

CON



By Kelsey Alpaio

Why truck-maker PACCAR
is seeking partnerships with
Silicon Valley startups

VOY



W

When Elon Musk first teased the all-electric Tesla Semi in 2017, he promised “a very spry truck” that would drive “like a sports car.”

We’ll have to wait until later this year to see if that statement holds up, but what’s clear now is that Tesla isn’t alone in the ring when it comes to electric, autonomous, and smarter trucks. Google’s parent company, Alphabet, owns a business called Waymo, which is working on autonomous semis. Startups are building app-based solutions like Uber Freight, Convoy, and Transfix.

And of course, there are the established players—like PACCAR, the 113-year-old manufacturer of brands like Kenworth, Peterbilt, and DAF. The company, which also has financial services, information technology, and parts distribution arms, earned a record net income of \$2.2 billion in 2018. And, according to Kyle Quinn, PACCAR’s first-ever Chief Technology Officer, they’re not afraid of new entrants to the industry—they want to connect.

“One of the reasons we think it’s so important to be engaged with these [startups] is one of them may make a breakthrough, and, ultimately, have a capable solution,” says Quinn. PACCAR is already collaborating with Waymo, providing them with Peterbilt trucks for testing. “We’re not involved in their solution, we’re not involved in their system, but [we’re] learning a lot just by collaborating with them.”

One way the company is creating new connections is through its new Silicon Valley Innovation Center. Opened in 2017, the center has a dedicated staff of 12 that reports directly to Quinn, and the main focus is discovering emerging technology and forming partnerships with startups. As of 2018, the team had already conducted more than 300 startup meetings and 50 meetings with venture capital firms.

Quinn says the core team at PACCAR’s Bellevue, Wash. headquarters also dedicates time to learning and utilizing various innovation methodologies, such as human-centered design, agile,



Workspace at PACCAR’s Silicon Valley Innovation Center.

and lean startup.

We sat down with Quinn at PACCAR’s HQ to learn more about the company’s innovation focus; what technology his team is pursuing; and how he is defining the role of CTO.

INNOVATION AT PACCAR

Quinn joined PACCAR in 2005 as its Sr. Director of Applications, and quickly became the company’s Chief Information Officer in 2008. He also spent a year as General Manager at the company’s Peterbilt division before taking on the role of CTO in 2018.

“Traditionally, the commercial vehicle industry and even the automotive industry has not been a huge focus of hype and emerging technologies,” says Quinn. “Boy, it is now. It’s an exciting time.”

In 2018, the trucking industry saw massive growth. According to a PACCAR, freight activity grew 6.6 percent in the United States last year,



which is the highest growth the industry has seen in two decades.

That growth has provided fuel for PACCAR's increased investment in R&D and innovation. The company says it will invest up to \$350 million in R&D this year, up from \$306 million in 2018. The 2019 investments will go towards "new truck models, integrated powertrains including zero-emission electrification and hydrogen fuel cell technologies, enhanced aerodynamic truck designs, advanced driver assistance systems and truck connectivity, and expanded manufacturing and parts distribution facilities," George West, Vice President of PACCAR, said in a press release.

"Our focus has always been on quality, technology, and innovation," says Quinn. "Of course, innovation has become this wonderful buzzword in the last 10 to 20 years. Innovation to us means that we make the necessary changes to keep our business viable at all times, create new tech-

nologies, and use innovation to make the highest-quality vehicles in the industry."

When it comes to "next-gen" vehicles, there are small product planning teams in each of the three truck divisions at PACCAR. These teams are studying the marketplace to identify what new technologies and ideas should be built into PACCAR's trucks in the future. Quinn says that individuals from corporate are also often involved in helping prototype or implement these ideas.

And Quinn says that the company is very strategic about its investments and expansion opportunities.

"We're a 113-year-old company," says Quinn. "We're pretty careful about investing in new businesses and expanding in new regions in the world. We'll be diligent and get into the details about whether or not we think we can do that profitably. Geographic expansion continues to be a focus of ours."

Quinn says that India and China are two lo-

cations where the company hopes to expand. In terms of investing in new businesses, the company's new Silicon Valley Innovation Center aims to help PACCAR better understand the emerging tech worth that may be worth investing in.

GOALS FOR A SILICON VALLEY INNOVATION CENTER

"Startups need to move quickly. They don't have a lot of funds. They don't have a lot of time. They need corporates to engage with, to do proof-of-concepts, and to help them validate their solutions," says Quinn.

He points to a map showing the number of automotive offices, labs, and startups in Silicon Valley. In April of 2016, there were only 26 "automotive-affiliated" buildings. Today, there are 114.

"This [increase] wasn't really the reason [we built the innovation center]," says Quinn. "The main reason was because we really wanted to engage at a deeper level with startups. When we envisioned this place in Silicon Valley, we really envisioned it as kind of a lab—a truck lab."

The company selected a 26,000-square-foot facility with 18-foot high ceilings in Sunnyvale, Calif. for its center. The space can accommodate up to five trucks on display, but also includes meeting rooms, offices, and event space. The center is used primarily for meetings with startups focusing on driver assistance systems, artificial intelligence, vehicle connectivity, and augmented reality.

Quinn says that driver assistance and autonomous vehicle testing were two of the main supporting reasons for the lab. He says most companies are working on "level one" solutions like cruise control, or "level two" solutions like steering control. PACCAR is working on higher-level solutions by collaborating with autonomous developers in Silicon Valley.

"We are the truck platform of preference for autonomous development for trucks," says Quinn. "Particularly Peterbilt, but Kenworth as well. It's because we will collaborate with the developers and enable them to use our truck as a platform to develop a solution. It's a little challenging for us because they're startups...but we're doing our best to support them."

When it comes to augmented reality, Quinn says there are plenty of applications for the technology in the trucking industry, especially during product development and design reviews, and in the aftermarket, for owner's manuals and service tools. PACCAR was one of the launch developers for the Microsoft HoloLens, an early AR headset.





The Peterbilt Walmart Advanced Vehicle Experience, inside PACCAR's Silicon Valley Innovation Center.

According to Quinn, a monthly call with the company's "technology board" keeps leaders at headquarters informed about what's happening at the innovation center.

USING LEAN STARTUP TO EXPLORE ELECTRIC VEHICLES

The lean startup methodology is central to the way PACCAR explores new possibilities, Quinn says.

"Proof-of-concepts, pilots, and using a lean startup approach—this is something that's been going on within PACCAR a long time," says Quinn. "It's at the core of how we innovate. ... The problem is [that] for any large corporation to fully industrialize and take something to production involves a lot of people and a lot of disciplines. It can get bogged down in the details and take a long time."

To counter that, Quinn says a lot of the company's projects start as nascent ideas or proof-of-concepts. Then, a small team will be formed to develop that idea, carrying it through prototyping and testing.

"You have to fully validate the solution," says Quinn. "The last thing that we want to do is to put out a solution that either doesn't work, or has a safety issue."

One area where PACCAR is utilizing the lean startup approach is in their work on the electrification and hybridization of vehicles. Because the market and technology associated with electric vehicles is evolving rapidly (with competitors like Tesla, Daimler, and Nikola already announcing fully-electric semis), PACCAR is avoiding the "five-year product development project," and is instead running pilot programs within each of its divisions.

PACCAR's DAF team in Europe is working on hybrids and battery-powered vehicles, while the Kenworth team is working on fuel cells as an alternative power source, as well as systems that would extend the range of a truck. Peterbilt is working exclusively on electric trucks. In the last year-and-a-half, 30 demonstrator vehicles have been built across the



"Make something happen every day. Be a little patient with yourself and with the company, too."

KYLE QUINN, PACCAR CHIEF TECHNOLOGY OFFICER



divisions. The teams working on these solutions in each division have less than 20 people on them.

Quinn highlighted two challenges these teams are working to overcome: expanding the company's knowledge-base from diesel to electric engines, and better understanding the supply chain for electric vehicle development.

"The majority of our product teams are very, very knowledgeable about diesel vehicles," says Quinn. "We're learning about electric vehicles. We're all engineers...but electric commercial vehicles on the scale of these powertrains are pretty new. The experimentation is really important."

At the 2019 Consumer Electronics Show in January, PACCAR exhibited three zero emission vehicles: a battery-electric Peterbilt Model 579EV; a battery-electric Peterbilt Model 220EV; and a hydrogen fuel cell electric Kenworth T680, which was developed in collaboration with Toyota.

WHAT MAKES DRIVERS HAPPY?

One of the big challenges facing the trucking industry is a massive driver shortage. In 2018, the American Trucking Association reported that 51,000 more drivers were needed to meet increased delivery demands. And despite increasing wages, drivers are still hard to come by, likely due to perceptions surrounding the job's lifestyle.

PACCAR aims to change that perception, and





The 19 DAF 90 Year Anniversary Edition.

has been using human-centered design to better understand what makes truck drivers happy.

“We sent teams to the Stanford Design School and also did some training with IDEO, then started to put it to work,” says Quinn. “It had some pretty big influences on us, particularly about creature comforts for drivers. We learned a great deal in that program related to how to apply human-centered design.”

One solution that emerged from the human-centered design approach is the Peterbilt 579 UltraLoft Sleeper, which began production in 2018.

“Our engineering team did a fantastic job at thinking about all the features and comforts that a driver or team of drivers really want to have in the vehicle,” says Quinn. “One of the things that we learned in our human-centered design efforts for the Sleeper is that a great number of truck drivers today use a CPAP, [a medical device that] helps you breathe if you have sleep apnea. If there’s two drivers, when they pull off to rest, they [may] need to operate two CPAPs in the truck, so there needs to be space, power facilities, and all those kind of things to support that. We designed the shelving around the beds and the electrical connections specifically to support that.”

Quinn said his team also employed human-centered design to develop features specifically with female drivers in mind. According to the Bureau of Labor Statistics, 6.6 percent of truck drivers in 2018 were female.

In interviews with female drivers, his team identified vehicle security and leaving the truck at night as a major concerns. To address these concerns, PACCAR integrated a panic button that can be triggered from the bed that would honk the horn and flash the lights to scare away intruders.

“One of the things we have also learned is that your vehicles are much more desired by fleets who buy them if the drivers really prefer your vehicle,” says Quinn. “We constantly are not only trying to meet design objectives that make us desirable for fleets, like reliability and fuel economy. ... We also very much want to be the driver-preferred truck.”

CHALLENGES OF A NEW C-SUITE ROLE

With both PACCAR and the trucking industry as a whole experiencing the strains of growth, the company realized it needed one of its senior leaders to be focused on trends and new technologies. The company tapped Quinn, who became PACCAR’s first CTO in April 2018.

“It’s just like being elected to a political office or taking a new job of any kind,” Quinn says. “You have to figure out, ‘What are the goals that I need to achieve?’”

Quinn said he put his goals into two categories: a six-month horizon and a one-year horizon. These goals were based on conversations he had with individuals and teams throughout the organization.

“The second piece of it is the listening piece,” says Quinn, “listening to what a lot of people think the CTO should do. On one side, it’s a bit of a burden because there’s a lot [on that list]. We’ve needed a CTO for a long time, is what I’ve learned, [so] we have a lot of things that need to be done.”

Several teams throughout the organization report to Quinn, including the Silicon Valley Innovation Center, the IT team, and the Powertrain team. As CTO, Quinn says he needs to own the innovation domain for the company, and one of his major initiatives is on building and enhancing a culture of innovation at PACCAR.

Quinn served up this advice for other new technology and innovation leaders in companies that have just created the role: “Don’t let yourself feel overwhelmed,” he says. “It took a while to create the position, and so you can’t solve everything in one day. [You need] perseverance and patience. Don’t give up. Make something happen every day. Be a little patient with yourself and with the company, too.” ●