore, EV tax credits will help ensure that Americans can buy American-made EVs (rather than imports produced by our foreign competitors), which will create millions of good-paying American jobs and help the United States win the global clean transportation race. If we don't invest now, the U.S. will concede this race to our foreign competitors, hurting all Americans.





TruVan Portal

TruTac introduce TruVan – the new compliance tool for Van and LCV operators

In response to new regulations, TruTac have launched 'TruVan'. The brand new TruVan product includes an App and web-based 'back-office' management system to enable all Van operators to comply with DVSA Best Practice and operating guidelines while efficiently managing their fleet all in one place.

From 21 May 2022, all van operators (or cars with trailers) over 2.5 tonnes, based in England, Scotland and Wales, will need a standard international goods vehicle operator licence to transport goods for hire or reward in the EU, Iceland, Liechtenstein, Norway and Switzerland.

According to TruTac, TruVan ensures minimum risk exposure and compliance with rules and legislation and comes as an all in one, easy-to-use system with driver App. Company directors are afforded protection, say TruTac, while being provided with demonstrable reporting and dashboards for full audit control. Making driver and vehicle management and maintenance easier than ever before.

SmartWitness launches modular road-facing/driver-facing dashcam for fleets

Sensata Technologies announced that recently acquired SmartWitness is bringing modular flexibility to video telematics with its new KP2 dashcam. The KP2 is a compact road-facing camera with a snap-on driver-facing camera option that enables commercial fleets to add driver-facing video at any time with no wiring changes, no added installation cost, and no downtime.

Available immediately through telematics service providers, the KP2 includes a choice of real-time ADAS (Automatic Driver Assistance System) and DSM (driver state monitoring) features for accident prevention, plus cloud-based AI event analysis software that eliminates hours of time that is often wasted in reviewing false alerts of risky driving behavior.

The SmartWitness KP2 is a 4G/LTE camera that records HD video at up to 30 FPS per channel with a 140-degree forward-facing and 130-degree driver-facing field of vision, contains a 64GB SD card upgradable to 128 GB storage, and measures just 126mm x 82mm x 64mm including the driver-facing camera.

Tata Motors signs MoU for the potential acquisition of Ford India's Sanand plant

Tata Passenger Electric Mobility Limited (TPEML), a subsidiary of Tata Motors Ltd, and Ford India Private Limited (FIPL), have signed an MOU with the Government of Gujarat (GoG) for the potential acquisition of FIPL's Sanand vehicle manufacturing facility including (i) Land & Buildings (ii) Vehicle Manufacturing Plant, Machinery and Equipment and (iii) transfer of all eligible employees of FIPL Sanand's vehicle manufacturing operations, subject to the signing of definitive agreements and receipt of relevant approvals. FIPL will operate its Powertrain manufacturing facilities by leasing back the land and buildings of the Powertrain unit from TPEML.

The Ford India vehicle manufacturing site at Sanand is a state-of-the-art site. TPEML would invest into new machinery and equipment which is necessary to commission and make the unit ready to produce its vehicles. With the proposed investments, it would establish an installed capacity of 300,000 units per annum, which would be scalable to more than 400,000 units. This MOU for a potential acquisition of this unit, is a win-win for all stakeholders and helps Tata Motors accelerate the enhancement of its PV/EV manufacturing capacity.

Volkswagen and Mahindra sign partnering agreement for MEB electric components in Chennai

Volkswagen and Mahindra & Mahindra Ltd. (M&M) are exploring the use of MEB electric components for Mahindra's new "Born Electric Platform". Both parties announced that they have signed a Partnering Agreement on 18th May to evaluate the scope of collaboration. Mahindra intends to equip its "Born Electric Platform" with MEB electric components such as electric motors, battery system components and battery cells. The Partnering Agreement evaluates the scope of collaboration – it indicates binding rules for the evaluation phase as well as the non-binding scope of supply. The binding supply agreement will be negotiated in a continued constructive and legally compliant way to conclude by the end of 2022.

Signing of the Partnering Agreement: Thomas Schmall, Volkswagen Group Board of Management member for Technology and Rajesh Jejurikar, Executive Director, Auto and Farm Sectors, Mahindra and Mahindra Ltd. (front row, from right to left)

Tata Power partners with Hyundai Motor India to power-up EV-charging Infrastructure in India

Tata Power has entered into a strategic partnership with Hyundai Motor India Ltd. (HMIL) to build a robust EV charging network and accelerate the adoption of EVs across India. Through this association, Hyundai Motor India Ltd. would become a key contributor to expansion of quality charging infrastructure.

Under the partnership, Tata Power will install Tata Power EZ Charge fast chargers (DC 60 kW) at HMIL's existing 34 EV dealer locations across 29 cities along with supply, installation, and commissioning of home charging for HMIL's EV customers. The association will make Tata Power and HMIL key contributors to the expansion of charging infrastructure. Currently, all 34 HMIL dealer locations are equipped with AC 7.2 kW chargers, and the company aims to expand the fast charging infra network across its pan India dealerships. This new partnership will be of tremendous benefit to customers as the vehicle charging time of a DC 60 kW charger is much lesser than AC 7.2 kW charger. DC 60 kW charging stations will enhance customer convenience.

The MoU was signed in the presence of Dr. Praveer Sinha, CEO & MD, Tata Power and Mr. Unsoo Kim, MD & CEO, Hyundai Motor India Limited at HMIL's Headquarters in Gurugram, Haryana.

Ford cancels plan of making electric cars in India

Ford Motor Company has dropped its plans to make electric cars in the Indian market for the global markets. The brand's management communicated this to employees in the Chennai plant.

Ford India was one of the 20 different companies who were selected under the Government of India's Production Linked Incentive Scheme. It is reported that Ford India may withdraw its application now.

People close to development said that the business case could not meet the volume projection and internal targets. This is the main reason behind the decision of cancelling plan of developing EVs in India.

Zoomcar and HERE Technologies reveal India's best and worst drivers

HERE Technologies in collaboration with Zoomcar revealed a city-based map of India that depicts the percentage of good, average and bad drivers in 22 cities across the country.

The top three Indian cities with the highest number of good drivers are Indore (35.4%), Lucknow (33.2%), and Hyderabad (33.1%). When it comes to bad drivers, the top cities are Mysore (18.5%), Ahmedabad (14.8%), followed by Bangalore (14%). The map was created based on data from Zoomcar's proprietary driver scoring system, between November 2020 and November 2021.

Road safety is a critical concern today and driver behavior has never been more important. A report by the World Bank suggested that road crash deaths in India are among the highest in the world, with 53 road crashes every hour, killing one person every four minutes.

To increase road user and driver safety, as well as monitor the conditions of its vehicle fleet across India, Zoomcar utilizes close to 200 million data points – vehicle speed, engine speed, acceleration, brake, battery and tire life, and more – daily from its vehicles to develop a scoring system that measures the driving performance of its drivers. External factors not within the control of the driver – bad weather and traffic – are also considered. With that, the smoother one drives, the higher the driver's score will be. Drivers who score more than 65 are considered good drivers, while those who score under 50 are considered bad drivers.

In Conversation with Industry Leaders

TIMUR ALMAEV
Export Manager
Escort Monitoring Systems

ZOLZAYA CHULTEMBAT
Partnerships Manager
what3words

RITURAJ SHRIVASTAVA
Managing Director
Danlaw

DEEP HANS ARORA
Director
GPSBOX

VIVEK RANJAN
Sales Head (India)
Pictor Telematics Pvt. Ltd.

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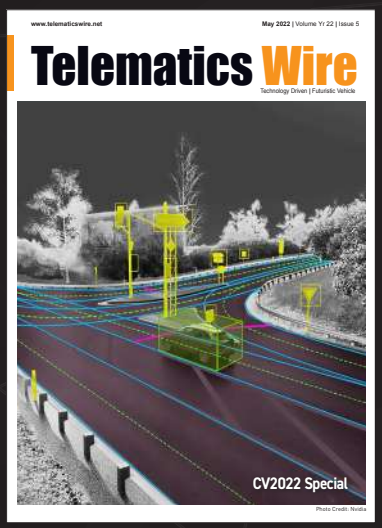

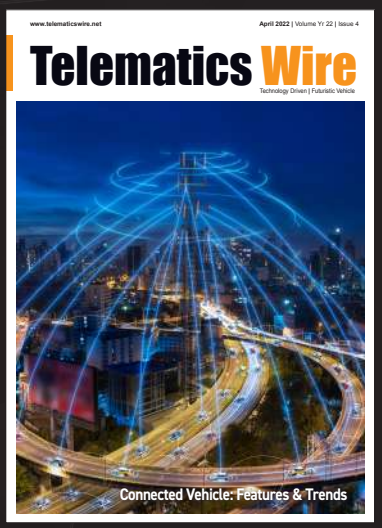

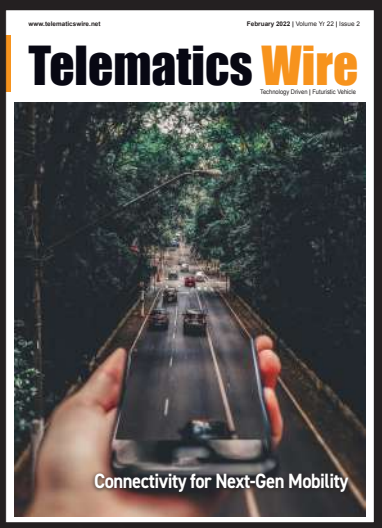

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