

# THINK ACT

## AUTOMOTIVE INSIGHTS

1 | 2015 BEYOND MAINSTREAM



AUTOMATED  
DRIVING

**Winning  
strategies for  
suppliers**

INTERVIEW

**Uber's  
Christian  
Freese  
about a new  
mobility  
market**

DIGITAL DRIVE

# The future of automotive

## 3 KEY TAKEAWAYS

The future of automotive is digital. By analyzing, developing new approaches and understanding changing mindsets Roland Berger experts help create value and change the game.

Analyzing  
Digitization

**The digital transformation also gives the automotive industry the chance to generate new business. Based on the trends we identified, we see four key areas where resolute action is needed: Digital data, automation, digital customer interface and connectivity.**

THE DAWN OF THE DIGITAL CAR

Rethinking  
Mobility

**"We are witnessing a radical change in the way people behave in conurbations. Trips are no longer planned and pre-ordered in advance. Ad hoc availability is the key."**

UBER GERMANY'S MANAGING DIRECTOR CHRISTIAN FREESE

Practicing  
Automated driving

**Any supplier with aspirations to become a full systems provider – complete with all the vehicle and integration skills required – will have to master three new areas of technology: Navigation, vehicle control and human-machine interface.**

WHO WILL BE IN THE DRIVER'S SEAT?



**Marcus Berret** is head of the global Automotive CC at Roland Berger and head of the company's supervisory board.

# Talking about a revolution?

## DEAR READER,

**DIGITIZATION** has captured the imagination of the automotive industry. The signs are visible everywhere – and not just at this year's International Motor Show in Frankfurt. Industry 4.0 is making production smarter, vehicles are being connected to their environment, and customers can draw on a plethora of channels to find out what they need to know about cars, buy them or have them maintained. To put it simply: Data is increasingly shaping the automotive industry's business models.

**TAKEN TOGETHER**, these developments have the potential to bring sweeping changes to your industry. As we have seen in the telecommunications, music and publishing industries radical upheavals are usually preceded by gradual development in several phases. Technologies mature, social acceptance grows and initial competitors from converging industries try their hand at new business models. Think of Uber! (See our interview with Christian Freese, head of Uber in Germany, on page 24.)

**ARE WE TALKING ABOUT A REVOLUTION**, then, or a process of evolution? And what will the coming changes mean for you and your company?

To begin to answer these questions, the latest issue of our Automotive Insights magazine – entitled "The digital drive" – is devoted to the topic of digitization. "The digital drive" sketches the wider scope of changes taking place right now, zooms in on individual country markets (the U.S., China and Brazil) and examines how the automotive industry is doing in areas such as multichannel retail, electromobility and automated driving.

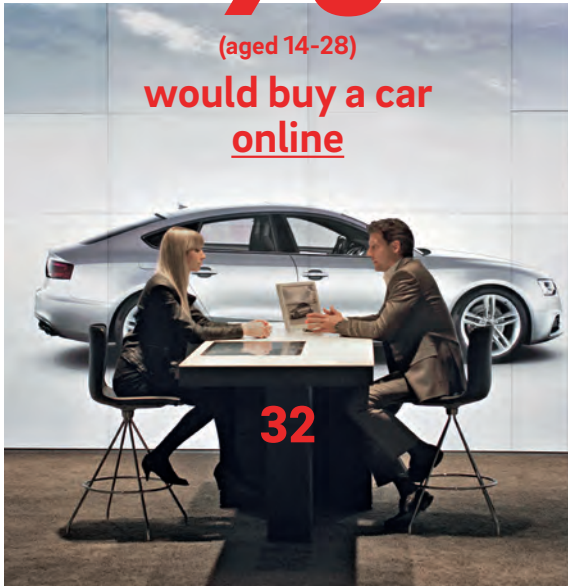
No one knows exactly where the road will lead. Yet there are clear markers and road signs along the way. These must be heeded if we are to shape the future of the market together.

Enjoy your read!  
Marcus Berret

# 44%

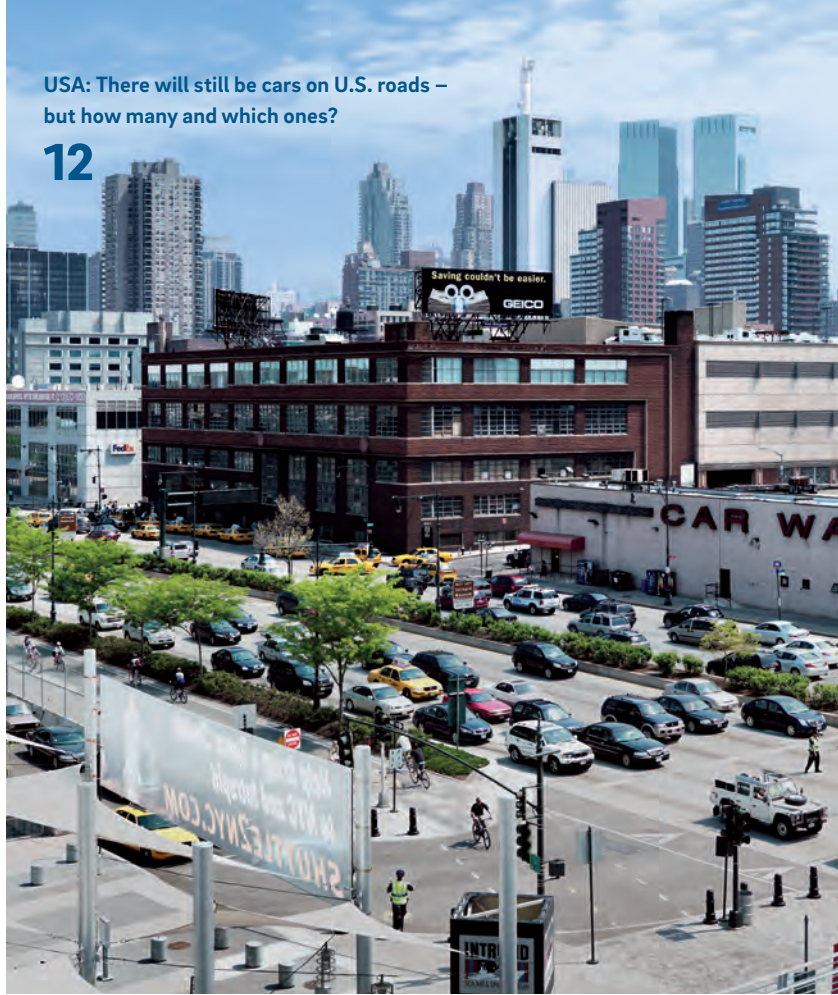
(aged 14-28)

would buy a car online



USA: There will still be cars on U.S. roads – but how many and which ones?

# 12

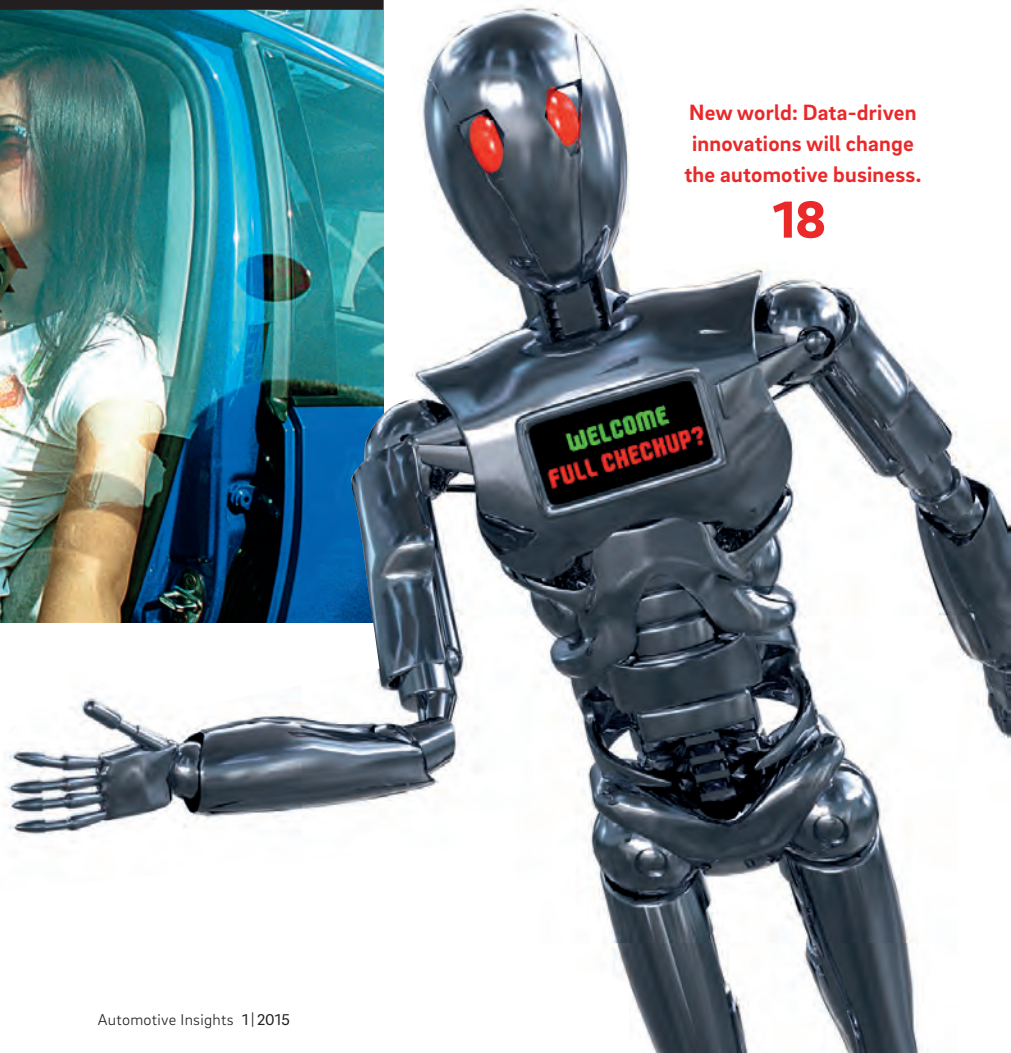


China: Buying a car could be more convenient in the future.

# 8

New world: Data-driven innovations will change the automotive business.

# 18



# "Are we talking of a revolution or a process of evolution?"

Marcus Berret, page 3

## CONTENT

### PLACES

- 6 Automotive pinboard**  
Trends, facts and figures on the brink of a new automotive world
- 8 Click and drive**  
How Chinese players are revolutionizing e-commerce in their automotive market
- 12 Owners, drivers and urban traffic of the future**  
In our U.S. market scenario we take an educated guess on three key performance indicators
- 16 Spotlight Brazil**  
The new vehicles market is losing momentum – but the aftermarket is vibrant. Handpicked results of our study

### PERSPECTIVES

- ▶ **18 The dawn of the digital car**  
Digital customer, connectivity, automation and digital data – OEMs and suppliers need to gear up for automotive 4.0
- ▶ **24 "Ad hoc mobility" explained**  
In our interview Uber Germany's Managing Director, Christian Freese, on where new entrants shake up traditional markets
- ▶ **27 Who will be in the driver's seat?**  
System provider or niche player in automated driving – it is time for suppliers to position themselves

### PLAYERS

- 30 Japan under siege**  
Our ranking compares leading nations in terms of market reach, technological maturity and industrial power
- ▶ **32 Reconnect with your customers**  
New ways to orchestrate multichannel retailing
- 36 Food for thought**  
Roland Berger's latest thinking on automotive and other industries
- 38 Famous cars: Golf**  
A "generation car", perhaps the last of its kind
- 39 Contacts and authors**



Represents the new players in the industry: Christian Freese

## 24

# AUTOMOTIVE PINBOARD

We collected insightful trends, facts and figures  
that may impact the industry

## CHANGING MINDSETS

### MIXED FEELINGS: TRUST IN AUTOMATED DRIVING

According to a Cisco study

# 57%

of people globally would  
put their trust in a driverless vehicle.

# 95%

of Brazilians embrace the concept.

In Japan only

# 28%

of people are willing to give up direct  
control of their cars.

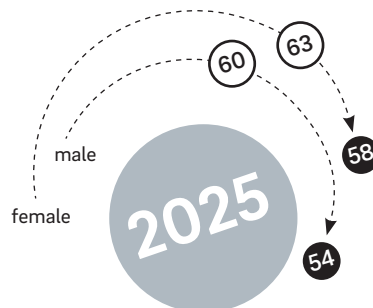
The U.S. acceptance rate of

# 60%

was above the global average.

### DECLINE: NEED TO OWN A CAR

► By 2025, the percentage of car  
owners aged 39 or younger will drop  
from today's 63% (female) and 60%  
(male) to 58% and 54%, respectively.



► While some 20 years ago most teens  
and tweens aspired to own a car, today's  
young people would rather spend their  
time interacting on social networks.

► 70% of adults globally say they are  
open to unconventional methods of  
transportation.

Sources: WSJ, AutoneWS, Reuters, TomTom, Forbes, FT,  
WEF, Ford Trends Survey, Cisco and Roland Berger.

### UP AND COMING: DIVERSITY IN AUTO FIRMS

**GM** names Mary Barra as  
the car industry's first woman  
CEO. In 2014, six of the com-  
pany's 25 corporate officers  
were women.

**Honda** taps its first female  
board member: Hideko Kunii,  
66. She is the first female  
director at a big Japanese  
carmaker.

**Toyota** named Julie Hamp,  
a senior official at Toyota  
Motor North America, as a  
managing officer, making  
the American the company's  
first female executive.

# A GLIMPSE INTO THE LABORATORIES



## SMART EYES

Mini unveils Augmented Vision eyewear: The technology packed into the glasses projects relevant information into the driver's direct field of vision.

## LIGHT BY SIGHT

Intelligent light systems Made by Opel: A new technology will enable drivers to direct the headlights to wherever their eyes are looking.

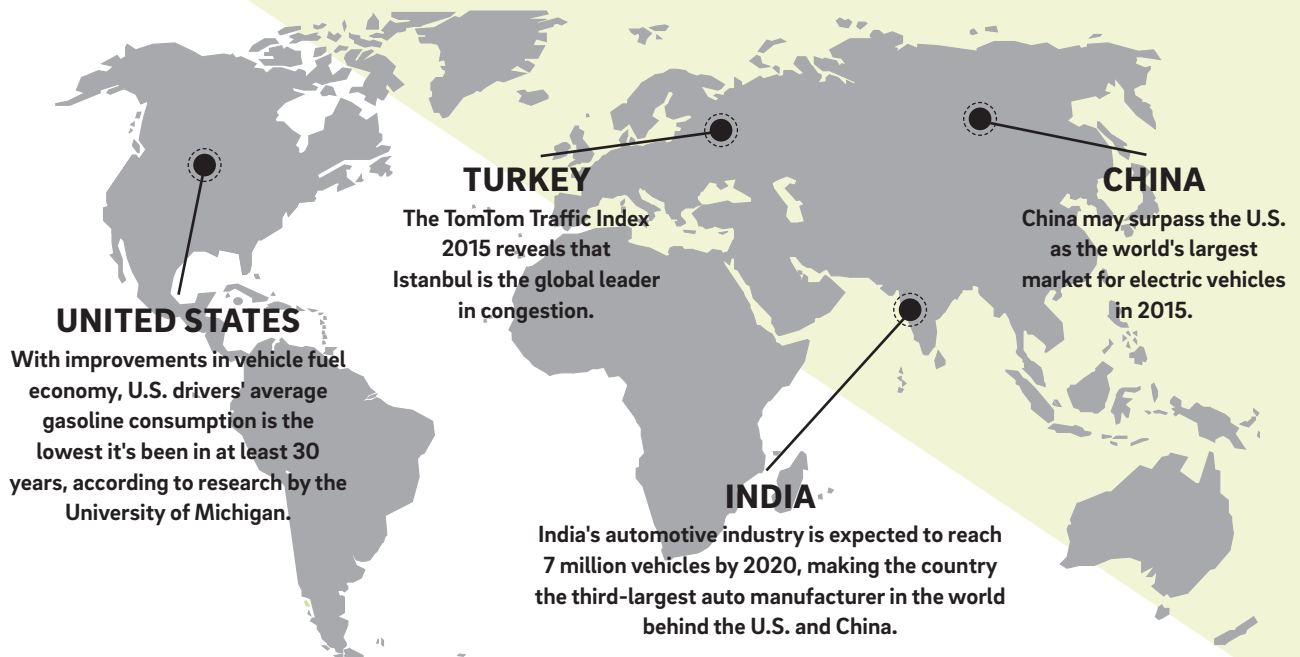
## MADE OF FLAX

For the Peugeot 308, Faurecia has supplied an injection-molded part that consists of 20% natural materials, such as hemp. Other new products containing hemp fibers are set to follow later in 2015 or 2016.

## POWER REVOLUTION

Bosch ushers in a battery revolution, offering double the range at half the price: Batteries for electric cars are going to get considerably better by 2020 – with negative consequences for the residual value of today's electric cars.

# POINTS OF INTEREST





E-commerce meets offline touchpoints: Many customers had experience with owning a car in the last decade. This is necessary if manufacturers are to merge offline and online channels.



Photos: Wang Zhao/AFP/Getty Images, Daniele Mattioli / Anzenberger Agency



# Click and drive

China's automotive e-commerce is gaining traction. The challenge is to connect offline and online activities and create an entire retail ecosystem. We illustrate future business models and draw conclusions on how OEMs can equip their platforms.

by Junyi Zhang and Fanny Cao

**C**hina is crazy about "Double Eleven": on November 11, the largest online shopping day in the world, China's automotive industry looks to set new records in online orders. One of the biggest platforms – Autohome – sold more than 30,000 cars online on Double Eleven 2014 alone, about 2,500 of them with full payment online. This success shows that Chinese consumers are passionate online shoppers. Today, roughly 45 percent already consider purchasing a car online. While the shopping craze on 11/11 can briefly generate

windfall revenue for retailers, with 24.3 billion yuan (CNY) worth of orders recorded in a single day, the surge of festival momentum invariably wanes. Average daily auto sales at websites, portals and online dealers continue to remain anemic. But we believe that China's automotive e-commerce is ready for liftoff in the coming years – experts forecast annual growth rates between 30 percent this year and 40 percent for the next, which in absolute numbers could amount to CNY 225 billion in 2016. What would e-commerce in the

Chinese automotive industry need to advance to the next stage and who will be the winners in that race?

#### **CONNECT OFFLINE AND ONLINE**

When buying a passenger car, most Chinese customers tend to get their information by conducting research on the internet, often using social media and mobile apps. Previously, automotive e-commerce was essentially limited to several specialized online marketing platforms for car dealers, with the biggest players being

Online portals: Car dealers are looking for new business models.



Autohome and Bitauto. Through their large user base, they could offer automotive manufacturers access to potential buyers and help dealers extend the reach of their physical showrooms by providing a centralized marketing platform. Via an application interface, dealers could create online showrooms hosted on Autohome or Bitauto websites where they would upload their automotive inventories, pricing and promotional information. The business model of these sites has been based on generating profits from advertising as well as collecting referral fees from dealers. Online sales, however, were handled separately from offline sales in the industry, because they were generally viewed by OEMs and dealers as playing only a supporting role.

Over the past few years, however, with major e-commerce platforms realizing the importance of leveraging customer data from both virtual and physical stores, a complete automotive e-commerce ecosystem has gradually begun to take shape. In the next phase, dealers are trying to integrate the two channels more closely into an online-to-offline (O2O) model.

Alibaba's B2C online retail platform, Tmall, marked its first involvement in payment transactions. The first step is that buyers can make an upfront payment online or use Alipay machines located near the point

## Paving the way to e-commerce

**The development of automotive e-commerce is fueled by two changes in the regulatory environment. Those are considered as favorable for e-commerce development:**

**According to China's "Enforcement Measures on Administration of Automobile Brands Sales" (2005), dealers can sell cars only after authorization by the OEM. Additionally, the rule puts automakers in charge of establishing business forecasts, dealer locations and standards for setting up stores. Chinese authorities are now considering, however, whether to relax restrictions on car dealers. So in the future they would be able to sell vehicles from multiple brands in the same store.**

**China's government is taking steps to introduce more transparency into parts supply. It published a joint statement on "Guiding Opinions on Promoting the Automotive Repair Industry Transformation and Upgrading to Improve the Quality of Service." Carmakers will be required to release vehicle maintenance and technical information about newly introduced models, thereby facilitating the sale of car parts by third parties.**

Sources: Bloomberg, Forbes

of sale to purchase a car conveniently and without cash by simply swiping their bankcards. In the long run, customers would not have to go to the showroom at all, but pay the full price online. This would also be a win for the online dealer: Customers leave behind a valuable data footprint that provides information about the effectiveness of marketing activities.

### FIRST MOVERS GUIDE THE WAY

Some OEMs, such as Geely, Guangqi Honda and Chevrolet, have started to promote selected models via their own e-commerce platforms. VW and BMW are also well aware of the opportunities and are teaming up with e-commerce platforms such as Tmall or Yiche to promote selected models. But activities are still far from being fully integrated. Fundamental issues such as the low transaction conversion rate and the challenge of incorporating online sales into daily operations have not yet been resolved. Managing such large inventories and offering aftermarket services are also virgin territory for e-commerce platforms. Part of the difficulty stems from the fact that an automobile today seems to be too complex to be priced and sold online in the same way as consumer goods like books or DVDs. In the coming stages of development, OEMs will need to know how to address consumers directly, try to

use online and mobile platforms, and establish direct B2C channels in order to support their offline dealer network. These activities enhance the customer experience, enable community-building, and improve the exchange of information over the complete product lifecycle.

### **INTEGRATE AFTERMARKETS**

China may be the world's biggest market for new car sales. But as more and more households own a car, demand will also rise for maintenance repairs and other aftermarket services. A look at the complete ownership lifecycle of a car reveals that the sources of profit in China's automotive market are quite different from those found in Western countries. The aftermarket has traditionally been highly fragmented and lacking information on the service and repair history of the vehicles being sold. This segment, which includes maintenance, repair, replacement parts and accessories, holds vast potential for growth. Data show that every CNY 100 spent purchasing a car would generate CNY 65 in revenue from aftermarket service. By 2020, turnover from the used car and after-sales markets is expected to grow at a rate of 19 percent annually compared to just six percent from the new car market.

Several online players are on their way to harvesting profits on the aftermarket, such as Chexiang, Cheyian and Chemayi. Chexiang, established by Shanghai's state-owned carmaker SAIC Motor, is a dealer-driven platform extended to include aftermarket service functions. The platform has a critical mass of users already, but it will have to invest in mobile apps and membership systems to retain customers after the first car purchase. Furthermore it will be crucial to link offline and online activities in a more intelligent way and create a sustainable profit model. OEMs currently dominate the wholesale business to dealers. Between them and the end customer are various layers of dealers, and profits diminish in every transaction. Creating a leaner distribution structure is therefore an easy way to optimize profits.

Cheyian and Chemayi are consumer- and service provider-driven platforms, respectively. They host contributions about service experiences, offer expert advice and provide a network of different service offers. Their success will depend on their ability to mobilize a threshold of active users to unleash a network effect. Their aim is to set up standardized services, a transparent pricing system and a community that is willing to share expertise and experience. Currently they earn the main part of their income from dealers' service commissions. In the future they may benefit even more from their function as aggregators of customer needs. However, they will need to cooperate more closely

with offline service providers like garages, 4S stores or fast-fit chains, which will make it possible to provide services without the need to maintain their own inventory and logistics structures.

To address future challenges properly by building on their own capabilities, we recommend that OEMs take to the following approach:

### **SHORT TERM**

#### **Excite and retain online users**

As platforms improve, channels will diversify and there will be many opportunities for users to get online. For any player that wants to make profits in automotive e-commerce, getting users online and retaining them is a must, especially in the aftermarket.

### **MEDIUM TERM**

#### **Build an ecosystem**

Use a membership system to build user communities related to the purchase of new cars, vehicle use, maintenance, used cars, financing and other businesses. Attract partners from other industries, such as travel, hospitality, outdoor activities, etc.

### **LONG TERM**

#### **Intertwine online and offline activities**

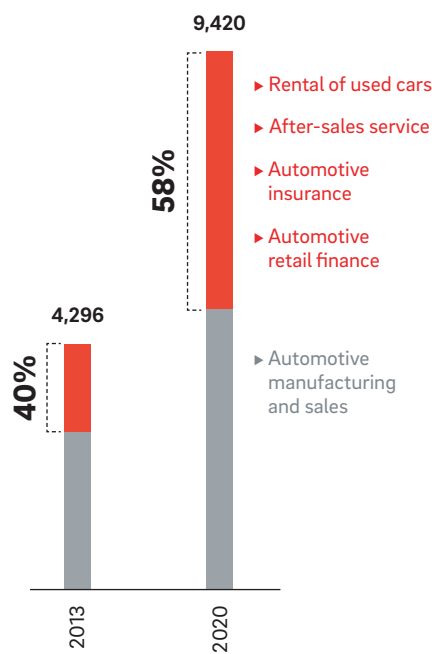
Completely connect online and offline marketing, not only in terms of new cars and aftermarket service but also in terms of the used car business. The result will be a car-service-mobility lifecycle. OEMs, dealers, service providers and platform companies can benefit from that.

We believe that OEMs will have advantages in the new automotive retail ecosystem, which makes speeding up their e-commerce easier. First, they can draw on a solid customer base, which saves on costs for new user acquisition. Second, they can use sources of customer data such as CRM systems, their dealer relationships and the data from onboard systems. Third, they possess the market visibility and brand equity to enhance valuable cross-industry partnerships, e.g. with garages as well as hotels, manufacturers of outdoor equipment, or self-driving tour operators.

## **Rebalance the value chain**

**A new sales ecosystem could boost China's aftermarket**

[Net profit in CNY bn]



Source: Roland Berger

# U.S. market scenario: Owners, drivers and urban traffic of the future

Shared or bought? In the future using a car will not necessarily mean owning it.



A new automotive era characterized by connectivity, shared mobility and automated driving may change the automotive market as we know it – but to what extent? We crunched the numbers for the U.S. market and analyzed how drivers, sales and car ownership will evolve in the light of these trends.

by Marc Winterhoff

Houston: A huge parking lot was turned into a park named "Discovery Green". Could this be the way forward if less space is needed for inactive cars in U.S. cities?



To examine the impact of new trends on the automotive market, we have selected the U.S. as a focal point: It is a global trendsetter, one of the world's largest car market and typically one of the first to be disrupted by new business models. Here one can find innovative automotive OEMs who compete with mobility startups and tech giants such as Google and Apple that are encroaching on the car industry. At the same time, Uber is developing a de facto standard for ride-hailing. Given the high reliance on individually owned vehicles in the U.S. and the wide range of geographic regions with varying population densities, it is a particularly interesting test market. We have identified three key trends – connectivity, mobility-on-demand and automated driving – as we expect those to have the biggest impact throughout the automotive value chain in the long run. This significant change will occur for two main reasons. First, the new automotive era has the ability to attract consumers away from public transportation and even short- to medium-

distance rail and air travel. Why spend hours in airports and cramped airplanes to travel 250 miles when mobility-on-demand can pick you up and take you to your destination in roughly the same time, while you work or relax in a comfortable, private setting?

Second: More people will be able to "drive" cars if licenses are not a limiting factor. This is especially true for very young people and people over 65. Early teens and many others will be able to ride in vehicles without having to depend on licensed drivers, and parents might be less inclined to car-pool to Saturday morning soccer practice when their children can travel independently while being monitored for safety. Those effects add to smaller increases in other population groups.

**NEW VEHICLE OWNERSHIP PATTERN**

Theoretically, each shared vehicle can replace up to eight individually owned vehicles. In our progressive scenario, the total number of cars on U.S. roads would be reduced by 8 percent (49 m). The effects of

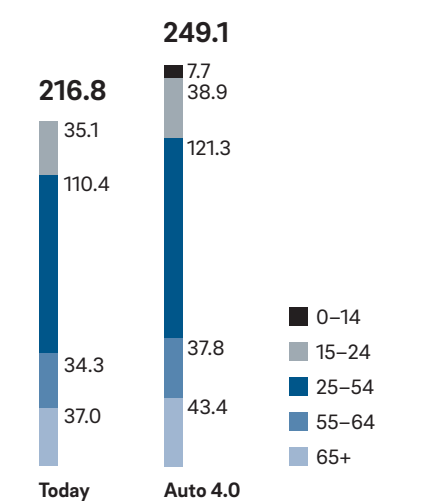
mobility-on-demand services will be far-reaching, but they will be seen especially in urban areas, dense and sparse alike. These areas, home to a third of the population, can alleviate congestion through mobility-on-demand, which poses a more viable alternative to the poor public transit infrastructure native to places like Los Angeles.

Connectivity technologies would further reduce traffic as fewer drivers have to search for a place to park their own car, which typically then remains unused for 23 of the 24 hours in a day. However, it is important to note that even in areas ideal for mobility-on-demand adoption, many US consumers will continue to opt in favor of owning a car for reasons including privacy, comfort and status. We expect that up to 36 percent of individually owned vehicles will be automated to ease the burden on drivers, especially those dealing with congestion and longer commutes.

For consumers and municipalities, the new mobility era is an opportunity to improve the quality of life in urban areas.

**More car users**

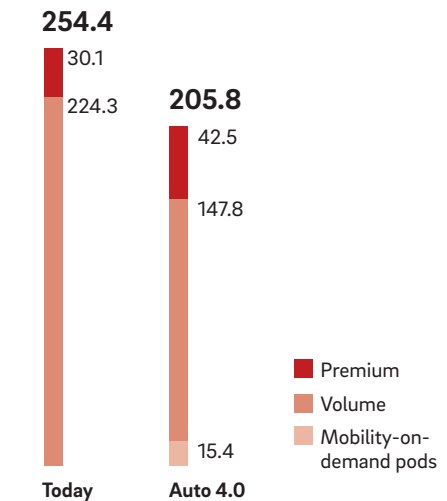
Users in the U.S. by age group [m]



- ▶ Automated driving and ride-sharing create new user segments
- ▶ Significantly greater participation of the youth (early teens) and elderly (65+)

**Fewer cars per owner**

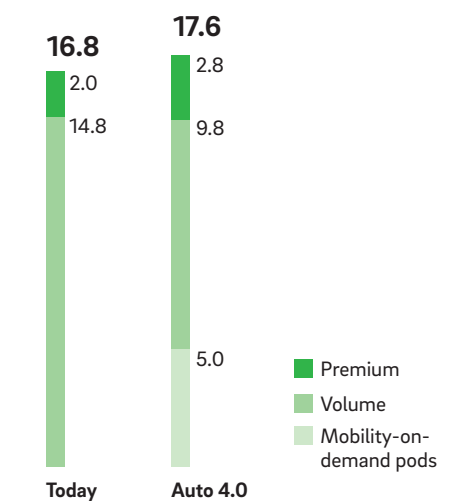
Vehicle parc in the U.S. [m units]



- ▶ 49 m fewer cars
- ▶ Sharp decline in volume segment
- ▶ Each shared vehicle would replace up to 8 individually owned ones.

**Increasing sales volumes**

Annual sales volume in the U.S. [m units]



- ▶ Increase in premium segment cars and sharp decline in volume segment
- ▶ New mobility-on-demand pods would cater to shared mobility.

Source: Press articles, annual reports, US Census, NHTSA, FHWA, IHS, Automotive Fleet, Roland Berger

New York City: What will roads in U.S. metropolises look like in the future?



There would be room for more parks, walking areas and biking lanes. Improving public transit requires substantial public investment, whereas the more efficient usage of existing roadways and vehicles that are otherwise parked is destined to be a win-win for all parties.

#### **ANNUAL VEHICLE SALES INCREASE**

There will be major shifts in the vehicle portfolio of the U.S. market. We estimate that 28 percent of vehicle sales (in units) will eventually shift to "pods" – the fleet of mobility-on-demand service providers. Who will own those cars in the future? OEMs, ride-sharing players or leasing companies? We don't know yet. But we've already seen how some players envision these pods in Chevy's EN-V 2.0, Toyota's i-ROAD and Google's driverless car. We expect the demise of the American two-car household in many areas, given that the "second car" is partially replaced by mobility-on-demand. With fewer cars being bought per household, more money will be

available to spend on the vehicles that are purchased. Therefore we expect an increase in sales in higher-trim vehicles or consumers trading up to the premium segment. What will be the net effect? Traditionally, the amount of vehicles sold has always been a function of the number of car owners or operators. In the future, we will have to look at it from a different perspective: The number of miles traveled will be the key predictor of vehicle sales. Provided that sharing vehicles is convenient enough not to reduce the miles consumers travel in vehicles, the number of cars on the road will shrink. But a new source of demand – the effect of new "users" who previously relied on public transit or their families for transportation – will outweigh the effects of the reduced car parc.

#### **THE FUTURE OF BUSINESS MODELS**

Volume OEMs – those that generate less than ten percent of their revenues from premium brands such as Ford and FCA – face the biggest challenge from the three

future trends we describe, as they will be sandwiched between premium and low-cost competitors. We estimate that five million purpose-built, efficiency-optimized pods will be sold every year; this will come directly out of OEMs' annual volumes and deprive them of more than USD 33 billion in added value. As their primary market shrinks, they could consider combinations of pushing further into the premium segment, leveraging their manufacturing efficiencies to move downmarket by building low-cost mobility-on-demand pods, or shifting their focus from manufacturing cars to providing holistic mobility solutions. Mobility-on-demand services are expected to become a market worth USD 113 billion annually. In the face of the biggest disruption the automotive industry has ever seen, the race is on to capture future customers and profits – but the difference between winning and losing will be determined by an OEM's readiness to adapt and the ability to transform its business model.

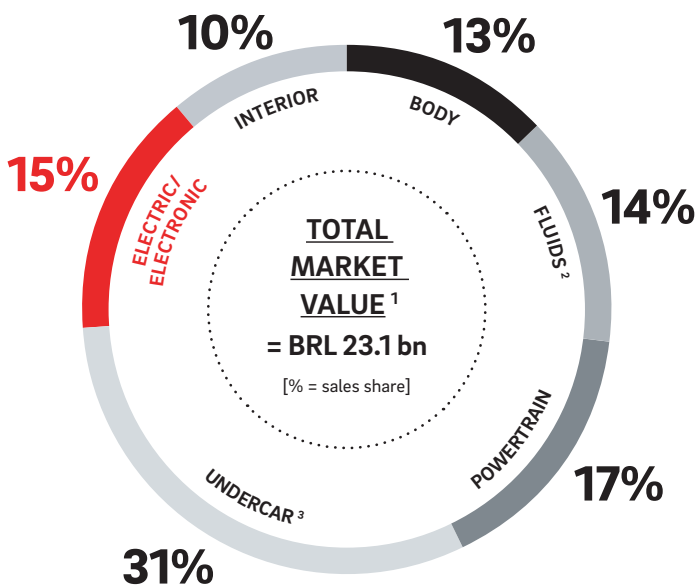
# SPOTLIGHT

# BRAZIL

With decreasing new vehicle sales, the focus is now on the aftermarket. We look at market development, distribution trends and customers – Here are some study highlights.

## MARKET

Electric and electronic components make up approximately 15% of the Brazilian aftermarket today. The amount of embedded technology in vehicles is increasing, so this segment in particular is expected to grow significantly.



<sup>1</sup>Number includes OES and IAM market volume, locally produced or imported, but excludes tires and accessories.

<sup>2</sup>Lubricants, hydraulic fluids

<sup>3</sup>Undercar/chassis parts (suspension, brakes, wheels, steering system, structural parts)

## PLAYERS

The independent aftermarket, which accounts for about 80% of the total market, lies in the hands of small and medium-sized businesses.

# 100,000

repair shops

# 35,000

retailers

# 300

distributors

# 1,200

suppliers

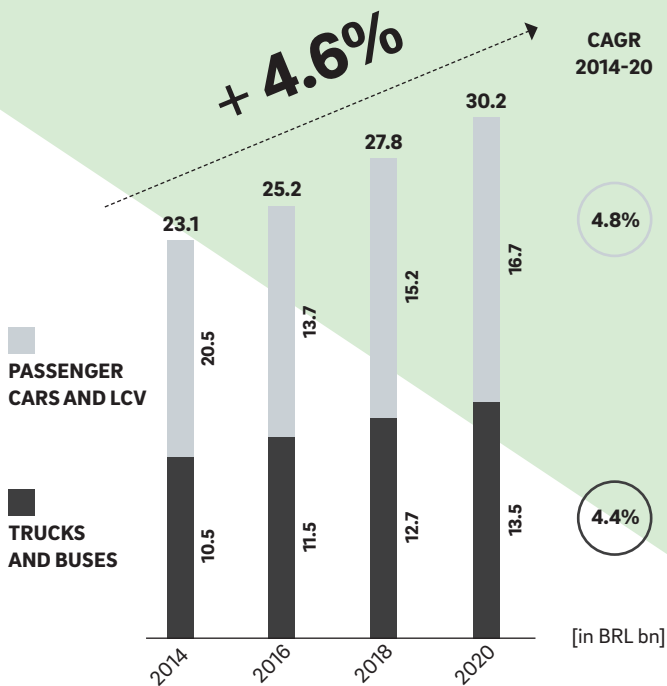




VW do Brazil: The Beetle was built in Brazil from 1959 to 1996.

## GROWTH

The total vehicle fleet in Brazil is growing, its profile is changing towards more sophisticated technology and consumers show new patterns of behavior. These developments will further drive the aftermarket. Passenger cars and light commercial vehicles (LCV) will see slightly stronger growth than trucks and buses.



## TRENDS

Brazil is still a maturing market. Some aspects of the ongoing transformation:

### CHALLENGES

- **Parts availability:** complexity here is due to the proliferation of vehicle models in the fleet, difficulties in identifying the right part and - given the scale of the country - have it delivered in reasonable time.
- **Inventory management:** Cost of capital and obsolescence loss are significant for both distributors and retailers.
- **Professionalization:** Companies across the whole chain need to enhance efficiency, stability and profitability.
- **Warranty:** Unclear roles and responsibilities generate risks at different levels of the chain.

### OUTLOOK

- The distinction between distributors and retailers is slowly disappearing.
- OEMs are trying to expand their share.
- Small repair shops are losing business to professional chains.
- The online channel is gaining importance over the long term.

Even in the current difficult economic situation, the growth prospects and the dynamics of the Brazilian aftermarket's distribution chain will create numerous opportunities for local and international businesses and investors.

#### ABOUT THE STUDY

For our comprehensive study on Brazil's automotive aftermarket, we partnered with three main industry associations: Sindipeças, Sincopêças and Sindirepa. Together they represent more than 130,000 companies ranging from part suppliers to repair shops.

Authored by Stephan Keese and Martin Bodewig

The full study (in English or Portuguese) is available for purchase at: <http://www.rolandberger.com/media/publications/>

Source: Roland Berger

## ABC CITY WEATHER FORECAST:

FRIDAY    SUNNY, 25°C   
SATURDAY    SHOWERS, 17°C   
SUNDAY    CLOUDY, 20°C 

## APPOINTMENTS:

LUNCH WITH JENNIFER AT 12:30pm  
MOST RECOMMENDED LOCATIONS (AVAILABLE)  
**RICK'S CAFE** ★★ ★  
[AMERICAN, 23 RECOMMENDATIONS]  
**RAM YUN** ★ ★  
[KOREAN, 13 RECOMMENDATIONS]  
**DA UGO** ★ ★ ★ ★  
[ITALIAN, 10 RECOMMENDATIONS]



# The dawn of the digital car



A real revolution? When does it start?  
We analyze how the digital transformation will change the automotive industry, outline where the journey could lead, and show what incumbents can do to stay in the race.

by Marc Winterhoff    Illustrations: Terré



**FRANK**

**STEVE**

# FILLING STATION

## FILLING STATION:

**GASOLINE PUMP: NOT AVAILABLE**

**5 ELECTRIC CHARGING STATIONS**

**1 COMPRESSED NATURAL GAS STATION**

## ABC LOCAL:

**CONGESTION: WEST RING,  
DURBAN HOSPITAL EXIT**

**CONSTRUCTION: SOUTHERN  
ROAD, BLOCK A**

**PARKING: 320 SPACES FREE  
CLOSEST: MAIN POST OFFICE;  
PLEASE FOLLOW NAVIGATION**



## WHAT'S UP IN ABC CITY?

**HIGHLIGHT: 8pm MESSA DA REQUIEM (VERDI)  
PERFORMED BY ABC CITY ORCHESTRA AND CHOIR  
(TOWN HALL)**

**CINEMA: PLEASE CHOOSE GENRE OR LOCATION**

**THEATRE: 7.30pm ROMEO AND JULIET  
(SHAKESPEARE) PERFORMED BY THE NORTHERN  
DRAMA GROUP (ABC THEATRE)**





Future maintenance experience: Robots and automated diagnosing systems could make life more convenient for the driver

Something is brewing in the auto industry. The "New Mobility World"-area on this year's International Motor Show in Frankfurt (IAA) is a get-together for new mobility players like BlaBlaCar, moovel or Drivy. Or take the haggling over Nokia's mapping service Here. Chinese internet giants (Alibaba, Baidu) were bidding alongside Uber, VW, Audi and Mercedes. In the latter the incumbents have won, but the rumor mill is working overtime. In China, internet giant Tencent has announced it is partnering with electronics supplier Foxconn to build an automated car. And Apple has allegedly set aside no fewer than 1,000 people to handle its automotive activities. Maybe they are all just there to continue developing the CarPlay multimedia system, but maybe the Cupertino firm's engineers are wiring their own electric car. Yet who builds the cars has long ceased to be the only issue. Other "industry outsiders" too are massing their ranks in further

areas that will determine the future makeup of the supply chain – or even spawn completely new business models. Uber is currently creating a ride-hailing worldwide (see our interview with Christian Freese on page 24). Car sharing has already become established as a new business line for a number of OEMs, as well as for other mobility providers. It all started when electronics and IT became integral parts of in-vehicle diagnostic systems about 20 years ago. But only in the last 2-3 years has convergence made the lines between industries virtually indistinguishable. Potential changes in the automotive industry are immense. There will still be vehicles, of course, but will today's big players still be the companies that make them? When complex market upheavals are unfolding, it is hard to separate cause and effect. Developments always seem to gather momentum when three factors coincide: First, when a critical number of interrelated key technolo-

gies reach a certain level of maturity. Second, when a significant shift in consumer habits becomes apparent. Third, when disruptive innovations come from adjacent industries – instead of established players. That is precisely what has happened in the automotive industry. It has opened its arms wide to innovative technologies from other areas of application to enhance its offerings. Sensor systems, driver assistance applications, telematics services and infotainment are now being linked together to form seamless systems. At the same time, consumers are changing their attitude to the industry's core product – the car. For many younger buyers in urban areas, owning a car is no longer so important. Greater acceptance for automated cars can also be observed: According to a Cisco study, 57% of people globally would put their trust in an automated car. Changes in society slowly translate into punctual regulatory initia-

tives; e.g. a public highway in Germany was accepted as a place to test-drive automated vehicles in fall 2015. The age of the digital auto industry is upon us. But are we facing a revolution, or is it more a process of evolution? Which of the many new developments are realistic, and which are wishful thinking? As of now it is obviously hard to predict. Even so, there are some useful clues about future business. We have trawled through a wide range of industries in search of patterns and indicators, and our analysis of the findings highlights the challenges that the digital transformation presents to traditional OEMs. But it also shows where the adaptable among them can find new opportunities.

**LEARNING LESSONS FROM OTHER INDUSTRIES**

Structural transitions might irrevocably shift the balance of power in the value chain. Players that change too slowly risk being edged out of the market by more agile rivals. History is ripe with examples of industries impacted by new technologies and business models that opened the door to disruptive players. Bricks-and-mortar retailers were disrupted by online retailers such as Amazon. Specialized retailers like bookstores were cannibalized by both online retailing and technologies such as e-readers. The music industry was broadsided by Apple iTunes. We have watched the demise of companies like Nokia and Kodak. Even Microsoft had to do massive write-offs in the telephone business. The pattern of events that occurred in each of these industries is relatively consistent. First, technological advances enabled the entry of disruptive players with new business models that were better attuned to new consumer needs. Then, incumbents with heavy baggage that were unable to adapt to the changes or unable to restructure began to see their margins erode. Lastly, the "old" industry suffered a wave of consolidation. So what separates the winners from the losers? We have seen how winners such as IBM and General Electric were agile enough to reinvent themselves and adapt to a changed competitive environment.

**DIGITIZATION OF INDUSTRIES - IT HAS HAPPENED BEFORE**

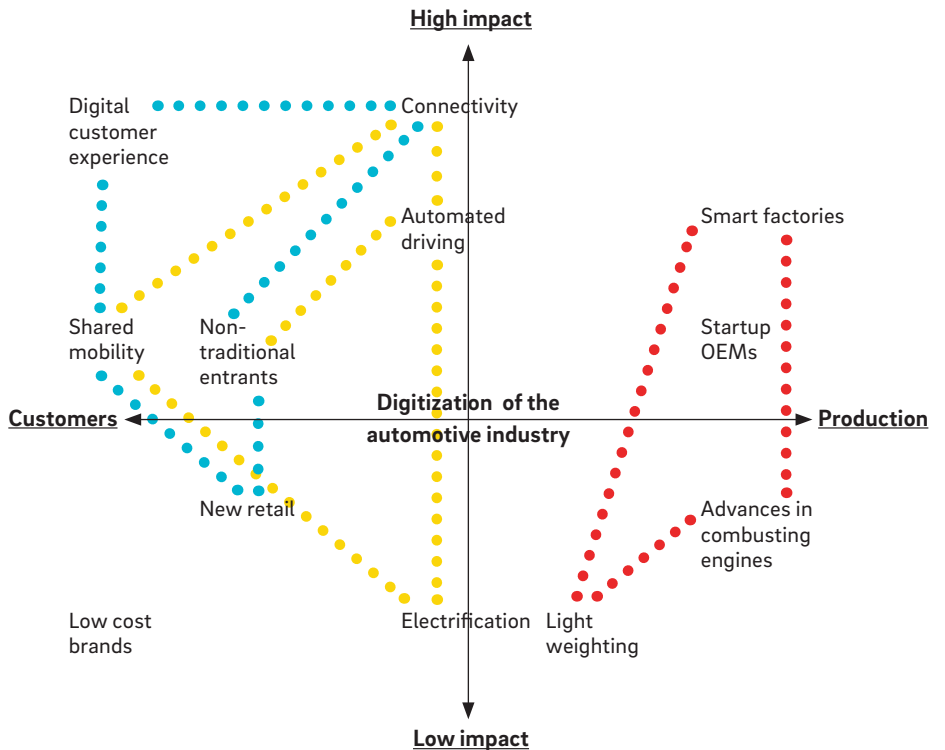
To predict the exact when and where of future development is difficult. But we can look at showcases of industries where transformation is more advanced already. The good news is there are new opportunities. However, some players will lose their leading position.

	IT hardware providers	Retail	Cell phone manufacturers	▶ Automotive
Technology change (product/process)	MS-DOS Reverse engineering of BIOS	E-Commerce	Smartphone	▶ Connected vehicle Automated driving
Entry of disruptive players	Acer Dell	Amazon	Apple Samsung	▶ Google, Uber etc. Tesla, Qoros
Large incumbents with baggage	Hewlett-Packard IBM	K-mart Borders	Nokia Motorola	▶ Multiple OEMs, suppliers and dealers
New customer needs	Integrated service/usage support	Integrated reviews Ease of shopping Larger availability	Integrated digital platform	▶ Digital consumer

Source: Roland Berger

**CONNECTING THE DOTS**

In our scenario analysis we identified about a dozen trends for the future development of the automotive industry. Some have high some have low impact on the existing business models. Digitization is an integrator and works as a catalyst.



Source: Roland Berger

They realized in good time what new business models suited their corporate DNA, and they succeeded in rebuilding their value chains in ways that accommodated the changes taking place around them. The timing and speed were right too: Step by step, they eased out of their "old" world entanglements and gained a foothold in the "new" environment. By contrast, the losers were not quick enough to spot the need for change. For too long, they continued to invest in businesses where margins were shrinking. Ultimately, they had to file for insolvency, were broken up or were swallowed up by their new competitors.

### A WORLD OF TRENDS

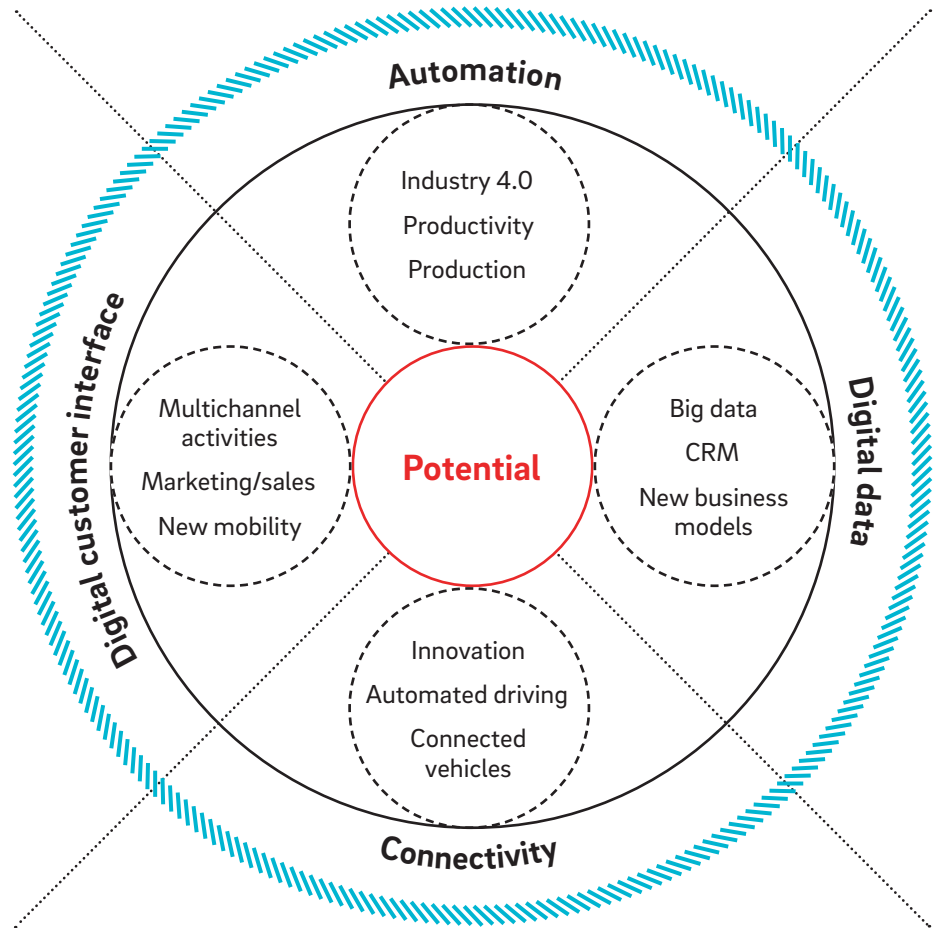
As a foundation for discussion, we asked internal and external stakeholders to identify trends that have the potential to shape the automotive world of the future. In the end we had about a dozen pointing to digitization as the overriding catalyst, meaning that the automotive future will be driven by trends with a high degree of digitization impact and will also have spillover effects on non-digital ones.

Two examples: Many OEMs have been investing in the development of e-cars for a long time. Up to now electromobility (a non-digital trend) has not yet brought pronounced changes to the way the industry lines up. But now its development is being fueled by digitization. If new shared mobility providers build up fleets of primarily electric cars, this will have a material influence on the quantities and models demanded by the market. And if vehicles are increasingly able to run driverless, the ability for car makers to use this or that engine as a differentiator may no longer be so significant – opening the door even wider to off-the-rack e-cars.

Digitization is also closely linked to new retail. If significant improvements are realized in technical ways to interconnect customer data, and if digital experience makes customers more willing to try out new things, this will create a whole new playing field for innovative retail formats. Customers will also come to expect more of their buying experience as they become more conversant with the digital availability of data and online shopping opportu-

## FOUR SPOKES FOR THE DIGITIZATION OF AUTOMOTIVE

IT and software giants are set up and ready to produce "computers on wheels". Incumbent OEMs and suppliers must react fast to maintain their position.



Source: Roland Berger

nities in other areas. The availability of multichannel offerings can then alter the balance of power within the automotive distribution landscape: If integrators possess the crucial competitive capabilities, it is possible for non-traditional entrants to attain far greater market significance than in the past (see our article on multichannel marketing on page 32).

### RESPONDING TO THE DIGITAL TRANSFORMATION

The changes taking place are numerous and the threat of losing market share is real. Yet the digital transformation also gives the automotive industry the chance to generate new business and tap new markets. At the moment, the incumbents are

still well placed, though they must move fast to exploit this strong position. Other market players – the IT and software giants, essentially – increasingly see cars as "computers on wheels". From their perspective, it should no longer be bodywork, engine size and driveline technology that set a car apart from competitors, but software and IT functionality. In their nascent worldview, the car itself is no more than a commodity.

For their part, the incumbents can counter by leveraging new technological possibilities to better emphasize what makes their automotive offerings so special. Based on the trends we identified and our understanding of the catalyzing effects they will have on automotive production and on the

customer, we see four key areas where resolute action is needed: Digital data, automation, digital customer interface and connectivity.

**Digital data.** Where the OEMs really have an advantage is in their vast reserves of the currency of the 21st century: the terabytes of digital data that every car produces. Whoever mobilizes the skills needed to crunch all that data can harness this precious resource to optimize customer relationship management. But that is not all: Reports in the press suggest that VW is, for example, thinking about setting up the most accurate weather information in Germany. Real-time information gathered by wheel sensors and digital windscreen wipers would then be beamed back to HQ in Wolfsburg from in-vehicle computers.

**Automation.** Another opportunity is to boost productivity in manufacturing. The smart, connected production automation technologies (Industry 4.0) can change the competitive ball game in the car industry. One study by the Fraunhofer Institute (FAO) and industry association Bitkom asserts that, thanks to Industry 4.0, the gross value added by the automotive industry in Germany could rise by as much as 20 percent between now and 2025. 3D printing already offers a comparably mature technology to produce low-volume parts made of complex material compositions.

**Digital customer interface.** In the future automakers would be able to orchestrate their sales activities and the way they approach customers across multiple channels. Other industries are already bursting with ideas about how to accompany the customer journey – from initial desire to buy to signed maintenance agreement – both online and offline. At present, however, too little use is being made of these opportunities.

**Connectivity.** The opportunities begin with apps that bring together information about alternative forms of mobility – from shared bikes to air travel. At the other end of the spectrum, they embrace automated driving: the vision of cars that autonomously recognize obstacles and glide effortlessly through even urban congestion without the driver having to lift a finger.

Simultaneously tackling all these issues presents a massive challenge to OEMs in general, and especially to volume manufacturers whose slender margins leave them little room to invest. It is already becoming apparent who is positioning themselves on what topic, and who is actively soliciting partners among the new crop of competitors to keep a cap on their own investment risks. Some premium OEMs are already devoting considerable attention to connectivity, using apps to link other modes of transport to their car business, for example. Incumbents such as BMW, Opel and Mercedes also operate their own car-sharing offerings that are working well.

Still others like Toyota are focusing their spending on alternative drivelines, amassing a wealth of experience with batteries and fuel cells. In the electric cars segment, all eyes are on how newcomer Tesla approaches the market. Mercedes, a traditional OEM, has invested heavily in the development of fuel cells, while BMW has done the same in electromobility. Renault/Nissan, Volkswagen and Hyundai/Kia too are still definitely in the race.

In the field of automated driving, cooperation with supplier Delphi has put Audi in a good position. Extensive initial test drives have already been completed on public highways in the U.S. Mercedes' strong truck division is yielding welcome development synergies, thanks to which the company's C and S classes are already on the road with semi-automated models. Ford plans to bring a series of automated driving technologies to market within the next five years. BMW is engaging in collaborative research with Chinese search engine Baidu on the subject of driverless cars.

These and other examples show that many trends have already been spotted, and that the industry is busily slotting them into its business models. Yet the digital transformation of the automotive industry is still in its early days. In the face of the biggest disruption the industry has ever seen, the race is on to capture future customers and profits. And in the age of automotive digitization, companies' readiness to adapt and their ability to transform business models will ultimately separate the winners from the losers.

The new world of connectivity: Smart car returns to smart home.



# "Ad hoc availability is the key"



Heavy smartphone user:  
Christian Freese is an ambassador  
for a new mindset on mobility.



**Uber has become a role model of how disrupting individual mobility market works. Without owning a single car or employing drivers, it shook up traditional taxi transportation all over the world. And this is only the beginning.**

## **An interview with Christian Freese, head of Uber Germany**

### **Automated driving, e-mobility, carsharing – the automotive sector is changing at a phenomenal pace. It is reasonable to talk about a revolution?**

**CHRISTIAN FREESE:** It certainly is! We are currently witnessing a radical change in the way people behave in conurbations. Trips are no longer planned and pre-ordered hours in advance: They are now ordered directly and begun immediately. Ad hoc availability is the key. Mobility on demand is set to flourish, although I personally feel that the term "mobility on the spot" more accurately describes the phenomenon. And then there is the fact that people want to travel safely and at low cost. We as a company come face to face with all three demands in every region of the world. The regional differences in customers' behavior are much less pronounced than many people think.

### **What business opportunities will the mobility market open up in the future?**

**FREESE:** Customers will want more options to choose from. They want to be able to decide at a moment's notice what is the best, fastest and lowest-cost alternative for them. We are responding to that as a company. We see Uber as a network of cars that are out on the road and whose capacity needs to be utilized. And we are in the process of organizing additional services for this network. For example, we are setting up UberEATS, which will let people have lunch and dinner delivered to them from their favorite restaurants. We also see huge potential for new services in logistics, e.g. the rapid delivery of letters and parcels.

### **That will generate new traffic. Doesn't car and ride sharing promise exactly the opposite: better utilization of cars as a resource?**

**FREESE:** Both aspects are true: More people will be moving around and car capaci-

ty utilization will improve. That is because the way we use cars is changing so rapidly. Take our UberPOOL service in San Francisco, for example. The passenger gets in at point A and wants to go to point B. Once the car sets off, an algorithm kicks in that identifies a second passenger who wants to go in exactly the same direction, but who doesn't want to get out until point C. When the first passenger gets out, our software pools the data again – and so on and so forth. We have reached the stage where we have drivers who go for hours with at least one passenger in their car.

### **Christian Freese**

**took over as head of Uber in Germany in January 2015, having previously been employed by Roland Berger – most recently as Principal – from 2006 through 2014. Freese holds an MBA from the University of Navarra's IESE Business School. He also studied industrial engineering at the Karlsruhe Institute of Technology (KIT) and the University of Seville.**

### **Uber**

**was founded by Garrett Camp and Travis Kalanick (its current CEO) as a car service in San Francisco in 2009. It develops, markets and operates the Uber mobile app, which allows customers to submit trip requests that are then routed to sharing-economy drivers. Today, the company operates taxi-like and ride-sharing services in more than 300 cities in 50 countries around the globe.**

### **Do tomorrow's customers really no longer want to own a car?**

**FREESE:** They don't. Among city dwellers, we see a tendency at least to do without a second car, and in some cases even the first car. We figure that in a couple of years, mobility on demand will cover 20 to 30 percent or more of traffic in conurbations. That doesn't mean the end of the privately owned car, and certainly not in rural areas. Many people in these regions will scarcely be able to get by without their own car. In sprawling urban areas too, our new mobility offerings will reach the limits of their effectiveness, because we won't be able to achieve attractive vehicle density everywhere.

### **How will the constantly growing share of mobility-on-demand offers in cities affect the sales market for automobiles?**

**FREESE:** Automotive OEMs will not see their sales collapse because of mobility on demand, as the mileage clocked up by cars will remain roughly the same. In the medium term, though, there will be significantly fewer cars on the roads, because they will be used more efficiently than they are today. If car capacity utilization increases by a factor of seven, which is what we as a company expect to happen, seven times more wear and tear will mean that new vehicles have to be bought much more quickly. That could lead to changes in OEMs' aftersales business.

### **Mobility companies with a global reach are establishing powerful new players on the market. What consequences could that have for the automaker?**

**FREESE:** There may be new players, but there won't be a really new situation for the automotive companies. You've already got global car rental firms in operation today. Unlike the latter, Uber doesn't even

## "Here and there we still sense opposition to digitization in Germany."



plan to become a direct customer for cars. At the very most, we will negotiate master purchasing agreements for our partner drivers. But we are a technology company, so we definitely have a keen interest in advancing technologies such as electromobility and automated driving. We also want to encourage OEMs to come up with product innovations – to create vehicles that are even better suited to our mobility services, for example.

**Does that mean you would like to work together with OEMs to develop new vehicles?**

**FREESE:** We are an excellent point of contact when it comes to finding out what the ideal vehicle for this or that new mobility segment might look like. For our part, we have no concerns about getting involved. Especially when you look below the premium class, there is still a lack of vehicle types that convincingly meet the demands of customers for taxi, rental and car-sharing services.

**Uber has announced its intention to collaborate with research centers on automated driving. Do you ultimately plan to build self-driving cars?**

**FREESE:** No, that's not what we want and that's not what we will do. Our only aim is to stay abreast of new and important product developments to make sure we don't miss the boat. Vehicles are the core

of our business model, after all. For us, it's important to gather knowledge about new technologies. By doing so, we make sure that new developments don't sweep us away. In the field of technology too, we want at some point to commit to powerful partnerships with others so that automated driving is given priority and makes progress.

**Will self-driving cars really be ready for the market in the foreseeable future? When will that be?**

**FREESE:** For me, there is no question that this technology will become established in the medium term. Around 90 percent of fatal car accidents are attributable to human error. So it makes a great deal of sense to replace people as a source of errors with self-driving systems. Having said that, there are still obstacles to be overcome, especially on the legal side. It will undoubtedly still be more than five years before self-driving cars are ready for the mass market.

**What part could Google play in this market?**

**FREESE:** I don't believe they want to become a transportation service provider themselves. But they are probably very interested in adding new car traffic data to their own data ecosystem. The company is now going all out to produce a self-driving car in its development workshop – this

could be a way of urging the automotive OEMs to pull out all the stops and get a move on with the technology. After all, the big groups have been working on this kind of vehicle for a long time, but may have slackened the pace a little.

**What about the incumbents? Are the traditional OEMs too confident about their own mastery of the complex automotive business?**

**FREESE:** That statement is a bit too sweeping for my liking. A lot is happening at the German premium OEMs in particular. They are getting hooked up to online platforms and ramping up new transportation services, for example, as well as pressing ahead with drive technologies such as e-mobility. A number of companies have set themselves up very smartly indeed. MyTaxi, a competitor of ours in Germany, for example, is part of the Daimler Group. Manufacturers such as BMW and VW are likewise very active in drive technologies and connectivity offerings.

**In Europe, Uber is having a really hard time gaining a foothold. In many places, the model of having occasional drivers who use their own private vehicle has been banned. In Germany, you have now launched a service that complies with legal requirements. Has Uber given up trying to overcome the resistance of the German regulators – or merely put that battle off for another day?**

**FREESE:** It is true that Germany is not an easy market. Some of the stipulations we face are way behind the times. They make no provision for the ability to use an app to place mobile bookings for transportation services, for instance. But we are confident that, in the months ahead, we can convince the German political arena of the need to modernize the rules and regulations. Here and there, we still sense a general opposition to digitization in Germany. And the simple fact that we are an American company doesn't make things easier with some of the people we talk to. But we are not prepared to walk away from the German market. We are here to stay. Once we have overcome Germany's skepticism, that will open doors wider in other countries as well.

# Who will be in the driver's seat?

Incumbent suppliers see automated driving as a chance to tap new revenue and earnings potential. But they don't necessarily have to become end-to-end systems integrators. We outline some alternatives.

by Wolfgang Bernhart and Markus Baum

In recent years, it was the OEMs who hit the automated driving headlines. Lately, however, the public gaze has increasingly turned away from manufacturers. Suppliers, who have invested hugely, dominate the news now. For example in April 2015, Delphi sent a self-driving car from San Francisco to New York City. Driveline company ZF Friedrichshafen has cast its net wider by taking over U.S. safety technology specialist TRW. The signs thus indicate that the future will shift the balance of market power, provided the automated driving market continues to develop. And this shift could open up new opportunities for suppliers. Why? Because they are the ones with the knowledge of relevant software and sensor technologies – object recognition, for example. As such, they are the ones who make it at all possible for

cars to operate in traffic and automatically take evasive action. Major tier-one systems suppliers such as Bosch, Conti and Delphi therefore believe they are well placed to play a leading role in the market for automated driving.

## REALITY CHECK

So far, there is little visible evidence of this positioning. And there are good reasons why it may never actually work. Understandably, large premium OEMs, but also volume producers, are not keen to see anyone steal their thunder in such an important market. They see the integration of automation functions as a core competence of their own and, in the medium to long term, as a way to set themselves apart from the competition. Moreover, most OEMs don't believe that tier-one suppliers

have what it takes to handle the role of general functional integrator. They therefore see no reason whatsoever to tinker with the traditional division of labor between OEMs and suppliers in the realms of automated driving, or in any other disciplines for that matter. This stance, of course, puts the former firmly in the driver's seat, from which they merely allow partners to develop individual components. (One such component is the software that uses camera and other sensor data to recognize and classify objects.) The OEMs themselves take care of in-vehicle integration, which they also do for hardware such as the actual sensors. Four new groups of players are arriving on the scene, all of whom are keen to offer automated driving as a complete package to establish themselves as leaders.



1 **Safety:** The display signals to pedestrians that the F 015 has "seen" them.



2 **Touch sensor:** Monitors the driver's ability to control the vehicle.

3 **Cockpit of the future:** Creates a comprehensive human-machine interface inside the car.



4 **Embedded camera:** Helps measure distances and recognize obstacles.

5 **Head-up display:** Projects content and information about points of interest.



**NEW ACTORS TAKING THE STAGE**

The first set of players consists of large IT companies such as Google. These corporations have defined self-driving cars as a lucrative line of business for the future. The second group is hardware and electronics specialists. Algorithms and the ability to link and "smarten up" relatively basic hardware or consumer electronics components are their key strengths. In their chosen niches, firms such as visual information specialist Mobileye already provide serious competition to established tier-one suppliers. They overcome the drawbacks of using cheap hardware (mono cameras instead of expensive stereo cameras,) by developing more complex and powerful software. Software specialists from robotics or the aerospace and defense sector make up the third group. They transfer their know-how from these industries to the automotive sector and act as integrators or software algorithm specialists on behalf of the OEMs. The fourth group comprises chip developers such as Intel and Qualcomm, who are good at developing integrated circuits for entire in-vehicle sensor systems. Some OEMs are already bypassing automotive suppliers and establishing direct collaboration with these chip developers instead.

We see three strategic options for suppliers to position themselves in the new market segment.

**Go for the big game.** Any firm with aspirations to become a full systems provider – complete with all the vehicle and integration skills required – will have to master three new areas of technology:

- Navigation based on map, object and infrastructure data fusion, as well as behavior prediction with the aid of machine-learning algorithms
- Vehicle control based on models and algorithms that can set target values for horizontal, transversal and vertical vehicle dynamics
- Human-machine interfaces (HMIs) to integrate the driver into vehicle control in certain situations

It is important to realize that the target group for the complete package will be small: incumbent OEMs with a technology follower position, niche providers in the premium segment, and start-up manufacturers from the emerging markets (mostly from China).

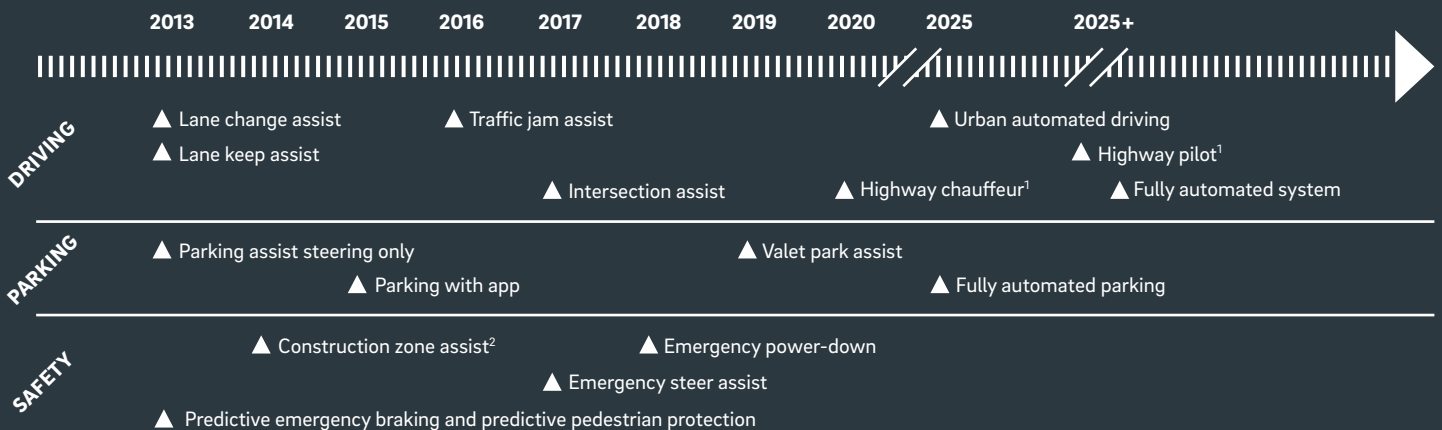
**Focus on "specialized commodities".** One interesting alternative can be to adjust positioning and become a "specialized commodity" supplier – of sensors or software, for example. If this strategic option is implemented cleanly, it can yield considerable

benefits such as less complexity. The world of mechanical engineering is full of examples of how such a model can be translated into business success: specialists for suspension springs, chassis and engine mounts, gaskets and powertrain actuators, to name but a few. To achieve success in the automated driving segment with this kind of positioning, suppliers must step up their development of hardware. That doesn't necessarily mean producing in house, but it does mean carefully considering which cooperative ventures with hardware developers could usefully complement your own competence and capabilities.

**Focus on integration of the driver.** In highly automated driving systems, the question of how to embed the driver is still a neglected task. But it will be an important feature in the future. HMI is a device that allows the driver to provide the system with input (in the future likely via voice or gesture recognition). But this will not be a one-way street: the HMI will also provide information on system status and on traffic. More importantly, it serves to monitor the driver and ensures that vehicle control can be handed over safely. It also helps to prioritize information. Although the HMI will remain a key differentiator for OEMs, they will still need partners to realize innovative ideas for driver integration.

**EVOLUTION OF AUTOMATED DRIVING**

Implementation timeline of selected automated driving functionalities



1) Highway pilot = highway chauffeur + higher degree of automation; 2) Tested – date of series production not available

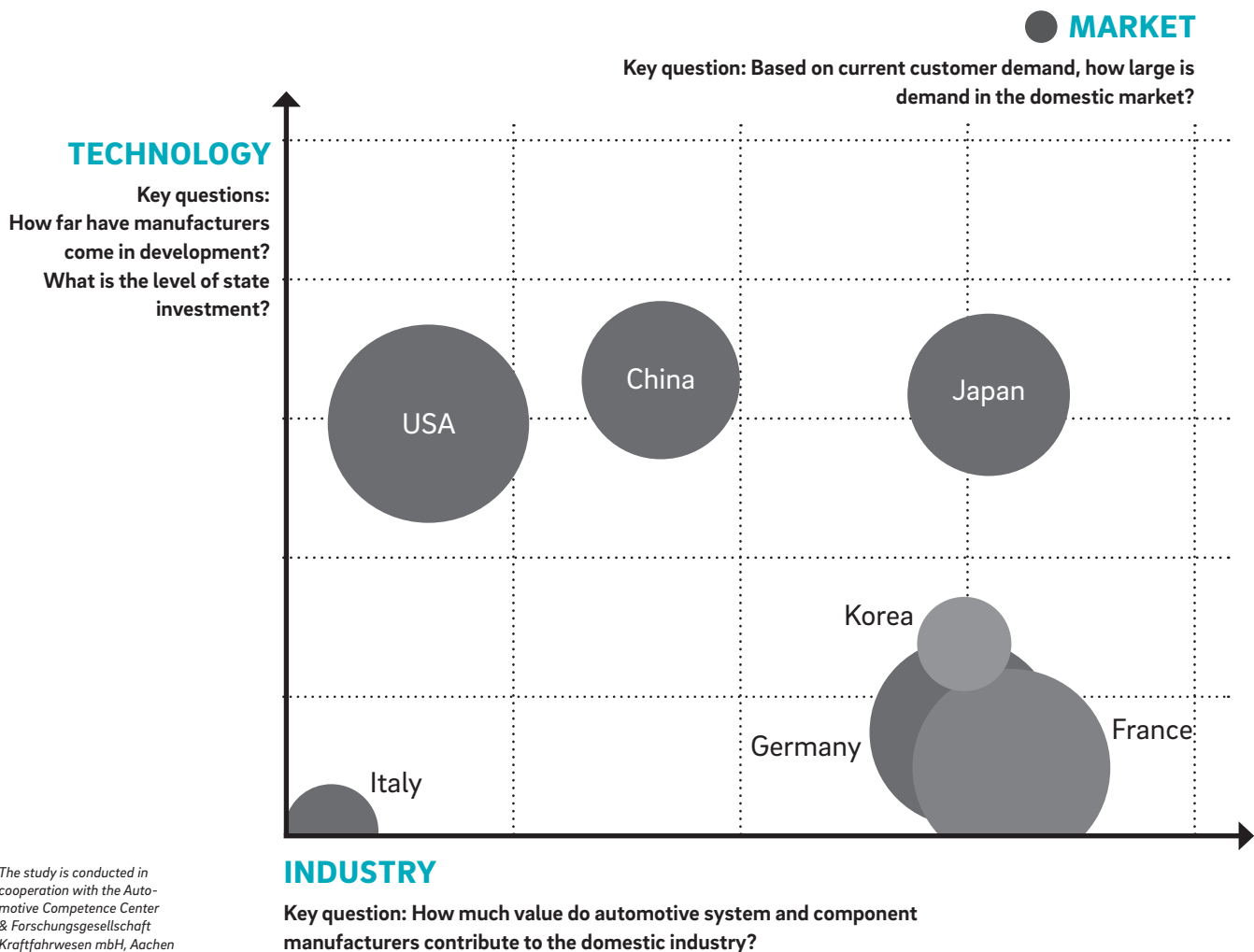
# JAPAN UNDER SIEGE

Reviewing electromobility – How leading automotive nations compare.  
An update in three dimensions.

by Wolfgang Bernhart and Thomas Schlick

## THE ROLAND BERGER E-MOBILITY INDEX

We regularly observe the e-mobility market, mapping the positions of leading players. Our analysis is driven by questions regarding the market, technology and industry.



*The study is conducted in cooperation with the Automotive Competence Center & Forschungsgesellschaft Kraftfahrwesen mbH, Aachen*



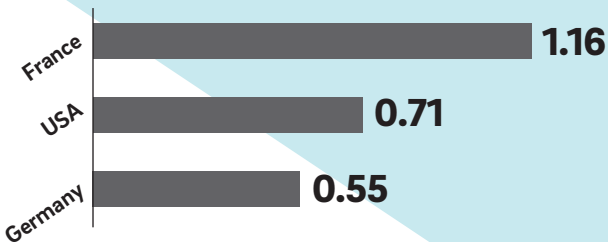
Charging station: Infrastructure for e-car owners is improving slowly.

## MARKET

### FIGHT FOR FIRST PLACE

France leads in terms of e-car/hybrid sales in relation to overall sales, followed by the U.S. and Germany. However, if we take a different perspective and look at total sales the U.S. are in the lead; China - the government pushes sales of domestic brands - is able to take the second position here.

#### E-cars/hybrid cars share of total sales [%]

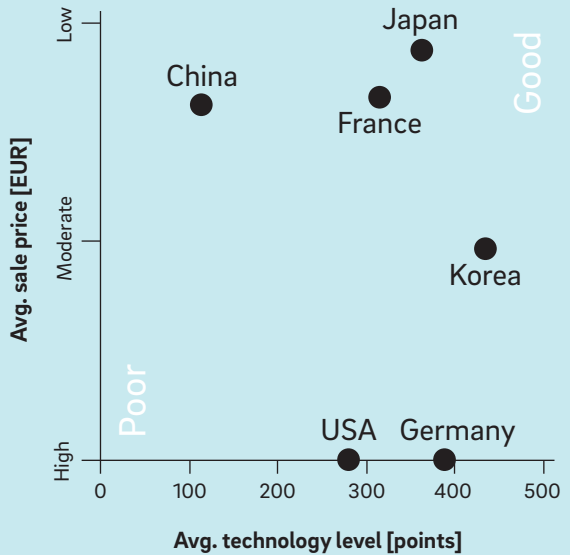


## TECHNOLOGY

### A NEW E-PREMIUM CLASS

E-cars continue to be very expensive in Germany and the U.S.. Japan has improved its value-for-money ratio. China is the price leader, but still lags behind in terms of technology. This might change soon: China's industrial and regulatory policy pushes innovation in electro-mobility. The government invests more than EUR 7.7 bn in this field, which is 0.1% of GDP. France and Germany rank 2nd and 3rd in terms of state investment.

#### Value for money [EUR/points]



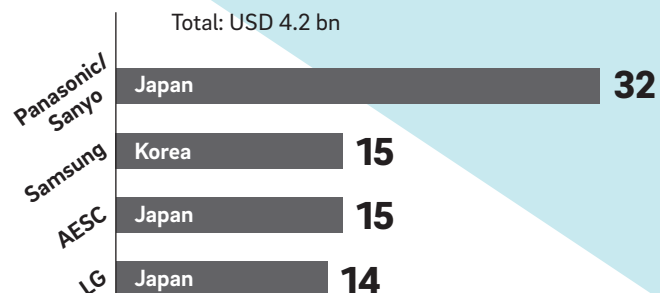
## INDUSTRY

### POWERED BY CELLS

It is not just the vehicles that are pushing the industry forward; cell manufacturers are crucial drivers as well. Japan's Panasonic/Sanyo group is leading here because of TESLA supply. Korean followers Samsung and LG are expected to see a major leap when 2018 vehicles are included.

#### Cell manufacturers:

#### Projected global market share in 2017 [%]



Source: Roland Berger

Photo: JTB Photo/UGC via Getty Images

Customer relations manager:  
Needs a broad range of skills to guide  
customers through all channels



# Reconnect with your customers

Many OEMs find themselves trapped in traditional structures when trying to innovate their retail activities. To facilitate a positive customer experience, OEMs need to be open about new retail formats, but should not lose sight of network efficiency

by Jan-Philipp Hasenberg, Philipp Grosse Kleimann





such as physical pain. Microsoft/Wakefield research revealed that 70 percent view dealers more as an obstacle to a fair and transparent transaction than a help, while 67 percent believe buying a car is one of the most intimidating purchases a person can make. What this means for automotive players: Third party providers such as Truecar and Autonation (U.S.) as well as meinauto.de (Germany) and Aramisauto (France) benefit from the low appeal of traditional sales channels to younger car buyers. The four retailers have adapted their business models to these new patterns of behavior. Customers can purchase a car that is tailored to their exact requirements conveniently from their own home with complete price transparency at any time of the day.

# <1%

chose the current car buying process as their ideal customer experience

Whether it is moving from offline to online channels, from stationary to mobile showrooms or from tangible to virtual customer experiences, the winds of change are disrupting the automotive retail industry. Fully integrated multichannel operations (e.g. BMW i, Tesla) and enhanced customer interaction centers (e.g. Fiat Live Store in Brazil) may still be scarce for now, but quite a few players are rolling out new retail formats (e.g. BMW Brand Experience Center in Shanghai, Audi City in London, Mercedes me Store in Hamburg) and setting up their own online sales activities (e.g. Mercedes in Germany and Poland, BMW i in many markets, Dacia in Italy, UK, Netherlands). Modeled on Apple's soft-sell retail stores, BMW introduced the "Product Genius" – customer service personnel who do not work on commission and consequently are incentivized, not to sell to, but to satisfy customers. This approach is also followed by other OEMs, such as the "Product Concierge" at Mercedes-Benz or Hyundai Rockar's "Angels".

In our experience, there are specific reasons that explain why the process of retail innovation is evolutionary rather than revolutionary. Path dependencies increase structural inertia within the retail organization and prevent true innovations from spreading. A comprehensive multichannel approach would for example require a

# 97%

use the internet for vehicle research

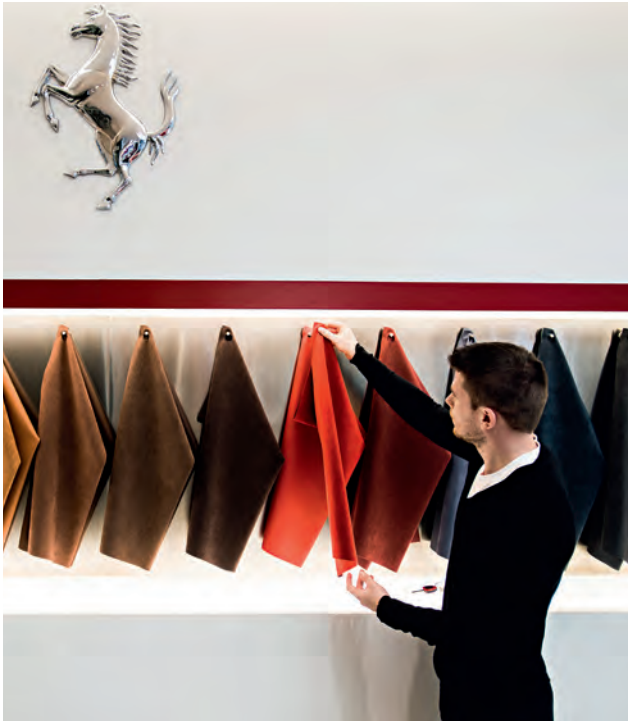
closer collaboration between marketing, sales and aftersales, as well as a redistribution of power between wholesale and retail operations, all of which is difficult to implement. This is why "greenfield" solutions with no legacy systems in place (e.g. BMW i and Tesla) allow for more progressive solutions. As a consequence, many initiatives of established OEMs remain in an experimental phase or are decentralized activities driven by the markets. Their focus often lies on digital sales and digitization of the point of sale, whereas the actual goal should be to increase the overall efficiency and effectiveness of the entire retail process (e.g. reducing investment requirements in facilities, improving conversion and loyalty rates). In many cases this leads to fragmented sales activities. Often the cost structure behind the innovations is neglected and a comprehensive vision of what the multichannel landscape will look like in the end is lacking.

# 42%

use multiple devices to shop for a car

Some premium OEMs are learning important lessons by looking to other business sectors for inspiration. Having started early, they are at the forefront of multichannel retail within the industry. The advantage of premium OEMs lies in their financial leeway to undertake comprehensive experiments. The resources of volume OEMs, which are operating within tight margin

**B**uying a car could be so much fun if it didn't fill people with dread. In recent years the shopping environment and customer needs have drifted farther apart in the automotive business than in any other industry. Worse, some customers actually perceive buying a car, for which they spend more than a year's salary, as an unpleasant duty instead of an exciting experience – a bizarre paradox in a buyer's market. Millennials, who are as comfortable interacting with devices as they are with people, unfortunately find the traditional car buying process a nuisance and associate the sales experience with negative attributes



Leather covers à la carte: Embarras de richesses (left);  
Clear the stage for...the new car (above)

structures, are by comparison far more limited. Priorities differ as well. While brand experience is the focus for premium manufacturers, maintaining an affordable sales network is the most important aspect for the activities of volume manufacturers. After conducting extensive research into retail innovations and best practices found in other industries, we can suggest many useful ideas that would help position manufacturers for the next developmental stage in automotive retail. Our proposals are flexible enough to enable an evolutionary multichannel approach for both premium and volume segments.

**1. BE OPEN ABOUT EXPLORING THE RIGHT FORMATS – BUT IN THE END CHOOSE A MANAGEABLE PORTFOLIO**

We have compiled a library of interesting formats for retail innovation, which can address various targets – but not all can be met at once. For example, stationary formats like brand stores increase brand accessibility and exposure and support the premium brand experience. Another approach would be to set up different yet complementary stationary formats, such as urban sales outlets: They help to bridge gaps in the network.

It may also be necessary to redefine the role of the dealer network if OEMs do not consider a transition to direct sales. Auto-

motive dealers have a unique position within the traditional sales process. Instead of circumventing them by offering direct purchases from the OEM, e.g. via the internet, they should be integrated into a multichannel model. The initial online sales experience may even exclude the actual transaction. OEMs could allow buyers to make most choices along the way online – including model configuration, test drive booking, trade-in evaluation and credit check. For the final price negotiation and contract closure, the customer may then be handed over to a branch office or dealer. Moreover, aftersales and service are key tools for an OEM to maintain customer loyalty, so dealers remain an essential part of the equation.

**2. BASE YOUR MULTICHANNEL CONCEPT ON THE CUSTOMER JOURNEY – BUT FOCUS ON CONNECTIONS AND GOVERNANCE**

Implementing new retail formats alone will not be enough to capitalize on the benefits of a multichannel retail approach. The new landscape has to enable a seamless customer journey. Implementing stable, systematic linkages between the various formats and adapting the governance system to new technological developments are key to success, but often ignored by practitioners as they are less visible than

new stores or digital touchpoints. In order to avoid creating multiple silos, all formats must be interconnected in an intelligent way. This is a prerequisite for actively guiding customers to the next step across various formats (i.e. from configuration to test drive). Such a move necessitates generating and distributing consistent data at all touchpoints linked to the customer based on a stable IT sys-

**21%**

see independent online vendors (e.g. Amazon) as an alternative sales channel to the dealer

tem. This is a true challenge for OEMs: it entails changing their perspective on the ownership of customer data between manufacturer and dealer. It also requires specific competencies in analytics and customer handling, not to mention employing new technologies.

Companies also have to ensure that multichannel activities are working as an integrated system. Therefore the overall issue of governance has to be revisited, including processes, organizational structure and a realignment of dealer compensation, for example. Today, only the dealership that successfully concludes the contract receives the full remuneration

("winner takes all"). This is not really a problem in today's world, as only standard dealerships with comparable ranges of services compete with each other. However, in a multichannel environment this may change. Retail formats are then set up to fulfill specific and complementary ser-

**44%**

would buy a car online

vices along the customer journey and may sometimes even not include a sales functionality. Brand or pop-up stores be geared only to generating leads and not cover contract conclusion. Test drive centers will be focused on a very specific step in the purchase experience. How can they be compensated for their contribution to the overall sales success in a way that allows for profitable individual business cases? We recommend a more differentiated approach. In the future, formats should earn commission on the service they have offered (e.g. test drive or consultation) if it leads to the successful sale of a car or service – no matter the format in which the customer finally concludes the contract.

**3. BE OPEN TO SIGNIFICANT CHANGES – BUT REMAIN REALISTIC ABOUT TOP-LINE BENEFITS**

We believe that multichannel retail operations can lead to a more effective and profitable retail business than traditional structures. However, the financial success won't come in every case, especially without comprehensive measures. To realize benefits instead of sitting on additional costs, OEMs have to realign the structure of sales partners and points of sale. The setup of a multichannel organization cannot be efficient if the new channels are established on top of the old ones. Apart from additional investment costs, the competition between sales activities of the same brand would increase. In most cases this calls for reducing and even replacing old structures with new ones. Often neglected, the real potential of a multichannel approach lies in its lower cost of retail: OEMs can offer more qualified support to their dealers. A Customer Interaction Center could prequalify prospects and forward hot leads to the dealer, for example, while a centralized test drive hub could cut financing costs for demo cars at dealerships. Higher operating costs for these new formats can be offset by retaining a share of

the dealer margin or charging commission fees from dealers. As a consequence, we believe that multichannel business cases should be calculated without the pressure of generating additional top-line benefits, such as immediately increasing sales volumes or prices. A business case should not take this for granted, but rather view it as upside potential and focus on increasing efficiency of the sales system first.

**59%**

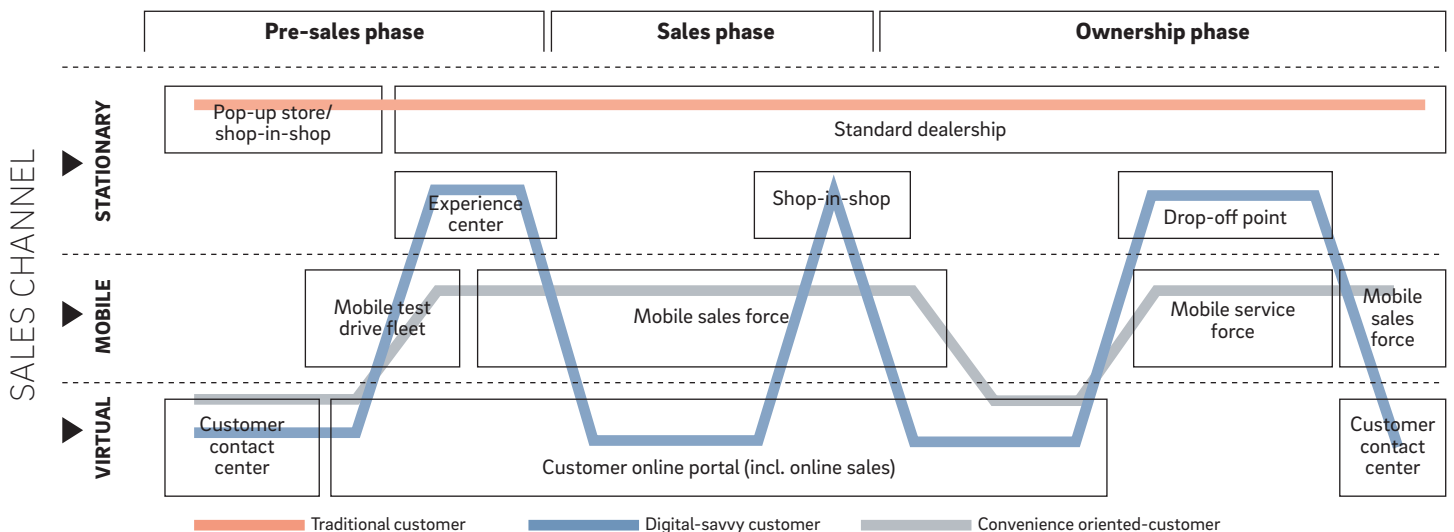
of young car buyers<sup>1</sup> expect a response to email/web inquiries within 24 hours

In the end, automotive customers should be able to enjoy buying a car or car-related services again. Car manufacturers should become benchmarks for customer experiences and offer consumers the convenience they expect. They should re-connect with their customers through tailored retail formats and individualized interactions without losing sight of the efficiency of their retail system.

1) aged 18-34. Sources for all figures: AutoScout 24 "Autokauf in der Zukunft" (2015); Autotrader "Car Buyer of the Future" (2015); Caggenini "Cars Online" (2014)

**FROM FIRST SIGHT TO LAST MILE**

No matter if a customer is traditional, digital-savvy or looks for convenience: A smart multichannel approach offers a very individual path through the journey with appropriate touchpoints for each type.



# Food for thought

Take a deep dive and find out more in related articles, studies and magazines by Roland Berger authors.

## What will automotive markets of the future look like?

The news is full of business models such as advanced connectivity systems, innovative shared mobility concepts, and of course, self-driving cars being showcased around the world. The automotive industry certainly plays a big role, but tech companies and new entrants are increasingly becoming the driving forces behind these developments. Once new players enter the value chain with innovative

business models and game-changing technologies, the ensuing shake-up can leave prominent incumbents irrelevant and facing consolidation or bankruptcy. The numerous trends impacting the automotive industry require the industry to respond – but it is the confluence of connectivity, shared mobility and automated driving that will truly put the industry as it's known today to the test.

### THE WORLD OF INDUSTRY 4.0

Industry 4.0, the comprehensive inter-connection of processes in production, logistics and services, is a huge issue at practically every large manufacturer in Europe. Humans, machines and resources all communicate with each other. Our latest magazine analyzes what this development means in particular for the COO – the Chief Operating Officer.



H. Krüger, CEO of BMW

## Business opportunities in precision farming: Will big data feed the world in the future?

Precision farming refers to a broad range of modern technologies that enable more efficient management of agricultural land. They can be clustered into robotics and automation technology, imagery and sensors, digitization and big data as well as bio-engineering. All of these technologies are interlinked via connectivity. Roland Berger experts analyze the global market for precision farming, look at how the technologies are going to develop in the period through 2030, consider their impact on traditional and new market players alike, and present five innovative business opportunities along the agricultural value chain.



New market players are pushing into the market with ever greater speed and aggression. Small wonder: The global market volume for smart agriculture applications will grow 12 percent per year through 2020. But traditional providers find themselves under increasing pressure in the near future.

**RETHINKING POWER ELECTRONICS**

Developments in power electronics – applications that supply the electric power to control motors – mean a prospective bonanza for smart players. With regulatory changes setting new targets for emissions and fuel efficiency, automotive players must step up their investment in electric technology by 2020.

**AUTOMOTIVE CORPORATE VENTURE – A STRATEGIC LEVER FOR AN INDUSTRY IN FLUX**

Corporate ventures offer large companies a window onto the start-up world along with access to the most cutting-edge technologies and innovations. Ventures act as laboratories for testing new ideas with minimal financial commitment. Yet the handful of existing automotive corporate venture initiatives have seen mixed results, as companies often struggle to overcome their bureaucratic nature or set a clear vision. Nevertheless, when done right, these initiatives provide not only financial returns, but critical strategic value.

**MEDIUM AND HEAVY COMMERCIAL VEHICLES IN INDIA**

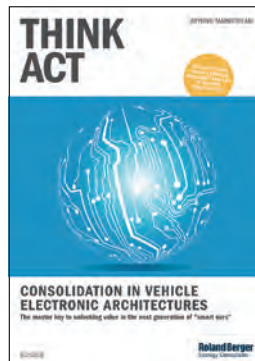
After two challenging years, the Indian economy is showing signs of modest recovery in 2015. All key indicators have improved over the last quarter or so, e.g. GDP growth has passed 5% after a gap of more than 2 years. India's medium & heavy commercial vehicle (M&HCV) industry is highly correlated with GDP; the cargo segment has a near-perfect positive correlation with GDP growth. As the economy recovers, the M&HCV cargo segment will be the first segment within the CV industry to rebound.

**RB'S AUTOMATED VEHICLES INDEX**

The Automated Vehicles quarterly index makes it possible to identify the competitive position of the relevant automotive countries and compare the automotive markets on the basis of identical global benchmarks. Germany and the US lead in the development and market launch of (partially) automated vehicles.

**THE DIGITAL TRANSFORMATION OF INDUSTRY**

How important is it? Who are the winners? What must be done now? A European study commissioned by the Federation of German Industries (BDI) and conducted by Roland Berger explores the causes and effects of the digital transformation with regard to the "industrial heart" of Europe.



**Vehicle electronic architectures – Consolidation ahead**

The master key to unlocking value in the next generation of "smart cars". Increasing the number and complexity of electronic control units (ECUs) is a major trend in the automotive industry. The industry is now at a tipping point where adding ECUs is no longer sustainable, either economically or functionally. Module consolidation – the use of a single domain controller instead of an independent processing unit for each ECU – is a solution already being made available to address the complexity issues arising from these trends.

**Publisher**

Roland Berger GmbH  
Automotive Competence Center  
Sederanger 1  
80538 Munich  
Germany  
+49 89 9230-0  
www.rolandberger.com

**Person in charge according to German press law**  
Marcus Berret

**Editors**

Dr. Cornelia Geißler  
*(Editor-in-chief)*  
Dr. Katherine Nölling  
*(Managing editor)*  
Johann von Georg  
Jan-Philipp Hasenberg

**Design**

Blasius Thätter *(Art director)*  
Kathrin Schemel *(Designer)*  
Susanne Nips *(Photo editor)*

**Printing**

Pinsker Druck und Medien,  
Munich

**Circulation (online/print)**

5,500

**Disclaimer**

Opinions expressed in this magazine do not necessarily reflect the views of the publisher. Some of the content contained in the publication is subject to third-party copyrights. The copyright of third parties is expressly indicated in the text where applicable.

# THE GOLF

Moving a generation



## Der Golf kann eine Menge vertragen.

16 Bierkästen zum Beispiel.  
Der Golf kann solche Mengen vertragen, ohne zu klagen. Denn er hat nicht nur einen Gepäckraum, der 700 Liter schluckt. Sondern auch eine Federung, die nicht in die Knie geht. Nun ist es bestimmt recht angenehm, wenn

man einem Auto so viel zumuten kann. Ihnen jedoch wollen wir nicht zumuten, solche Mengen zum Auto zu schleppen.

Deshalb ist der Golf nur drei Meter siebenzig lang. Und kann in allen Lücken parken, die für lange Autos zu kurz sind.

Eine große Arbeitserleichterung ist außerdem seine Heckklappe. Es gibt nur eine Möglichkeit, sich die Arbeit noch leichter zu machen: Nehmen Sie Ihren stärksten Freund mit. Die Fahrt im Golf wird ihn für die Mühe entschädigen.



**Golf, der Kompakt-VW. Auto, Motor und Spaß.**

**The Golf takes whatever you throw at it.** 16 crates of beer, for example.

The Golf swallows them all without a murmur. It's not just the 700-liter space in the back: The suspension too just shrugs and does its job. It's nice to have such a forgiving car that puts up with everything, of course. But we still don't want you to have to cart so much stuff around in your car. That's why the Golf is only 3.70 meters long, slipping neatly into all those lovely parking spaces that are too tight for long cars. But if you do have to load it up, the tailgate too makes things so much simpler. In fact, there is only one way to make life even easier: Take your strongest friend along with you. Getting to ride in a Golf will be more than enough reward.

**Golf, the compact VW. A car, an engine and a bundle of fun.**

The Golf 1 marked the beginning of an era. It was the car for an entire generation. Especially in Germany and Europe, it became synonymous with a certain carefree, can-do lifestyle. Driving it made life easy and fun for the '70s generation. This was the car that tore down barriers, creating a sense of boundless freedom. Chosen to succeed the vastly popular Beetle, the Golf

had big shoes to fill when it was launched in May 1974. Yet the newcomer (and its successors) exceeded all expectations and became Volkswagen's most successful car, selling 27.5 million models around the globe. Finding another model to become the symbol of a generation will be a tough task, though. As car ownership loses its appeal to younger drivers (see "Trends" on

pp. 6-7), the Golf may turn out to have been one of the last of a dying breed. For now, that doesn't seem to be a problem for Volkswagen: The 2015 Golf has been named North American Car of the Year™ by fifty-six independent automotive journalists. Having moved an entire generation – in every sense of the word – the Golf is obviously still going strong.

# CONTACTS AND AUTHORS

For more information about the topics covered in this issue, please contact our contributors:

## AUSTRIA

### Rupert Petry

Phone +43 (1) 53602-101  
Rupert.Petry@rolandberger.com

## BELGIUM

### Didier Tshidimba

Phone +32 (2) 6610-0  
Didier.Tshidimba@rolandberger.com

## CROATIA

### Vladimir Preveden

Phone +43 (1) 53602-301  
Vladimir.Preveden@rolandberger.com

## FRANCE

### Sebastien Amichi

Phone +33 (1) 53670-479  
Sebastien.Amichi@rolandberger.com

### Max Blanchet

Phone +33 (1) 53670-479  
Max.Blanchet@rolandberger.com

## GERMANY

### Markus Baum

Phone +49 (89) 9230-9249  
Markus.Baum@rolandberger.com

### Dr. Wolfgang Bernhart

Phone +49 (89) 9230-8909  
Wolfgang.Bernhart@rolandberger.com

### Marcus Berret

Phone +49 (89) 9230-9249  
Marcus.Berret@rolandberger.com

### Alexander Brenner

Phone +49 (89) 9230-8511  
Alexander.Brenner@rolandberger.com

### Norbert Dressler

Phone +49 (89) 9230-8511  
Norbert.Dressler@rolandberger.com

### Philipp Grosse Kleimann

Phone +49 (89) 9230-8511  
Philipp.GrosseKleimann@rolandberger.com

### Jan-Philipp Hasenberg

Phone +49 (89) 9230-8511  
Jan-Philipp.Hasenberg@rolandberger.com

### Felix Mogge

Phone +49 (89) 9230-9249  
Felix.Mogge@rolandberger.com

### Jürgen Reers

Phone +49 (89) 9230-8909  
Juergen.Reers@rolandberger.com

### Dr. Thomas Schlick

Phone +49 (89) 9230-9249  
Thomas.Schlick@rolandberger.com

## UNITED KINGDOM

### Robert Thomson

Phone +44 (20) 3075-1103  
Robert.Thomson@rolandberger.com

## GREATER CHINA

### Andreas Männel

Phone +86 (21) 5298 6677-860  
Andreas.Maennel@rolandberger.com

### Junyi Zhang

Phone +86 (21) 5298 6677-860  
Junyi.Zhang@rolandberger.com

## HUNGARY

### Frigyes Schannen

Phone +36 (1) 30170-70  
Frigyes.Schannen@rolandberger.com

## INDIA

### Dr. Wilfried Aulbur

Phone +91 (91) 67218-171  
Wilfried.Aulbur@rolandberger.com

## ITALY

### Roberto Crapelli

Phone +39 (02) 29501-257  
Roberto.Crapelli@rolandberger.com

### Andrea Marinoni

Phone +39 (02) 29501-291  
Andrea.Marinoni@rolandberger.com

### Paolo Massardi

Phone +39 (02) 29501-218  
Paolo.Massardi@rolandberger.com

## JAPAN

### Dr. Satoshi Nagashima

Phone +81 (3) 35876-741  
Satoshi.Nagashima@rolandberger.com

### Yuzuru Ohashi

Phone +81 (3) 35876-741  
Yuzuru.Ohashi@rolandberger.com

### Akio Okamura

Phone +81 (3) 35876-385  
Akio.Okamura@rolandberger.com

### Dr. Martin Tonko

Phone +81 (3) 35876-675  
Martin.Tonko@rolandberger.com

## MALAYSIA

### Anthonie Versluis

Phone +60 (3) 2203-8600  
Anthonie.Versluis@rolandberger.com

## MIDDLE EAST

### Tobias Plate

Phone +973 (17) 5679-23  
Tobias.Plate@rolandberger.com

### Michael Wette

Phone +41 (43) 336-8631  
Michael.Wette@rolandberger.com

## NETHERLANDS

### René Seyger

Phone +31 (20) 7960-608  
Rene.Seyger@rolandberger.com

## NORTH AMERICA

### Jiten Behl

Phone +1 (312) 662-5500  
Jiten.Behl@rolandberger.com

### Stephan Keese

Phone +1 (248) 729-5116  
Stephan.Keese@rolandberger.com

### Thomas Wendt

Phone +1 (248) 729-5116  
Thomas.Wendt@rolandberger.com

### Marc Winterhoff

Phone +1 (248) 729-5500  
Marc.Winterhoff@rolandberger.com

## ROMANIA

### Codrut Pascu

Phone +40 (21) 30605-00  
Codrut.Pascu@rolandberger.com

## RUSSIA

### Eduard Cherkin

Phone +7 (495) 2257-645  
Eduard.Cherkin@rolandberger.com

## SINGAPORE

### Keisuke Yamabe

Phone +65 (6597) 4545  
Keisuke.Yamabe@rolandberger.com

### Thomas Klotz

Phone +65 (6597) 4566  
Thomas.Klotz@rolandberger.com

## SOUTH AMERICA

### Martin Bodewig

Phone +55 (11) 3046-7111  
Martin.Bodewig@rolandberger.com

## SOUTH KOREA

### Soosung Lee

Phone +82 (2) 2288-0003  
Soosung.Lee@rolandberger.com

## SWEDEN

### Per I. Nilsson

Phone +46 (31) 75755-14  
Per.I.Nilsson@rolandberger.com

### Per M. Nilsson

Phone +46 (31) 75755-10  
Per.M.Nilsson@rolandberger.com

## SWITZERLAND

### Sven Siepen

Phone +41 (43) 336-8671  
Sven.Siepen@rolandberger.com

