

# wedrive

The magazine for cars and mobility | Issue 02



## Changing lanes

An industry repositions itself

**Market:** OEMs and suppliers – do we need a new relationship? **Study:** Change – more opportunity than risk? **Microchips:** The next great race?

KEARNEY

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awaits on the  
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KEARNEY

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OEMs and suppliers –  
a relationship story

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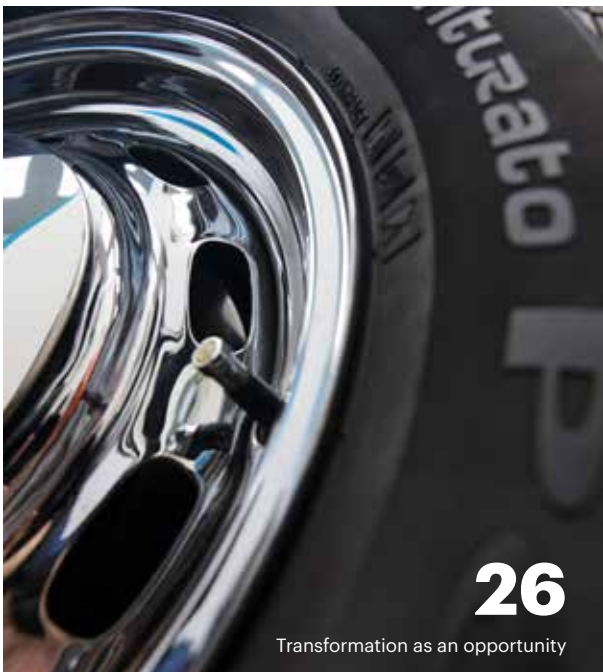
The next great race in the automotive industry has begun.

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Transformation as an opportunity

## Editorial

It's 2021. We still do not have flying cars – but the transformation from car to moving computer is in full swing. In our first issue of we drive, we looked at the fact that cars are now smartphones on four wheels – today, numerous car companies are already advertising them as just that. Like Volvo ("Like your smartphone – just bigger") or Byton ("Your platform for life"). So before cars fly, they first become a computer. And for this to happen the design has to change and, above all, so do manufacturing and the entire supply chains. After all, companies that used to develop spark plugs may be producing microchips in the future.

In the new issue of we drive you will discover how the structures and relationships between OEMs and suppliers are changing and why it is microchips that will decide who will come out on top in the international competition of the automotive industry in the future. We have also spoken with experts and managers from the industry about this structural transformation and new possibilities of sustainability and mobility.

We would very much welcome any feedback on our magazine: What did you like and where do you see room for improvement? We will continue to experiment so that the magazine is always up to date for you and has an attractive style.

We hope you enjoy the issue.

Yours,  
Christian Malorny,  
Partner & Global Head of Automotive

Stephan Krubasik,  
Partner & European Head of Automotive

Dough Mehl,  
Partner & Head Americas Automotive Practice

Jian Xu,  
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Partner & MEA Automotive Practice



**08**

Spotlight on Catena-X



# News

## we drive is also available as a podcast

Automotive experts and Kearney partners Christian Malorny and Thomas Luk discuss the future of mobility with high-quality guests. Whether Smart Mobility, autonomous driving, megatrends from China or the future of premium cars – we drive is the podcast for everyone interested in regular insights from the mobility scene. Whether you're a CEO, creative director, start-up founder or researcher – we drive will give you the lowdown.

[de.kearney.com/wedrive-podcast](https://de.kearney.com/wedrive-podcast)



## Outstanding!

Compete against the best! This is our motto for the industry competition "Factory of the Year" jointly organised by Kearney and SV Veranstaltungen in cooperation with the trade magazine "Produktion". Since it started in 1992, more than 2,000 factories from Germany, Europe and the world have taken part and competed for the coveted eponymous title of "Factory of the Year". The use of state-of-the-art technologies, coupled with an unconditional drive for efficiency and a focus on sustainability, earned Volkswagen Slovakia a.s., Bratislava plant, the title of "Factory of the Year 2020".



[fabrik-des-jahres.de](https://fabrik-des-jahres.de)

SV Veranstaltungen KEARNEY

### Play games to save money

German car production alone can save 6.5 billion euros – through gaming! The Kearney study on gamification shows how this can be achieved sustainably in practice while motivating employees at the same time.

[de.kenarney.com/gamification](http://de.kenarney.com/gamification)



# 1.2°C

### Green game-changer

More and more private equity firms are assigning a high priority to ESG (environmental, social and governance) criteria, and the climate impact in particular, in their investment decisions. And with some success, as shown by the results of a new study by Kearney in cooperation with the Technical University of Munich and the climate metrics and software provider right. based on science GmbH: If the European economy as a whole acted like the climate-friendly private equity funds, its contribution to global warming would be 1.2 degrees Celsius lower by 2050. That might not sound much, but it would be a real game-changer.

[de.kenarney.com/nachhaltig-investieren](http://de.kenarney.com/nachhaltig-investieren)

### New magazine

We will be providing an overview of what is currently keeping busy the high-tech world and which topics are relevant in the various sectors in our new "tech tonic" magazine. In the first issue we will show you where Europe and Germany stand in international comparison, why other parts of the world are already further ahead in many areas and what companies in this country should do. Join us on a journey of discovery.

[de.kenarney.com/de/techtonic](http://de.kenarney.com/de/techtonic)





# Headlight

CHRISTIAN MALORNY AND ANDREAS FORM

# The automotive ecosystem must accelerate digitally

In the future, new approaches and ideas will be needed to keep the individual players and networks in the automotive and supplier industry together. The new Catena-X network has the chance to become a powerful general system with collaborative approaches for the automotive industry.

Sustainability, compliance, product safety or cyber security: the bar is constantly being raised in terms of demands and goals for more and more topics in the automotive industry – and justifiably so. And not just for a company's sphere of influence in its own region and country. In the meantime, a number of issues along the entire value chain are coming under the spotlight, from mines for raw materials through to the finished product, in some cases initiated by companies themselves, such as the goal of climate-neutral trade, or in other cases, as with Germany's upcoming supply chain law, by the legislator. This represents a challenge for the industry; after all, the business model of the automotive industry is depend-

ent on international cooperation, as it involves global value chains spanning multiple countries.

A prerequisite for having any kind of control over the value chain is transparency. This requires uniform standards for data and information flows. Under the name "Catena-X Automotive Network (Catena-X)", the German car manufacturers and more than 20 other founding members have joined together to form a Europe-wide partner network. The legal framework for this is a registered association under German law, which was founded in May 2021 with a board of directors and an advisory board. Catena-X sees itself as a (data) ecosystem in which car manufacturers and suppliers, dealer associ-



ations as well as equipment suppliers, infrastructure providers or tech companies can participate. Catena-X is expected to grow to up to 1,000 member companies within two years.

At the same time, work on the content of Catena-X will begin. This will build on the preparatory work within the framework of the European data sovereignty initiative Gaia-X. This operates in Brussels as the not-for-profit "Gaia-X Association Internationale sans but lucratif (Gaia-X AISBL)" as the supporting organisation. The plan is for a "distributed cloud service" with decentralised data processing via multi-edge, multi-cloud or edge-to-cloud for maximum interconnection advantages. The aim is not to copy hyperscalers such as Amazon (AWS), Microsoft (AZURE) or Google (GCP), but to actually build decentralised data and computing structures. The goal is to achieve interconnectivity with technical and semantic standards at the network, data and service level between edge or cloud instances. The participation of hyperscalers is not explicitly excluded, but it is based on open standards that ensure interoperability, thereby reducing the risk of vendor lock-in. In other words, the risk that customers are so dependent on the products or services of one provider that switching to a competitor would not be economically viable.

In addition to the unanswered questions about IT implementation, it is still not entirely clear which use cases can be presented transparently at all. Examples include the traceability of parts, batches or materials, carbon footprints, certificates of compliance with process standards and issues relating to compliance, end-to-end quality assurance and effective risk management. Even topics such as capacity management to avoid supply bottlenecks are conceivable and are sought after by individuals in light of the current

shortage of semiconductor components and raw materials, for example. However (and this is where it becomes challenging from a legal perspective) it is necessary to clarify which topics can actually be presented transparently under antitrust laws and which are subject to competition. For example, there is unlikely to be unrestricted transparency about suppliers' production capacities, because this information plays an important role in pricing between business partners. In the past, one Achilles' heel in such consortia has been the agreement on clear data granularity and quality. Many an attempt to build an industry-wide data network has failed because of the question of which data should be made available, in which quality and with which structure. There are also questions of data ownership. It is not always clear today who actually owns what type of data and who should or even must make it available to a network. The fact that data also has a price and how it should be paid for will also be discussed. It is clear that there will be many new roles in such a data network. New companies will take on responsibility for data clearance, data aggregation, data configuration or data trading. Whether these new players will also lead to a shift in the traditional balance of power along the automotive value chain remains to be seen. The "first movers" in the digital data alliance include at least the major traditional OEMs and suppliers. They have recognised the enormous importance and are in a good starting position to help shape future standards and to exploit the potential for themselves in the best possible way.

It is to be hoped that this time Catena-X will succeed in establishing a powerful data network in the automotive industry. It would be a real breakthrough and a great success for achieving European data sovereignty in the leading automotive industry.

[Kearney regularly comments here on current issues in the automotive industry in this 'Headlight' column.](#)



**Christian Malorny**

When it comes to technical, regulatory and political issues of the future, sustainable business models and global and regional growth strategies in the automotive industry, Christian Malorny is the person to speak to. As a partner at Kearney and global head of the automotive consulting division, he drives strategic and operational change for automotive manufacturers and suppliers.



**Andreas Form**

As a partner in the Munich office, Andreas Form has a passion for successfully guiding his clients through the challenging digital transformation of the automotive industry. His projects with automotive manufacturers, suppliers and new mobility companies include corporate and digital strategies, comprehensive transformation, sales and marketing, and new business models. Andreas Form is Head of Automotive Digital at Kearney in Germany.



# A changing relationship

This is how it's been for a long time: The car manufacturer creates, the supplier carries it out. Electrification, networking and other drivers of transformation are shaking up the balance of power between OEM and supplier – with sometimes drastic consequences for cooperation between the two sides.

TEXT BY CHRISTOPH HENN

Anyone today who talks about the great electric vehicle disruption and assumes that electrically powered vehicles will overtake the internal combustion engine in volume for the first time in the near future is, strictly speaking, not quite right – at least from a historical perspective. Around 1900, according to the Encyclopædia Britannica, almost twice as many cars in the USA ran on electricity as on petrol. Incidentally, even more vehicles were steam-powered at that time. The early electric cars were impressive because they were quiet, required little maintenance and, above all, were easy to start, whereas petrol cars still had to be cranked by hand. However, the balance of power shifted relatively quickly: with the hand crank no longer needed, and thanks to its significantly greater range, the triumph of the internal combustion engine began in the 1920s.

In this respect, we are currently experiencing a late comeback of electric mobility – albeit an impressive one: the sales target of one million electric cars by 2020 proclaimed by German Chancellor Angela Merkel has not been reached, but thanks to extensive subsidy programmes and the popular category of plug-in hybrids, it could still be achieved in 2021. In any case, the spread of electric motors has



rapidly picked up speed recently: in 2020, almost 200,000 passenger cars with electric powertrains were registered in Germany, three times as many as in the previous year. And between January and May 2021, a good 22 percent of new registrations involved an electric car.

After a long period of hesitancy, manufacturers have reordered their priorities. They are responding not least to legal requirements for CO<sub>2</sub> reduction, which are especially strict in Europe and China. Volvo wants to sell only electric cars from 2030, Volkswagen has declared an "electric offensive" and wants to be producing more than 1.5 million electric vehicles a year by 2023. The Audi brand, in turn, was the first German car manufacturer, in the summer of 2021, to present a concrete plan to phase out combustion engines: according to this plan, the brand will no longer develop any new petrol or diesel models from 2026 and will only sell electric cars from around 2032.

As if the upheavals in the powertrain were not enough, digitalisation is also changing the market more and more. A means of transport that was once described primarily by horsepower, design and brand image has become a kind of "smartphone on wheels": a technologically well-equipped vehicle that is increasingly networked with the Internet, traffic infrastructure and other cars, where safety, comfort and desirability are determined by the quality of the hardware and software and the quantity of data that can be accessed. In the medium to long term, these factors will also have a crucial impact on the success of autonomous driving, which is currently gaining momentum in parallel with electrification. The new Mercedes-Benz S-Class will be the first mass-produced vehicle with Level 4 automation to be launched on the market, and the two houses of the German parliament have laid the foundations for fully driverless vehicles to be routinely permitted on public roads with the law on autonomous driving, which was passed in May in a fast-track procedure.

These two major technological developments and accompanying sub-trends such as "Mobility as a Service" require players in the automotive industry to rethink technology and business models.

In addition, the coronavirus pandemic exposed with unprecedented clarity the vulnerability of supply chains and fragility of sales expectations. Each of these changes is a challenge for manufacturers and suppliers alike. Combined, they amplify the force of the transformation the automotive industry is currently undergoing – with the greatest change coming from electromobility. "We are on the cusp of the biggest transformation in our history," says Dr Uwe Gackstatter, Chairman of the Powertrain Solutions Division at the major supplier Robert Bosch, referring to electrification.

"The switch from conventional combustion engines to hybrid and fully electric drives is changing the entire value chain and forcing a profound transformation of the entire market," explains Thomas

Luk, automotive expert and partner at Kearney. On the supplier side in particular, Kearney experts assume a slowed increase of about one percent per year through to 2035. The slowdown results from the flattening growth of total vehicle sales as well as falling value creation in the classic combustion engine, combined with falling costs for the core components of the electric car. In its latest forecasts, Kearney predicts that the proportion of fully electric "zero emission vehicles" out of all new vehicles produced globally will rise from two percent in 2019 to 38 percent by 2035.

The concrete effects on individual suppliers will be very different. Since some components will be very positively or very negatively affected by the transformation and others not affected at all, there will be significant shifts within the value creation structure. Tyre producers, for example, will remain unaffected by electrification, but will also offer smart solutions in the area of connectivity. Internal combustion engine specialists, on the other hand, will have to cope with reductions, while components related to battery electrics will become more important. "New technology components, including from new players and start-ups, will experience strong growth throughout and classic drive components will decline more and more quickly and, in most cases, with less and less profitability," says Luk.

This trend is reinforced by the increasing connectivity and automation of the car. While heavyweights like Bosch can respond to this with openness and pursue different technologies in parallel, the fate of many smaller suppliers will increasingly depend on which components they specialise in. However, this does not mean that they are completely at the mercy of this fate. Traditional suppliers with declining sales numbers can consolidate in order to achieve economies of scale in the declining market if they are successful as "scale champions". This is what happened, for example, with the merger of Magneti Marelli and Calsonic Kansei under the umbrella of investor KKR, which created the world's seventh-largest tier 1 supplier in 2018. This cleared the way for synergies in the area of exhaust systems and associated cost benefits, for example through supplier consolidation and a common parts kit.

On the other hand, there are the "electric newcomers" who specialise in electromobility and are growing with their products in areas of increasing added value. The more resilient companies, on the other hand, whose products are only slightly or not at all affected by electrification, are likely to continue on their path as before. In contrast, the "integrators" will play a growing role, expanding their value creation from component to system production or increasing the depth of value creation of the components they produce. For example, ZF, a supplier known for its high-performance transmissions, is increasingly turning into a system provider. For the Mercedes-Benz EQC, for example, the compa-



See interview on page 16



Whether door opener or front light – there is barely any car component that has not made a leap forward in development in recent years. Electromobility poses completely new challenges for cooperation between OEMs and suppliers.



For a long time, anyone who wanted to know what was happening behind them had to rely on their rear-view mirrors or looking over their shoulder. In modern vehicles, more and more assistance systems ensure a safe, all-round view. The future of mobility is inconceivable without cameras, radar or lidar systems.



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interview  
on page 16

ny supplies a complete powertrain consisting of electric motor, transmission, power electronics and control software. ZF has also secured major orders in the field of hybrid technology, including from BMW, Jaguar Land Rover and Fiat Chrysler.

"Around one third of our suppliers have changed their product portfolio in recent years as part of a transformation process," says Uwe-Karsten Städter, Member of the Executive Board with responsibility for procurement at Porsche AG, describing this part of the trend. Another part goes hand in hand with more profound changes: on the one hand is the disappearance of traditional suppliers who can no longer operate economically in the face of declining order volumes and uncertain prospects – or who gratefully accept takeover offers. On the other hand is the arrival of new suppliers to the market, seeking to meet the needs of the electrified and digitalised car. At Porsche, for example, a quarter of suppliers are new additions from the last five years.

This statistic alone shows that even if it is the suppliers that are more affected at first glance, by no means nothing will remain the same for the OEMs either. "The classic division between OEM and supplier is shifting permanently," predicts Kearney expert Luk. "And we are already seeing strategic competition between the current market participants. Strategic foresight and operational excellence are now required simultaneously to ensure long-term success." The playing fields of this rivalry are manifold: on the one hand, traditional car manufacturers could take on more or new manufacturing tasks themselves to compensate for the shedding of staff caused by the elimination of the labour-intensive combustion engine. On the other hand, the supplier Bosch, for example, reports of new OEMs that are buying the complete fuel cell drive instead of individual components.

The coronavirus and most recently the chip crisis have shown that OEMs are having to fundamentally rethink their supply chains. At the same time, they are dealing with companies that supply a wide variety of industries and are far less dependent on the major car manufacturers than traditional suppliers. This, in turn, is only a foretaste of how the transformation is likely to shake up the usual balance of power and the distribution of roles between suppliers and car manufacturers.

The deciding factor will be the product category. Compared to the traditional, combustion-engine-focused suppliers, the balance is likely to shift in favour of the OEMs. They are facing weaker partners in this segment. However, this also brings new risks. "We need specialised suppliers for the future," says Porsche Executive Board Member Städter, referring to the challenge of keeping fiercely struggling suppliers afloat. Even though he emphasises that the focus is always on competitiveness, overall, it is to be expected that the OEMs will not manage to secure

their traditional supply chain entirely without costly subsidy measures.

In other supplier segments, however, the industry-wide increase in price pressure could lead to OEMs and suppliers moving closer together to collaborate on increasing value creation through jointly optimised processes. The extent to which the relationship with high-tech providers of the digital industry will become more cooperative remains to be seen – in any case, the once dominant position of the OEMs over AI specialists like Nvidia, who are in high demand, is likely to be reversed. Especially when it comes to connected mobility and automated driving, the once all-powerful car manufacturer may become more of a junior partner in the future. "This is all the more true if in future it is the software that is the critical differentiator, not the engine," says Kearney principal and automotive specialist Jan Mingo. He is alluding to the prominent and brand-building importance of certain IT components, as demonstrated for many years in the PC sector by the "Intel Inside" label.

The bottom line is that the transformation of the automotive industry will require a rethink on the part of both OEMs and suppliers. "For both sides, speed, flexibility and decisiveness will be elementary factors for success," Mingo emphasises. This includes – but is not limited to – identifying technological future fields and markets and reacting to them in time, be it by adapting the product portfolio on the one hand or early cooperation with suitable suppliers on the other. For both sides, this transformation process and the intensifying competition will be associated with considerable costs – which is why building up a corresponding war chest should also favour a successful transition.

Above all the challenges posed by electrification, automation, connectivity and other drivers of transformation, there is one major piece of good news: the car, often declared dead, is by no means at an end. Quite the contrary. The pool of all profits that can be generated across the entire value chain is growing. Depending on how the transformation is handled, however, this may be bad news for some market participants. The division of this growing pie will change and become even more contested, with currently clear advantages for software manufacturers and other industry newcomers.

# "We can do transformation"

1



Dr Uwe Gackstatter, head of Bosch's powertrain division, explains how the transformation of the automotive industry will affect business and workers – and why suppliers will maintain the most diverse types of cooperation with OEMs in the future.

INTERVIEWS BY CHRISTOPH HENN

Since 2018, Dr. Uwe Gackstatter has headed the Powertrain Solutions division of Robert Bosch GmbH. With more than 80,000 employees at more than 60 locations worldwide, it is the largest business unit within the company's Mobility division. The company itself is considered the automotive supplier with the highest sales in the world.

2



After holding various positions within the Volkswagen Group since 1974, Uwe-Karsten Städter was appointed Member of the Executive Board for Procurement at Porsche AG in 2011. During the industrial specialist's term of office, Porsche AG's purchasing volumes rose from two billion euros to over nine billion.

Uwe-Karsten Städter, until recently Member of the Executive Board for Procurement at Porsche, explains how the supplier structure has changed in the course of the electric transformation, how important suppliers are kept and new ones are won – and what role sustainability plays in all of this.

# "Preferably right at the front"



**Dr Gackstatter, how do you think the market shares of electromobility and combustion engines will develop in the next few years?**

We expect that by 2030 one in three new vehicles worldwide will be purely electric. In China and Europe, it will probably even be one in two due to legislation. Bosch's powertrain division is therefore facing the biggest transformation in its history.

**What technological impact will this have on your division?**

The classic powertrains will continue to be used for a long time, especially in the commercial vehicle sector. But new technologies will be added into the mix. Even though Bosch decided years ago not to manufacture battery cells in-house, the battery-electric drive will become a core business for us. For example, we provide the power electronics, the electric motor, entire drive units plus software. Secondly there is the Fuel Cell Electric Vehicle, i.e. an electric vehicle with a fuel cell system. We see great opportunities for this, especially in commercial vehicles.

**How do you cope with the multiple burden of working on conventional and new technologies in parallel?**

It is a major challenge for any management team to maintain and develop the core business on the one hand and to develop a new, very innovative business

on the other. For us, transformation means working on both. This year alone, we are investing 700 million euros in fuel cells and electrification. Those who work for us in the combustion sector are helping to finance the new business while those who have switched to the new divisions are helping to make history in the new powertrain systems. It is an advantage for us to have so many experienced engineers. Their qualities are now contributing to getting fuel cells and battery electrification up and running.

**How are your staff distributed among the powertrain technologies?**

Our Production works at a ratio of 10 to 3 to 1. For every ten employees in the diesel drive segment, there are three in the petrol segment and one in the electrification segment.

**How did that come about?**

A diesel engine consists of many more components than an electric motor. Due to the high vertical integration of diesel and our market position, we can employ more people there. In the transformation, we have to relocate as many manufacturing jobs as possible from the combustion engine segment to the electrification segment. However, we can already see that job cuts will be unavoidable. The situation is different in Development.

**Mr Städter, has your supplier structure changed in recent years?**

Yes, significantly. About a quarter of our suppliers are new ones within the last five years. About another third have changed their product portfolio.

**Is this all because of the transformation to electromobility?**

There are several reasons. A lot goes back to the development of the Taycan. Our first fully electric sports car, which has been on the market since 2019, represented a big step towards electromobility. As early as 2018, we had decided to be the first German car manufacturer to phase out diesel. There were also new legal requirements regarding internal combustion engines.

**What does it mean for your relationships with suppliers from the combustion engine segment when it seems like the end is getting closer for this technology?**

This is an important topic – relevant for the entire industry. We have to make sure in good time that our traditional suppliers are positioned for the future with their product portfolios. That's why we have been in intensive talks with our partners about transformation for a long time. Many of our suppliers

are highly specialised. Which is precisely why we urgently need them for the future.

**How do you create loyalty among these suppliers?**

With give and take. We ask for future plans from our long-standing suppliers. The internal combustion engine will be around for a while yet. But it is difficult for suppliers to predict what the demand will be in 15 to 20 years. That's why we rely on a mixture of support and incentives for how our partners can make themselves fit for the future. To this end, we hold strategy dialogues with them. We look at the current portfolio and their long-term plans. Financing is also important.

**And is it a matter of managing the risk of a supplier disappearing from the market at some point?**

Yes. It's about financial stability. And also potential situations where suppliers become the target of financial investors. Such offers can be tempting – especially for smaller companies that see only a limited future for themselves with their components or that would have to spend a lot of money on transformation. This is a challenge for us if we desperately need the supplier's core competence in the long term. What's more, these are companies with soul that have done a great job over the decades – and

### **In what way?**

The fuel cell system overlaps technologically with the classic internal combustion engine. That's why we have already taken development staff off classic combustion topics so that they can work on new components for the fuel cell and the electric powertrain. We are also turning mechanical engineers into software developers with our extensive training programme, as we see considerable growth in the software sector.

### **Are there similar programmes for Production?**

Yes, but the question of how many of our skilled workers we will still be able to employ after the transformation is still unanswered. We can do structural change. This is true for the entire car industry, which has constantly been evolving for more than a hundred years. But with regard to the current CO<sub>2</sub> legislation, I say structural change cannot be sudden. You have to give the car industry the time it needs to transform.

### **How does this change affect your business model and your cooperation with the manufacturers?**

In the classic business model, a large part of the value creation takes place at the supplier. The OEM assembles the engines and is ultimately responsible for the entire vehicle. In electrification, this is currently heading in a different direction. The OEMs are taking on more tasks themselves because they also want to secure jobs. As a result, procurement is decreasing

and the pressure on suppliers is increasing, especially in Europe. In addition to this change in the classic business model, there are others: we are already working with customers who rely exclusively on the new powertrains. They operate very differently from the traditional OEMs. They demand much shorter development times and greater flexibility in product development and cooperation.

### **What does that mean in concrete terms?**

Primarily it means diversity. We are working with an American start-up that wants to go into series production with fuel cell trucks in 2023. As a supplier, we want to provide the corresponding technology. This will have an impact over the entire lifetime of the vehicle. At the moment, many OEMs are entering into extensive partnerships and joint ventures, especially in fuel cells, in order to achieve economies of scale and reduce costs. We are trying to be as open as possible. We are working with a start-up in the USA, have entered into a joint venture with a Chinese manufacturer and are still maintaining the classic supplier-OEM relationship in Europe.

### **Do the business models vary depending on the region?**

Yes, that's the way it is at the moment. Everyone has to remain flexible in order to bring the different technologies to market quickly and affordably. That is why

it is my honest concern that they should remain in business. This is often successful, but not always.

### **You don't just have to keep classic suppliers, you also have to acquire new suppliers that you need for electrification.**

Again, we act very early on. Together with our development department, we define products, projects and components in the pre-development phase and coordinate with the supplier market. Michael Steiner, Member of the Executive Board for Research and Development, often sits at the table when a supplier gives us their view of a product that's going to be developed. Is it technically proficient and can it add that certain extra something that is so typical of our brand? These are the questions we ask.

### **How is that working out?**

We are well on the way with electrification. Many suppliers appreciate the fact that we work very closely with them on new products and projects. For our partners, this is an opportunity to grow with us.

### **Nevertheless, you are in competition with other companies that are looking for the same expertise in the course of the transformation.**

Exactly. And we prefer not to be at the back of the queue, but rather at the very front.

### **And that works?**

Our success rate speaks for itself. That's because we get on board with the manufacturers at an early stage. The important step is the one before: deciding who to work with.

### **Could you elaborate?**

We come from the race track! That's why we don't just look for suppliers who can hold their own against the competition with their current competencies. It is also important to us that partners want to go the extra mile – for our brand and for our customers.

### **What impact does it have now that you are having to purchase components at the same time that are in very different lifecycle phases: classic internal combustion engine components and ramp-up products from electromobility?**

It is a particular challenge to keep several balls in the air in such a way that none fall to the ground. New parts are necessarily at the start of their lifecycles, and at the same time we need those proven components that will eventually be phased out. Sometimes the two overlap. For those doing the procurement, this is a highly complex issue. Our experts have therefore developed a so-called heat map. We use this matrix to precisely classify all Porsche com-

this transformation is such a major challenge, for which there is no blueprint.

**Will the cooperation between OEMs and suppliers become more partnership-based in future in order to shoulder the high costs of the transformation?**

On the one hand, there will be joint venture partnerships, while on the other hand there will also be a shift in value creation: away from the supplier, towards the manufacturer. We ourselves maintain the most diverse models of cooperation worldwide. Our now very heterogeneous customer structure also shows that the automotive market is still an attractive one. Past predictions that only a few car manufacturers would survive are simply not true.

**On the contrary, the market is attracting new manufacturers and suppliers, for example from the technology sector. What does that mean for you?**

For us as a system supplier, new providers open up new opportunities. They tend to tap into our engineering kit more than established manufacturers. For example, they'll place an order with us for a complete fuel cell powertrain. A traditional OEM would rather make the engine itself and buy in components.

**Does it affect procurement when some components are in less and less demand and others are in greater demand?**

ponents within a lifecycle grid. We sort suppliers according to the technology level of the components and in which of our vehicles they are installed. This enables us to identify at an early stage what needs to be done and by when, and where we may need to invest in additional tools or more capacity.

**How has Porsche coped with the chip crisis so far?**

Relatively well. Of course, we are also affected by the fact that some component or other in some semiconductor configuration or other is struggling. This is a 24/7 task where we are in constant exchange with the VW Group and the semiconductor manufacturers and fight week after week to get enough semiconductors.

**Is the balance of power between OEM and supplier changing here? In contrast to classic suppliers, the chip manufacturers also sell their products in other sectors.**

The entire automotive industry is changing, including its value chains and structures. But basically the balance of power between manufacturer and supplier is in equilibrium.

**Really?**

Yes. Generally, supply chain structures change as a result of demand. Take the semiconductor market

Yes, definitely. We are already seeing that semiconductor manufacturers, for example, are less willing to invest as the unit numbers in the combustion engine sector are expected to decline.

**That is a problem ...**

Yes, especially since combustion technology is currently recovering from the slump brought about by the coronavirus and has returned to growth. But in the next few years the point will come when sales start to shrink. We have to motivate many suppliers, ourselves and customers as well to continue to be able to supply combustion technology.

**How will the transformation affect your existing value creation structures?**

Our factories are spread all over the world, but we still have very high value creation in Europe. We already produce more combustion technology than the market absorbs here and export it. If Europe is the first region to want fewer combustion engines, that will have a direct impact on the factories here. And also on the supplier structure. Many customers have announced that they no longer want to manufacture certain combustion engines in Europe, but will buy them from outside Europe if necessary.

at the moment: because people are spending more time at home due to the coronavirus pandemic, the demand for computers, game consoles or household appliances, for example, has increased. This has shifted the balance of power – but not between us and the supplier. For the most part, we are not in direct competition with consumer electronics. That sector requires very different high-performance chips than in the automotive industry.

**What does that mean for cooperation?**

We have to redesign supply chains and cooperation. We are also getting closer to these industries in the transformation. In the future, it will be important to determine even earlier which products we need in the vehicle and what the supply chains for them look like. So I have to present supply chains transparently and analyse exactly where problems might arise in terms of security of supply.

**Is the cooperation between OEMs and suppliers becoming more partnership-based?**

That depends on the component. For traditionally sourced components, there is not much change. With other components, quite clearly a different form of cooperation is needed, and with the sub-suppliers too.

**What does it mean for your value creation if the internal combustion engine is gradually eliminated?**

The combustion engine is a mature technology. This results in economies of scale, thanks to which we can manufacture very cost-effectively. In battery electrification, the ramp-up is still to come. But the markets are not prepared to pay a premium for battery power. So battery electrification is under considerable price pressure from the outset because it has to compete with the combustion engine. The same goes for the fuel cell. All market participants are having to deal with very ambitious target costs and target prices.

**What role do influences like coronavirus and the chip crisis play in the transformation process in your company?**

Our company is over 130 years old and many of our customers have a long tradition in the automotive sector. We have internalised our planning process over decades and have always been relatively good at predicting sales figures. Everyone has aligned their development cycles, teams, investments and so on to this. Now we are seeing that long-term planning capability is disappearing. Most recently, the coronavirus pandemic, which had a completely different impact on the global markets, has shown that we have to position ourselves much more flexibly. We managed to adapt well at the beginning of the crisis. But we also recognise that supply chains are not as resilient as would be ideal.

**How are you responding to this?**

Our clear takeaway from the alternating ups and downs is that we want to make the entire supply chain more robust. Only recently, for example, Bosch opened a semiconductor factory in Dresden. This is a contribution to our own, higher value creation. It is also important that we focus on different powertrain technologies, because today no one can predict exactly which vehicles will be most in demand in the future. And in the powertrain sector we are perhaps the only manufacturer in the world that is active in all segments, so, not just in the passenger cars and commercial vehicles field, but also in the off-road machines and large diesel engines business. In addition, we support the introduction of reduced CO<sub>2</sub> fuels. We are positioning ourselves broadly and openly in order to emerge from the transformation strengthened and successful.

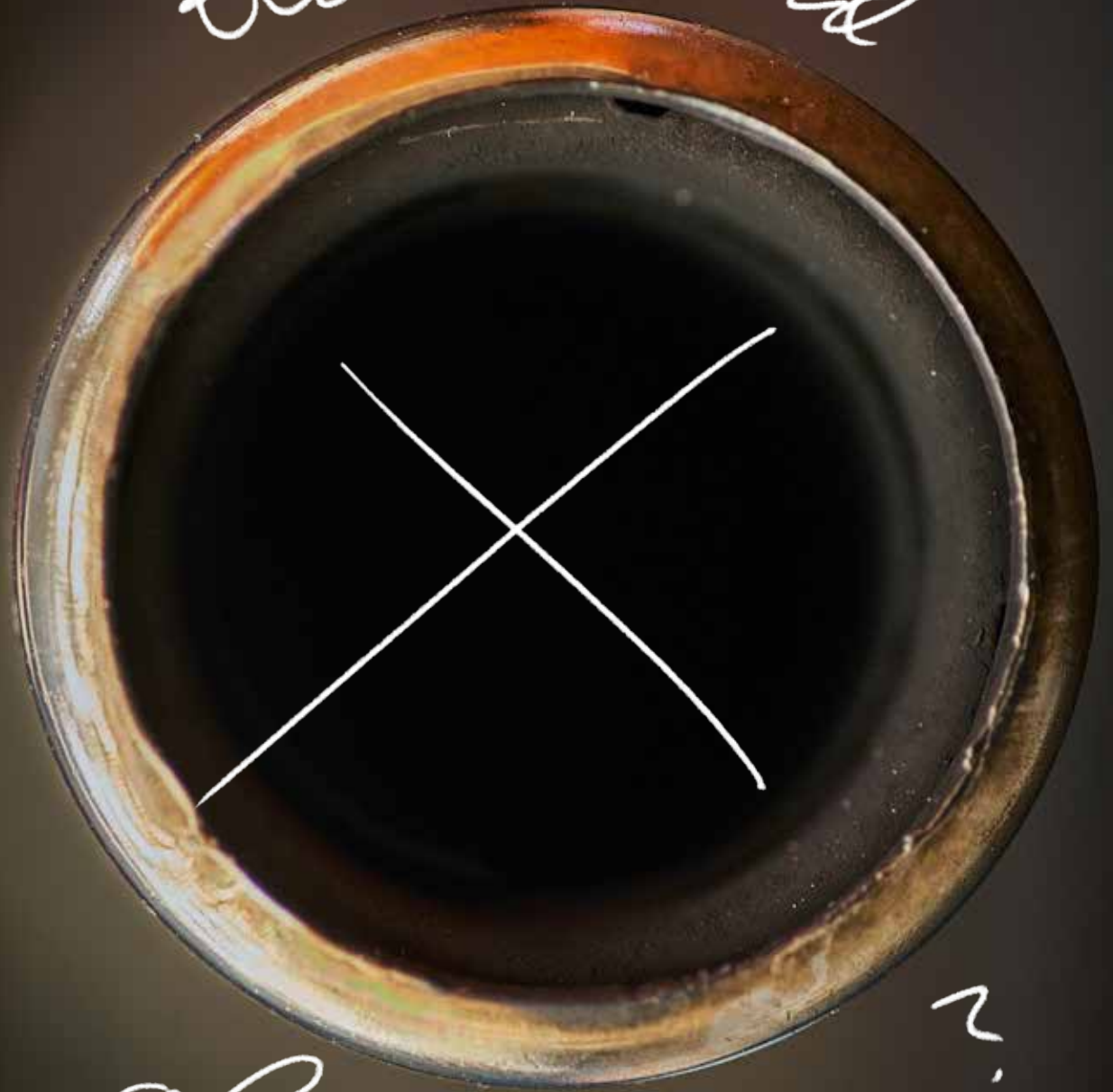
**To also jointly shoulder the costs that arise from electrification and other new technologies?**

It's all about opportunities that we develop and share with the supplier. Of course, this also creates the opportunity to talk about investments at an early stage and discuss where we could support each other. What is important is competitiveness: ultimately, it has to remain cost-effective for all parties involved.

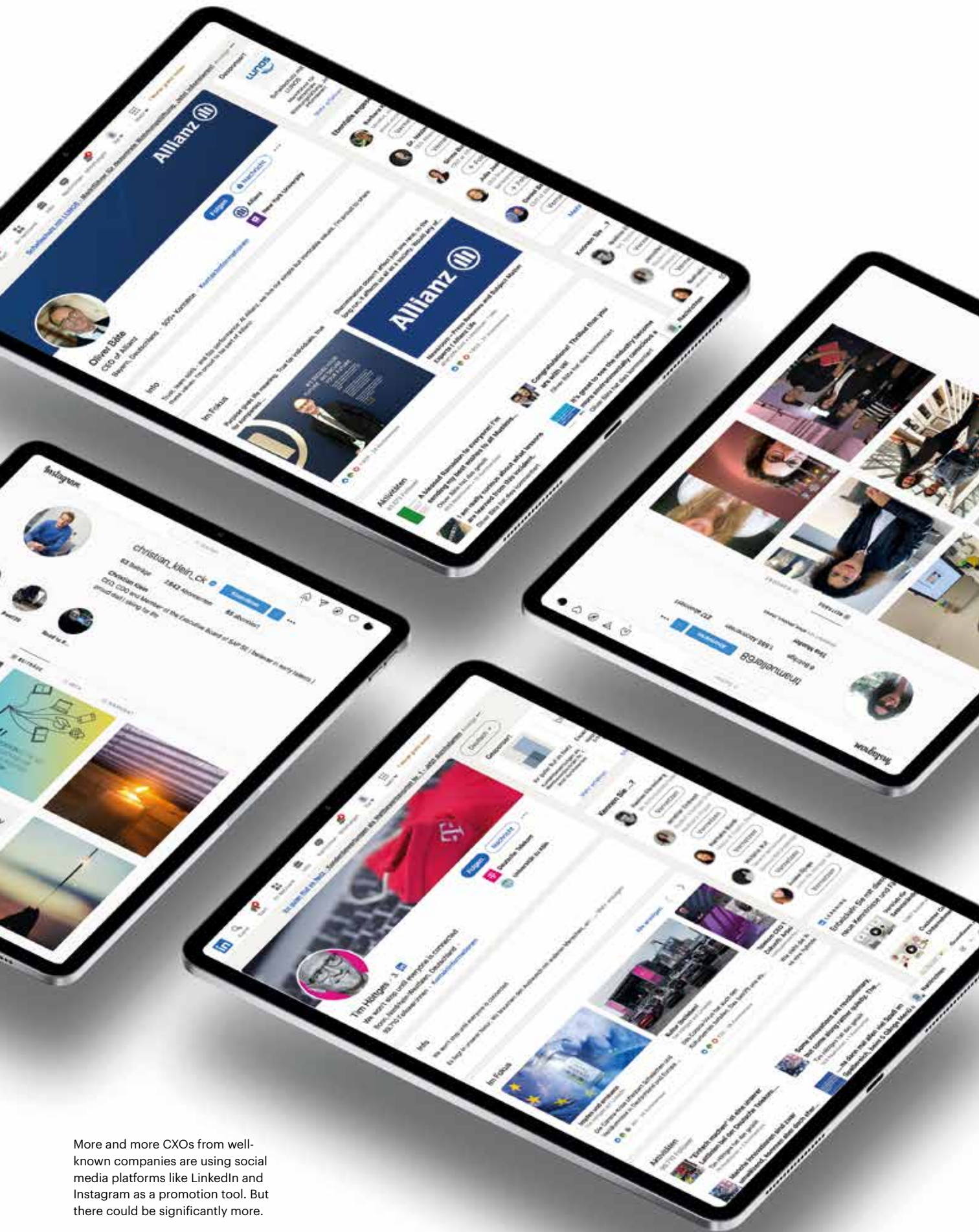
**Partnership increasingly includes standards along the entire value chain. The supply chain law is a good example of this. How do you ensure this?**

Sustainability is a core value of our corporate strategy. We have set ourselves ambitious goals: by 2030, we want to become carbon neutral throughout the entire supply chain. This is only possible in conjunction with the supply chain. Since 2019, sustainability has been a binding criterion for contract award in Porsche's procurement. And since July of this year, we have required our approximately 1,300 series suppliers to manufacture our components using only renewable energies. We have already been requiring this of our battery cell suppliers for two years and have had positive experiences here.

the end



of an era?



More and more CXOs from well-known companies are using social media platforms like LinkedIn and Instagram as a promotion tool. But there could be significantly more.

# Simply being there is not enough

The role of CXOs is changing. Yet many bosses are only tentatively making friends with social media – and are missing a great opportunity as a result.

**R**elaxed behind the wheel, sleeves rolled up in his striped casual shirt, the sun on his face. The pictures that Herbert Diess shared last year on his LinkedIn profile with about 190,000 followers are still unusual for a German company leader. As was the text that went with them: "Going on holiday with an electric car – can't be done? Yes it can! I picked up a vehicle with my daughter Caro in Munich from the ID.3 pop-up store for my summer holiday in Italy." As unusual as the personal experience on the market launch of the new VW ID.3 is, the story exemplifies how CXOs do things right on social media.

"Such content leaves a much greater impression on social media than the casual sharing of press releases or company posts," says Mirko Warschun. Because those who don't say anything or simply repeat their own marketing are selling themselves and their organisation short. Michael Meier of Egon Zehnder takes a similar view. In a recent study, the Swiss HR consulting firm, together with Kearney, took a close look at the social media activities of CXOs. According to Meier, the era of the corporate soldier is over. At the same time, social media helps corporate leaders to show "their human side" and do justice to their changing role in the world.

But it is not just on LinkedIn that VW boss Diess shows what makes a corporate influencer. Recently he's also been found on Twitter – and in his first post he congenially challenges Tesla boss Elon Musk directly. A few days later, he also takes on the new US President Joe Biden. After Biden announced in a speech that the US government's fleet would be converted to electric vehicles, Diess praised the "good decision" and the "good timing". After all, he said, VW was ready to deliver. Of course, Herbert Diess is not the only CXO who successfully uses social media for his own benefit. Oliver Bäte, CEO of Allianz Insurance, for example, has been having success on Instagram for some time. "Instagram

has fulfilled what I wanted: to have a communicative presence in the 25 to 34 age group and among women. In other words, where my young employees and my customers of tomorrow are to be found." Indeed, along with Telekom boss Tim Höttinger and Christian Klein of SAP, he is still one of the few DAX CEOs who have actively adopted the platform of fashion, beauty and fitness influencers for their CEO branding. If you look at the figures of the study, you will find more on LinkedIn, the most popular platform in the German-speaking region for professional networking and CXO and personal brand building. More than half of the DAX CEOs have a registered profile on the platform; around a quarter have a profile on the short messaging service Twitter.

Regardless of which platform is used – simply being there is not enough. According to Warschun, the credibility of a profile depends on two factors. "The personal messages from the CEO should be in line with the company's values." For example, it is not a matter of commenting on arbitrary events and developments in politics and society. Rather, a clear reference to the company should remain recognisable. "Furthermore, the profile must fit the personality of the CEO in tone and character. If the messages all too obviously come from ghostwriters, the social media presence becomes a caricature." CEOs who are not comfortable with social media should therefore leave it alone instead of being only half-heartedly active.

*The full study is available at [de.kearney.com/ceo-influencer](https://de.kearney.com/ceo-influencer)*

# The special



"This is the glove compartment of a Porsche 356 Carrera 2 from 1964. I've just come from a classic car rally through the beautiful Elbe Sandstone Mountains in Saxony. In my glove compartment is an old Falk city map of West Berlin. Legendary! It's from 1975 and has been living in the Porsche for quite a long time. Then, of course, a charging cable for my mobile. But the most recent thing is my camera drone. My company, Kearney, gave it to me at a partner meeting, and it has accompanied me on rallies ever since. You can take spectacular photos with it. It even follows the car on its own."



BY CHRISTIAN MALORNY,  
PARTNER AT KEARNEY AND GLOBAL HEAD OF AUTOMOTIVE



# **glove compartment**



# Beyond the Gigafactory

TEXT BY DOMINIK WÜCHNER

The transformation of the automotive industry holds more opportunities than risks. According to a recent study, this applies not only to the large car manufacturers, but also to the supplier industry. Disruption and transformation, accelerated by the Covid-19 pandemic, are also offering new perspectives for growth and success strategies.



Even before the pandemic, the automotive industry was facing a global decline in demand, the diesel emissions scandal, the new WLTP cycle for determining fuel consumption and other societal changes. Then production plummeted by over 16 percent during the pandemic. Now the industry is battling with disrupted logistics chains and a shortage of raw materials and semiconductors. These developments, of course, hit automotive suppliers hard. The result was disruption and insolvencies. Investors, many of whom tended to give the industry a wide berth in the past anyway, increasingly rated the attractiveness of the sector even lower and behaved cautiously. At the same time, in the shadow of the pandemic, the trend towards the electrification of the powertrain continues to gain momentum. Car manufacturers are therefore increasingly fo-

cus on the associated technologies, supported by a political and social consensus. The share of pure internal combustion engines is declining irreversibly in favour of hybrid and electric powertrains and is set to fall to well below 50 percent by 2030.

#### **High development costs**

Accordingly, the challenges for established market participants are considerable and will ensure that they must increasingly adapt their competences. Because the costs for the development and production of components for electric powertrains are still sizeable and will not fall in the short term to such an extent that the revenue will provide the margins that have come to be expected from combustion engines. At the same time, revenues from the repairs business

will continue to decline as the penetration of purely electric powertrains in the fleet on the road increases. Electric motors, after all, require less maintenance and the number of wear parts is lower. Consequently, we must assume sustained pressure on the profitability of car manufacturers and suppliers.

### **Reacting in good time**

In this mixed situation, the opportunities for manufacturers, suppliers and investors alike lie in understanding the future value chains at an early stage and adapting their own strategies. In a detailed value chain analysis for more than 40 components and systems, Kearney has simulated the future trends of the supplier industry. For the industry as a whole, the experts from the automotive and private equity sectors expect stable business with only slight growth in value creation of one percent per year until 2035. However, the recently published study "Beyond the Gigafactory" shows that the shifts within the industries will be massive. "While individual components and technologies will boom, some companies will have to develop alternatives for their current business models if they want to permanently avoid going out of business," says Kearney automotive expert Christian Malorny.

### **Massive upheaval**

Component manufacturers in the areas of engine, exhaust and fuel systems are likely to be affected by falling demand during this period. This is because electric powertrains not only manage with far fewer parts, but they are also completely different. They need neither fuel lines or injection valves, nor pistons or engine blocks. The significantly more complex hybrid technology will at most delay development, but it will not stop it completely. The winners will be those suppliers who develop and deliver the necessary components for electric powertrains. This applies to electric motors, inverters and the important high-voltage cable harnesses that carry the electricity from the battery to the drive units. And this applies in particular to the new centrepiece: the battery. Competition is already fierce today, and as soon as sales figures pick up significantly, the progress in innovation will in some cases be huge too. "In ten to 15 years at the latest, the value added by pure electric components will exceed that of conventional drives in value – a massive upheaval of an entire industry," says Marcus Weber, one of Kearney's experts on the production of new components for vehicles with electric drives.

### **Software in demand**

But the further development of components outside the powertrain also offers potential – for example, in axles and braking systems that have to be designed for higher vehicle weights, or in lightweight bodyshells



that place different demands on developers and producers. Not to mention the second wave of disruption sweeping the automotive industry: the digitalisation of vehicles. Software is becoming increasingly important and not just for vehicle control – cars are becoming “gadgets on four wheels” thanks to online-based applications and entertainment components. For younger target groups in particular, these factors are becoming increasingly relevant in their purchasing decisions. This leaves a third group of suppliers that can continue their business models (almost) untouched, since cars will continue to move on four tyres in the future, and will still need seats and windows. Other components that are not subject to major change include displays or lighting systems.

#### **Various investment opportunities**

For the affected car manufacturers and their suppliers, it is therefore now a matter of finding the right strategy to profit from the shifts in value creation. And investors should also take a look at companies in the supplier sector. While the segment has long been considered not very attractive for investments, there are now many opportunities. However, this requires understanding the profound industry transformation and then focusing on the right companies and the appropriate strategies. “Those who focus on the ‘electric newcomers’ can become part of the booming electrification sector, but should be well versed in the barriers to market entry in an environment with high innovation pressure and clear growth aspirations,” says Astrid Latzel, Kearney expert for private equity investments in the automotive sector. But it is also possible to invest profitably in supplier companies in a declining market. On the other hand, scoring points as a “scale champion” can succeed if the answers are consolidation and operational excellence. “Integrators”, meanwhile, focus on expanding their business models, building on an increase in the vertical integration in the producing components and systems. And for those who prefer long-term strategies, the model that focuses on more resilient companies is worthwhile. Here, investments focus on the segments already mentioned that are barely affected (or completely unaffected) by the disruptions. “A stable and predictable market field allows for lower-risk planning with a low risk of default,” says Latzel.

Even if the automotive industry is currently marked by uncertainty due to the current sales crisis and the upcoming electric revolution, there are still opportunities for investors and suppliers to profit from the changes – and especially beyond the pure electric vehicles built in Tesla’s Gigafactory. So it’s worth taking a close look and showing courage – with the right strategy!





# Who should invest in what?

System

Strategy

## The scaling champion

Consolidation of suppliers with a decreasing number of units to achieve a scaling effect even in a shrinking market



## The integrator

Expansion of the company's value creation from component production to system production, or deepening of value creation in terms of the components produced



## The resistor

Continuation of solid business with products that are only slightly or not at all affected by electrification

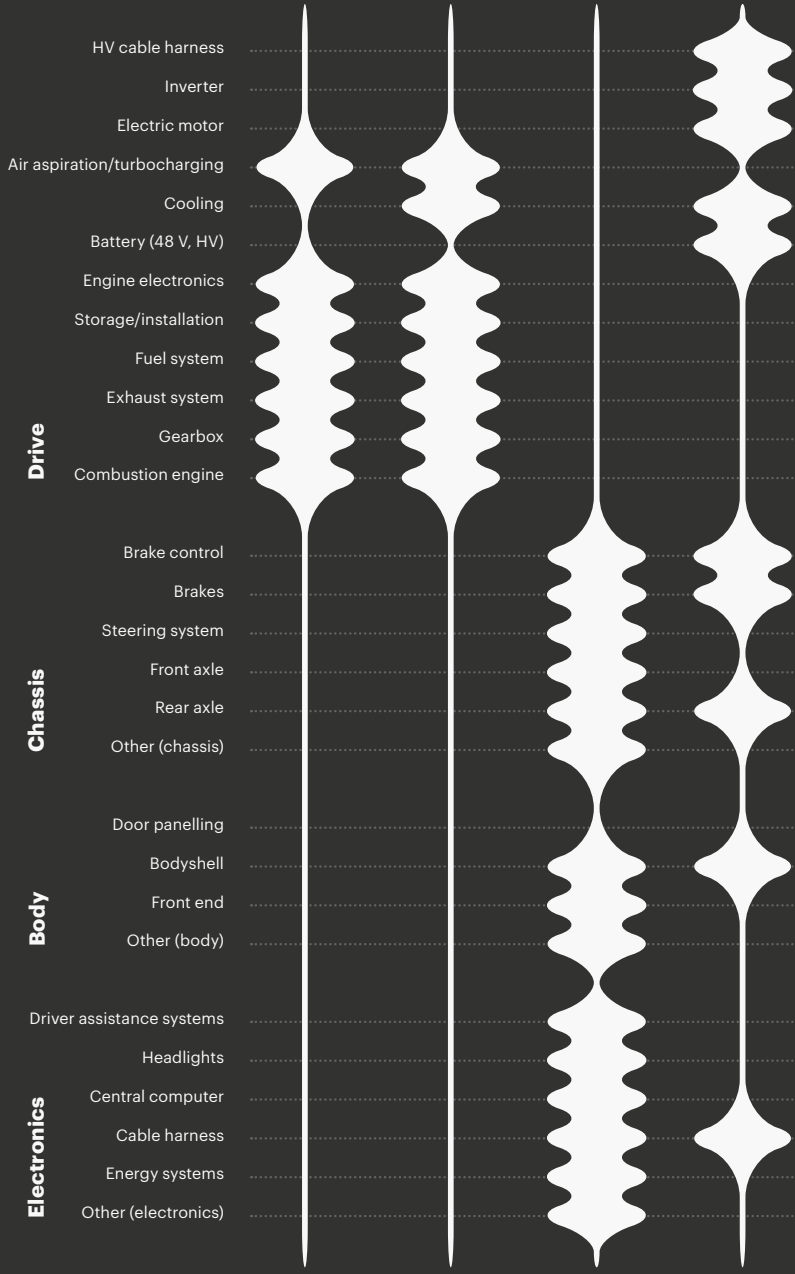


## The electrification hotshot

Advancement of the growth of established or new players with products in areas that increasingly create value



Source: Kearney



# The future of manufacturing

Mercedes-Benz is building the car factory of the future with its "Factory 56". Here you can discover one of the most modern automotive production facilities in the world.

In Factory 56, Mercedes consistently and comprehensively uses innovative technologies and processes in the production of vehicles under the keywords "digital, flexible, green". This creates a modern working environment that takes greater account of individual needs. Ultimately, flexibility and efficiency in the factory will again be significantly increased compared to our current vehicle assembly lines. We give you a sneak peek.

## Sustainable

By 2022, all German Mercedes-Benz Cars plants will have a carbon neutral energy supply. New plants worldwide are already being planned with this premise in mind. Factory 56 will be supplied with carbon neutral energy from the outset when it goes into operation. There is a photovoltaic system on the roof which feeds in self-generated green electricity for the production hall. Approximately 40 percent of the roof area will be covered in grass. In addition to compensating for sealed ground surfaces and rainwater retention, this also improves the indoor climate.

## Flexible and efficient

A key feature of Factory 56 is its 360-degree networking across the entire value chain – from development and design, to suppliers, production and customers. In discussions with our suppliers, for example, the advantages of tracking and tracing are used, whereby load carriers can be tracked digitally anywhere in the world. This makes it possible to detect deviations in the supply chain at an early stage and to react more quickly as a result.

## Intelligently connected

Machines and systems are interconnected. Selected assembly systems and the conveyor equipment become "Internet of Things" ready. The basis for this is a high-performance wireless and mobile radio network. For the first time, the use of high-performance 5G mobile technology will be tested in pilot applications in assembly. The assembly hall itself will be completely paperless. Employees will work with monitors and personal digital assistants (PDA).

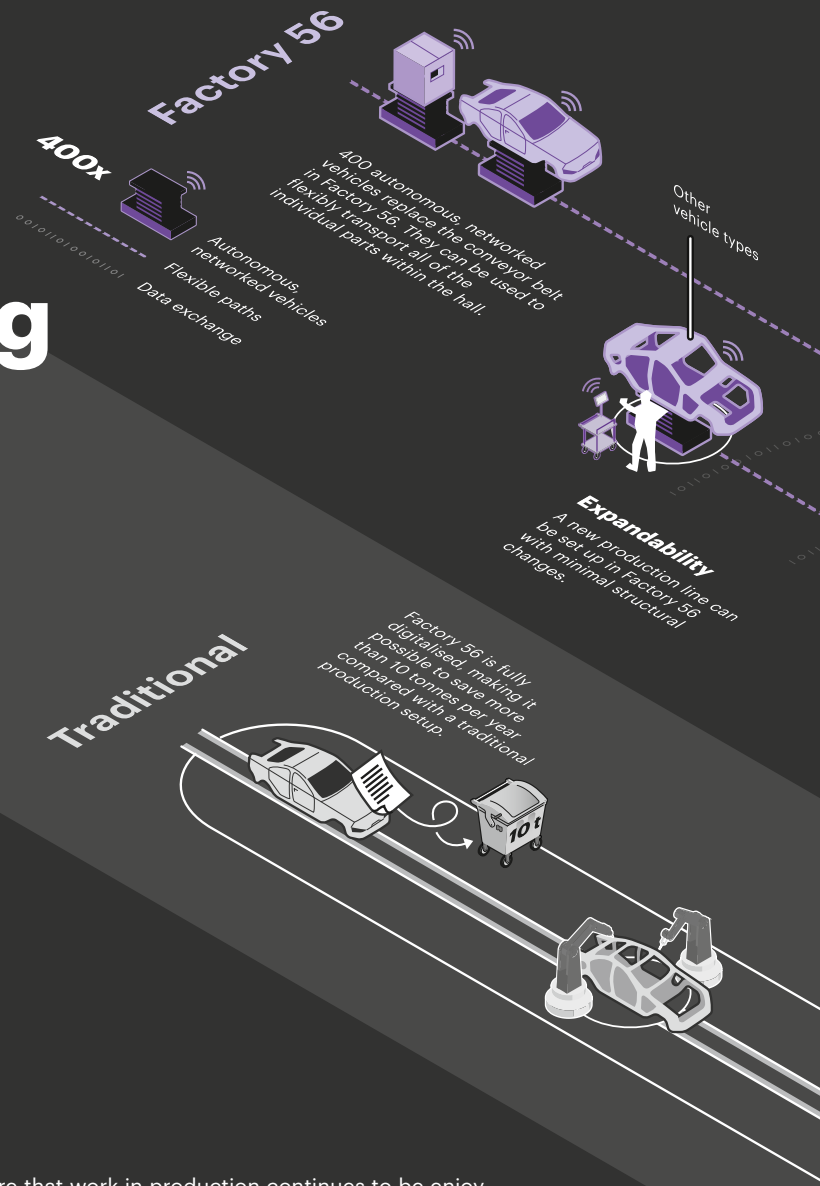
## Employee-focused

In Factory 56, it is the people that take centre stage. For this reason, the level of automation is being scaled back and framework conditions are being created to

ensure that work in production continues to be enjoyable. To shape the future of production, an innovative work organisation and new working time models are being developed in conjunction with the Works Council. The aim is to reconcile the needs of the company and those of employees with feasible and practicable solutions.

## Forward-looking

While the company wants to increase flexibility, increase capacity utilisation and expand the company's working hours, employees often want to have more freedom for their individual needs with more flexible working hours and locations that can be arranged at shorter notice. With this in mind, a model for flexible deployment, known as a Personnel Deployment Pool, is already being tested. In the future this will make it possible to better take into account employees' wishes with regard to the work schedule depending on their personal situation, and therefore promote the compatibility of family life and work. It is conceivable that one day employees will be able to choose their working hours via an app. So really forward-looking.





**25 years of construction time**

**€ 730 million of investment**

**220.000 m<sup>2</sup> of floor-space**

Location: Mercedes-Benz factory in Sindelfingen

**Facts about Factory 56**

**Energy management**

Lightwells provide a pleasant amount of light without requiring additional energy.

not to scale

**12.000x**

Approximately a third of the energy required by Factory 56 is supplied by around 12.000 photovoltaic modules.

Excess energy is stored in raised car batteries.

**Flexibility in the event of a malfunction**

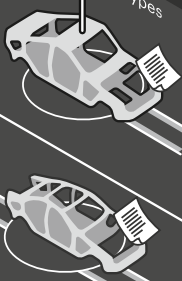
In the event of a malfunction autonomous vehicles are rerouted, making it possible to avoid long delays.



**Digitalisation**

The entire production hall has 5G network coverage, which enables comprehensive networking.

Other vehicle types



**Expandability**

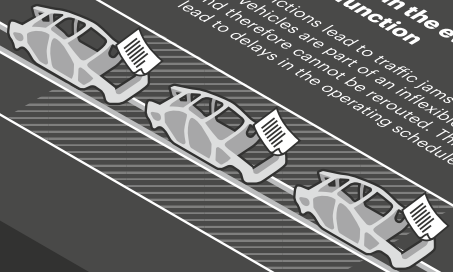
In a traditional factory, new conveyor belts are required to set up a new production line.

**Workstation**

Workstations can be ergonomically adjusted thanks to rotatable ceiling mounts and height-adjustable vehicles. The employees can select their shirts freely and digitally via an app.

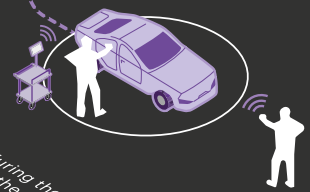
**Flexibility in the event of a malfunction**


Malfunions lead to traffic jams because the vehicles are part of an inflexible system and therefore cannot be rerouted. This can lead to delays in the operating schedule.



It is almost impossible to implement change requests from the customer during the production process.

Even during the production process, the customer can still make changes via an app.



An aerial photograph of a city grid, viewed from a high angle, with a large, semi-transparent microchip overlaid on the center. The chip's intricate circuitry is visible, and its edges are slightly blurred, suggesting it is a digital overlay on the physical city. The text is superimposed on the chip and city grid.

# Will microchips decide the next great race to see who will lead the automotive industry in the future?

Microchips – the next great race for innovative leadership in the automotive industry has begun. This is also changing existing supply chains.

TEXT BY GORDON DETELS

**F**or many decades it was (and largely still is) true in the automotive industry: a car is defined by its mechanics, by classic features such as performance, driving comfort, space and passive safety. But vehicle electronics? That's more a means to an end. The electrical-electronic architecture (E/E) is designed accordingly. There is a multitude of comparatively simple control units distributed throughout the car, which ensure that all components work well together. If, for example, there is a problem with the central locking system or the electronic immobiliser, a specific error message appears on the display.

Due to new developments and current trends, especially from the areas of autonomous and highly assisted driving, as well as connectivity and digitalisation of the operating concept, the tide has begun to turn – things have become more complex. The importance of electronics and software functions as differentiating elements is sharply on the rise. For example, electronics and data for software code already represent almost 30 percent of the value creation for a vehicle – and will more than double by 2030.

With this transformation, the E/E architecture and chip types are also changing. The 70 to 80 control units installed in cars up to now, which have relatively low performance due to computing speed

and memory space, are no longer sufficient; centralised structures based on (a maximum of three to four) high-performance computers are required. This is also because software approaches are being used that have their origins outside the automotive industry. Specifically: clear separation of operating system, middleware and dynamically reloadable application software, AI algorithms and over-the-air updates. And these place completely different demands on chip performance. Conversely, advances in chip design make new software functions possible. This can be seen, for example, in the increase in augmented reality functions on mobile phones, which are also beginning to find their way into the vehicle's head-up display. In summary, after electrification and software, it is chip architecture and chip design that will dominate the next great race for innovation leadership and value creation in the automotive industry.

Tech companies have long recognised that to innovate and differentiate from competitors, it is necessary to design software and microchip architecture together in an inclusive approach. Examples include Apple, which turned away from Intel and developed its own M1 processor. Or Amazon and its partnership with Dutch semiconductor manufacturer NXP to develop its own server processors.

Tesla led the way as the first automotive OEM

to introduce its own high-performance processor for its cars' central computer in series production as early as 2019. Tesla's pooling of the functions of originally distributed control units into one central computer allowed the software applications to perform significantly more complex tasks, also enabling their continuous development and updates. And they went one step further: after using Nvidia processors in the first generations of its central computer, Tesla introduced a self-designed chip in the second step. This includes, among other things, 3x Quad Core Cortex CPU, Mali GPU, NPU, cryptography unit and other hardware accelerators and is produced for Tesla by Samsung (in the advanced 7 nm process). By taking this step, Tesla has once again demonstrated its ability to innovate with approaches originating from the high-tech industry.

Traditional automotive companies, on the other hand, still often have a too conservative view of chips, seeing them as far removed in the supply chain, and find it difficult to break up these established structures – even if a rethink is slowly setting in. There's one problem: partnerships are often formed with chip suppliers, but these are built on the platforms of the chip companies, which have often also been optimised for cross-industry requirements. This is problematic because such broad platforms limit the ability to focus on the needs of the automotive industry due to their suboptimal performance. However, companies like Nvidia will only consider individual wishes of a manufacturer to a limited extent due to the comparatively low order volumes. Apple, for example, bought as many semiconductors in 2019 as the entire automotive industry combined. At Taiwan Semiconductor Manufacturing Company (TSMC), the world's largest contract manufacturer of semiconductor products, for example, automotive accounted for just four percent.

A better way would be for automotive companies to build up their own know-how, says Sebastian Dörfler, Principal at Kearney and one of the experts on IT technology in cars. This is happening slowly. "Only this year, some well-known automotive companies dared to take the next step. Continental, for example, announced a partnership with the Californian chip start-up Recogni. And Volkswagen AG CEO Herbert Diess announced that Cariad, the automotive software subsidiary within the group, needed to and would build capabilities in processor manufacturing for autonomous driving."

The advantages of an OEM's own automotive chip are obvious. The best functional performance can only be achieved by optimally matching software architecture, chip design and semiconductor manufacturing technology. Tesla also took advantage of this fact. By introducing its own chip design, the company was able to eliminate unnecessary semiconductor structures, use the space gained

for functions directly integrated in the chip, such as "functional safety", and at the same time significantly reduce the power consumption of its central computer. Compared to an equivalently equipped purely electric car based on a traditional electronics architecture, the average on-board power load of a Tesla is 30 percent lower. This is directly noticeable to the customer, for example in a longer range.


An OEM's own automotive chip based on more advanced semiconductor technology will enable new applications in autonomous driving or operating logic in addition to higher computing power and energy efficiency through the clever combination of hardware elements. For Kearney, one thing is certain. The first fully autonomous Level 5 car will be offered by an OEM based on its own software-hardware platform.

Without the step towards OEMs' own automotive chips, however, the traditional automotive industry will find it difficult to lead the next major milestone in innovation and would once again run the risk of leaving the playing field to companies from the tech environment. To put it another way, if Apple and Google wanted to, building on their software-hardware expertise, they could have the rest of the car, i.e. the framework of electronics and sheet metal, produced by a contract manufacturer – and their car would be ready.

Quite apart from maintaining innovation leadership in the future core area of the car as the main plus point, there are other advantages for the automotive manufacturers: there are often supplier oligopolies for highly specialised chips from the field of AI applications. Due to the very high costs of changing technological platforms, these are quasi-monopolies. In the case of chips, only around 50 percent of the costs are for the pure hardware; the rest is overhead including margins. In other words, the (very high) profit margin lies with the computer chip producers.

Designing their own chips would enable the OEMs to control a substantial part of the value creation, circumventing technological lock-ins and skimming off a large part of the margin. This could easily amount to savings in the triple-digit millions.

The current shortage of available semiconductors and the resulting interruptions in car production (almost all well-known OEMs had to temporarily stop assembly lines for several weeks and in some cases even order short-time work) not only showed how heavily the OEMs and their direct suppliers depend on the semiconductor manufacturers with their production capacities, it also showed the lack of possibilities of exerting influence. Since OEMs, to put it bluntly, often only talk to their direct suppliers, there is no contact with the chip manufacturer, a limited flow of information, no relationship of trust. Coordinating capacity planning and responding flexibly to



**Tech companies have long recognised: that to **innovate** and **differentiate** from competitors, it is necessary to **design software and micro-chip architecture together.****

the OEM's demand become correspondingly more difficult. Where this has happened recently nevertheless, for example at BMW and Toyota, it was because they understood better how to integrate the semiconductor manufacturers more directly into the management of their supply chains. This allowed them to react to the new supply situation in good time. Things are even better for an OEM that designs chips itself. This means it enters into a direct business relationship with the respective contract manufacturers, has a more direct insight into production capacities and can also secure them proactively and in the long term.

Ultimately, car manufacturers must not and cannot afford to relinquish control over the future core of the automobile. While the industry has already come to this realisation in terms of automotive software and decisive steps are being taken in the right direction, the underlying processor hardware still requires a major rethink. OEMs should therefore be building specialised processor design capabilities in parallel with their software organisations. Developing these capabilities from scratch independently is unlikely to be realistic for a player in the automotive industry – but it is not necessary. Instead, it would be possible through initially strategic partnerships with chip design companies or even by recruiting appropriate teams of developers.

Whichever path the traditional automotive industry takes, it should not wait much longer. After all, nothing less than its future is at stake.

**If Apple and Google wanted to, they could bring a car to market relatively easily. Building on their software-hardware expertise, they could have the framework of electronics and sheet metal produced by a contract manufacturer and their car would be ready.**

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As a global consulting partnership in more than 40 countries, our people make us who we are. We're individuals who take as much joy from those we work with as the work itself. Driven to be the difference between a big idea and making it happen, we help our clients break through.

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### Champion Maico MC 400 H



Elect	
Top sp	Top speed: 85 km/h
Total w	Total weight: 520 kg
Engine	Engine power: 15 HP
Total n	Total number: 3873 models
Price	Price range: from DM 3.750
Cruise	Special feature: Convertible roof
Charg	Launch: 1955