Quo Vadis OEM Aftersales? CASE Technologies as Disruptors and Enablers
**Growth:** Steady growth in the vehicle population will provide the automotive industry globally with revenue growth in the aftersales business from its present 579 to 755 billion euros by 2035. The main driver for this is the vehicle market in China.

**Risk:** Electromobility, autonomous driving and shared mobility usage will reduce demand for repairs, maintenance and spare parts by up to 67 percent compared to conventional cars.

**Opportunity:** Connectivity and shared mobility open up new aftersales business models. Shared mobility alone offers an additional revenue potential of up to 320 billion euros in Europe, the USA and China by 2035.

**Transformation:** New players with their own platforms and networks exploit the increasing networking of customers, and compete with OEMs for the customer interface. OEMs lose their pole position if they respond hesitantly and wrongly.

**Need for action:** Manage digital disruption instead of responding to it, intensify customer orientation and establish a consistent customer experience; optimize internal business processes using a data-driven approach.

**Time pressure:** Two out of three top managers in the aftersales sector who were surveyed consider themselves inadequately prepared for the digital transformation.
First the good news: the vehicle population will continue to be the most important revenue driver in the aftersales business for the next years. In 2035, 1.5 billion cars will be on the roads worldwide, around 50 percent more than today. However, aftersales will also benefit from the digital connectivity of vehicles and customers. These technologies form the basis of new data-driven OEM business models; also in the context of shared mobility. For example, innovative options for shared mobility fleets, as Toyota has done with its “Total-care Service” for the ride-sharing provider Grab in Singapore. More about this below.

Time is pressing. Those who want to hold their own in tomorrow’s competitive world must act now, since there is also bad news: Electromobility and autonomous driving will shrink aftersales revenues. The keyword is eMobility: About a third of all global revenue is currently earned in the drive train area, where gasoline and diesel engines still play the main role.

However that will not always be the case, since electric drives are less technically complex, and therefore subject to less wear and tear, and require much less maintenance. The deficits will become ever more noticeable as traditional gas-powered cars are increasingly superseded by electric vehicles. After sales revenue will also be reduced by highly automated driving cars. Experts expect a mode of driving that makes less demands on the technology and decreasing numbers of accidents; repair costs and demand for spare parts are reduced. At the same time, vehicle connectivity and methods of analysis such as machine learning allow new service products such as predictive maintenance to be established - for reducing the warranty costs and increasing customer satisfaction and loyalty.
“The digital transformation will transform the automotive manufacturers’ aftersales business in a lasting and radical way. However, for the digital transformation to take place on a wide scale will take time. Time that automotive manufacturers should make use of to set a new course. In conurbations, the disruption by CASE technologies will be felt very soon. It’s essential to be prepared for it,” says Jonas Wagner, Partner, Berylls Strategy Advisors.

He bases his appraisal on Berylls’s new study “Quo Vadis OEM Aftersales?,” a detailed analysis of the automotive manufacturers’ aftersales business in the wake of the CASE technologies and the digital (r)evolution. Berylls’s market experts surveyed 30 top managers from the aftersales business about their expectations and their appraisal of the future development. The picture showing the medium and long-term development of the aftersales business and key action fields is completed with comprehensive market analyses and forecasts.

The future picture painted by Berylls until 2035 does give ground for optimism at first glance. “Realignment of (digital) service offering and innovative revenue models are capable of making up for lost revenues that are created by electromobility and automated driving.” says Wagner. However, he warns against overoptimistic expectations: “The revenue gains will be very different from region to region.”

**NEW AUTOMOTIVE WORLD: OPPORTUNITIES AND RISKS FOR AFTERSALES.**
The automotive future will change the aftersales business in the long term. Developments and effects are complex and their medium to long-term effects on aftersales are not yet precisely predictable.

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### DISRUPTION AS AN OPPORTUNITY - FOR THE PREPARED

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**NEW (DIGITAL) SERVICES**
CASE: UP TO THREE QUARTERS OF REVENUE WILL FALL AWAY

The forecasts about when and to what extent CASE technologies will take to the road are still vague. However, in order to quantify the effect of CASE technologies on the aftersales business until 2035, the Berylls experts modeled the development of the vehicle population, taking into account all the CASE drivers and their interactions. The calculations show severe implications:

In the case of a personal vehicle with conventional combustion engine, some 790 euros revenue per year is generated in aftersales business. For purely electrically driven vehicles, the amount falls by a third to roughly 540 euros. For autonomously driving and TCO-optimized electric vehicles, which will dominate the shared mobility fleets, the annual aftersales revenue will amount to only 260 euros on average - a revenue loss of 67 percent compared to conventional vehicles. Of course, this only applies where the autonomous vehicle is more cost-effective than the piloted vehicle, including labor costs for drivers. Thus, the new technologies and the increased pressure resulting from increased fleet business exert huge pressure on costs and consequently on the process efficiency of the OEM aftersales business.

TECH-IMPACT: CASE TECHNOLOGY REDUCE REVENUES

The Berylls model calculations show: The aftersales revenues per vehicle decrease with increasing electrification, automation and sharing by up to 67 percent compared to conventional cars.

1) Autonomy level 4/5
By 2035, revenue in the aftersales business – labor and parts – is expected to grow from the present 579 to 755 billion euros (+30 percent). The growing vehicle population will ensure growth of over 50%. As regards the CASE drivers, electromobility, in particular, will result in a decline of 13% globally. However, considered regionally, the development looks entirely different. According to Berylls analyses, the biggest revenue growth in the next years will be obtained in China (+3.8 percent p.a.). But this can mainly be attributed to the growth of the vehicle population, which will grow two-and-a-half fold. In Europe and the USA, on the other hand, Berylls’s experts expect revenue to grow by not even half a percent annually by 2035. For Germany, they even forecast that aftersales revenues will fall slightly. The new technologies will thereby completely wipe out the growth resulting from the vehicle population. Besides regional differences, the effect on the active market participants - OEMs and independent workshops, as well as work-shop chains – is significantly more alarming.

OUTLOOK 2035: IMPACT ON THE AFTERSALES BUSINESS.
The growing vehicle population is securing the aftersales business, especially in China. In the saturated markets such as Germany, for example, the population is expected to decline.

After Sales Revenue in bn €

<table>
<thead>
<tr>
<th>CAR PARK GROWTH</th>
<th>ELECTRIFICATION</th>
<th>MOBILITY SERVICES</th>
<th>AUTOMATED DRIVING</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>579 (100%)</td>
<td>301</td>
<td></td>
</tr>
<tr>
<td>2035</td>
<td>755 (130%)</td>
<td>75</td>
<td>18</td>
</tr>
</tbody>
</table>

REGIONAL GROWTH

<table>
<thead>
<tr>
<th>REGIONAL GROWTH¹</th>
<th>2017</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>+3.8</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>+2.6</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>+0.4</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>+0.3</td>
<td></td>
</tr>
<tr>
<td>Rest of the World</td>
<td>-0.3</td>
<td></td>
</tr>
</tbody>
</table>

¹) Average annual growth rate ²) Rest of world
The OEMs’ brand-name workshops are currently responsible for about half of their aftersales revenue, depending on the region; the most important revenue drivers are vehicles with a relatively low age (< 5 years). The other half is split among independent workshops and workshop chains, such as ATU and Pitstop. The way that the revenue distribution between the OEM and independent suppliers might develop until 2035 is shown in a scenario developed by Berylls. It assumes that OEMs will stick to their traditional aftersales structures and business models. The consequences would be drastic: their OEM-global aftersales revenue could fall to about 35 percent. In particular, their high dependence on young vehicle segments means that they will be impacted first by the effects of CASE. Even if the OEMs of the future will certainly not accept this passively, the figures make clear the urgency of exploiting the opportunities of digitalization.

**GLOBAL AFTERSALES 2035: OEMS DO NOT BENEFIT FROM GROWTH.**

If the OEMs persist in their traditional aftersales structures and business models, the consequences are as follows dramatic: Their share of worldwide aftersales revenues could fall to around 35 percent.

After Sales Revenue in bn €

<table>
<thead>
<tr>
<th>Region</th>
<th>2017</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GLOBAL</strong></td>
<td>579</td>
<td>755</td>
</tr>
<tr>
<td><strong>OEM</strong></td>
<td>51%</td>
<td>65%</td>
</tr>
<tr>
<td><strong>IAM</strong></td>
<td>49%</td>
<td>35%</td>
</tr>
<tr>
<td><strong>2017</strong></td>
<td>102</td>
<td>167</td>
</tr>
<tr>
<td><strong>2035</strong></td>
<td>53%</td>
<td>44%</td>
</tr>
<tr>
<td><strong>36%</strong></td>
<td>35%</td>
<td>31%</td>
</tr>
</tbody>
</table>
EXPLORING DIGITALIZATION AS AN ENABLER

The digital transformation is still a step into the dark, and the automotive industry is by no means on the home stretch as regards connectivity of the vehicle and with its customers. The opportunities and risks have still not been clearly identified, and there is therefore a great deal of uncertainty. That is also reflected in the survey of top managers for Berylls’s study. They assessed big data, artificial intelligence and connectivity as enablers for innovative and profitable aftersales business models. On the other hand, there is still a great deal of uncertainty surrounding customer connectivity, or the complex topic of mobility service offerings. In addition, most of them are only insufficiently prepared for the digital transformation.

The recommendations for action derived in Berylls’s study include, for example, differentiation of the service option and corresponding (digital) transformation of the organization, restructuring of the service network, reinforcement of the service offering throughout the service life of the vehicle, as well as setting up digital platforms and innovative operator models.

DIGITAL TRANSFORMATION AS ENABLER: YES! BUT HOW?
The majority of the top managers surveyed for the Berylls Altersales study see a need for action for the company; however, implementation is only just beginning - and still hesitant.
By 2035, the vehicle population in China will increase from the current 180 million passenger cars more than two-and-a-half-fold to 460 million. More than half of these vehicles will then be older than five years, 16% will be even older then 12 years" anstatt "a third of them even more than nine years old - and will be correspondingly in need of repair and maintenance.

Thus, besides the disproportionately high growth of the vehicle population in China- in an international comparison - the inordinately greater aging is the actual reason why China's share of global aftersales revenue will increase from its current 18 percent to about 30 percent by 2035, when it will be 199 billion euros. This is also why OEMs will not necessarily profit from this growth. After all, the Chinese show little brand loyalty: the workshop around the corner is usually the Chinese car owner’s first choice once the OEM's warranty has expired. And in some cases even earlier than this. Bringing about a rethink here is the biggest challenge facing OEMs in China: Establishing loyalty and connectivity of the vehicle and customer are the crucial success factors in China.

Seamless integration into the digital world of the Chinese customer is not a choice, but a necessity in China. This has long been recognized by the platforms established in China, such as Alibaba and JD.com, as well as aftersales specialists such as tuhu.

CHINA AS REVENUE DRIVER: IT’S THE AGE THAT COUNTS

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According to Berylls’s expert Wagner, the automotive manufacturers’ strength lies in direct, close contact with the customers over many years: “Within the first four years after the purchase of a new car, most maintenance and repair customers remain loyal to the automotive manufacturer.” This is where a start should be made and the customer experience improved through consistent exploitation of the possibilities resulting from digitalization. “However outmoded this may sound, entrepreneurial action must center on fulfilling customer expectations. The actual key to success lies in even exceeding them. And in reality, OEMs are still unfortunately battling with the former,” says Wagner. He also warns that “Competition will intensify.”

Since ever more new players, including those from outside the industry will come into play. They no longer lure customers in with comparatively low costs and cost transparency, but with services and options that are ever more attractive since they are oriented to genuine customer needs. Specialized repair server providers - the best example is car glass - are shaking up the market, and earning good money in their niches. But online platforms for workshops or spare parts are examples of the new kids on the block in the aftersales market. They are first movers and are considered innovation drivers - even if their market penetration is still relatively low. After all, Amazon also once started small, and is watching this market, too, like a hawk.

**COMPETITION IS GROWING: NEW KIDS ON THE BLOCK**

**DIGITAL PLATFORMS FOR PARTS AND SERVICES ARE TAKING OFF.**
Online platforms for parts and workshop services have gained momentum over the last few years; so far but still strongly regionally differentiated and with the most varied business models - from pure broker to an online seller.
The future success of the OEMs in the aftersales business - not only in China - will crucially depend on how well automotive manufacturers succeed in ensuring the loyalty of their new car, and increasingly also of used car, customers. The rule is simple: the more satisfied a customer is with his OEM and his offering, the more loyal he will be to his products and services, including in aftersales.

The new power is called “connected services.” A highly diverse range of services already exists that can be provided to the connected customer via app to his smartphone or directly into the connected car, and will be continually expanded in the future: Informing the customer about upcoming maintenance work, online appointment arrangement and online tracking of the work in the workshop, as well as pick-up and delivery, cleaning and express service. In a connected car, the on-board diagnostic system not only transmits the vehicle data to the OEM, but, via the vehicle’s own infotainment system, also notifies the customer of, for example, when the next service is due or a wear part should be replaced. The advantage for customers is that wear and tear are identified at an early stage, and it may be possible to avoid more extensive damage.

„CONNECTED SERVICES“: THE NEW POWER.

The spectrum of services offered to „connected customers“ via app on their smartphones or directly into the connected car is already manifold today. They are the basis for new revenue models for OEMs.
“Connected services reinforce customer loyalty and increase customer satisfaction - provided that they are oriented to customer needs. New approaches, such as predictive maintenance or troubleshooting via software update over the air are highly promising. Berylls thus also works together with experts from science and research institutes, in developing new concepts and service options. Besides the success-critical digitalization of the aftersales core processes, data-driven business models are opening up new revenue potentials for aftersales business. However, these potentials should be questioned very critically: in what form can and may customer and vehicle data be used to design a service offering added value? Which data will OEMs have exclusive, and therefore monetizable, access to?

FIELDS OF APPLICATION CONNECTED SERVICES: COST/BENEFIT POTENTIALS MUST BE WEIGHED UP.
Internal use cases often generate major effects and serve as pilot projects.

A perfect “customer journey,” directed by the OEM, could be as follows: In the event of an accident, the connected car sends the GPS data for the location and information about the state of the vehicle occupants to the emergency center and at the same time to the OEM’s dealer network, breakdown service and, depending on the extent of damage, the transport of the vehicle to the workshop is organized from there. At the same time, the following traffic is warned about the accident scene by Car-2-X communication. The OEM subsequently takes care of complete handling of all necessary processes through to clarifying insurance claims by the customer. The OEM benefits as the best connected partner in an emergency.
To the chagrin of the OEMs, onboard diagnostic data must in the future also be made accessible to third parties, such as independent workshop portals. The latter draw up customer-specific cost estimates and direct the car owners to workshops in their partner network. For OEMs, this means losing the customer interface.

However, it is not easy to establish a robust platform concept for mediating workshops. Among others, Bosch and Autoscout24 have also launched just such portals - but without success so far. It is a dilemma. Once the customer has found a workshop he is satisfied with, he will book there directly in future. If the recommended workshop does not meet expectations, the customer will not use the portal again. At the same time, it has not been possible to achieve connectivity of the portals with the vehicle needs by means of so-called OBD adapters on a large scale. The customer benefit is still too low at present. “For OEMs, on the other hand, the platform concept is very promising: With their own platform and seamless connectivity of services, they can bind their customers - as long as they continue to own the data. At the same time, however, the established platforms are working ever more intensively on offering customer-relevant services. An example is Amazon, with its “home services”, which already simply and conveniently mediate services such as tire exchange. And they have one thing in common: customer access,” says Jonas Wagner.

**MATCHMAKERS: NEW PLAYERS IN THE NETWORKED AFTERSALES WORLD.**

The connected customer with his connected car is for OEMs as well as for companies outside the industry, an attractive target group for those wishing to enter the profitable aftersales business. The better one wins!

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1) Web-based platform vehicle data
Autonomous shared mobility offerings will gain significant modal share alongside public and individual transport primarily in urban areas. The experts from Berylls anticipate a shared mobility fleet of 20 million vehicles in Europe, the USA and China by 2035. This corresponds to approximately 2.5 times today’s mobility fleets - not taking into account piloted vehicles in 2035 which will still be around.

The mileage of these vehicles will vary strongly depending on the city and mobility service and, in the estimation of Berylls, will be of the order of 100,000 km per year. For this reason alone, the outlook appears favorable: the annual need for maintenance will lie well above that of privately used vehicles – with corresponding revenue potential for OEMs.

At the same time, there is of course also the risk of cannibalization of private vehicles and the associated aftersales business by shared mobility offerings. “Whether this concern is justified at all remains to be seen. Individual mobility behavior is complex and multifaceted. The step towards complete abolition of the personal vehicle is very sensitive to even the most minor deficiencies in alternative options,” says Christian Heid, mobility expert at Berylls. It must not be forgotten that repositioning trips without passengers result in additional vehicle mileage in the system and thus need for “additional” maintenance.

\[
\begin{align*}
\text{VALUE-CHAIN STRUCTURE OF AUTONOMOUS MOBILITY SERVICES}^1
\end{align*}
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Shared mobility business models generally focus on the customer platform - but the greatest potential lies in daily care (USA, China, Europe 2035 in billions of euros p.a.; rounded to 5% or 10 billion euros).

Besides this need for maintenance, a much larger potential lies dormant in entirely new services. While mobility service providers yearn for the age of autonomous vehicles, a complete replacement for the current drivers is yet to be found. After all, autonomous driving systems can only replace part of the value added by the driver. Daily interior and regular exterior cleaning, charging of vehicles, parking overnight in front of the own house door and, depending on the mobility service, even the financing and insurance of the vehicle are today performed by the driver as a matter of course. Once drivers will not be part of this system anymore, alternative and most importantly professional large-scale processes and structures will be required.

1) Aggregated over various mobility offers; unallocated share of value added from energy supply
2) Includes all activities from research & development to vehicle insurance
Berylls estimates the value of all activities along the shared mobility value chain at 920 billion euros by 2035. Because of the high vehicle mileages and under the assumption of special purpose vehicles, the share of the traditional OEM business fields Sales, Aftersales and Financial Services in the total value creation will drop to 30% (300 billion euros). With 35% (320 bn euros), a large proportion of value creation will be generated in daily fleet care, which is not very much work in itself but has to be carried out every day.

320 BN € VALUE CREATION IN DAILY CARE OF MOBILITY FLEETS¹. Supply of space and infrastructure accounts for 160 billion euros or 50% of value chain – OEMs with good prerequisites for all activities (USA, China, Europe 2035 in billions of euros; rounded to 5% or 10 billion).

From the point of view of mobility service providers, all aftersales-related incidents represent a reduction of the revenue-generating time. As is already the case today in goods transport, “uptime” will be a highly relevant profitability lever. The greater the shared mobility fleets, the more important it will be that any such activities do not only offer high process efficiency but also integrate seamlessly into the operating requirements of mobility service providers.

While daily fleet care is uncharted territory for OEMs, their retail sites in good city locations and their qualified staff represent an outstanding basis for systematically building up suitable offerings.

“However, the actual strategic advantage over potential competitors lies in the possibility of not only developing and building TCO-optimized shared mobility vehicles, but also immediately dovetailing them with automated processes and infrastructures,” says Jonas Wagner. In this way, OEMs would have the opportunity of moving up to become indispensable partners of mobility service providers, and thereby outpace competitors such as ISPs.

¹) Aggregated over various mobility offers; unallocated share of value added from energy supply
Toyota has recognized the signs of the times and is exploring the subject in Singapore with its “Total-care Service.” At the end of 2018, Toyota launched its cooperation with the mobility service provider Grab, and pilots its offering with a fleet of 1,500 Toyota vehicles. The service package covers services such as fleet management, insurance and maintenance - based on the evaluation of actual vehicle data.

However, the future vision must be highly automated hubs, in which shared mobility fleets are cost-effectively cleaned, charged and optimally maintained for smooth operation, as well as parked. “Parking the vehicles overnight may sound trivial at first. However, providing space for several thousands of vehicles rapidly becomes a logistic challenge in big cities, with severe implications for the entire profitability of the mobility offering,” says Christian Heid. The uplink of the charging infrastructure of such a hub to the public electricity grid makes it additionally difficult to find a site. Solutions outside the professionally organized procedures, such as the use of public charging infrastructures and on-street parking may still be reality today. However, with 20 million commercially operated, autonomous vehicles on the roads of our cities, regulatory pressure will increase enormously.

It is still uncertain who will benefit from this revenue potential. The map of possible operators for the necessary services is very heterogeneous. It will be necessary to rapidly evaluate possible positionings by the OEMs, since many suppliers are already positioning themselves.
BERYLLS’S ACTION PLAN: WHERE TO START, WHAT TO DO?

1. **Connected Customer:** Holistic customer orientation and establish a consistent customer experience. *For example* by personalized service offers, from the arrangement of an appointment up to the online payment processing as well as special customer loyalty programs, e.g. older vehicles.

2. **Connected Car:** Securing the direct access to data and Customer information (“first-to-know” & “first-to-act”). *For example* by building digital platforms, dare also "disruptive" concepts, e.g. multi-brand service platforms.

3. **Big Data / Artificial Intelligence:** Creating Added Value through innovative, efficient services for customers and above all in their own organization. *For example* through innovative revenue models, such as predictive services or connected fleet management or optimization processes in logistics and workshops.

4. **Electromobility:** Looking ahead to the decline in revenue and to open up new revenue potential. *For example* by restructuring the service network and a stronger focus on B2B customers (e.g. through the development of from automated service factories).

5. **Mobility Services & Automated Driving:** Structure special offers for shared mobility fleets and services. *For example* complete integration of TCO-optimized SPVs with hub infrastructure and highly automated hub processes.

The disruption by these CASE technologies will soon be noticeable in conurbations. It is essential to be prepared!
Berylls Strategy Advisors is a top management consulting firm specialized in the automotive industry, with offices in Munich and Berlin, in China, in Great Britain, in South Korea, in Switzerland and in the USA.

Its strategy advisors and associated expert network collaborate with automotive manufacturers, automotive suppliers, engineering services providers, outfitters, and investors to find answers to the automotive industry’s key challenges.

The main focus is on innovation strategies and growth strategies, support for mergers & acquisitions, organizational development and transformation, and profit improvement measures across the entire value chain.

In addition, together with our clients, experts at Berylls Digital Ventures develop solutions for digitizing and transforming the business models of OEMs, suppliers, and engineering services providers.

Longstanding experience, well-founded knowledge, innovative solutions, as well as an entrepreneurial mindset distinguish Berylls’s consulting teams. Through partnerships with experts, Berylls can draw on in-depth technology expertise, a comprehensive understanding of the market, and powerful networks in order to develop workable solutions.
Munich, January 2019

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