berylls
STRATEGY ADVISORS

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WHICH OEMS ARE SETTING THE PACE ON FIELD DATA?

Ranking the leaders making the most of data generated by cars on the road

WE KNOW OEMs ARE COLLECTING A LOT OF DATA FROM VEHICLES IN THE FIELD. BUT ARE THEY MAKING THE BEST USE OF IT?

The marketing potential is clear: drivers who treat the road like a racetrack may be looking for an upgrade to a sportier model

Working with third parties is also a great opportunity: if a driver passes the same fast-food place every day, the restaurant could send a discount code as they go by

A huge benefit of gathering and using data is to improve vehicle quality and reduce the millions OEMs spend on warranty costs, **as our earlier research shows**

Finally, field data is vital for turning the future vision of highly autonomous cars into a reality. Forward-looking OEMs are using it to teach driver assistance systems how to react to real-life situations the way a human would

> All in all, we think that many OEM should strengthen their efforts to collect data and extract relevant information for the benefit of their customers and for future products.

HEIKO WEBER

WE HAVE ANALYZED OEMs' CAPABILITIES AROUND MAKING USE OF FIELD DATA WITHIN FOUR DIFFERENT CATEGORIES AND RANKED THEM ACCORDING TO HOTEL CLASSIFICATION.

NAME	RANK*	75% DATA AVAILABILITY	75% DATA VOLUME	100% DATA TRANSFER	150% DATA USAGE
Tesla	⬢⬢⬢⬢⬢	5	5	5	5
Audi	⬢⬢⬢⬢⬡	4	4	4	4
BMW	⬢⬢⬢⬢⬡	4	4	4	4
JLR	⬢⬢⬢⬢⬡	4	5	4	4
Porsche	⬢⬢⬢⬢⬡	2	5	5	5
Toyota	⬢⬢⬢⬢⬡	4	5	4	4
Volkswagen	⬢⬢⬢⬢⬡	1	5	4	5
Volvo	⬢⬢⬢⬢⬡	2	5	5	5
Xpeng	⬢⬢⬢⬢⬡	3	5	5	4
BYD	⬢⬢⬢⬢	3	5	5	3
GM	⬢⬢⬢⬢	2	5	3	4
Kia	⬢⬢⬢⬢	2	5	3	4
Mercedes-Benz	⬢⬢⬢⬢	3	4	4	4
Polestar	⬢⬢⬢⬢	3	4	3	4
Ford	⬢⬢⬢⬡	2	4	3	4
Honda	⬢⬢⬢⬡	3	4	3	3
Hyundai	⬢⬢⬢⬡	3	5	3	3
Renault-Nissan-Mitsubishi	⬢⬢⬢⬡	3	3	3	3
Tata Motors	⬢⬢⬢⬡	2	5	4	3

- One of the OEMs is clearly ahead: Tesla is the only OEM ranked ⬢⬢⬢⬢⬢. This is mainly due to Tesla being the front runner with its systems delivering data for the past 10 years
- The good news: Lots of ⬢⬢⬢⬢⬡ competitors (8/19). Among these most of the European premium brands. Further competitors with ⬢⬢⬢⬢ are just a small step behind (5/19). Mainly as they have launched their systems shortly after the ⬢⬢⬢⬢⬡ competitors
- ⬢⬢⬢⬡ competitors have usually slightly less sophisticated systems in place, delivering less data less frequently (5/19)

* Alphabetical order within the ⬢ categories Hotel Categories: ⬢⬢⬢⬢⬢ five stars, ⬢⬢⬢⬢⬡ four and a half stars,....

HOW DID WE CALCULATE THE SCORES? (1/2)

Our overall ranking for each OEM is based on **four categories**, the first two categories being a rating of the data available for analysis and the data volume collected in the cars...

1 DATA AVAILABLE – 75% WEIGHTING

- The basis for using field data at all is to have enough cars on the road with systems in place that allow for data collection.
- **Key ranking metrics:** How long has data been collected for? How many cars are in the field to collect information from?

Description	Rating	# of OEMs receiving this rating
>10 years of data	●●●●●	1
>5 years of data	●●●●	4
>3 years of data	●●●	7
>1 year of data	●●	6
<=1 year of data	●	1

> "Most of the OEMs seem to have started data collection in the vehicles only when eCall systems became mandatory."

TIMO KRONEN

2 DATA VOLUME – 75% WEIGHTING

- How much data is actually transmitted by each of the cars in the field also matters.
- **Key ranking metrics:** How much and what type of data is sent back to the OEM by the car?

Description	Rating	# of OEMs receiving this rating
+ Full sensor data (camera, lidar, ...)	●●●●●	12
+ Environmental data (internal temperatures, weather data, timestamps,..)	●●●●	6
+ **DTCs** (fault codes, display messages,...)	●●●	1
+ **Driving information** (distances driven on different road types, average consumption,...)	●●	0
Vehicle service information (service intervals of wear and tear parts, fluid levels,...)	●	0

> "All OEMs have realized that the more data they collect, the better! This is why many OEMs have recently upgraded their systems (such as VW) or have at least started (such as Ford and GM) to bring them to the field."

DR. DAVID GUTJAHR

HOW DID WE CALCULATE THE SCORES? (2/2)

…the other two categories being a rating of the frequency of data transfer and of the data usage, once the data has reached the OEM.

3 DATA TRANSFER – 100% WEIGHTING

- In our experience, it is even more important that the OEMs receive the data frequently. Current data is good data!
- **Key ranking metrics:** When is the data transferred back to the OEM and how often?

Description	Rating	# of OEMs receiving this rating
+ Close to real-time	●●●●●	5
+ Configurable data logger (increased flexibility on what is logged and when it is transmitted	●●●●	7
+ Event-based (in case of specific abnormalities)	●●●	7
+ Milage-based (after a fixed distance driven)	●●	0
Last-State Call (when car is locked)	●	0

> With estimated cost of ~1,5 ct/MB for a full image update it is surprising that many OEMs so far are sending data based of specific events, only.

DR. MATTHIAS KEMPF

4 DATA USAGE – 150% WEIGHTING

- Most important of all is that OEMs have systems and organizations in place to analyze the data and draw conclusions.
- **Key ranking metrics:** What is done with the data after it is transferred? What is the focus for the OEM?

Description	Rating	# of OEMs receiving this rating
Autonomous driving development	●●●●●	4
Product improvements	●●●●	10
Online services	●●●	5
Maintenance & service	●●	0
Marketing & sales	●	0

> Most OEMs focus on using field data for making product improvements, while only a few are collecting data to develop autonomous driving features. This surprised us, given the time and attention devoted to vehicle autonomy.

PHILIPP STÜTZ

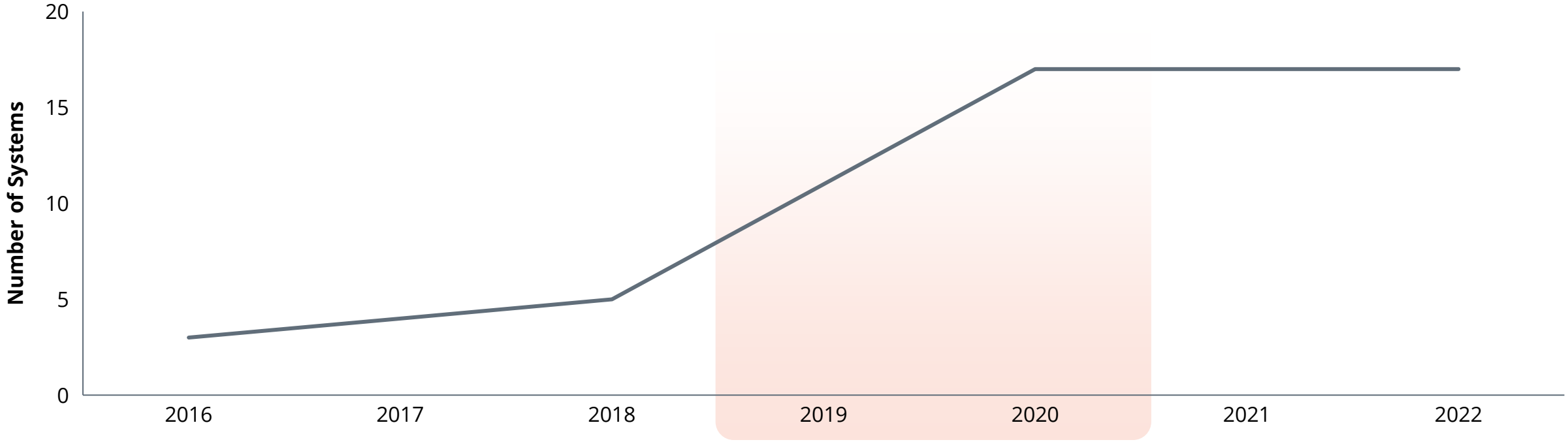
EACH OEM HAS A SLIGHTLY DIFFERENT APPROACH TO DATA GATHERED IN THE FIELD. SOMETHING WE HAVE SUMMARIZED HERE:

NAME	RANK*	REMARKS
Tesla	⬢⬢⬢⬢⬢	Tesla is certainly the frontrunner among the OEMs analyzed. The company has continuously collected data for 10 years and it is obvious that, as well as product improvement, Tesla is using the data extensively to train its autonomous driving functions
Audi	⬢⬢⬢⬢⬡	Along with most of the members of the ⬢⬢⬢⬢⬡ club, Audi does a solid job in collecting and using field data. In common with many European players, Audi could be more aggressive in the type and volume of data collected, with a looser interpretation of GDPR rules
BMW	⬢⬢⬢⬢⬡	BMW probably started earlier than many other OEMs in making use of field data. Like Audi, the company could be more aggressive in terms of collecting data
JLR	⬢⬢⬢⬢⬡	JLR is collecting a vast amount of field data and could – in our judgement – make even more use of it to improve their autonomous driving technology
Porsche	⬢⬢⬢⬢⬡	Porsche has massively increased its data collection capabilities with the Taycan. They could potentially become the European frontrunner, once they have more cars in the field
Toyota	⬢⬢⬢⬢⬡	Toyota is another solid member of the ⬢⬢⬢⬢⬡ club, which is not lagging behind the European players
Volkswagen	⬢⬢⬢⬢⬡	Volkswagen is a surprise. They definitely came late to the game, with only the latest versions of their telematics systems being competitive with other players in the ⬢⬢⬢⬢⬡ club. Nevertheless, they are now getting it right. VW is collecting a huge amount of data and has big aspirations to make use of it to develop autonomous driving functions
Volvo	⬢⬢⬢⬢⬡	Volvo is definitely a hidden champion in Europe. With top systems in place, they certainly go all the way in using data to develop autonomous driving functions
Xpeng	⬢⬢⬢⬢⬡	It is not so much of a surprise that Xpeng, one of the younger OEMs in the field, is competing alongside the established OEMs. However, we believe they could do even more in terms of developing autonomous driving functions with the data they collect
BYD	⬢⬢⬢⬢	From everything we know, BYD is focusing mostly on developing online services in the car, such as journey planning and making hotel reservations en route, based on field data. This is surprising as their data collection capabilities would certainly allow for more
GM	⬢⬢⬢⬢	GM is a late adopter of the most up-to-date data collection technologies and still transfers data with limited frequency. In general, the members of the ⬢⬢⬢⬢ club started gathering data slightly later, and have slightly less sophisticated systems in place
Kia	⬢⬢⬢⬢	Kia is a typical example of the ⬢⬢⬢⬢ club
Mercedes-Benz	⬢⬢⬢⬢	Seeing Mercedes-Benz in the ⬢⬢⬢⬢ club is a surprise for us. Now, they have the same solid capabilities and are making as much use of data as their European peers. They just started later than the other players
Polestar	⬢⬢⬢⬢	Another surprise was that Polestar is not battling with Volvo higher up the rankings. However it seems that they are collecting less data and making less use of it
Ford	⬢⬢⬢⬡	Ford is a typical example of the ⬢⬢⬢⬡ club. As with the other members, they have fewer capabilities in place and are making less use of the data they collect. We are not talking about dramatic neglect of the opportunities, however more is clearly possible
Honda	⬢⬢⬢⬡	Honda is another typical member of the ⬢⬢⬢⬡ club
Hyundai	⬢⬢⬢⬡	As is Hyundai…
Renault-Nissan-Mitsubishi	⬢⬢⬢⬡	…and Renault-Nissan-Mitsubishi
Tata Motors	⬢⬢⬢⬡	Tata Motors just started to build their data capabilities recently and has very ambitious plans for its telematics platform, which is a joint platform for commercial vehicles too. It will be interesting to see how they develop their data usage

* Alphabetical order within the ⬢ categories

2019 AND 2020 SAW A GOLD RUSH IN TELEMATICS: MOST OF THE OEMS ANALYZED HERE IMPLEMENTED THE DATA COLLECTION CAPABILITIES THEY CURRENTLY USE IN 2019 AND 2020.

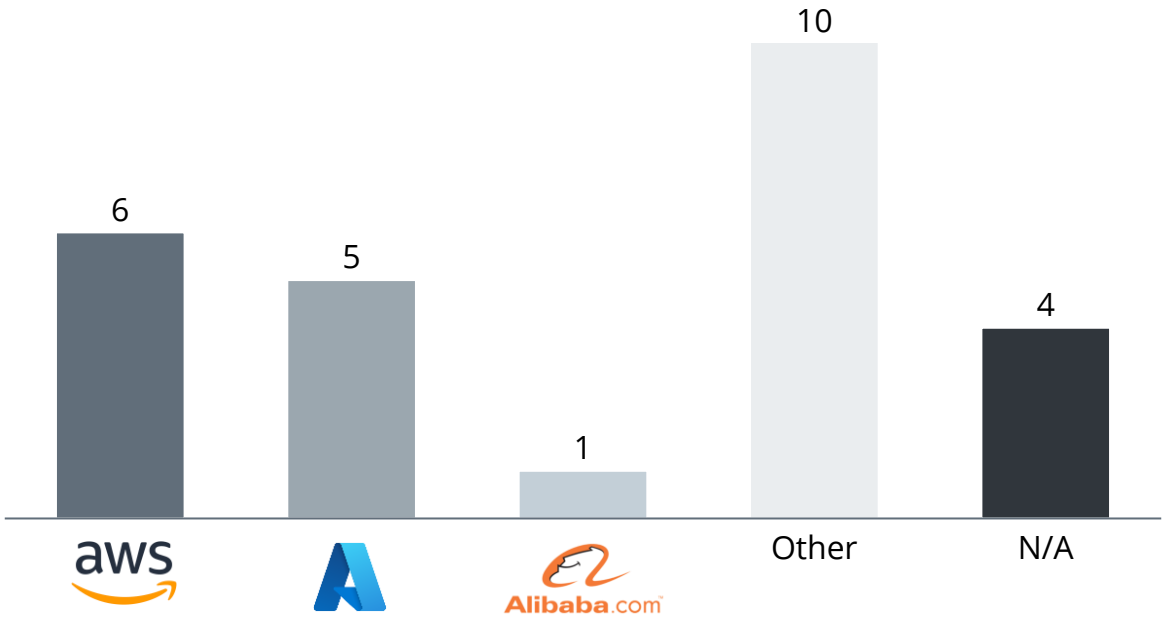
WHEN WERE THE SYSTEMS CURRENTLY IN USE IMPLEMENTED?



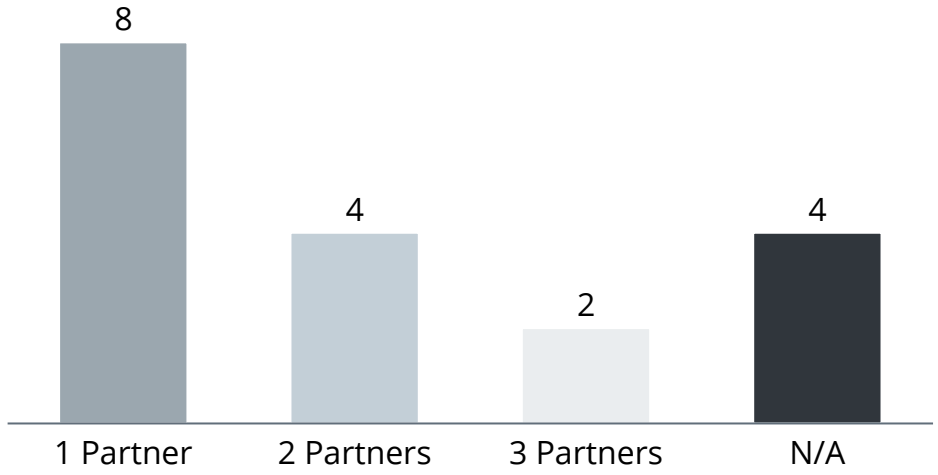
DATA IS PRIZED: The fact that 18 out of the 19 OEMS analyzed scored either five or four stars for data volume shows that carmakers have realized that the more data they collect, the better. This is why many OEMs have recently upgraded their data-gathering systems (for example, Volkswagen) or introduced them for the first time (Ford and GM)

ALMOST ALL OEMs ARE PARTNERING WITH A CLOUD DATA PARTNER. SEVERAL OEMs WORK WITH MORE THAN ONE PARTNER.

WHO ARE THE MOST IMPORTANT COOPERATION PARTNERS?*



HOW MANY PARTNERS DO THE OEMS WORK WITH?



DATE NIGHT: AWS and Microsoft Azure are the most common partners of choice for OEMs. However, many are partnering with smaller data analytics providers. Also surprising is that AWS and Microsoft Azure are often partners, both at the same time.

* Some OEMs work with more than one partner. Therefore, the total differs from the number of OEMs analyzed

YOU'VE READ THE RANKINGS – WHERE DO YOU GO NEXT?

- All OEMs have realized that collecting data in the field and making use of it is important – none of the carmakers we analyzed are scoring below ⬢⬢⬢⬡.
- But even among the highest performers, there is still more to reach for – our research shows most OEMs are using data to continuously improve their products, but a far smaller number go beyond and use the data to develop and improve autonomous driving functions
- As a result, only Tesla has a ⬢⬢⬢⬢⬢ ranking, but members of the ⬢⬢⬢⬢⬡ group are closing in, with mostly newly installed data collection capabilities. It is now well within the grasp of automakers to save millions in warranty costs by making full use of vehicle data, for example, as we described in our previous report. Some, especially the Europeans, also have to find ways to collect data even more aggressively to really make the most of their field data
- Members of the ⬢⬢⬢⬢ group are late adopters, but their capabilities are now mostly good enough to close the gap with the ⬢⬢⬢⬢⬡ club. They will make progress by creating and pursuing more use cases for the data they have. The ⬢⬢⬢⬡ group has fewer capabilities in place, and that is where they should start if they want to move up the ladder

HAVE QUESTIONS

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