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SMART AUTOMOTIVE

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Editorial

What does it take to be a developed economy? Money, resources, education or centuries old democracy. I am not sure, but one thing which keeps coming to me is the thought leadership by the decision making entities. Economic growth and new business formation is more about continued policies and regulations change; to be in sync with the fast changing world. For an example if we look at the NHTSA, US Dept of Transport, they have been working with matching speed with which the mobility is changing in United States. They are thought leaders when it comes to changing/revamping/creating policies related to transport, which in-turn has been making it possible for their industry to develop and test the next generation mobility. On other side, developing economies, not only have been playing a catch-up role with policies and regulations, at times they have a very laid back approach to it.

The next-generation mobility will disrupt insurance, public transport, personal vehicle ownership, automobile manufacturer and many others. The government needs to look into it more realistically and come up with guidelines which can help the industry get maximum mileage in the present context. The "cost of opportunity" would be expensive as the segments which may loose out due to this, range from transport & logistics to software & IT. While it MAY be good to look around(abroad) for good case studies and examples to be followed, but nirvana is "within ourselves", in our very own country, which one needs to see, spend time and deliberate along with the people concerned to come up with an inclusive policy. Though, absence of regulatory framework or uncertainty have been a part of the economic environment of free enterprise, where entrepreneurs and existing business seek opportunity, to begin with. But at a later stage its the policies and regulatory framework which bring investments and fuel growth. Referring to two developments which affect automotive telematics in India- insurance discussion paper from Insurance Regulatory and Development Authority of India (IRDAI) and AIS 140 are steps in this directions.

In this issue we have covered some of the industry leader's viewpoints about insurance telematics in India in the opening article(Pg 6-10) and we look forward to seeding of regulatory framework in this space which can encourage the entrepreneurs and insurance companies to continue finding new value propositions in insurance telematics for the end customers.

Apollo, the autonomous platform being pushed by Baidu(Pg 16) is worth noting and perhaps needs to be followed for systemic development & understanding of autonomous vehicle platform for the larger benefit of IT and software development in India.

As we continue to move closer to connected vehicle, maybe government can consider setting up big data centre for connected vehicle, to begin with for their own vehicles under state transport corporations, PSUs, central government ministries for operation improvement through analytics and moreover for security. It can be considered as an infrastructure investment by the government for "public good". If this is extended to the commercial vehicles run by transporters and corporates, it can serve a larger purpose. Considering the demand of All India Motor Transport Congress (AIMTC) which has been asking for doing away with toll tax, which they can compensate by paying similar or more directly to central government on an annual basis; as they will save on time and fuel at toll booths. Such centralised tracking can help the central government(MoRTH) have some assessment how much each toll road has to be compensated with from the pool of centralised revenue. Its time for thought leadership!

Maneesh Prasad
Editor & CEO

Insurance Telematics in India

Automotive telematics is enabling insurance companies to create new value propositions. As the penetration of automotive telematics increases, it offers an option for personalised insurance policy based on how, where, when and how much you drive. Telematics insurance, which is also known as Black-Box Insurance, GPS Car Insurance, Smart Box Insurance, Pay as You Drive (PAYD) Insurance, Pay How You Drive (PHYD) Insurance, and Usage based Insurance (UBI), among others is gaining traction and acceptance in the global motor insurance industry. These programs benefit both insurers and consumers by providing data for better risk assessment, as well as incentive-based programs. Insurance companies are leveraging automotive telematics data to extract information about the way a vehicle is being driven to offer more personalized services to customers in a cost-effective manner, thereby making it increasingly attractive to both the insurers and policyholders.

Evolution of insurance telematics

The use of telematics was first introduced to the insurance industry in the mid-90s. Initially picked up by a couple of forward thinking early adopters including Direct Line and Aviva (formerly Norwich Union), they were among the market players who were keen to leverage the technology in monitoring the behaviour of the driver and the vehicle. Since late 90s, with the evolution of technologies, insurance telematics started gaining traction. Today telematics-based products and solutions are becoming popular in the motor insurance industry of developed economies. In countries like US, UK, Italy and others where insurance telematics has gained traction, the technology uses embedded devices or smartphones to draw data based on the driver behaviour such as driving times, parking locations, standard of driving, vehicle, and mileage data and various aspects of driving. Insurers are taking advantage of this data to get deeper insights into customers' driving habits that in turn helps in optimum premium calculation. Since the customers can be incentivised based on safe driving and usage patterns, insurance telematics solution leads to reduction in claim costs and administration cost to a huge extent—which is a win-win situation for all. OBD-II-based telematics solution, is assisting insurance providers have data, such as on-road activity (including braking and cornering speed or acceleration), the time of day when driving, and the amount of time spent behind the wheel. This data

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can help insurers in analysing driver's behaviour to give constructive feedback, which encourages safe driving. Policy holders or drivers can usually access their driving score online and receive regular alerts or notifications of what they do well and what they need to improve in terms of their driving style. By tracking the vehicle's movements through tracking system, insurance providers can assess their driving ability. Furthermore, such systems also help the policy holders in case of emergency situations like accidents, or when their vehicle is stolen or damaged to send the First Notice of Loss (FNOL) by providing verified data and eventually facilitates the claim process. With FNOL, insurer would be able to better analyze the data from sensors on brakes, air bags, seat belts, and other systems and predict the severity of the accident. The insurer can further help the customer by initiating appropriate actions, such as calling ambulance or emergency personnel etc. Moreover, the analyzed data would help both the parties in claims handling process and subsequently reduce loss adjustment expenses.

Telematics enables original equipment manufacturers to aggregate data from diverse geographical location and usage patterns for maintenance needs and assessment of unit performance. Furthermore, through telematics gateways, OEMs can understand the usage pattern and customer requirements that help them in creating more personalized offerings.

With advancements in mobile technology, particularly mobile application development, and capabilities embedded in mobile devices have further acted as a catalyst for adoption of insurance telematics, especially among millennials. In August 2015, Willis Tower Watson reported that millennials show particularly strong interest in a Usage Based Insurance (UBI) policy- 88 percent interested "or "may be," compared to 74 percent for other survey participants. It shows that UBI programs are driving behavioural change among millennials on issues surrounding road safety, while making them cost conscious. The telematics-based innovative UBI solutions thus promotes safety and learning among young drivers. It also enables parents to get great insight into their children's driving behavior, such as distracted driving, rapid acceleration, speeding, harsh braking, excessive idling, length of journey and time of day. As the parents receive alerts on their children's driving, safety relevant events such

Industry Leaders on Insurance Telematics

What is the current scenario of insurance telematics market in India?

Pratap Hegde: In India, motor insurance is at a nascent stage and so is telematics, but both the sectors are coming up and clubbing them would be beneficial. Telematics insurance has been successful in many other countries but Indian scenario around vehicle insurance is different; and hence we need to go through our own learning and create India specific models. One of the unique situation in India, particularly wrt commercial vehicle, is that the ownership of vehicles is fragmented. There are challenges from regulators side, customer side as well as operation side. But with a base of 23 lakh motor vehicles' (excluding two wheelers) insurance every year sets up a huge building block for the associated industry.

Shoummo K Acharya: There is hardly anything in the market except for one high value product, there too The insurance company is using it monitor possible highjack. There is no attempt to integrate telematics data to control marine insurance claims, which I think is what will be the change driver.

Joy Nandi: Insurance telematics is at a nascency in the India market. World-over, some insurance companies are trying to tailor the premium on their policies on the basis of driving habits of vehicle owners/users (how aggressively they accelerate or brake, how effectively their bank on corners, etc.), and also on the basis of type of use - which locations they travel to, how long do they drive, driving during peak hours etc.

First and foremost, to even come up with a standard method for assessing driving behaviour in India is a hugely challenging task. Who decides what is considered safe driving practice, what if they had to run an errand at peak traffic times, or what if a cow or dog runs across requiring the driver to slam their brakes. Should their insurance premium fluctuate on that basis?

Second, there is no standard guideline on what all information can and will be made available. First ALL automobile manufacturers have to agree to making the exact same basic information being made available for monitoring. Most auto OEMs have the info, but they only rely on using it for their own diagnostics when the vehicle goes to the service station. OEMs have to agree on making their information available to a centralised agency.

Then comes the ability to consolidate all the information being sent to the cloud to a centralised location which IRDA makes available to all insurers. This can only be done if IRDA appoints an agency for centralised collection of data, makes Auto OEMs comply with having to provide the info, and mandates all Insurance providers to use the same data. Else, if porting from one insurance vendor to another, you will not be able to get the same premium benefits, if at all.

So, in the near term, expecting a high incidence of usage based insurance (UBI) policies using telematics being available is highly unlikely.

Tabish Anwar: Whereas the telematics industry is ready with the required technology to introduce UBI for the Indian market the regulatory bodies are a few steps behind in making a framework for the commercial deployment.

Vijay Sinha

Managing Director & Chief Executive Officer
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With the advent of Pay As You Drive (PAYD) & Pay How You Drive (PHYD) Telematics Insurance, it is expected that the OD (Own Damage) premiums will fall. Non-Regular users of self-owned car will prefer to go for PAYD or PHYD kind of insurance products as and when available. This would enable Insurers to price basis usage. Telematics insurance is likely to pull in safer and aware drivers who put a premium to their car and their family's safety, thereby providing the insurance company with a better risk profile. Lower OD premium is expected to be compensated by lower claims as adoption of these Usage Based Insurance Products would be more by owner driven cars and owners who want to ensure their car is driven properly when they are not driving, through the help of tracking of speed, quality of driving by their drivers made, possible by the telematics device.

as harsh braking and acceleration are expected to get reduced. Since young or unexperienced drivers have more accidents and that insurers base their rates on perceived risks. This is the reason why they have to pay the highest rates for auto insurance in many situations. With Usage-Based Insurance programs, insurers can get a realistic overview of the level of risk that a driver carries, thus, a young motorist who follows the road rules and drives carefully, can expect a substantial reduction in premium.

According to MarketsandMarkets, the insurance telematics market size is expected to reach USD 2.21 Billion by 2020, at a Compound Annual Growth Rate (CAGR) of 20.9%. Decreasing cost of connectivity solutions, increase in regulatory compliance and regulations, consumer's interest for in-car connectivity, and rise in smartphone penetration are driving the market. Technavio study shows that the global automotive usage-based insurance (UBI) market will grow at a CAGR of almost 8% during the period 2017-2021.

Insurance Telematics in India: The journey so far

The Indian government liberalized the insurance industry in 1999 and detariffed the general insurance industry in 2008, leading to a period of great growth. With the government mandating all public transport vehicles with over six-seater capacity should have location tracking devices, insurance companies in India are well positioned to capitalise on this growth. The new regulation, coming into effect from April 1, 2018, will be applicable for state transport buses, school vans, ambulance and other special purpose public carriers. Major insurers like Bajaj Allianz, ICICI Lombard and Liberty Videocon have already live-tested telematics solutions on the road. Telematics adoption is expected to pick up the pace for insurance companies as most of them already have a vehicle distribution network, tie-ups with dealerships and run multiple telematics pilots to validate their business plans.

In India, the industry has not evolved much as compared to its western counterparts. However, the insurers have just kickstarted selling motor insurance policies with an option of adding telematics free of cost for those customers opting for add-on covers.

In the present scenario, vehicle's safety features have become a significant factor in deciding the cost of insurance premium. Since nowadays, most vehicles feature sophisticated safety mechanisms like advanced braking systems, airbags, advanced locking systems, tracking devices, alarm systems, anti-theft devices, etc., it not only enables driver safety but also makes the vehicle less susceptible to damage or theft. Most insurance companies are offering discount on the car insurance premium if the vehicle is fitted with any safety device or feature as listed by the Automobile Research Association of India (ARAI). The added benefits of safe driving and operational transparency is likely to influence the cost of insurance.

Bajaj Allianz General Insurance Co had launched its telematics-based offering in 2016- Drive Smart. It has been made available to private car owners buying a comprehensive car insurance policy, as well as some add-on covers like 24x7 assistance. This offering requires the customers to have a telematics device fitted in their vehicle. While the insurer does not charge any additional cost for this device, the consumer's yearly outgo would go up by Rs 1,500-2,500—compared to a basic comprehensive motor insurance policy—due to the add-on covers.

At the time of the launch of this offering, the insurer had also said that the company will use the data gathered using telematics at the time of policy renewal, to determine if the user is a 'safe driver'. And based on this, a consumer could get discounts on the own-damage part of insurance premium.

Currently (April 2017), Bajaj Allianz has nearly 6,000 vehicles of its policyholders fitted with telematics devices — which track vehicle location, driving pattern, provide geo-fencing, engine/battery health indicators, towing services and alert emergency services in case of accidents. While currently the policy is for cars, the company can adapt usage for light and heavy commercial vehicles too.

In 2015, ICICI Lombard has deployed telematics to arrest marine cargo losses. It has been able to track goods in real time during transit to ensure that the carrier does not deviate from the course. As a result, it has been able to minimize hijacking incidents. The technology is used for the benefit of customers who are covered under the marine insurance policy (transporting goods by land or sea). It enables real time tracking of goods during transit to ensure that the carrier doesn't deviate from the course. In case, there are any unscheduled stops, they get reported real time thus reducing incidents of hijack, cargo theft, pilferage and accidents.

Uber has tied up with ICICI Lombard General Insurance to provide accidental cover for its 4,50,000 driver network (Economic Times, Aug'17). This will provide drivers with free coverage for accidental death and disablement, hospitalization, and outpatient medical treatment in case of an accident while online on the Uber App.

Technavio opines that, the commercial vehicle telematics market in India will grow at a steady pace to post a CAGR of around 16% by 2020. Fuelling this growth is the increased demand for vehicle tracking and monitoring systems from the logistics segment. However, it is important note that, only one-third of a vehicle's lifetime is used for delivery.

Recently (August 2017), IRDAI had put up a discussion paper on Insurance-Telematics. This paper highlights how several other aspects can be part of the premium - pricing decision (Insurance Telematics in India, Sept-Oct 2017, Smart Automotive).

This UBI solution can work in the Indian market where insurance claims are high due to numerous road accidents. Currently, customers pay the same premium without any differentiator on their driving habits. However, with telematics-based UBI solution, the tracking device and the condition for claim settlement would ensure that the drivers use a safer mode of driving. It will also help insurers alert drivers of unsafe driving habits, unsafe road and weather conditions and areas that are more prone to accident or theft.

The telematics box would also prove to be helpful in curbing the incidents of the vehicle theft as they have a tracking mechanism which would allow the owner to detect any theft and locate his vehicle. This system of insurance is better than traditional one as it helps create more responsible and better drivers who can enjoy the privilege of paying fewer premiums. This would also encourage all the drivers to behave in a responsible manner and save some money. Also, it will contribute to the society by giving them good drivers on the road.

Can telematics create new value propositions for insurance in India?

Pratap Hegde: In India the insurance products are commoditised, so telematics can be used to divert customer attention to some of the values that can be added by using telematics equipments like vehicle tracking, improving driver behaviour etc. Advantage of using vehicle tracking devices can be used in cases of vehicle thefts and third party liabilities and quick disposal of claims without getting into legislation.

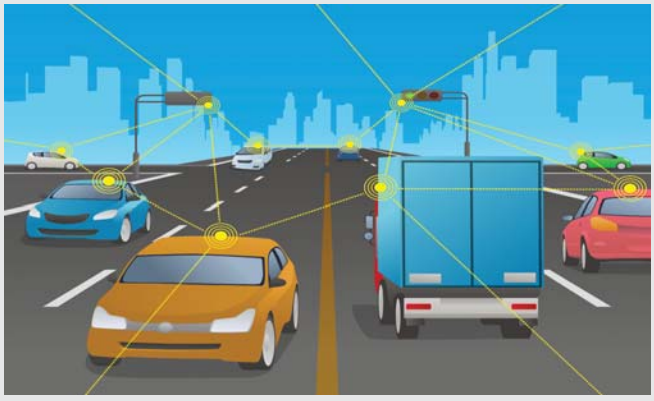
Partnerships can be forged for adding value added services & hence increasing profit margins. Privacy can be an issue for insurance companies & should be taken care of but today also the companies are handling huge amount of customer data.

Shoummo K Acharya: Telematics can prove a complete change driver in the insurance industry, one example where a gas company has started using telematics to monitor driver behaviour as also ensuring no night driving has resulted in reduction of accidents from 13 in a two year period prior to introduction compared to three in seven years post introduction. One can imagine the reduction in claim settlement amount.

Joy Nandi: There is definitely a use-case where telematics can create a value-proposition for both insurers and users. The insurer can offer better premiums for "safe-drivers" based on their driving habits. I don't think the location of where you travel, how long you travel, and at what time you travel is of any consequence in India. Yes, you can say greater mileage covered is directly proportional to risk of accidents, so thereby that would be a factor, but where, how long, and time of travel is not practical or necessary. Further, even if usage is high, if the driving behaviour is "safe", the premiums should be reduced. Knowing the location through a GPS monitoring system, definitely has value to both insurers and users, especially in case of theft. But again, that is the extent of the usage of location that might be of value in the near term. Even if there is no IRDA regulation regarding the same, a few insurers could underwrite the black-box, come up with parameters to monitor, get users to agree to lower premiums if their driving behaviour and duration of travel is monitoring 24x7.

The ability to reduce or increase premiums appropriate, however, has to be allowed then by IRDA, in the least. At Lithium Urban Technologies, India first and only 100% Electrical Vehicle (EV) based Fleet Transport Services provider, we have 400+ EVs with factory-fitted telematics units. We constantly monitor driving behaviours (since that is in any case important when operating EVs). We would definitely welcome any insurance provider giving us the benefit of safe-driving despite us clocking over 250-300km/day on our EVs.

Tabish Anwar: Telematics can bring enormous benefits for Insurance companies and consumers UBI is a more rational and data driven method of premium calculation. Dig data is being deployed across industries successfully; the same will be true for UBI and Telematics.



What are the challenges in the larger adoption of vehicle telematics by the insurance sector?

Pratap Hegde: Although the price of the insurance is de-tariffed but the structure is still tariffed. In India the average premium charged is 1-1.5% while in developed countries it is 3-4%. Though the price of the telematics device can be clubbed but in our insurance ecosystem industry cannot absorb the cost of the device. It should be realized that it is not viable for insurance companies to bear the entire cost of Telematics and hence many other values should be created around telematics for supporting the adoption.

Shoummo K Acharya: The ability of the integration service provider to assimilate data from different vendors in one platform and creating proper analytics to help insurance companies to use the information also decide on future action.

Joy Nandi: Already mentioned as answer to #1 above.

Tabish Anwar: There are a number of challenges the primary challenge facing Telematics companies, is to gain the trust of Insurance companies as to the accuracy of data (data harvesting and interpretation of data) and customer education regarding the benefits of using such a system. Sooner or later the privacy argument will enter the telematics domain as at its core is GPS tracking and maintaining historical tracking data.

These are of course followed by the problems of cost of deployment (Hardware and periodic subscription) for example if X is a good driver follows all the rules and qualifies for a discount on his premium will the discount be so huge as to offset the annual subscription of 2000 or 2400 rupees. Another example if X Company deploys the hardware bundled with the insurance premium, will it be able to recover the cost by employing a new method/formula of premium calculation. Ownership of data, security of data are other challenges we face at the moment.

Adoption of a technology has to pass the litmus test of economic viability for all parties. If telematics is unable to pass this litmus test then it will be doomed. The entire premise of technology is that it brings efficiency and cost saving wherever it is deployed, the question is, does it hold true for telematics and UBI in India.

The Road Ahead

The adoption of telematics in insurance industry has its own set of challenges. The industry is evolving, and the insurers need to focus more on avoiding road accidents through driver behavior and feedback, tariff incentives, ADAS functions and data analytics. Indian insurance companies need to invest in technology to offer Indian customers telematics enabled insurance programs that could benefit them in the long run. In the present scenario, it becomes imperative for insurance industry to make necessary investments in order to overcome the risks and challenges associated with the vehicles, drivers and road infrastructure in the country.

The reduction in premium is another big challenge in emerging markets like India. There is also a huge need to spread awareness regarding the potential

Can vehicle telematics drive new growth opportunities for insurers and OEMs?

Pratap Hegde:
For OEMs

Telematics/tracking device can be fitted in each vehicle at the initiation and inception of the supply, installation and commissioning. (Please note: Usage of mobile devices for tracking should not be taken as an option, as they are attached to the individuals and not to vehicles.). Though cooperation between car manufacturer and insurance companies can help in increasing the penetration of insurance telematics but idea is still at nascent stage, the time has not come where vehicles come pre fitted with telematics devices.

For Insurers:

A concept of " Group Vehicle Policy " can be considered i.e. a specific policy for a set of similar commercial vehicles which are connected onto a single platform through telematics technology wherein the risk considerations gets spread across the community of Stakeholder vehicles in the platform. There are many such Commercial Vehicle groups platforms already operating in the country and the size of such groups are considerably big and all those vehicles operate within certain functional and geo-graphical boundaries . As they already are fitted with telematics devices and no additional technology investments are needed, these platform based groups / networks are easiest options for introducing telematics based Insurance policies in India.

Shoummo K Acharya: Insurers stands to gain a lot by promoting telematics in logistics industry, a 10% reduction in vehicle insurance cost will not only save marine claim, this will also eradicate false claims.

Joy Nandi: First part answered in #2 above. For OEMs, definitely this is off value. They could sell vehicles with factory-fitted tamper proof telematics devices, at a slight premium; and they could also offer through partners, a subscription service, for self-diagnostics, navigation and vehicles services, to increase their revenues through ancillary services. Imagine a time when the vehicle diagnostics is linked with service centres/ workshops and to emergency services, so that accidents or vehicle breakdowns are automatically communicated to them, for instant despatch. There are many in India who would subscribe to such services, if available. From an insurance claim perspective, details like location of accident, speed of travel etc. can also be automatically conveyed. Of course, given how the current ecosystem of insurance claims, surveyors, etc. works, it will take a bit of time before this information is voluntarily sent by vehicle operators.

Tabish Anwar: Growth opportunities will present themselves as India progresses from a low cost vehicle demand market to a matured higher cost vehicle market, As long as Alto dominates the sales figures there is little head room for exponential growth. Steady single digit growth will happen and is happening now but exponential growth will take a few years to happen.

Can government agencies and IRDAI help drive the adoption of insurance telematics in India and how?

Pratap Hegde: Regulatory reforms that need to be adopted by Government agencies and IRDAI to help driver adoption of insurance telematics in India:

- There must be properly laid down process for vehicle owners to migrate from one insurance provider to another for various reasons as it will be very critical in determining if Insurers will use Telematics at all. There also needs to be clarity on data access to Insurers of individual vehicles.
- Data should be owned by the entity that invests in producing data. Explicit consent from Insured Subject should be required to share this data with other entities.
- Insured Subject can, at the time of buying a policy, or buying the data device, decide to take co-ownership of data by paying as per a rate card to cover the cost of generation of data (rate card can have a standard framework) or get discount by giving away right to co-ownership.
- Other Insurer(s) can buy data from the existing data owner(s) by paying as per rate-card. Alternatively, customer (if owns data) can volunteer data for free.
- On data generated, create a shareable Summary version and keep the Raw version separate- privacy proof (strip off time and location info) and chargeable for additional access.
- Insurer should never own data. Even if same organisation, the data owner telematics division and underwriting entity should be at arms length to ensure fair market access.
- There can be a regulatory agency for telematics service providers, which can draft functional framework for service providers and insurance companies, so that the consumer/ customer/end user is assured about their data privacy and rightful usage.

Shoummo K Acharya: If IRDAI/Government agencies can persuade the insurance companies to extend the above benefit to commercial vehicle sector, it can be a game changer.

Joy Nandi: It will take the collective will and collaboration of IRDA and other government agencies related to the Automotive sector, along with the support of industry associations, automobile OEMS, insurers, telematics box solution providers, and third-party ancillary vehicle service providers, to make the above a reality.

At Lithium, we would be keen to join a pilot project to demonstrate that the above is feasible, if we were to find a few other willing partners for doing so.

Tabish Anwar: IRDA can surely help by coming up with a regulatory framework for Insurance companies and telematics companies. Electronics manufacturing policy also needs to be looked at as it will drive down cost of hardware. But it is unit economics that will finally decide the fate of success of UBI and Telematics driven Insurance.

benefits of use of Telematics while ensuring them that insurers would be able to best manage and handle their driving data. Also, implementing Telematics would involve cost of data collection, management and analysis, that needs to be integrated into the pricing structure.

While it offers competitive advantage to insurance providers, it also ensures a seamless experience for the customers. It will benefit the society as a whole by laying stress on road safety and improving driver behaviour to reduce the frequency and cost of accidents. It will help build the intelligent road infrastructure to reduce traffic congestion, pollution, and the number of road accidents. With better priced and fairer policies, it will promote road safety, enabling safer, more efficient transport.

The future is as safe as you make it, and so the adoption of telematics in vehicle insurance, may going forward lay the foundation stones for a "safe and secure future."

Telematics Wire Team

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Many Insurers, Insurtechs & OEMs will be entering UBI in India

Telematics Wire interviewed Sourabh Chatterjee President, Head- Technology, Digital Marketing and Sales. In the interview Mr. Chatterjee talks about various aspects of Insurance Telematics Industry in India.

Sourabh Chatterjee
President, Head- Technology
Digital Marketing and Sales
Bajaj Allianz General Insurance

Sourabh Chatterjee is the Head of IT, web sales, digital and direct marketing at Bajaj Allianz General Insurance. He has over 15 years of IT expertise as well as a successful track record in creating business value through innovative use of technology in the life and general insurance space in the US and India.

Q Insurance telematics has been successfully tried and tested in other parts of the world, what are the challenges faced by it in the Indian market?

A Sourabh: Insurance Telematics has been successfully implemented in US and UK with more than 12 million policies being issued already. Markets such as Italy have penetrated really well despite venturing late into the technology. In UK telematics in insurance is mostly used for Usage Based Insurance (UBI), while in US it is used for offering curator services to the drivers such as tracking and emergency services.

At present, Motor Insurance in India is primarily being sold on the basis of make and model of the vehicle and typically, adoption of new advancements will happen at its own pace. Being the only insurer offering telematics insurance in the country we feel that we are still in a nascent stage and a lion's share of the market is still need to be tapped in order to create the requisite awareness about telematics' usage. Country is at the cusp of digital revolution and the number of drivers acquainted with IoT and connected ecosystem still is not humongous in number.

Q Bajaj Allianz had launched 'Drive Smart' last year, how has been the response and what it tells us about the insurance telematics market in India?

A Sourabh: It has been over a year, since we launched Drive Smart in September 2016, the response has been overwhelming and with time the number of requests that we are receiving for Drive Smart device is also moving upwards. We have also launched Drive Smart Lite - a device-less version of the product in August this year. With this app based version, all our private car policy customers can take the benefit of Drive Smart Lite by just downloading Bajaj Allianz Mobile app Insurance Wallet.

The company also launched mobile application version of Drive Smart in August this year, which is industry's first device-less telematics based value added service that can be availed through its self-service app – Insurance Wallet. The application extends the experience of DriveSmart. 'DriveSmart Lite' is a free value-added service for all private car policyholders. It is an app based solution where the car owners can record their trips to get details of kilometres travelled, fuel economy, and other non-hardware related information, specific to make and model of their car.

Q What steps should regulating agency in India take to help increase the penetration of

> ***"I believe that the Telematics and UBI market in India is at a very interesting junction and will take a sharp turn with many Insurers, Insurtechs and OEMs entering it in a big way."***

insurance telematics?

A **Sourabh:** IRDAI recently issued a paper inviting dialogue over Pay As You Drive (PAYD)/ usage based pricing for telematics insurance in India. As of now, we are also looking forward to specific guidelines that the regulatory body decides to introduce in order to help increase the penetration of insurance telematics. Actuaries can actually use these IoT connected devices to assess individuals' lifestyles choice for better precision in pricing of insurance policies. Also, this will ensure that a good driver does not subsidize for a bad driver.

Q Where do you see Indian insurance telematics market in next 5-6 years?

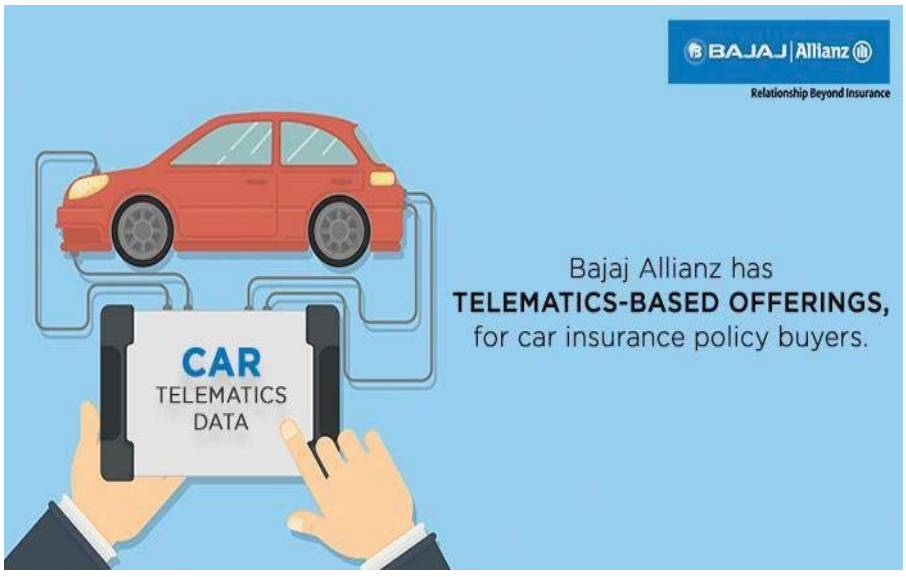
A **Sourabh:** Telematics insurance presents prospects for a real time and consistent involvement with the customers and over a period of time this engagement is surely going to increase along with amplifying number of users. In the times to come, sales pitch of an insurance policy will include how the price is optimized in line with the car safety and security features. Features like Geo Fencing, real time tracking and accidents prevention and automatic claim initiation are going to be the real eye catchers. In times of claims, insurers have already introduced technologies that enable them to know about the damages and the real situation through the mobile apps.

During next few years-

- Infotainment Services may get clubbed with the Telematics device such as radio, video, news, emails, calls, while navigation based services like parking, fuel prices, weather, traffic and journey times are going to be more comprehensive.

- Safety based services addressing remote monitoring, tracking of stolen vehicles, emergency services provided through Connected Car services along with convenience.

- Benefit based Services such as toll fees, green and eco driving, saving fuel through habit optimisation, car sharing, driver behaviour tracking for insurance premium savings with models like Pay As You Drive (PAYD), Pay How You Drive (PHYD) and the more advanced Control Your Driving (CYD) can be implemented.



Picture Courtesy: Bajaj Allianz General Insurance

Q What are your views on privacy of data and its ownership?

A **Sourabh:** We take a concurrence from the customer towards collecting data and analyzing it. As an insurance company we are a part of a regulated industry. The regulator takes privacy of each and every customer very seriously and we too being part of this ecosystem abide by all laws strictly and ensure that data is only used for purpose of insurance analysis and remains accessible to our organization only. All the customer driving data has been hosted on to a secure cloud and the ownership vests with BAGIC. We follow stringent compliance norms with respect to data collection and storage. We make sure we collect data only with respect to driving behaviour which translates to reduced data management cost and granular analysis.

Q What are your views on much talked about approach of forging partnerships with OEMs and other players of the automotive ecosystem for adding more Value added services and hence increasing profit margins and RoI?

A **Sourabh:** We have already forged such partnerships in the insurtech space, with startups to deliver us a greater level of customization and agility. Such partnerships help us not just leverage the latest and best in technology, but also reduce our time to market. The end point is better engagement, and better retention of customers, in the long run.

The efficiencies that we derive out of this will help the profits as well as justify the return on investments. Right selection of partners would help us provide holistic solution to customers thereby enhancing customer experience. This would also help us with more customer information which would help us price and design customized products. I believe that the Telematics and UBI market in India is at a very interesting junction and will take a sharp turn with many Insurers, Insurtechs and OEMs entering it in a big way. Only time will tell who will do well in this space and who will not. But I can forecast that whoever gets the 'Connected Ecosystem' right and makes the Customer Value proposition strong, will definitely have an edge over the others.

Delphi acquires nuTonomy

The automotive industry has entered into an era of collaboration, where carmakers, technology giants, software start ups, telecom providers are combining their strengths to meet challenging needs of autonomous car. Myriads of partnerships and acquisitions have been taking place adding new players to this automotive ecosystem. Adding to this trend Delphi Automotive, is all set to acquire nuTonomy, an MIT spin-off technology startup company that makes software to build self-driving cars and autonomous mobile robots, for an upfront purchase price of $400 million and earn-outs totaling approximately $50 million.

The transaction brings together the leading start up and Tier 1 in autonomous driving (AD) and further accelerates Delphi's commercialization of AD and Automated Mobility-on-Demand (AMoD) solutions for automakers and new mobility customers worldwide. Thanks to the acquisition, Delphi will now have 60 autonomous cars on the road across three continents by year-end, The acquisition will further increase Delphi's access to new customers and markets in the emerging mobility space

and add more than 100 employees, including 70 engineers and scientists, to Delphi's more than 100-member AD team. Delphi will now have AD operations in Boston, Pittsburgh, Singapore, Santa Monica, and Silicon Valley.However, nuTonomy will continue to be based in Boston, where both companies currently operate AMoD pilot programs. Apart from above mentioned developments for the companies, the deal will also have ramifications on contours of the automotive ecosystem. Navigant research had recently released a Leaderboard Report that examined the strategy and execution of 18 leading companies developing automated driving systems.

The report had placed GM, Ford and Daimler as the "leaders" in the present scenario and had put the Delphi and nuTonomy as in the list of "contenders" and "challengers" respectively. But the situation is going to change with this acquisition and Delphi will be a force to be reckoned with now. nuTonomy has partnerships with the many key players in the automotive ecosystem like group PSA with which the company is collaborating to seamlessly integrate its sophisticated software system into customized PEUGEOT 3008s for on-road testing of fully autonomous cars in Singapore.

It has a strategic R&D partnership with Lyft focused on understanding and optimizing the end-to-end experience of autonomous vehicle (AV) passengers. Under the partnership, both the companies plan to align their respective technology platforms to gather valuable research and insights into all aspects of ensuring a passenger's comfort and safety during an AV ride. nuTonomy has also got partnership with Grab, Southeast Asia's leading ride-hailing app, the partnership is aimed at expanding nuTonomy's ongoing public trial of self-driving cars in Singapore. There were reports earlier this year that Delphi was interested in foraying into autonomous ride hailing service, so this acquisition can help Delphi in realizing this dream as it opens a new business opportunity altogether for the company.

Delphi has its own partnerships with key companies like it is working with Mobileye, an intel subsidiary, to build a self-driving car by 2019. Mobileye, a former Tesla partner, develops vision-based advanced driver-assistance systems and automated driving. At the same time Delphi has got investments in the LiDAR technology companies like LeddarTech, Innoviz and Quanergy. The company has also recently acquired companies like Ottomatika—which developes autonomous driving software solutions -- and Movimento -- a leading provider of secure over-the-air (OTA) software lifecycle and data management services to the automotive industry. Delphi has also entered into an agreement with BlackBerry, under which the company plans to launch its own autonomous driving solution for car manufacturers and mobility service fleet operators in 2019, using BlackBerry QNX as the operating system for the automated drive solution. Moreover, the company is working with Intel, BMW, FCA, Magna international, and Continental AG as development partner and system integrator for development of Autonomous driving platfom -- an open platform for the next generation of cars and a new cooperation model for highly and fully automated driving that will provide scalable solutions for the entire automotive industry worldwide.

The acquisition also is an opportunity to develop Singapore as new center for autonomous cars as the city-state has many advantages for instance it has got infrastructure in its place, the government is working on a mission to develop a car-light society. In addition being a small country Singapore has no ambiguity in regulatory environment and is easier to navigate. Thus the acquisition of nuTonomy opens many opportunities for Delphi and helps the company to further develop and emerge as a dominating force in the automotive industry. Delphi also plans to split itself into two separate companies: Delphi Technologies, which will consist of the powertrain systems business unit, and the automated driving and electrical architecture business, which will operate under the name Aptiv. ▪▪■

Telematics Wire Team

Connecting cars for over 12 years

The automotive industry found u-blox sometime around 2005. It was neither anticipated nor planned, but looking back, it's been a fantastic adventure. Since, we've sold dozens of millions of positioning and communication devices to automotive Tier Ones and OEMs. The automotive industry has become one of our most important verticals, generating over a quarter of our revenue. Today, we work with most major OEMs and have gained extensive know-how on working successfully with the industry and an in-depth understanding of its requirements and constraints. Now, twelve years in, it's safe to say that we truly speak automotive.

If we've learned anything, it's that the automotive value chain is long and complex. If smart watches and Bluetooth trackers are agile speedboats, automotive OEMs are freightliners: high stakes operations where mistakes are consequential. This understanding permeates how we work with the automotive market. While in consumer markets, product lifecycles are short, those in automotive stretch over years. Of the three years it might take to bring a new device to market, well over half goes into certification and qualification. Understandably, changes in chip and module specifications or stock-outs are not appreciated. Customer focus, we've learned, is key to success. For us, this translates to offering products tailored to a variety of use-cases, from classic chips to integrated, tested, and certified modules that combine multiple components, thereby shortening the value chain. It also means that we go the extra mile to deliver superior performance. Augmented with dead reckoning technology, our NEO-M8L module, for example, accurately detects its position even in tunnels or dense cities where standard GNSS receivers fail to deliver.

To meet the industry's stringent demands, we provide our complete automotive portfolio in automotive grade. As such, our modules meet industry standard automotive specifications and are qualified strictly according to ISO 16949 and AEC-Q100 and are delivered with the PPAP (Production Part Approval Process) documentation to ensure compliance with customer requirements. Because automotive applications are often mission critical, we test them to ensure that they withstand high levels of electromagnetic interference, bumps, shocks and vibrations, and temperature extremes. Complete qualification and failure analysis in-house means that we can quickly and competently diagnose and address the root cause of failures. And we are committed to bring down failure rates through the u-blox zero ppm program.

We believe that our close customer engagement, our attention to quality, and our continuous efforts to innovate have all played their part in making u blox the market leader for automotive GNSS and a strong provider of wireless communication technology for automotive applications. Roughly 19% of our sales are invested in R&D, keeping us ahead of the game. And by offering nested designs and sticking to the same pin-outs for successive module generations, we try to make it as easy as possible for our customers to follow, helping them save time and money in the design process. Our new automotive grade MAX M8Q GNSS module with an extended temperature range is a case in point. Looking forward, we are determined to stay at the forefront of automotive technologies, as augmented reality, advanced navigation systems, and second generation V2X products take the driving experience to the next level. In particular, we will deliver reliable and safe GNSS technology to enable highly automated or autonomous driving.

Thomas Nigg
Senior Director Product Strategy
Product Center Positioning
u-blox

The automotive market has been good to us for over the past 12 years, and we are committed to returning the favor. With now over twelve years of experience working with the automotive industry, we are excited about the disruptions, challenges, and opportunities that lie just around the corner.

Big Data Center Focused on Connected Cars in China

Hyundai Motor has opened its first global Big Data Center in Guian, China. The center will gather and analyze massive volumes of data collected from the company's connected cars.

Big Data Center in China lays the foundation for a China-focused Car Cloud, leveraging expertise in connected car technologies gathered through years of Hyundai Car Cloud operation. The location for the center was strategically chosen to take advantage of access to local IT companies, such as China Unicom, to develop, analyze and process multiple data streams positioning Hyundai Motor at the forefront of the automotive big data revolution. It is expected that the new facility will allow Hyundai Motor to expand significantly its R&D capabilities in connected cars, advance its market projections, and enhance business operations in China.

Apollo Autonomous Driving Program

A car deployed with Apollo capabilities is on display at Baidu Developer Conference in Beijing in July. Baidu Online Network Technology (Beijing) Co., Ltd

Baidu this year launched Apollo autonomous driving program, that has emerged as one of the largest autonomous driving platform with around 70 members.

The project aims to develop an open, reliable and secure software platform for Baidu and its partners and eventually help them develop their own autonomous driving systems through on-vehicle and hardware platforms. It aims to become Android of the autonomous driving industry, but more open and powerful. The project aims to provide developers with tools including data, APIs, open source code for some portions and even reference hardware to help them bring autonomous driving products to market.

Being an open platform, Apollo can evolve faster, and as participation grows, more accumulated data becomes available which would help in further development.

Till now (Oct'17) more than 70 partners have joined the Apollo open autonomous driving project, forming one of the largest and most diverse autonomous driving ecosystems.

Members of the Apollo alliance includes:

- Vehicle manufacturers, such as Chery Automobile, FAW Group Corporation, Changan Automobile Group, and Great Wall Motors, among others;
- Tier 1 suppliers, including Bosch, Continental Automotive, ZF Friedrichshafen AG, and Desay SV Automotive, among others;
- Key components providers, such as NVIDIA, Microsoft Cloud, ZTE, Velodyne, & TomTom, among others;
- Startups, including AutonomouStuff, Horizon Robotics, Momenta and iDriver+ Technologies, among others;
- Ridesharing companies, such as UCAR and Grab Taxi, among others;
- Five top universities and six local governments.

Hyundai Motor, ROS, ESD electronics, Neousys Technology are the latest addition to the list of members.

The company plans to open up Apollo's abilities to developers gradually over time. At the inception, the developers got access to driving technologies for specific, restricted areas but recently (Sept'17) another version of the platform Apollo 1.5 was released which added few more capabilities. Built upon Apollo 1.0, Apollo 1.5 adds five more features like:

- Obstacle perception, this capability enables vehicles to accurately identify obstacles during both day and night.
- Planning, which allows vehicles to plan the correct driving path and make optimal driving decisions.
- Cloud simulation,
- High-Definition (HD) maps and
- End-to-End deep learning.

By the end of 2020, Baidu hopes to offer a platform that can handle full autonomous driving on both urban roads and highways. In the autonomous driving industry, the different players are trying to forge right partnerships in order to overcome different aspects of the challenge. In this context Baidu's open approach seems innovative and productive strategy.

Since its launch Apollo has added more than 65,000 lines of new code and around 1,300 companies have downloaded Apollo source code and nearly 100 companies have applied for open data via the Apollo website. Baidu has also announced a 10 billion RMB ($1.5 billion) fund to invest in 100 autonomous driving projects in the next three years.

China is the largest automotive market with a lot of potential for prospects like connected vehicle and autonomous vehicles. This has attracted the companies across the world over working on automotive and peripheral sectors to the country.

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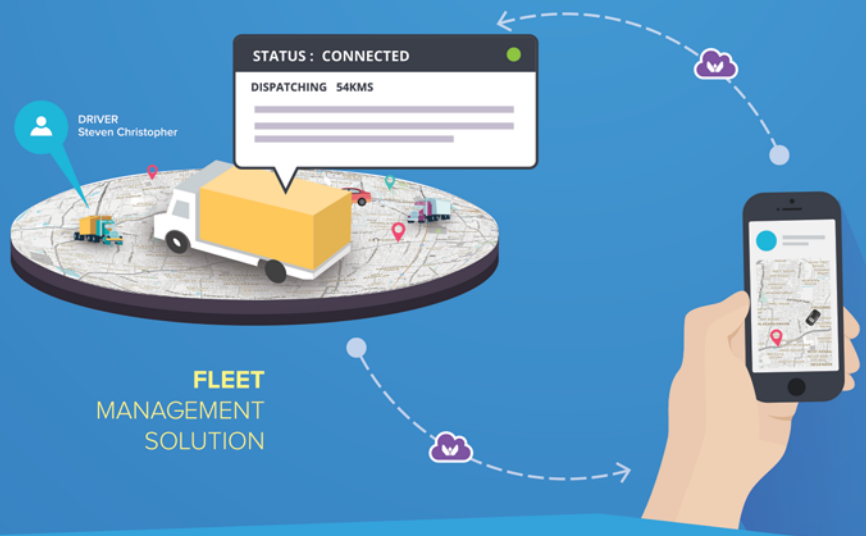

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How everyone can gain from sharing data?

Emil Dautovic
VP Automotive, Mapillary

Emil is leading Mapillary's automotive initiative for providing data and services for the future of cars based on Mapillary's street-level imagery platform that is powered by collaboration and computer vision. He has been involved in automotive related business for more than a decade. Emil holds a Master of Science degree in Electronical Engineering from the Faculty of Engineering at Lund University, Sweden.

As the world is constantly changing, maps need to be updated continuously as well. Today and in the future, autonomous vehicles will be heavy consumers of up-to-date map data. The question that arises then is how this is supposed to work since traditional ways of mapping have a hard time keeping up with these needs. The more people, organizations, and companies could add value, the better. If that kind of data was available to everyone, maps could be kept updated all the time to ensure safer and smoother rides in the autonomous vehicles.

Teaching the car to see

As humans, we take in a lot of data about our surroundings when we're driving: how other cars, cyclists, and pedestrians are moving, the street signs that we see, as well as other parts of the traffic scene such as toys lying around close to a road. Based on all this and combining it with our past experience, we can anticipate potential hazardous situations (e.g. a child running onto the street) and adapt accordingly.

Autonomous vehicles will need to go through the same chain of taking in a lot of data, processing it, and then making decisions based on that. To get somewhere close to the experience of human drivers, autonomous vehicles initially need a lot of data so that the algorithms that drive them can be properly trained to recognise different objects that may occur in traffic situations such as vehicles, pedestrians, lanes, etc. For this, we need training data from different locations and different scenarios like time of day, weather conditions, and season. Diversity is key when training algorithms as traffic scenarios could differ quite a lot between continents and countries, e.g. there will be cyclists on the narrow streets in Amsterdam while they would be sparse in other street scenes like Los Angeles. Also, as cities are constantly changing, there is a lot to be won from having diverse data so that you can prepare for not just today but for the future as well.

The more data sources you have and the more diverse they are, the better your algorithms will be. But this is also what makes it hard to gather enough images on your own. A collaborative approach could help solve this by creating a diverse dataset that covers all kinds of scenarios.

How to get the best training data

Imagine if you could get access to street-level images from a platform that anyone can contribute to anywhere on the globe, regardless of what type of camera they use (e.g. mobile phones, action cameras, professional surround-view camera rigs as well as embedded automotive cameras). Then you would be able to find the different images needed for algorithm training, based on location, time and date, and what types of different objects are found in the images.

When you have selected the images you want, they need to be manually annotated and labelled by humans and then you have your dataset ready for training vehicle algorithms to recognize different types of objects and understand street scenes. There are different datasets available out there, but the Mapillary Vistas Dataset (http://www.mapillary.com/dataset/vistas) is the only one constructed from a collaborative pool of imagery, and as a result is one of the most comprehensive available for this kind of AI training. Today, there are many different types of contributors to Mapillary's platform. Hobby contributors would like to share their work. OpenStreetMap volunteers capture and use the images when editing maps. Cities like Amsterdam and countries like Lithuania share their imagery for public access and the chance for others to develop services and applications upon it.

Amsterdam city scene (image on Mapillary by shravan91, licensed under CC-BY-SA)

Companies share their existing imagery for disaster recovery purposes like Microsoft sharing images from hurricane-affected areas in Florida and Texas. And so on—different immediate purposes, but sharing means that everyone benefits from more than they contribute just by themselves. And that's what motivates everyone to collaborate on the same platform, creating a very rich pool of data.

From training to the real world-getting map data

After we have built up an imagery database, enabled everyone to contribute to it, and also created a dataset from the imagery that could be used for training algorithms, what's next?

Los Angeles city scene (image on Mapillary by gyllen, licensed under CC-BY-SA)

Now it is time to extract data from all the images. What kind of data would be of interest when we think about autonomous vehicles? The obvious ones are traffic signs, both to find all of them in a street scene and to understand which one is which. In addition, there is a lot of other information in the images that is of interest, such as guardrails, sidewalks, mailboxes, and fire hydrants. The computer vision algorithms at Mapillary are trained to recognize 97 different object classes, including also moving objects that are not very common such as caravans, or objects that are in the street scene only temporarily such as temporary traffic lights.

What is the use of all this data extracted from the images?

In addition to the ability to understand the world around them, autonomous vehicles also need maps to help them navigate. The more detailed the map, the better it helps the vehicle to understand its surroundings.

When building an HD (high definition) map for an autonomous vehicle, the starting point is a base map—the underlying framework. But the key differentiators in the future will not be the different base maps but rather the kind of map data (such as map objects derived from geotagged imagery) that takes the map from SD (standard definition) to HD.

Object detections on Mapillary include common traffic participants such as cars as well as more rare ones like caravans (image on Mapillary by jeluf, licensed under CC-BY-SA)

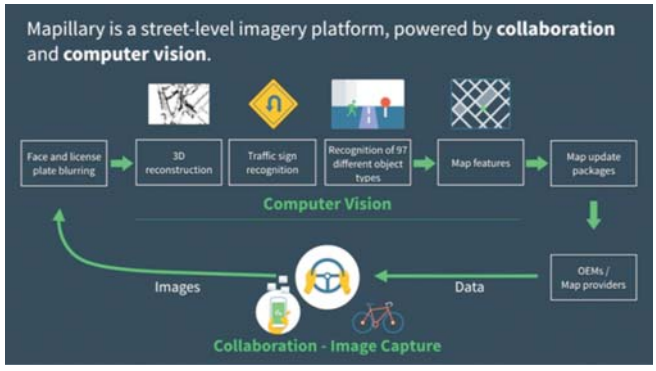
This kind of map data has traditionally been collected with help of dedicated fleets of vehicles equipped with sensors and cameras that gather information and map a certain area by driving through it street by street. There are limits to this kind of approach though, as it doesn't scale above the number of mapping vehicles. So the data becomes outdated quickly—if it's available at all.

Scaling it up

Just like with computer vision training data, more is better also when it comes to map data. The fresher and more extensive the HD maps of an area are, the better the navigation experience will be. This is why the best approach to gather data is a collaborative one where anyone with some kind of camera with GPS can contribute. This helps mapping companies expand the areas they can cover in HD and also keep existing coverage updated.

The approach doesn't compete with what map providers are doing with their own mapping vehicles and maybe even with their own crowd-based solutions, if they should have those as well, but rather complements it. Remember, more data means better maps. It also keeps the costs down as it is not cheap to drive around with a dedicated mapping fleet. Last but not least, the same data can be used for lots of other applications besides making HD maps for autonomous vehicles. So collaboration and data sharing lead to more innovation, faster progress, and lower costs for everyone. It creates a network effect where everyone benefits from contributing to the same pool.

With that vast amount of images, computer vision is the only scalable way to get map data. All images get processed in Mapillary's cloud, and as a result of combining object recognition with 3D reconstruction, map features are automatically extracted and then included in map update packages that are available to OEMs and map providers. To give an overview of the flow in the Mapillary cloud, see the image below.



Some final words

To summarize what Mapillary does:

- Building a collaborative street-level imagery platform that anyone can contribute to using a wide variety of hardware (cameras and GPS systems) for image/data collection
- Using computer vision technology to extract map data from imagery
- Helping train autonomous vehicles with diverse datasets
- Providing fresh and comprehensive map data that helps autonomous vehicles to navigate

The technology is there, so the final question is whether the automotive world is ready for collaboration on data collection, regardless of suppliers, camera hardware, and base maps used. Hopefully yes, so that we can enable all autonomous vehicles get out there soon, safe for everyone. ▪▪■

NVIDIA Pegasus for Robotaxis

The robotaxis are being seen as the next big thing in the automotive market that would put an end to private ownership of cars, but the technological hurdles in this direction are yet to be cleared. It is known that the computational requirements of robotaxis are enormous. It needs perceiving the world through high-resolution, 360-degree surround cameras and lidars, localizing, tracking vehicles and people around the car, and planning a safe and comfortable path to the destination. All this processing must be done with multiple levels of redundancy to ensure the highest level of safety.

Nvidia claims to have found an answer to this need through what it calls the world's first artificial intelligence computer designed to drive fully autonomous robotaxis. The new system has been codenamed Pegasus and it extends the company's DRIVE PX AI computing platform to handle Level 5 driverless vehicles. The company claims that Pegasus gives more than 10 times the performance of its predecessor, Drive PX 2, delivering over 320 trillion operations per second. The company also informed that more than 25 companies are developing Level 5 Robotaxis on NVIDIA CUDA GPUs--

Pegasus is powered by four high-performance AI processors. It couples two of NVIDIA's Xavier system-on-a-chip processors -- featuring an embedded GPU based on the NVIDIA Volta architecture -- with two next-generation discrete GPUs with hardware created for accelerating deep learning and computer vision algorithms. The system will provide the computational capability for autonomous vehicles in a computer which is almost the size of a license plate. Besides form factor also reducing energy consumption and cost.

NVIDIA's rival Intel is making great strides towards autonomous cars, through intelligent partnerships and delivering superior products. Although a late entrant, the company has managed to emerge as a dominant player in the automotive ecosystem with acquisition of Mobileye, and announcement of its partnership with Waymo . Waymo and Intel are most likely to collaborate on level-4 and level-5 autonomous cars as well. The companies are also working together with Delphi, BMW, FCA, Continental, Magna to deliver a self-driving, flexible vehicle platform by 2021. In addition the company has acquired Movidus,-- that designed neural compute-capable Myriad X VPU, Nervana Systems artificial intelligence processors— and Wind River Systems known for security solutions for self-driving cars. Intel also replaced NVDIA as infotainment component supplier for Tesla.

NVIDIA is not ready to cede its place easily and thus is making efforts to get ahead in this race to autonomous cars. The company with HERE and ZENRIN is working to expand the Live Map capabilities of autonomous vehicles. It has also got partnership with Audi on development of self-driving cars, both the are jointly working to put advanced AI cars on the road starting 2020. NVIDIA has also got partnerships with companies including Honda, Volvo, Mercedes-Benz and BMW, Autoliv, Toyota, Bosch, HELLA, ZF etc. The company is working on various aspects of autonomous technologies with these companies.

Pegasus will be available to NVIDIA automotive partners in the second half of 2018. ▪▪■

Telematics Wire Team

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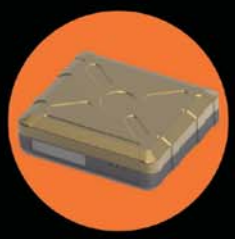

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Connected cars or supercomputers on wheels

Sanjay Gupta
Vice President & India Country Manager
NXP

Sanjay has remained a pioneer in developing & leading high performance global teams for high complexity IC design, embedded software development & Business development. He is responsible for leading NXP's business in India and ensuring local compliance with government and corporate programs and policies. He leads Methodology, Quality and Culture for the Automotive Microcontrollers & Processors (AMP) R&D in the organization. He is also the Chairperson for Innovation board for BU Automotive across organizational units.

The global automotive industry has been witnessing a transformation over the last decade with digital communication technologies making rapid inroads in vehicles. While it is no news that data is the new oil, automakers and others want in on the data-for-dollars boom, thanks to the emergence of increasingly capable and cost-effective processors, image sensors, memories and other semiconductor devices, along with robust algorithms. This has resulted in automakers bringing together various pieces in a car such as infotainment, telematics, and diagnostics and developing an ecosystem to provide variety of services, including usage based insurance, preventive diagnostics, and location based services using the generated data.

Global Connected Car Market

While automotive digital technology has traditionally focused on optimizing the vehicle's internal functions, an average car today possesses the computing power of 20 computers with more than 100 million lines of programming code, and processes nearly 25 gigabytes of data every hour. But this attention is now turning to developing the car's ability to connect with the outside world and enhance the in-car experience. Though there will be little change in vehicle ownership cost for consumers, a dramatic increase in vehicle connectivity will increase the value of the global market for connectivity components and services from €30 to a whopping €170 billion by 2020. In the premium automobile segment, spend on digital technology is expected to rise to 10% of total vehicle sales by 2021; more than double the current level of 4%. While technological advances have driven the automotive sector for decades, the key to driving this dramatic acceleration is by arriving at electronics architecture that optimize on the costs while providing value to the customer.

In the hood of Connected Cars

One can see the architecture of the connected car as the vehicle connected to anything with an electronic device. Traditionally, automotive architecture comprised of Infotainment, Telematics, and Diagnostics which had minimal to no communication between them. The advent of advanced communication such as vehicle-to-everything (V2X) communications, telematics, near-field communication (NFC), and multi-standard digital broadcast reception complemented by advanced driver-assistance systems (ADAS) that implement autonomous driving features, cars of the future will be supercomputers on wheels.

The technological architecture of modern connected cars comprises of two main components:

Advanced driver-assistance systems or ADAS

The proliferation of sensors in today's vehicles has fueled the rapid evolution of ADAS. Once a domain of only high-end luxury cars, today ADAS systems have found their way into mid-range and economy vehicles. This paradigm shift towards mass adoption has also flagged the path to piloted drive and fully autonomous vehicles. Automobile and tech giants including GM, Uber, and Tesla Motors, to name a few, seem to be in a race to develop and ship affordable autonomous vehicles into the market. However, there are several challenges with respect to developing ADAS, including high development costs, compliance with rigorous safety certifications, and integration of ADAS components from multiple suppliers.

Connectivity

Inventors being drawn to connectivity is no news. Since the first telegraph message in 1838, to the discovery of radio waves, the telephone and, of course, the

> "Though there will be little change in vehicle ownership cost for consumers, a dramatic increase in vehicle connectivity will increase the value of the global market for connectivity components and services from €30 to a whopping €170 billion by 2020."

Picture Courtesy: NXP Blog

Internet, our desire to stay connected in every possible way has amplified over the years. And the automobile is part of the same evolution. From CB radios to monstrous car phones, drivers have often gone to seemingly any length to make sure their drive time didn't mean they were out of the loop.

Considering that an average Indian spends 600 hours a year behind the wheel, there's real pressure to provide an intuitive user interface that allows a user to interact with the car over wireless networks to perform variety of operations starting from getting vehicle status to controlling some of the aspects of the car like switching on the HVAC or locating a car in the parking lot.

This is where connectivity enhances as a key product feature of the Connected Car Gateway (CCG), an entry point for a car to communicate to the external world. Comprising of several smaller blocks such as LTE, Wi-Fi and Bluetooth along with radio navigation system like GPS, connectivity will impact not just roadway object detection, but how the car and driver communicate with their electronic environments.

Security Protocols – A Need of the Hour

With more and more vehicles getting connected to internet allowing access to vehicle information and control of vehicle from remote location, the security threat to vehicles from external hackers has increased exponentially. While several studies some years ago have already warned that hacking into a car is possible, and hackers recently demonstrated that they could indeed gain remote control over vehicles. Despite the paradigm shift, car makers, who until now focused on innovation of safety devices, such as brakes, will have to invest in additional security to protect the vehicle against hackers.

Having said that and considering the rapid change in the face of automotive industry, NXP has put together a framework consisting of four security layers that provides a holistic approach for securing the complete vehicle architecture, using a defense-in-depth strategy. These include, Secure interfaces, which connect the vehicle to the external world; Secure gateway, which provides domain isolation through separating interfaces, infotainment, safety-critical systems, among others; Secure network, which provides secure communication between control units (ECUs); and Secure processing units, which implement all the features of the connected car. Each connected component has its own specific security challenges.

> "Today ADAS systems have found their way into mid-range and economy vehicles. This paradigm shift towards mass adoption has also flagged the path to piloted drive and fully autonomous vehicles."

> "A framework consisting of four security layers that provides a holistic approach for securing the complete vehicle architecture, using a defense-in-depth strategy."

So, NXP believes that a four-layer security framework provides the right level of protection and countermeasures to individually address the security needs for each one. This structured approach delivers multiple levels of defense, from the vehicle's perimeter to the individual electronic control units (ECUs), eliminating vulnerabilities.

While the future of automobiles would be much smarter and safer than the current time, automobiles will no more be just a means of commuting but a progressive and personalized information hub. Innovations are helping create a more entertaining, customized experience for consumers as well as making driving safer and easier.

Though these vehicles, offering car owners multiple possibilities, will prove a boon to the people, the immense quantity of data generated will be red meat for marketers. Automakers on the other hand, can use this opportunity to keep customers happy and loyal.▪▪▪

Connected cars will ultimately converge under a unified IOT ecosystem

Jacob (Coby) Hasson
EVP, Head of Global Sales
Scope Technology

Telematics Wire got the chance to interview Mr. Jacob (Coby) Hasson, EVP, Head of Global Sales at Scope Technology, He leads the planning and execution of strategies to grow sales and revenues of the company.

Q How do you see the connected car market developing in the next 5-6 years?

A Jacob: While there seem to be disparate connected car trends between the OEM's, insurance carriers, consumer OBD II based solutions and the vehicle repair and maintenance verticals, our view is that they will ultimately converge under a unified IOT ecosystem that will open up the domain to new & non-traditional newcomers, generate new opportunities for the incumbents, and present new & innovative solutions & business models.

Q How important is collaboration among the different players in the market for a better future?

A Jacob: It is both critical & inevitable. There is a vital and great need for standardization, and the overall opening up of the market. The path the industry needs to take is very similar to the path which was taken by the mobile handset market, which was transformed by the introduction of Android OS and the opening up of the market to content and service providers.

Q What are your views about the Indian Telematics market and what are the factors that make it unique?

A Jacob: The Indian market presents a very unique set of potential and challenges. It is characterized by a somewhat delayed/hesitant initial adoption phase, followed by exponential growth rates, and on-going aggressive pricing challenges. The principle of survival of the fittest is quite prominent. From the perspective of Telematics the market is driven by the growing maturity of the commercial fleet management vertical, OEM's new connected car initiatives, and the initial foray into the UBI space by some of the leading insurance carriers.

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Q Vehicles will be generating a huge amount of data, what are the new business models that can develop in the future?

A Jacob: An example of models can include an algorithm based auto-bidding similar to the one practiced by on-line advertising, revenue share between customer data aggregators & service/product providers and data analytics on a per instance basis such as a vehicle diagnostics company providing vehicle health analysis per request, etc.

Q There are security-related concerns about aftermarket telematics solutions, what would you say to allay those fears?

A Jacob: The security concerns primarily involve access to the ECU's via the Telematics device & data privacy concerns in respect of the data transmission by the Telematics unit or the data base of the platforms containing the data. These concerns can and should be addressed by selection of experienced technology vendors with proven solutions that address these security concerns

Q What are the challenges for wide-scale adoption of insurance telematics in markets like India, how can they be met?

A Jacob: The main challenges include: regulation, defining an ROI that takes into account the low premiums and the need to create clear benefits across all activities of the carrier inclusive of the actuarial department, claims, marketing and client engagement.

Q What steps do you think the government in a country like India should take to encourage the development of the Telematics industry?

A Jacob: Provide tax incentives to all commercial fleets that utilize telematics, regulation (insurance industry) and extend the AIS 140 initiative.

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Welcome to Connected Vehicles 2018

The event where you connect with dynamic leadership to get inspired and insight into the Future Mobility

As we move closer to connected world, we also find ourselves in midst of transition in mobility with questions wherein we need to pick the top brains from industry experts to market research professionals:

- What are sustainable services in connected vehicles?
- What is new mobility concept in connected world?
- Who all will define and lead the connected vehicles market In India?

For an answer to these and for further discussions on topics mentioned below, join us at "Connected Vehicles 2018":

- Connected Cars: Innovation Driven by Data
- In-Vehicle Infotainment for a Hyper-Personalized User Experience
- Sync the Smart Car with the Smart Mobility
- IoT's impact on Automotive and Mobility
- Building Cybersecurity Standards & Best Practice
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- Mobility Service Providers
- Tier 1 Suppliers
- Tier 2 & 3 Suppliers
- Semiconductors
- System Integrators
- Software Providers
- Content Providers
- Application Developers
- Wireless Carriers
- Insurers
- Cloud Service Providers
- Component Manufacturers
- Government
- Car Sharing Companies
- Taxi Aggregators
- PSU/ STC
- Financial Services
- Association
- TSP's
- Chip Manufacturers
- Big Data Analytics
- Telecom
- Policy Makers

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THE RISE OF RIDE-HAILING MARKET IN INDIA

Like any other social transaction, commuting is linked to the needs of the population in that area/region/state or country. With the growing distances between the workplaces and habitats, travelling to job locations is a major contributor the commuting needs. In our context in India urbanization is taking place at a faster rate and multilateral agencies have given us a strong idea about the pace of change. India's urban population rose from 27.82% to 31.14% between 2001 and 2011. This was projected to double to around 600 million urban population by 2030. In this scenario there is a huge need for smart and sustainable transport solutions to support the process of urbanization which is taking place at a faster rate than ever before.

Private sector has been emerging as a dominant player in the transportation segment, primarily in the urban agglomerates. Though traditionally owning a private car even an introductory level/mid-segment for the middle class had acquired a status symbol. But, this mindset of people seems to be changing. There are some sections of society who feels that access and ease of travel in transportation is more important than ownership.

According to Vishnu Mathur, DG, SIAM, mentioned to Businessworld, that ride-hailing services offered by Ola, Uber, etc, will change the face of urban mobility in India. He could not say whether this is going to reduce the number of vehicles in the country, but was sure about better utilisation of the fleet.

E-hailing or ride sharing services are seeing widespread adoption. In July 2017, Indian government laid more stress on examining ways in which it can reduce the growing problem of urban congestion in major cities across the country and formed a federal think-tank, which is chaired by Hon'ble PM Shri Narendra Modi. It has been publicly disclosed that Uber has partnered with the government on the federal think-tank discussions. The three-month trial will allow the government "to assess the economic and environmental impact of using private cars as taxis." We can therefore expect a decline in private car ownership in the future due to changing consumer preference and government's initiatives in this space. Though as per a report shared by the International Energy Agency (IEA) in June 2016, it is expected that passenger car ownership in India will grow by 775% over the next 24 years.

Enabling regulatory framework

A lack of clarity on the laws has always been a point of concern for cab aggregators and public—and finally government is bringing clarity on the rules for cab aggregators. In April 2017, the Lok Sabha has already passed the relevant amendment to the Motor Vehicles (Amendment) Bill, 2016, which has been welcomed by the industry, as app-based cab aggregators will no longer be required to register as a taxi operator under obsolete laws. After the law is passed—once the Rajya Sabha approves it, a Presidential assent follows, and eventually state governments will issue licences to taxi aggregators as per central government guidelines. These guidelines are part of a series of amendments tabled by Shri Nitin Gadkari, Union Minister for Road Transport and Highways and passed in the Lok Sabha earlier in April 2017.

Competition beyond Ola and Uber in ride-hailing

The online cab-hailing industry in India has undergone phenomenal growth in the last two to three years. Ola and Uber together can be credited as the game changers in Indian ride hailing services. With each passing year there has been a multi fold increase in number of rides booked through their respective platforms. In addition to these two major players, the space is currently inhabited by ride-sharing startups like Ryde and Bla Bla Car as well as self-driven rental car services such as Revv, Voler and Zoomcar. Other names include inter-city taxi service Wiwigo, Delhi-based TaxiVaxi and bike taxi operator Rapido.

In a significant development the $19-billion diversified Mahindra group is also set to foray into the ride-hailing and cab aggregation business. According to Anand Mahindra, chairman of the group ride hailing is giving impetus to the auto industry's growth. "It is like recognising a new reality. We cannot expect the auto industry to grow like this in the absence of ride-share." Mahindra's entry

into the business will coincide with the development of new electric vehicles by the group that will cater to the shared-mobility segment. "The new philosophy of millennials and many others is that they want access to transportation, not ownership. They prefer ride-hailing, or car-pooling... This will come first in dense urban clusters," added Mahindra as reported by ToI.

Earlier in December 2015, the Delhi government launched the PoochO driver app, through which customers could book taxi and auto-rickshaw services in India's capital. Disgruntled drivers of the cab aggregators, too, have been taking on Uber and Ola by launching their own platforms. In Karnataka, former Uber and Ola drivers sought the backing of the state's ex-chief minister HD Kumaraswamy, who went on to launch HDK Cabs. In New Delhi, drivers launched their own taxi-hailing app called SEWA in April. Last month, Mumbai's khaki-uniformed local cab drivers launched the Aamchi Driver (our driver) app. Talking about the government's initiatives in this market, the Indian government too could soon become a player in the ride-hailing market by launching its own taxi-booking app as per Shri Nitin Gadkari, Union Minister for Road Transport and Highways. According to the plan, the app will allow commuters to choose any mode of travel—from electric four-wheelers to two-wheeler taxis—from myriad service providers. At the end, it will come to the fact that commuter is the king and he has a right to hail about—anytime, anywhere.

Rosy rides but hiccups are there

The online ride-hailing market in India has been exploding with different schemes for customer-friendly services. However, with growing competition, a strong opposition by drivers has been witnessed due to immediate fallout of the lower incentives for drivers. Adding to the competition and intra industry squabbles we have traditional cab service operators who are not only gearing up to match the established players with technology, innovation but also going into the judicial arena of country's antitrust watchdog Competition Commission of India (CCI). Another sensitive issue which has caught

the equal attention of government and judiciary is the practice of surge pricing adopted by cab aggregators which has been challenged in the court and is under active consideration to regulate at the state government levels.

The cab aggregators are undoubtedly providing the technology and platform for drivers and passengers to connect. However, ensuring safety of the commuters is the first and the foremost responsibility of the taxi or bus aggregators. In last few years safety issue in public and private transport has come at centre stage particularly for women passengers. There have been wide spread public reactions to such incidences in the past.

It has become imperative for the app-based taxi or cab aggregators to fill in safety gaps with technology such as GPS-tracking, in-app emergency buttons, vehicle details, telematics, and customer privacy during and after rides. National Legal Services Authority has already been directed by SC to set up an expert panel to frame model rules for granting compensation to victims as there was no uniformity in schemes followed by states.

What needs to be understood by the top management both in public and private sector is that effective processes, checks and safeguards must be instituted to ensure that safety and legal compliances are met otherwise a very heavy price will be paid not only by the organisation in terms of its image, business or legalities but by the industry as well.

Indian Ride Hailing Market and its dominance

According to a report entitled "Ride Hailing Market by Service Type (E-hailing, Car Sharing, Station-Based, Car Rental), Data Service (Navigation, Information, Payment, Others), Connectivity (3G, 4G, 5G, Wi-Fi and V2V, V2I, V2P, V2N), Vehicle Type, & Region - Global Forecast to 2025", published by MarketsandMarkets™, the Ride Hailing Market globally is projected to grow at a CAGR of 19.81% from 2017, to reach a market size of USD 276.00 Billion by 2025. The report says that Asia-Pacific is estimated to dominate the Ride Hailing Market, and is projected to grow at a significant CAGR during the forecast period. The growth in Asia-Pacific market is attributed to wide customer base due to dense population and rising urbanization in emerging economies wherein India and China have a prominent role in the projected growth in APAC.

Conclusion

Over past few years, ride-hailing apps have successfully catered to the growing demands of people for on-demand cabs and taxis that enables commuters to make bookings anywhere, anytime via their smartphones. Some of the issues which ride hailing can eventually address are:

Parking blues in the cities and metros

City/town road Infrastructure which is already stretched beyond it carrying capacity

Last mile connectivity which would sync-up with the metro and other city transport being undertaken or envisaged. ▪▪■

Telematics Wire Team

MAX4 Autonomous Driving Platform

Magna has unveiled MAX4, autonomous driving sensing and compute platform that can enable up to Level 4 autonomous driving capabilities in both urban and highway environments.

MAX4 combines cameras, RADAR, LiDAR and ultrasonic sensors with a compute platform easy to integrate with any automakers' existing and future platforms—including hybrid and electric vehicles.

It aims to simplify the way drivers engage with autonomous driving systems including the option of user interface. A lighted display indicates the vehicle is in autonomous mode, and drivers can disengage that mode via brake pedal or an emergency button.

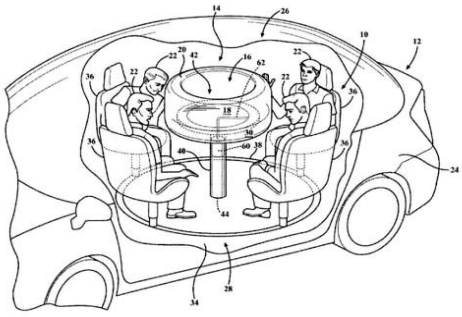
Bloomberg Philanthropies releases its Global Atlas of AVs

Bloomberg Philanthropies released its Global Atlas of Autonomous Vehicles (AV), a comprehensive, first-of-its kind map showing transition efforts of AVs across the globe.

The Atlas was developed as a key piece of the Bloomberg Aspen Initiative on Cities and Autonomous Vehicles that promotes knowledge-sharing and collective action worldwide.

According to the Atlas, Bloomberg Aspen Initiative, AV programs are taking shape in 53 cities covering nearly every continent. Bloomberg Philanthropies will track the work of cities across the globe and will update the map with new AV pilots and policymaking efforts that feature a significant role from local government.

Ford patents a retractable table fitted with airbags for autonomous cars



Ford has patented a retractable table fitted with airbags for autonomous cars. The vision behind this is that in a fully autonomous car where the driver will be just another passenger, the front seats that can turn around 180 degrees and passengers can interact with each other over the table. An airbag that extends around the perimeter of the top surface of the table is to limit the likelihood of an occupant impacting the table and/or to absorb energy from the occupant during the vehicle impact.

Ford has announced its plan to launch fully autonomous cars by 2021 but whether this kind of design will be included in those vehicles has not been made clear. As the race towards autonomous cars is gaining pace, automakers are leaving no chance to gain an edge over each other. This spurt in the patents related to it only corroborate this fact.

Ford and Virginia tech create illusion of driverless car on road

Ford Motor Company has partnered with Virginia Tech Transportation Institute to conduct a user experience study to test out a method for a self-driving vehicle to signal its intent by soliciting real-world reactions from people on public roads.

Ford placed a light bar on the windshield of a Transit Connect test vehicle and researchers developed an innovative seat suit to conceal the human in the driver's seat. Designed to look like an ordinary driver's seat to others, the suit creates the illusion of a fully autonomous vehicle, which is essential for evaluating real-world encounters and behaviours between van and other road users.

Six high-definition cameras were mounted to provide a 360-degree view of surrounding areas to capture the behaviour of other road users. The team then went to work experimenting with three different light scenarios to test the signalling of the vehicle's intent:

- Yielding: Two white lights that move side to side, indicating vehicle is about to yield to a full stop.
- Active autonomous driving: Solid white light to indicate vehicle is driving autonomously.
- Starting to go: Rapidly blinking white light to indicate vehicle is beginning to accelerate from a stop.

Ford's Transit Connect simulated autonomous driving on public roads in northern Virginia throughout August 2017, with researchers capturing video and logs of people's reactions. More than 150 hours of data over approximately 1,800 miles of driving was collected in an urban environment, including encounters with pedestrians, bicyclists and other drivers. External signals were activated more than 1,650 times at various locations around Arlington, including at intersections, parking lots, garages and airport roadways. Ford is also working with several industry organizations to push toward creation of an industry standard, including the International Organization for Standardization and SAE International.

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Tesla switching from Nvidia to Intel for its infotainment system, says report

Tesla has replaced chip supplier Nvidia with Intel for its infotainment system. Neither of the three companies gave any statement on the matter. Intel's acquisition of Mobileye and the recent revelation of it being the supplier of chips for Waymo has strengthened the company's position as a significant player in the automotive industry. Nvidia too has entered into partnerships with multiple companies like Audi, Volvo, Toyota and has around 6 percent of its revenue coming from the automotive sector. There were also speculations that Tesla is working with AMD to develop its own AI chip for self-driving cars. If the company is successful in developing its own AI chip it would get closer to delivering a totally autonomous car.

Currently, Tesla relies on Nvidia's graphics processing units as part of the Autopilot self-driving hardware. Although GPUs from Nvidia is capable of doing multiple tasks but are not automotive specific, so developing a customised chip for the self-driving cars might be one of the purposes of this 'collaboration'. Reducing dependence on Nvidia can also have financial implications for the company. Earlier, Tesla used chips from Mobileye but post an accident involving a Tesla car the companies ended their collaboration. Tesla has recently roped in Jim Keller, who has briefly worked with AMD and now heads Autopilot hardware and software for Tesla. Semiconductor companies like Qualcomm, Intel, Samsung electronics have become very active in the automotive segment so AMD raising its stakes in the sector does not seem surprising.

Autonomous software may cause disruption across the automotive value chain: Frost & Sullivan

Frost & Sullivan has released a paper "Strategic Analysis of Waymo's Future Autonomous Disruptive Capabilities for the Automotive Industry". According to it Waymo's autonomous software may cause disruption across the automotive value chain from OEMs to dealerships.

Some points raised by it are:

- Waymo could potentially help commercialize its autonomous technology earlier than its competition, disrupt multiple industries ranging from shared mobility to logistics, as well as hold the key to Alphabet's ecosystem of connected devices, thus enabling the collection of data from vehicles and users to offer customized services.
- Waymo-powered, Level 5 autonomous vehicle, featuring complete connectivity, to become available to the public by 2025. It would be based on Fiat Chrysler Automobile's Chrysler Pacifica, which is currently being used as a test mule.

Potential growth opportunities for Waymo include:

- Securing partnerships with third-party developers to build applications for vehicles based on vehicular data;
- Licensing its autonomous software and tailoring it to logistics, thereby saving fuel and driver charge costs;
- Licensing its in-house manufacturing and distribution of light detection and ranging (LIDARs) and sensors for autonomous cars; and
- Extending its software to power autonomous buses for public transport.

Recent partnership with Lyft is a strong indication of Waymo's

interest in entering the shared mobility space.

Regardless of Waymo's entry, the automotive industry is poised to transform into a highly connected ecosystem. Nevertheless, as Waymo is at the forefront of developing autonomous driving software for cars, the entry of Waymo could offer existing ecosystem participants tough competition.

Waymo releases its safety report

Waymo has released its first-ever Safety Report, that cites the procedures and technology adopted by the company to make sure its self-driving cars remain safe and secure.

Waymo's Safety Report also addresses the U.S. Department of Transportation (DOT) federal policy framework for autonomous vehicles: Automated Driving Systems 2.0: A Vision for Safety.

Lyft secured $1 billion in new funding led by Alphabet

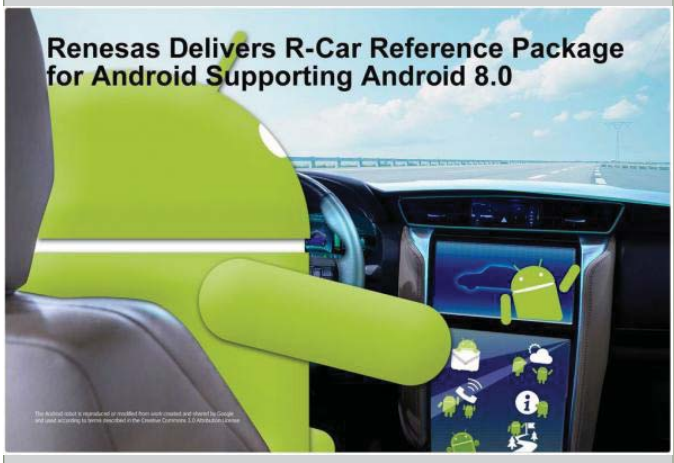
Lyft has secured $1 billion in new funding led by Alphabet. The investment was made through Alphabet's CapitalG venture capital arm. The fresh funding has helped the company to increase its valuation by 50% to around $11 billion.

Lyft last month entered into a partnership with an automotive giant Ford for development of self-driving cars, the company has also got investments from GM and JLR as well of $500 million and $25 million respectively. The ride-hailing firm is also working with nuTonomy, Drive.ai on self-driving cars. It has also formed a separate division for development of self-driving cars. Through these moves, the company has successfully established itself as the chief competitor for Uber.

Waymo inks deal with AutoNation on maintenance and repair of its self-driving cars

AutoNation has partnered with Waymo to support Waymo's autonomous vehicle program. It will provide vehicle maintenance and repairs for Waymo's self-driving Chrysler Pacifica hybrid vehicle fleet and will expand with Waymo as they add additional brands. Having served over 40 million customers, AutoNation is currently representing 33 brands.

Renesas launches R-Car reference package for Android



Renesas Electronics Corporation has launched R-Car reference package for Android for its R-Car automotive system-on-chips (SoCs). This package supports Android 8.0, the latest OS announced by Google.

Android 8.0 is the first version of Android OS to include support for functions required in automotive systems. The high-level cloud services for smartphones will now be available in vehicles and is expected to spur the development of new cloud-based services for cars. The combination of this OS with Renesas' automotive SoC simplifies development of automotive Android platforms. The R-Car reference package for Android comprises the R-Car reference board and an extension board as hardware environment, and the board support package (BSP) as software support.

Goodyear equips Tesloop with wireless sensors in its tires

Goodyear Tire & Rubber Company is equipping Tesloop, a city-to-city mobility service that exclusively uses Tesla electric vehicles, with wireless sensors in its tires to improve overall tire management and maximize uptime for its growing fleet.

The wireless sensors continuously measure and record tire temperature and pressure, which is paired with other vehicle data and connected to Goodyear's cloud-based proprietary algorithms.

As part of the program with Tesloop, Goodyear is also extending its mobile fleet solutions to passenger vehicles, providing tire maintenance and repair while Tesloop vehicles are at charging stations, during regularly planned downtime.

Tesloop operates a fleet of Teslas that average up to 17,000 miles per vehicle, per month. Goodyear has been working with Tesloop since January 2017 to study the effect of autonomous technologies on tires. In addition to its fleet management offerings, Goodyear is also working with automakers to provide tire information to vehicle control systems to enhance safety and performance.

Audi "Aicon" has no steering or pedals

Audi unveiled a new concept car "Aicon" at IAA in Frankfurt. This car is autonomous and electric and with a range about 500 miles, it has no pedals or steering. The focus while designing the car has been on offering a maximum of comfort, communications technology and freedom for its occupants during a long journey. It combines the scopes for autonomous driving in an urban environment and on the highway with a long range for an electric drive.

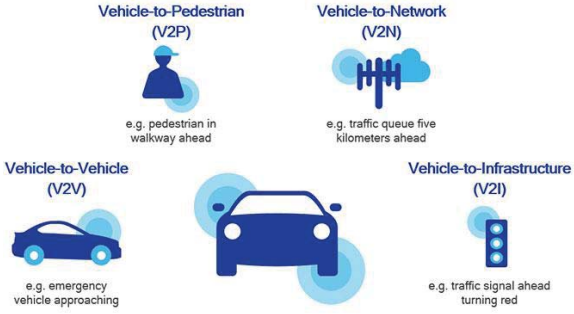
The key features of the car are as follows:

- Designed for purely electric operation to cover distances between 700 and 800 kilometers on a single charge.
- Even at moderate speed limits, long distances can be covered at a high constant speed of around 130 km/j (80.8 mph). Passengers experience the journey as comfortable cruising without constant braking and accelerating.
- A total of four electric motors are located in the area of the front and rear axles. The energy storage units are integrated into the area below the floor. These are solid body batteries with considerably more energy capacity than lithium-ion batteries.

- The four electric motors produce a total of 260 kW and 550 Newtonmeters (405.7 lb-ft). Each drive one wheel, enabling electronically controlled, variable quattro all-wheel drive. Maximum acceleration played a less important role in the specification than maximum efficiency and thus also range.

AT&T, Ford, Nokia, and Qualcomm Technologies come together for the first Cellular-V2X (C-V2X) trials in the U.S

AT&T, Ford, Nokia, and Qualcomm Technologies are coming together for the first Cellular-V2X (C-V2X) trials in the U.S. Testing which is expected to take place in the San Diego Regional Proving Ground with the support of the San Diego Association of Governments (SANDAG), Caltrans, the City of Chula Vista, and intelligent transportation solutions (ITS) provider McCain, Inc.



C-V2X platforms are expected to be installed in Ford vehicles using the Qualcomm 9150 C-V2X solution to facilitate direct communications and are complemented by AT&T's 4G LTE network communications and ITS platform that takes advantage of wireless base stations and multi-access edge computing technology from Nokia. For the new communication technologies being deployed, McCain will help facilitate the effective integration with existing and emerging traffic signal control infrastructure.

Testing will support direct C-V2X communications operating in the 5.9 GHz ITS spectrum for safety enhancements and advanced vehicle communication capabilities for improved traffic efficiencies.

The trials will be aimed at demonstrating to automakers and road operators the anticipated cost-efficient benefits associated with embedded cellular technology in vehicles and synergies between the deployment of cellular base stations and roadside infrastructure. The initial testing phase is expected to begin later this year.

Honda unveils concepts for future mobility

Honda unveiled several concepts of vehicles equipped with electrification technologies and AI features.

- Honda Sports EV Concept
- Honda Urban EV Concept
- Honda NeuV
- Honda CR-V
- Clarity PHEV
- Honda RoboCas Concept

Honda at Tokyo connected lab unveiled these concepts:

- Honda Ie-Mobi Concept (pronounced: ee-a mo-bee – "Ie" is a Japanese word for "home")
- Honda Fure-Mobi Concept
- Honda Chair-Mobi Concept
- Honda Ai-Miimo Concept

LG unveils V2X

LG Innotek has developed a 'Second Generation V2X Full Module' for connected cars and autonomous vehicles.

The module by LG Innotek combines the three varieties of V2X core components, namely the HCI module and Hardware Security Module (HSM) for controlling the communication protocol and the Application Processor (AP) into one product. The Module can survive high temperature of 105°C and operate normally. It has sensitivity level of -94dBm as well as a transmission power of 23dBm for a device with a communication speed of 6Mbps. It possesses the V2X modules optimized for the main V2X chip set companies including Autotalks, NXP Semiconductors, and Qualcomm.

LG Electronics (LG) and Qualcomm to jointly develop a range of next-generation connected car solutions

LG Electronics (LG) and Qualcomm, have announced that they will jointly develop a range of next-generation connected car solutions and will also establish a joint research center in South Korea to develop 5G for vehicle and C-V2X (Cellular Vehicle-to-Everything) technologies.

5G is considered to be vital to the deployment of a fully connected car platform and C-V2X, which is included in 3GPP (Third Generation Partnership Project) delivers double the operation time at a lower cost than DSRC (Dedicated Short Range Communications) over existing mobile communication networks. LG Electronics has been active in telematics market since 2013 and Qualcomm with the acquisition of NXP last year has emerged as an important player in the automotive semiconductor industry.

Argo AI acquires LiDAR technology company Princeton Lightwave

Argo AI has announced that it has acquired Princeton Lightwave, that has extensive experience in the development and commercialization of LiDAR sensors. The acquisition is expected to expedite the process of commercialization and deployment in self-driving cars.

The lineup of LiDAR sensors by the company will help Argo to extend the range and resolution needed to achieve self-driving capability in challenging urban environments. Princeton Lightwave's technology will also aid the company's virtual driver system— mandated for SAE levels four and five autonomous driving — in handling object detection in challenging scenarios.

OTA updates market for automotive to grow at 18.2% reaching $ 3.89 B by 2022

According to a report by Research and Markets, the global Over-The-Air (OTA) updates market for automotive is projected to grow at a CAGR of 18.2% from 2017 to 2022, and to reach USD 3.89 Billion by 2022.

The report further says that stringency of vehicle safety legislations and increasing demand for connected car devices and services to fuel the demand for over-the-air (OTA) updates market for automotive. The major factors driving the growth as pointed out by the report are increased production of electric vehicles; rising demand for connected car devices, government regulations regarding safety and cyber security of the vehicle; increasing demand for advanced applications such as telematics, and infotainment; and new vehicle safety norms encouraging the automakers to protect vehicle data from remote hacking and malfunctioning, which in turn is increasing the demand for OTA updates for automotive.

Challenge for the OTA updates market is the non-availability of supporting infrastructure in developing countries.

Velodyne more than quadruples production for its LiDAR sensors to meet strong global demand

Velodyne LiDAR has more than quadrupled production for its LiDAR sensors to meet strong global demand. As a result, Velodyne LiDAR's sensors are immediately available via distribution partners in Europe, Asia Pacific, and North America, with industry standard lead-times for direct contracts, the company informed through a press release.

The company bolstered this aggressive production expansion by doubling the number of its full-time employees over the past six months.

Notably, Velodyne invented and patented the world's first 3D real-time LiDAR sensor for autonomous vehicles. Over the last ten years, Velodyne sensors have been installed in thousands of vehicles around the world, traveling millions of real-world miles. The company has recently signed an agreement to commercialize LiDAR. Velodyne has got investments from companies like Ford and Baidu. It had also announced a groundbreaking design for a solid-state LiDAR sensor that can deliver a subsystem cost of under $50 U.S. when sold in high-volume manufacturing scale.

BlackBerry introduces new cybersecurity consulting services

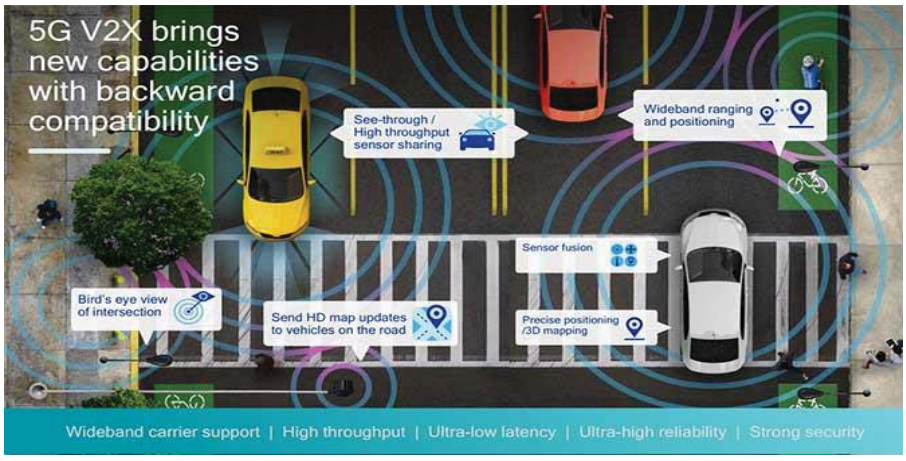
BlackBerry has introduced new cybersecurity consulting services aimed at enabling enterprise GDPR* compliance and mitigating security risks in connected automobiles that threaten personal and public safety. Spring Cloud will be the first partner to work with BlackBerry to provide the new cybersecurity consulting services to a range of automotive technology providers. Today, BlackBerry Cybersecurity Consulting provides a holistic cybersecurity approach to help all enterprises manage complex security structures and mission-critical systems around the world.

*It is known that General Data Protection Regulation (GDPR) —set to go into effect in May 2018— is a regulation by which the European Parliament, the Council of the European Union and the European Commission intend to strengthen and unify data protection for all individuals within the European Union (EU). It is applicable to any enterprise controlling or processing Personally Identifiable Information (PII) of European Union residents, GDPR demands major changes to the ways organizations may collect, use, and store PII about customers and employees.

DiDi Chuxing and GEIDCO to build EV charging network

DiDiChuxing has started a new joint venture project with Global Energy Interconnection Development and Cooperation Organization (GEIDCO) to build its own EV charging systems. DiDi's charging networks will not only cover its own fleet but will also serve general public EVs. DiDi claims it is the online transportation platform with more than 450 million users and 21 million drivers. As many as 25 million rides are completed on its network, twice as many as the rest of the world combined. According to DiDi, more than 1 million electrical vehicles will be operated on the DiDi platform by 2020.

Qualcomm Technologies introduces its first C-V2X commercial solution based on 3GPP



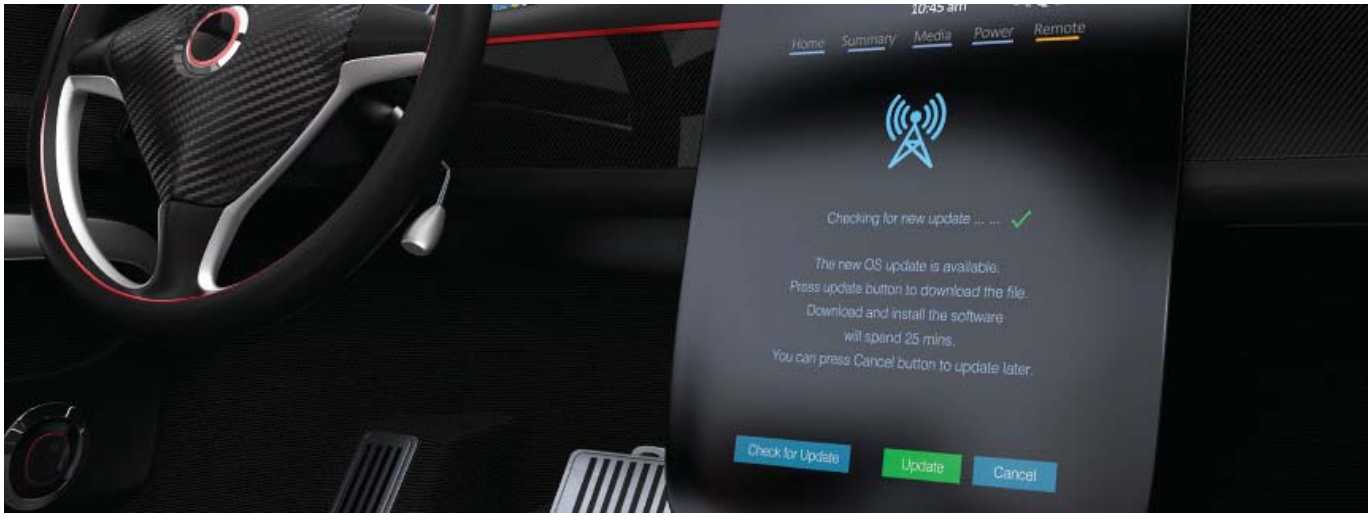
Qualcomm Technologies has introduced its first Cellular Vehicle-to-Everything (C-V2X) commercial solution based on 3rd Generation Partnership Project (3GPP). The Qualcomm C-V2X reference design will feature the 9150 C-V2X chipset with integrated GNSS capability, and include an application processor running the Intelligent Transportation Systems (ITS) V2X stack and a Hardware Security Module (HSM).

The 3rd Generation Partnership Project (3GPP) unites seven telecommunications standard development organizations (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC), known as "Organizational Partners". C-V2X's overarching technologies encompass two transmission modes of direct communications and network-based communications, which are designed to serve as key features for safety conscious and autonomous driving solutions, while complementing other Advanced Driver Assistance Systems (ADAS) sensors, such as cameras, radar and LiDAR, to provide information about the vehicle's surroundings, including non-line-of-sight (NLOS) scenarios.

C-V2X direct communications is designed to support active safety and helps enhance situational awareness by detecting and exchanging information using low latency transmission in the globally harmonized 5.9 GHz ITS band for Vehicle-to-Vehicle (V2V), Vehicle-to-Infrastructure (V2I) and Vehicle-to-Pedestrian (V2P) scenarios without the need for a Subscriber Identity Module (SIM), cellular subscription or network assistance. Network-based communications complements direct communication transmissions, and is designed to utilize the wireless operator's 4G and emerging 5G wireless networks for Vehicle-to-Network (V2N) and operates over licensed operator spectrum to support telematics, connected infotainment and a growing variety of advanced informational safety use cases. The C-V2X standards include both the global 3GPP specifications at the radio layers and reuse the established service, and application layers, defined by the automotive industry, including the Society of Automotive Engineers (SAE) and European Telecommunications Standards Institute ITS (ETSI-ITS).

Qualcomm Technologies has been engaged with the V2X ecosystem for years. With IEEE 802.11p-based products and the new addition of the 9150 C-V2X chipset, Qualcomm Technologies' commitment to supporting safety conscious, connected automotive transportation remains strong. The 9150 C-V2X chipset is designed to offer the industry enhanced V2X capabilities, including extended communication range, improved reliability and NLOS performance to expand support for safety and autonomous driving use cases. With a strong evolution path in 3GPP to 5G New Radio (NR), Qualcomm Technologies continues to invest in the C-V2X roadmap and in delivering new and complementary 5G-NR based C-V2X capabilities.

HARMAN's OTA Version 11 launched



HARMAN International has launched Remote Vehicle Updating OTA version 11 solution, based on technology obtained through the acquisition of Redbend in 2015.

Seventeen OEMs have chosen HARMAN's OTA solution enabling 25 million vehicles.

HARMAN's Remote Vehicle Updating offering enables full-vehicle management, from head units to the smallest ECUs, even those with low processing and memory resources. The solution leverages its unique Smart Delta technology which reduces the file update package up to 99 percent. This is accomplished by generating a small delta update file containing only the changes that were done in the software from the previous version.

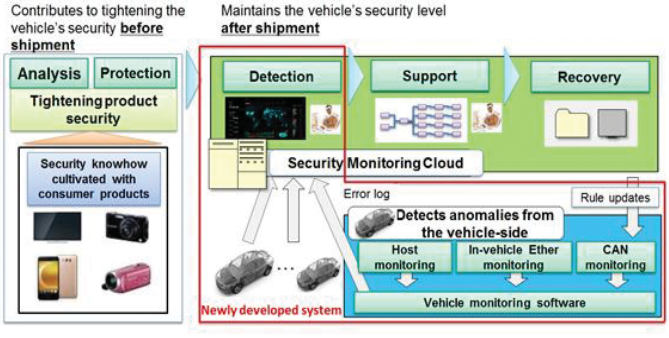
EU sets working groups and launches "EU battery alliance"

At present, the electric-car battery industry is dominated by the Asian countries and it is now being realized by the European leaders that for the countries to completely switch to electric vehicles, Europe needs companies which specialize in the fabrication and assembly of lithium-ion battery cells. Maroš Šefčovič, EU Commission vice president, therefore has recently announced a number of working groups on issues ranging from the supply chain, investment financing, trade issues, and R&D related to electric vehicle batteries. Once the working groups meet and discuss the various topics, they will issue a roadmap for Europe's battery cell industry. An alliance known as "European battery alliance" has also been announced that will adopt a strategic plan as early as February 2018 and start working on it.

Panasonic develops automotive intrusion detection and prevention systems for autonomous and connected cars

Panasonic Corporation has developed automotive intrusion detection and prevention systems as a cybersecurity countermeasure for autonomous and connected cars. The features of the new systems are as follows:

- Detects intrusions of attacks from the Internet at an early stage, and additionally detects intrusions to the in-vehicle network as a second step.
- In addition to the widely used CAN the systems are also compatible with Ethernet, which is expected to spread in the future as an in-vehicle network, and enables comprehensive detections of intrusions to the entire vehicle.
- By collecting information from multiple vehicles on the cloud, the systems can detect attacks before they are identified as a true security incident.



The system consists of a vehicle-installed "monitoring module" and a "monitoring cloud" that is linked to the monitoring module. The vehicle-installed monitoring module monitors the entire vehicle based on the monitoring rules.

New federal guidance for ADS

The U.S. Department of Transportation and the National Highway Traffic Safety Administration (NHTSA) have released new federal guidance for Automated Driving Systems (ADS): A Vision for Safety 2.0. NHTSA has said that autonomous drive systems have the potential to reduce the number of accidents and thus save lives as well as economic losses due to these. In the document, NHTSA claims that they expect "fully automated safety features" and "highway autopilot" in the years 2025. A Vision for Safety 2.0 paves the way for the safe deployment of advanced driver assistance technologies by providing voluntary guidance that encourages best practices and prioritizes safety. The document also provides technical assistance to States and best practices for policymakers.

Samsung embedded Universal Flash Storage (eUFS)

Samsung Electronics has introduced the industry's first embedded Universal Flash Storage (eUFS) solution for automotive applications that consists of 128-gigabyte (GB) and 64GB versions. eUFS solution has been designed for advanced driver-assistance systems (ADAS), next-generation dashboards and infotainment systems. The new eUFS solution also features error-handling process. It supports advanced data refresh and temperature notification features for system reliability.

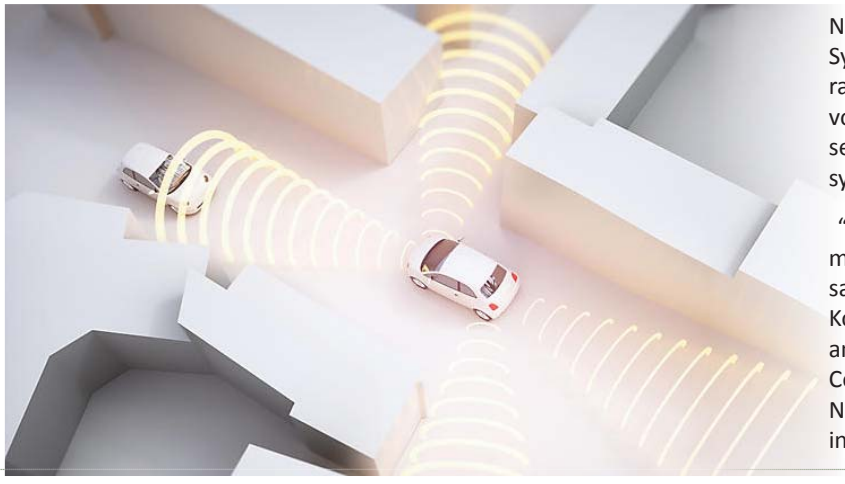
WABCO introduces OnLaneASSIST

WABCO has introduced OnLaneASSIST, a safety technology for heavy- and medium-duty trucks and buses. It is the first application of active steering technology in Advanced Driver Assistance Systems (ADAS).

WABCO's OnLaneASSIST helps improve commercial vehicle safety and driver comfort by avoiding collisions related to unintentional lane departures. It leverages unique active steering technology and a forward-looking camera to provide active lane correction functionality. It also detects lane markings and continuously evaluates the vehicle's position relative to them. It distinguishes between planned lane changes and lane drifting. In case of lane drifting, the system autonomously intervenes before the vehicle unintendedly leaves its lane by applying a correction torque to the steering wheel to return the vehicle towards the lane center. It also smoothly releases the torque as soon as the proper driving path is reestablished.

The launch follows the company's recent acquisition of R.H. Sheppard Co., Inc., a key supplier of steering technologies for commercial vehicles, and signing of a cooperation agreement with Nexteer Automotive, a leader in motion control.

NI Technology announces Vehicle Radar Test System



NI Technology has announced the Vehicle Radar Test System (VRTS), that can be used to test 76–81 GHz radar technology from the R&D lab through high-volume production test and from individual radar sensors to integrated advanced driver assistance systems (ADAS).

"We can use the VRTS to configure the industry's most advanced ADAS test systems to improve the safety and reliability of vehicles," said Michael Konrad, Konrad Technologies founder and CEO and cofounder of the ADAS Innovation in Test (IIT) Consortium. The VRTS is available through select NI Alliance Partners who provide advanced system integration and support.

BlackBerry partners with Delphi to provide automated driving solution

Delphi will be launching its fully integrated automated driving solution, Centralized Sensing Localization and Planning (CSLP) 2019. It aims at providing car manufacturers Automated Mobility on Demand (AMoD), a turnkey automated driving solution. As safety in high-performance computing systems is paramount, BlackBerry QNX has been roped in by Delphi to facilitate proprietary Ottomatika software algorithms and middleware. Delphi has therefore signed a commercial partnership agreement with BlackBerry according to which BlackBerry will provide the operating system for Delphi's autonomous driving system.

Data of more than 540,000 vehicle tracking devices leaked from SVR Tracking

Data of more than 540,000 vehicle tracking devices belonging to company SVR Tracking (California, U.S.) was leaked, according to some reports. The leaked data includes device information, username/password, email addresses and other associated information. It has been reported that leak happened because the Amazon S3 "bucket" in which the information was stored, had not been properly secured. Of late, there have been many instances where sensitive data stored on a misconfigured cloud server gets leaked. However, whether the information was accessed by hackers or not is not clear until now. It should be ensured that no such leaks happen in future as it leads to more apprehensions in the minds of the already hesitant consumers and acts as a hurdle for the adoption of technology.

Continental offers Intelligent doors with no handle, no keys, contactless door opener

Continental has expanded its Smart Access solution that allows users to gain access to their vehicle even if the car battery is flat – and can do so completely digitally, without having to resort to the mechanical emergency key. In combination with the Continental Smart Access system, the entire door is intelligent, which means that it opens and closes independently. It does so by using buffered energy from the door control unit, which is sufficient to allow the door to be unlocked once more. It is being claimed that in combination with the automatic door opener, even the entire door handle will become obsolete, which offers more options for the exterior design, whilst simultaneously improving the vehicle's aerodynamic resistance. Smart Access enables convenient vehicle access via a smartphone. The system centers on the virtual key, which is saved to a mobile end device.

Chery plans to produce Level 3 vehicles by the end of 2019

Chery is planning to mass produce vehicles featuring Level 3 autonomy by the end of 2019. Not only that even Level 4 autonomy cars will be launched by the company by 2021. Huang Yong, executive director of Chery's intelligent vehicle technology center is quoted in some media reports giving this information at a conference held in China.

The automaker will be launching its first intelligent model EXEED, by the end of 2018. The model has IQTEC system which is said to have face recognition along the other connected services like navigation, personalized service etc. The company is working with Baidu on connected vehicles and developing self-driving systems.

ACEA releases six key principles of automobile cybersecurity

The European Automobile Manufacturers' Association (ACEA), has published six key principles of automobile cybersecurity. ACEA in a press release has stated that Firstly, the number of data interfaces within a vehicle should be limited. Secondly, interfaces that are needed for connectivity purposes should be protected with very high cybersecurity measures. ACEA has also warned that if adequate cybersecurity mechanisms are not implemented and cybersecurity risks not dealt with appropriately, the interfaces of connected vehicles can present an opportunity for exploiting vulnerabilities.

ACEA has expressed confidence in the automobile industry and to ensure user safety, ACEA and its 15-member companies published the following set of six key principles: Cultivating a cybersecurity culture; adopting a cybersecurity life cycle for vehicle development; assessing security functions through testing phases; managing a security update policy; providing incident response and recovery; improving information sharing amongst industry actors.

OmniVision announces availability of ARDS

OmniVision Technologies, has announced the availability of an automotive reference design system (ARDS) that provides a plug-and-play platform for developing automotive imaging systems.

The modular approach allows automotive imaging-system and software developers to mix and match image sensors, image signal processors and long-distance serializer modules. With its compact form factor, OmniVision's ARDS is ideally suited for advanced driver-assistance systems (ADAS), rear video mirrors, camera monitor systems (CMS) and dash cameras.

CCC ONE Platform for OEMs introduced

CCC has introduced the CCC ONE Platform for OEMs. The hyperscale platform connects car manufacturers to CCC's network of insurance carriers, collision repairers, and third-party service providers. CCC ONE solutions empower OEMs to realize measurable value from driving data via CCC network partners.

CCC ONE for OEMs already processes data for millions of connected cars and has scored more than a billion trips. CCC has processed more than 180 million claims, including vehicle total loss valuations and vehicle repair estimates.

Continental's cooperative automation

Continental has developed a central input device-- the Smart Control input device-- that transparently and intuitively configures the change of role from driver to user of automated driving functions.

To ensure the safe division of tasks between driver and vehicle in the conditionally and highly automated driving phases (SAE level 3 and 4), the new input device from Continental performs several key tasks that are discussed below:

- As an element in the center console of the vehicle, it continuously informs vehicle occupants of the current driving mode using a kinematics function. During manual driving phases, it disappears into the center console so the driver can only use the touchpad on top, to control the infotainment, for example.
- As soon as the vehicle is on a section of road where automated driving can be engaged, the device comes out of the center console and the driver can activate automation. The device can be operated in a similar way to a joystick supported by variable haptic feedback.
- By additional color coding, Smart Control provides clarification on the current status of automation. Depending on the driving mode, the input device, together with other elements in the cockpit such as the fully digital instrument cluster, lights up in a specific color. This new development from Continental also significantly contributes to keeping the user's attention at an optimal level, even during automated driving.
- The driver can use the input device to switch between different information displays on the digital instrument cluster – from maximum surroundings visualization, which displays all road users in the immediate vicinity, to a drastically reduced view that shows only the sections of road ahead. This function goes a long way to help build up trust in automated driving, by providing the right amount of information transparently and at all times.

The company calls this "cooperative automation", according to Dr. Frank Rabe, head of the Instrumentation & Driver HMI business unit at Continental.

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IMS Software Development Kit (SDK) to build connected car and telematics services into existing or new mobile applications

Intelligent Mechatronic Systems Inc has introduced IMS Software Development Kit (SDK) for organizations looking to build connected car and telematics services, including data collection, directly into their existing or new mobile applications. The IMS SDK includes sample code; full technical documentation; comprehensive developer support; and APIs for easy connectivity into IMS' DriveSync platform-based solutions, services, and capabilities.

Octo releases Glimpse Plus telematics service for insurers

Octo Telematics, has released Glimpse Plus, which provides a way for insurers to gather accurate data on driving behavior, as well as more detailed crash detection and claims analysis. Glimpse Plus uses the smartphone to notify crash and instant FNOL.

Capabilities include:

Pairs with smartphone for driver identification and data transmission; improves reliability and accuracy of data collection and risk event detection over smartphone-as-a-device model; adds crash detection, instant FNOL, and crash reconstruction capabilities; drastically reduces battery usage over smartphone-as-a-device model; detects vehicle trips and events even when the smartphone is not present in the vehicle, among others.

IEEE and IEEE-SA form task force to develop standard for greater than 1GB/s automotive Ethernet

In order to meet the demand for higher speed Ethernet in the automotive environment, IEEE and the IEEE Standards Association (IEEE-SA), has announced the formation of a task force to develop IEEE P802.3ch—Standard for Ethernet Physical Layer Specifications and Management Parameters for Greater Than 1 Gb/s Automotive Ethernet.

The organization has invited OEMs, suppliers, semiconductor vendors and tool providers to participate in the upcoming 7th annual Ethernet & IP @ Automotive Technology Day (E&IP@ATD) to be held 31 October to 02 November 2017 at the San Jose McEnery Convention Center, San Jose, CA.

GENIVI Alliance working on Vehicle Domain Interaction Strategy

The GENIVI Alliance is working on a Vehicle Domain Interaction Strategy focused on developing open standard interfaces and code that will define the necessary paths bridging multiple car software domains.The new GENIVI Vehicle Domain Interaction Strategy is primarily based on a key market trend of system on a chip (SOC) consolidation that has created the need to bridge the auto software domains (e.g., safety, infotainment and consumer electronic). Cross-domain bridging is essential to ensure information or data generated in one domain is displayed and managed in another. The primary result of this strategy will be a set of standard solutions and interfaces (APIs) facilitating the necessary cross-domain interaction. Where possible, proofs of concept code will also be delivered in the open, keeping with the GENIVI process of producing code for all defined interfaces. Additionally, GENIVI programs will continue to balance current IVI and connected vehicle work with newly-launched activities to produce the technologies to effectively bridge the domains.

A mathematical formula proposed that can bring certainty to the open questions of liability in autonomous car accidents

Amnon Shashua, Mobileye CEO and Intel senior vice president has offered the autonomous driving industry a way to prove the safety of autonomous vehicles. His solution provides a formal, mathematical formula to ensure that a self-driving vehicle operates in a responsible manner and does not cause accidents for which it can be blamed.

Shashua presented his solution at the World Knowledge Forum in Seoul, South Korea, based on an academic paper he wrote together with professors Shai Shalev-Shwartz and Shaked Shammah. Their proposed Responsibility Sensitive Safety model provides specific and measurable parameters for the human concepts of responsibility and caution and defines a "Safe State," where the autonomous vehicle cannot be the cause of an accident, no matter what action is taken by other vehicles.

Startup Corner

Ceantra Technologies, which is currently under incubation at the Electropreneur Park in Delhi, has recently announced that it will launch the SmartCarX device within two to three months for commercial usage. The SmartCarX is based on a connected vehicle platform that enables monitoring of vehicle health, better road safety and data driven online driver marketplace.

*"The SmartCarX Device is completely designed, developed from scratch in India and it will be also manufactured in India. CEANTRA was selected by Ministry of Electronics, Govt of India (MEITY) and STPI (Software Technology Park of India) under the Electropreneur Park initiative of Govt of India to promote Design in India and Make in India."- **Rajeev Tiwari, Director & Founder of Ceantra Technologies***

In an exclusive interaction with Telematics Wire, Rajeev Tiwari, Director & Founder of Ceantra Technologies tells more about the venture, SmartCarX device, automotive telematics ecosystem in India and company's future plans. Below are the excerpts of the conversation.

Q What motivated you all to start Ceantra Technologies?

A Rajeev: CEANTRA Technologies Pvt Ltd is a Product Company focused on Designing and Making Innovative Internet of Things (IoT) products for Smart Car and Smart Transportation domain. The company is being incubated at Electropreneur Park, Delhi, an initiative of DEITY to promote ESDM sector in India.

The members of founding team used to work in senior position in the industry when this idea of working on an Innovative Connected Car IoT Platform was born. If you see generally Car of today they have 60-70% of the BOM cost due to Electronics; cars have an Intelligent Engine Control Unit inside(ECU) but at the Consumer/Driver level we are still not able to make use of the Inherent Smartness of the Car. So, we started working on a Smart Connected IoT Vehicle Product Platform called "SmartCarX" which is based on a connected vehicle platform that enables monitoring of vehicle health, better road safety and data driven online driver marketplace.

The founding team comprises of experienced people from industry having diverse background which is an essence for developing any end to end IoT Product Platform. The founding team comprises of Rajeev Tiwari (BTech from NIT Jamshedpur, MBA from XLRI Jamshedpur) having 15+ Experience in Embedded and Semiconductor Industry, Anurag (MTech-Embedded Systems, 15+ year of EDA experience), Abhishek Gupta (a Hard core Techie and Auto Freak and Head Product Development), Kumaar Sanjjiv (Head Cloud and Mobility- ex TCSer having 17+ years of experience), Sandeep Vadnere (Sales and BD Head- ex Infoscian having 15+ years of experience), Kshitiz Bishnoi (Hardware Design Head), Manusmriti Mishra (HR and People Development).

The team at Ceantra Technologies

Q How has been the journey since you founded Ceantra, in terms of resources, market response and business challenges?

A Rajeev: The journey has been quite exciting ever since we started working on this SmartCarX product at CEANTRA around one year back. Good part is that the Founding Team is quite diversified covering the entire gamut of IoT including Hardware, Sensors, Controllers, Server, Analytics expertise, Sales and Marketing; and it has given us a strong capability to develop the things in end to end. Meanwhile, the SmartCarX device has been tested and has undergone field trials so far. It has also received user inputs in terms of excessive power being generated or signals being lost as this device has a GPS -GPRS and a micro controller fitted in it, similar to that in a mobile. This has been fixed in newer hardware iterations of the device. We have taken a 3D printing of the product and will now be getting on board a de signer to give the aesthetic touch and better curvature to the outer casing of the SmartCarX device.

Currently the team size is around 10 including 7 members of Founding Team.

In the B2B Segment, Ceantra's targeted customers will be car fleet management firms, car rental companies and the insurance sector. We are currently in talks with prospective customers for marketing their product –these include commercial vehicle OEMs as well as fleet operators and logistics players, where it can be used

SmartCarX device

as a tracking device, especially for fleet management.

The insurance industry is opening up fast to user-based insurance in India, as the Insurance Regulatory and Development Authority of India has floated an expression of interest and is asking stakeholders to give their inputs on user-based insurance. Currently, the vehicle insurance premium remains the same irrespective of how many distance the vehicle has been driven, SmartCarX data-based analytics will be integral for differentiating premiums for car insurance as is prevalent in the US.

The Automotive Industry globally is currently undergoing a rapid change and we strongly believe to succeed in this segment, a startup will always have to keep refining its product and make it relevant as per current needs, and with SmartCarX strategy of owning and developing the complete hardware and software from scratch; completely owning the IP; any customization and adaption to latest trends can be quickly incorporated.

Q Tell us about SmartCarX device. What are its unique features and how it is different from existing products (if any) in market?

A Rajeev: The SmartCarX is based on a connected vehicle platform that enables monitoring of vehicle health, better road safety and data driven online driver marketplace.

Based on the real-time Internet of Things data analytics, it is integrated with hardware software and developed by the Ceantra to facilitate preventive car maintenance and online analysis of car driver driving behavior. In addition, the device will capture engine-related performance parameters from any vehicle that is Euro IV compliant, initially.

The SmartCarX Device is completely designed, developed from scratch in India and it will be also manufactured in India. CEANTRA was selected by Ministry of Electronics, Govt of India (MEITY) and STPI (Software Technology Park of India) under the Electropreneur Park initiative of Govt of India to promote Design in India and Make in India.

To make it operational, the SmartCarX device is plugged into the car's OBD port, the SmartCarX app is installed on the mobile and it starts locating the vehicle's mileage, location and health insights once the vehicle is driven.

SmartCarX Hardware has a powerful Microcontrollers, GPS, GPRS, and a host of advanced sensors. The various sensors and peripherals that attach it to the vehicle, transmit the data real time to the central server.

At the server-end, the team of founders is building a strong business data analytics as well as process data in the form of notifications that are consumed by an app or an online portal.

SmartCarX differentiating factor is that we are not just building an Intelligent IoT Hardware Device but also the Complete IoT Platform around the Hardware with Analytics, AI and Intelligence embedded into it. This will lead to development of a SmartCarX Connected CarOS and we are soon allowing the possibility of an open API that will enable developers to build on top of this open API via our Connected CarOS Platform. This API Called "SXOpAPI" – or, "SmartCarX Open API for Connected Cars" – the API offers the ability for partners and Third-Party Developers to access vehicle and car diagnostics, as well as trip data, trip activity, and driving data, for use in their own applications.

These apps and ecosystem can be then be focused on numerous use cases, ranging from tracking and improving fuel usage or social road or trip -sharing applications, Or they can be aimed at business ventures, including those involved with logistic and fleet management, those who need to pull data from the vehicle into their own billing or expense platforms, or even those designed for ride-sharing services, or creating a network of Car Service Centres or Vehicle Toeing Stations or breakdown assistance network providers. The end use cases are numerous and can be added as and when the need and scenario demand the changes.

Q What are your observations about the automotive telematics ecosystem in India?

A Rajeev: If you see Telematics market in India, it is quite fragmented and in nascent stage. The technology adoption has been slow, but with the advent of IoT, digitization, and current change in people behavior coupled with increased limelight of connected devices, focus on driverless cars globally and increased pervasiveness of electronics gadget, we see a strong demand going forward for such SmartCarX device both at B2B and B2C level.

Also, there has been newer set of Technologies emerging globally like V2V (Vehicle 2 Vehicle); and V2I (Vehicle 2 Infrastructure), Increased Emphasis on Car and Passenger Security, Proliferation of Electric Vehicles; Driverless and Autonomous Driving. All these technologies are further going to lead towards convergence and adoption of digital and IoT technology and enable use of smart devices in vehicles.

Q What would you suggest an entrepreneur considering the telematics market in India?

A Rajeev: Look for relevant problem set and try to come up with an end to end service and delivery offerings. For Hardware start-ups, it is important to focus on Product Core features, Hardware Platform and Stability first. Also, the Hardware platform should also be modular and easily customizable so as to incorporate newer sets of sensors, and technologies which are coming in a fast changing automotive landscape. The shelf life of a product is decreasing and constant refinement in Product features (Hardware and Software) is a must to remain competitive.

Q Where do you see Ceantra in coming 3 to 5 years?

A Rajeev: In 3 to 5 Years, we see Ceantra Technologies addressing pain points in Global Telematics and Automotive landscape by building innovation Product and Solution centred around Telematics, Driverless and Car and Passenger Security. SmartCarX Ver1.0 is just the starting point, in this process we have mastered the Hardware Design and Hardware Development, Firmware Development, Analytics and complete end to IoT Product and Platform development sub pieces.

We are in parallel focusing in integration of Artificial Intelligence, Machine Language and incorporating newer set of LTE/4G and Wifi Based solution over a GHz based CPU so as to develop an In Car Wifi and AI based solution in order to incorporate enhanced use cases for Autonomous driving in SmartCarX Ver 2.0. Overall, we are in an exciting time going forward. ▪▪■

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