

The convergence of the technology and automotive sectors



The following is a summary of a moderated discussion with KPMG's Mark Gibson (national sector leader, Technology, Media & Telecommunications) and Gary Silberg (global sector leader, Automotive) on how technology will continue to impact the automotive sector. It has been edited for length and clarity. The full conversation can be heard [here](#).

Did it surprise you that the KPMG global semiconductor industry outlook indicated the automotive sector would emerge as the second most important revenue driver over the next year?¹

Mark Gibson: When you listen to what the semiconductor executives are telling us, it is that the automotive sector is in the fast lane when it comes to driving revenue. I wasn't overly surprised. For years the wireless category has been considered the most important revenue driver for the semiconductor industry. But what came out this year is that respondents are really, really focused on the automotive sector. Predictions by KPMG are that over the next couple of decades, the automotive semiconductor market is going to reach \$200 billion annually,² which is astounding. So clearly, the intersection of tech, semiconductors, and automotive is at the forefront.

Gary Silberg: We have been talking about this for a long time in automotive. As an auto guy, I think about the car going 80 miles per hour at minus 20 degrees or plus 120 degrees. It has like 90 semiconductors, hopefully working at the same time so you can both drive your car and do amazing other things. So, yes,

this is a supercomputer on wheels and the market for this is only going to grow massively. And if you can't get the chips, you can't get the cars, as we have unfortunately learned. This merger between auto and tech is quite amazing.

Mark Gibson: These highly technical, tiny little chips went largely unnoticed for decades, and now they have become household names. They are just in everything. I think we're arguing in the tech sector that semiconductors are the most critical component of a rapidly digitized global economy. And that is certainly the case in the auto sector.



¹ Global Semiconductor Industry Outlook, KPMG LLP, 2022

² Automotive Semiconductors: The new ICE age, KPMG LLP, 2019 [Editor's note: subsequent to this discussion, new KPMG analysis predicts the automotive semiconductor market will be worth \$250 billion annually by 2040.]

What are you seeing when it comes to autonomous technology being used to deliver goods?

Gary Silberg: The National Highway and Traffic Safety Administration recently announced they will allow for driverless vehicles with no steering wheel or brakes, which is a huge step for autonomy. They will be popping up, mobility as a service, throughout the country. I think you are going to hear more announcements next year and the year after, and then autonomous delivery of goods. The big retailers are starting to get autonomous delivery. Although not tomorrow, they are starting these deliveries and pilots in many cities.

I thought, Mark, you were spot on because it's these chips that allow you to do everything we just described. It's from the minute you walk into the car to all the infotainment that you're going to be getting. And I want to talk about all the safety systems that you have from braking to the autonomous area. Obviously, the

software sits on it. These are massive super computers on wheels. Maybe, Mark, you and I can talk about what gets done in the cloud and on the edge.

Mark Gibson: What's interesting too, Gary, is from the tech sector, there are lots of big tech conferences and how much of the agenda is focused on automotive and autonomous driving, and self-driving delivery. When you go to the Consumer Electronics Show, which is all the cool stuff, what's amazing is the prominence of the auto sector. It's not just the R&D shops of the car manufacturers anymore. It's all of Silicon Valley and the tech sector as well. And the amount of private equity funding and venture capital funding that's going into automotive tech development. So the convergence is certainly here and it's important for the future of both sectors.

Where does 5G play? Are we going to see a big introduction of 5G into vehicles?

Gary Silberg: Think of your screens within your phone. A lot of data and information will be popping up through infotainment. The virtual realities that you'll be able to do. Obviously, you can make commercials and make money off of this. So there are a lot of big-time players just in the infotainment screens.

You can imagine videos and movies and all the things you do today, but having it be interactive within your car. But how do you get the data? How do you send the data? How do you receive it in a fast, effective way? 5G is one answer, and I think that's a possible 6G mark. I think all that will be in play in the next few years as people want an infotainment fun experience within their vehicle.

Mark Gibson: The other thing about 5G is maybe some safety concerns. I think that's such a short term view. 5G is certainly here to stay and, for the automotive

sector, it actually has an important role to play in safety: the ability for interconnectivity, between cars on the road, being able to communicate with each other, with sensors, between cell phones and your car. 5G is a platform that allows a lot of development, that's going to be necessary from a safety standpoint. Gary mentioned 6G. It's on the agendas already. It's really, really important technology. It's the telecoms and the automotive sector where the leadership position of making 5G active is.

Gary Silberg: To the safety side of it, that's a great point. One of the interesting complexities going on in the car right now is how much of the computing is done on the edge, i.e., in the vehicle, versus how much do you send to the cloud and back down? And what is that balance? So it's really evolving in many ways as the new tech can impact how people think about the electrical architecture of a vehicle.

What do you see over the next year or two as the big trend with car ownership and technology?

Gary Silberg: There's going to be a massive difference, even in two years, about the technology on the vehicle. I can tell you the vehicles are going to be way more advanced from a technological perspective. And they'll be more expensive given the technology input prices. So you may want to think about owning versus leasing.

The other thing is from a safety perspective. The probability of you crashing in a car just drops. These new cars will be so much safer because there will be optical sensors. There will be 8 to 10 cameras on most new vehicles. And you'll have these GPUs, graphics processing units, with the deep learning algorithms.



You'll have LIDARs eventually, which are light pulses that can see 200 meters or farther. You'll have sonar. You'll have radars within the vehicle baked in for an incredible amount of safety and autonomy over time.

I'm not sure what that will do for ownership, to be honest with you. Americans in general love to own things. But by the same token, you can push a button and things are going to come to you. You don't have to go to it. You don't have to go shopping, as we're all seeing. You don't need a vehicle

as much, or you can share the vehicle more. So it could play out in many different scenarios.

What are the top skill sets you're hearing in the automotive space?

Mark Gibson: The other thing we're seeing that has really had an impact on the tech sector and the automotive industry is talent. It's been on the short list of risks and agenda topics in the tech sector for a long time--how much demand there is for software engineers, talented R&D folks, computer scientists, etc., and how the demand is outpacing the supply. What we're seeing is it's no longer just the big tech companies fighting for these individuals and people moving between tech companies. We're seeing that automotive is stealing the Silicon Valley tech talent. It's opening up a whole new channel. As we see these people trying to build and design what Gary just described, it's not the same R&D shop of an automaker anymore. They need the tech talent.

Gary Silberg: A major auto company just announced they are reorganizing their entire company. Why are they doing it? In great part exactly what Mark just said--because they have specific talent needs. They're creating their own EV division. They need software engineers and want to attract them. They're going to operate at different paces and different comp structures. And they're trying to be much, much more creative. The integrated software within the vehicle is one of the mightiest secret sauces. They're setting up these new computers on wheels and this is the talent they have to grab.

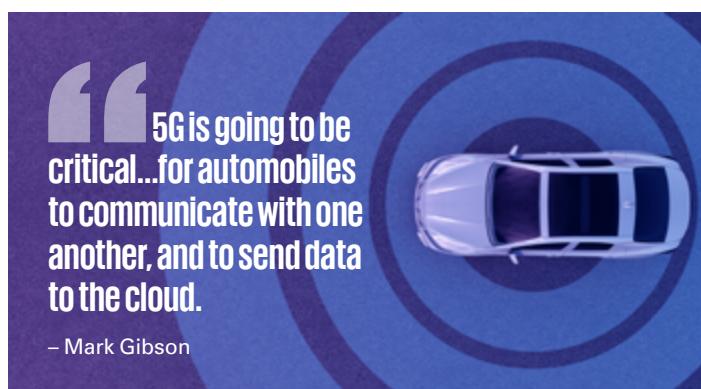
Can you sum up the intersection of the technology and automotive sectors?

Mark Gibson: Several points come to mind that bring this home from the tech side:

- The connectivity between automotive and tech is hitting at multiple levels and really the whole tech stack is being impacted.
- We talked about how important the automotive sector is to the revenue growth of the semiconductor sector. But we're also seeing it be a huge driver for big tech, either partnering with OEMs or investing in electronic vehicle companies, and at times even becoming direct competitors.

- We are seeing a massive amount of venture capital private equity, that has historically invested in classic tech, expanding into automotive development.
- 5G is going to be critical. We talked about it from the safety side, the ability for automobiles to communicate with one another, for your cell phone and your car to communicate with sensors on the road, and for cars to send data to the cloud and back in an efficient enough manner so that it does not have to be stored in the vehicle.

Gary Silberg: We are at the earliest stages of convergence and have not seen anything yet. I look at 2030 and the vehicles, and what we have are these supercomputers on wheels. It will be hard to comprehend that we actually drove vehicles. I think we are at the early stages and it is really exciting.



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