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AUTOMOTIVE COMPETENCE CENTER CLIENT MAGAZINE

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TECHNOLOGY
SAFETY FEATURES
"ADAS" will boost the automotive business

INNOVATION
SMART MOBILITY
Cars become part of our connected world

STRATEGY
NEW RELATIONSHIPS
Suppliers and OEMs profit from collaboration

COVER STORY
SUPPLIER OUTLOOK 2013+
How to win in a weak market

Editorial

Ralf Kalmbach
Partner and Member of the Executive Committee
Roland Berger Strategy Consultants

Dear Reader,

I hope you have had a good start in the first quarter of this year! I am happy to present exclusive and inspiring stories in this first 2013 issue of "Automotive Insights".

In the cover story, our experts examine the supplier industry's upcoming challenges and opportunities. After two years of outstanding revenue growth and profit margins, this sector faced tougher times in 2012 and the foreseeable future remains complex: uncertain demand volumes and growing capital needs might become the next big issues. We also interviewed Jean-Marc Gales, CEO of CLEPA (European Association of Automotive Suppliers), about his personal outlook for the industry.

Our experts from Italy look at the future of traffic and transport and analyze the different facets of "infomobility", while our French colleagues discuss the reinvention of OEM/supplier relationships and highlight the benefits of collaborative models. We also have some interesting food for thought on advanced driver assistance systems. Finally, we take a close look at the German market for automotive services and the growth of specialized online platforms.

By the way: Don't forget to download the relevant iPad eMag from our Roland Berger Kiosk. It includes a lot of interactive extra content and video interviews.

I hope you enjoy our latest issue! If you would like to share your views on any topics or trends or if you have any questions, please get in touch with me or my colleagues. I look forward to your feedback. But first of all: I wish you insightful reading!

Kind regards,

Ralf Kalmbach

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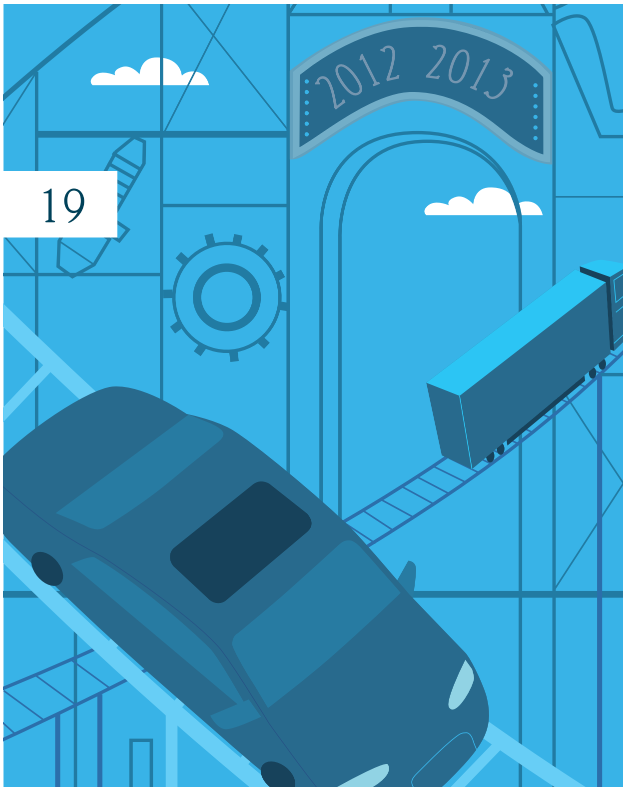

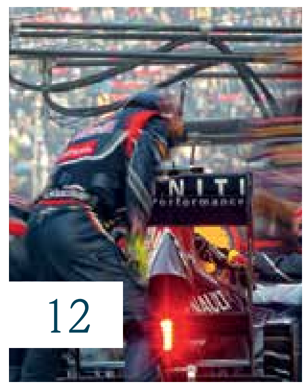

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INTELLIGENT MOBILITY

A long way to go: smart mobility will be the future, but is still in its infancy

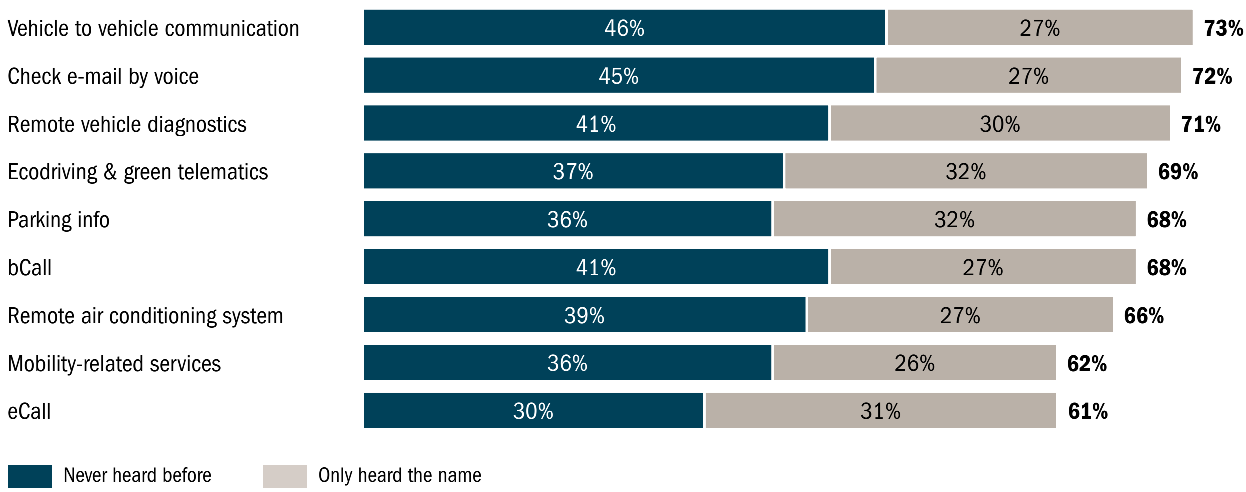
THE HOLY GRAIL OF SMART MOBILITY

Our future vehicles will be integrated into a digital environment of information services: The technology is available and everyone stands to benefit from it. So why is it yet to take off?

Every mobility expert knows the new buzzword: Infomobility. The word appears in the plans of virtually all of the world's vehicle manufacturers, suppliers, and public transportation companies. It is also used by most municipalities, seaports, logistics companies, and several IT firms, to mention only a few.

Infomobility – recently renamed "smart mobility" to reflect new solutions such as smart cities and smart energy – represents all the services that aim to improve the flow of traffic and physical mobility by means of connectivity, communication and location positioning. Infomobility comprises means of transport, transport infrastructure, and any communication system that transmits useful and relevant information to users.

INFOMOBILITY SURVEY: DO YOU KNOW THE FOLLOWING TECHNOLOGIES?



Source: Frost & Sullivan

Smartphones, which enable smart mobility solutions, are already widespread across the entire planet. Today, people can easily be located while they are on the move. Why, then, do vehicle drivers still spend long hours in daily traffic jams in cities around the world? Why are emergency and rescue service providers still unable to immediately locate an accident? Why is private and public intermodal transportation still so "disconnected" and inefficient?

More than 60% of Europeans have never heard of any smart mobility technology

While the answers may seem obvious, they depend on who is asking the questions. Infomobility services are at different stages of maturity in world markets, and so a Japanese driver would likely have a different perspective than someone in Europe or the United States. And yet regardless of location, no one in the world has experienced the full potential of smart mobility yet. In fact, 60-70% of Europeans have never heard of any specific services, or even of smart mobility itself.

In our view, infomobility – too often addressed as mainly or even purely a technology issue – is hindered by the fragmented value chain. In short, there is no aggregated view of its benefits and costs.

Take the vehicle manufacturers, for instance. All major OEMs provide infomobility services in some form, including emergency or breakdown hotlines, connected navigation, satellite alarm and remote maintenance services.

However, too often they still neglect to consider the elements needed to complement these services. For instance, some carmakers sell connected navigation devices without reliable real-time traffic information on the location of traffic jams. This could be compared to selling cars without even considering whether or not there are roads to drive them on.

Similarly, most municipalities and public transport companies have neglected to look at the big picture. For instance, some have put up expensive electronic boards that indicate waiting times for their urban buses without providing information on connections with other means of transport. Many have also failed to encourage intermodal transportation by neglecting to build parking lots that would enable a seamless transfer from private to public transport.

A seemingly simple problem, that gains complexity when examined more closely, is at the core of all these issues: there is no aggregated view of smart mobility. What is more, the main actors do not coordinate their activities with one another. While the technical challenges to smart mobility have largely been solved, business and organizational challenges still need to be addressed. Indeed, all of the main stakeholders must

Today's mobility is anything but smart: in some European cities, inhabitants on average spend more than 100 hours per year in traffic jams cooperate to solve the common problem of traffic and everything it entails. In so doing, they could seize a shared opportunity and reap the benefits of an improved transport situation.

How different stakeholders will benefit from the spread of infomobility

If there were real-time traffic information, OEMs could significantly increase sales for navigation devices and infomobility services. Municipalities would save the costs of traffic management and gain political credit. Public transport companies, in turn, would save money and increase revenues because more people would use public transport. Telematics service providers would benefit as much as shovel manufacturers did during the gold rush, and insurance companies would completely change their car insurance business models. By gaining a better ability to track behavior, they could price their products more accurately and increase their profits.

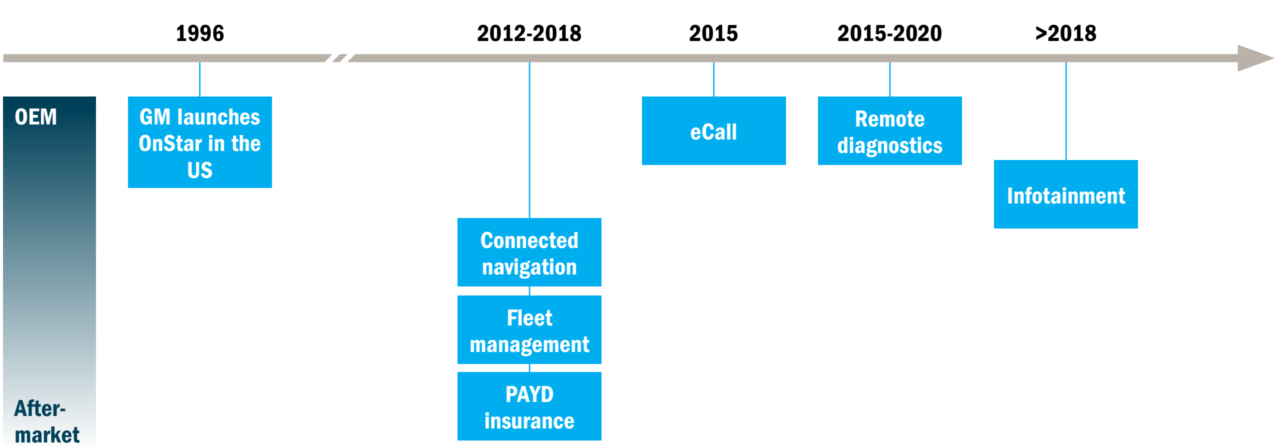
The list of benefits is endless, as smart mobility could become as widespread as the Internet. Despite the potential benefits for many stakeholders, it is still in its infancy. While it seems as though smart mobility is about to experience a breakthrough in terms of development and widespread adoption, its growth continues to be stunted. To overcome this, two things need to be done: First, companies with a large stake in the new technologies should initiate a coordinated approach to market development. Second, local authorities or central governments can promote the adoption of smart mobility solutions by implementing the right policies. Unlike the Internet economy, which was built from the bottom up by start-ups that have since become corporate giants, there is no smart infrastructure from which smart mobility can grow. Today, most cars do not carry smart devices except for those that drivers and passengers carry on board with them.

In spite of the current challenges, developing smart mobility is a worthwhile endeavor, as doing so would secure major returns both in monetary and social terms.

Some countries have recognized these chances and are beginning to take a coordinated and collaborative approach. There are several examples that clearly illustrate this development, including the following:

- The US DOT Vehicle Infrastructure Integration project was launched in 2005. A joint initiative of the country's department of transportation and automobile manufacturers (GM, Ford, Toyota, etc.), the project aims to prove the feasibility and benefits of smart mobility.

THE TIMELINE OF INFOMOBILITY: SEVERAL TELEMATICS SERVICES FOR AUTOMOBILES ARE EXPECTED TO STILL TAKE OFF WITHIN THIS DECADE



Source: Press research; Roland Berger

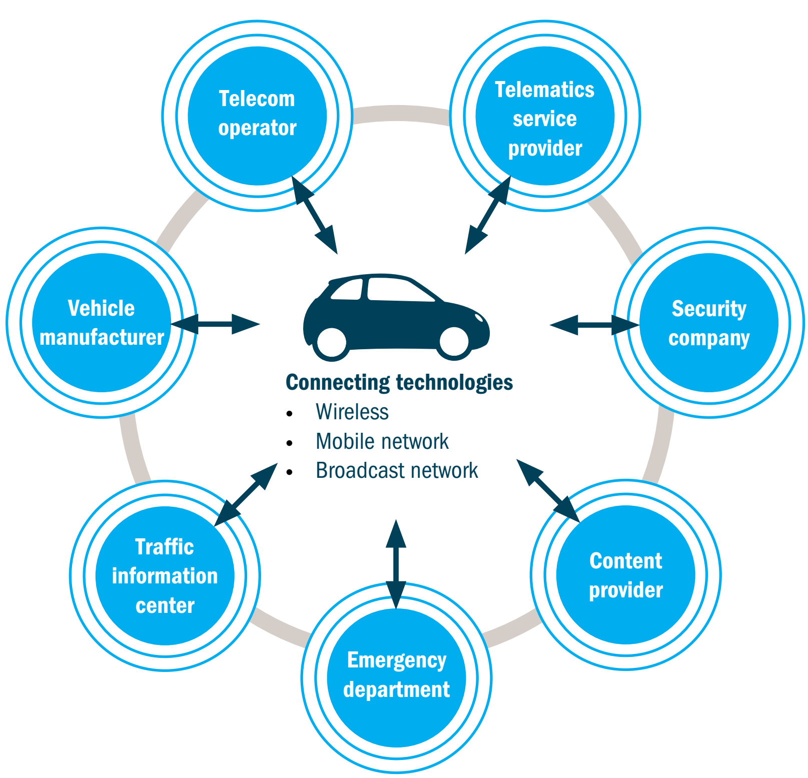
- In Italy the UIRNet has been founded. The network serves as an infomobility service platform for logistics operators, including seaports, inter-modal freight villages and freight forwarders. It is the result of a law introduced by Italy's Ministry of Infrastructure and Transport, and counts several major participants: Telecom Italia, IT system integrator Finmeccanica's Selex Elsag, the satellite manufacturer Telespazio, and the national highway operator Autostrade per l'Italia.
- In the Netherlands a nationwide pay-per-use road pricing program (launched by the Dutch Ministry of Transportation) aims to replace fixed vehicle taxes with a fee based on the annual distance driven. The fee is calculated based on variables including time, place, and environmental characteristics.
- In Brazil the planned Contran 245 resolution will require all new vehicles to be fitted with an antitheft device. The aim is to reduce the high number of carjackings and to lower vehicle insurance rates.
- The EU and Russia are also planning to launch similar initiatives, albeit with different purposes. The "eCall" and "ERA-GLONASS" initiatives will serve as emergency call systems that will make it possible to determine the exact location of crash sites, thus enabling emergency services to respond more quickly in the event of accidents.

As these examples show, different state and corporate actors can cooperate with the aim of developing infomobility services that will benefit both communities and stakeholders.

It needs a strong initiator to make the vision of smart mobility become reality

Such joint initiatives have the potential to create a new business that can pay off in terms of shareholder value, employment and quality of life. For this to happen, however, someone needs to get the ball rolling.

NEW PLAYERS, NEW COOPERATIONS, NEW SERVICES: THE WIDESPREAD GROWTH OF CAR TELEMATICS WILL ENABLE A WIDE RANGE OF SMART MOBILITY SOLUTIONS AND CHANGE THE VEHICLE INDUSTRY



Telematics services

SECURITY
- eCall, bCall
- Stolen vehicle tracking

CONTROL
- Remote vehicle control
- Remote vehicle information (remote diagnostics, CRM, etc.)

COMMUNICATION
- Connected navigation
- Internet

PAYMENT
- PAYD (Pay-as-you-drive) insurance, usage-based insurance
- Electronic toll collection

Source: Roland Berger

The automotive industry is suffering due to the sluggish economy in many parts of the world: smart mobility services could help to overcome the crisis

Any party large enough and with a high enough stake in the success of infomobility can initiate the process of bringing all the relevant parties together and begin working on a joint program to launch smart mobility initiatives. Initiators could include individual vehicle manufacturers or a joint venture between several carmakers.

Even the Association of the European Vehicle Manufacturers (ACEA) itself can play the role of the initiator in order to aggregate key players that can work together on an institutional program to launch smart mobility "big time".

Once smart mobility services become more widespread, political support and client's willingness to pay will increase

Without doubt, the growing economic uncertainty in the last few years has exacerbated the need for car manufacturers to rethink their strategies, products and services. It is time to seize new opportunities, and OEMs are in the best position to drive smart mobility forward. Indeed, they have a great deal to gain from doing so:

- Europe's sluggish car market can be given a boost only if customers are offered new incentives beyond the conventional need to replace old cars or meet an emotional need for novelty. Technological advancements that improve mobility could be such an incentive. Electric or hybrid vehicles come to mind here, as does smart mobility.
- The global population is increasingly concentrated in urban areas, in the developed as well as in the emerging countries. And this trend is still accelerating. As a result, the demand for smart mobility will increase around the globe, not only in the mature economies.
- In light of this, there are a number of things that vehicle manufacturers can do to move forward and secure their future success. First, they can revise their infomobility business plans to consider the social return of smart mobility if it is implemented on a large scale.
- Doing so would immediately lead to the second step: getting the ball rolling on smart mobility, preferably through joint ventures with other vehicle manufacturers.

Since there are already successful joint ventures to share the development and manufacturing costs of engines, powertrains, and transmissions, why not initiate partnerships for a concept that will contribute to driving the global automotive industry's future success?

Internal infomobility business plans exist, but they do not get the attention they deserve

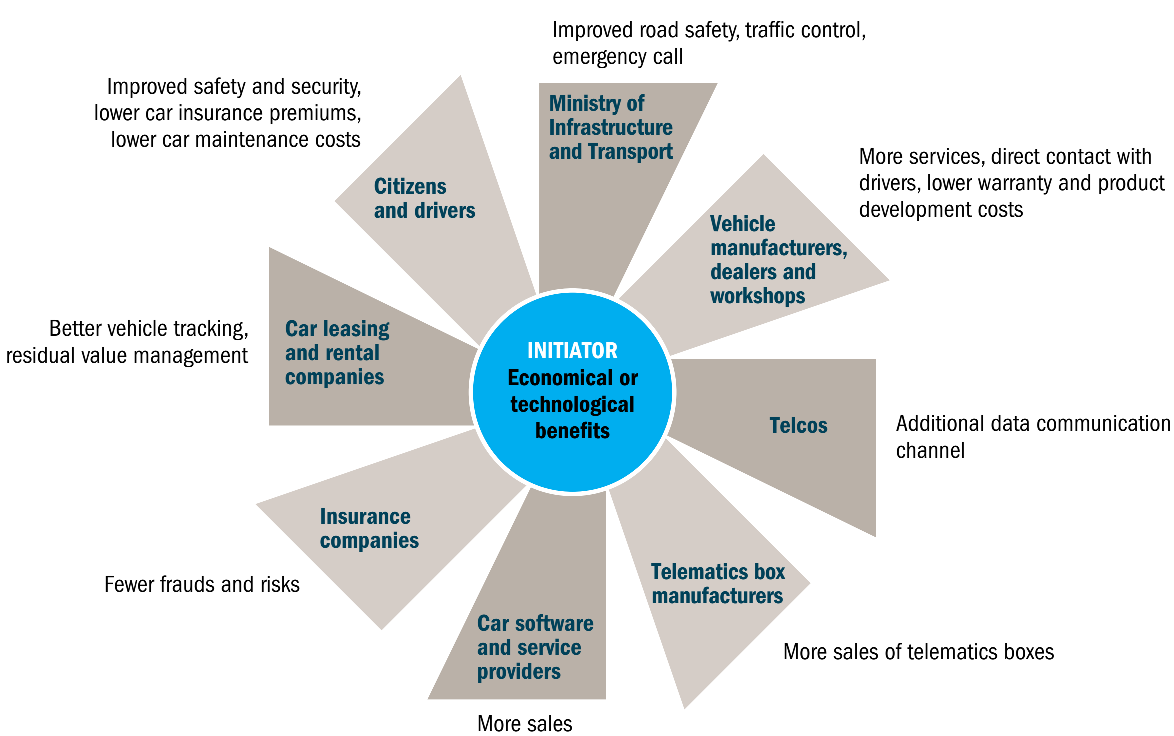
Once such partnerships begin to flourish and the smart mobility value chain becomes less fragmented, development costs can be shared by several parties. And as efforts to develop smart mobility concepts become more concerted, political support is likely to grow. Once services become more widespread and awareness of infomobility grows, customers' willingness to pay will hopefully increase. A number of vehicle manufacturers have already developed internal business plans for infomobility services, but these plans have not been given the attention they deserve.

There are several reasons for this: first, many of these business plans have simply not delivered the expected return. Second, "ancillary" downstream services such as infomobility are rarely considered a top priority, which means they do not generally attract top management attention.

And yet if infomobility were put on CEO agendas, carmakers could learn to see their industry through a different lens. This would allow them to take on a new role as providers of smart mobility solutions and services, providers that interact with other stakeholders.

Combined with the need to produce vehicles that are better suited to urban traffic (in terms of emissions, fuel/energy consumption and vehicle size), adopting this new business model would help manufacturers become natural partners of city and transport authorities in the area of smart mobility solutions.

THE WINDMILL OF SMART MOBILITY: TO MAKE IT SPIN, AN AGGREGATION OF STAKEHOLDERS (*SEE THE MILL SAILS*) INITIATED BY A LEADING PLAYER *(CENTER)* IS NEEDED. THEY ALL WILL EXTRACT DIFFERENT BENEFITS (*OUTER CIRCLE*)



Source: Roland Berger

Not only for private cars: public transport and intermodal traffic would benefit from smart mobility solutions, too

Indeed, carmakers could become trusted experts in helping make urban traffic more sustainable as the number of cars on city streets continues to grow. By building their smart mobility competencies, vehicle manufacturers could cooperate more closely with politicians, who are struggling to find solutions to urban gridlock.

It's anything but the Holy Grail: the technology is available. Get the ball rolling!

Although smart mobility still sounds like the legend of the Holy Grail, which everyone knows about but no one can grasp, there is now plenty of scope to take action and make it happen. The technology is available and in demand. All that is needed is for someone to take a bold step and get the ball rolling.

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SUPPLIER/OEM RELATIONSHIPS

1 Enhance customer perception

2 Contribute technology leadership

SEVEN DIMENSIONS OF COLLABORATION

After years of competitive pressure, OEMs are discovering the benefits of collaborative models with their suppliers – to the advantage of both sides

3

Assist OEMs in their efforts to shorten the development cycle

4

Drive industrial investments and reduce costs

5

Assume responsibility for parts of vehicle diversity management

6

Apply joint tier 2/tier 3 purchasing strategies

7

Support OEMs in their international expansion

Seven dimensions of collaboration

Suppliers and manufacturers can leverage their relationship throughout the entire vehicle lifecycle, from innovation to after-sales. We have identified seven value-adding dimensions for suppliers to reinvent their collaboration with OEMs.

Now more than ever, the automotive industry is facing tough challenges all over the world: the capacity crisis in Europe is still enduring, different emerging markets are gaining a rising importance, and politics and governments all over the world are working on tougher regulations on carbon emissions and further environmental protection measures.

Apart from that several groundbreaking technological improvements are going to change the industry deeply. They have the potential to shift the balances of power, which have been tared for many years: Just think about the beginnings of smart mobility, connected vehicles and powertrain electrification. Last but not least, the automotive market is faced with an explosion of segments and models.

It's no surprise that manufacturers will not succeed in this changing environment without the help of their suppliers. But after years of intense competitive pressure, unbundling and asking for systematic price reductions and productivity gains, the rules of collaboration will change. That's a disruptive and challenging cultural effort for both of them.

There is an urgent need to reinvent the traditional relationship between manufacturer and supplier. This process can work in various ways and depends on the respective players: It can include completely new approaches, such as shared cost structures, involving suppliers in pre-development phases, co-innovation, shared target-cost design approaches, on-site development teams, volumes visibility and commitment or even long-term agreements. Some good illustrations of these new approaches already exist:

- Ford's "Aligned Business Framework" (ABF): Launched in September 2005, the network consists of a diverse group of automotive suppliers that play an important role in Ford's global sourcing plans. They help the Ford Motor Company to improve the quality and to reduce the costs of development and production. The "Aligned Business Framework" aims to promote mutual profitability and technology innovation.
- The "Excellence de la Relation Fournisseur" of the French PSA Group is a comparable network, founded to strengthen the relationship between the OEM and its most important suppliers elected as strategic.

This deep cultural shift will revolutionize ways of working together, as these collaborative approaches require much more transparency and confidence on both sides.

1
Enhance customer perception

The idea: Customer perception of the vehicle is a complex alchemy that manufacturers have been trying to understand for years. The scope of perception is wide: Just think about style, interior atmosphere, road behavior, safety, robustness, comfort, and the sound of the engine.

Finding the right balance seems to be more of an art than a science. Historically, this has been an area almost exclusively reserved for OEMs. But today, suppliers can play a role by contributing very specific expertise. OEMs rely on this market knowledge in making their final decisions.

The example: Human Machine Interfaces (HMI), which form the heart of the connection between vehicle and driver, are the results of efforts by very new suppliers, even those outside the traditional automotive industry. Another example would be the sound of future cars: exhaust noise, a key component in overall engine perception, can be smooth, sporty, quiet or loud. Exhaust suppliers have built up unique expertise in providing a consistent sound signature to OEMs across their entire range of models.

The change of relationships is a clear opportunity for suppliers to reposition their strategies

2

Contribute technology leadership

The idea: Several pionnering technology topics are revolutionizing the global automotive industry: cloud connectivity, new car-sharing models, demotorization and electric drivetrains, active safety (see our story on ADAS on page 34) and autonomous functions, to name just a few. Most technical modules of the vehicles, from powertrain to interior console, will be heavily impacted. OEMs cannot tackle this challenge on their own.

Suppliers will collaborate more and more on innovation strategy and pitch their technology to the manufacturers. Access to that technology will be a future competitive advantage.

The example: Turbo technology (the "rolling heart") has been a cornerstone of engine downsizing. It was enabled by strong collaboration between OEMs and suppliers on integrating new charging technologies. But the true core of this technology has been mastered entirely by suppliers developing leading-edge turbochargers (such as variable geometry and dual stage solutions) based on their advanced expertise of "rolling heart" technologies.

3

Assist OEMs in their efforts to shorten the development cycle

The idea: The lifecycles of vehicles are becoming shorter, while the number of models is booming (due mainly to brand multiplication, new segments and local geographical specifics).

These trends put the manufacturers' engineering departments under pressure to deliver new vehicles on time and reduce development costs at the same time. Integrating suppliers into new development schemes with OEMs, such as co-engineering in early phases, is essential to parallelize and accelerate the development cycle. It also provides standardization opportunities and reduces development costs.

The example: Major modules such as seats or interior panels, which help shape the overall vehicle architecture, are usually co-designed early on with few selected suppliers. More and more suppliers are developing standard modules to accelerate these development phases.

4

Drive industrial investments and reduce costs

The idea: Some vehicle components demand a high level of capital expenditure due to production processes that require a lot of equipment. Some OEMs do not have sufficient volume to fully utilize the capacity of the expensive facilities. But suppliers can concentrate their footprint, standardize production lines and spread costs across several customers to achieve volume effects and reduce their industrial costs.

The example: Bumper production requires heavy presses and paint shops. These facilities are concentrated by a few suppliers in "technology production centers", which generate value by utilizing available capacity and offering logistical proximity to OEM customers.

Another appropriate example are high-volume components such as fuel tanks. Industrial capacity and logistics optimization are becoming even more critical here, since most supplier plants are dedicated almost entirely to one or two manufacturer terminal assembly plants.

5

Assume responsibility for parts of vehicle diversity management

The idea: It has always been a challenge for manufacturers to manage vehicle diversity while keeping industrial inventory down and avoiding component supply breakdown. Due to increasing constraints on plant space and the inventory reduction targets of the past few years, OEMs need more suppliers to assume responsibility for part of diversity management.

The example: The recent development of just-in-time plants for sub-assembly systems (such as seats, bumpers, and chassis corners) is a clear transfer of diversity management from the vehicle manufacturers to the suppliers.

6

Apply joint tier 2/tier 3 purchasing strategies

The idea: Purchasing costs account for a large share of the entire cost structure of OEMs and their tier-one suppliers. Both can leverage synergies by rethinking their tier 2/tier 3 purchasing systems and developing new joint approaches.

The example: For stamping parts, suppliers are not always big enough to negotiate steel contracts as well as OEMs can. Schemes such as resale or "quasi resale" increase a manufacturer's negotiating leverage while keeping suppliers operationally in charge. By contrast, seatbelt makers have a strong negotiating position regarding connectors and captors. They can provide OEMs with a clear advantage by sharing the benefits of their efficient negotiations with tier 2/tier 3 partners.

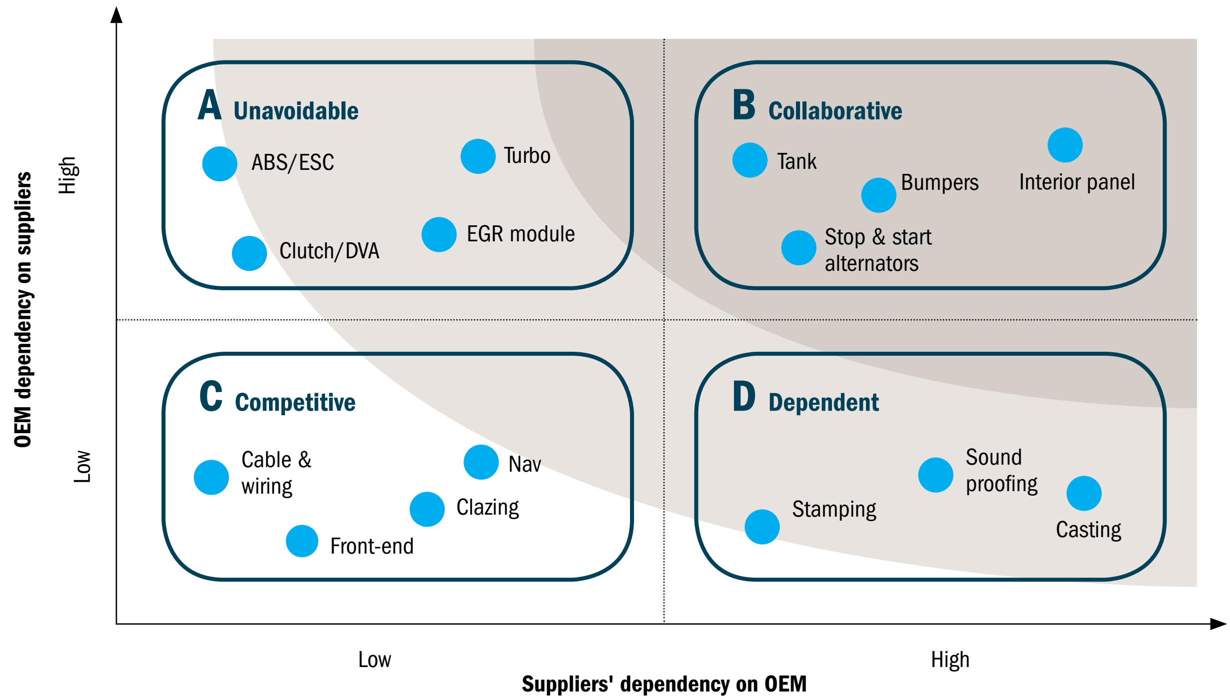
7

Support OEMs in their international expansion

The idea: OEM internationalization is on the way. Worldwide vehicle platforms, global engineering and long-distance logistics sourcing are becoming necessities. Suppliers must keep pace with this development. They will do so through a "glocal" approach: be global to align products, technologies, process and organization on a worldwide scale. Simultaneously act local by using proximity capabilities (industrial footprint, engineering centers, people) to define the specifics of local markets and be more responsive.

The example: Since the turn of the millennium, BRIC countries have become a gold mine for OEMs. All of the major suppliers have progressively implemented their own local capabilities to serve manufacturers, partnering with OEMs as much as possible. Today, only a few suppliers can accompany OEMs in introducing a global platform and are able to serve simultaneous launches at multiple locations.

FROM UNAVOIDABILITY TO DEPENDENCY: RELATIONSHIP BUSINESS MODELS BETWEEN OEMs AND SUPPLIERS



Source: Roland Berger

Four types of relationship: How suppliers and OEMs can collaborate successfully

We can identify four types of relationships between suppliers and OEMs distinguished by the level of interdependency: unavoidable, collaborative, competitive and dependent. The type of relationship, in turn, influences how to leverage the value creation dimension. Suppliers have to adapt their collaboration model to each specific situation.

The unavoidable relationship
Main characteristics: The unavoidable relationship favors the supplier. It is often found for very technical parts that are provided by only a few suppliers. OEMs cannot substitute these suppliers without risking technical performance or even vehicle safety. Critical powertrain parts, E/E components and specific style parts fall into this category.

Implications for suppliers:
- Enforced corporate governance
- Relations governed by a strict strategic framework contract
- Supplier's innovation and technical skills better integrated into the OEM's development process
- Shift to more collaborative models in the long term, to avoid drastic steps by OEMs such as developing alternative sourcing or even insourcing the activity

Examples of components: ABS, turbo.

The collaborative relationship
Main characteristics: In this model, the level of dependence between suppliers and OEMs is very high but balanced. It consists of structural win-win or lose-lose relationships depending on the ability of both parties to collaborate. Most capex-intensive parts are included in this model. Suppliers look for volume to amortize their industrial investment, and OEMs cannot select new suppliers without paying a high investment "toll" to the new entrant.

Implications for suppliers:
- Enforced corporate governance and partnership approach
- Joint innovation process
- Upstream selection processes outside traditional RFQ schemes
- Optimized joint manufacturing and R&D costs
- Trust and transparency in collaboration with the OEMs to adapt processes accordingly (key account management, for instance)

Examples of components: Seats, bumpers, interior panels.

The competitive relationship
Main characteristics: This is the traditional model. It is a balanced relationship in which neither the OEM nor the supplier depends on the other player. This model is typical for mature-tech parts with limited capex requirements. In these segments, OEMs can easily change suppliers. Suppliers therefore spread the RFQ risk across multiple OEMs, countries or even industries.
Implications for suppliers:
- No specific governance between suppliers and OEMs
- Systematic competition, which is maintained by the OEMs

Examples of components: Cables and wiring.

The dependent relationship
Main characteristics: In this model, the OEM has strong bargaining power with its suppliers. The purchasing range is very fragmented, and suppliers face considerable overcapacity. This situation could be seen as favorable for the OEM, but decisions such as market attributions can have serious social impact. Thus, managing this relationship requires a very specific, long-term and responsible approach.

Implications for suppliers:
- Specific governance with the manufacturers to enhance collaboration and transparency
- Steadily reshaping the collaboration in conjunction with the OEMs to move toward a "competitive" relationship

Examples of components: Stamping, casting.

Collaboration is a new opportunity for suppliers to create value

To further reduce costs, share investments, speed up time to market, boost innovation and increase differentiation, OEMs will increasingly expect suppliers to play a new role.
This new role will be based on a more collaborative relationship, new governance models and joint operational approaches. For suppliers, this is a clear opportunity to reposition their strategies, switch to more profitable business models and identify new value-adding dimensions for themselves and for their OEM customers.

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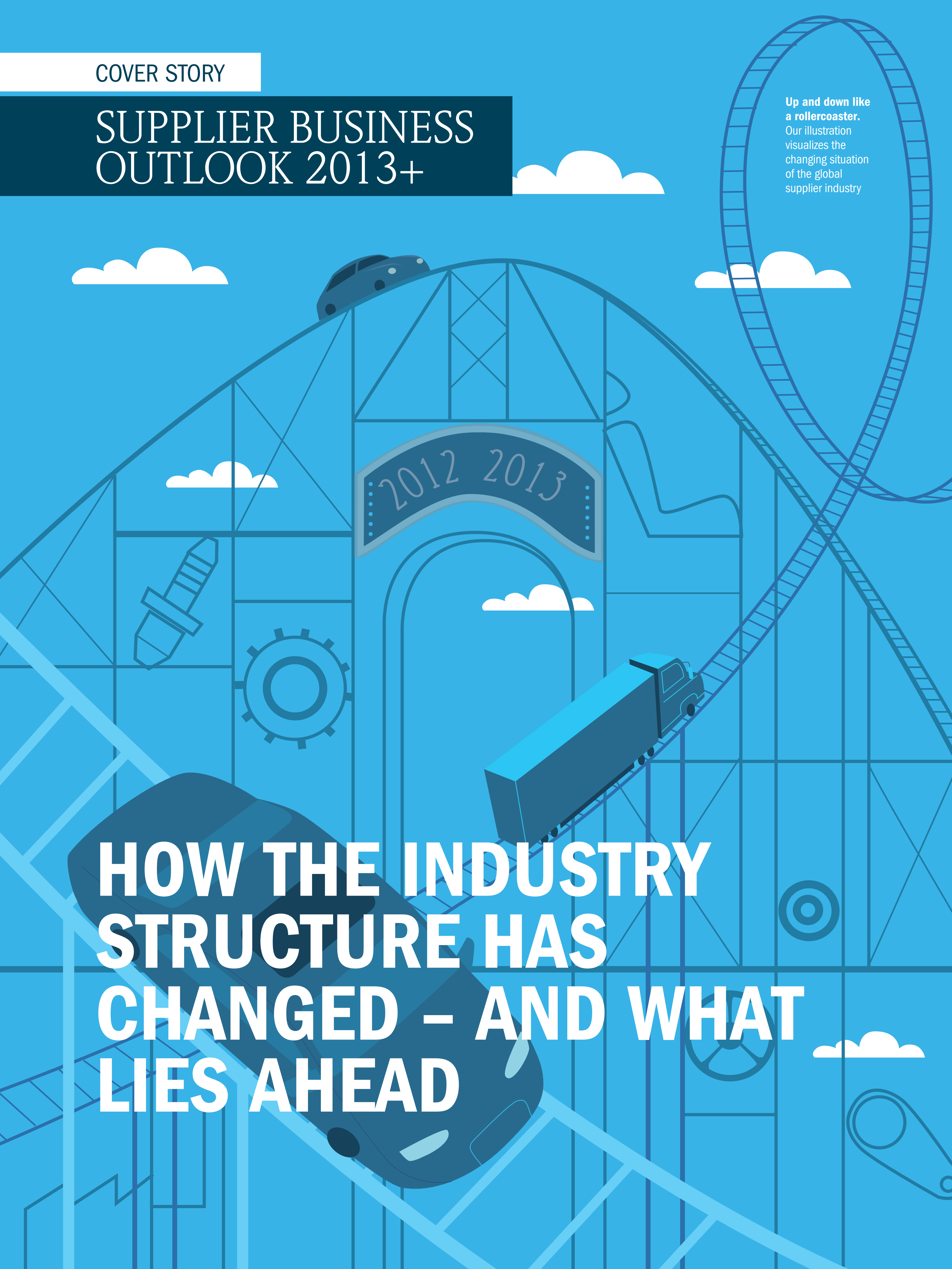
COVER STORY

SUPPLIER BUSINESS OUTLOOK 2013+



Up and down like a rollercoaster. Our illustration visualizes the changing situation of the global supplier industry

HOW THE INDUSTRY STRUCTURE HAS CHANGED – AND WHAT LIES AHEAD

After two years of outstanding revenue growth and profit margins, times have become tougher for automotive suppliers in 2012 again. The foreseeable future remains challenging: global volumes will continue to grow, but the demand especially in Europe is lagging behind available capacity

Going into 2013, many suppliers are looking back on a year in which performance fell short of the records set in 2010 and 2011. This is certainly true in terms of profitability, and in very many cases, also in terms of top-line growth.

But these figures – average at best, and indicating a slowdown in the supplier industry following the impressive recovery and extraordinary revenue growth in the wake of the global economic crisis in 2008/2009 – tell a deeper story. The structure of the industry today is substantially different than it was prior to the crisis – in part precisely because of it, but only in part.

Looking back: substantial changes in the supplier industry's structure

After a period of top-notch revenue growth and profitability levels, the overall performance of the global automotive supplier industry was somewhat less satisfactory in the last year: We expect 2012 revenues to be only slightly above the 2011 level. Revenue growth has thus been far less dynamic than a year before, when the supplier industry continued its extraordinary recovery and surpassed the revenue level it used to have prior to the crisis 2008/2009.

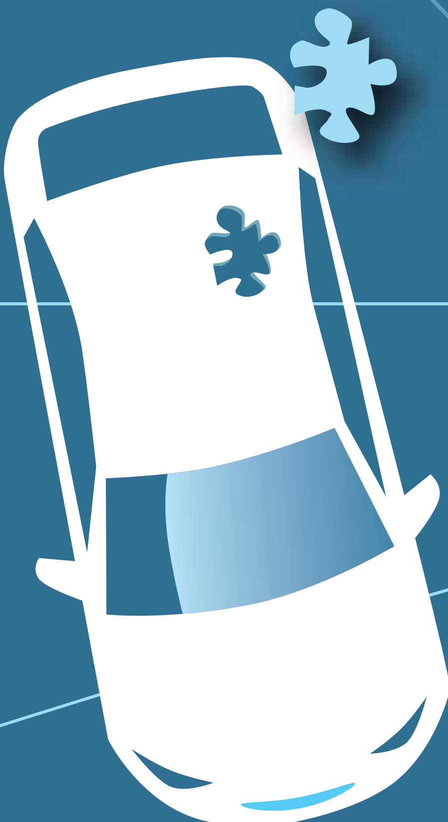
Continuing the upswing from the previous year, 2011 was still very good for the industry, also in terms of profitability. The global average EBIT margin reached 6.6%, just slightly lower than the record-breaking level seen in 2010. We project the average 2012 margin to fall remarkably short of that, at around 5.5 to 6.0%. Two main reasons account for this development: Vehicle sales, and thus production volumes, lost momentum in major growth regions around the globe over the second half of 2012. In Europe, they even declined compared with 2011. Pricing quality started to deteriorate with many suppliers in 2012, as programs won during the crisis in 2009 were often contracted at low price levels and are now entering into production.

The outstanding performance in 2010 and 2011 clearly found its way into suppliers' balance sheets, improving the financial stability of the industry across the board. The 2011 equity ratio of the global industry reached more than 38%, up more than 3 percentage points from the crisis level of 2008/2009. Accordingly, leverage dropped over the same period, from 2.6 to 1.6 at the global level.

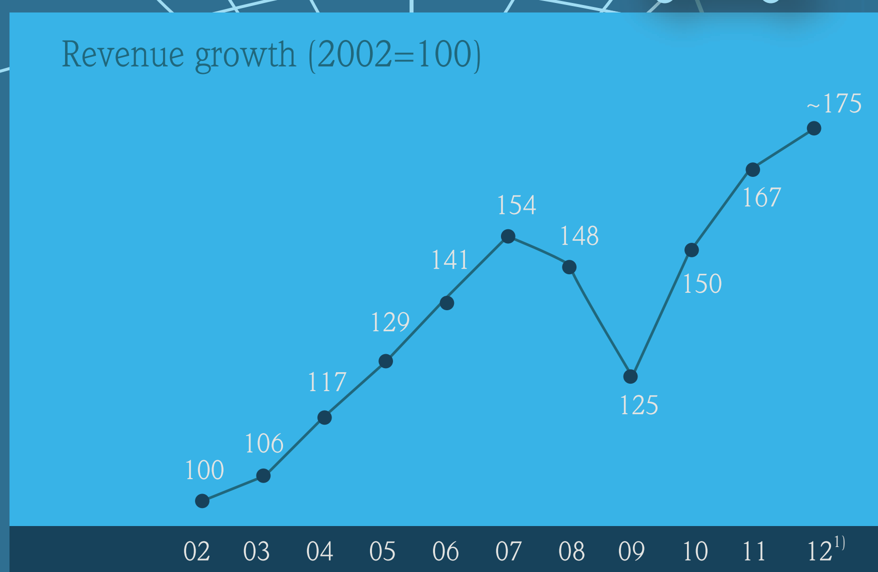
Despite the profitability decline in 2012, the global automotive supplier industry is still doing better, on average, than its customers. At around 5.5%, the revenue-weighted EBIT margin of the top 15 OEMs for the first half of 2012 once again trails behind supplier industry profitability. This is by no means a new phenomenon: in nine out of the last ten years, supplier industry profitability, as measured by company-wide EBIT margins, surpassed that of OEMs.

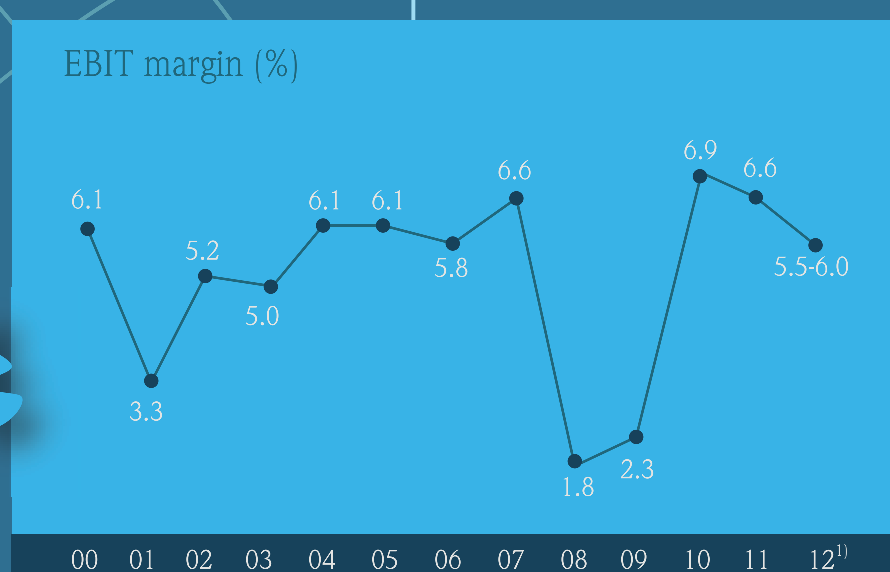
As already observed for several years, growth and profitability are far from being equally distributed across the supplier industry. The gap between top suppliers and low performers in the industry increased even further in 2011/2012. The former managed to continue on their growth path in 2012 – albeit at a reduced pace – more than tripling their business over the past ten years. More importantly, the top performers have clearly surpassed the level they had achieved prior to the 2008/2009 crisis, which is what differentiates them from the low performers.

The average revenue of the latter was still around 15% lower in 2011 than in 2007, and is not expected to change significantly for 2012. A similar picture unfolds



REVENUES ARE GROWING, BUT EBIT MARGINS ARE SHRINKING: THESE KEY INDICATORS, BASED ON FIGURES FROM ABOUT 600 SUPPLIERS FROM ALL OVER THE WORLD, ILLUSTRATE THE SITUATION IN THE INDUSTRY





1) Estimate

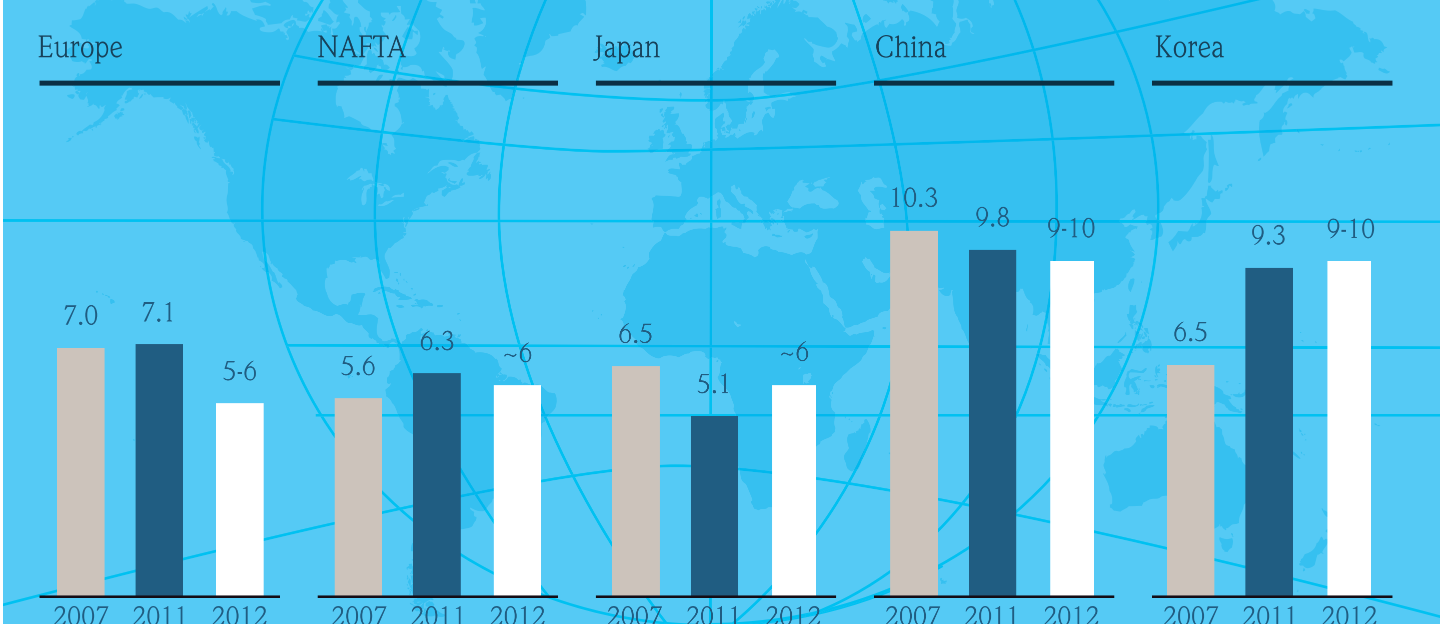
when looking at profitability: the average 2012 EBIT margin of the top performers is expected to be around 1.5 times higher than that of the low performers. This is a substantial increase over 2007.

The development of supplier performance across the global regions has undergone a major shift over the past five years. Suppliers from NAFTA turned out to be the main winners. In 2007, their profitability was by far the lowest of all the major global regions. This picture completely changed in 2012: with an average EBIT margin of around 6%, NAFTA suppliers will likely surpass the global industry average for the first time in ten years and shorten the gap to best-in-class. This title once again goes to Korean and Chinese suppliers, whose average EBIT margin is projected to approach 10% again in 2012. In addition to the strong car production growth in their home markets, NAFTA suppliers are currently also benefitting from radical restructuring during the crisis.

At the other end of the range, suppliers which are headquartered in Europe have lost considerable ground. Down from a record-breaking profitability level of more than 7% in 2010 and 2011, the average EBIT margin is expected to drop to around 5 to 6% in 2012. Unlike their NAFTA competitors, European suppliers have suffered from sluggish local markets, especially in the second half of 2012. Find further figures about the regional differences in the infographics below.

There are also significant differences between different sectors, although the changes in recent years have been less radical than at the regional level. Chassis-focused suppliers continued to be the most profitable, with an average EBIT margin of almost 7.7% in 2011, followed by tire suppliers. For the former, the high degree of product innovation – and thus potential for differentiation – clearly paid off. The latter, meanwhile, continue to benefit from its large share of aftermarket business, which typically yields higher margins. By contrast, suppliers focused on interior and electric/infotainment trail behind, with EBIT margins of around just 4.5%. The process-based business model of most suppliers in those segments continues to limit their ability to create differentiating features that are recognizable to car buyers (and that OEMs will thus pay for).

SUBSTANTIAL DIFFERENCES BETWEEN THE VARIOUS LOCAL MARKETS: SUPPLIER EBIT MARGINS BY REGION, 2007 VS. 2012, ILLUSTRATE THE SHIFTS IN THE INDUSTRY



Having a certain size, however, seems to be gradually losing its function as a qualifier for supplier performance. By the middle of the last decade, suppliers generating revenues in excess of around EUR 5 billion annually stood out from the crowd, achieving better margins than average. Size obviously mattered at that time. This is no longer the case today. In 2011, no single group of suppliers of a particular size was significantly more profitable than the industry average, indicating that such criteria as region, customers and products have surpassed mere size in terms of relevance.

Looking ahead: challenges for 2013 – and beyond

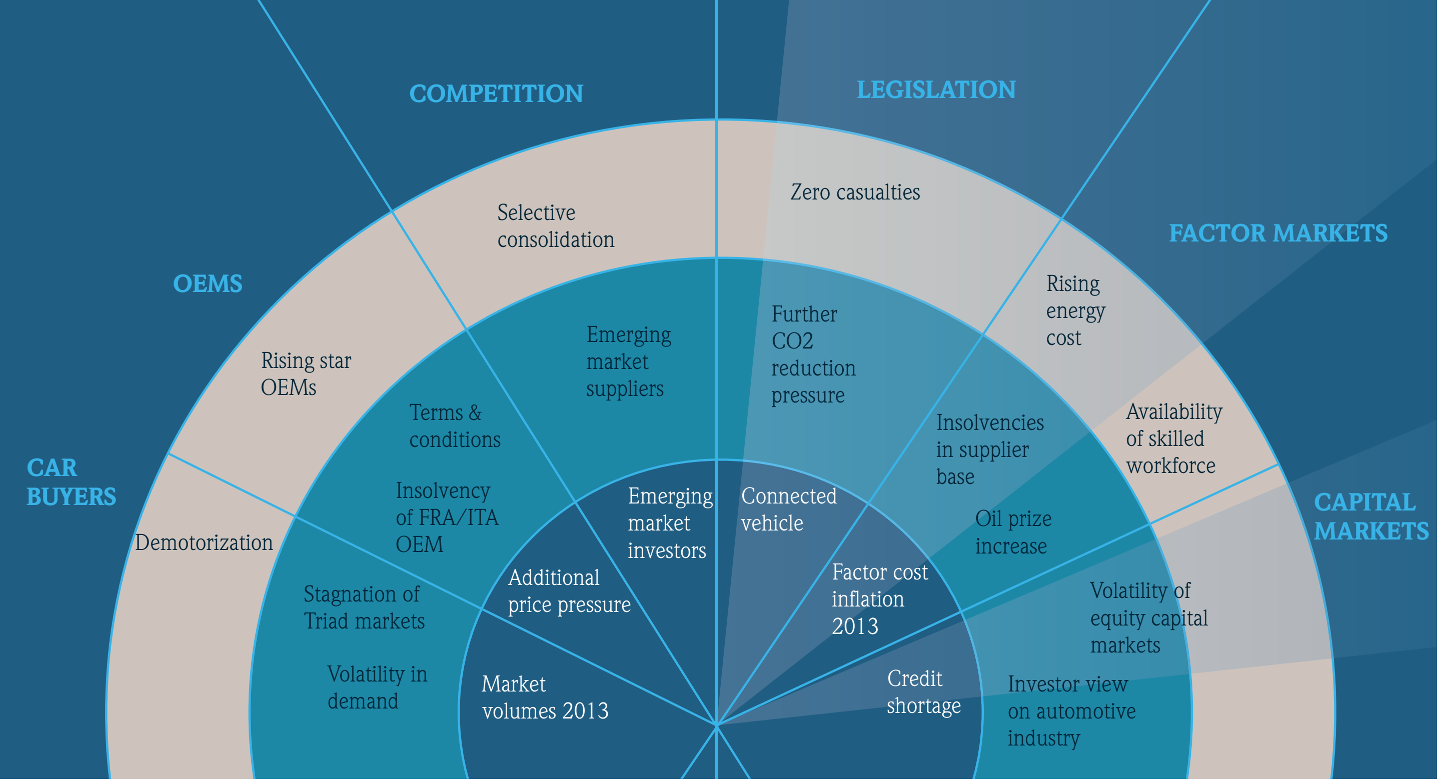
Taking a closer look at supplier CEOs' agendas these days, uncertainty regarding the development of production volumes, particularly in Europe, clearly tops the list. This issue has been the industry's key concern since last summer, and will likely prevail for most of this year, but it is by far not the only one. Most suppliers are currently facing a list of issues that is longer, more diverse and more complex than ever before in the past.

Our Supplier CEO Radar Screen provides a compact and comprehensive overview of the relevant issues for suppliers in six key areas in 2013 and beyond: car buyers, OEMs, competition, legislation, factor markets and capital markets. On top of these six areas, suppliers typically face various other technological and operational challenges. Since the former are segment-specific and the latter (in many cases) company-specific, these aspects are intentionally not covered here.

The short-term challenge: uncertain production volumes

Studying the list of issues on the Supplier CEO Radar Screen in detail, one challenge becomes very clear: there's no avoiding the issue of uncertainty regarding

OUR SUPPLIER CEO RADAR SCREEN SHOWS THE KEY ISSUES THAT WILL DOMINATE THE AGENDA OF THE INDUSTRY IN 2013 (AND BEYOND)



production volumes for 2013. In fact, this issue already began developing in 2012.

The key growth markets of the past 18 months – China, NAFTA, India and Russia – lost some of their momentum during the second half of last year.

In Europe, however, the situation was far more severe right from the start of 2012. Sales volumes were down more than 8% over 2011 all across Europe. While a few markets, such as the UK, remained stable at the 2011 level or, like Germany, lost only moderately in volume, the situation in Southern Europe was little less than disastrous. France was down 13%, Spain 15% and Italy 21% – all measured against a 2011 basis that was far from satisfying. In 2012, the combined sales volume in these three markets was 2.6 million vehicles, or 37% below the 2007 figure.

For 2013, there is some reasonable expectation of stabilization, but little hope for any real improvement. We project global light vehicle sales to total around 82 million units in 2013, up from around 79 million units in 2012. While the first half of 2013 could once again yield rather difficult market conditions in Europe, the situation should improve at least slightly in the second half.

The regional developments from the second half of 2012 are likely to continue in 2013. China is projected to grow by 8 to 10% again, maintaining its role as the primary growth promoter for the global industry. NAFTA is expected to cut its 2012 growth rate of more than 10% roughly in half, still yielding substantial growth opportunities. With Japan and South America being roughly stable at their solid 2012 levels, Europe remains the key region to worry about. We foresee the light vehicle sales volume holding at approximately 14 million units. That's still a reduction of about 4.5 million compared with 2007. In Germany, the modernization of the vehicle fleet during the scrappage scheme of 2009 – which infused the market with approximately 1.4 million additional vehicles – continues to diminish demand for new cars, while the ongoing recession in Southern Europe will likely prevent the markets from taking off again.

The market situation will continue to determine the development of global vehicle production volumes in general and the impact on various OEMs in particular. The European volume OEMs Renault, PSA, Opel and FIAT will continue to suffer the most. In 2012, they were the first to be heavily affected by the slowdown, with sales declining and EBIT margins barely above or even below the break-even point during the first three quarters. Strong dependence of the Southern European markets, a weak presence in NAFTA and China, and relatively inflexible manufacturing capacities led to trouble.

Some other OEMs, in contrast, were able to benefit from the situation, gaining market shares in Europe and growing their output on a global scale. In the volume segment, mainly Volkswagen and Hyundai rank among the winners, while BMW continues to lead the pack in the premium segment. But even those companies are not likely to hit their 2011 profitability levels in 2012.

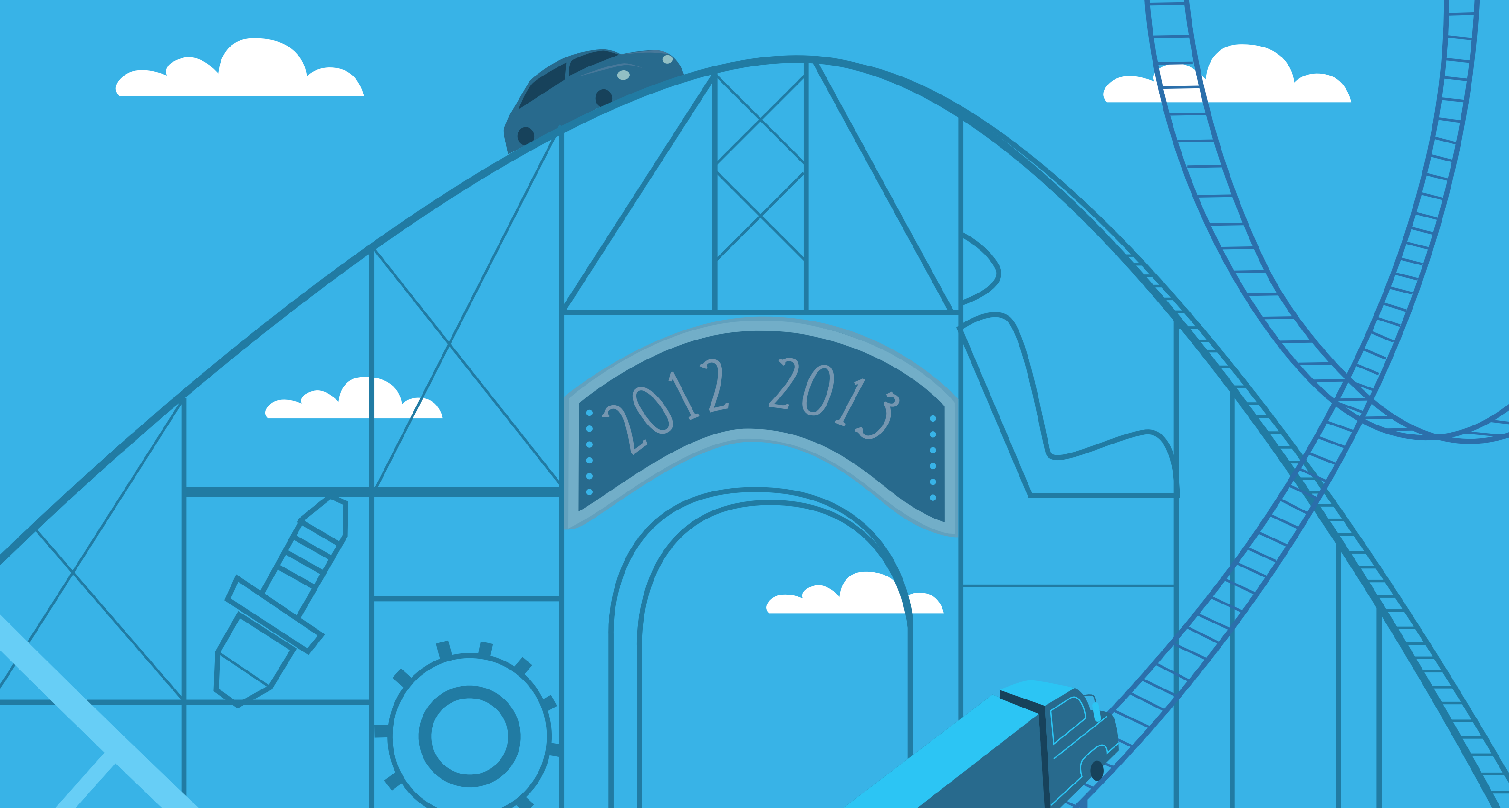
In either case, in addition to modest demand volume, suppliers will face further increases in price pressure. Weak-performing OEMs lack the financial ability to forego any annual price contributions or quick savings from their suppliers, or to support a supplier that itself is experiencing financial difficulties.

For the well-performing OEMs, this is currently not a question of ability, but of necessity. More and more suppliers in Europe are striving to expand their business with Volkswagen and German premium OEMs. At the same time, the portfolio of suppliers offering state-of-the art product technology and quality at highly competitive prices is growing by the day – and evaporating OEMs' willingness to agree to any price concessions.

Despite the twofold burden of stagnating or even declining volumes and rising price pressure, the situation for suppliers in 2013 will remain significantly different from that at the end of 2008. A total collapse of volumes is currently not foreseeable, and some suppliers might even see growing demand on a global scale, provided they focus on the winning OEMs and regions.

As a consequence, few suppliers will face the need for a full-scale restructuring like the programs implemented in 2009. Rather, the challenge for the management teams of many suppliers will be to simultaneously manage very different situations in the various regions:

- Restructuring and rightsizing production capacities and related cost structures in Europe (R&D and overhead costs, for instance), especially more aggressively shifting capacities from Southern and Western Europe to Eastern Europe
- Participating in attractive growth opportunities in the North American market
- Managing the continued growth in China and preparing for a medium- to long-term reduction in margins in a gradually maturing market
- Finding profitable business models for the fast-growing but very complex Indian market
- Selectively addressing the other Asian growth markets



The mid-term challenge: rising capital needs

Another major issue will soon climb (further) up the priorities list of supplier CEOs: the rising need for additional capital. Certain developments will drive capital requirements up over the next three to five years. In the meantime, a prolonged slowdown of the industry could further intensify the situation, as suppliers might lack recently achieved profit levels to fund their capital needs internally.

Despite some commonly held beliefs, the supplier industry has actually fostered its efficient use of capital in recent years. Comparing the key performance indicators for capital in 2011 with those from 2007, a slight improvement can be seen from most angles. The economic crisis of 2008/2009 apparently played a supporting role in that development, when most suppliers were heavily constrained on capital and had to focus on more efficient use of existing funds, as new funds were barely available on the open markets.

As one result, average payment terms for the supplier industry are the most favorable, on average, in a decade. In 2011, the average number of days payable outstanding was 54, compared with 52 in 2007, before the crisis. On the customer side, suppliers managed to improve the number of days sales outstanding from 63 to 61 over the same period. The latter was primarily driven, not by the favorable conditions granted by OEMs during the crisis – which have since largely been repealed – but by more stringent receivables management on the supplier side.

Most suppliers successfully leveraged the 2008/2009 crisis to optimize intra-plant logistics, reducing material and work-in-progress stock. However, the unexpectedly strong revenue growth in 2010 and 2011 drove up inventory needs again significantly, with the average number of inventory days rising from 52 in 2007 to 56 in 2011.

In addition to optimizing their working capital, suppliers have recently been more cautious on capital expenditures, as well. The average capex ratio declined from well above 6% of revenues in the pre-crisis period to below 5% of revenues in 2009/2010; it climbed back up to 5.8% in 2011. Two main reasons have been fostering this development: due to the efficiency gains resulting from the restructuring programs in 2008/2009, many suppliers were able to manage the post-crisis volume growth with a leaner equipment base. In addition, new investments in capital goods were selectively shortened, with the average capex still being well ahead of the depreciation level.

The Globalization, the technological complexity and the purchasing strategies of OEMs will be the three main drivers of the rising capital needs of suppliers.

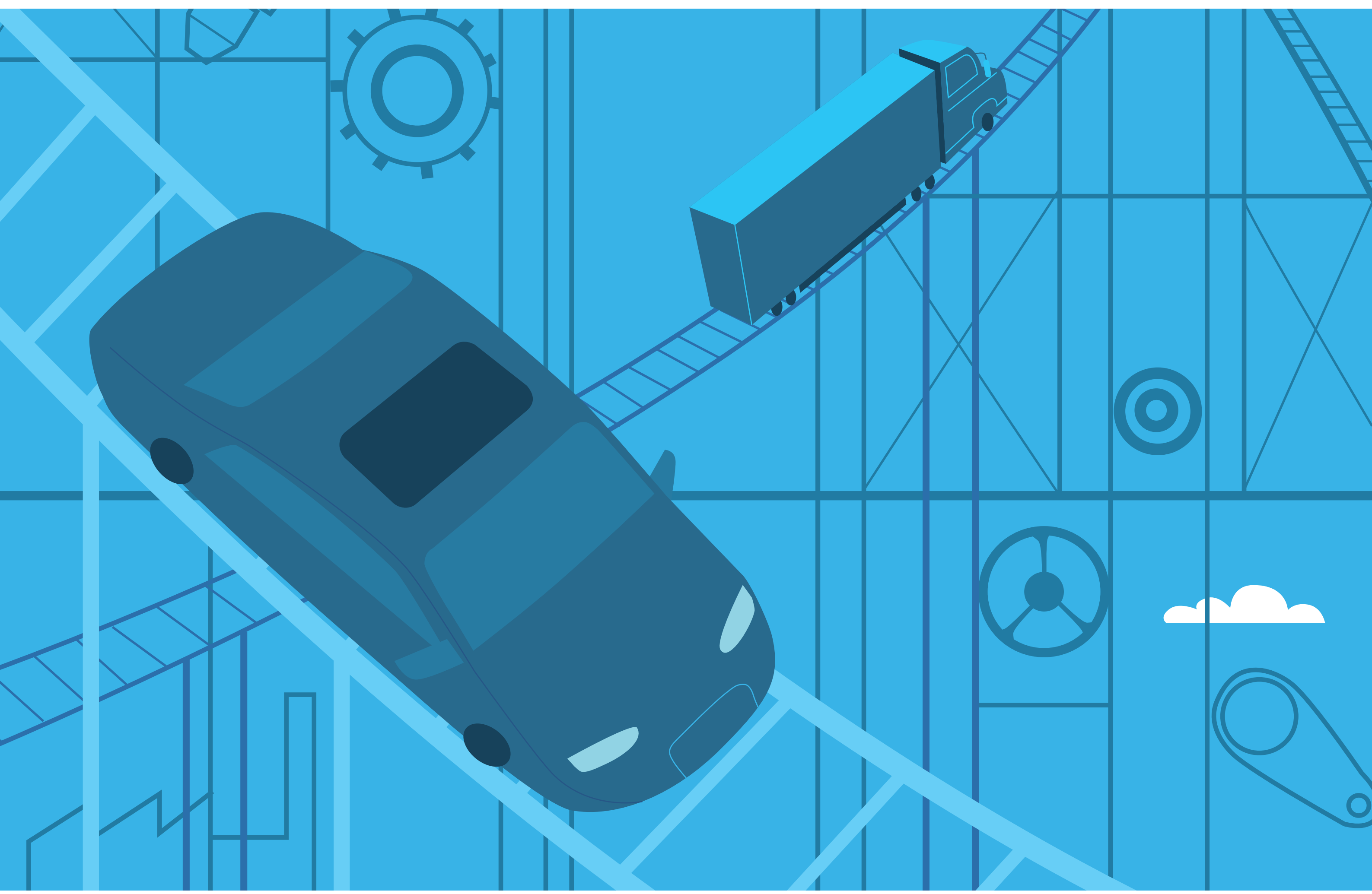
First, the relocation of production volumes to the growth markets – primarily in Asia – is going to continue over the coming years. While IHS projects only slight growth for production volumes in Europe (from 15.7 million units in 2012 to 17.9 million in 2017, excluding CIS countries and Turkey), the respective volumes produced overseas will likely grow considerably over the same period (from 65.6 million units in 2012 to 82.6 million in 2017). China is expected to account for about 55% of this incremental volume. India and Brazil will be the other major growth markets.

At the same time, we expect manufacturers to further enforce their local sourcing requirements. For more and more product segments, suppliers will be considered for successor business on overseas production only if they provide local manufacturing and engineering support capabilities. The benefit from the increased volume in Asia that has recently loaded the manufacturing capacities of European suppliers with volumes for export will soon come to an end.

Suppliers are thus facing ever-increasing capital needs from two angles: They will have to open up new facilities or expand existing ones outside of their home regions. This will be a challenge particularly for small and mid-sized tier 2/3 suppliers that, unlike large tier 1 suppliers, are not yet present in all major global regions.

Aside from the principal investment in new facilities, the expansion of the manufacturing network will also increase financing requirements on an ongoing basis. This is due to inter-plant logistics potentially becoming more complex, and a higher total inventory being required to manage a larger number of facilities in the network (though not necessarily corresponding with a higher total business volume).

Second, the constantly increasing technological complexity of vehicles and vehicle parts shows no signs of slowing down. Tight CO_2 reduction targets, the long-term electrification of the powertrain, new driver



assistance and safety features, intelligent de-contenting in the rapidly growing low-cost segment – all of these developments require new technological solutions.

At the same time, we expect manufacturers to continue outsourcing different R&D activities to their suppliers, narrowing the gap in value creation between product development and product manufacturing. In the first the OEMs still hold a majority stake today, in the latter the suppliers already cover roughly two-thirds of the entire vehicle value creation. Suppliers will therefore have to bear a major portion of the efforts required to develop these new technologies.

Hence, suppliers are facing a further-increasing need for capital to finance more comprehensive basic research activities, as well as a growing number of new, development-intensive programs. In addition, the risk associated with those R&D expenditures is systematically growing, primarily in research. The development path is currently not predetermined in various segments. Hence, a decision to focus on the wrong technology can easily threaten the business model for an entire segment in the medium to long term. The alternative of investing in alternate technologies in parallel might limit that risk, but comes at the expense of even higher capital needs.

Third, OEMs' purchasing strategies will further shift pre-production financing requirements toward suppliers. The up-front financing of R&D efforts, tool development and manufacture, and purchasing of production equipment by suppliers is not, per se, a new development. However, we are currently seeing a clear trend of manufacturers enforcing it, following a slight easing of such requirements during the crisis in 2008/2009.

Again, suppliers are facing ever-increasing capital needs from two angles: by the mere fact that they have to pre-finance product R&D or tool development, and by the fact that they have to do so for a broader range of products. At the same time, the uncertainty regarding future demand volumes is increasing the risk of not being fully compensated for the investment, at least as long as amortizations are being agreed on a piece-price basis.

The recipe for success: six main challenges for the supplier industry

Recent years – and especially the two crisis years 2008/2009 – have proven that the automotive suppliers can successfully adjust their businesses to changing market and industry structure environments. In the near future, successful suppliers will be those that

- put their investments and focus into the right market segments
- manage to differentiate their position vis-à-vis the competition (despite the fact that OEMs will continuously try to work against differentiation potentials in their supply base by further stepping up the commoditization pressure)
- yield a revenue mix that corresponds roughly to global OEM car market shares
- manage to find the optimum balance for the different regional market situations
- achieve real best-in-class performance in all functions, from R&D, purchasing and manufacturing to logistics, etc. – around the globe
- maintain a stable balance sheet structure with equity ratios well above 35%

We are vinced that many players in the supplier business will use the current market environment to further strengthen their position.

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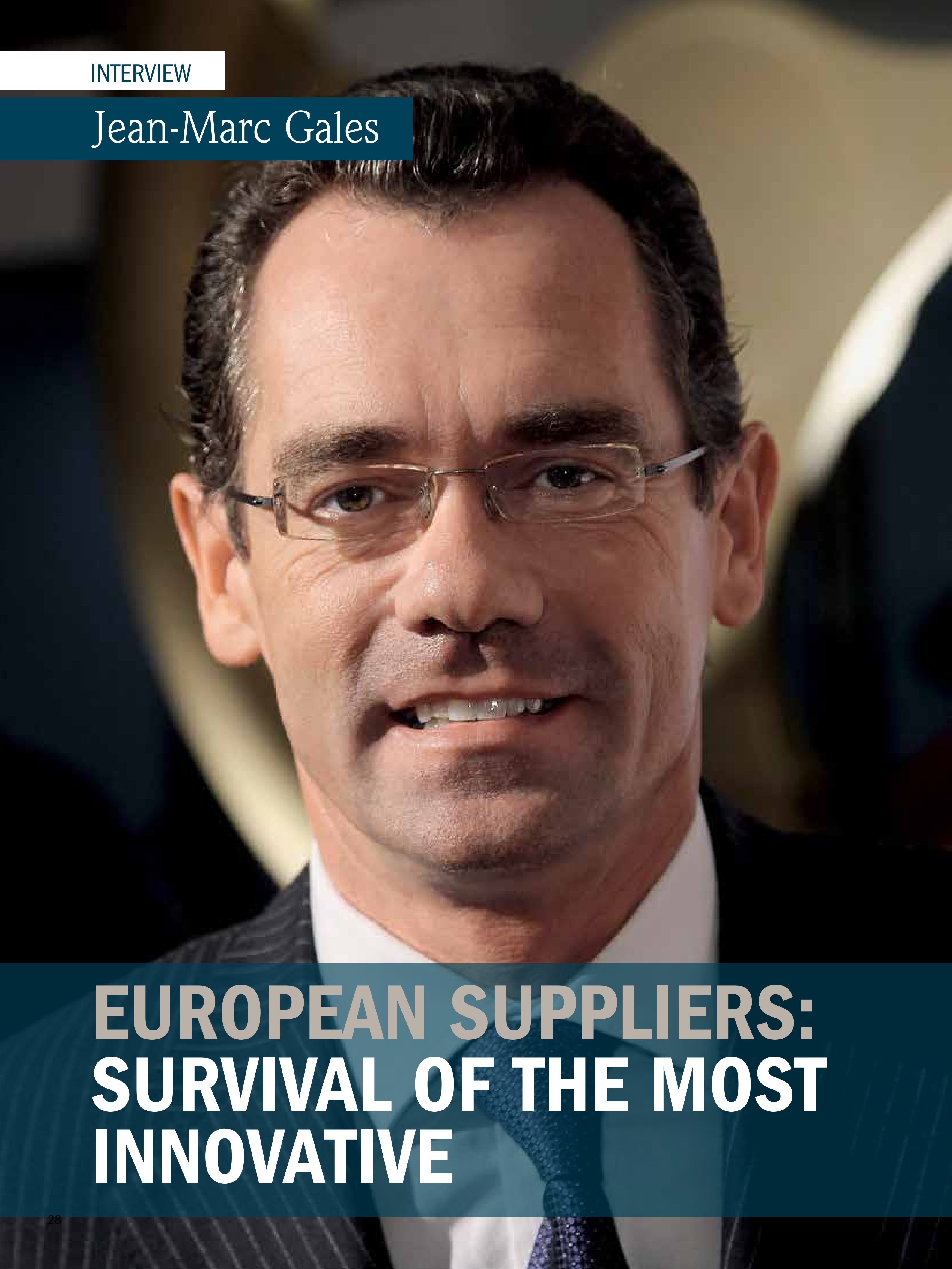
INTERVIEW

Jean-Marc Gales



EUROPEAN SUPPLIERS: SURVIVAL OF THE MOST INNOVATIVE

Jean-Marc Gales, CEO of the European supplier association CLEPA, talks about the challenges facing the industry in 2013 and beyond, about R&D tasks and future vehicles

INSIGHTS Mr. Gales, which way do you see sales and production figures in the European automotive market going in this year 2013?

JEAN-MARC GALES People have been talking a lot about the crisis recently; but there's one bit of good news, which is that the automotive industry is growing, seen in global terms. We don't always see that here in Europe, because of all the problems we're facing. But the market is growing at a global level: we will probably make and sell nearly 80 million cars this year, and cross the 100 million mark in 2018/2019.

And how do the forecasts for Europe look?

I don't expect Europe to grow in 2013. Our sales figures will stay on a par with last year's if we're lucky. Production is bound to fall slightly, because most OEMs ended 2012 with relatively high stock levels.

And if we're unlucky?

All other things being equal, I expect the market to shrink 3% compared with 2012. It could even fall 5% in the first half of the year in certain circumstances, but then I expect it to pick up slightly in the second half.

What does this mean as far as suppliers are concerned?

The main effects in the first instance will be on investment plans, which overlap with OEMs' plans to close plants. This is something the market has never seen before. On the one hand, many suppliers have to invest massively to keep up with the growth in Asia and in China in particular. The same applies somewhat for the US market, which is in very good shape.

But ...?

At the same time, most suppliers can no longer expect their European business to grow. Everyone's been talking things up recently, saying "give it two or three years and things will recover". But now many people believe Europe will never reach 2007 sales figures ever again.

Is that how you see it?

Yes, the facts speak for themselves.

How so?

There are four reasons: First, Europe has 500 cars for every 1,000 people, so we're already pretty mobile. Second, we're getting older, and that's happening here much faster than it is in the US or BRIC nations – and you move around less as you get older. Third, we have very good mass transit networks, at least in conurbations, so more and more people don't need cars any more. Paris has fewer cars proportionately than Poland, for instance.

And fourth?

Cars are getting better and better and lasting longer. Also, cars in Europe are relatively young: if the US market did well in 2012, that was also because their cars are 10 years old on average compared with just 8.3 or 8.4 here.
So, as you can see, things are simply not looking good in the mid-term. If the European market can maintain its current level, we'll be doing well.

What are the things your sector really has to do?

Many suppliers are already moving to reduce capacity in Europe, or will have to do so, and the just-in-time producers in particular. The OEMs are forcing them to even close entire plants in some cases.

You expect suppliers to close plants, too?

Yes, that's coming, this year and next.

What other challenges do you see?

Cash management is one issue. If you want to grow, you need capital – to invest in new plants, but also to close plants efficiently if you need to.
Then I think of internationalization, which should be well up the list of priorities to share in growth outside Europe. This is turning into a challenge for smaller businesses in particular. It's astonishing, but you can even find some companies with annual sales of EUR 2 billion that don't have the specialists they need to really drive internationalization.
The third issue is R&D. Suppliers have been investing heavily in innovation and developing technology since way back when. This is precisely where our members are well out in front, which you can see just in the number of patents coming out of Europe. That's a good foundation for the future.

Regional markets are developing very differently now, unlike in 2008/2009, when the automotive industry worldwide was on its knees. We are finding as consultants that many suppliers are facing new, and no less complex, challenges than they did five years ago. How do you see that?

Absolutely. These shifts on the world map – having to pull back in one place and ramp up massively in another and find the people you need – is a whole new challenge many people aren't ready for. You need to be proactive here, and set up a regional structure if you don't already have one, if you want to deal with this situation much better. This is where people really come in, though: there are massive bottlenecks in HR. I don't know any of CLEPA's suppliers who have enough good engineers and experts to meet this change.

And how can suppliers here in Europe prepare themselves for the future?

By innovating: that's our main guarantee of survival here in Europe. We're expensive, after all, and can survive only if we keep ahead by innovating.

What about the R&D spend this will require?

One thing which will change above all is how expenditure will be shared between

Jean-Marc Gales has been CEO of the European Association of Automotive Suppliers (CLEPA) since April 2012. Before that, Gales worked for several automotive manufacturers such as Mercedes-Benz, VW, General Motors, BMW and PSA.

CLEPA represents about 3,000 companies with five million staff in Europe. It is highly respected as a discussion partner by European institutions and the industry and plays a key lobbying role in the European automotive sector. The association was founded in 1959 and is based in Brussels.

OEMs and suppliers. Today, it's 50:50. By 2020, it will be two thirds suppliers and just one third OEMs.

What areas are people investing in most?
Our members are already investing heavily in drivetrains, and will continue to do so, whether it's about reducing carbon emissions, where converging emission laws worldwide will boost demand heavily in the next 10 to 15 years, or increasing efficiency by reducing friction and using new engine management systems.
Hot topic number two is using electric power more. This can range from relatively simple start-stop systems, which are already available for EUR 100-200, through to full hybrids that can reach 30-40 km on electric power alone. More than one third of all R&D spend goes on investing in these technologies.

What about safety then?
This is another key issue, of course, and is set to become even more important. Not just in the established markets, but also especially in the BRIC nations. And we have a lot to do, in terms of both active and passive safety. The next few years will be mainly about preventing accidents: because we all agree, 1.3 million people dying and more than 50 million being injured on the roads worldwide every year is way too many. What gives me hope is that European suppliers were always out in front on safety anyway, and rising demand will put them in an even better position.

There are many ADAS, or Advanced Driver Assistance Systems, that haven't yet reached the mass market, though.
Things like automatic braking systems are mostly already developed or at the test stage; but we need to work with the automotive industry and the EU to make sure they're fitted too.

Where else do you think European suppliers are strong on innovation?
On environmental technology, safety systems and ADAS, as already mentioned and safety. In the segments, Europe produces the most patents by far. And we have many world leaders here, including even some unknown companies: Autoliv, for example, supplies one third of all airbag systems fitted worldwide.
Europe as a whole is out in front, though: nowhere else puts as much money into R&D as we do. Together, our suppliers invest EUR 18 billion a year. That's more than Japan and the US put together. But then, of course, the world's top suppliers are European, and German particularly, with Bosch and Continental leading as the world's number one and two.

We're talking a lot with our clients about "smart mobility" right now – is this what suppliers are focusing innovation on, too?
You bet! To be quite honest, even I am surprised at how many are working on intelligent traffic management right now, and how intensively the big suppliers in particular are working on this. Here, too, Europeans are out in front. And, if you look at the figures, we really need this: traffic jams cost the economy EUR 80 billion a year – and that's just in Europe. And that figure is likely to rise if anything.

It was European suppliers' ability to innovate which kept their margins up, until the 2008 crisis, at least. Things are changing now, though: the Americans have caught up a lot. The Japanese and Koreans are very strong anyway. What do Europeans have to do to compete successfully in future, too?
Keep on investing in R&D above all, because faith in technical innovation is the reason why buyers worldwide are prepared to pay more for European vehicles. On the other hand, studies show there is a healthy limit on how much to invest: 4-5% of sales seems sustainable. Any more doesn't necessarily pay off.

Finally, Mr. Gales, let's talk about regulation – an essential topic for CLEPA. Is the vehicle industry under- or over-regulated?
Regulation has definitely increased in recent years – just think of eCall or reducing carbon emissions. And so politicians and business need to talk with one another more, which is where organizations like ours come in. Generally, though, regulation is not a bad thing – even if it is often presented that way. It needs to be "smart", though.

Can you explain that, please?
You mustn't strangle the market, but go only as far as you need to get industry to make better cars: by reducing emissions, for example, or developing innovative safety solutions. Calling for "smart" regulation like this – in dialog with the European Commission – is one of our major tasks here at CLEPA. At the same time, too, there are areas – such as eCall or intelligent transport systems – that aren't regulated at all yet. This is where we need to set guidelines, but only insofar as it helps European industry, as I said.

What else is on CLEPA's agenda?
Hot topic number two, after "smart regulation", is ensuring the industry gets the attention it needs. That's down to our colleagues at ACEA, the European Automobile Manufacturers' Association, but we're also working on it too. After all, we represent five million staff in Europe, and indirectly their families as well. And it is precisely to compete globally that European industry needs the subsidies. Then there's education and training...

Education and training?
Well, it may sound banal, but our needs are massive here. Just 130,000 students graduate in STEM subjects – science, technology, engineering and mathematics – in Europe each year. China has a million, India 700,000. We run the risk of losing out in developing technology and innovation, because we lack the experts we need. We're even running out of time here, because good educational policy should always be looking ten years ahead.

What can CLEPA do here?
We need to make being an engineer or scientist attractive again. Brussels needs to help here, though, and I can see European countries and the industry taking responsibility to a major extent here: there are some CLEPA members who are already inspiring young people, and at an age when you can still really inspire them, between 10 and 18. We need to act here. Because its members' ability to innovate is what keeps the industry alive.

6 REASONS
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ADVANCED DRIVER ASSISTANCE SYSTEMS

Huge economic potential: advanced driver assistance systems can help to boost the sluggish vehicle market

SAFETY DOES NOT HAPPEN BY ACCIDENT

The global automotive industry stands to boost its revenues with advanced driver assistance systems, which are the latest smart vehicle technology. It is time to promote their widespread use

When California decided to allow Google and other companies to test self-driving cars on the state's roads in late 2012, some drivers became nervous at the idea of sharing the road with autonomous vehicles. And yet the step reflects the direction in which personal mobility is headed.

Today, millions of drivers around the world are already using intelligent vehicle systems, and there are many products available that aim to ease the driver's workload. These technologies service a variety of purposes, from increasing safety and convenience to making communication easier.

Advanced Driver Assistance Systems (ADAS) are the latest generation of intelligent vehicle technologies. They are designed to prevent accidents, increase driver comfort and integrate communication systems. ADAS can help reduce the number of crashes (and thus road deaths) caused by human error. They do this by connecting drivers with their own vehicles, with other vehicles on the road and with the environment. If a driver is distracted, automotive safety features can issue warnings, for instance when a vehicle begins to drift out of its lane. ADAS can also see beyond the range of headlights to detect people, objects on the road or animals such as deer.

Most premium cars are already equipped with sensors, cameras and artificial intelligence that support drivers. For instance, parking assistance systems can help drivers park their cars more safely and efficiently. Vehicle technologies have moved far beyond using sensors to maintain a safe distance behind other cars. They now also include more advanced brake assistance and collision warning functions, and ADAS cover a broad and growing spectrum of safety features. These range from blind spot monitors, night vision and intelligent windscreens, to rearview cameras that are connected to navigation systems.

Although these trendsetting technologies will help to drastically reduce the number of accidents, uptake has so far been relatively low. There are three reasons for this:

- First, customers have limited knowledge of safety features. This can be attributed in part to the recent flood of new technologies.
- Second, since these features were previously available only in the luxury segment, most car buyers are even unaware of their existence. This is changing, however, with ADAS now increasingly featured in compact cars. But OEMs have not yet found a good way to promote these safety features. Most are optional or bundled in packages.
- Third, dealers are given little incentive to inform customers of these features, and have few opportunities to demonstrate the technologies to potential buyers.

By successfully tackling these three issues, OEMs stand to reap significant benefits. Especially in light of global demographic trends and the growing prevalence of networked communication the market for ADAS is potentially lucrative.

Advanced safety features would allow an aging society to remain mobile for a longer time; they could also address growing environmental concerns. Moreover, safety features could help mitigate the risk of driver distraction, which will inevitably arise as ever more cars are equipped with infotainment systems.

PENETRATION RATES OF ADAS ARE STILL LOW BECAUSE OF THREE REASONS

1 Customers are insufficiently informed

Typcial questions:

- How does the system work and how can I test it?
- What are its benefits?
- Why I should pay for it?

2 Access to ADAS is not as easy as it should be

Typcial questions:

- Why isn't it available for my current car model?
- Why is it only available with another system or package?

3 Dealers need better sales inducements

Typcial questions:

- What's in it for me?
- How can I explain/demonstrate it easily to my customers?
- How can I make ADAS attractive to them?

Source: Roland Berger

A typical situation which illustrates various use cases of ADAS: parking would be much more comfortable for this driver if his car was equipped with a parking assistant, a rear-view camera and pedestrian detection

A lot of customers still worry to cede the driver's seat to a computer

Given the broad range of safety features that have entered the market in the past decade, it is not surprising that customers are confused about ADAS and their benefits. Having just become accustomed to conventional safety systems such as ABS, ASR and ESP, drivers are now confronted with myriad new systems with names and abbreviations unique to each carmaker.

Similar systems with different names make it difficult for consumers to distinguish between them and truly understand how the technologies work. Some consumers even worry that they will have to cede the driver's seat to a computer. Others still are simply concerned about a loss of driving pleasure. Some drivers find that prices lack transparency, and are annoyed at having to buy an entire package when they want only one specific feature. Since most ADAS employ a combination of electronic systems and sensors, few consumers can accurately estimate their price. Ultimately, this is an obstacle to stronger growth and higher profits.

There is a large discrepancy between the way in which ADAS are perceived and their actual contribution to improving safety. Many consumers consider the features as a "nice to have", but do not think they are absolutely necessary. And yet studies have demonstrated the contrary: emergency brake assist systems, for instance, can prevent 28% of all rear-end collisions involving personal injury (*find further figures in the chart on page 37*).

Despite such findings, ADAS are considered less important for safety than conventional safety systems, which are more easily associated with accident prevention. Changing this view will be a challenge, as safety features are notoriously difficult to promote. General resistance to new safety technology further exacerbates the problem, and reflects consumers' very low willingness to pay for ADAS. Clearly, OEMs need to educate their customers.

It does not help that customers have very little – if any – opportunity to experience the features in action, and thus have no way of seeing how safety features work or of feeling how a car equipped with these technologies drives. However, surveys have consistently shown that willingness to pay can be dramatically increased with live demonstrations and information. This applies also to ADAS: a test drive experience almost doubles a consumer's willingness to pay for the feature. This suggests that OEMs should take up such initiatives to exploit largely untapped business potential.

While 93% of customers want the car of the future to offer maximum safety and 75% stress the importance of driver assistance systems, penetration rates remain fairly low. In Europe, 11% of new cars are estimated to be equipped with lane departure warning systems. Only 8% feature adaptive cruise control, and 6% have driver drowsiness or blind spot detection. And just 2% of vehicles are equipped with night vision systems.

But penetration rates can change dramatically when carmakers offer certain features as standard. This partly explains the relatively high penetration rate of driver drowsiness detection compared with other features.

The EU wants to halve the number of road deaths by 2020 – ADAS can help

The right policy can increase uptake rates significantly. As part of the Road Safety Programme 2011-2020, the EU is progressively making the installation of safety systems mandatory. The goal of this program is to halve the number of road deaths by 2020. The regulation is expected to have a broad impact. Lane departure warnings, for example, will be mandatory for all trucks and buses by 2015.

Over the next decade, some ADAS will likely become mandatory in passenger cars in several regions around the world. In Europe, for instance, the European Commission has made a number of statements in this direction, with the possibility of autonomous emergency braking (AEB) technology becoming part of European crash tests from 2014.

Limited access to ADAS is another important reason for low penetration rates. Until now, only consumers who have bought and driven powerful cars in the premium segment have been able to experience advanced intelligent safety features. However, ADAS are now moving beyond the luxury car segment and are entering the mass market for compact vehicles.

As a result, the systems will soon be available to a much larger number of car buyers. For instance, the recently introduced seventh generation VW Golf is available with an optional ADAS package. And advanced emergency brake assist and driver drowsiness detection are already standard in the Mercedes B-Class.

Although these sophisticated driver assistance safety features are becoming more widely available, customers will buy them only if the price is right. OEMs, however, appear to be having difficulty finding the ideal offering strategy. Each company is following its own strategy, with individual products being offered either as standard or optional. Still others are tied to a system or package.

A look at the Audi A6, BMW 5 series and Mercedes Benz E-Class shows just how different the ADAS offering can be. The A6, for instance, comes with a standard pre-crash safety feature. Several optional features are also offered with the model, including adaptive forward lighting, head-up display, lane departure warning and blind spot detection. In contrast, the BMW 5 does not offer any standard ADAS features, but offers optional head-up display and lane departure warning. Most of its ADAS features are tied to other systems. The E-Class, in turn, offers standard pre-crash safety and driver drowsiness detection features, with optional adaptive forward lighting and a number of other features available only as part of a package.

Giving car buyers more freedom to choose their own set of safety features could encourage more customers to buy them. More detailed customer purchasing analysis might also help OEMs determine which features different types of car buyers want or could be persuaded to buy. Clearly, there is a need to rethink the current offerings.

A lot of untapped potential: the after-market will strongly profit from ADAS, too

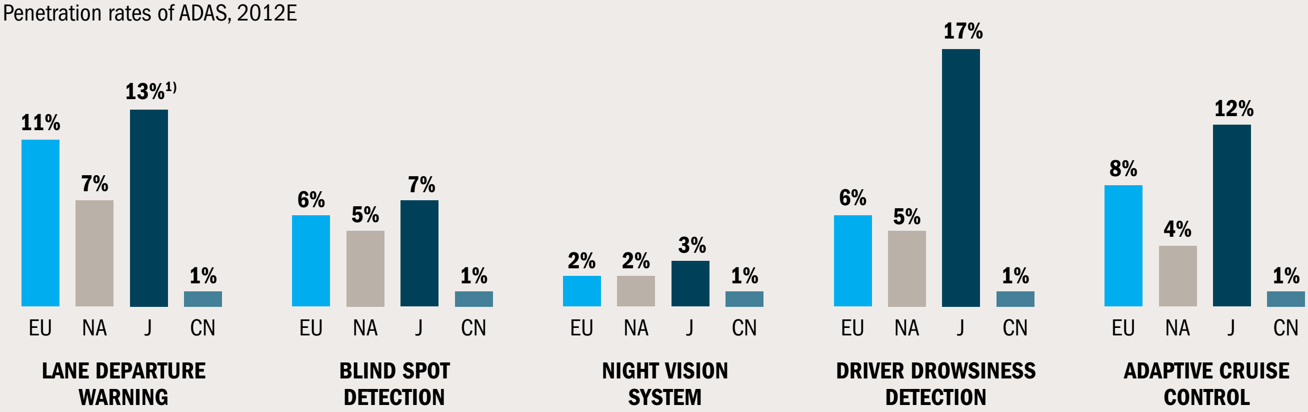
Access to ADAS is also hampered by the limited availability of these features in the market for original equipment spares. When upgrading their vehicles, acoustic parking systems are the only intelligent safety features consumers can currently purchase. There is thus considerable untapped potential in the after-market. In 2011, the accessories after-market in Europe amounted to EUR 8.7 billion. ADAS could play a much larger role here.

ADAS also open up new business opportunities for the independent after-market. Some providers are already offering upgrade kits. While a built-in OEM lane departure warning system costs EUR 550, upgrade kits in the independent after-market are available for as little as EUR 299.

At present, most ADAS are not being promoted in showrooms, and this is part of the reason why car buyers are not embracing cutting-edge safety features. Dealers are given little incentive to inform customers about available safety features. And those who are

DESPITE THE HIGH INTEREST IN SAFETY FEATURES AND THE ATTRACTIVENESS OF ADAS, PENETRATION RATES WORLDWIDE ARE FAIRLY LOW

Penetration rates of ADAS, 2012E

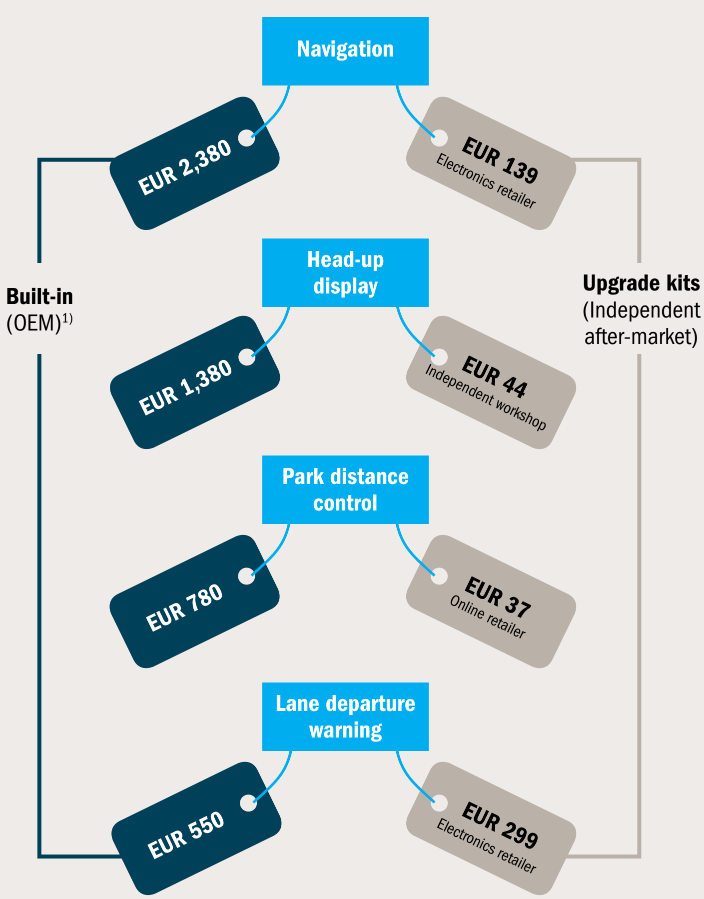


EU = Europe; NA = North America; J = Japan; CN = China

Source: Strategy Analytics; Roland Berger

NEW BUSINESS OPPORTUNITIES FOR SUPPLIERS: MANY ADAS FEATURES ARE ALREADY OFFERED IN THE AFTER-MARKET AT A VERY REASONABLE PRICE

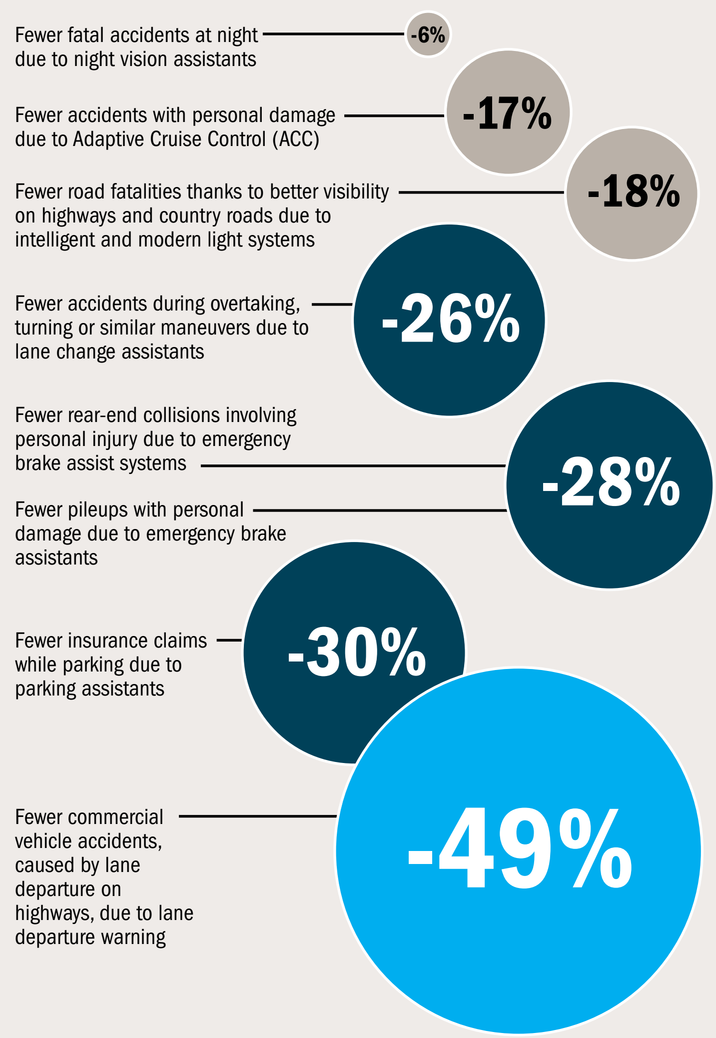
Evolution of built-in vs. upgraded systems



1) Typical OEM prices; built-in systems may come in packages and offer additional functionalities

Source: Roland Berger

LESS ACCIDENTS, LESS DEATHS, LESS CASUALTIES – SEVERAL STUDIES SHOW THE HUGE BENEFITS OF ADAS



Source: eIMPACT, 2008; IIHS, 2008; AZT, 2008; GDV, 2009; TÜV Rheinland, 2007; BASt, 2006 interested in selling ADAS have few opportunities to demonstrate the technology. This is unfortunate, as surveys consistently show a correlation between experiencing a safety feature and buying it. Dealers play a decisive role in bringing ADAS to both interested customers and to those unfamiliar with the technologies. To promote ADAS successfully, dealers need to be well informed about the different functions, costs and benefits of the systems. In short, training and support are essential.

While most car buyers are willing to pay more for increased horsepower, acceleration time or rim size, they are generally not willing to spend more on features that make driving safer and more comfortable. This is why it is essential that dealers are well prepared with feasible cost calculations and sound arguments. For instance, a potential buyer who is skeptical of parking assist and other self-parking features could be convinced with a simple calculation of average damage versus system costs.

OEMs should consider integrating ADAS sales into their dealer margin schemes. Especially when linked to insurance companies, an incentive system could be established that would benefit everyone. In an ideal incentive system, car dealerships that manage to sell a car with optional ADAS features could provide car insurance at a discount.

With the insurance contract, the dealer would give the customer an incentive to spend money on ADAS and get a better insurance deal. In this scenario, everyone would win: the customer, the vehicle manufacturer, the supplier, the dealer and the insurance provider.

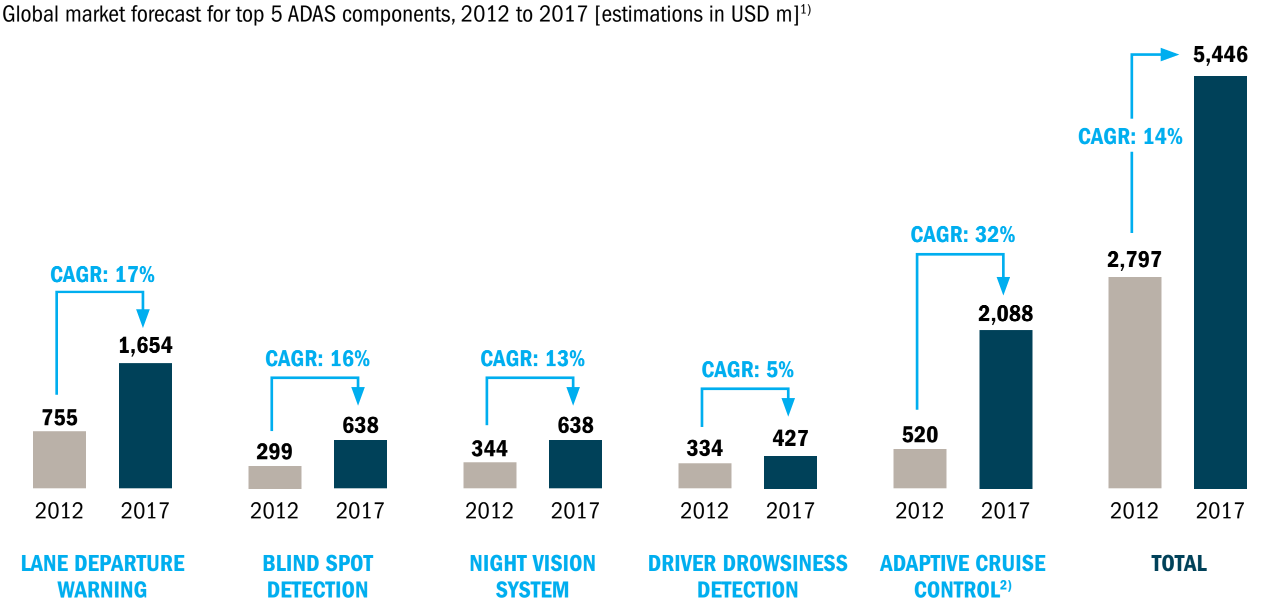
The challenge lies in getting the calculations right. Not only does the carmaker have to calculate a profitable incentive model, it also has to consider the statistical accident reduction potential of new systems. In addition, it must consider that it would be difficult to subsidize lower insurance premiums from the ADAS margin.

Vehicle manufacturers act as integrators and have the most to win

Many stakeholders in the global automotive sector are interested in ADAS becoming standard. To make this goal a reality, a strategy needs to be devised. Customers want improved driving safety, and governments are

SAFETY SYSTEMS CAN HELP TO GENERATE CONSIDERABLE REVENUE STREAMS: THE DEMAND FOR ADAS COMPONENTS IS EXPECTED TO MORE THAN DOUBLE FROM USD 2.3 BN TO OVER 5.4 BN BY 2017

Global market forecast for top 5 ADAS components, 2012 to 2017 [estimations in USD m][1)]



1) Based on OEMs' average purchase prices for entire systems 2) Also basis for collision avoidance systems

Source: Strategy Analytics; Roland Berger considering making safety systems mandatory. Insurers, in turn, see major savings potential. The independent after-market is keen to take advantage of new business opportunities, and fleet managers want to lower costs. Each of these stakeholders would benefit from a higher prevalence of intelligent driver assist systems.

Suppliers and OEMs would benefit as well. Suppliers can expect demand for ADAS components to more than double by 2017, from USD 2.3 billion today to over USD 5.4 billion. These figures are based on OEMs' average purchase prices for entire systems, not on customer purchase prices. If margins are added to this, the financial value for vehicle manufacturers increases significantly. Adaptive cruise control and lane departure warning systems show the most promise. ADAS are attractive for OEMs, as they bring additional revenue with high profit margins.

Manufacturers are rolling out ADAS features on medium to low-end cars for a number of reasons. Doing so allows them to bolster their safety image and helps set their products apart in addition to generating an additional source of revenue. OEMs act as integrators: they bring supplier innovations to the car, have marketing and sales power, control options and packages, and are the link to insurance companies. As a result, they are in the best position to promote ADAS. Carmakers would also benefit most from a business perspective.

Unless OEMs play an active role in promoting them, ADAS are unlikely to gain broad acceptance

To take full advantage of their prime position, vehicle manufacturers should consider following a multifaceted strategy: they must see to it that customers experience ADAS firsthand and are given greater freedom to select the safety features they want. They should also give customers the option of choosing between packages and individual features, and offer both standard and optional technologies.

Car manufacturers also need to follow through on their strategy of bringing ADAS to cars in the lower vehicle segments. To ensure that deals are made in showrooms, they should support and train dealers, providing them with the skills they need to sell advanced safety features and persuade the big share of indecisive customers. Moreover, manufacturers should include insurers in the ADAS sales and marketing process. Safety is no accident, and the success of advanced safety features won't be either.

Several regions like the EU have ambitious goals to reduce the number of accidents strongly – it will need the widespread use of ADAS to achieve them

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ONLINE BUSINESS

Online meets offline: the new online service platforms have to combine high web usability with reliable handcraft in the workshop

WHO WILL BECOME THE "GOOGLE" OF AUTOMOTIVE SERVICES?

The Internet transforms the aftersales business: established brands launch their own offers in the web and have the potential to change customer behavior. We take a closer look at the German market, which plays a leading role

Around the new millennium, numerous start-up companies launched online portals for brokering and selling services. Only some of them made the cut – well-known international examples are Qype and Ciao. These portals are based mostly on user reviews and ratings of companies, products and services. Another good example of an online service broker is the German website for contractor services myhammer.de, which lets users get quotes on their specific service needs.

Following this first wave of online service portals, a second wave of more specific online portals for automotive services started around 2008 (see our timeline below). You can find examples almost all over the world, but since there's an emphasis on the German-speaking market, the following analysis focuses on this area, too.

Since 2008, a variety of platforms have emerged that also let users rate and review the services of authorized workshops and independent garages. Some of them allow users to make appointments directly at the selected workshop via the website. Some portals are not even limited to their online service offerings, but also include a customer-friendly pick-up and return service (Easy Auto Service, for instance), so that customers can have their vehicles serviced without even leaving home. Our matrix *(see chart page 42)* compares services of the biggest German online portals.

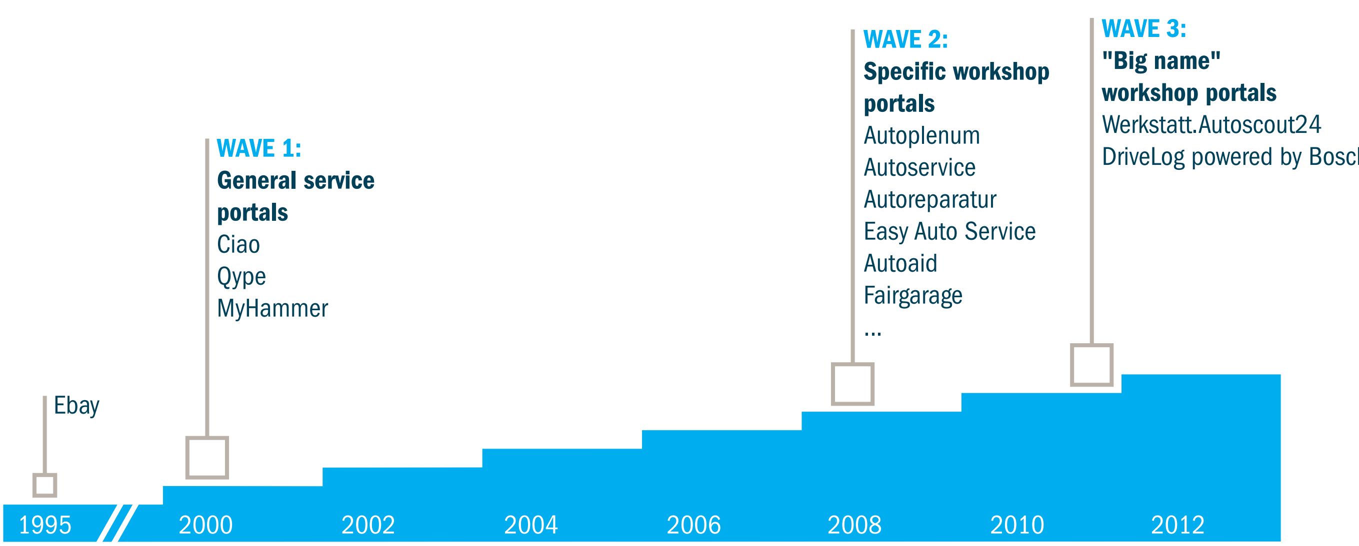
However, the second wave failed to produce a clear success. We see two main reasons for this: one, starting with the back end of the business, many portals did not have enough workshops participating in their offering. The second reason is the lack of traffic on the platforms. Start-ups naturally lack a strong customer base, and building this base from scratch takes considerable time and investment. Most startups did (and still do) not have the financial means.

The Internet is already a powerful distribution channel for aftersales

Starting in 2011, a third wave of online services has appeared on the market, with professional players such as Autoscout24 and Bosch joining the battle. In contrast to the websites established during the second wave, these players are well-known in the automotive market. Unlike start-up companies, they already have established reputations and a strong customer base.

The Internet is already a recognized distribution channel in selected areas of aftersales. In the tires business, for instance, 30% of independent repair shops and 16% of OEM authorized workshops are listed as official tire platform partners. In such cooperative arrangements, customers purchase tires online and have them mounted at a partnering repair shop. While customers benefit from cheaper online prices, participating workshops can secure their customer base.

THE DEVELOPMENT OF AUTOMOTIVE SERVICES ONLINE: THREE BIG WAVES SINCE 1995



Source: Company information; Roland Berger

And they might also gain new customers by taking a smart online marketing approach. Brokering or selling standard automotive services online has not yet had a big impact on the classic aftersales business.

But as competition on the automotive after-market heats up, we take a closer look at the platforms run by Autoscout24 and Bosch and evaluate whether they can reshape the future of automotive service sales.

More than a niche market: some new "old" players try to seize opportunities

Autoscout24 is Europe's biggest online used car sales platform, with 15.6 million users per month alone. It recently launched its subformat werkstatt.autoscout24 ("Werkstatt" is the German word for "workshop"). This new feature appears on the German website along with the well-known used car search.

The platform offers price comparisons of standard services at local workshops, and customers can book appointments directly online. To be listed on the Autoscout24 website, workshops have to become partners – partnerships differ only by subscription length. To quickly gain professional partners, Autoscout24 actively approaches big workshop chains as well as single independent workshops. Euromaster, for example, has enrolled all of its more than 300 outlets on the portal's website. The company hopes to benefit from this cooperation as they are today mainly perceived as a tire specialist while aiming to provide a much broader spectrum of aftersales services.

To also attract OEM dealers and authorized workshops, Autoscout24 does not permit price-aggressive chains such as ATU to participate. In addition, to convey a message of quality to their users, Autoscout24 asks enrolled workshops to respect OEM guidelines for price calculations on services. They also do not use price but location as the main search criterion in the workshop search. In total, they have already integrated about 2,200 workshops all over Germany into the portal.

The key to success for online service portals is to generate user traffic

In addition to smart partnering, Autoscout24 heavily pushed the new format by developing a fully integrated cross-media advertising campaign. TV commercials

SERVICE COMPARISON: OFFERINGS OF THE TEN LEADING GERMAN ONLINE AUTOMOTIVE SERVICE PLATFORMS

Services	Werkstatt. Autoscout24	DriveLog	Autoplenum	Autoservice	Autoreparatur	Easy auto service	Autoaid	Fairgarage	Reparaturpilot	Service Lister
Vehicle test + emissions test, oil service, planned maintenance	■	■		■	■	■	■	■	■	Pure 2B portal of TÜV-Nord
Wear & tear, crash repair		■		■	■	■	■	■	■	
Workshop database/ search	■	■	■	■			■	■		
Price comparison	■							■		
Quote request		■		■	■	■				
Direct appointments	■	■		■			■	■		
Workshop ratings		■	■				■			
Other		Digital service log	Blog			Pick-up service			Pick-up service	

Source: Kfz-Betrieb; Company information; Roland Berger

Which player offers the most solid and reasonably priced services? Due to the rise of online platforms customers can compare the prices and the quality better

combined with print, radio and online ads emphasized the benefit of maximum price transparency for the customers. News "bites" on their own social media channels accompanied the campaign. Finally, they even redesigned their main website: now when opening Autoscout24.de, the six million visitors each month automatically see the workshop search first instead of the usual form for used cars. All this shows that Autoscout24 has understood that the key to success for online service portals is to generate the relevant user traffic and to achieve customer acceptance. Once this has been done, convincing workshops to join an online portal is a much easier task.

Bosch, on the other hand, has used a completely new format, named DriveLog, to enter the online aftersales service market. DriveLog's headquarters are located in the start-up atmosphere of Berlin, and partners with a social media agency. The website aims to become a comprehensive – and perhaps the only – online portal for any car owner. Therefore, in addition to finding, comparing and rating garages, users can also upload and search for current prices at gas stations and keep a history of all their vehicle service activities in an online log book.

However, unlike Autoscout24's workshop portal, there is no way to compare price offers. Naturally, numerous Bosch Car Service workshops are already listed in the database. DriveLog also automatically enters authorized workshops, independent workshops and gas stations into the database and allows free registration. In the future, the platform will offer premium partnerships that better position the workshop within search results.

DriveLog provides a very active social media community, but other advertisement efforts lag far behind those of Autoscout24. So far, the portal seems to be known only by people familiar with the automotive industry, and all but a few workshops' ratings are blank. Granted, the portal is still only a couple of months old, so it still has a chance to close that gap.

We see three important implications for the industry

After observing recent developments in the automotive online aftersales market, we have identified three main implications for the industry.

1. OEM-authorized workshops will not benefit very much from an online platform, as they already have a strong brand and hence quality statement to attract customers.

However, using online channels gives them more direct access to younger customer groups, which are highly Internet-savvy and buy and drive mainly used cars older than four years. But before participating in an online platform, OEM workshops need to ensure that the appeal of the website does not contradict their quality statement.

2. Independent workshops that belong to a franchise system or concept (about 50% of the roughly 20,000 independent workshops in Germany, for instance) ideally already have a strong brand as well and handle their local market professionally. Nevertheless, the advantages of engaging in an online platform are the same as for OEM authorized workshops. In the case of integrated chains, cooperative arrangements such as that between Euromaster and Autoscout24 could yield additional benefits for the chain.

In our view, independent workshops that do not belong to any chain or concept would profit the most from online platforms. Generally, they are able to be very competitive on price. Therefore they could attract many new customers from relevant age segments in their local market (in particular, drivers of used cars older than four years).

3. Intermediaries – for example, insurance companies, leasing companies or mobility service providers – will be very open to online initiatives. They can use online workshop portals as an additional customer interaction and sales channel. Besides, portals can serve as a strategic investment with the goal either to diversify the product portfolio or to leverage the existing customer data base integrating automotive-related services into the offering.

What about the sleeping giant eBay? It has all the tools to threat the competitors

More and more users are becoming accustomed to the social media elements on websites and mobile phones and want to see ratings and reviews on products and services they buy. This means the time is right for online automotive service platforms to have an impact on customer behavior.

Once they get used to looking for workshops and comparing their services on the computer or via apps on their smartphones, customers will be heavily influenced by ratings from other customers.

One question remains: which platform can become the "Google" of automotive services? The next few months will show whether Bosch's DriveLog can profit from the image of quality and the customer base of its parent company. Considering Autoscout24's huge online user base, marketing efforts and planned extension of service offerings, it currently seems to be the only player with the potential to establish itself as the number one in Germany.

Only one "sleeping giant" has the necessary potential to challenge Autoscout24: eBay. Its "Motors" section already offers access to online used car and parts sales. In addition, they own the mobile.de brand, the second large used car platform in Germany. In terms of traffic, existing customer base and marketing means, eBay has all the necessary tools to pose a threat to Autoscout24. However, so far they have not shown any signs of moving in this direction.

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Books & studies

Connected Mobility 2025
[January 2013]

Our latest think: act study analyzes strategies how to overcome the problem of increasing global traffic. The smart connection of traffic data and modes of transportation will become one of the core challenges for the entire vehicle industry.

rolandberger.com/connected_mobility_2025

Rebound of the US supplier industry? [October 2012]

This study examines the current health of US suppliers and how they are doing compared to the rest of the world. Special attention is paid to undervaluation, despite record profits and healthy balance sheets.

rolandberger.com/rebound_US_supplier_industry

Beyond cross-functional collaboration [November 2012]

Our study, conducted jointly with the IESE Business School in Barcelona, discusses questions relating to new technologies, sales strategies and environmental protectionissues. Based on this, it outlines strategies for the European car industry in response to these trends.

rolandberger.com/beyond_collaboration

Connected vehicles: Conquering the value of data [September 2012]

The automotive industry is facing massive change. Broadband, cloud and data networks link cars with the world around them. Connected vehicles are becoming a reality. This forces the industry to rethink traditional business models. We analyze appropriate strategies.

rolandberger.com/connected_vehicle_value_of_data

AUTOMOTIVE Insights 02/2012 [September 2012]

Prompted by the occasion of the International Motor Show for commercial vehicles, the last issue of our "AUTOMOTIVE Insights" publication focused completely on the corresponding vehicle sector. Our experts describe the six upcoming megatrends in the industry. We also take a closer look at the growing Southeast Asian region and at China – the world's largest market for construction equipment.

rolandberger.com/automotive_insights_02_2012

Automotive retail business [September 2012]

The debt crisis in Europe is putting around one in five local automotive dealers under financial pressure. We analyze strategies for diverse players in the market: The dealers themselves have to carry out detailed risk analyses and draw up scenarios for potential cashflow situations, for instance. Manufacturers need to take action to minimize the risks and support their dealers.

rolandberger.com/automotive_retail_business

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rolandberger.com/automotive_insights

FAMOUS CARS

Elektrische Viktoria

Just a replica: the originally recreated "Viktoria" 2011 in Berlin

More than 100 years old, but quite modern: the ancestor of electric mobility

The current Insights issue focuses amongst others on new mobility concepts. Electric mobility is among the most popular and tangible aspects of new mobility. Nevertheless, it is anything but a brand-new invention. The first electric vehicles (EVs) were constructed more than 100 years ago. One of the most famous is the **"Elektrische Viktoria"**, built by Siemens between 1905 and 1909.

Its top speed of 30 kph (19 mph) was quite low, but its maximum range of 80 km was almost comparable to current EVs. The electric motor of the Viktoria operated at a nominal potential of 88 volts and a maximum current of 40 amperes. Its maximum power was 3.5 kW (that's about 4.8 hp).

Some technical details appear to be quite modern, too: the Siemens engineers added regenerative braking, for instance. This enables the system to turn the electric motor into an generator which charges the battery while braking, using the available kinetic energy to extend the cruising range.

The Viktoria was built in different versions (a four-seat convertible, a kind of pickup and a van) by the Berlin based electrical engineering factory Siemens-Schuckertwerke, a Siemens subsidiary. Its top speed of 30 kph met customer needs, since it was mostly used as a taxi for luxury hotels or as a delivery truck in the downtown area of Berlin.

The total number of units built in the beginning of the last century is unknown, but according to Siemens about 50 were made. The price was steep by 1905 standards, at 11,000 to 17,500 Goldmark, depending on the model and battery capacity. At the time, a worker's monthly wages were in the range of 120 to 150 Goldmark.

Unfortunately none of the Viktorias survived the century, but in 2010 Siemens built a full-scale replica, based on sketches and photographic images. Only the battery was modified for environmental reasons, avoiding the original lead technology.

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