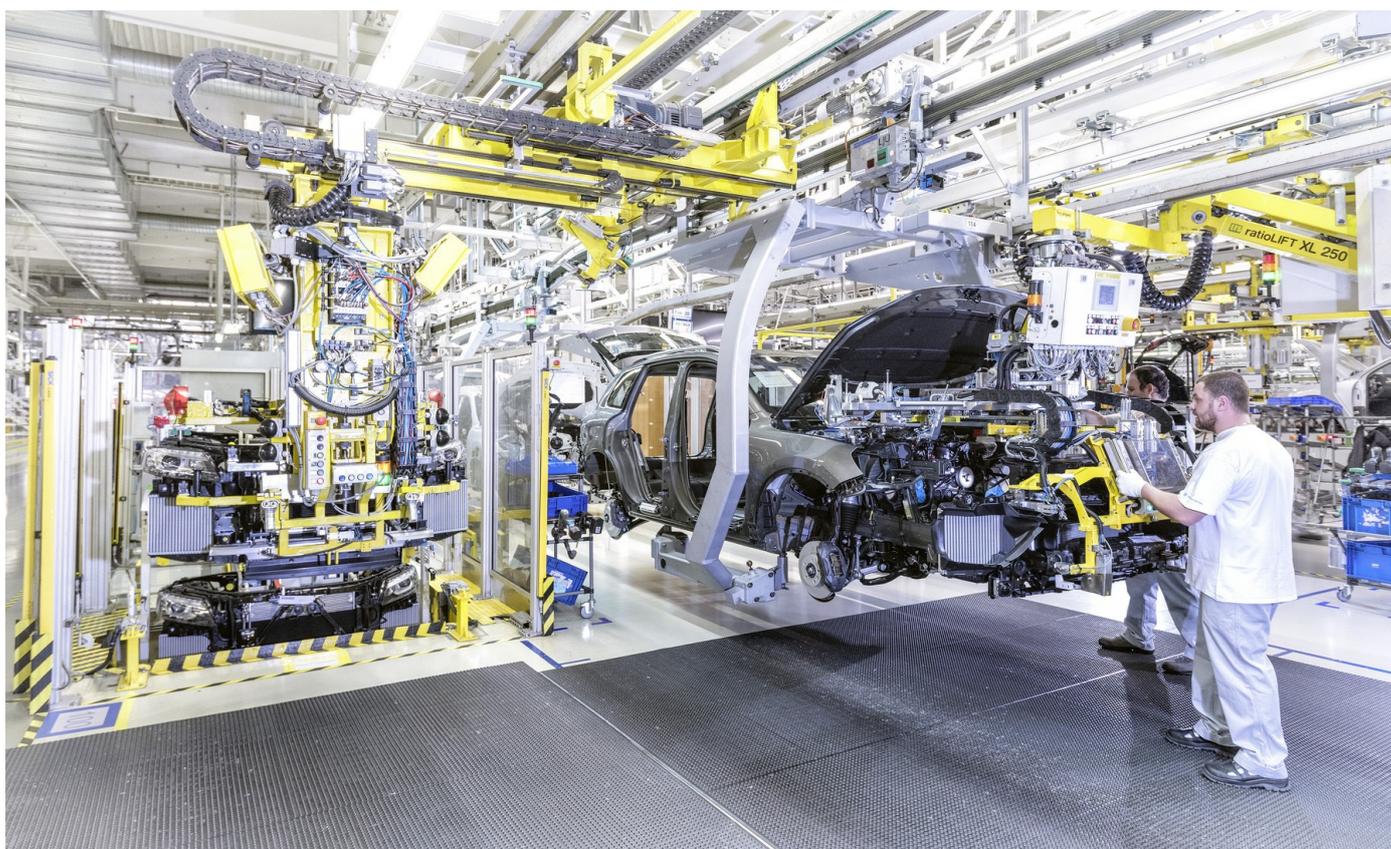




IT meets automotive: Why VW chose Amazon for its industrial cloud



In an interview with [automotiveIT](#) late last year, Volkswagen Group CIO Martin Hofmann was quite clear about his vision for the carmaker's manufacturing and supply chain landscape. "We are planning to build a digital production platform that connects every plant in the world," he said.

At the time, Hofmann didn't announce that Amazon Web Services (AWS) would help turn that vision into reality, but given the size and scope of the American internet giant and its cloud services, it was highly likely that the world's largest automaker would turn to the biggest cloud computing player to help boost manufacturing efficiency.

Historically, the VW Group, which includes 12 car and truck brands, has never been the world's most efficient carmaker. That's partly because the regional state of Lower Saxony, which partly



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owns the company, and VW's powerful unions have traditionally prioritized jobs over efficiency.

For a long time, that didn't matter all that much. The sizable price premium a VW model could command on the basis of its strong quality brand more than compensated for the extra costs incurred in producing the car.

Two things changed, however. Foreign competitors raised their quality game and the VW brand took a major hit when the company was found to have cheated on diesel emission tests. Now under new management, one of the carmaker's top imperatives is to become more efficient.

"We will continue to strengthen production as a key competitive factor for the Volkswagen Group," said Porsche CEO Oliver Blume, who also has group responsibility for manufacturing.

This is where IT and the cloud come in. Like most companies in the manufacturing industry, automakers such as the Volkswagen Group have come to realize that digital technologies and cloud-based computing and data storage can boost efficiency, save money and allow for the kind of scaling that, in the past, would have required much heavier investment in new systems and manpower.

Amazon vs Microsoft

Last year, VW announced a tie-up with Microsoft, the second biggest cloud computing company, to expand globally its so-called "Automotive Cloud" that would be focused on in-vehicle and customer applications. The unlimited cloud storage capacity, edge computing, artificial intelligence and Internet-of-Things functions of the Microsoft Azure platform were cited as key enablers for the carmaker's plan to build a digital ecosystem to form the core of its vehicle and service data operations.

In the wake of that decision, it was only logical for VW to opt for AWS, Microsoft's biggest cloud competitor, on the production and supply chain side. No manufacturing company wants to be fully dependent on one IT service provider across all its operations.

"As a company, we use the individual strengths of both cloud providers," Gerd Walker, head of Volkswagen Group production, said in a press release. "With Amazon Web Services, we are gaining a strong partner for the industrial cloud who has great technological capabilities and



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innovative cloud technologies in the production environment. Especially in the areas of logistics and the supply chain, they are among the leaders.”

CIO Hofmann explained the difference between the two projects as follows: “The Volkswagen Industrial Cloud is about production processes, connecting machines and systems in the factory and, in the long term, integrating the entire supply chain with our suppliers.” With the automotive cloud, on the other hand, “Volkswagen is concentrating on creating an automotive ecosystem that provides digital value-added services via a cloud connection in the cars of our customers.”

It is not yet clear the extent to which the industrial cloud will assume some functions, or even replace over time, any number of legacy enterprise, manufacturing or logistics IT systems across the Volkswagen Group. However, the company seems to be intending to use it as a secure, yet open architecture from which to connect many other systems and services. An example is that industrial giant Siemens will also play a key role in the industrial cloud, including in connecting equipment and data analytics.

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Mobile and cloud

If collaboration is key to these cloud partnerships, it is nevertheless also stiff competition. In the automotive race between Microsoft and AWS, recent laps have been neck and neck, as VW's own split between the two providers shown. BMW, meanwhile, has just announced its own partnership with Microsoft for a similar industrial cloud that connects the carmaker's global plants and assets, including for control of autonomous transport systems.

Overall the global market for cloud infrastructure spending is dominated by AWS and Microsoft, which, according to market researchers Canalys, together control half the sector. In 2018, AWS was the clear leader, with a 32% global market share. Microsoft came in second with 17% and Google Cloud was a distant third with 9%.

Why is AWS so successful? Dirk Didascalou, vice president Internet of Things at the company, sees the company at the center of today's industrial transformation because it combines the key trends redefining how companies work. “Mobile and joining together the cloud and the internet is the most



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disruptive technology shift you can imagine,” he said in an interview with automotiveIT International at the CES high-tech show in January. “We are part of the disruption, but we also give companies the tools to be part of the disruption. That way they aren’t disrupted themselves.”

Didascalou declined to discuss how individual automakers are transforming their operations. He acknowledged that, because of its size, the auto industry “has a tendency to be a little bit slower.” But he added: “Like in other industries, you have fast and slow movers.”

Didascalou said any manufacturing company can be successful in moving to the cloud. “It’s a matter of mindset and culture,” he said. “Culture is either the biggest impediment or the biggest accelerator.”

The cloud works for companies regardless of size. It helps startups avoid the high investment required to capture, store and analyze growing amounts of data from connected devices. And for big companies such as Volkswagen, it’s the scalability and availability of near-infinite computing power and storage capacity that offers the biggest incentive.

AWS provides more than 165 kinds of services ranging from basic computing and data storage functions to analytics, machine learning, security and application development.

Volkswagen will use a suite of AWS IoT services to build a cloud platform that will capture real-time data from its 122 manufacturing plants. Further down the road, the carmaker wants to integrate more than 30,000 facilities and 1,500 suppliers that make up its global supply chain.

Services the company plans to use include:

- AWS IoT Greengrass, a technology that enables edge computing
- AWS IoT Core, which lets devices connect with cloud applications and other devices
- AWS IoT Analytics, which analyzes massive volumes of IoT data
- AWS IoT SiteWise, which collects and organizes data from industrial equipment
- Amazon Simple Storage Service, which offers object storage tailored for scalability, data availability, security, and performance
- Amazon SageMaker, a service that provides the ability to build, train, and deploy machine learning



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models

AWS Outposts, which brings native AWS services to physical locations to allow a hybrid operation.

VW is clearly in a hurry. The collaboration with AWS was signed for five years, but the carmaker wants to have the supporting corporate architecture in place and working by the end of 2019.

To make sure the project has the right resources to move ahead quickly, VW and AWS will jointly establish a number of key locations at tech hubs in Germany, including a development center for the Industrial Cloud in Berlin. In Dresden, specialists will concentrate on platform and software development, with a special focus on the Internet of Things. Other VW labs such as the one in Munich will also be involved. Altogether, more than 200 specialists will be working on the cloud project.

The partnerships with both Microsoft and AWS are themselves not monolithic, but intended, in part, as the basis for further integration not only of facilities and suppliers, but also other IT specialists, micro-services and solutions. Illustrating the open architecture of the VW and AWS cloud, a few days after the companies announced their partnership, VW also revealed that Siemens would play a key role in connecting the industrial cloud. The equipment and technology provider will ensure that production and materials handling equipment are networked to the industrial cloud, and support the monitoring and analytics of data and services like predictive maintenance.

Walker, VW's production boss, said. "Other partners from industry, logistics and trade can participate," he added, citing suppliers and machinery builders. "They will all benefit from networking and an open exchange of information."

VW's vision goes even further. Other car manufacturers could join the initiative, underscoring how the auto industry is increasingly aware that sharing resources may be the only way to maintain a viable car business in the long run. The ambition is similar for BMW and Microsoft, as both companies said they wanted to encourage other manufacturers, suppliers and even non-automotive firms to join their platform.

To that extent, it wouldn't be surprising to see more suppliers and specialists participating across a multitude of cloud networks across OEMs – but the real benefits could come in how much they are able to share between them.



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-By Arjen Bongard

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