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Welcome & opening remarks

From metal to mobility:
A paradigm shift in full gear

Gary Silberg has been in self-driving cars before. But for the first time ever, he paid for the ride.

As Silberg welcomed attendees to KPMG’s 14th Annual Automotive Executive Forum in Detroit, he recounted his experience just the previous week at the Consumer Electronics Show (CES) in Las Vegas.

Lyft and its tech partner Aptiv operate an AV fleet that offered thousands of rides during the event, and Silberg was one of the lucky passengers. More, customers are pleased with experience. On average, the driverless vehicles receive near-perfect “driver” ratings.

The success helps prove that AVs and mobility as a service are not just ideas, but commercially viable ideas whose time has come—and come faster than anticipated.

Silberg took a brief look back at KPMG’s thinking over time starting in 2012 with papers on the rise and consumer acceptance of self-driving cars and mobility as a service, as well as on the clockspeed dilemma facing automakers used to operating on a multiyear calendar in an era of accelerated innovation such as artificial intelligence and deep learning. Meanwhile, AVs are rolling out as KPMG had foreseen in what Silberg calls “islands of autonomy.” *

“We predicted many of the things that are happening today would happen in 2025, just to show you how fast things have moved,” he said.

Silberg then unveiled KPMG’s latest paper, “Autonomy delivers,” detailing how consumer desire for on-demand, home-delivered goods will fuel the rise of AV delivery vehicles and business models.

“It’s been a fantastic journey with big ideas at KPMG,” Silberg said. “We are honored to be able to talk about those today.”

* KPMG’s thought leadership on innovation in the auto industry includes the following:

— Self-driving cars: The next revolution (2012)
— Me, my car, my life... in the ultraconnected age (2014)
— I see. I think. I drive. (I learn): How deep learning is revolutionizing the way we interact with our cars (2016)
Islands of autonomy: How autonomous vehicles will emerge in cities around the world (2017)


To access Gary’s presentation, please click here
George Blankenship has had the unique experience of working for two of the most revered leaders in the business world, Steve Jobs and Elon Musk.

“Both of them were like they were here from a different point in time, and trying to get us to places they knew we could go, but that we didn’t. And both were a blast to work for. Frustrating at times, exhilarating, but the sense of accomplishment you got working with them after you accomplished stuff that you thought was impossible, that was pretty cool.”

Through his tenure at Apple and Tesla, among other world-class companies, Blankenship learned a number of lessons about innovation and customer experience that he shared with the audience.

**Engaging with customers in unexpected ways**

“The way most people thought about Apple products in the year 2000 was, ‘I don’t want one.’”

When Blankenship started at Apple, he observed that consumers had preconceived reasons for avoiding Apple computers, from having to learn a different operating system to believing Apples were “only for those ‘cult’ people.”

Apple would have to do something very different, and the company’s answer was to “ambush people when they’re not thinking about buying a computer” by opening stores in high-traffic shopping centers. When the first two Apple stores opened in 2001, 1,500 people lined up outside each, and Apple sold out of the laptops they had launched that weekend.

Similarly, Tesla sought to attract customers who had never heard of the company and sell a product that wasn’t even available yet.

Blankenship asked, “What if buying a car could be fun? Could be something you look forward to? Was done in a cool place, with product specialists, not commissioned sales people? What if we could take a model we had before, ambush people when they’re not thinking about buying a car, and get them to want a Tesla?”

Those questions inspired Tesla’s first shopping center store in Santana Row in Northern California, which was outfitted with big graphics on the wall, a 42-inch touch screen where customers could design a car, and a huge video wall where they could “throw” their design onto the big screen. The store attracted visitors in droves.
Driving desire for a product, sight unseen
Blankenship described the iPhone as a turning point for a company that had gone from trying to sell products consumers didn’t want, to having people camp outside stores overnight “so they could be first in line to get an Apple product that no one had ever even seen.”

What drove that desire? Blankenship believes it comes down to four elements: innovation, design, simplicity, and the ownership experience. Form, function, and even color all attracted customers to the products, from the iMac to the iPod. “But the products are complemented by the experience.”

Tesla started selling its larger sedan before it was available, and by the time the first car was finally delivered, the company had collected $5,000 apiece from more than 20,000 people willing to lay down money on a promise. As Blankenship had told the New York Times, “I hope we never sell anyone a car. I want people to buy a Tesla because they want it.”

Offering customers great experience, on their terms
At Apple, “We wanted to be able to engage with customers however they wanted to engage with us, and that’s what we set out to do,” Blankenship said. Apple’s purchasing process includes the ability to buy online and pick up in the store, as well as use an app for self-checkout.

As for Tesla, Blankenship contends it’s not the company’s electric vehicles that make it disruptive in the auto industry. Rather, it’s the distribution model that goes directly to the customer, with the ability to order a car online and never set foot in a dealership.

“The first time you ever have to deal with somebody from Tesla? When you pick up your car,” he said. “But at the same time, you can visit the store 57 times before you order your car if you want to. It’s however you want to be engaged with.”

Making the impossible possible
“Things are not impossible, they just haven’t been done yet,” Blankenship said at the close of his remarks.

Musk, whom Blankenship described as “a little bit of Steve Jobs, a little bit of Thomas Edison, a little bit of Christopher Columbus wanting to go to the New World... in a nine-year-old boy,” continually seeks to do the impossible.

That’s what the idea of a Tesla car was 10 years ago fully electric, 250+ miles on one charge, zero to 60 in 4.2 seconds, chargeable anywhere. “People absolutely said that’s impossible. And it was, sort of. Until Tesla did it.”
Autonomous vehicle regulation: What the future holds

Panelists:

Robyn Boerstling, Vice President, Infrastructure, Innovation and Human Resources Policy, National Association of Manufacturers (NAM)

Ryan Bowers, Counsel, Global Cybersecurity and Privacy, General Motors

Robbie Diamond, Founder, President and CEO, Securing America’s Future Energy

Sam Kling, ACLS/Mellon Public Fellow, Global Cities, Chicago Council of Global Affairs

The automobile drove a revolution in cities in terms of how people use public space and the street, Kling said. Regulation and infrastructure changed to handle the explosion in cars while protecting pedestrians, and it will have to change again once the computer is driving. “It raises the question, how are we going rethink the street once autonomous vehicles come about?”

Tackling regulation in a city is one thing; regulating AVs across state lines is another.

“At the end of the day, federal leadership is going be really important on this issue, because we can’t have a 50-state patchwork,” said Robyn Boerstling of NAM, which advocates on behalf of the manufacturing industry. “But I am very optimistic, I think that the technology is advancing so quickly and consumers are going to be placing high demands on automakers, the government is going to have to come along.”

Robbie Diamond, who leads two organizations focused on ending oil dependence, is concerned about long-term implications of short-sighted regulation. “The decisions we’re making today are more important from a regulatory perspective than we think,” he said. “The threat… to billions of dollars that are being invested today is real, and profound, and it’s being overlooked in many ways by people who run companies who are engineers as opposed to understanding the politics,” he said.

Consumer concerns

Another primary concern with the rollout of AVs is data security, said Ryan Bowers, who handles privacy and cybersecurity issues at General Motors. This includes data from unmanned delivery, in which the AV “is a moving set of sensors collecting data, collecting videos… What are they going do with that data and how that data’s going be leveraged?”

Bowers suggested that customers may not yet understand how or the extent to which their data is being used. Case
in point, a number of audience members said they use doorbell cameras but far fewer of those knew that R&D employees in the Ukraine were examining the video feeds.

In fact, surveys show that consumers are more concerned about AV hacking, and many remain uncomfortable with the concept of autonomous driving altogether. At the same time, oil companies, trial lawyers, and others continue to hamper adoption for their own purposes, Diamond said.

“I think that we’re in for a political battle,” he said. “It’s like a gun fight and the truth is, the advocates for [AV] haven’t even brought a knife to the gun fight, they have a spoon.”

Balancing support for AVs and public transit
In light of Washington, DC’s dysfunction, Boerstling said she’s more bullish on adoption in cities as those governments look for AVs and mobility as a service (MaaS) to help meet the specific challenge of congestion. However, Kling warned that AV rollout must be considered in tandem with improvements to public transit.

“I agree that there is the potential for autonomous vehicles to reduce congestion, but ultimately a car is the size of a car whether it’s driven by a computer or driven by a human,” he said. “A city is going to want to prioritize transit because that moves a lot more people a lot more efficiently.”

Diamond countered that public transit is one more party that’s going to fight against AVs, and it could remain more expensive per mile than travel via electric AV while still failing to move consumers all the way from point A to point B. Kling responded that low AV electric vehicle (EV) mobility per mile really doesn’t cover total cost of deployment, including infrastructure, while congestion, pollution, and other negatives remain.

“Autonomous vehicles can certainly be part of the solution, but transit has to play a very big central role in these dense global cities,” Kling said. “Really they’re part of the same system, and you can’t have autonomous vehicles working properly without a well-functioning transit system.”

Second-order impacts
Indeed, while AV MaaS could reach underserved neighborhoods, including lower-income areas now disconnected from employment zones in cities, it represents one of the biggest dangers to public transit if fares are so low they undercut transit, Kling continued.

“Ridership would go down, funding would go down, service would go down, and therefore no one would ride transit really. It means just a flood of cars on the road, autonomous or otherwise.”

Diamond expects autonomy will drive the electric car revolution even faster, offering consumers the proposition of convenience, time, and safety. “What’s really exciting is electrification and this force multiplier between connected, autonomous, shared, and electric,” he said. Consumer demand for EVs “will drive that revolution to end oil dependence, lower carbon emissions, and everything else. This is capitalism at its best.”

Another second-order impact of a positive nature could help the trucking industry, Boerstling said. If consumers as well as legislators can get over the psychological resistance to large, autonomous delivery vehicles, the industry could eliminate its driver shortage issue, currently in the neighborhood of 50,000 vacancies.

Finally, Bowers suggested that new businesses may arise as AVs open up free time. “You can think of shopping, of gaming, of entertainment, and I think there’s going to be an interesting ecosystem that could develop around that time spent in a vehicle.”

Added Diamond, “Great, I think people should invest in driving games because while you’re in your car... you’ll not actually be driving your car.”
Managing technology risk in an evolving automotive industry

Moderator: Ron Plesco, Principal, Cyber Security Services, KPMG in the U.S.

Panelists:

Rob Bathurst, Worldwide Managing Director, Cylance Inc.
Colin Dhillon, Chief Technical Officer, Automotive Parts Manufacturers’ Association
Mike Krajecki, Director, Emerging Technology Risk Services, KPMG in the U.S.
Mike Westra, Connected Vehicle Cyber Security Technical Manager, Ford Motor Company

Protecting the entire ecosystem

Risk management and other support for AV technology has to be done in synchrony with cities, according to Colin Dhillon, CTO of the Automotive Parts Manufacturers’ Association. APMA is working with Stratford, Ontario to test a fleet of 20 vehicles and 200 pieces of connected technology. Every one of Stratford’s 26 intersections will be smart by the end of the year.

“You cannot have Level 4 AVs and cities that really aren’t smart and aren’t connected,” he said. “They have to move at the same pace. If they don’t, we’re going to be challenged to actually pull back the pace of development on vehicles.”

Michael Westra, who manages vehicle cybersecurity for Ford Motor Company, agreed. “The functional safety engineers say the vehicle has to be able to safely drive itself, but the optimization is really where the city comes in.”

Regarding the AV, a primary concern is how to balance the needs and desire to incorporate the latest technology with where to establish the connectivity in those embedded technologies, according to Rob Bathurst, whose firm, Cylance, consults manufacturers on the careful application of new technologies to mitigate risk.

“At some point you have to trust something, and what part do you trust?” he asked. “We run into an interesting position in trying to enable organizations to be safe and secure while also building that innovation.”

As great as the technologies are, it’s the data that makes AVs possible, and it’s the data that needs to be secured, according to Mike Krajecki, who leads IoT risk solutions for KPMG. “We’re moving into a transit model where it’s not electricity, it’s not gas—our cars are powered really by data and by algorithms we put into them. That data is what has the value, and it’s what makes the vehicle a threat from a cyber perspective.”
The industry has to view data security over its lifecycle, understanding where data reside at all points in time, across the dozens of companies that come together to make these AV ecosystems possible, he added.

**T rusting machine learning and AI**

Machine learning, a subset of AI, represents its own unique risks. Westra discussed a demonstration by a University of Michigan professor who used some strategically placed tape to trick machine learning algorithms into reading a stop sign as a 45 mph road sign, and he extrapolated this finding to show that similar attempts could work against a whole range of vision-driven machine learning systems.

In order to analyze how such systems are built, trained, and secured, firms like Cylance use what’s called adversarial machine learning or adversarial networks. “The whole purpose of it is to take all those well-meaning models that people have spent a lot of time training, and circumvent them, change them, manipulate them, and cause the output of the answer to be incorrect,” Bathurst said.

This allows manufacturers to better understand which AI-driven subsystems within a vehicle, such as LiDAR technology, are vulnerable, he continued. “Because the machine has trained itself and because you’ve told it that it can make decisions. Attacking that model becomes very important for circumventing the safety system."

The auto industry is known for building the world’s safest products, and yet its cybersecurity practices are lagging in part due to a general naiveté about technology risk, Dhillon said, citing our collective willingness to fire up our laptops on free Wi-Fi at Starbucks. “As an industry, we need to be ahead when it comes to security and privacy, just like we are with safety.”

At the same time, there’s work to do in getting the general public to accept AI and other technologies that make autonomous driving possible, Krajecki said. “People inherently don’t trust technology the same way we trust physical things,” he said. “As an industry, we have a big opportunity to bring trust and transparency to AI, to get the general public on board. This actually can save millions of lives.”

**Risk mitigation**

There is a wide breadth of risk mitigation activities the industry can take and is taking. Bathurst stressed the importance of understanding residual risk within the supply chain. “You’re inherently trusting somebody that is inherently trusting somebody that is inherently trusting the silicon that was made somewhere else, checked by someone else.”

Westra highlighted issues with a number of OEMs, including one Tier One supplier that had been hacked yet had not corrected many of its vulnerabilities, and another that built a system on a version of Android that Google had stopped supporting.

“It highlights the weakest link problem,” Krajecki said. “And all it takes is one supplier, one Tier One to not want to cooperate or want to cut costs and cut corners [to create the] the opening an adversary needs, and all of a sudden the entire system’s taken down.”

On the flip side, added Dhillon. “As a Tier One, it’s quite simple. If your cybersecurity is up to scratch, it makes you more competitive.”

Krajecki suggested that the same AI technology we seek to protect can also be used to defend against nefarious activity more quickly and more in depth than humans can do alone, referring to one client who wrote software to perform security testing on as many as 15 releases a day. “There’s no way we can move forward with traditional, manual SDLC where you have somebody running test scenarios and marking things on a spreadsheet, or somebody pointing a tool at it,” he said. “That will move way too slow. We’ll never keep up with the clockspeeds in this industry. It all has to be automated in some way.”
An analyst’s perspective on the automotive industry

Moderator: Gary Silberg, The Americas Head of Automotive, KPMG in the U.S.
Presenter: Adam Jonas, Head of Global Autos & Shared Mobility Research, Morgan Stanley

KPMG’s Gary Silberg engaged Morgan Stanley analyst Adam Jonas in a conversation about the global auto industry and its electric and shared mobility future, as well as the companies and personalities that dominate the sector.

U.S. auto sales decline while trucks and EVs are on the rise

Morgan Stanley is forecasting a 2019 SAAR of approximately 16.5 million new vehicles sold, below consensus and a decline after four years over 17 million. “Without an extraordinary level of stimulus, the incremental lending attitude is a little bit less good today than a year ago,” said Jonas, who heads up the firm’s global autos and shared mobility equity research. A 5 percent drop in used car prices doesn’t help.

Still, he was positive. “I think it’s a year where the industry might struggle to grow profitability, but from historic or cyclical standards, it can be a year where the industry can still generate cash, and we’re not having a recessionary discussion.”

As the world moves toward shared mobility, Jonas said he anticipated that new vehicles might still have the footprint or silhouette of a passenger car, but that the market has shifted to larger vehicles. “The average car in the United States is a truck.” If GM retreats from the passenger car market in South America as it did in Europe, it could mark a permanent shift.

Electric vehicles (EVs) continue to be viewed through the lens of private ownership, which has a limited market of 5–10 percent of U.S. revenues. But in fact, ride sharing and the logistics of fleet management will alter the dynamics, potentially increasing EV market penetration beyond those limits, Jonas said.

Challenges in China, opportunity in India

China wants to go electric, but they need help from foreign manufacturers. The country lifted its 50 percent foreign ownership cap for joint ventures, and Jonas joked that BMW’s increased stake in Brilliance China Automotive wasn’t necessarily all free will. “The Chinese government goes, ‘When we say you can go above 50 percent, we’re saying you will go above 50 percent.’”

But at present, the Chinese market is contracting. The greatest positive impact could come this spring from the National Development and Reform Commission (NDRC), such as lowering the reserve requirement ratio, VAT cuts, or direct auto-specific consumption tax stimulus, Jonas said. That will make the difference between China being up as much as 5 percent, or down 10–15 percent. “Until that point, there’s a buyer’s strike.”

When it comes to U.S.–China trade policy, tariffs have disrupted the global supply chain, and industry leaders are looking for resolution while watching carefully for anti-American sentiment on the ground.
As China becomes less accessible, the auto industry is shifting its focus to India where vehicle penetration is just 3 percent the same as the U.S. in 1915, Jonas said. However, private ownership in India will struggle to reach even 15 percent as the market will likely go straight to shared, electric mobility, in large part based on environmental concerns: India is home to 9 out of 10 of the world’s most polluted cities.

“We think India is going to be one of the largest—if not the largest—shared mobility [market] in the world,” he said. “I’m not trying to make it look like it’s God’s gift, but it’s the main event.”

Europe and its major manufacturers
For Germany to meet Europe’s emissions standards by 2026 would require a rapid transition to pure electric mobility, ripping the economy apart, Jonas said.

“When I solve for clean air in Germany, I’m solving for two million jobs at risk, because the skills transferability for making internal combustion engines and transmissions to making electric motors is not one-for-one.”

Jonas also called the Daimler–BMW partnership “smart” given the likely commoditization of mobility services and how expensive and uncertain the transition will be. Volkswagen and Ford are also a good fit; however, it remains to be seen if their arrangement is actually transformational. In any event, Volkswagen will look to control joint projects.

Autonomous vehicle technology companies
Jonas described the autonomous car race as a marathon that begins with a sprint, and we’re still sprinting. “You’re going to see some companies that are not going to make it. Or those that you think were running really fast actually didn’t pace themselves and they’re going to burn out.”

He discussed Aurora, Zoox, Argo Al/Ford, and Cruise Automation/GM, but agreed the leader is clearly Waymo. Morgan Stanley’s internet and Alphabet analyst team values the company at a whopping $175 billion, which is in line with consensus. The valuation is driven by a market for mobility that is measured in vast miles traveled and time spent in cars, as well as by the logistics and licensing models.

Waymo won’t try to be as big up front as the major ride-sharing companies, Jonas added. “They’re not going to have a million cars on day five. They’re going to go to Portland and just blow whoever’s there away,” he said.

Industry leaders past and present
Jonas said his colleagues looked into the arrest of Carlos Ghosn by Japanese officials in November 2018, and he hinted that the trouble seemed to start with a dispute around control of the combined Renault-Nissan-Mitsubishi Alliance, which may have been moving more favorably toward the French.

“When you look for stuff, sometimes you find stuff,” he said, adding, “It seemed like there was an incentive to have the Japanese law enforcement and government look for stuff.”

Elon Musk is spending about a third of his time focused on space and wants to leave Tesla because he’s “bored,” Jonas said. Without a natural buyer, Jonas and team are solving for a merger between Tesla and SpaceX in the next year or two, “kind of like a reverse SolarCity.”

Jonas called the late Sergio Marchionne “the best auto CEO, industrialist, deal maker, risk taker, leader of anyone I’ve seen in any industry,” adding that he believes GM’s Mary Barra inherited his mantle. “She is bar none the best CEO living today. It’s great that she gets attention as a mother and as a woman CEO. But forget best female CEO—best CEO, period. Not just autos, any industry.”

Finally, Jonas quoted Marchionne, who would say, “Vision without execution is hallucination.” He added, “There’s a lot of vision out there right now. It’s relatively easy to have the vision. To do the execution, that’s a whole different kettle of fish.”
Driving i4.0 value with your supply chain

Moderator: Doug Gates, Global Sector Chairman, Industrial Manufacturing, KPMG in the U.S.

Panelists:
- Dave Grimmer, Vice President of Manufacturing, DENSO
- Howard Heppelman, Divisional Vice President and General Manager, Connected Operations Solutions, PTC
- Eric Logan, Principal, Strategy, KPMG in the U.S.
- Joseph Wyrzykowski, Purchasing Industry 4.0 Lead, Ford Motor Company

First step: Defining the value of i4.0
Joseph Wyrzykowski, head of i4.0 for procurement and purchasing at Ford, said the company is focused on data analytics and how it can lead to an unprecedented level of connectivity and transparency in building their supplier network—and even to new purchasing models.

The industry has “done things the same way for a long time, and we want to do them differently in order to take advantage of what these advanced manufacturing technologies have to offer,” he said. “What that really gives us, especially in a sharing scenario with our partners, is an unprecedented level of connectivity and transparency in building a supplier network.”

At PTC, one of the largest CAD/PLM and Manufacturing IoT and Augmented Reality (AR) companies, the effort is on what Howard Heppelman calls the “physical-digital convergence,” leveraging i4.0 to help manage the workforce crisis of increasing retirements and a shortage of new hires. Like Ford, the company also sees opportunities to improve data usage, “looking across the enterprise at what insights can be driven to be handed back to the plant managers, workers, and maintenance teams that are responsible for squeezing every ounce of productivity out of the plant.”

Heppelman added that over the last two years, he has finally seen a number of organizations move from i4.0 technology pilots into implementation. “Companies are recognizing that... there is in fact a big opportunity at the end of the rainbow, and they’re now shifting to, ‘how do we organize to go take advantage of that?’”

That top-line vision for what i4.0 can do “has to be flexible, because the technologies are changing. It can’t be something that’s rigid,” according to Dave Grimmer, who leads i4.0 research and development at Tier 1 automotive supplier, DENSO. Starting small allows you to learn and fail quickly in order to decide which efforts will truly add value, “so that when you build your vision, you’re building it on data points that you can rely on.”

Industry 4.0 (i4.0) is more than a collection of smart manufacturing software, AI applications, data analytics, and connected products, according to Doug Gates, the global sector chairman in Industrial Manufacturing at KPMG. “It’s about integrating that information together to drive business value.”

Panelists from major auto and component manufacturers joined KPMG strategists to discuss clearing the hurdles to benefit from i4.0.
However, KPMG’s Eric Logan said he still sees organizations placing a lot of effort into individual use cases, but failing to take a holistic approach. “Remember, you’re solving for a business problem, not a technology problem. The technology is an accelerator to help solve the business problem.”

To that point, often there’s too much focus on “electronic eye candy,” Grimmer said. “We can create a lot of things in the IoT space that look pretty on dashboards, but are they really creating the value to change the speed and the quality of your decision making? If it isn’t doing that, you’ve got to stop doing it and take a look back.” DENSO has tried to standardize its evaluation of new technologies to make sure they’re unique and add value, he noted.

The necessity of top-down transformation

Meanwhile, collaboration up and down the supply chain is the goal, but industry efforts remain fragmented, Grimmer said. “You can imagine how complex that is,” he said, adding that his company often steps in to help tier two and three suppliers. “They don’t have the resources or the expertise to even tackle this in a way that would make sense.”

Indeed, trying to institute an i4.0 initiative across thousands of suppliers around the world is a huge undertaking, Wyrzykowski said. “A vehicle has 30,000-plus parts, times whatever skews of that vehicle there are… plus a global footprint. How are you going to have an Industry 4.0 initiative around that large of a supply race and that big of a network standardization? Data analytics, machine learning and moving all the way into AI is really what we’re using to get over some of those barriers.”

Internal culture also can get in the way, Wyrzykowski added, which is why it’s important to work outside the organization as well. “Since a lot of these technologies are in their infancy, you’ve got to make the right partnerships and get the right technology;” he said. “It’s not just the typical, ‘let’s go hire that skill set.’”

Logan also emphasized that i4.0 implementation and governance needs to come from the top but acknowledged that the purse strings for such efforts are typically controlled by the functions, and responsibility and accountability are often fragmented. “Somehow you have to break down the silos and make sure that you’re working cross-functionally.”

Heppelman agreed. “Digital transformation, if done correctly, happens at the company level,” he said, adding that some in the industry get it. “They’re saying this is life and death, and so now the CEO is owning the project.”

He also echoed Wyrzykowski on the need to bring in expertise. PTC has “gone through an amazing transformation to become an IoT and CAD and PLM and AR and digital physical convergence company,” he said. “But every time we had to pivot, we pulled in somebody from the outside, because it’s not in our value network to be able to pivot on our own and move with the sense of speed and urgency that we need to.”

At the same time, the existing workforce has to buy in to the i4.0 transformation and build its own knowledge base. A recent KPMG survey assessing organizational maturity for i4.0 indicated that the most mature organizations had already established a collaborative culture, Logan said. One company he interviewed rolled out a 3D printing approach that was originated by the engineers on the shop floor, rather than by management. “In those organizations, maturity flows through quickly because they’ve already established a culture that really believes in innovation.”

Wyrzykowski added that technology can make an inexperienced workforce almost instantly more experienced. “You may have someone on the job for 30 years who’s leaving, and you can enable your two- or three- or five-year hire using some of the technologies that we talked about to become a more capable worker.”

Finally, Heppelman reminded the audience that there’s not just one but multiple disruptive technologies at play, “any one of which should be concerning to a manufacturer’s business,” he said. “I would be concerned if my company was still asking the question about how serious it is.”

To access the latest KPMG whitepapers on this topic, please click on the links below.

— A reality check for C-suite leaders on Industry 4.0 (2018)
— Industry 4.0 investment—Don’t leave government incentives on the table (2018)
— Beyond the hype: Separating ambition from reality in i4.0 (2017)
Blockchain: Seizing the potential in automotive

**Moderator:** Arun Ghosh, U.S. Blockchain Leader, KPMG in the U.S.

**Presenter:** Nick Pudar, Director of Corporate Strategy, General Motors

Blockchain has the potential to transform processes throughout the automotive industry, and yet, many remain unsure about how blockchain works and how it can be applied. Nick Pudar, Director of Corporate Strategy at GM, provided a simple tutorial on blockchain and how it’s already being put to work in the sector.

**The origin of blockchain and how it works**

While the internet allows the secure transfer of information, until recently it has been challenged to allow the secure transfer of assets as well, Pudar said. In particular, security is compromised because assets, once digitized, can be copied.

“This notion of something of value being replicated to multiple copies, that just makes things break,” he said. “That’s why today when we do digital money transfers, we always rely on a middleman... who can help make the transaction and control the verification.”

For example, an electronic transfer of money between two people using PayPal is more complicated than it appears on the surface, involving PayPal’s ledger, two banks and their clearinghouses, and personal ledgers as well, all due to a lack of trust between the many parties.

“Everybody has to reconcile and synchronize and audit and verify that nobody’s cheating, that no mistakes were made,” Pudar said. “The amount of energy and costs associated with this process is high. It also takes a lot of time.”

But blockchain allows all parties to have an identical copy of one “distributed” ledger, creating a “single version of the truth for all users,” he explained. When one party adds a transaction to the ledger, all parties see the same information, and no permissions or middlemen are required. “When Alice wants to send Bob some money, she makes a transaction to her copy, and this distributed ledger updates Bob’s copy and now he has the money, and there isn’t a set of clearinghouses and banks.”

Pudar simplified it even further. “Blockchain is just a database. But it has some superpowers, and those superpowers are that there is autonomous synchronization across the network that it is append only. You can add a transaction, but once you’ve made that transaction, you can’t delete it. You can’t edit it. Nobody can change it.”

**Emerging automotive applications**

Ethereum, an early innovator of blockchain technology, gave rise to the concept of “smart contracts,” which incorporate code that can be triggered by certain conditions.

In Pudar’s example, a smart contract for cryptocurrency could automatically allow the transfer of assets from an owner to an heir with the confirmation of death based on published obituaries. This eliminates the need and cost for lawyers and probate courts. Smart contracts are being applied to supply chains, such as to determine the provenance of conflict minerals, or the source of auto parts to guard against counterfeits.

Meanwhile, blockchain-enabled “smart property” can protect the rights to shared assets. This capability could come into use as the shared economy continues to expand, car owners lend their vehicles for shared use,
and consumers increasingly consider partial over full vehicle ownership.

In geo commerce, blockchain can enable payments for ride sharing, tolls, EV smart grid usage and fuel, parking, and more. Audit services also can use blockchain to prove that a document or transaction existed at a specific date and time.

And finally, blockchain assists with identity services. In the auto industry, such electronic verification can be used in finance, including for payments and for service and vehicle history.

“These tools are pretty powerful, and when you understand the technical aspects of how they work, you can begin to see where they might be applied,” Pudar said.

Nick Pudar from General Motors and Arun Ghosh from KPMG

Determining the need for blockchain

While blockchain offers exciting opportunities, Pudar suggested that organizations need to follow a chain of logic to determine if blockchain is really necessary for their needs.

The first question to ask is simple: Does the organization need a database? “If you don’t need a database, you don’t need a blockchain,” he said. Organizations also don’t need blockchain if the following hold true: shared write access is not required, all the users who need to write to the database are trusted and their interests are unified, or a trusted third party is required to handle disputes.

If organizations conclude that blockchain could improve their processes, they then need to determine what type would be best for their applications.

Public blockchains run on protocols without a point of control, while a cartel of interested parties run private blockchains to reduce costs and improve security. Meanwhile, hybrid models are emerging that leverage the public blockchain to lock in the truth. “From an auditing standpoint, it is really hard to falsify anything.”

Current and future use cases

Nonprofit MOBI, a consortium of OEMs seeking industry standards for blockchain applications, is exploring a digitized or tokenized “birth certificate” for vehicles that can incorporate the maintenance and accident history.

“All of these things become part of the health record of the vehicle,” Pudar said. “This notion of immutability says that nobody can falsify it, ever.”

He also described the use of blockchain in a subscription model, such as shared vehicle ownership among an aging, less-mobile population. “You can imagine a retirement community having a fleet of vehicles that they have fractional ownership of. If [drivers] want to go beyond what those rights are, they can pay for it like they would in a rental service. Then the revenues through smart contracts automatically get distributed back to the owners.”

GM began exploring blockchain approximately two years ago, bringing on a chief blockchain architect and supporting a team to develop applications, Pudar said. However, don’t expect the automaker to make waves about the technology.

“When they do come into production, are you all going to hear about great blockchain applications? No, because it’s the stuff in the background. It’s just going to make it more effective, it’s going to be cheaper, it’s going to be more secure. And the customer experience will be enhanced because of what it can do.”

To access this presentation, please click here.

For more information about KPMG’s Blockchain practice, please visit here.
Women’s executive breakfast

**KPMG co-hosts:**
Betsy Meter, Managing Partner, Detroit, KPMG in the U.S.
Terry Grayson-Caprio, Partner, Audit, and Inclusion & Diversity Leader for Industrial Manufacturing, KPMG in the U.S.

**Moderator:** Constance Hunter, Chief Economist, KPMG in the U.S.

**Panelists:**
Alicia Allen, Vice President and Corporate Controller, Dynatrace
Kelly Bysouth, Chief Supply Chain Officer, IAC Group
Angela Hoon, Executive Director of Strategic Risk Management, General Motors
Nicole Stevenson, Vice President of Business Strategy and Marketing, Flex Automotive

Women from across the automotive sector gathered in the room and on the stage for the KPMG Women’s Executive Breakfast at the Detroit Auto Show. They shared compelling personal stories of success, were honest about their common challenges, and demonstrated their passion for their work and industry.

**Taking a pass on formal mentoring programs**
While mentoring is often lauded as necessary to advance women in the workplace, all of the participants said they drew more from their personal lives and the work relationships they cultivated on their own.

Kelly Bysouth, Chief Supply Chain Officer at IAC Group, found her career inspiration at home. “My dad really instilled a work ethic in me, and that’s something that is just invaluable,” she said. “He was the type of person that powered through everything, went to work every single day whether he was sick as a dog or not… basically made me understand the value of money.”

Angela Hoon, Executive Director of Strategic Risk Management at General Motors, had an unofficial mentor at the start of her career, which she recognized only in hindsight. When Hoon moved from her home country of South Africa to the U.S. to work for KPMG, a partner subtly took her under his wing. He placed her on all of his engagements and encouraged her involvement in a host of extra projects and initiatives that she believes put her on the partnership track.

“By him just giving me that opportunity, putting me in the right place and putting my name in the hat, made a huge difference,” she said. “The experience I gained, the network I made from that, is really what set me up.”

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Meanwhile, Alicia Allen, Vice President and Corporate Controller at Dynatrace, said, “I have a couple of people—plus a village.” One friend and former manager supported her through difficult years at a challenging job, and demonstrated how to stay strong under fire. “She taught me, whether she knows it or not, diplomacy,” she said. “The way she could deal with people and bring everyone on board in those tough situations... helped me learn that skill.”

For Nicole Stevenson, Vice President of Business Strategy and Marketing at Flex Automotive, “it’s not so much one specific person or one specific event, it’s more a culmination of incidents and different circumstances,” she said. “Let’s face it, automotive is kind of this old boy’s network. I think dealing with a lot of that over the years helped me grow this thick skin.... That helped enable me to be a little bit more aggressive in conversations and in my career goals, in trying to get my voice heard, insisting and pushing my way in, and making sure I have a seat at the table.”

The panelists agreed that formal mentoring programs have fallen flat for them. “I’ve been in the situations where it’s sort of orchestrated, ‘you’re this person’s mentor: That never works,” Bysouth said. “I think I’ve done best when I’ve picked... from different people the strengths that they may have. And you lean on that person when you have a situation that you know they’re particularly good at dealing with.”

“Mentoring hasn’t worked for me as specific and formal, it’s been as the situation arises,” Hoon agreed. “It’s more about who’s a friendly ear, who can I bounce ideas off of, who might’ve done it before. And again, a lot of them are friends.”

Added Stevenson, “It’s just wherever you can find help at the time, and the right person. Sometimes it’s not even work people. It’s your friends or family.”

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Career inflection points and hard decisions
All of the panelists faced a significant challenge at one or more points in their work lives, forcing them to make career-defining choices while at the same time balancing work and family.

Shortly after Allen joined International Automotive Components Group, the company asked her to move to Germany, a request that also impacted her husband and two school-age kids.

“At first it sounds like a great adventure, and then you realize the task you’ve signed up for,” she said. “It was hard. There were days I’m like, ‘why did we do this? I’m getting a plane ticket, we’re all going back.’ But from a family perspective and work perspective, I learned more than I could ever really quantify.”

Bysouth also agreed to take an ex-pat assignment in Germany for Johnson Controls when her kids were just 2 and 4 years old. But the country had little infrastructure for families with two working parents.

“It was personally a challenge for all the reasons that Alicia mentioned. But it set me up to take on the top role in procurement and supply chain at JCI,” she said. “Both personally and professionally, it was a total game changer for me. And again, it took a leap of faith. It was not easy, but it was extremely rewarding.”

KPMG offered to make Hoon a partner if she would move from Houston, where she and her husband had settled with their 2-year-old into a balanced and happy life, to Philadelphia. As a couple, they determined that becoming a partner would set Hoon up for greater opportunities going forward. Then, once she agreed, she found out she was pregnant.
“It was a really tough year. But looking back, it was the best thing we did. You’ve just got to work through it,” she said.

Stevenson also took a chance to move to Germany for a promotion around the time she learned she was pregnant, a choice she doesn’t regret as difficult as it was. But a particular pivot point came early in her career when she was pulled from the lab where she worked as an engineer to join a multidisciplinary group on a difficult project. That opportunity “was totally mind blowing and really opened my eyes to all the other pieces of the business,” she said. While she loved engineering, “it was definitely time for me to make a move,” and she ultimately transitioned to roles in strategy and operations.

**Accidental role models**

Several of the women said they found themselves playing role models, even if they were unaware of it.

Allen realized it as she was leaving for a new job. “I had a lot of women say, ‘You have really set the tone for women in leadership at the company, and whether or not you knew, I was paying attention, and you’ve been a mentor.’” She was surprised. “I certainly try to lead by example, but figuring out the extent to which people were watching and learning… made me think a little bit about it as I went into the next role. Okay, be aware.”

Bysouth had the same experience of becoming a role model for other women, particularly in Germany where women in leadership are scarce. “You have to play that role, whether you’ve really signed up for it or not,” she said. “And that’s why whenever I’m asked to do things like this, I absolutely say yes, because I enjoy doing that and playing that role if I can.”

Sometimes the role is helping colleagues better understand the dynamics of the working mother, several panelists said. A lot of male executives don’t have working wives, and there are a number of executive women who don’t have children.

Allen said that most of her bosses have been in tune with the need for balance, but when they missed the point, she did not hesitate to speak up. “I’ve never been afraid to go, ‘Hold on a minute. Let me describe what’s going to happen when I leave here today,’” she said. “I think all too often women don’t speak up, because they’re afraid to do it. But I’ve never had an issue, and I’m not shy.”

Finally, the panelists fielded a question from the audience about what all of us can do differently to encourage more women to pursue math-and science-based careers, and to strive for management roles.

A number of the women on stage had parents who drove them in that direction, and they are now emphasizing the importance of strong math skills for their girls as much as for their boys. Stevenson suggested that we can point to the great women leaders we have today as shining examples of what women can achieve. “There are so many wonderful women role models out there. Look at GM right now having two top ladies on board, which is amazing,” she said. “Make sure that the kids are aware and see this is possible.”

To access KPMG’s 2018 Global Female Leaders Outlook, please click here.

To access the 2019 KPMG Women’s Leadership Study: Risk, resilience, and reward, please click here.
When Caresoft Global’s President and CEO Mathew Vachaparampil demonstrated the technology developed by his engineering company, the audience audibly gasped. Caresoft developed a vehicle benchmarking process using a high-energy scan to gain insights into vehicle design, electronic components, pricing, and more. Since launching at the 2017 Detroit Auto Show, the company has attracted over 25 global OEM customers, including several Tier-I suppliers, with its patent-pending technology.

A three-dimensional view inside vehicle engineering

Caresoft starts with a high-energy scan of a complete vehicle, “the first time that someone has used a CT scan to reverse engineer or benchmark a car,” Vachaparampil said. The equipment, originally developed for the U.S. military to check for quality defects inside bombs, is 80 times more powerful than a hospital scan.

The resulting digital imagery shows every part of the car, low-density, and high-density, down to individual screws. Density variations are used to identify the objects and materials, estimate the geometry of each part, and determine the vehicle architecture. Dimensions and geometries for some of the low-density components that don’t scan as well are examined physically.

Caresoft also developed software that allows the reconstruction and segmentation of data for a complete set of engineering data for an entire car. “Our objective is, we take the competitors vehicle and we can give you the same data that the competitor company has itself.”

Vachaparampil and his colleague Prideep then gave a live demonstration of how to view the results in three dimensions using data prepared from the company owned Tesla Model 3. Donning a VR headset projecting onto the big screen, Prideep “dove” into the Tesla Model 3. Turning his head left and right, up and down, he provided the audience a view not only of the Model 3 interior but of the interior of the materials and components themselves, from the battery to the transmission.
Prideep then used his hands to reach out and grab components like the steering knuckle, removing it from the digital representation of the vehicle and turning it around to view the part from all sides. And because the 3D image is linked to the database, he showed that by virtually clicking on a component, all the engineering data for that part could be accessed.

“Anything that is there in the car, which is a physical object, we can see this in our high-energy scan,” Vachaparampil said. “It’s exactly what the doctor sees in the hospital.”

**The democratization of engineering data**

Vachaparampil said it costs Caresoft approximately $4 million to gather the data for a full car, which the company then turns around sells to each customer for between $300,000 and $400,000. By comparison, it might cost a manufacturer $200,000 to buy and tear down a car, but it takes time and resources for a less “intelligent” result, he said.

“The value proposition is instead of you doing it yourself and getting 2D data or just photos and weights, you can buy this data and you can straightaway put it in your PLM,” he said. “They’re not apples and apples comparison.”

In addition to the Tesla Model 3, Caresoft has analyzed the Tesla Model X and 2017 Chevy Bolt EV, and at the time of the Detroit show, it was examining the Jaguar I-PACE. “As the world is moving from ICE engines to electric vehicles, a lot of OEMs and Tier Ones and Tier Twos are interested in what it takes to build an electric vehicle and the inner workings,” Vachaparampil said.

Use-cases for the technology include manufacturing training, service, support, and even sales and marketing, he said. Vachaparampil described how Chinese consumers increasingly skip the dealership to buy online. Caresoft’s VR improves the experience by allowing buyers to examine cars in their home or office. The company also is looking to extend to web conferencing, enabling multiple parties in different locations to view 3D scans.

“I think by the end of this year, every OEM will be using our technology as standard because it’s [like] the transition from a Nokia phone to an iPhone,” Vachaparampil said. He added that he believes the technology will help bridge the gap between the leaders and the followers—and that’s a good thing. “It’s very, very powerful, and our whole idea here is to democratize the data and make it available to everybody.”
Global economic outlook—2019 and beyond

Moderator: Gary Silberg, The Americas Head of Automotive, KPMG in the U.S.
Presenters: Constance Hunter, Chief Economist, KPMG in the U.S.
Emily Kolinski Morris, Chief Economist, Ford Motor Company

Chief economists Emily Kolinski Morris and Constance Hunter took the audience on a quick tour of key markets and trends with the potential to impact the automotive industry.

China in 2019, a tale of two halves

Chinese auto sales have been declining on a year-over-year basis for the first time since 1989–1990, back when their total annual vehicle sales were less than one million, according to Morris, Ford’s Chief Global Economist. The first half of 2019 is projected to remain very challenging until government stimulus kicks in and turns things around by the second half.

“The only thing I’ve learned in covering China is that it’s usually a mistake to count them out too soon,” said Morris. “They tend to have a way to pull levers and make things happen.”

However, longer-term worries exist, she added. Hunter, KPMG’s Chief Economist discussed her observations from a recent meeting with economists from across the U.S. and China that she has attended biannually for a decade.

“Our Chinese colleagues were the most pessimistic they have ever been on the Chinese economy,” she said. “There were a number of people really expressing concern that this may be a bigger set of problems than these policies can fix…. I think we might have a situation of China sneezes and the world catches a cold—or possibly even the flu.”

One key headwind is that China’s growth has been predicated upon the build-up of significant debt: nonfinancial corporate debt is up 270 percent in eight years, totaling 170 percent of GDP, Hunter said. Second, China has been trying to lower interest rates and increase liquidity, but their currency is still “virtually pegged” to the U.S. dollar and, hence, to U.S. monetary policy.

Finally, stimulative measures such as tax cuts and more bank lending will continue increasing the debt while the country’s working age population is shrinking, she said.

“We may discover that China is, in fact, pushing on a string… that these stimulus measures are too little, too late.”

Potential macroeconomic headwinds in the United States

“I think even with a modest decline [in U.S. auto sales] this year, we’re still going to be looking at a very healthy industry,” Morris said, referring to industry estimates of approximately 17 million SAAR for 2019.

The market has not been significantly oversold, compared to the mid-2000s when the federal government last raised interest rates, and the industry experienced very aggressive negative pricing and a huge supply push. “It’s a very competitive industry, everybody’s wanting to maintain their market position,” she said.
pace of growth this year, but not all those [comments] necessarily mean that you’re leading down the slippery slope into recession,” she said.

Hunter agreed, saying that we shouldn’t anchor our idea of a recession to our experience during the financial crisis, which was “extraordinary.” She added that recent research by the Cleveland Fed indicated that the longer the expansion, such as the one the U.S. has enjoyed to date, the shallower the recession. “The more people that get pulled into the labor force, the more savings that accumulate, and so the steadier and more stable the economy is.”

Hunter continued that while we are looking at a recession, consumption will not likely decline, rather, investment would decline or trade could go negative for several quarters. “But these things eventually kick back in.”

“Europe

The rejection of the Brexit plan in January 2019 wasn’t unexpected, but the magnitude of its defeat was a bit of a shock, Morris said. Ford has been planning for a smooth exit, but will maintain a scenario for the alternative outcome until there is a definitive resolution, and won’t adjust until it sees a definitive resolution. Additionally, just as in the U.S., some slowing is expected in Europe, but it’s more of a reversion to a trend than a downturn, she said. In particular, the U.K. industry has not seen significant declines, and German auto manufacturing is doing pretty well despite some exposure to China.

Regarding Brexit, “My gut on this is that the EU is kind of like the Hotel California. You can check out anytime, but you can never leave,” Hunter said. On the one hand, she said she thinks that “somehow, someway, they’re actually not going to leave, but I’m pretty scared that the alternate scenario could occur. So certainly do what Ford is doing, and keep your scenario planning active and vigilant.”
How autonomous delivery vehicles will transform our world

Moderator: Tom Mayor, National Strategy Leader, Industrial Manufacturing, KPMG in the U.S.

Panelists:
Katherine Black, Principal, Strategy, KPMG in the U.S.
Todd Dubner, Principal, Strategy, KPMG in the U.S.
Bala Lakshman, Managing Director, Strategy, KPMG in the U.S.

In “Autonomy delivers: An oncoming revolution in the movement of goods,” KPMG discusses how autonomous vehicle (AV) efficiencies will allow delivery timelines to shift in response to consumer demand for speed from next-day to same-day to, ultimately, same-hour.

KPMG strategy and retail professionals brought that discussion to life on stage at the Detroit Auto Show, exploring the rise of specialized autonomous delivery vehicles designed to reach the last mile.

Removing the cost of the delivery driver
The average number of shopping trips per U.S. household dropped to approximately 380 in 2018 from 480 in 2009, while online shopping now accounts for 9 percent of U.S. retail sales. The pressure to deliver all of those online orders the next day or on the same day already tests the efficiency and resources of traditional retail models, and growing demand for same-hour delivery only increases that pressure.

“The largest players are faced with the reality that if they don’t have an offering that appeals to the customers and competes effectively with newer online entrants, they’re going to lose the share,” Katherine Black said. “And at the same time, they’re faced with having to invest in all the infrastructure that it takes; delivery is an even more substantial investment.”

Today, a number of retailers try squeeze out some delivery costs by aggregating demand and bundling multiple orders. They can’t afford their own customized delivery services on such thin margins.

“It’s all in and out, there is no drop density. There is no ability to make the driver and that vehicle efficient, so what do we have to do?” Tom Mayor asked. “We have to take the driver out.”

Indeed, the driver represents the highest cost in logistics, and the solution could be a driverless, small, light vehicle that can affordably shuttle back and forth, he added. “For all of you here in the room, there’s potentially a massive market for small delivery bots that can affordably get me all kinds of products, in the time that today I get a pizza.”

“Groceries on wheels”
Delivery logistics are only becoming more complex, according to Todd Dubner. He asked the audience to consider the number of packages delivered each day, and then given the increasing urgency of delivery, how to bundle and simplify routes. Delivery vehicles that can meet all these requirements efficiently, effectively and affordably will have to be structured differently.

“The vehicles will likely get smaller and smaller, until they are truly autonomous and... well, we think, they probably
Manufacturing light commercial AVs
At approximately $2,000 apiece, delivery bots today are “extremely cheap,” Lakshman said. Because there are no requirements to carry or protect a human, these simple machines require only a lightweight electric motor and a guidance system, with an operating cost of approximately 5–10 cents per mile.

However, “The jury is still out as to whether it’s going to be an OEM’s play or a new entrant,” he added. Auto manufacturers have to guard themselves against trying to over-engineer for long-lasting vehicles that can handle significant mileage and weather, while upstarts produce a vehicle that may be suitable for limited geographies and have shorter lifespans but are so inexpensive they have a stronger appeal.

Black added that the latter makes sense in the consumer-driven retail industry which, by its nature, requires customization. “You can design sort of a one-size-fits-all [vehicle], which is probably where the market is today. But I would imagine that ultimately that’s going to need to be much more specialized with quite a bit of variety in it, and much tighter integration with the [retail] business models.”

Economics and delivering the last few feet
Quick, autonomous delivery can get down to between 40 and 50 cents per delivery assuming Dubner’s “groceries on wheels” lightweight and inexpensive frame that makes continuous trips of five miles or less. “Those kinds of economics, if you’re asking me for a dollar to get [my delivery] in two hours versus get it tomorrow, we think drives that demand,” he said.

Still, retailers are challenged to deliver all the way from the warehouse into the customer’s hands, a harder proposition with autonomous technology. Amazon already proposed gaining access to customer homes, but other technologies are still evolving.

“These are the questions that I think are also creating big opportunities. Innovating the last couple of feet can give a competitor an advantage,” Dubner said. “That’s where a true system provider that helps coordinate from the fill of the delivery vehicle to the empty of the delivery vehicle, and the coordination of the logistics from point A to point B, may have an advantage.”

To access this panel presentation, please click here.
To access the KPMG whitepaper on this topic, Autonomy delivers, click here.
Reinventing the wheel—
Autotech Council
innovation review

**HAAS Alert**

“A major safety problem on our roadways desperately needs the attention of the automotive industry,” according to Jeremy Agulnek, Vice President of Connected Car, at the start-up. “HAAS Alert is all about making our roadways safer for everyone.”

First responders and civilian motorists in the United States are involved in nearly 100,000 collisions with each other every year. In fact, first responders are at a greater risk of death and injury while traveling to an incident scene than at the scene itself. Construction and other workers on the roadway are also at risk, especially as distracted driving has increased with smartphone usage.

HAAS Alert leverages cellular networks to send data into what HAAS calls a “Safety Cloud” when a police, fire, or other fleet vehicle activates warning or emergency lights, Agulnek explained. HAAS then intelligently processes that data and sends an alert to drivers in proximity to the emergency or other vehicle. The technology is sophisticated enough to not simply provide a radius-based alert, but rather, it can analyze the trajectories both the motorists and an emergency vehicles are taking, alerting only those drivers whose paths may intersect within 30 seconds.

HAAS Alert is live today for the 25 million users of the Waze GPS and traffic application, “but getting into Waze and other mobile apps is literally just the starting point for us,” Agulnek said. HAAS Alert seeks to incorporate
its data into the vehicles themselves, where the alert can be provided any number of ways to the driver, such as displayed on the navigation screen and through audible notifications.

This integration is important as vehicles become more autonomous, he added. “By delivering an alert 10 to 15 seconds ahead of that possible collision point, the autonomous vehicle system can make a safer and smarter driving decision, and even reroute itself automatically around a hazardous situation.”

Beyond helping drivers, components of smart city infrastructure such as traffic signals and streetlights also could benefit from HAAS Alert’s real-time data and analysis, Agulnek said.

**Humanising Autonomy**

“Our mission is to improve the safety and efficiency of autonomous mobility systems by understanding and predicting human behavior,” Humanising Autonomy cofounder and CEO Maya Pindeus explained. “It’s really about making autonomy safe for people.”
As autonomous vehicle (AV) technology develops, it’s important to consider that humans are good evaluating situations and reacting in seconds, while machines “identify obstacles, but they fail to identify all the subtleties of human behaviors,” she said. “This is exactly what we are tackling with Humanising Autonomy. We need a deep understanding of human behavior in order to be able to deploy autonomous vehicles in cities like London, New York, Detroit, Tokyo, and many more.”

Humanising Autonomy detects the full range of human behaviors using visual sensor footage, and then it applies deep learning to predict in real time what the pedestrian on foot, bike, or other mode of transportation around the motorized vehicle will likely do. Today, the company can identify and recognize more than 150 body language and other characteristics by fusing behavioral psychology and novel artificial intelligence methods.

The technology also can be used globally because it considers that citizens around the world behave differently, Pindeus said. “It’s really important to take this contextual and cultural aspect of human behavior into account. By building a modular prediction system, we’re able to tune our system to take the prediction from one city to the other with a very small amount of data.”

More than setting its sights on the AV market, “we’re tackling a human safety market,” she said. The company’s two core market streams today are Level 2 AVs and up, and pedestrian safety technology for vehicle-to-everything infrastructure systems. Clients to date have included Airbus, to improve the safety of ground vehicles across their manufacturing and production sites; Kyocera, to improve crosswalks around central Tokyo; and Ann Arbor’s public transportation authority, to complement the bus driver and improve safety.

**Ushr**

Michigan-based start-up Ushr has produced the most precise representation of the U.S. and Canadian interstate roadmap in existence, according to Brian Radloff, Vice President of Business Development and Sales.

In contrast to the competition, Ushr approaches data gathering from the perspective of a surveyor, who requires far greater geo-spatial accuracy, than a typical GPS map producer, who simply needs to represent the roadway from a visual perspective.

Ushr’s HD map is accurate within 15 centimeters, with probably 95 percent of the points on the map accurate within three to eight centimeters, Radloff said. By comparison, Ushr’s closest competitors advertise accuracy at around a meter. The map’s details also include lane markings, roadway edges, slope, and other details necessary for AV technology.

*Brian Radloff from Ushr*

While much attention has been paid to the robo-taxi and shared mobility markets, Radloff said Ushr is focused on the autonomous personal mobility market. The company launched its map in October 2017 in the Cadillac CT6 Super Cruise, a highway pilot product.

“We see the robo-taxi market as very interesting to us, but commercial deployments on a broad scale are probably still several years away,” he said. “This is a revenue path for us today, while we are still building out a map.”

Radloff added that robo-taxi vehicles are still in proof-of-concept phases, and once manufacturers prepare for mass scale deployment they will consider commercial solutions to help drive cost reduction. “We’ll be there with a map for the urban environments when they’re ready to deploy across multiple environments.” Ushr’s next phase involves mapping all state and federal highways, and then secondary and tertiary roads, by 2023.

Ushr also closed a first round of funding in November 2017 for $10 million, doubled its staff within the last year, and raised its profile. It also earned a number of awards, including the GM Supplier Innovation Award, the first start-up in history to do so.

**Karamba Security**

Karamba Security believes it has found a better way to prevent hackers from compromising vehicle safety, according to Bryan Short, Vice President —North America. WiFi, 5G, Bluetooth, DSRC, etc., are all gateways for hackers to get into the vehicle, and most companies have taken an information technology (IT) and data center approach with traditional intrusion detection, he said. But that’s like putting up a 20-foot fence with surveillance cameras between your house and the hackers, while the house is still vulnerable.

“My valuables, all my personal and professional data, might be in that house. I’m locking the doors and the windows—and that’s what we decided to do. We’re going to protect the car at the end point, and we do it on the individual ECUs.”
Karamba helps ensure the ECU or engine control unit maintains factory settings until the manufacturer makes a change or updates, spotting and shutting down attempts by malware to change the code, Short said. While IT can take days or even weeks trying to remediate a cyber attack after the fact, “we detect and then prevent the attacks from actually occurring.”

The patented process adds less than 5 percent to overhead costs, depending on the size of the code. As importantly, no change to the existing architecture is required. ISO 26262 standards for release this year include ASIL D requirements for certain autonomous and connected vehicle components, potentially driving demand for Karamba’s ISO-and ASIL D-compliant technology, Short added.

The company also has introduced additional security technologies beyond its initial ECU protection capabilities, including SafeCAN network protection allowing the hundreds of individual ECUs within a given car to communicate effectively with encryption, as well as its ThreatHive command center used to track, anticipate, and test systems against hacking attempts.
Solving the multigenerational workforce puzzle

However, the ideals of the youngest generations are often at odds with the Traditionalist firms they are joining. Lancaster suggested that if you told Traditionalist employees to jump, they might ask, “How high?” while Millennials would ask, “Why?”

“Nobody’s right or wrong, they’re just different, and we need all of them. We need those experienced Traditionalist values because they’ve got history. We need those new young ones because we need to innovate. If we can bring the two together, we can avoid some really big mistakes.”

**Baby Boomers: 1946–1964**

While Traditionalists put their faith in institutions, Boomers shook them up. Today they lead companies, communities, and households, yet retain a lot of the traits of their formative years. Many are still working because they have to, or often want to.

The events and conditions that people are exposed to during their formative years shape a generational personality that can last a lifetime, according to Lancaster. The author, professor, and counselor to Fortune 500 companies offered tactics to leverage the value each generation brings to the workplace.

**The Traditionalists: Born before 1946**

Even though few Traditionalists remain in the workplace, many of our corporate cultures are influenced by them. Traditionalist institutions are largely built on a military model, with ranks, a clear line of authority, and information that flows from the top down. In this culture, individuals are expected to be loyal and put aside their own needs to serve the greater good.

The auto industry is not alone in its struggle to successfully recruit and retain a diverse, cross-generational workforce in an era of unprecedented low unemployment.

“Everybody’s competing for the same people,” generational expert Lynne Lancaster said. “We have to figure out what it takes to connect in a unique way so that they’re going to fall in love with automotive, and they’re going to want to come work with you—and stay.”

The events and conditions that people are exposed to during their formative years shape a generational personality that can last a lifetime, according to Lancaster. The author, professor, and counselor to Fortune 500 companies offered tactics to leverage the value each generation brings to the workplace.
and mentoring, she said. And don’t wait to discuss a Millennial’s career trajectory. “It seems ridiculous to have to sit someone down and talk about career paths when they’ve been there for one month, but Millennials are already fretting about it.”

Unlike the Millennials, who were reared during the praise and self-esteem movement, cynical Gen X parents are raising Generation Z with a greater degree of honesty.

As a result, Gen Z is pragmatic about work, including their desire to avoid college debt and start their careers as soon as possible. They already have plenty of skills and experience, as many of them started their own entrepreneurial endeavors at young ages.

While many in Gen Z are still in school, companies can start reaching them now, Lancaster said.
For example, General Motors sponsors a girls’ robotics team as a great way to get in front of engineering-minded students.

“Getting them exposed to the fact that big automotive companies are interested in them—that we have a place for them, that’s key,” she said. “They’re making big decisions about careers already in high school.”

Added Lancaster, “If we can see the world through the eyes of another generation, maybe we can do better at reaching out, managing, recruiting a little smarter, and boosting our retention to be more competitive—just by being a little bit more customized to each generation.”

Generation X: 1965–1979
The media landscape exploded over the formative years of Generation X. Satellite and cable TV broadcast MTV and world events 24 hours a day, and Gen X saw every American institution that the Traditionalists had upheld called into question. They also remember their parents giving their lives to their jobs only to be downsized out, and often divorced as well.

Naturally skeptical Gen X employees want to know if their companies will truly offer them a good career and stick by them, and they appreciate straight talk and honesty, Lancaster said. “They need to know that, career-wise, we have their backs.”

Also appreciate where Gen X sits in the workplace, sandwiched between 80 million Baby Boomers clogging the top positions—“the grey ceiling”—and 82 million Millennials who demand mentoring and won’t leave them alone, she said. “Xers have really paid their dues and developed a lot of expertise, but don’t necessarily have any place to go.”

The two most important efforts employers can make for Gen Xers right now is to pay attention to their leadership career path, and to allow them to innovate, Lancaster said.
Consider leadership development programs and training, special projects, and other opportunities to increase their visibility.

Millenials are unfairly stereotyped, even though many have proven themselves in the workforce for years, Lancaster said. They already represent nearly half of the U.S. workforce and will make up 75 percent of the global workforce by 2025.

Millenials have been immersed in technology since early childhood. They crave innovation and expect the technology they use at work to be up to date. Organizations like the Pennsylvania Department of Transportation are trying to attract Millennials by showcasing opportunities to work with the latest tools, such as innovative design software and 3D printing, Lancaster said.

Millenials also had a more open and casual relationship with their Boomer and Gen X parents than those generations did with Traditionalist parents. As a result, Millennials are used to having a voice, and no topic is off limits, Lancaster said. “They’re comfortable talking to people of any level in the organization.”

To connect with Millennials, companies need to offer access to leadership, strong communications,
Adapting transportation and infrastructure for a driverless future

Moderator: Ted Hamer, Managing Director, Global Infrastructure, KPMG in the U.S.

Panelists:
Mark de la Vergne, Chief of Mobility Innovation, City of Detroit
Richard Threlfall, Global Head of Infrastructure, KPMG in the U.K.
Zachary Wasserman, Head of Global Business Development, Via—On-Demand Transit

The future of public transit requires a symbiotic relationship between traditional public services and commercial innovators to help citizens travel that last mile or two between home and job.

“Right now we’re faced with a pretty dynamic shift in the way people get around,” with bus ridership in most urban areas down 15 percent to 20 percent, impacting transit budgets, according to Ted Hamer, a managing director of Global Infrastructure at KPMG.

Meanwhile, the rise of the sharing economy is changing customer expectations, with mobility-as-a-service companies offering more paths from A to point B than the bus, on demand. All this is occurring during a significant decline in infrastructure investment and a projected increase in miles traveled thanks to shared and autonomous vehicles that will worsen congestion.

The microtransit option

The panelists delved into one potential part of the solution: microtransit, which offers flexible shared minibus or van trips on demand where and when gaps exist in bus and other public transit service.

As detailed in Accelerating mobility, KPMG teamed up with shared microtransit company Via to run simulations, and they concluded that microtransit options provide high time value of money, as microtransit is both convenient and cheap.

The data show that the average microtransit trip lasts only two to four minutes and is almost 70 cents less than bus service per trip. At an average distance of only 3–4 miles per trip, microtransit can complement the bus routes that 90 percent of customers live near, and serve a societal role as well.

“As cities talk about mobility as a service and integrating all these different ways to get around, [they] can achieve not only economic and growth outcomes, but also really important social outcomes that shouldn’t be lost on anybody,” Hamer said.

In Detroit, for example, it’s hard for a lot of citizens to get around, car insurance costs are the highest in the country, and there’s a lack of regional cooperation and investment in transit, according to Mark de la Vergne, the city’s chief mobility officer responsible for integrating new mobility technologies and services with transit and infrastructure.

“Detroit is a really good representation of the challenges with mobility and transportation, and how that can really impact an overall economy of a city,” he said. Whether it comes to employment or access to healthcare, “the inability to just get where you need to go holds people back.”
“You can’t just escape by putting drones in the sky, because capacity is going to be constrained there as well,” he said. “The effect of [adding more shared mobility vehicles] is to bring everything to a standstill in our cities. We have to counteract that by finding modern technology, and ways of creating that shared transit environment.”

Detroit takes a partnership approach to working with companies, rather than viewing their role as purely a government regulator, de la Vergne said. “This is the challenge for a lot of cities…. They’ve been doing planning or administering of paperwork and things like that, and not really thinking through how you actually take this from square one to implementation.”

Transit authorities and local governments are struggling to work out the new regulatory environment they need to put in place to bring innovation into the city without negative impacts, Threlfall said. “‘How do you get that balance right?’ is a question I’m asked almost every day, wherever I go in the world.”

De la Vergne added that companies are facing a similar struggle in trying to work with various governments and agencies “because they’re facing 95 million different regulatory frameworks across the world.”

Gary Silberg, the Americas Head of Automotive at KPMG in the U.S. and host of the conference, ended the session with some final words.

“The cities that have world-class, multimodal transportation will be the most innovative cities in the world. And the Luddites that are out there, who are trying to over-regulate and not let technology adapt, I think will be the laggards.”

Public and private transit, working together

Via already offers approximately 2 million rides a month globally, and it sells contracted transportation services to cities and transit agencies. The company is about to launch two Federal Transit Administration-funded projects around Seattle and Los Angeles, according to Zachary Wasserman, the company’s director of Business Development.

“All these different partnerships… are making the existing public transit infrastructure better for the people who use it, and we are bringing more people into the shared use mobility system by giving them a viable alternative to driving on their own,” he said.

The next problem to solve is funding, and that’s fundamentally a political question, Wasserman added. He said he expects to see one or more bills at the federal level creating new funding sources for transit agencies to own and operate their own microtransit systems, as well as some local ballot initiatives.

“In the next five to 10 years, this mode is going to migrate from the periphery of our transportation system to the core, and really become a cornerstone of our transportation infrastructure,” he said.

Cities like Detroit are interested in these types of new solutions because they can’t cover every square mile with the frequency customers are looking, even if they are investing in their transit system, de la Vergne added. For example, Detroit launched a pilot last year with Lyft to focus on the first and last miles while city buses run less-frequent late-night service.

Integrating new mobility solutions into the city

The biggest challenge is understanding how to put all the solutions together seamlessly in a true system, de la Vergne continued. Richard Threlfall, global head of Infrastructure at KPMG International, agreed, adding that that public leaders have to facilitate the entry of mobility solutions into a city environment due to capacity constraints.
A panel of auto industry reporters and editors discussed their observations on the sector, starting with their view of why 2019 feels like a recession for the industry despite relatively solid sales projections.

“Seventeen-plus million vehicles in the United States is not a recession. But at the same time, the froth and the effervescence that has been in this market since roughly 2010, 2011 has definitely flattened out,” said Joe White, global automotive industry editor from Reuters.

Auto companies have been “running recession drills,” with layoffs and plant closings as companies squeeze operations in response to tariff and trade issues, he added. “It’s definitely not as bubbly, and there are real reasons why.”

In fact, Bloomberg News declared a “car recession” just as the Detroit show was kicking off, said Craig Trudell, automotive team leader for the news organization. “A lot of the industry got caught flat footed by this massive shift from passenger cars to crossovers and SUVs.”

“What strikes me is just how much bigger and riskier the bets are that automakers are making right now,” said Joann Muller, automotive reporter at Axios. “Now you have companies completely having to change their business model, saying goodbye to things that they’ve done well for a long time. The idea that you would cut off an arm—which is sedans—is radical…. They’re doing it because they need to figure out where they’re going to put their money going forward.”

White agreed. “These companies are all facing an enormous squeeze. Wall Street, by and large, does not want them to spend more capital.” So where does the investment for autonomous technology, electrification, and other advances come from, he asked? “It comes from [reducing] jobs, it comes from getting rid of the sedans.”

Partnering for innovation

The need for auto manufacturers to efficiently pursue innovation also is leading to alliances such as the Ford/Volkswagen agreement announced during the auto show, the panelists said.

“We have to spread the risk,” Muller said. “Ford and VW in particular are two companies that have some self-inflicted wounds. They find themselves in the position of having to move quickly to shore up the core business so that they can focus on the future. First, we have to see how well they work together.”

Trudell added that the Ford/VW alliance could be a letdown if little comes from it. Regarding electric and autonomous mobility, “they really need to demonstrate that they have a clear plan, and a compelling plan that people can get excited about and not… just a checked box.”

White agreed the announcement was somewhat disappointing because it didn’t move the two companies
Indeed, EVs are only getting more expensive, Trudell said. “It’s really hard to walk out of a dealership without spending 30 grand, even on a car that a few years ago you were maybe talking about 18, 20 [thousand]. I think there’s definitely a real question of what’s going to happen without the full incentives.” He added, “I guess the question is if Tesla is able to convince everybody that a compelling electric car can be made affordably. I think up to this point they’ve proven an ability to build a really cool brand and something that is coveted, but unless you’ve got 50 grand to blow, or more…. ”

Yet automakers continue to manufacture EVs, and if they have trouble selling them without the subsidies they will simply use the industry’s “tried and true method for moving metal, which is slashing the price, adding discounts, incentives,” Muller said. “Then they will pay the price in terms of profit. That’s why I say a world of hurt is coming.”

“I do think that the car companies feel put upon, that they are bearing all the risks for this transition [to EVs],” White said. The government and politicians have created challenges by shifting their own climate change responsibilities on to automakers, “which you won’t take on your own because you’re afraid people are going to riot in the street,” while at the same time demanding manufacturers provide jobs “as kind of a national utility.”

Tesla is likely to continue to dominate the U.S. EV market, the panel agreed. Meanwhile, Elon Musk and his company have “pushed the traditional automakers to move much more quickly than they ever would have before,” Muller said, including changing the dealership model. “It might actually not be Tesla that changes that, breaks through that wall, but I do think we are going to start buying cars in a different way soon.”

The electric vehicle market minus incentives

Outside of China, automakers don’t see the support for electric cars (EVs) or the infrastructure needed to sustain sales without subsidies. “Regulation is critical to the electric vehicle market. I think we all understand that,” White said.
The future of automotive retail

Panelists:
John Jullens, Principal, Strategy, KPMG in the U.S.
Bernie Moreno, President, Bernie Moreno Companies
Cuyler Owens, Vice President of Client Services, Dealerware

Tom Mayor from KPMG

KPMG’s Tom Mayor painted a grim future for the traditional dealership model as autonomy meets mobility services, and consumers start hailing rides instead of buying cars. Consumers may keep cars with personality or purpose, but the volume of vehicles sold through dealer networks will decline 30 to 40 percent. As more advanced driver assist systems are introduced, cars will crash less, and margins on collision part pass-throughs to body shops will shrivel. Increasing transparency in the used car market driven by disruptors like Carvana will shrink margins there as well.

The panel discussed these pressures and how auto manufacturers and dealers can begin to adapt to the new market reality.

Understanding disruption and customer centricity

“I think right now the most pressing issue against the car dealership model are the car companies themselves,” according to Moreno, a multi-dealership owner.

There exists a disconnect between how auto companies view and manage their dealership network and the reality of disruption from new technologies and competitors, he said, with too much focus on the showroom and not enough on customer demands. “Imagine you’re Blockbuster Video in the 1980s and early 1990s, and their answer to Netflix is to have brighter, newer stores that are getting remodeled every five years.”

In fact, Netflix is a great example of a company that disrupted by organizing around the consumer experience, according to Owens from Dealerware, a modern fleet-management platform heavily focused on mobility solutions.

Today, the consumer view of car shopping “is one that almost brings up dread and fright, and walking in to have the interaction is more and more something that folks are trying to avoid,” he said. Dealerships need to respond by meeting the customer where they are and finding ways to deliver on exactly what they are looking for, instead of just providing the traditional, “prepackaged” dealership experience.

Shifting the dealership model

Traditional dealerships contain multiple, independently operated businesses with very different economics under one roof, a low-margin operation requiring a fair amount of investment, KPMG’s Jullens said. They’re facing estimated price declines of over 2 percent a year from an already low point, and regression analysis suggests that, if the current trend continues, there may be no margin left by 2025. Meanwhile, mass adoption of electric vehicles over
what Tesla does: three different models, three different trims, colors—beep. That’s it.”

Owens discussed the need to get as close to the customer as possible, something his small startup can do serving the dealerships. “We can understand what they’re asking for and design around that quickly,” he said. As consolidation demands that large manufacturing organizations give dealers a larger role in ensuring customer centricity, “it’s figuring out a way to have those organizations flatter, more accessible, and giving the dealer body a voice.”

Digitization will be key, but obsession with maintaining a brick-and-mortar presence stands in the way, Moreno said. “If I operate a dealership, the expectation of manufacturers is that I’ll spend $500 to $1,000 for a website…. but they want to spend the equivalent of $800,000 or $900,000 a year for a facility. It’s perverse. Imagine if it were reversed. What would the consumer really prefer, if the car companies invested that kind of money in technology to make the retail buying experience frictionless?”

In the short term, automakers need to determine if they will continue to invest in smaller dealers, while at the same time ensuring larger dealer groups continue to offer their brands as part of their portfolios, Jullens said. Longer term, manufacturers need to consider alternative scenarios and determine how they will fit in, including collaboration with potential new competitors on data analytics and other innovations, he added. “Because if you don’t, they will. They have the capital and the wherewithal to do so, and they might just beat you to it.”

Next steps for manufacturers

Moreno suggested that manufacturers should view their retail distribution as a strategic advantage and set their dealers up for success by addressing customer pain points, for which they are primarily responsible.

“They come up with these [incentive programs], and the crazier and nuttier and more complicated, the more they feel like they can stand out. As a result, you’ve got this Rubik’s Cube of nightmares out there on the retail distribution side,” he said. “What do consumers really want today? They want simplicity.”
Because the U.S. had the highest statutory tax rate in the OECD, Congress wanted to change the behavior that this rate has encouraged—a wave of inversions, IP migrations, and U.S. companies finding it harder to compete on assets and bidding on assets against their foreign competitors. The bill lowered the federal corporate income tax rate from 35 percent to 21 percent, bringing the rate closer to the median for developed economies.

Historic precedents
Gimigliano enumerated a number of historic precedents and changes marked by the passage of the TCJA, many of them partisan in nature. “Republicans saw an opportunity to do a once-in-a-generation tax bill, and they did it. And they didn’t really worry about whether Democrats were onboard.”

This was similar, he said, to the passage of the Affordable Care Act by Democrats during the Obama administration, where the party in control was able to support a long-term priority without the need for bipartisan support.

Another new precedent was Republican tolerance for higher deficits. “Republicans didn’t blink about adding a trillion and a half dollars to the deficit. A tax cut of that magnitude ... is kind of new ground for Republicans.”

He noted that Republicans were also willing to provide more tax cuts for businesses than for individuals. “That, again, upended conventional wisdom.” In addition, he pointed out that Republicans made the corporate tax rate and other benefits to business permanent while the individual provisions are only temporary. “They could’ve easily reversed those.”

Another precedent was Republican attitudes about dynamic scoring to measure the impact of proposed tax legislation. “After the score that they got, I don’t know that they’re going continue to push that,” he said. The possible “weaponization” of Congressional parliamentarians to block proposed legislation was also a new development.
Perhaps the most important precedent involved lobbying. “Speed kills lobbying,” Gimigliano said, explaining that from first review of language to sending the bill to the president for signature was only 47 days. “This bill was done so fast that the lobbyists could never really lobby it. That was not an accident.”

Where do we go from here?
Gimigliano was clear that changes are coming for the TCJA. Additional explanation and clarification will be included in a “Bluebook” published by the Joint Committee on Taxation. Some areas will require enactment of additional law; technical corrections may be needed to clarify the law where Treasury does not have adequate authority; and substantive changes may also be made to the law to clarify, correct, or modify the bill.

However, most changes in taxes between now and 2020 will be driven by politics. As Gimigliano explained, tax policy and politics are the really same thing.

“You can’t distinguish from politics and policy. They all blend together. Policy is meaningless without politics, and politics is meaningless without policy.” He added that Democrats now “control the agenda,” in the House. “They’ll be able to pass whatever they want.”

But in the Senate, Republican Chuck Grassley will serve as chairman of the Finance Committee. As a result, Gimigliano doesn’t expect a lot of new tax changes to emerge from Congress between now and 2020.

Despite the current partisan divide, however, Gimigliano was optimistic that a number of measures might attract support from both parties.

For example, new legislation might include the Retirement Enhancement and Savings Act (RESA), a bill designed to increase access to retirement accounts among small businesses by making it easier to join open multiple employer plans (MEPs). Discussions might also include IRS reform bills, and tax extenders (now retiring) related to healthcare, the CFC look-through rule, and TCJA items. An infrastructure bill might attract bipartisan interest, although there is currently no agreement as to funding, middle-class tax cuts and other improvements to the TCJA might prompt other actions.

Gimigliano was also confident that the Democrats will pass a House bill in response to the TCJA. Even though they know that it wouldn’t get though the Senate, it would still serve as a public and very political statement about their beliefs and why the voters should give them complete control of Congress in 2020.

He added that if indeed the Democrats have a clean sweep in 2020, the new president still wouldn’t be sworn into office until January 2021, and a new tax law would probably take a year or more to write and be enacted. “We’re probably talking 2022 or maybe even more realistically, 2023, until we could see some major changes in the TCJA.”

For more information on Tax Reform, please visit here.
Regulatory update and discussion

Moderator: Ron Dabrowski, Principal, Washington National Tax, KPMG in the U.S.
Presenters: Sarah Boss, Assistant Director, International Tax, General Motors
Steve Jenks, Tax Attorney, Ford Motor Company

“Just the beginning”
Dabrowski suggested that the TCJA’s regulations are really only opening bids. “Everything is still in progress.”

The preambles in the regulatory tax packages are more like a part of legislative history—intent, versus specific regulatory language that comes later on. “It’s still going to be a fairly long process before we really understand how all of these rules play together,” he said. “And I think it’s going to be a learning process for Treasury as well on the guidance front.”

The “fun part,” Dabrowski added, is that “the preambles don’t really line up that well, or oftentimes don’t line up… with the language of the proposed regulation itself.” The regulators often riff on their general thinking, which is why “the preamble sounds like a much broader rule.”

For now, Dabrowski said he expects more questions than answers as government regulators use the drafting process to try to figure out what to do, often taking the most conservative position and waiting for the comments to roll in. That’s why proposed regulations generally come out harsher, but with comments, the regulations “get softer.”

Foreign tax credits and BEAT
GM’s assistant director of International Tax, Sarah Boss, said that the new regulations are going to make tracking and calculations related to foreign tax credits (FTC) extremely difficult.

“We now have all of these different categories … It’s still not entirely clear to me how you deal with tiering when you have multitier structures, and how you now deal with all of these different categories going forward,” she said. New software could provide some relief, Boss added. “I’m hoping maybe that we have some systems that come out that can assist… but it’s certainly going to be a compliance challenge in future years.”

Meanwhile, Dabrowski took a critical stance regarding the TCJA’s base erosion and anti-abuse tax (BEAT). “I think they pulled punches in the whole BEAT world.”

He acknowledged that regulators are drafting new language that takes “a much bigger view” of profit shifting overseas by corporations to avoid taxes. But he felt that this effort is being mitigated by the need to balance a number of policy issues. As a result, “the regulations have a mixed bag for taxpayers.”
**Living with tax reform**

The speakers touched on a broad array of technical topics such as GILTI and anti-abuse rules, 965, Section 163(j), and anti-hybrid regulations. But the day’s conversation also included an assessment of how the TCJA is affecting tax professionals and their industry on a day-to-day basis.

“The rate reduction is very good. The ability to repatriate cash more easily has been very good,” Jenks said. He also noted that the sheer complexity of the new regulation has only served to increase the need for tax professionals. “I would say their jobs are pretty safe. The complexity is just multiplied.”

“We think it’s good for the industry,” Boss agreed. “We think it’s good for our consumers, which means it’s going to be good for us.”

While the issues have been much more complex than she and others were anticipating, “that’s just served to highlight the value of the tax department to our business and to our management. I think the international tax group has become more important than ever.”

Boss added that the TCJA has actually contributed to career growth for tax professionals.

“These opportunities don’t come along very often. It’s been great for our staff, great for development,” she said. “Overall, I’ve been having a blast.”

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**Impact on tax operations**

Dabrowski asked the panelists how the new regulations and proposals have changed tax operations in their daily jobs. “Do you see your jobs, your tax department... evolving to meet this, or was it a track you were already on?”

Ford’s response includes an effort to improve automation in their compliance process, according to Steve Jenks, their tax attorney.

“This is a path we need to continue to follow,” he said, citing new levels of complexity in addressing compliance issues. “It’s like with the FTC. It’s just mind boggling.”

Boss said that General Motors has already seen several changes in response to the new regulations.

“Modeling has become even more important, given how these provisions all interact with each other. You have to have your hands on the data and be able to quantify it, and quantify it quickly,” she said.

“I’d say we interact with our business more than we ever have, particularly with the BEAT provisions,” Boss added. “The last thing you’d want to have is a surprise, so we’ve really had to make sure we’ve got a good solid forecasting process, and we understand trade flows and legal entities more than ever.”
Today’s tax departments are rapidly evolving to address new regulations and growing complexity, according to the panel of KPMG tax advisers.

A technology-first holistic approach
Citing a recent survey by KPMG of 300 Chief Tax Officers (CTOs), BTS Partner David Leiter said that three quarters of respondents are “bullish about growth and growth of the company.” While positive, this means increased work for tax professionals who are expected to do more with less. Meanwhile, the vast majority of respondents, 90 percent, said they are changing the way they do tax planning because of tax reform.

As such, technology plays an increasingly important role in the tax function, he said. “As our organizations become connected enterprises, the stakeholders who work with tax are going to want responses instantly. Saying, ‘I’ll get back to you tomorrow’ is not going to be good enough.”

However, less than half of survey respondents reported that their tax function is keeping up with the rapid evolution of technology. One of KPMG’s solutions, Tax Reimagined, is a technology-first holistic approach designed to reduce costs, optimize quality, and uncover value, Leiter said. KPMG invests more than $100 million a year in tax technology through Tax Ignition, a multidisciplinary resource focused on tax transformation, as well as through other means. This technology investment is being used to design operating models for the tax function to help realize both immediate and long-term benefits.

For example, many companies aren’t claiming the research tax credit even though it could amount to seven or eight figures of permanent tax savings, he said. “Why aren’t they doing it? Well, they can’t get to the data needed to defend the claim. With data enablement, now you can do that—you can unlock that value.”

Potential with blockchain
Novoa, a partner in Global Tax and Transformation, focused on how technology is—and is not—used by tax functions today. According to the KPMG survey, only about a third of CTOs say they are receiving timely insight on the impact of technology or using data analysis to make informed decisions, “categorically a low amount.”

Whether it’s reporting, compliance, or another area of CTO responsibility, “every one of these work streams...relies on the data of the enterprise in order to get it done,” he said. As such, 79 percent of CTOs say they are receiving timely insight on the impact of technology or using data analysis to make informed decisions, “categorically a low amount.”

As such, 79 percent of CTOs say they are receiving timely insight on the impact of technology or using data analysis to make informed decisions, “categorically a low amount.”

“Everybody in tax relies upon the data to drive what they do,” Novoa said. With data enablement technology, tax professionals can import data from worldwide global systems, supported by tools such as QlikView and Tableau to enable quick analytics.
At the same time, blockchain technology innovation holds significant potential for the tax function, he said. Blockchains are a way of ordering and verifying transactions in a distributed ledger, where a network of computers maintains and validates a record of consensus of those transactions based on an encrypted audit trail.

Within tax, blockchain can help ensure that transactions are accurate for counterparties while preventing access, deletion, or the corruption of information by bad actors. Blockchain-enabled “smart contracts” are stored and replicated on the system and supervised by the network. Any third parties in a transaction, such as an auditor or a bank, have direct visibility to it in real time.

Blockchain “is fundamentally changing how certain businesses can be done,” Novoa said. “It erases the inefficiencies, and it eliminates risk of tax overstatement due to the fact that you didn’t collect the right markup.... If you’ve ever been burned on getting penalty and interest for not reporting the right amount due to the fact that the transaction captured in the existing technology wasn’t right, the blockchain makes great sense.”

**The sourcing continuum**

BTS Partner Herschman provided an assessment of how corporations are sourcing their tax and finance resources with solutions ranging from full internal staffing to comprehensive lift-out solutions in an effort to address a host of issues.

“We’re spending a lot of time with departments of all sizes, in all industries, with all different levels of global footprints assessing their internal needs and the problems they’re facing,” she said. Many clients are having significant staff turnover at the lower level as well as technology issues based on outmoded technology. “All that impacts their efficiency.”

Herschman stressed the importance of workshops to uncover the details. For VPs of tax and above, “you may think you know what your people are doing, but you don’t really know until you start asking,” she said. Different employees might be pulling data from different areas with different methods, for example. “When you start to lay out those step-by-step items, it can be eye-opening to what’s going on in the department and what's really frustrating to them.”

Looking at the broad picture, Herschman said that maybe 15 years ago, the tax function was viewed as being either an in-house or outsourced solution. Now, there is a lot more play in between. KPMG has made investments in technology and can share innovation with clients without license fees. As a result, she said, “that kind of midpoint of co-sourcing has become a much more popular option for people to consider.”

To access this panel’s presentation, please click [here](https://www.kpmg.com/).
Caught in the trade war crosshairs

Trade has overtaken tax reform as the hot topic in the auto industry, according to Steven Davis from KPMG’s Value Chain Management practice. He, and Doug Zuvich from KPMG Trade and Customs, led Steve Gardon, Vice President, Global Indirect Taxes & Customs at Lear Corporation, and Everson Ascencio, General Director—Global Customs at General Motors, in a discussion on the details of the latest tariffs and trade deals affecting the sector.

The shift toward protectionism

“Some in the U.S. see liberal free trade policies as negatively impacting the U.S. economy,” Davis said. As a result, large multinational trade deals like the North American Free Trade Agreement (NAFTA) have been reconsidered.

Ultimately, trade wars and tariffs are just tools in the fight between the two largest economies in the world, he added. China is turning its attention from excelling as the low-cost, high-volume manufacturer into a tech leader, and the U.S. has had to increase its focus on protecting its intellectual property. “There’s a tariff discussion going on, but this is really about who is going to be the next powerhouse in technology, and a fight over 5G.”

“Trade is now a policy lever,” Zuvich agreed, providing an overview of U.S. tariffs, including sections 201, 301, and 232, as well as global retaliatory tariffs and negotiations around exemptions. Global trade tensions are expected to remain elevated, and steel and aluminum tariffs will likely stay in place through 2019 as a means to get countries to the negotiation table.

Indeed, the U.S. administration remains inclined to levy steep tariffs on imported autos and auto parts as a threat to force Japan and the European Union to negotiate, Zuvich added. However, as of the Detroit Auto Show, these tariffs were not likely to move forward in 2019 because of staunch opposition from the U.S. automotive industry and a lack of support among Republicans.

“Even if there’s a change in administrations, it’s entirely logical to say that the policies—at least with respect to China—would remain as is,” Gardon added. “They’re going to evolve, but I think the protectionist stance is going to remain.”

Mitigating the impact of tariffs

Once OEMs and suppliers assess the true economic impact of tariffs on their organizations, they can try multiple routes to try and reduce the impact, Davis said. These include pure trade strategies, changes to supply chain operations and/or potentially passing costs on to suppliers, vendors or even customers. How far companies may be willing to go of course depends on how material the impact is and how long it’s expected to last.

Other upstream considerations include understanding the countries of origin for materials import, how materials are classified, whether suppliers can be switched, and the global manufacturing, logistics and distribution footprint.

Changes can also be made downstream, but not without possible commercial impact, Davis said. “If you increase your price, it’s likely to have an impact on market share; and
it may have an impact on brand.” Changes to operations and transactional flows also can introduce new tax liabilities. “You don’t want to solve your tariff issues and create tax issues.”

The impact of the 232 steel and aluminum tariffs varies significantly by company depending on their mix of products, inputs, and materials sourcing, Gardon said. And because domestic steel prices also have risen to the level of foreign tariffed steel, companies that source only from the U.S. are still impacted greatly.

Meanwhile, 40,000 exemption applications have been submitted, but the process requiring detail on a product-by-product basis is “torturous,” he added. It’s unpredictable, political, and the domestic industry has an opportunity to argue against the petitioner. On the positive side, the tariffs related to Mexico and Canada are a short-term issue likely to be resolved by the United States-Mexico-Canada Agreement (USMCA).

Alternatively, 301 tariffs related to China represent a long-term issue, necessitating new sourcing options requiring certification of supplier locations, Gardon said. “People are coming around to the view that this isn’t going away, and the model of sourcing from China for use and production in North America...is going to remain less attractive.”

**Complexity introduced by USMCA**

In general, USMCA modernized what had been NAFTA, but the benefits to individual manufacturers vary, Zuvich said. “If you’re a U.S. OEM, U.S. supplier, you’ve got more complexity, but you’re probably in a better position than another company that has to import engines or other significant parts of their vehicles.”

The regional value content (RVC) requirement for OEMs is rising to 75 percent from 62.5, making it harder to qualify for duty-free treatment. The tracing list to track the value of certain parts was eliminated, complicating matters. Certain core parts must originate in North America at 75 percent; 70 percent of the steel and aluminum purchased by the producer has to be North American; and 40 or 45 percent of the labor value content (LVC) has to earn $16 dollars an hour or higher, excluding benefits.

For suppliers, three tiers determine how much has to be regionally sourced, from 75 percent for core items like the engine and car bodies, to 70 percent for tires and other principal auto parts, and 65 percent for complementary parts such as wire harnesses, as examples, Zuvich said. “Determining the impact is not easy because not everyone has visibility into where all the suppliers are getting their parts.”

The OEM’s impact and process is very similar to the supplier, Ascencio said. Although OEMs aren’t obligated to comply with LVC, RVC requirements will make the qualification of passenger vehicles and light trucks more difficult because it requires more averaging across the board. “The amount of requirements and the complexity to getting there is going to be huge, [requiring] a significant amount of administrative technology to support us.”

Steel and aluminum requirements should not pose any issue to U.S. OEMs because they largely source from North America, Ascencio said, adding that GM, for example, manufactures core parts like engines and transmissions locally. “We don’t see the cars being manufactured here in U.S. being really affected on this requirement. It looks like it was more of a link for 232, and to push a little bit for the USMCA to have this kind of requirement,” he said. However, for Japanese and European OEMs that import a significant number of transmissions and engines, qualification will be an issue. “They need to invest more in auto parts or localize more here for sure.”

Ascencio said he thinks some companies will relocate their supply chain or manufacturing plants so that U.S. companies would supply U.S. OEMs, Mexico to Mexico, etc. But because most OEMs already largely self-produce core content such as engines and transmissions in the U.S., qualification for those parts should be even easier under USMCA than it was under NAFTA.

Finally, U.S. and Canada production should meet the LVC requirement, he said, but Mexico production may prove to be more of a challenge.

The USMCA side letters exempt vehicles from Canada and Mexico into the U.S. from section 232 tariffs, Zuvich added. “Companies feel pretty comfortable right now that that’s not going to impact those vehicles, so they can keep their manufacturing in Canada and Mexico.”

From the supplier’s perspective, the USMCA is clearly stricter, regardless of category, and requires more North American content to qualify, Gardon said. As such, OEMs and suppliers will have to source more parts from North America and face an increased compliance burden.
A panel of KPMG tax and advisory professionals, moderated by KPMG’s Managing Director of M&A Tax, Katy Chapman, led the Automotive Executive Forum audience through a lively discussion about joint ventures, tax strategies, and driving value in partnerships.

Lenny LaRocca, a partner in Financial Due Diligence, expects 2019 will be an exciting year for deals in the automotive sector.

“What we’re seeing in the market right now is a lot of really cool joint ventures and a focus on the future of mobility,” he said. However, he also was quite candid about potential issues and challenges that the automotive sector is waking up to. “In order to play in the future, it’s going to be very expensive.”

As such, the deal market has become more energized among core automotive suppliers such as in steel, casting, and plastic injection molding, LaRocca said. Companies are looking to do everything from consolidating their footprint to growing internationally and expanding their customer base, as well as increasing their product portfolio.

However, there has been a struggle to launch new technologies and well as absorb tariffs, among other issues, “so we’re seeing some distress in the space as well,” he said. “That’s all leading to transactions, and I think there’s going to be more to come in the next year or so.”

Deal activity today isn’t always leading to an expected return on investment, LaRocca said. “There’s been a lot of M&A that doesn’t really generate the value that people really were hoping for,” and companies are truly starting to address that shortfall. They are asking more questions about potential synergies and performance improvements in the due diligence phase.

“When they go into do a deal, it’s not just a traditional, ‘let’s kick the tire, let’s do the due diligence, let’s figure out where the risks are.’ It’s really turning more focused on ‘how are we going to really create value with this transaction?’”

**Benefits of a tax partnership**

Phillip DeSalvo, a principal in M&A Tax/Partnerships, noted that about twice as many partnerships than corporations are being created in the U.S. today, and he offered three reasons why these flow-through entities are popular.

The first benefit is flexibility in issuing varying types of equity interests to sponsors or management. “It’s a little easier to get into a partnership,” he said, noting that corporations have to meet certain control requirements to create a tax-free organization that don’t apply in the partnership context. “Pretty much at anytime you can influx new cash, new assets, whatever you need in the joint venture, and there’s typically no tax to the contributing party.”
The second benefit is that during operations there’s only one level of tax. “If you have two corporate taxpayers, that benefit is a bit muted, but in your typical context when you have private equity that’s investing in partnerships, it’s really beneficial to have that one level of tax,” DeSalvo said, adding that corporate parties can strip out cash, so tax is deferred.

The third benefit involves disposition and increased value delivered to the buyer. “A buyer gets to use a step-up to offset tax income in the future, and therefore...the buyer is willing to pay a little bit more for a partnership than it would for a corporate entity,” he said. Generally, a prospective buyer will pay a premium for the ability to obtain a stepped-up tax basis in the acquired assets from, for example, corporate asset sales, partnership asset sales, or the sale of partnership interests versus a sale of corporate stock.

DeSalvo also cited a number of common risks for operating partnerships, such as inaccurate historical tracking of I.R.C. Section 704(b) and tax capital accounts. In particular, when the partnership owns I.R.C. Section 704(c) property, detailed tracking of the capital accounts is necessary to properly allocate items among the partners.

Other risks involve the issuances of profits interests or options; non-pro rata contributions by partners and non-pro rata distributions from the partnership; and the so-called “mixing bowl” rule that prohibits one partner from putting an asset into the partnership and then sending that asset out to another partner.

**Foreign tax credits**

Ron Dabrowski, principal, Washington National Tax, discussed new issues involving foreign tax credits and global M&A. He noted that since U.S. multinationals are subject to a worldwide tax base, assets that are invested or transferred through transactions create a ripple effect across various tax regimes based on domestic and foreign tax codes. A number of these provisions have cliffs and clawbacks; BEAT can be a concern; and taxes or expenses might not be deducted. Companies need to question how they could be impacted.

“Can you actually achieve the goal that seems to be out there and the opportunity that’s out there? And then certainly for domestic but more for international deals [is] the risk element. What are you actually buying in terms of tax risk? What are the company’s postures around the globe?”

Dabrowski said that the market is showing more variability on both the buyer and seller side, with more potential outcomes based on tax. “I’m selling to X and I know X and they have their attributes, but if I’m selling and I don’t know who the buyer is yet [or I’m dealing with] different buyers and different perspectives, the deal will happen differently because of tax and tax planning.”

He concluded by noting that the challenges of current audits, changes in tax law, and greater due diligence were all being addressed in the face of increased pressures to do more deals, faster. “It’s all sort of on the table, and as much as anything, this becomes a prioritization exercise in this period of uncertainty and tax.”

To access this panel’s presentation, please click here.
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