Automotive DETROIT 16

NOVI, MI// JUNE 8-9

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CONFERENCE REPORT

Highlights and insights to share with your colleagues, clients and partners

Conference wrap up:

- **A concise overview of the conference buzz at a glance**
- **10 key takeaways: your review of the main industry themes and topics addressed**

Louis Bedigian

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Author

Louis Bedigian

Contents

1.

Overview

This year's TU-Automotive Detroit proved to be the most diverse one yet. Dozens of auto industry leaders – including technologists, cybersecurity experts and IoT specialists – came together to share, discuss and debate the future of automobiles.

While autonomy and ride-sharing remained hot topics, a new theme emerged around the necessity to advance the in-car experience through connectivity. Consumers are not overly concerned about smart city features or the ways in which vehicle-to-vehicle communications could improve driver safety. The main thing consumers want to know is that their smart devices will work easily and seamlessly the moment they enter the car.

In fact, when looking at new automobiles, consumers are starting to place a greater emphasis on device connectivity. Several presenters shared stories in which smartphones played a more significant role in the car buying experience than any other feature.

Connectivity – in this case, productivity and entertainment – has already improved the in-car experience but it won't be the thing that pushes the auto industry to new heights. To usher in the next level of mobility, automakers have begun to take a closer look at ride-sharing. This was evident throughout both days of the show but automakers and their partners are somewhat divided on how it will impact car ownership. At the very least autonomous vehicles are expected to help attract consumers to ride-sharing services.

Security continues to play a huge role in the future of mobility. This was especially apparent when members of the Auto Information Sharing Analysis Center spoke about the proactive attitude towards cybersecurity. But they aren't the only ones working to improve car security. Wireless carriers may prove to

be an unexpected ally if over the air updates become the norm for connected vehicles.

Automakers may have once feared disruption from Silicon Valley but many are embracing start-ups by exploring how they can help the auto industry excel. Many agree that automakers need to become more like Silicon Valley (more technology-focused, more willing to evolve) in order to compete against the current and potential new entrants, such as Apple.

Data collection is another area that automakers are still trying to grasp. Some don't believe the industry is doing enough, especially when compared to the petabytes of data collected by major tech companies.

Telematics could prove to be a significant and transformative part of both insurance and customer retention. Insurance telematics currently represent a small part of the overall industry but that is expected to change in the years to come.

What role will regulators play in the future of autonomous driving? There aren't any definitive answers just yet but Dr. Mark Rosekind, administrator for the National Highway Traffic Safety Administration, provided some key clues during to the conference.

What follows are the key takeaways from this event.

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DETROIT 16 / **TELEMATICS**
AUTONOMY
NOVI, MI// JUNE 8–9 / **MOBILITY**

2.

Key Takeaways

TU-Automotive Detroit 2016 began with a video message from Gary Peters, a United States senator from Michigan that helped form the bipartisan Smart Transportation Caucus to solve a host of mobility issues. Peters started his message by highlighting traffic fatalities – more than 30,000 annually in the United States alone. He said that research shows that connected vehicle technology could reduce that number by as much as 80% but he did not specify where the research came from or provide any additional details.

Looking to the future, Peters expects new technologies to bring employment opportunities to underserved communities. He, like many in the auto space, also expects technology to help reduce traffic congestion.

"There's no question that we have to work together to bring these technologies to market safely and quickly," said Peters. "As you know, Michigan continues to lead the way in transformative research and development and testing of these new possibilities. The University of Michigan's Mcity provides real-world scenarios for testing V2X technology and eventually self-driving technology. And I'm very excited about the plan to transform the former Willow Run powertrain facility into the American Center for Mobility."

Willow Run is less than 30 miles from the Suburban Collection Showplace in Novi, Michigan, where TU-Automotive Detroit 2016 was held. The facility is expected to bring together OEMs, partners, regulators and others to bolster the industry's R&D and testing efforts. Peters said that the federal government will play a "critical role" in this partnership.

The future of mobility

Can the world live without personally owned vehicles? Not everyone came to a conclusion at this year's conference but Kaye Ceille, president of Zipcar, explained that it is already possible to bypass ownership. She opened TU-Automotive Detroit 2016 with a keynote speech about the benefits that car-sharing can bring to consumers and the environment.

Said Ceille: "At Zipcar or any other share company, we know that each shared vehicle we put on the road takes up to 13 personally owned vehicles off the road. We're really, really good for cities." Her statements echo the company's initial goal to clear the road of personally owned vehicles and reduce road congestion. Zipcar, the largest car-sharing service in the world, has also found that each of its nearly 1 million members reduces their carbon footprint by almost 1-tonne. That's good for society on the whole but what about consumers?

"Consumers save hundreds of dollars each month versus owning a car by joining our network," she said. "And our members alone report to us that they save close to $6,000 on an annual basis when they decide to ditch their car and join a car share network or a Zipcar."

With fewer cars on the road, Ceille pondered a future where additional residential units or retail space could take the place of existing parking lots. "Or, quite honestly, can we take those parking lots and municipal spaces and turn them into greener space – turn it into parks?" she questioned. "That's the future that we see going forward."

It's not just about parks and a better, more efficient use of city space. Ceille is also keeping a close eye on how autonomous vehicles will transform Zipcar. "Tomorrow the car will come to you and take you exactly where you want to go. I love where we sit today and where this industry is going," she said.

Zipcar is a participant in the University of Michigan Mobility Transformation Center, which is dedicated to the advancement of self-driving technology. Ceille said that her firm continues

to work with government and municipal partners, as well as public policymakers, to ensure they have the right things in place. The company has also formed an R&D division called ZipLabs.

"[It's] where our best and brightest get together, work with other people in the industry to understand how we can bring this technology to life for our members," said Ceille. In the meantime, Zipcar wants to make it easier for consumers to sign up for its service. The company announced a new membership process that eliminates the waiting period when booking a vehicle.

Zipcar is also expanding its one-way service (where consumers can pick up and drop off a vehicle at two different points) to Washington and Baltimore after a year of testing in Boston. These efforts could help Zipcar grow the car-sharing market nearly ten-fold from an estimated 2.4M users today to 23.4M by 2024.

Fewer cars? Not so fast

Ceille may be excited about reducing the number of cars on the road but her dream is easier said than done. In fact, some believe that ride-sharing could actually increase sales.

"I'm here to tell you that traditional car ownership, plus ride-sharing, plus ride-hailing is going to [lead to] increased sales," said Roger C. Lanctot, associate director of Strategy Analytics' global automotive practice. "It's about utilisation of capacity – getting more usage out of the car. So the average Uber driver is driving 50, 60, 70,000 miles a year. You're getting almost a lifetime use out of a single year. That means more service opportunities. There's new ownership models – that means new credit and financing models, new service and maintenance models, new insurance."

Grant Bodley, general manager of global manufacturing at Hortonworks, thinks that ride-sharing and e-hailing will drive demand for low-cost autonomous vehicles that can platoon and provide mobility at a dramatically lower cost. Said Bodley: "It's not just going to be the upper end of the market in luxury. It's also going to be convenience for the average person to get from A to B and also be connected with their life as they go through that journey."

Bret Scott, head of Silicon Valley future technologies at Fiat Chrysler Automobiles, noted that autonomous cars will also help those who are no longer able to drive. This represents

another key market. "Let's say your parents [want] to go to the grocery store, and as baby boomers have had independence for their entire lives," said Scott. "[They] can maintain their independence with autonomy. They can go grocery shopping without having to drive their own car. The habits associated with driving are about to change in some fashion. We don't all know how they'll change [but] autonomy is a piece of that."

Widespread disruption

Many speakers shared their views on the various ways the auto industry may be disrupted, but INRIX came up with a list of four specific trends that it believes are most significant.

- Autonomous
- Connected
- Electric
- Shared Vehicles

"Connected vehicles are obviously super important – getting and mining data and creating interesting results based on that," said Bryan Mistele, founder and CEO of INRIX. "Electric vehicles, I think people are very familiar with. The work that obviously Tesla, BMW, Chevy and a variety of others have done in the electric car space and electrification of the combustion engine."

Mistele was most intrigued by the fact that all of these trends are happening at once. He said that up until now the industry remained the same for roughly 100 years. "Now as I think we all know, everything is changing," Mistele added. "But the more interesting question to me is, why is it all happening at the same time?"

Mistele also discussed how technology will inevitably change the consumer's mobility experience. "If you think about what autonomous vehicles are, it's really about safety and about improving the safety and the experience because people are stuck in congestion and they want to sit there and read emails as opposed to drive their car," he said. "If you think about electric vehicles, it's about reducing pollution, which is obviously a huge issue – not just here in the United States, but if you spend time in Moscow or Beijing, you know that this is a real problem that cities are struggling with."

Mistele said that shared vehicles have the potential to address the issues of cost and convenience. "It's exciting to me that the technology now exists for these things to happen," he added. "But at the same time, private companies are stepping in and recognizing that we can have a big impact on solving some of

these problems that governments have been unable to solve."

Smartphones lead the way

Matt Jones, director of future technology at Jaguar Land Rover, is very concerned about consumers and their needs. Instead of simply pushing technology into vehicles, Jones said the company is dedicated to solving consumers' problems.

"We're actually identifying the problems that future customers didn't know they had," said Jones. "When we started to move toward that, we very quickly discovered that customer expectations really aren't based on our Jaguar Land Rover competition – they're based on the smartphone. They're based on the tablet. They're based on the home entertainment experience, which kind of makes complete sense."

Consumers expect to be able to download an app, get into the car and discover a seamless integration between the device and the automobile. Jones expressed disappointment that he is not yet able to experience that with every app. "But that's my expectation," he added. "And ultimately we really believe that the only way we will get there is for the whole of the automotive industry to accept this and push all of our suppliers, all of our internal teams, the Apples, the Googles and the other big players in the world to say, 'This is the undisputable customer expectation.'"

Jones kicked off the second day of TU-Automotive Detroit 2016 by telling a story about consumer perception. He said that consumers in India expect to see the same technology in a $3,000 Tata Nano as they would a $200,000 Range Rover. "How can we ultimately achieve this in cars of the future?" Jones questioned. "It doesn't matter of it's a Jaguar Land Rover, a Ford or GM, it doesn't matter what that car is. That customer expectation is exactly the same. "

This is owing to the mobile computing experience delivered by smartphones but it poses new challenges for automakers. He said the industry should try to better understand how fast technology evolves. He noted that the iPhone came out nine years ago in 2007 and pointed out where the industry is today: surrounded by technology and a craving for in-car features and apps. The evolution is bound to continue, which is why he thinks it's important for automakers to be very flexible in their future plans.

Said Jones: "We don't have one product roadmap for 2025 – we have this whole range of different things that we could offer.

As we get closer, we pare that down. We're not afraid to kill projects. I know other big OEMs still have one vision 10 years out. How can we improve that? How can we change the mind-sets of some of these organisations to accept that we're going to be disrupted?"

Part of that disruption comes from the consumer environment. "If I lived in San Francisco today, I'm not sure that I would own a car," Jones added. "It would not be useful. We talk to a lot of our customers now in Shanghai, Tokyo, Seoul, Mumbai and other places. They're not particularly worried that in the future their children don't want to own cars. They see transportation as a way from getting from A to B. Ideally, in those vehicles, they want to be using their devices."

Seamless life

John Schnoes, programme director of vehicle information technology and autonomous drive at Nissan, is also trying to focus on what consumers want as the industry evolves. He said: "Customers are asking for safety. They're asking for a truly stress-free environment. They're asking for free time. But, at the same time, we know the people who are driving Nissans still really love to enjoy driving pleasure. How do we create a system, that is inside of the vehicle, seamlessly go from autonomous to a manual driving mode that our customers are really wanting to enjoy?"

Once again, it all comes down to smart device connectivity. "They want their seamless life," Schnoes added. "It doesn't matter if we're here in North America if we're in China or if we're in Japan or India, that seamless life is where people want to be."

This as much a product of consumer preference as it is consumer trends. Traditional PC use has dropped tremendously as more and more individuals adopt mobile technology. Said Schnoes: "Everything is starting to transition to your phone or iPad. People are really looking to have that sort seamless experience when they've been working on their phone and then they walk into their car and they expect the platform to know what they've been doing."

Kal Mos, vice-president of Mercedes-Benz R&D North America, wants more personalisation from his in-car experience. "My user interface should be different from yours, it should be different from everybody else, even if we all use the same car," said Mos. "That's a very important goal."

Hortonworks' Grant Bodley thinks the demand for connectivity will increase with the demand for ride-sharing. He believes that

connectivity will also play a role in the shift to autonomous. "I see the whole interplay with connected services becoming very, very dominant," said Bodley. "Where it's very convenient, where the car actually becomes part of the network of different modes of transportation. Where each individual has a way of bringing their digital experience with them."

While there has been a lot of talk about the cost of autonomous vehicles, Bodley speculated that mobility could be offered for free in exchange for consumer data. "Incentives for things like that which would make their lives easier, and ultimately connect their digital life through maybe a connected services network, which I think will have a profound effect on the design of the vehicle," Bodley added.

Cognitive load

Tom Gebhardt, president of Panasonic Automotive Systems Company of America, pointed to the inherent risks involved in bringing too much technology into the car.

Said Gebhardt: "In addition to keeping drivers' eyes on the road, we also need to consider the cognitive load new vehicle features, systems and consumer applications bring to drivers as well as the impact they have on concentration. Cognitive overload impairs our ability to anticipate and respond to our environment. It's a big consideration when it comes to increasingly complex infotainment and cockpit systems."

Automakers continue to stuff the centre console with smartphone information, as well as info specific to each car model. Gebhardt is concerned that if critical info becomes available through too many sources, consumers will become frustrated. More importantly, he worries that drivers could be less safe if their attention is diverted from the road.

"The experience that's been missing is a way for consumers – through one single, intelligent feed – to easily assemble their own personal FM-like radio station that lets them discover the greatest variety of content and information that is most relevant to them and what they are doing at any given moment," said Gebhardt. "The hardest thing to do is create easy-to-use products but that's what we're doing."

Gebhardt is referring to Panasonic's OneConnect platform, which provides a "holistic service-focused approach" that merges information so that drivers are served "everything they want, when they want it, without searching."

An important role

Consumers may be distracted by the more entertaining and productive side of connectivity but Strategy Analytics' Lanctot thinks that connectivity is more important for delivering software updates to the car.

Said Lanctot: "*We are steadily moving toward a complete software update capability in the car, and that has all kinds of implications for vehicle architecture. It goes against a lot of deeply held beliefs in the industry about how we should build things and do things. It's going to disrupt all that because we must simply must have software updating capability.*"

Without in-car updates, Lanctot said that tomorrow's vehicles won't be secure. "In fact, at a very basic level, one of the things that Tesla does that's so clever is, because they're constantly updating the software in the car, a hacker's dealing with a moving target," Lanctot added. "The software's not frozen, it's not just sitting out there in the parking lot – it's always changing."

Automakers aren't the only ones that will benefit from the proliferation of connected vehicles. Lanctot said that this would also be good news for carriers (which will provide many of the connectivity service options), especially now that smartphone sales are peaking.

The battle for eyeballs and fingers

Displays are everywhere, including the car. This creates an opportunity for innovation, but it also presents new challenges as designers strive to produce a better in-car experience.

"It's a real challenge moving forward because there's still a large portion of the buying public that cannot afford a 12-inch screen, but have a thirst and a current use [for] lots of information," said FCA's Scott. "All of the car companies are exploring ways to bring this relevant information into the vehicle in a way that can be afforded by the broader population." Luxury cars are a no-brainer for large displays but Scott said that automakers "have to figure out other ways to bring that context-relevant information to people that can't afford the $40,000 car."

"The information will be in the car even if the displays are not," Scott added. "Displays, voice technology, content-sensitive displays – the display might be small but have the right information at the right time. All of these things are going to become really important as we look to the next five years. We have solutions for luxury brands, non-luxury brands, the average buyer, etc."

Andrew Poliak, vice-president of product planning and business development at Panasonic, expects technology to disappear as it's merged inside the vehicle. Said Poliak: "You're not going see it, it's going to be invisible. You'll start to see information be contextually relevant and portrayed to the driver of the passengers that are necessary for them to engage."

For now drivers are overwhelmed with a deluge of information. "There's so much content that you could have access to at any given time," said Poliak. "From multiple displays within the vehicle to heads-up displays to sound and audible warnings. I think a lot of it will start to blend and it will become a little bit natural and it will be relevant to what's going on right now."

Giles Shrimpton, CEO of NNG, a global provider of navigation software and infotainment solutions, believes that the display influx is causing automobiles to become "exponentially more complex".

"At the end of the day, we have got to keep this simple," said Shrimpton. "This idea that less is more. What I would like to see is that we, as an industry, managed to create a fantastic user interface. [An interface that] my three sons can get into the car and be really proud and your children can be really proud of what they're experiencing and what they're doing."

Jaguar Land Rover has learned through experience that not everything can be crammed into a touch screen environment. "We've had the digital cluster in [the Jaguar XJ] since probably 2011 or so," said Tim Philippo, product strategy and cross car line manager at Jaguar Land Rover. "The mission-critical stuff goes in the heads-up display. The stuff that you need to use occasionally goes in the instrument cluster. Stuff that maybe the passenger would interact with or the stuff you only need to use occasionally go in the centre stack."

Early on Jaguar decided to put everything in its touch screen and discovered that consumers prefer physical buttons in some circumstances. "We've been slowly pulling some things back out," said Philippo, noting that heating and ventilation controls are back to normal. "You probably just want to reach out and just turn that dial. That probably seems regressive to people, but that's the easiest way to interact with that control. Finding the right balance of what goes where, I think, is what we're all trying to figure out."

A dramatic shift

Are young consumers more excited by smartphones than cars? Anecdotal evidence shared at TU-Automotive Detroit

2016 suggests that may be the case. The most significant indicator came from Sam Schwartz, CEO of Gridlock Sam and a former traffic commissioner of New York City, who presented the results of research and focus groups he conducted. Most notably, he said that between 2003/2004 and 2013/2014, VMT (vehicle miles travelled) declined for the first time in history.

This wasn't a minor shift either – Schwartz found that millennials drove 20% to 25% fewer miles. "That was extraordinary," said Schwartz. He blamed the transition on the so-called "hassle" of driving. Many 16-year-olds got older without a license, went to college and learned that they could live without an automobile.

"Suddenly there were fewer people buying cars, fewer people getting driver's licenses," Schwartz explained. "And I'm not saying the majority of millennials don't drive – the majority do drive. But a 20% shift…is dramatic." VMT has gone up since 2014 but it is still lower per capita. Schwartz said that this is something for the auto industry to think about in the years to come.

Safety and security

Security is one of the most critical parts of motor vehicle development. If a car is vulnerable, the results could be catastrophic.

The Auto ISAC (Information Sharing Analysis Center) was formed in July 2015 to bring automakers together and prevent the worst from happening. It is still relatively new (it was not fully active until January 2016) but vice-chair Jeffrey Massimilla took a moment to detail how the Auto ISAC would respond to an issue.

"If we received any information through our coordinated disclosure programme or somebody reached out to us in any other way, [we] would take in that information and immediately begin processing it," said Massimilla, who also serves as General Motors' chief product cybersecurity officer. "We would set up some sort of instant response activity."

If there proves to be validity in that information, Massimilla said that he would immediately start to share what GM had learned with the ISAC. "We wouldn't actually try to share it and assess it in its entirety," he explained. "We would share that we have some information in our environment and this is what what's happening."

Representatives from Ford, Honda, Toyota, Nissan, Kia, BMW, Mazda, FCA, Hyundai, Mercedes-Benz and Volkswagen are among those who sit on the ISAC board. How would Massimilla help them in the event of a security breach or some other

problem? "They can start to disseminate what we're sharing," said Massimilla. "As we go through our instant response activity and understand what we're going to do about it, we would continue to update the Auto ISAC vulnerability information so other automakers were on top of what we learned. That's organisationally how the ISAC should work."

In the end, Massimilla believes that the Auto ISAC offers a solution to an industry problem. He encourages other automakers to join. Said Massimilla: "I would argue that probably a number of companies don't have threat intelligence gathering information similar to what the ISAC provides. You get that just by joining the ISAC. [If] you start facing something in your environment, you don't stop and go, 'Wait a minute, I'm going to pick up the phone and dial 30 different people, call them and say, 'Hey, I'm facing this, just in case you're facing it too.' This is the way that we do this once."

Henry Bzeih, managing director of Kia Connected & Mobility, added that the auto industry "cannot afford" to skip the Auto ISAC. "I don't think you need a business case, to be honest with you," said Bzeih. "It takes leadership and… and it takes vision and looking forward and being part of the solution."

New safety metrics

Dr. Mark Rosekind, administrator for the National Highway Traffic Safety Administration, is eager to know what the new safety metrics will be for testing automobiles.

"We can't just take lives lost, injuries prevented and crashes and count those the same way, miles driven, as the cut-off for saying, 'Okay, not okay,'" said Rosekind. "We need new safety metrics and I think those are being developed as we speak."

Rosekind provided an interesting example from a recent trip to Mountain View, California. During the trip he said a bunch of the NHTSA folks were driving when the door of another car (parked on the side of the road) suddenly opened. "The vehicle stopped hard – crash avoided!" said Rosekind. "But of course, it got labelled as, 'Hard braking.' What's interesting is, if that were reported to the California DMV, that would have been used against them as, 'Whoops, hard braking,' as opposed to, 'Crash avoided.' We need new safety metrics. That part, I think, is going to be absolutely critical."

How wireless carriers can help

Many people expect automakers, suppliers and cybersecurity companies to take care of security. Strategy Analytics' Lanctot

thinks that wireless carriers can also lend a helping hand.

"There are very few car companies that are seriously exploring using the cellular connection for vehicle-to-vehicle communications starting out using the cloud, which is something they should be doing to set the stage for direct vehicle to vehicle communications," said Lanctot. "BMW is enabling infrastructure to vehicle communications via cellular for map updating and applications of this nature. But not enough work is being done in this area."

Lanctot added that carriers are partially to blame because it is in their interest to foster and promote the use of cellular for something other than infotainment but they aren't doing that. "In the meantime, safety is the primary concern," said Lanctot. "Carriers should dial into that, along with car companies."

Automotive's biggest disruptor

During a panel with inductees of the 2016 TU-Automotive Hall of Fame, moderator and TU-Automotive managing director Gareth Ragg asked: "In the next five years, who do you see being the biggest disrupter in the auto space?" The response was split down the middle between Apple and Google.

"If you look at Apple's development environment and what it has created, they have created mechanisms so that they can allow their developers to very quickly develop new technologies," said Charles Link, founder and CTO of M2MD Technologies. "Not to mention that they have billions of dollars in the bank ready to go."

Ragg followed his question by asking the hall of famers if they think that Silicon Valley will leave Detroit behind. "To run a search engine or a company that makes handsets is completely different than creating an object that the misuse – or the decay of it – can kill you," said Scott McCormick, president of the Connected Vehicle Trade Association. He believes that while Silicon Valley is indeed the innovator, it is not the leader.

Kevin Link, founder and chief creative officer of Convey, LLC, highly recommended a visit to Silicon Valley. He said: "You need to put that on your list. The Valley is full of events. You'll come back completely invigorated and you'll ask yourself, 'Who is leading these innovations? Is it Detroit or the Valley?' It's going to take both but if you want to see creativity and innovation far faster than you can see it in this city, go spend a week."

During a panel on how new mobility is reinventing the org

chart, Ford's Mike Tinskey said that many auto companies have already established research facilities or labs in Silicon Valley. "We use it as a scouting lab as well as a lab to try new things out," said Tinskey, who serves as Ford's global director of vehicle electrification and infrastructure. "That's been a really neat experience because the number of companies we're interfacing with has gone up exponentially."

Attractive new talent

Technological limitations are often cited as the auto industry's biggest challenges but automakers are also dealing with a shortage of new talent. Instead of going from college to Detroit, many grads think the best jobs are with the biggest tech companies.

Tinskey has experienced this first hand while recruiting at his alma mater, Georgia Tech. He said it is challenging to go up against established tech giants. "You can see that at the career fairs – the line for Facebook is wrapped around," said Tinskey. "We have to change the way we show what we're working on. When you get in front of students and you start talking about the things that you're doing and the type of disruption that's going on in this industry, it's almost immediate that they're like, 'Wow!' They had no idea, they'd love to come join."

It's not easy to get the word out. While automakers are quickly transforming into tech companies, Tinskey said that tech companies have been promoting their brands – both as great places to work and as places for innovation – for years. "They have a whole culture established," said Tinskey. "The students migrate there without thinking. [Getting] that core talent will take a cross-industry effort of education awareness [and] telling students what they can work on as we go through this change."

Dan Ratliff, an associate at Fontinalis Partners, said that students value the careers and start-up potential they get out of Silicon Valley. He said: "You're always continuously seeing people spinning out and starting their own start-ups. If you start seeing that happen from some of the OEMs, I think they'll become sexy. I think as they become more technology and software companies, you'll start to see that. And then I think that'll help spur that movement and the sense that it's got a little more of an entrepreneurial feel."

The importance of data

Chris Heiser, CEO of Renovo Motors, focused heavily on data and how it could help automakers advance in ways the industry never imagined. He said the majority of cars sold in

2015 were connected, and of those that were, some require a trip to the dealership to reveal what little data was collected.

"The most important rule for data in platforms is that you have to log everything," said Heiser, emphasising that the second rule is also that you "have to log everything." By logging everything, automakers can learn about the system, improve it, build faster and gain a better understanding.

However, the auto industry seems to be falling behind when compared to Facebook and other giant tech companies. Heiser explained how the social network gathers 2 petabytes of data every day from more than 1Bn daily active users. He said: "When you normalise it down to the user, it's a few megabytes of data stored every single day. This is why Facebook and Google and all the companies are building data centres that store exabytes of data. To put that into perspective, 5 exabytes of data would store every single word I've said, and the rest of humanity has said, ever. It's a massive amount of data and these systems are storing maybe as much as that in every year to two years. It's pretty staggering."

By comparison, Heiser said that automakers typically log no more than "tens of kilobytes" of data per day. This gives the tech companies an advantage, many of which have acquired start-ups to increase the amount of data they collect. Tesla, which Heiser described as being at the "leading edge" of data collection, is the sole exception. "They store gigabytes of data a month, can log almost everything in the car, it can get access to that in real-time," he said. "That can be really useful for them. When things go wrong, it allows them to understand why they went wrong really quickly. That's good for the engineers." Data could also help Tesla find answers if an accident did not occur the way a customer claimed. Having that data is "incredibly powerful," Heiser said.

Aside from Tesla and Google, Heiser also highlighted the data collected by Apple (which learns something new every time a user accesses its Maps app) and Uber. "Uber has got a lot of knowledge about what ride sharing and shared vehicles really looks like today," Heiser added.

A collective responsibility

Don Butler, executive director of connected vehicle and services at Ford, was among those who acknowledged the importance of data and analytics. When asked how Ford handles data, Butler replied that it was a "collective responsibility".

"From a Ford perspective, that vehicle data, it's the customer's data," said Butler. "We view ourselves as stewards of data on

behalf of our customers. We will not collect any data without the consent of our customers. And if we use that data in a personally identifiable way, we make sure we have their consent for that usage."

Butler also had some ideas for how that data could be used. He said: "There's also opportunities in terms of what we can do on an aggregated basis. There are opportunities that we can take advantage of with our vehicles as sensors and the data that's available there as well. The landscape is quite broad in terms of what some of the opportunities are."

Ford isn't eager to rush into new markets, however. The company wants to understand which areas make sense before trying something new. "What assets do we bring to the table that uniquely position us, and then how are we going to win in this space?" Butler added. "We're taking what we hope is a more strategic approach to it and trying to understand, instead of just diving in and doing things because others are doing them."

Speaking of others, the auto industry has received a lot of attention after Google and Tesla entered the scene. Faraday Future is among the start-ups that plan to produce high-end electric vehicles. Others are dedicated to autonomy, while the plans of some tech giants – Apple in particular – remain a mystery.

"There is room for tons of players," said Butler, adding that the Silicon Valley entrants may have a competitive advantage in some segments. "But if I look more broadly at moving people from place to place, Google will not have a 100% share. They've already said they are not an automaker. They could be in a luxury niche. But Ford competes in all segments."

As for connectivity, Butler said that Ford will fight for dominance. That hasn't stopped the automaker from adding Apple CarPlay and Android Auto to the mix. Regardless, he feels that Ford provides a special user experience that remains a valuable asset to consumers. "We are not going to cede that to Apple or Google," he said.

Scalability

Jim Levendusky, vice-president of telematics at Verisk Insurance Solutions, said that if automakers are going to collect data, they must consider how that collection will be scaled in the years to come.

Said Levendusky: "If you're an OEM and you're collecting data and you want to make it available for the benefit of your customers throughout the insurance industry, you've got to deal with 300 different entities in the United States alone. And just the logistics of dealing with legal, regulatory infrastructure, data security – these are huge. For OEMs to work directly with insurance companies, essentially they have to invent the wheel each and every time they engage with a new insurer. So scalability is truly, truly a problem."

OEMs and other industry players must also decide how much data to collect and use. "And when you think about what the sensors are capable of collecting, the numbers get huge very, very quickly," Levendusky added. "At this point insurers have some idea of the data they like to use, but they're also in the position where they're exploring. They're trying to find out which variables – some of them they've identified, others they haven't. This poses a challenge as well. The idea that each and every collector of data is going to work individually to help solve these problems, I think, is impractical."

Where telematics and dealers collide

David Miller, chief security officer of Covisint, thinks that automakers will miss out if they continue to neglect the consumer once a vehicle is sold.

"The old model for selling vehicles was a 'sell it and forget it' model," said Miller. "I sell to you and, as far as I'm concerned, you are now dead to me until you want to come buy another car. That's not the way it works anymore. Now I sell to you and would love to be able to get telematics information about how that car is behaving in different situation so that I can reduce warranty costs, so I can do other things related to give you a better experience with that vehicle."

Miller said that dealers want to be connected to consumers' vehicles as well. "When the check engine light comes on, they would have the ability to say, 'I can diagnose that,'" he added. "Maybe [the dealer] could send you an email saying, 'Hey, your check engine soon light came on, it actually isn't a big deal.' I, as the owner, get input."

It's not just about input, however. Sanat Joshi, vice-president and industry principal of Oracle's automotive and manufacturing industry business unit, found that dealers have other reasons to be excited.

Said Joshi: "The industry has been grappling with this for a while. Very recently one of our North American customers ran some tests. For the longest time the issue was, 'Do dealers

get disintermediated in this connected vehicle journey?' Well, this OEM customer of ours was able to leverage telematics to actually derive more traffic to the dealer."

Joshi said there are industry statistics that show that if a dealer can convince a customer to return – not only within the warranty period but for service after that as well – the customer is more likely to remain loyal to that automaker. He did not cite the source of that info but the tests conducted by his customer show promise for future strategies geared toward consumer retention.

"We believe it's not an either or question," said Joshi. "It's both because the customer needs service, they need hand-holding, they need that personalised experience. The dealers are critical to that. With connectivity, the OEM and dealer are really able to operate as one unit to be able to service that customer. Telematics is able to offer that."

Big market opportunity

Telematics isn't just for the dealer, however. Jonathan Hewett, global CMO of Octo Telematics, thinks that telematics will become a massive part of the auto insurance industry.

"We see a very big and exciting market for insurance telematics – $35Bn," said Hewett. "That's before you start to think about the adjacencies in fleet [and] diagnostics. We are very focused as a business in seizing as much of that $35Bn as we can."

Hewett is also "tremendously excited" about autonomous vehicles and the role they will paly in mobility. "We think that in 100 years there will still be people riding bicycles, walking along the pavement, riding their horse in the country," said Hewett. "While at the same time there will be all sorts of autonomous cars in various states of autonomy from all of the big OEMs. What's going to be absolutely fundamental is to know what's happening in the moment of an accident or collision, because there will still be accidents."

Hewett added that the granularity of data is going to be significant. "I also think that as autonomy and connected cars and ride sharing all start to have an impact, that ability to actually pay per trip is really important," Hewett added. "To be able to pay an insurance premium for that specific trip that you make is going to be vital in having the safety and security and peace of mind that people are insured should the worst happen. I think it's really, really important – it is absolutely about driving analytics in context."

Transformative future

Verisk's Levendusky was hesitant to make any specific predictions about how autonomous vehicles will affect the insurance industry. But he did say that it will "probably be transformative" when cars make the switch to autonomy.

Said Levendusky: "Obviously one of the benefits of that full autonomy is fewer or, perhaps, almost no accidents. That will be transformative, no doubt about it. I think it's really more a question of timing. There are these steps in the ladder that OEMs are climbing to get to different levels of autonomy, but at full autonomy that's very transformative. I think it's transformative for the automakers, for society and for insurance companies."

Customer retention

Raj Paul, vice-president of IoT and Connected Services at Lochbridge, detailed the four important outcomes that he believes automakers are striving to achieve:

- Loyalty
- Differentiation
- Monetisation
- Quality

Paul said that from a loyalty standpoint, every OEM wants to create a "sticky relationship" with its customers so that they purchase "the same product from the same OEM" every time. He added that has redefined the meaning of TCO because it is no longer 'Total Cost of Ownership' – it should be 'Total Convenience of Ownership.'

"If I have a very good ownership experience, I'm going to be a loyal customer," said Paul. "I think we have come a long way in that regard." Paul has two luxury cars in his household, one domestic and one imported. He described them as "convenient" and "connected" automobiles that provide service reminders. He said: "The convenience of owning it has progressed quite a bit. I think it's very important."

Can that same level of quality be found within automobiles across the industry? Paul isn't so sure, but he said the industry is making progress. "Is there room to grow it?" Paul questioned. "Definitely. If I have a problem with my car and my car tells me there's a problem, even before I get to know the problem, that is a good experience."

Loyalty alone is not enough, however. Paul said that differentiation is essential in today's crowded marketplace. More

often than not, automakers use technology to stand out from the crowd. Once again, the industry has made progress in this regard but Paul believes there is still room to grow.

Of course, differentiation is useless without monetization. Said Paul: "How do you make money when you're spending so much money on connectivity? Money can be made from this connection in a number of ways. One example, usage-based insurance. I'm sure all of you know about the progress of the Snapshot product. Progressive has a tie-up with OnStar where the connectivity comes into play to essentially do usage-based insurance as well."

Paul added that there is "so much value" in the data collected and that automakers could create a system (using healthcare or insurance providers) to produce a "beautiful monetisation model".

Lastly, Paul said that insights gathered from the product could reduce operating costs in a variety of ways. One example is predictive alerts. Paul concluded: "If I can predict what is going to fail, I can save a lot of money by avoiding recalls."

Principles of cybersecurity

Doug Moeller, vice-president of connectivity at Lear Corporation, shared his six principles of cybersecurity during a presentation entitled, *Cyber Security Strategies Recommended for the Automotive Industry*.

- Safety by Design
- Third-Party Collaboration
- Logging/Evidence Capture
- Over the Air Security Updates
- Segmentation & Isolation
- End-to-End Validation

Safety by Design: Moeller stressed that security needs to be built from the very beginning of the design phase. He said it is not something that can be tacked on later. "I think that's where a lot of people have gotten stuck before – they had security as an afterthought," said Moeller.

Third-Party Collaboration: Moeller is a strong believer in third-party collaboration with security. He said: "It's not something you can do in isolation. You really need to work with your suppliers, customers, competitors, everybody, to understand where the threats are coming from so you can fix them."

"Security is not something which you want to be proprietary with," Moeller added. "It's really in everybody's best interest to have secured vehicles. If anybody gets compromised, it really hurts consumer confidence for all of us."

Logging/Evidence Capture: Moeller recommends that automakers log what's happening to evaluate the situation and gather analytics to uncover where attack threats are really coming from.

Over the Air Security Updates: Said Moeller: "Security is something we're never, ever finished with. There's always new attacks, new threats and you have to have the ability to change your system over the air so you can update your security policies for these new threats. Over the air software updates are very important for cybersecurity."

Segmentation & Isolation: When an attack occurs, automakers need to be able to do something about it. Moeller said that's where segmentation and isolation comes into play.

"If an attack is coming from the Bluetooth interface or a tire pressure sensor, isolate that interface, protect it from getting onto the rest of the vehicle bus or spreading to other vehicles," said Moeller.

End-to-End Validation: Last but not least, Moeller advised automakers to provide end-to-end validation that extends beyond the company's own technology.

"Security is not something you can do just for your piece of the system," said Moeller. "The systems we deliver, there's half a dozen to 10 suppliers in that. If we all do security right within our box, that's great. But you really have to validate how the whole system goes together because that's really where most of the holes come from, that integration of components from different suppliers and not having a real understanding of the specification or how things are supposed to work."

Lear's basic philosophy is to block everything and only let necessary elements pass through. Said Moeller: "What you do let through you authenticate, make sure it's coming from the person it's supposed to be coming from and the place it's supposed to be coming from. And then you secure it – you either sign it (if you don't care about privacy you can just sign it). Or, if you do care about privacy, then you encrypt it and then you log in."

The role of regulators

During a panel about guidelines and regulations, NHTSA's Rosekind was asked about the extent of NHTSA's authority in regulating autonomous vehicles. He said: "I think the good news is that we're interested in collaborating with everybody. For us it's all about the safety, so an opportunity for us to test and deploy new technologies that could save 32,675 lives on our roadways, that's what we're after."

Rosekind added that NHTSA is trying to find collaborative approaches with automakers that help bring safe automated vehicles to market. "To this specific point, it ends up the federal government has a lot of authority in these areas, so there have been folks who basically have pushed to just pre-exempt," he said. "That's not going to be the answer. And that's why really trying to come up with a model that allows a unified framework but still the flexibility."

States will still get to determine how their own roads are regulated. "I think the idea is to help them understand, this is NHTSA's part, we'll take care of that," Rosekind continued. "This is all your realm, you do it the way you want but hopefully the states will get together and at least have a core of that consistent so an autonomous vehicle doesn't get to a state line and stop."

Assistance or interference?

GM's Massimilla indicated that he has had a positive experience working with NHTSA. "They've been very involved as a very good and strong partner [in the Auto ISAC]," said Massimilla. "I think that's really important to say. They have a lot of interest in what we're doing, especially NHTSA and the Department of Transportation. NHTSA is our regulator… but they haven't come in and said, 'You will do this,' or, 'We will sit in on your board meetings,' or anything of that extent. They are all about collaborating, understanding what the ISAC is doing. Again, I think they have a common goal – it's just like the automotive industry, and that's the safety of our customers."

In another panel, Vijitha Chekuri, senior director of IoT and solutions consulting at Lochbridge, expressed her views on how the government can get involved in smart city development. She said: "[The way] the government can help is probably not interfere. I think that's probably one of the most powerful of forces in this whole smart city ecosystem that can either stop growth or take it backwards. All they have to do is let the private companies safely, securely innovate and make smart cities happen."

Approach with caution

Rosekind warned that "we have to be very careful about" any regulations that are applied because of the slow speed at which they are implemented.

"If you were to have a regulation on any aspect of this, you would have version 242.38 before the regulation was actually on the street," he warned. "We need nimble and flexible, rapid prototyping kinds of approaches, they're going to be able to collect data so we can make these calls literally in the moment, so we know how, going forward, we're going to be iterating more safety."

Next stop for map makers: autonomous driving

Jan-Maarten de Vries, vice-president of product management in the automotive sales and marketing team at TomTom, spoke about the "crucial" element of software building blocks "both in the vehicle and in the cloud."

Said de Vries: "We have captured the whole Autobahn of Germany. That's the highest road class – 28,000 kilometres. We've done the same for 20 states in the USA – 95,000 kilometres. And we are aggressively moving to roll out this High-Definition Map and RoadDNA to the rest of the world, starting with Europe and North America. We want to use this momentum to actually create a future together and create more partnerships."

TomTom also made two announcements at TU-Automotive Detroit 2016, the first involving a new partnership with Volvo, the other regarding the firm's real-time lane positioning technology. de Vries invited conference attendees to visit the TomTom booth to learn more about these announcements and to see the lane positioning tech in action.

"[Volvo] took pretty much everything we make," said Matthieu Campion, TomTom's senior marketing manager of automotive. "It's a global deal covering all regions, all countries, including Japan, China, Korea. And we're going sell them all our autonomous components."

During a demonstration at TomTom's booth, Pieter Gillegot-Vergauwen, vice-president of product management maps, spoke about the potential for innovation within autonomous fleets. "What if your truck is driving automatically and the truck doesn't have to stop?" he questioned. "The driver can sleep while the car is driving itself. It would immediately have a huge economic impact for all these transport agencies. I think you'll see it happen faster than just an everyday car."

3.

Announcements

Octo Telematics introduced a new insurance telematics solution, OCTO Fleet, for fleets in North America. The solution (which previously launched in Europe) offers vehicle and driver intelligence to both the insurer and their fleet policyholders, combining elements of fleet management and usage-based insurance. State Auto is OCTO Fleet's first insurance partner in the United States.

Movimento and **Sierra Wireless** announced that they have formed a partnership to launch a new software management system. The two companies say their system will allow automakers to simultaneously update all in-car software.

Qualcomm revealed a new Connected Car Reference Platform for automakers and suppliers to explore, prototype and commercialize different types of connectivity designs in their vehicles.

INRIX announced that it will integrate **PayByPhone**'s on-street parking data and payment options into INRIX's end-to-end parking solution for the connected car.

Symantec launched another cybersecurity solution for automobiles, Symantec Anomaly Detection for Automotive, this time focusing on the connected car. The company said this will allow automakers to protect against zero-day attacks, as well as issues never seen before in automotive.

Nissan extended its partnership with **Airbiquity** infotainment services through 2020, adding another four years to the deal. Airbiquity previously assisted Nissan in launching NissanConnect Mobile Apps and Infiniti InTouch Apps.

VoiceBox announced that its voice technology has been integrated into the INRIX Open Car platform. The company also launched version 5.0 of its popular VoiceBox Automotive Software Development Kit, adding deep neural networks technology to the mix.

4.

Conclusion

Ride-sharing – whether in the form of personally driven cars or autonomous vehicles – is expected to shape the future of automobiles. Many believe that ride-sharing is essential to reducing road congestion, which wastes time and resources as consumers spend a growing number of hours stuck in traffic.

Ride-sharing is also expected to have an impact on:

- Urban living
- The environment
- Parking
- Cost
- Convenience

In addition to ride-sharing, autonomy and security, there was one general theme that seemed to surround every aspect of TU-Automotive 2016: no one is moving fast enough to reach the future. Matthew McCullough, director of field services at GitHub, summed it up quite nicely: "Sometimes when we say, 'Oh, it needs to move quickly,' it's not just pressure, it's not just a goal to hit it sooner, but that there is a cliff in which delivering past a certain point is irrelevant."

Automakers will have to deal with that pressure as they work to achieve the future they are dreaming about today.

TELEMATICS
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📞 **Call Jack Palmer – Project Director**
+44 207 375 7572 (UK) or
1 800 814 3459 ext 7572

🖱 **www.tu-auto.com/detroit**

@ **jack@tu-auto.com**