High-tech cars bring Detroit, Silicon Valley face to face

August 18 2015, byDee-Ann Durbin

In this photo taken Thursday, Aug. 13, 2015, technical director Dragos Maciuca poses in the lobby of the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. Maciuca left Apple this year to become the technical director of Ford's Silicon Valley lab. Maciuca, an engineer who worked for BMW and Nissan in the late 1990s, says auto companies got little respect in Silicon Valley until a few years ago. But that changed after automakers moved in and started helping tech firms understand how to incorporate their apps and software into cars. (AP Photo/Eric Risberg)

The office has all the trappings of a high-tech startup. There's a giant beanbag in the foyer and erasable, white board walls for brainstorming. Someone's pet dog lounges happily on the sunny balcony.

Welcome to the Palo Alto home of the Ford Motor Co., six miles from the headquarters of Google.

Meanwhile, in a squat, industrial building in suburban Detroit, a short drive from Ford's headquarters, workers are busy building a small fleet of [driverless cars](#).

The company behind them? Google.

The convergence of cars and computers is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and [autonomous cars](#). Tech companies—looking to grow and sensing an industry that's ripe for disruption—are heading to Detroit to better understand the auto industry and get their software embedded into cars.

The result is both heated competition and unprecedented cooperation between two industries that rarely spoke to each other five years ago.

"It's a cross-pollination. We're educating both sides," says Niall Berkerey, who runs the Detroit office of Telenav, a Sunnyvale, California-based firm that makes navigation software.

There's also plenty of employee poaching. Apple recently hired Fiat Chrysler's former quality chief. Ride-sharing service Uber snagged 40 researchers and scientists from Carnegie Mellon's Pittsburgh robotics lab. Tesla's head of vehicle development used to work at Apple.

In this photo taken Thursday, Aug. 13, 2015, technical director Dragos Maciuca, right, talks with lab director Dave Kaminski, left, at the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. Maciuca left Apple this year to become the technical director of Ford's Silicon Valley lab. Maciuca, an engineer who worked for BMW and Nissan in the late 1990s, says auto companies got little respect in Silicon Valley until a few years ago. But that changed after automakers moved in and started helping tech firms understand how to incorporate their apps and software into cars. (AP Photo/Eric Risberg)

For years the fast-paced tech industry showed little respect for the plodding car industry. Google and Palo Alto-based Tesla, with its high-tech electric sedans, convinced many to give the industry another look. The average car now processes more than 4,200 signals—from the engine and transmission to the backup camera to the radio—using 40 electronic control units, according to Boston Consulting Group. Those units can contain up to 100 million lines of computer code, more than in

a fighter jet. The average number of control units has climbed from 30 in 2007; some luxury cars have as many as 100.

"People think it's shiny Silicon Valley versus grungy Detroit, but that's garbage," says Chris Urmson, who leads Google's self-driving car program. "If you look at the complexity of a vehicle, it's an engineering marvel."

In this photo taken Thursday, Aug. 13, 2015, technical director Dragos Maciuca poses in the entryway of the Ford Motor Company Research and Innovation

Dragos Maciuca, a former Apple engineer who's now the technical director of Ford's Palo Alto research lab, says he's seeing a new excitement about the auto industry in Silicon Valley. For one thing, cars provide a palpable sense of accomplishment for software engineers.

"If you work at Google or Yahoo, it's hard to point out, 'Well, I wrote that piece of code.' It's really hard to be excited about it or show your kids," Maciuca he says. "In the auto industry, you can go, 'See that button? The stuff that's behind it, I worked on that.'"

But cocky tech companies have had to adapt to the tough standards of the auto industry, which requires technology to work perfectly, for years, in all kinds of conditions. Maciuca spends much of his time educating software and app developers about the industry's needs.

"Silicon Valley goes toward this model of a minimum viable product. It's easy to throw things out there and try them and see if they work," Maciuca says. "We can't do that."

Santa Clara, California-based Nvidia was best known for making chips for computer games before it got into the car business. Now, it makes the [computer processors](link) that power Tesla's 17-inch touchscreen dashboard and Audi's experimental self-driving cars, among other products. It had to develop new manufacturing techniques and higher

levels of certification for the auto business, such as tests to make sure its computer chips would still work in subzero temperatures, says Danny Shapiro, Nvidia's senior director of automotive.

In this photo taken Thursday, Aug. 13, 2015, a research engineer works on image processing at the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

For their part, the automakers are learning that rolling out cars that remain static for years until the next model comes out is no longer practical. At the insistence of tech companies such as Telenav and Nvidia, they're learning to make cars with navigation, infotainment and other features that can be constantly updated. Mercedes-Benz, Tesla,

Toyota, BMW, and others can now update vehicle software wirelessly to fix problems or add more capability

Shapiro says the cost-conscious auto industry has had to learn to spend a little more—maybe $10 to $20 per car—on computer hardware. Automakers would often go with the cheapest option but then spend even more fixing bugs, or be forced to replace processors that didn't have enough power to add updates.

Nvidia now has eight permanent engineers at various automakers in Michigan.

In this photo taken Thursday, Aug. 13, 2015, technical director Dragos Maciuca poses while sitting in a driving simulator in the immersion lab of the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. Maciuca left Apple this year to become the technical director of Ford's Silicon Valley lab. Maciuca, an engineer who worked for BMW and Nissan in the late 1990s, says auto companies got little respect in Silicon Valley until a few years ago. But that

"We've helped them adopt more of a computer industry mindset, which is not to reinvent what they're doing every five to seven years," Shapiro says.

Even with that new spirit of collaboration, automakers and tech companies also use their local labs to do a little spying.

Frankie James, a former NASA researcher who now runs General Motors' Palo Alto office, says spotting trends and potential threats is one of the most important parts of her job. Her team alerted GM to the car-sharing trend, for example, and the automaker invested $3 million in Relay Rides in 2011.

Now, she's watching companies that could potentially disrupt the auto business, such as Google and Apple. Google has promised a self-driving car within five years, and Apple has hired people from Tesla, Ford and other car companies for its own top-secret project.

In this photo taken Thursday, Aug. 13, 2015, Nitin Bandaru, right, works on a hackathon project at the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

"We need to say, 'OK, if we think Apple is going to build something like this because they've got this vision of the future,' if we take that same vision of the future, what can we do? How can we continue to play?" James says.

The tech industry is also watching its back. Telenav is making a new navigation system for the 2016 Tacoma pickup and other Toyota vehicles, but Apple and Google are also vying for the car's dashboard with their CarPlay and Android Auto systems, which give drivers access

to certain smartphone apps.

In this photo taken Thursday, Aug. 13, 2015, is the foyer of the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

Telenav's Berkery says automotive accounts for 70 percent of its business, up from just 10 percent when it opened its 10-person Detroit office four years ago. Its success in Detroit led to new offices in Berlin, Shanghai and Tokyo.

"A huge amount of disruption is going to take place in this landscape, and new players will come in," Berkery says. "There's no reason why

traditional players will succeed."

In this photo taken Thursday, Aug. 13, 2015, a neon sign is shown inside the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

In this photo taken Thursday, Aug. 13, 2015, Alison Truong, left, and Lena Beavers, right, sit on a large beanbag in the foyer of the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

In this photo taken Thursday, Aug. 13, 2015, comments and signatures are shown on a wall inside the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

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In this photo taken Thursday, Aug. 13, 2015, a miniature remote controlled car sits on a counter at the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

In this photo taken Thursday, Aug. 13, 2015, is the exterior of the Ford Motor Company Research and Innovation Center in Palo Alto, Calif. The convergence of cars and technology is blurring the traditional geographical boundaries of both industries. Silicon Valley is dotted with research labs opened by automakers and suppliers, who are racing to develop high-tech infotainment systems and autonomous cars. (AP Photo/Eric Risberg)

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