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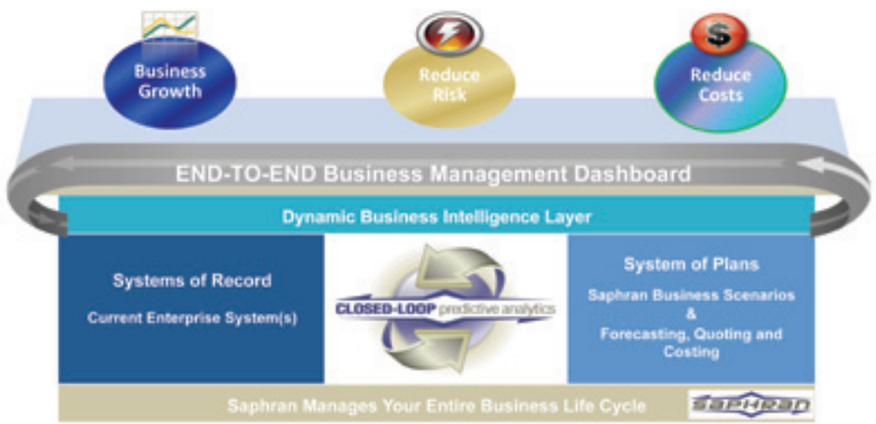

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Why do we bother?

Industry outsiders must often wonder just why such obviously talented high-energy people choose to remain in a sector which seems to be under a constant state of siege.

Editor, Ed Richardson

Truth be told, seldom does one find a relaxed-looking auto executive. In good times, we can't make enough cars, and in bad we can't move them out of the stockyards fast enough. Either way there's stress. And, if one is running a traditional Western company, there's the added strain of pressure building from low-cost producers in the East. Not only do they make cars for less, but their quality is improving exponentially.

But, as the infomercials say, "there's more". Consumers (wouldn't business life be wonderful without the demands of customers) are becoming more demanding, and governments want engines to burn cleaner and use less fuel. Both have tremendous power – consumers in the form of their discretionary spending, and government through legislation.

I could go on, but you get the picture. Perhaps you will now be asking yourself the same questions. But, before you dust off your resume and apply for a job in an ice cream factory, ask yourself what other industry is as rewarding and – frankly – as much fun?

Let's start with the product. For most, a car is an emotional purchase. People are making a personal statement and lifestyle choice when they buy a car. Our challenge in the industry is to reward that choice every time the motorist gets behind the wheel. The technology we are using to achieve that is becoming ever more sophisticated as industry-wide quality standards ensure that every new vehicle on the road is fully functional. In short, they work. Some are faster than others, some use hybrid power systems, and some drive through all four wheels. But, they all get the motorist from A to B.

Buyers are, therefore, looking at design and style in order to make a statement. As we see in Automotive Industries, Tier 1 suppliers have developed paints, glass systems and plastics materials which have given designers unprecedented freedom that is only constrained by the physical forces of drag and minimum ground clearance. So, there's a car and color for you, whether you want to look funky, sexy, macho or standard issue business. And, if all you want is a cheap and reliable people mover, you'll find that too.

The next generation of differentiators are, therefore, not found in the traditional physical appearance of the vehicle, power plant under the hood, or in the suspension and safety systems. Those are all a given. A nice parallel is the personal computer. When they first came onto the market, one spent hours poring over the specs, calculating whether they would be able to run the programs one was using. Now, we choose what looks best, weighs the least, and falls within our budget. Every new computer will have the power to do the job.

That same computing power is now helping OEMs to differentiate their models. Computer chips control the ambient lighting, adjust the seat, set the air conditioning, and manage complex multi-media systems which also connect vehicle and driver to "the cloud".

So, to come back to the original question, we have to ask why anyone with an ounce of creativity and ambition chooses any other industry. No other sector provides equal opportunities to be at the leading edge of such a variety of disciplines – from the art of design to the science of creating new chemical compounds.

Next time you're having a bad day, go out and kick a tire – and marvel at the machine you helped create. AI

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Audi joins **Joule** to **advance biofuels**

By: Bob Brooks

Based on a flurry of press reports, Audi and Joule Unlimited have joined in an effort to commercialize Sunflower-E and Sunflower-D fuel based on Joule's proprietary microorganism secretion technology.

The E (ethanol) and D (diesel) fuels are reported to have basic cost of $1.28 gal (production + total capital, 70/30 debt equity, 15 year depreciation). Key advantages of Joule fuel are complete elimination of the need for any food or non-food crops, comparatively little land use, no use of fresh water and use of waste CO_2 from power and manufacturing plants as raw material.

Taken together, the Joule fuel, which Audi will help to promote, has remarkable economic, environmental and domestic job creation advantages certain to gain widespread favorable recognition as contrasted with the long term pollution, oil spill, dollar outflow and geopolitical negatives of petroleum.

For some time, Joule's experimental production system was based on expensive complex flat panels with internal spaces for circulation of the microorganism solution oriented to the sun for energy. The cost of this aspect of the overall system has since been drastically reduced by Joule with the use instead of plastic tubes about two meters in diameter and up to 50 meters long simply laid out on the ground.

Joule is reportedly now in limited production of fuel, but closing in on expansion to scale (early 2013) based on proven technology. Joule is 100% privately owned, hence, depends on interest and investment from outside firms. It is staffing up with experienced personnel for worldwide marketing of its technology. An interesting aspect of Joule's affiliation with Audi is the degree to which Audi's expression of interest in the basic advantages and nature of the technology will rub off on others with somewhat similar systems. A case in point is the Florida Algenol project that has been using plastic tubes on the ground to house algae-based solutions for some time. Algenol's non-crop, no fresh water, waste CO_2 input characteristics are essentially the same; the one vital difference being algae based vs. Joule's unknown microorganism.

Another is the Algae.Tec system that also does not use biomass and fresh water. Like Joule, it uses waste CO_2 which its producers are required to otherwise sequester at considerable cost. Algae. Tec houses its production system in 40 ft. modules supplied with solar energy via fiber optics from outside solar energy collectors. Also coming into view are suggestions that one of the routes to higher IC engine efficiency is higher compression, in turn requiring the higher octane of ethanol. Interest in this would presumably gain with new sources of non-crop, non-fresh water based ethanol. Such systems, however, based on simultaneous changes in both engines and fuels are difficult to achieve.

For now, Audi has aimed the publicity spotlight on direct support of new, economic, green fuel. This serves to suggest that bio fuels at least for automotive use may have at long last reached critical mass, on the road to wide adoption. Surely, recent publicity characterizing biofuel as $27/gal product will now fade away. AI

Ai Insider Bob Brooks is a member of the Society of Automotive Engineers, and long-time automotive technology journalist specializing in powertrains and fuels.

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market trends

Troubled times for the **European** aftermarket

By: Andrew Jackson

The woes that have befallen the automotive industry since the global economic crisis have courted much press attention over the last four to five years. As recently as the Paris Motor Show, the general mood was not one of optimism. The sentiment has not been helped in recent weeks by increasing numbers of manufacturers announcing production cuts and lowered sales forecasts.

The turmoil in new vehicle sales has ramifications for the aftermarket. Firstly, the drop in new vehicle sales is a symptom of the overarching austerity that has swept Europe. Slower growth of the vehicle parc affects the aftermarket. In addition, motorists themselves are refraining from spending on anything but the most vital maintenance, and are prolonging component life by reducing or adapting vehicle usage. Secondly, the manufacturer dealer networks have been placed under tremendous pressure to fill the revenue void left by falling new vehicle sales. This is not an easy task, and it will require radical steps to truly compete with the independent aftermarket (IAM).

There is a "silver lining" in that, with declining new vehicle sales, comes a general increase in average age of the parc. With older vehicles in operation, more parts should be required to repair and maintain the fleets of aging vehicles, especially those parts which can be termed "captive" (any parts which upon failure have to be replaced otherwise the vehicle is rendered inoperable).

Unfortunately, while this phenomenon helps staunch the exodus of customers from the aftermarket, this isn't a panacea for the whole European aftermarket. Datamonitor's 2012 European Aftermarket Database shows clear signs are emerging across Europe that - before inflation - not only is the volume and value of market in decline for the mature Western Economies, it is also showing worrying trends for items considered "non-captive".

Breaking down figures from the four largest European aftermarkets in our database (Germany, United Kingdom, France and Italy), into seven key product families (service parts, wear & tear, mechanical, tires, crash repair, consumables and accessories), we see a clear indication that motorists' austerity measures are impacting growth of "non-captive" items such as consumables, accessories and, to a lesser extent, crash repair parts. All of these items register significant revenue declines of between -1.2% and -2.4%, whilst captive parts register declines between -0.4% and -0.7%. Items that are "nice to have" are increasingly overlooked in favor of those that ensure vehicles remain functional.

This results in our characterization of the aftermarket for these four countries being valued at circa €120-bn. This value is set to decline at a rate of -0.7% pa between 2012 and 2016 and will be faster for dealer networks (-1.1%) than the independent aftermarket (-0.6%).

In the emerging Central and Eastern European areas growth in vehicle use is ensuring that the likes of GDP and economic activity are even closer linked to the use and maintenance of vehicles than in the more stable mature Western countries. However, this on its own is not enough, as these areas all too easily catch a cold if Western Europe sneezes. In addition, the attitude of Eastern European motorists to repair and maintenance is wildly different to that of their Western cousins. Elements of this can be seen by the worrying increase in black market maintenance products being sold. This saves the motorist money, but both removes economic support for the industry and can bring the vehicle's reliability and safety in to question.

So how can the market respond in order to ensure its survival?

In the most basic forms discounts and sales offers have been proliferating throughout Europe, offering significant discounts on components (such as tires). Many garage networks (including main dealers) are now offering price-match guarantees, and there is also an upswing in radio "infomercials" where a number of the larger service providers are advising motorists to have their vehicles inspected for "safety reasons".

Unfortunately, one does get the feeling that the inexorable slide of the European auto industry, and with it the aftermarket, will not be reversed using marketing gimmicks. Ultimately the consumer is king, and if they perceive the purchase of any item to be profligate they will loathe parting with their cash. We can be sure that the aftermarket will eventually halt its decline and return to growth in both volume and value terms. However at present we cannot realistically expect rebound in 2013 or 2014 if the current economic situation continues to flat line - which results in stabilization and growth returning by 2015 at the earliest for the mature markets.

What is certain is that captive components present the safest waters to be in at present, and any companies operating in the European environment would be well advised to assess and modify their retail portfolio to suit. To coin a well-used political phrase: "never let a good crisis go to waste", and indeed there is evidence to suggest that many are doing just that. AI

Datamonitor Automotive is a specialist in the Automotive Aftermarket. Its' portfolio of databases covers 28 countries in Europe and 7 emerging economies. Datamonitor covers 38 components across seven product families and 11 retail channels, and tracks volume, value, market share and replacement rate data.

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The US Auto Industry in 2013: **Five Forces** to Consider

By: Ray Uzwyshyn.

The US auto industry is one of the most important industries and economic sectors in the United States. It contributes 3-3.5% to the overall US GDP (CAR, April 2010), and is also one of America's largest exporter's (Blunt, 2012). Production numbers for 2011 of 8.5 million vehicles are only outweighed by China, and are currently roughly in line with Japan (OICA, 2011). The industry employs over 1.7 million people directly, and 4.5% of the population indirectly (CAR, April 2010). China overtook the US as the world's top auto producer in 2010, and this status is expected to continue.

Industry Profile

The "big three" US Domestic market leaders remain General Motors, Ford and Chrysler. Foreign competitors include Toyota, Honda, Hyundai and Nissan. As of October 2012, US market share is divided into 15.6% Toyota, 15.3% General Motors, 12.0% Ford, 11.4% Hyundai-Kia, 8.5% Honda. In total, this makes up, 62.8% of the market with a classification of a medium concentration level, and very high revenue volatility (IBIS World, October 2012). Comparing a previous quarter's market share (January-May, 2012), GM led with 17.8% followed by Ford 15.6%, Toyota 14.5%, Chrysler-Fiat, 11.5, Honda, 9.6% and Nissan 8.1% (Zacks, June 2012). The variance shows the degree of competition in the marketplace.

Because of the current state in the global economy, higher oil prices and movement towards green technologies, the automotive industry is in a state of transition. Hybrid vehicles, fuel efficiency and technological innovation are paramount. Larger trends include moves to smaller, more fuel efficient vehicles and moves towards more robust technological frameworks on production and product levels. The global industry is highly capital and labor intensive with the US domestic industry comparatively hampered by significant historical legacy costs (i.e. UAW). Labor, materials and advertising are all significant costs (Industry Handbook, 2012). Sales occur through individual and high-volume fleet sales, with the seasonal highs in April-June, and lows November-January (Industry Handbook, 2012). Revenue comes from sales, as well as financing, leases and extended warranties.

Industry Market Structure

The oligopolistic market is dominated by a small number of manufacturers (10 or less) whose actions directly influence one another's profits. The U.S. Bureau of Census of 2007 reports that four firms dominate 68% of the motor vehicle market and eight firms dominate 86% of the market (Samuelson). The fates of oligopoly automotive industry firms are mutually interdependent (Samuelson), and this may be best retrospectively witnessed in the recent financial crisis of 2009 where all of the big three US automotive manufacturers went into dire economic straits, and faced similar challenges. While there is class uniformity in that all of the major auto manufacturers produce vehicles for transport; there is also wide variation in product features, prices and range of options. Because of this, advertising and marketing to various market segments also becomes extremely important.

The industry is partially protected by the high barriers of entry in introducing new products, which include production facilities, vehicle development costs, advertising and marketing infrastructure (Samuelson).

Future Outlook

In a 2012 US Automotive survey, "A Return to Optimism" management consultants Booz & Company point out that the future outlook for the US auto industry is good. The International Organization of Motor Vehicle Manufacturers 2011 auto sales figures show an 11.5% increase over 2010 figures. Whether this trend continues remains to be seen. Since the 2009 financial crisis, major automotive manufacturers and suppliers have cleaned their balance sheets, removed excess capacity and restructured costs (Booz). Of the big three, most analysts are more bullish on Ford's future with categories of hybrid, gas alternative and fuel efficient models leading the pack. The big three also agree that that they need to grow "intelligently" to avoid future financial calamities with a sense of "black swan" preparedness and caution. Robust possibilities of wireless networks and "digitization" present opportunities for further technologies to be embedded within vehicle systems, including safety, navigational connectivity and entertainment in order to meet consumer needs.

Porter's Five Forces and the Auto Industry

Porter's five major forces shaping all industries and structures are: the bargaining power of buyers, the bargaining power of suppliers, competitive rivalry in the industry, threats of new entrants and threats of substitutes (Porter, 1979).

Bargaining Power of Automotive Buyers

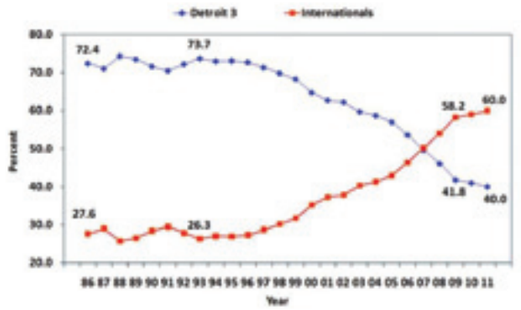
In recent years, this seems to have weighed heavily towards buyers - with industry players needing to be more vigilant regarding consumer preferences. Because of the current global economic conditions, there is a smaller number of buyers at both US and global levels. This is most evident in Europe currently with Ford having to close plants, cutting 6,200 employees, or 13% of the European workforce to stem losses exceeding US$1.5 billion (Barr, October 25, 2012). Consumers are also keeping their automobiles for longer, and being more prudent and judicious when buying new. Strategically, the opportunity is for the industry to focus on fuel efficiency and price sensitive strategies more fully to shift from profit and production models previously centered on trucks and SUV's.

Bargaining Power of Automotive Suppliers

The Industry Analysis Handbook 2012 describes the automobile supply business as fragmented. Many suppliers rely on one or two automakers for the purchase of the majority of their products. Because of this, suppliers hold little power and are susceptible to demand and requirement of automobile manufacturers. The exception within this is the world price of steel. ▶

Competitive Rivalry

A longer term chart from the Ann Arbor Center for Automotive Research is quite telling:



The chart shows in stark detail the market share of US motor vehicle percent sales from 1986-2011 of the Detroit Big Three versus the international competitors. Looking from a 10-year perspective, the trend has shifted from the big three enjoying a 60% domestic market share to the reverse, with international competitors now holding the 60% share. If the trend continues for another 10 years, the market share would shift to 73% international, and 25% domestic. The future strategy seems clear – take a new look at what the Japanese and other ascendant market players are doing and copy and improve upon them. The lesson also evident from the trend and the chart is that the domestic manufacturers are clearly not vigilant enough regarding this threat. The maximizing of plant efficiency with regards to costs is important in order to maximize capacity utilization. Moves to 24 hour shifts and more agile manufacturing processes such as Toyota's lean production plants methods are needed to be able to switch model production to meet changing market demands.

Threat of New International Entrants

While it is true that the barriers to entry for auto manufacturing industry in the United States are high, the increasingly global nature of the economy and relatively recent emergence of foreign competitors with the capital, technology, management and marketing skill represent a real threat to the domestic industry. This becomes evident in looking at the larger global market in terms of vehicle sales. According to the International organization of Motor Vehicle Manufacturers, the following OEMs sell more than a million vehicles a year:

World Motor Vehicle Production, 2010

1 TOYOTA 8,557,351
2 G.M. 8,476,192
3 VOLKSWAGEN 7,341,065
4 HYUNDAI 5,764,918
5 FORD 4,988,031
6 NISSAN 3,982,162
7 HONDA 3,643,057
8 PSA 3,605,524
9 SUZUKI 2,892,945
10 RENAULT 2,716,286
11 FIAT 2,410,021
12 DAIMLER AG 1,940,465
13 CHRYSLER 1,578,488
14 B.M.W. 1,481,253
15 MAZDA 1,307,540
16 MITSUBISHI 1,174,383
17 CHANA AUTOMOBILE, 1,102,683
18 TATA 1,011,343 (OICA, 2010)

Strategically, domestic competitors need to identify further global opportunities and look at competitors and their strategies for market incursion and entrance. An example of the threat is Korean automaker Kia, which has entered the American market through low-cost, high quality cars with enough reliability to offer a 100,000 mile 10-year warranty (Kotler and Keller, p.128, 2012). New entrants such as Kia can now more easily leverage existing capabilities and cash flow to further shake up market share rankings.

Another characteristic of Porter's five forces is low returns because of the costs of competition. It would be wise for domestic manufacturers to keep versed in foreign lower cost strategies. Low-cost and high quality producers such as Kia and Tata have the potential of taking more market share from domestic producers, especially from the growing low end of the market. It is also useful to note that the existing loyalty to major brands has eroded. Another strategic recommendation here would be for domestic manufacturers to more sophisticatedly leverage customer switching costs through social networks and car owners' club brand loyalty.

Threat of Substitutes

The 20th century can be seen as one dominated by the rise of the automobile, and automobile manufacturing. This is expected to change in the 21st. One of the factors influencing the change is the price and availability of oil and gasoline, which impacts consumers' willingness to buy a new or second vehicle. These higher costs will likely lead a smaller market segment of consumers unless higher levels of fuel efficiency combined with lower ownership cost are achieved.

More subtle structural threats include the larger shift towards a knowledge economy from an industrial base with its urban, commuter culture. A shift towards a knowledge economy and rise of online modalities reduce the need for a two or more vehicle household. The Center for Automotive research estimates that currently the number of cars at 2.1/household has reached its peak, and will either level out or drop to 2.07/household or less by 2025 (CAR, 3). The Center notes that while the motor vehicle will remain the dominant transportation mode for most US households for the new millennia's first 25 years, market opportunities will shift from domestic needs to emerging economies going through industrialization and creation of a middle class (i.e. China, India, and Brazil). Domestic US opportunities lie in the supply of alternative/hybrid transport options and segmenting into these markets with low cost vehicles.

Conclusion

More than anything, Porter's Five Forces model opens a necessary dialogue for the Big Three, and increasingly ascendant foreign competitors. Strategies must be devised both domestically and globally to confront and address new economic players. Porter's model also provides a picture of the industry within larger economic frameworks, especially with regards to the global economy and necessary changes that must occur in manufacturing. Consumers will keep this a viable and dynamic market, and it is important domestic manufacturers aren't left behind. Porter's model also allows strategic avenues so the US auto industry can again thrive both in recession and economic boom times. Understanding forces that shape competition provides a focal constellation to better see strategies for profitability. This will put the US industry on a smart trajectory towards success. AI

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BMW's 1.5 litre TwinPower Turbo Engine.

Navigation system integrated into engine management

By: Nick Palmen

Despite much hype and promise, the all-electric vehicle will continue to be a niche application until there is a breakthrough in the supply of power to the motor. Leading up to that, market leaders such as BMW are keeping motorists on the road through increasingly intelligent management systems, which are integrated into the navigation function.

Automotive Industries (AI) asked Dr. Bernardo Lopez, Head of Powertrain Evaluation, how Efficient Dynamics is driving the company forward.

Lopez: Efficient Dynamics (ED) is an integral part of all areas of vehicle development at BMW. The goal is to continuously reduce the fuel consumption of all the group's vehicles. One of the pillars of ED is to improve conventional components, and the other is maximizing the potential of electrical components. In the plug-in hybrid, we put the best of the two worlds together. We have a three cylinder engine and electric components which can move the vehicle on electric power alone for around 30 km. Conventional drive-trains will remain with us for the medium term. By 2020, we expect to have 5-15% either driven by battery or plug-in hybrid. We'll still have 85-95% conventional combustion engines or active hybrid models.

Bernardo Lopez, Powertrain, Head of Function Operation Evaluation, BMW AG.

AI: You showed in Paris the first turbocharged three-cylinder engine of 1.5 liters. Is this the future?

Lopez: The smooth and spontaneous three-cylinder 1.5-litre TwinPower Turbo petrol engine is derived from BMW's six-cylinder power unit, and features high-precision direct fuel injection, Valvetronic - a fully variable valve control - and turbocharging to help maximize efficiency. A raft of BMW Efficient Dynamics technologies, including Auto Start-Stop and ECO PRO mode, help to achieve remarkable efficiencies.

AI: What is the degree of commonality between the petrol and diesel engines in the new engine system?

Lopez: TwinPower Turbo technology has become the common feature uniting all of the brand's petrol and diesel engines. The new engine concept allows considerable savings to be made in development, integration and production, while raising quality. The number of identical parts used in engines powered by the same type of fuel climbs to 60%, while the level of structural similarities between petrol and diesel engines is around 40%. Because petrol and diesel engines will be produced on the same production line for the first time, the production process itself will be significantly more flexible. The engine family will provide the base from which BMW will be able to offer future body derivatives.

Predictive Power Management is already standard equipment on the new BMW 7 Series. AI asked Lorenz Makeschin, Expert BMW ConnectedDrive, how the power unit learns to "see" using the navigation data?

Makeschin: We are talking about different features. Predictive power train management will be available as of 2013, while the ECO PRO Mode is available already now with every BMW vehicle. ECO PRO foresight as an additional feature is available now with the new ActiveHybrid 7, 7 Series and 3 Series Touring, and will be available successively with all other models.

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ixetic
Precision to move

Car hotspot

BMW's Car Hotspot is the first LTE – enabled high-speed mobile internet to be offered in a production car. All that is required is an LTE-capable SIM card. Once it is active, passengers can enjoy LTE high-speed internet access on any devices they connect with. The hotspot comes with a built-in battery pack and antenna, allowing portable use for up to 30 minutes outside the vehicle without an external power supply. A standard USB power supply unit enables fully autonomous use from the vehicle.

BMW ConnectedDrive, New generation Navigation system Professional.

These systems link the control of the vehicle's engine to the Professional Navigation System. With the aid of the navigation-based information, the transmission control and the Foresight Assistant are able to chart the course of the road and the profile of the route, with its hills and descents, as well as the speed limits - and then to take these into account for gear selection and vehicle deceleration. Even the turning radius is known to the system before the driver reaches the bend in the road.

AI: Let's talk about the new generation BMW Navigation system Professional. What does the new system offer in terms of performance (Navigation, HMI, Connectivity & Speech)?

Makeschin: Our system has Smartphone - equivalent performance. The new-generation BMW Navigation system Professional has a new design and an optimized control concept that gives the various displays a more sophisticated, sharper, more attractive look. The readouts appear against a black background, and the state-of-the-art feel is further intensified by an atmospheric lighting effect. Overall, the new display concept makes the contents clearer to read and the functions easier to use. For the first time, individual menus are structured entirely in virtual, three-dimensional spaces. Calculation is performed in real time. Quite apart from allowing smooth scrolling and browsing, the high-performance system with a 1.3 GHz processor and dedicated 3D graphics chip features top-quality animations and dynamic transitions to make the whole operating experience an immensely enjoyable one

AI: What about functions?

Makeschin: The route guidance graphics and the map views within the navigation function have been modified and improved by the addition of interactive options. The split-screen portion of the central information display, for example, now includes new display functions for the navigation mode. When the driver enters the destination, it is shown in a map view on the split screen for easier orientation. The driver can use a zoom function to change the section of map shown and check that the selected destination is the intended one.

The arrival of the new BMW Navigation system Professional also sees new functions being added to the BMW ConnectedDrive Mobile Office portfolio. It is now possible to have two telephones connected to the vehicle simultaneously, in which case the contact details from both are combined into a joint contact list for phone calls and emails. Calendar and contact information is imported in next to no time thanks to the high-performance hardware, meaning that both telephones are fully readied for in-vehicle use as quickly as possible.

For the Asian markets, and for the very first time, the BMW development team has integrated a touch-sensitive pad into the iDrive system's central control unit. Measuring 45mm across, the multi-touch surface of the iDrive controller makes certain in-vehicle control functions more intuitive, faster and easier to use.

The new generation of the BMW Navigation system Professional adds new speech functions to the BMW ConnectedDrive Mobile Office portfolio. Most notably, a dictation function that employs a speech recognition system to transcribe the driver's words. The dictated text can then be sent by SMS or email. There is also a voice memo function which can record up to two minutes of speech. This can be sent in an email or archived. More intuitive voice control allows virtually all functions of the BMW Navigation system Professional to be operated more simply, easily, quickly and, most importantly, safely than ever.

On the multimedia front, a 20 GB hard drive makes for a richer in-car entertainment experience. The Music collection search function has been reprogrammed to allow the desired track to be located for playback faster than before. The extended toolbar principle is once again employed for fast access to additional sub-menu options, as well as greater simplicity and ease of operation. AI

Connecting the Automotive Sector

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"If we have connectivity, green and safety we can deliver "killer" products."

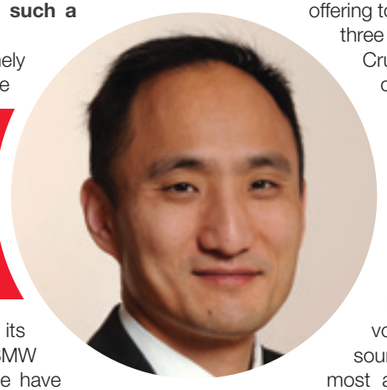
Advanced **head units connect** driver and car

By: Nick Palmen

Infotainment specialist Harman has developed what it describes as its most advanced head units for BMW.

Automotive Industries (AI) suggested to Harman's Senior Vice President Engineering Kelei Shen that the company must be delighted to provide such a significant contribution to BMW.

Shen: Absolutely. Harman is extremely fortunate to have an excellent and close working relationship with BMW and its engineers. We have been co-operating with BMW for over 10 years now, and in that time we have delivered branded premium sound systems, navigation systems and head units to the BMW Group. To launch this new system, which is based on our Premium platform is, we believe, a testament to our infotainment strategy to only deliver products that provide OEMs with the best green, connected and safe technologies. In addition, this product is part of our platform offering to serve all segments in infotainment with core three platform levels: Entry, Mid and Premium. Crucially, each level offers scalability to cover all customer demands.



Kelei Shen, Senior Vice President Global Engineering at Harman.

AI: So what is the product and how does it relate to Harman's strategy?

Shen: Our new two DIN Premium Head Unit platform is the heart of BMW's ConnectedDrive, announced by BMW in the summer of this year. The product incorporates a range of industry firsts, including intuitive email and Office synchronization, as well the recording of voice memos and email dictation. It may sound like a cliché, but it really is one of the most advanced head units created. It was only possible through rigorous systems integration. First, let me explain the green element and how we ensured it was part of this product. We worked closely with BMW's technical partners to maximize efficiency on both a silicon and a materials level. We have a range of technologies under a brand called GreenEdge™. It's a comprehensive set of technologies that offer efficiency gains through a mix of novel design, intuitive software and power management, as well as lightweight materials. As an example the Premium Head Unit is specified with a magnesium chassis, which we believe is one of the first of its kind.

The BMW NBT Head Unit developed in partnership with Harman.

On the Harman production line.

AI: Connectivity must also be an important part of such a head unit. Could you explain this element?

Shen: We had a clear aim for "seamless connectivity". Together with BMW, we wanted to simplify the complexity of connecting to consumer devices. To achieve this, we even developed a proprietary piece of middleware that can support Bluetooth, WLAN, Edge and UTMS. There is now a much simpler Bluetooth pairing function and it is possible to connect two phones to the system. Above the middleware, we also integrated various connectivity features into the onboard applications in the most seamless way, such as real time traffic, internet radio etc. The key is to let the end-user enjoy the content with minimum effort.

AI: So that leaves safety. What have you introduced with respect to that?

Shen: Aside from making connectivity simpler, we looked at improving the human machine interface (HMI). There is the integration of Nuance's Dragon Drive to increase the level of voice control. Without taking their hands off the wheel or eyes off the road, the driver can dictate short emails, texts or voice memos of up to two minutes and in six languages to be composed and sent. It's all in real time too. We believe that this safer form of messaging is unique in the market today.

Also, by specifying the NVIDIA EMP9 graphics processor and combining this with Intel's 1.3 GHz processing unit, we were able to increase clarity and detail of the HMI to the point where we could introduce 'virtual' 3D menus with a very smooth flow that help drivers quickly make choices and minimize distraction. It's worth noting too that the head unit doesn't just work in isolation from the rest of the car. There is a neat feature called High Guiding. It's an automatically activated function that provides detailed information in the instrument cluster, central and head up displays of the next navigation instruction when you are within range - that's 150 meters in a built up environment. So, the information is close to hand wherever you happen to be looking. You can also get more detailed information with a "bird's eye" view at the approach of, say, an intersection. The navigation engine can also generate more realistic 3D 'city models'. This means in certain urban areas you get a street level view, so you know exactly where you are at a glance and can compare it to the view outside.

AI - There must have been challenges with such a complex product?

Shen: Packaging all the features in the 2DIN head unit required significant expertise from our engineers. The challenge for the Premium Head Unit was to incorporate the DVD mechanism, a 200GB hard disc drive, internal amplifiers, processors and tuner as well as optical network components, all whilst ensuring the unit ran cool. We had to look at power management as well as the componentry to achieve this. That goes back to the GreenEdge technologies we discussed earlier. You can see the importance of our strategy. If we have connectivity, green and safety we can deliver "killer" products.

AI: Despite all this connectivity, it is still a radio and media player? What developments have you introduced there?

Shen: Of course entertainment is very much a part of Harman's business outside of automotive. Occupants, both front and rear, now have the option for multiple audio and video playback simultaneously for different seats and another nice feature is "more like this" - a form of automated playlist generator. The unit has both analogue and digital tuners including SDARS, HD, DAB and DMB giving us compatibility for future.

AI: Ensuring future proofing must be difficult, particularly with the rate of development of consumer devices?

Shen: We have to consider this. It is a good example of where being able to access consumers through our consumer electronics or Lifestyle divisions gives us an edge against traditional Tier 1 suppliers. That market operates so quickly, and being part of it enables Harman's infotainment division to get an early insight and often this can be an advantage. The level of connectivity we have in this product means we now have a simpler way of updating and adding new features.

AI: Finally, when is the product launched?

Shen: The first car to get the system was the BMW 7 Series this summer. It will be rolled out on other models such as the 3 Series, 5 Series and M5 and M6 too. AI

“We did a lot of development in the field of transmission fluid management, which will be the biggest part of our portfolio in the next five years.”

Company transformation reflects **changing automotive** market

By: Nick Palmen

Suppliers to the auto industry have to be increasingly nimble innovative and geographically diversified in order to meet the needs of the ever-changing market. One of those successfully navigating through the waves of change is ixetic.

Automotive Industries (AI) spoke with Georg Wolf, Management Board Chairman of ixetic at the Internationale Automobil-Ausstellung (IAA) which took place during September in Hanover this year, and asked what had changed for ixetic in the last 12 months.

Wolf: The main issue is the big platform business – you have to be in it for seven to 10 years. The business that we've got into in the last two years is much bigger in volume than before. We are supporting engine platforms, which require huge volumes. Our challenge, apart from volume, is to follow the customers worldwide. In the past, our company was focused primarily in Germany and Europe. Now the picture is changed completely, and we have had to prepare the company to be a global player. That was the biggest change for the company in the past year.

Georg Wolf, Management Board Chairman of ixetic.

AI: How well are you prepared for the electrification of the auto industry?

Wolf: First we have to distinguish what is behind electrification. When we talk about electrification, we are talking about a very small volume of full electric cars. It's clear that we are not going to have millions of electric cars within the next few years. On the other hand, we are talking about hybrids as well as the electrification of the powertrain. We do not sell a product, but a function for fluid management, so we have to be well prepared. We have to know how the fluid is managed – is it with electric driven pumps, or with belt or mechanically driven pumps? In the last few years we've built an organization that is capable of developing software, ECUs for the control units, and also electric motors. What we showed at the last automotive show in Frankfurt, and in Hanover, is the complete thermo management electrically driven compressor for managing battery packs. We have also developed electric-driven pumps covering more or less all ranges. What must follow now is the volume, which is still weak. I think we will see a lot of electrified products in the next year judging by our current mechanical portfolio on the market.

AI: What alternative solutions do you offer at present?

Wolf: In the past, we only dealt with power steering pumps. Following the trend for CO_2 reduction, our product portfolio is now completely changed. We have done a lot of development in the field of transmission fluid management, which will be the biggest part of our portfolio in the next five years. We also developed the next generation of vacuum pump technology delivering reduction of weight, reduction of energy and also thermo management for battery packs. We are looking at the world of non-automotive, where we can use our knowledge in thermo management, for example, in vending machines and other applications. We've already seen the first success and I think that in the next couple of years, a serious business will follow.

“ixetic is in transition - from traditional pump producer to a company supporting customers with mechatronic products.”

The new ixetic battery cooling system for commercial hybrid vehicles.

AI: What efforts have you made to meet the OEMs' demand for efficiency?

Wolf: There is room for improvement in almost every product in the car, and especially in the powertrain itself. There is a big waste of energy in the engine management and in the transmission. We were the first company in the world to introduce vane technology in the environment of the transmission. What we see is that a lot of transmission producers are switching from gear type pumps to vane pumps. Currently we are number one worldwide, providing the most efficient pump technology for transmissions. We've also developed tandem pumps, full mechanical switchable vacuum pumps (on/off) combined with variable displacement pumps for all engines. This is our contribution towards achieving the next goal of 95gr CO_2 per km.

AI: What new technologies can we expect from ixetic?

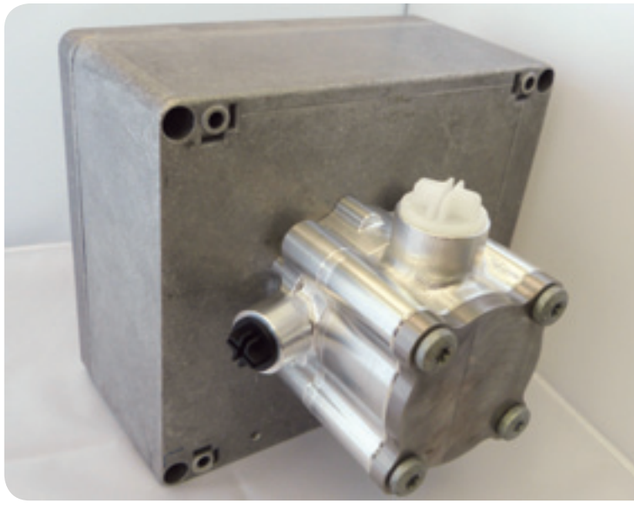
Wolf: ixetic is in transition - from traditional pump producer to a company supporting customers with mechatronic products. In the next year we will see a lot of new products where we've combined our knowledge of software, control units and hardware (pumps and pump functions together). We will also see products with more than one function, with a system function where we've combined several customer demands.

AI: Any new products?

Wolf: At the IAA for commercial vehicles in Hanover, we presented our new electric power steering pump drive. It allows commercial vehicles to be equipped with a hybrid drive without having to modify the existing hydraulic steering system. There is also our new battery cooling system for hybrid vehicles and an ethanol pump for commercial vehicles.

AI: How do you see ixetic's global positioning changing in the future?

Wolf: Our near future is fixed. For the next five years our business is booked with new series launches. Our goal is to increase ixetic's volume worldwide. The biggest challenge is to support our customers locally. A new facility in China will enable us to support our customers in the region. The next strategic step for ixetic will be to open a site in North America. We will do that by the end of next year. We have to remember that the global financial crisis was not long ago. We used the time to develop the company and the product portfolio so the organization's global footprint could increase together with our customers worldwide. Five years from now, ixetic will be a real global player. AI



New electronic power steering pump from ixetic.

A custom Sierra Wireless 3G key will plug into the USB port in the Peugeot touchscreen navigation system where the Peugeot Connect Apps service is installed.

Building the **Connected Cars** of the Future

By: Nick Palmen

"To date, PSA Peugeot Citroën has shipped more than one million eCall-equipped cars, all using Sierra Wireless modules, and more than 5,000 people have used the lifesaving service."

We all know about smartphones, but consumers rarely seem to talk about "smartcars" (yet). Just as mobile data services changed the experience of using a phone—indeed, changed the very idea of what a "phone" is—cellular connectivity is poised to transform the modern driving experience.

With the number of connected vehicles growing every day, cellular connectivity is becoming an increasingly vital part of the auto industry, both for auto manufacturers and their customers. Connected vehicles offer a number of important benefits, giving drivers more information and entertainment options than ever before, improving overall road safety and offering auto manufacturers new opportunities to connect with their customers and differentiate their vehicles. To take advantage of all of this, however, original equipment manufacturers (OEMs) need to make sure they are working with partners that can meet the unique demands of automotive connectivity.

The Rise of the Connected Vehicle

In some parts of the world, especially in Europe, regulatory requirements are driving adoption of connected car technologies. The European Commission's eCall program, for example, seeks to equip vehicles with technology that can automatically detect a crash and call emergency services even if the driver is incapacitated. The commission claims that eCall can cut emergency response times in half, and hopes to eventually have the technology required for all vehicles sold in Europe.

While similar mandates do not currently apply in North America, many parts of the United States and Canada have already outlawed the use of smartphones and cellphones while driving. In these areas, cellular-connected vehicles with in-dash "infotainment" systems can provide a much better option for delivering the connectivity and information services users want.

In addition to regulatory factors, auto manufacturers are finding in-car connectivity to be an increasingly important competitive differentiator. Cellular-connected vehicles can provide a number of useful services, including in-dash navigation, weather and traffic information. OEMs around the world have found that these services up the "cool" factor of the driving experience and the features have become an important selling point for dealers.

Supporting Connected Cars

It is essential to use solid wireless solutions that meet the unique demands of in-vehicle environments. It is not enough to take a cellular module designed for other applications, and fine-tune and market it as an auto solution. The reality is that a cellular module deployed in a vehicle must withstand extreme temperature swings, thermal shocks, constant vibration and humidity, and will need to operate in the field for many years. A basic wireless module—even one designed for industrial applications—simply cannot be relied on to meet all of these requirements.

One of the leaders in the development of purpose-designed in-car connectivity is Sierra Wireless, which was the first wireless provider to field a dedicated automotive team, and the first to create a wireless module designed from day one to meet automotive specifications. As a result of this early and sustained focus on the auto industry, the 12-year-old company is now the worldwide leader in automotive wireless solutions. It has sold more than two million wireless modules to automotive customers, in dozens of countries around the world.

PSA Peugeot Citroën recently announced a next-generation in-vehicle infotainment solution built with Sierra Wireless cellular technology.

Sierra Wireless worked with PSA Peugeot Citroën to bring to market one of the first eCall solutions. To date, PSA Peugeot Citroën has shipped more than one million eCall-equipped cars, all using Sierra Wireless modules, and more than 5,000 people have used the lifesaving service. Sierra Wireless also enables one of the most advanced in-vehicle infotainment systems in the world, the Carminat TomTom LIVE system, offered by Renault and Mazda in vehicles across Europe. The integrated system provides comprehensive navigation services, as well as local search for nearby services and points of interest, mobile safety camera reporting and sharing, weather information and more.

Recently, PSA Peugeot Citroën announced a next-generation in-vehicle infotainment solution, also built with Sierra Wireless cellular technology. The Peugeot Connect Apps service, which will be available in 17 European countries this year, uses a custom Sierra Wireless 3G key that plugs into the USB port in the vehicles' touchscreen navigation system. Users can then access a variety of applications and services, including real-time traffic and weather, local gas station locations and pricing, local business directories, parking information, and Michelin guides to local restaurants, hotels and attractions.

A New Generation of High-Speed Connectivity

While infotainment services are already transforming the driving experience, it is important to remember that we are still in the very early stages of this technology. The next step: high-speed broadband services to the vehicle using 4G/LTE wireless technology. With data speeds up to 100 times faster than conventional wireless solutions, LTE will open the door to amazing new in-car services. This could include more advanced video, conferencing and entertainment options, and other applications we cannot even imagine yet. For example, the extremely low latency of LTE connections could support real-time communication between cars, and enable new kinds of safety systems. Theoretically, the connected vehicle could become the next smartphone —a versatile platform for virtually unlimited new mobile applications, services and business models.

Auto manufacturers are already beginning to explore LTE. Audi is working with Sierra Wireless to test a next-generation LTE-enabled infotainment system. Sierra Wireless is also a world leader in LTE, having helped numerous wireless network operators and OEMs launch their first mobile computing solutions for new LTE networks.

Moving Ahead

While LTE will unlock amazing new capabilities, LTE adds new complexity, requiring specialized antennas, support for a dizzying combination of cellular modes and frequencies, and sophisticated intelligence to maintain the best possible connection at all times. Sierra Wireless is at the leading edge of this technology. The company is investing what it calls "significant resources in research and development to create new LTE solutions that meet the unique requirements of the automotive industry.

"The future is bright. No matter what challenges lay ahead, Sierra Wireless will be working hand-in-hand with auto companies and OEMs to meet them," says the company. AI

The BMW i8 being introduced to shareholders at the 2012 annual general meeting in Munich, Germany.

innovation

BMW takes suppliers along on the journey

By: Ed Richardson

BMW wants to sell two million cars in its 100th birthday year in 2016, Dr. Norbert Reithofer, Chairman of the Board of Management of BMW AG, told the 92nd Annual General Meeting of BMW AG in Munich earlier this year.

"We want to remain profitable in the long term too. This means an EBIT margin in the range of 8 to 10% in the automotive segment. So far, hardly any other car maker has managed to sustain such a figure over an extended period of time. Our vision for the year 2020 is: to be the leading provider of premium products and premium services for individual mobility," he added.

The BMW Group is one of the most successful manufacturers of automobiles and motorcycles in the world with its BMW, MINI, Husqvarna Motorcycles and Rolls-Royce brands. As a global company, the BMW Group operates 29 production and assembly facilities in 14 countries and has a sales network in more than 140 countries.

Frank Wienstroth, BMW spokesman on purchasing, suppliers and logistics.

Collaboration and partnerships with suppliers and other auto makers are needed to turn the vision into a reality. "The BMW Group is highly innovative. That makes us an attractive collaboration partner. Which is why many manufacturers want to work with us. Toyota has paved the way for hybrid technology. We are now working together on new advances in lithium-ion cell technology. The BMW Group is the pioneer of state-of-the-art diesel technology and Toyota Europe plans to buy four-cylinder diesel engines from us," he said.

Partnerships extend into the supplier relationships. "With the SGL Group, we opened a carbon fiber production plant in Moses Lake, in the US State of Washington in 2011. Carbon and aluminum – not steel – are the materials of the future for the automotive industry.

Automotive Industries (AI) asked Frank Wienstroth, BMW spokesman on purchasing, suppliers and logistics, how the supplier base is expected to contribute to the profitability of the company.

Wienstroth: Suppliers need to:

- Ensures that they optimise supply services and adherence to deadlines
- Provide top quality at a competitive cost: Qualitative competition is growing even tougher. Cost engineering is seen as an enabler for meeting joint cost targets.
- BMW is looking for a global supplier base with expansion of natural hedging to create a robust supply chain. This also allows hedging against currency fluctuations.
- Ensure access to innovation and new technologies
- Optimises processes for efficiency and value creation

AI: Is it BMW profitability at the cost of supplier profitability?

Wienstroth: Our demand for profitability is not at the expense of our suppliers. BMW aims to achieve maximum performance together with its suppliers. BMW's principles of action lay the foundation for profitable and efficient business relations.

These principles include:

- Excellent quality as the prerequisite for business relationships
- We motivate our suppliers towards maximum performance in intense competition that is tough, but fair
- We demand the most efficient implementation worldwide from our suppliers and from ourselves. This also stabilises our suppliers' business model
- Supply security can only be assured if the supplier is healthy

AI: What do you look for in new suppliers?

Wienstroth: As a responsible company, the BMW Group takes the challenge of climate change and finite fossil resources very seriously. The BMW Group aims to make new fuel-saving technologies accessible to a large number of customers as quickly as possible, and thereby contribute to sustainable mobility. We expect the same from our suppliers. We look for sustainable suppliers (from a social, environmental and economic perspective). Suppliers are also evaluated in ▸

NXP connects the car

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Car-to-x Communication
(802.11p via Software-defined Radio, Telematics, Authentication)

Location-based services
(Telematics, NFC, Authentication)

Broadcast Reception
(Software-defined Radio, Digital Radio, AM/FM)

Remote Car Management
(Two-way RF, Telematics, Authentication)

Personalization
(NFC, Authentication)

Making connected mobility a reality requires a variety of high-performance, automotive ready technologies. NXP Semiconductors offers exactly that. Our connectivity solutions cover multi-standard digital broadcast reception, NFC (Near Field Communication), IEEE802.11p and GPS/GSM Telematics – and we can ensure these wireless technologies integrate seamlessly with the car's internal networks. Secure communications and privacy are crucial in Car-to-x communications, location-based services, remote car management, broadcast reception and personalization applications. And as a leader for RF crypto and authentication chips, NXP brings state-of-the-art, proven security to the connected car.

Leading in High Performance Mixed Signal

www.nxp.com/connected-mobility

NXP

The BMW i8 Concept vehicle is one of the designs that helped BMW win 48 awards in the 2012 Automotive Brand Contest. The plug-in hybrid is described by BMW chairman Norbert Reithofer as "a genuine sports car".

terms of their cost attractiveness and/or best-practice level, technological leadership/innovations.

AI: How has the focus on vertical integration affected suppliers?

Wienstroth: For us, a profitable supply chain requires intense involvement with critical n-tier suppliers. Focal points are sustainability, quality and supply. Our supply chain structure requirements encourage our suppliers to examine their own supply chain.

AI: A number of suppliers are enhancing their expertise in "vertical integration". Do you believe this to be a favourable strategy for the future?

Wienstroth: The advantage of vertical integration is that the increased latitude strengthens innovation. An adequate degree of vertical integration at a Tier 1 supplier is therefore critical to the success of a stable business model.

- Technological and commercial synergies
- Cost benefits for the consumer through the effects of fixed cost degression
- Financial stability

AI: Does the strategy create any opportunities?

Wienstroth: Control of n-tier stages is becoming increasingly important. We therefore support the move towards vertical integration – at a competitive cost. We have already implemented the options available today in our vehicles. We will continue to focus consistently on the most attractive suppliers.

Active market consolidation through technologically and financially-strong strategic investors is leading to the formation of sufficiently large and stable long-term suppliers. Technological and commercial synergies; cost benefits for the consumer through the effects of fixed cost degression and financial stability.

BMW supports this market development in principle – if it leads to stable, reliable industrial structures. A reduced supplier portfolio makes cooperation easier. AI

The technology behind **motion control**

By: Ed Richardson

Gas springs and hydraulic vibration dampers have quietly enabled designers to provide drivers and their passengers with ever greater levels of comfort and convenience.

Take the humble glove box, as a useful example. Before the development of low-cost and reliable gas springs, they opened downwards, and invariably spilled their contents over the passenger's feet when over-filled, and the retaining mechanism had worn out. Or the trunk lid – their size and configuration was governed by the power engineers could build into a complex steel spring mechanism. Today, many trunk lids or rear doors opens smoothly at the touch of a button.

The same technology can be found in interior applications such as center consoles, armrests, and seat adjustors, and door openers. Further refinements are being added by Tier 1 suppliers in response to ongoing challenges from OEMs to refine the technology. One such refinement is the development of electromechanical drives, which have made it possible for motorists to effortlessly open and close rear gates and trunk lids doors, lids and hoods at the press of a button. An example is BMW, which adds value to the X5 by offering an automatic opening and closing function for the tailgate and automatic soft closing for the doors. In Europe, Audi offers a power tailgate and trunk lid option on its new A6, among other models.

Remote tailgate openers and lifters are also found in volume models produced by most of the major OEMs. With that comes greater customer expectations of comfort at entry level.

Tier 1 suppliers are constantly challenged to raise the bar when it comes to the design and supply of the gas springs and hydraulic dampers which have become indispensable design elements that make life more comfortable for the driver and passengers during long commutes and road trips.

And, as always in the automotive industry, functionality, reliability and cost-effectiveness are simply the ticket to the game. In order to play, the suppliers have to continuously reduce size, mass, failure rate and – of course – pay close attention to cost and price.

Oh, and they have to be maintenance-free. All for components which are barely mentioned in any of the OEMs marketing material for their vehicles. AI

Gas springs and hydraulic vibration dampers have quietly enabled designers to provide drivers and their passengers with ever greater levels of comfort and convenience.

Close-up of the Powerise module.

Technical leadership through Innovation - the solution powering the **automotive industry**

By: Ron Charles

Automatic lid and gate drives have become standard equipment on all but the lowest-specced vehicles in all segments following the development of gas spring technology, which together with electromechanical drives - has made it possible to open and close doors and lids at the push of a button.

Ongoing development by market leaders such as Stabilus is adding new functionality: “Continuing improvements, weight and installation space reduction, as well as increased performance, are the reason for our market success in this demanding application. The result is a very impressive product, the POWERISE system: a push on the remote control will conveniently open, close and stop lids in any intermediate position. Integrated sensors reliably detect and eliminate safety risks due to improper operation or use,” says the company, which has grown from being a component manufacturer to a system supplier.

Dietmar Siemssen, Chief Executive Officer and Managing Director of Stabilus.

In 2001, Stabilus launched DORSTOP, a stepless door positioning system that variably adjusts door-stay, and prevents the unintended closing of doors. This has been followed by POWERISE, an electric lid drive system. Besides such innovations Stabilus’ core business is in the production of gas springs and hydraulic dampers for the commercial vehicle segment, and is the sole supplier for a number of applications for trucks, busses, trailers, RVs and construction machinery.

With its headquarters in Koblenz, Germany, the global presence of Stabilus includes plants in the USA, Mexico, Brazil, China, Korea, Romania, Australia and New Zealand, as well as a global sales and service network. The company has doubled its rate of investment over the past year. For example, doubling its production capacity in China of gas springs products. And in Mexico, extending their assembly operation to manifest the success of the electromechanical POWERISE family - plus, fortifying their competitive position to support the strong growth in the NAFTA markets.

Stabilus has been under the stewardship of its 47-year-old Chief Executive Officer and Managing Director, Dietmar Siemssen, for just over a year. Siemssen, who took over the reins in June 2011, has extensive development and management experience in the automotive industry, and particularly in the high-growth Asian market. He joined Stabilus from Continental AG.

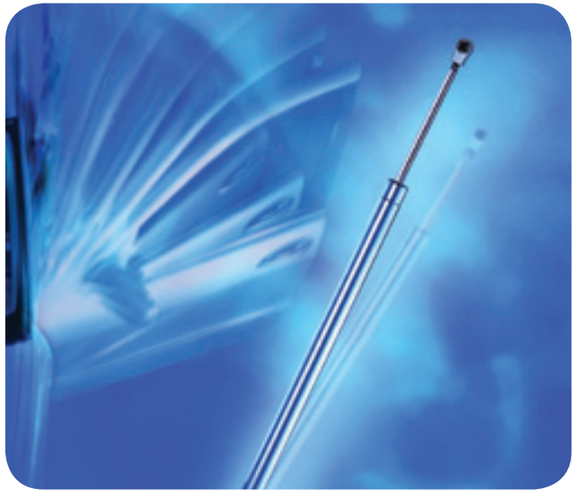
Automotive Industries (AI) asked Siemssen how the expansion of the company’s Powerise plant in Mexico had helped grow its presence in the region.

Siemssen: Our Mexican plant follows our global footprint strategy to “manufacture in the region for the region.” It is ideally located in the northern part of Mexico, close to the large United States automotive market to the north, as well as local Mexican OEMs. Competitive cost structures on one side and motivated staff on the other help control cost and enable us to offer competitive quality products to our customers. The strategy is to increase production of Powerise in Mexico, and to double the gas spring manufacturing capacity in China.

AI: How will you double production capacity in your China plant?

Siemssen: China is a huge success story for Stabilus. Not only have we successfully participated in the impressive market development, we have significantly outgrown it by securing new market share and penetrating into new segments and customers. The next steps of expansion in China will follow the blueprint of our strategic success in a very fast-growing market, and will include the introduction of new products.

Examples of the Stabilus range.



Doors open and close smoothly with the stepless DORSTOP module.

AI: What new products is Stabilus offering automotive OEMs?

Siemssen: Stabilus offers a large variety of specialty gas springs featuring additional and special functions to improve ergonomics and comfort, such as solutions to compensate for adverse impacts of temperature patterns. The ability to stop gas springs in predefined positions helps owners handle larger rear doors of vehicles, for example.

AI: How has Stabilus evolved from being a component manufacturer to a system supplier?

Siemssen: When we first came up with the idea of POWERISE it became very clear to us that this innovative product would present challenges way beyond the sheer product or its components. The transition from component supplier to system supplier was a very exciting process, overcoming a number of challenges with a great and dedicated team benefiting from our long history of project experience, competence and technical expertise. Everything happens so fast in this extremely dynamic environment that we really did not have the time to worry about setbacks or even failure, but had just to focus on our mission.

AI: What is Stabilus’ strategy to grow in the automotive aftermarket?

Siemssen: Stabilus will do all it can to leverage the advantages of being an OEM supplier, and offer aftermarket products of high OE quality level with all OE functions. The strategy is to offer best program coverage, which means the widest range of relevant products compared to other suppliers and distributors in this segment. On the distribution side, Stabilus will go even more global – reflecting the market developments in regard to sales potential. Stabilus has gained the status of being one of the top trading companies in the independent aftermarket. We wish to expand to all potential markets around the globe.

AI: What technologies did Stabilus showcase at Automechanika Frankfurt, 2012?

Siemssen: Stabilus made a strong statement about its position as market leader through a noticeably bigger presence at the Frankfurt Automechanika exhibition. First and foremost, we showcased a wide range of products for replacements. We also demonstrated the company’s strength in innovation and technical leadership to the visitors, which is part of our positioning strategy. It was one of the first opportunities for the aftermarket to see the Powerise technology. Automechanika was very successful for us.

AI: How would you rate your first year at the helm of Stabilus – what are some of the major changes the company has undergone this past year?

Siemssen: The successful transition from component supplier to system supplier has already been mentioned. As such, Stabilus was able to win key platforms with key technology partners in the POWERISE business. During the past year we developed STAR, our long term strategy process where we plan to double the size of Stabilus by 2020.

The recently implemented organization structure based on a matrix with global Business Units, as well as strong regions and functions, improves our global set-up and enables us to support our customers closer and faster than before. All in all, we are well on the way on the path to a strong future.

So, how would I rate my first year at Stabilus? Highly dynamic, a lot of fun! AI

The Stabilus headquarters in Koblenz, Germany.

"Fantastic off-road capability" – the Range Rover differentiator from other luxury saloons.

Meeting the challenge of "**making it better**"

By: Nick Palmen

Jaguar Land Rover has engineered its new Range Rover to power to the top of the luxury segment by bench-marking against some of the best saloons in the market.

Automotive Industries (AI) asked Alex Heslop, Chief Program Engineer for the new Range Rover, what the vision of the company was when it started with the development of the new model.

Heslop: We did a lot of research, and the customers told us "don't change it, just make it better". That's an incredibly easy thing to say, but very difficult to do. We wanted first of all to improve our sustainability. Number two was to develop a car that can truly compete with the world's best saloon cars. By that I mean rear seat ambience and space, entry and egress, and - as it is a Range Rover - fantastic on-road and off-road capability.

Alex Heslop, Chief Program engineer for the new Range Rover.

Going back to sustainability, that was about getting us onto a virtuous weight circle – take weight out, downsize the engine and maintain the performance. We effectively used aerospace assembly techniques to make a body shell capable as a Range Rover needs to be, but 25kg lighter than the 3 Series BMW and 85kg lighter than Audi Q5. It has the world's largest aluminum body shell – one that is Land Rover capable, but lighter than CD segment cars. That was the architectural transformation that allowed us to downsize the engines. We effectively replaced the 4.4l diesel with a 3l diesel, put stop/start and an eight-speed gear box on it and the aluminum body shell with numerous other weight saving technologies. We created a car capable of achieving figures of 37.7mpg (7.5 lit/100km) and 196g/km.

AI: How does the design reflect the heritage and spirit of the Range Rover?

Heslop: At just under 5m long, the new Range Rover has a very similar footprint to the outgoing model, but with a smoother and more streamlined profile. It is the most aerodynamic Range Rover ever, with a drag coefficient starting from 0.34. The cabin retains the characteristics of extremely clean and elegant surfaces, using the finest leathers and veneers. With over 118mm more legroom, the rear compartment offers more space and comfort, with the option of the new two-seat Executive Class seating packages. Customers are able to create a bespoke vehicle with a choice of colors, finishes and special details, from the color-themed interiors of the exclusive Autobiography series, to a stylish range of alloy wheels up to 22 inches in diameter.

AI: How does the new model compare to the outgoing one?

Heslop: It has been engineered from the ground up to be the most refined, most capable Range Rover ever. With the adoption of the latest body and chassis technologies, the vehicle's all-terrain performance has moved on to another level, both in its off-road capability and its on-road handling and refinement. Amongst the industry-leading innovations is a next-generation version of Land Rover's Terrain Response® system, which analyses the current driving conditions and automatically selects the most suitable vehicle settings.

AI: What can we expect in terms of performance and comfort from the new model?

Heslop: We wanted the car to be competitive with the best saloons. We benchmark and measured the Mercedes-Benz S class, Audi A8, and Bentley Flying Spur, and we've delivered a car that is despite being a SUV, is quieter than the A8, and just as quiet as an S class. We delivered a car that is able to absorb undulations in the tarmac road better than the Bentley. For the first time we truly have an alternative luxury saloon. Attention to detail ▶

Automotive

ADITYA BIRLA NOVELIS

Enabling the world's first lightweight SUV

Novelis is the sole supplier of aluminium sheet for the all-new Range Rover enabling the world's first SUV with an all-aluminium body.

Novelis' revolutionary lightweight platform delivers significant enhancements in performance and agility and improved fuel economy and CO_2 emissions.

For a better view of the road ahead, visit www.novelis.com or email us at automotive@novelis.com

novelis.com

Novelis

“Going back to sustainability, that was about getting us onto a virtuous weight circle – take weight out, downsize the engine and maintain the performance.”

The world’s largest aluminum body shell – a body-in-white on the Solihull production line.

throughout the development process has eliminated all unwanted sounds and traces of harshness. Measures like the rigorously optimized body structure, acoustic lamination of the windscreen and side door glass, and new dual-isolated engine mounts have led to a significant reduction in noise levels.

The new chassis architecture is combined with completely re-engineered four-corner air suspension, and together they have enabled engineers to achieve even more luxurious ride comfort and refinement, in addition to transformed on-road handling, with more confident and agile cornering. Customers have a choice of two petrol (5.0-litre 375 PS LR-V8 and 510PS LR-V8 Supercharged) and two diesel (3.0-litre 258PS TDV6 and 4.4-litre 339PS SDV8) engines, all of which are now paired with a smooth and responsive eight-speed automatic transmission. A lightweight suspension architecture delivers class-leading wheel travel, providing exceptional wheel articulation and composure to deal with the toughest conditions.

AI: Why did you choose aluminum for the new body, and what were the structural benefits?

Heslop: Jaguar Land Rover is in its second decade aluminum body shells. What we do is give the car strength where you need

The control cabin of the new Range Rover – high-tech combined with luxury finishes.

it within the vehicle. That means you need strength within the sub-frames and the suspension system, and you need strength from the body shell - where you interact, where you connect with the suspension system. With the use of Anticorodal®-600 (Ac-600 PX) we effectively got an all-aluminum monocoque body structure which is 39% lighter than the steel body in the outgoing model. Combined with weight savings throughout the chassis and driveline, the lightweight structure contributes to a model-for-model weight saving of up to 350kg compared to the outgoing vehicle.

The weight saving helps the 510PS LR-V8 Supercharged model to accelerate from 0-60mph in just 5.1 seconds, a reduction of 0.8 seconds over the outgoing model. At the same time, fuel consumption is cut by 9%. The lighter structure has also made it possible to introduce the sophisticated 3.0-litre TDV6 engine into the model line. With performance just as strong as the previous 4.4-litre TDV8 Range Rover, the smaller engine takes the total weight saving up to 420kg, and delivers a dramatic 22% reduction in fuel consumption and CO_2 emissions, achieving figures of 37.7mpg (7.5 lit/100km) and 196g/km.

AI: What are some of the technological highlights of the new Range Rover?

Heslop: Premium features including keyless entry, soft door close with power latching, power upper and lower tailgates, cooler compartments, and an electrically deployable towbar. A high-end Meridian audio system is incorporated into high-resolution displays, which include a full digital instrument cluster and a central 8-inch touch-screen with Dual-View functionality. The latest LED interior illumination creates subtle and sophisticated ambient lighting, with the ability to change the colour scheme to suit the driver’s mood

Driver assistance technologies include two-channel Dynamic Response active lean control, and Adaptive Dynamics with continuously variable damping, adaptive cruise control with a new Queue Assist feature which allows the system to continue functioning at low speeds and down to a complete stop, blind spot monitoring, and a surround camera system with T-Junction view, trailer reverse park guidance, and trailer hitch guidance. AI

Novelis and Jaguar Land Rover to supply lightweight SUVs

By: Nick Palmen

A twenty-year history of close cooperation between Novelis and Jaguar Land Rover has culminated in a multi-year agreement for the supply of aluminum sheet.

Under the agreement, Jaguar Land Rover will secure rolled aluminum from Novelis for a wide range of Jaguar Land Rover models, helping to support the auto maker's industry-leading strategy to reduce the weight of its vehicles and thereby decrease CO_2 emissions. As a key component of the sole-supplier relationship, Novelis will recover and recycle all of the automaker's aluminum scrap, thus creating a closed-loop recycling system.

Roland Harings, Vice President, Global Automotive for Novelis

"Novelis' superior innovation capabilities, technology expertise and global investment strategy for delivering high-quality aluminum sheet make the company an ideal long-term partner for our own sustainable growth strategy," said Mike Brown, Senior Purchasing Manager, Jaguar Land Rover.

This agreement coincides with the launch of the fourth-generation Range Rover, the world's most refined Sports Utility Vehicle (SUV). Sales began in September 2012 following a three-year engineering project, supporting 1,000 jobs in design, product development and manufacturing at Jaguar Land Rover. It is the world's first SUV with lightweight all-aluminum construction. This saves up to 20% from the previous model's curb weight in some trims. Fuel consumption and carbon dioxide emissions are down by 22%, according to Land Rover.

The arrival of the latest SUV follows a significant investment in all-aluminum production processes at Land Rover's Solihull plant, where more than 6,800 workers are employed on Range Rover and other models. "This outstanding new Range Rover symbolizes our commitment to investing in Britain and exporting around the world, delivering class-leading performance, agility, quality and luxury in a model that enjoys iconic status in almost every market," said Dr. Ralf Speth, Jaguar Land Rover Chief Executive Officer at the launch. "As the UK's leading automotive investor in R&D we are proud of the work that has gone into developing the new technologies and innovations to make the new Range Rover possible."

Novelis aluminum is used widely across Jaguar Land Rover's product range, including the Jaguar XJ, XF and XK models as well as the Land Rover Defender, Discovery 4, Range Rover, Range Rover Sport and Range Rover Evoque. To meet the rapid growth in customer demand for automotive aluminum sheet worldwide, Novelis is more than doubling its global capacity dedicated to the automotive market. In August 2012, demand for vehicles helped lift pre-tax profits at Jaguar Land Rover by 32% to US$540 million for the first quarter of the current fiscal year, with more than 85,000 cars sold in the three months to June 30.

According to John Edwards, Land Rover Global Brand Director, "Land Rover has seen 12 months of continuous sales increase, up in every region, up 40% in total. Our objective at Land Rover is to be the world's SUV brand of choice for today and tomorrow, a car for all reasons, fit for every purpose."

Automotive Industries (AI) asked Roland Harings, Vice President, Global Automotive for Novelis, about the company's contribution towards the new Range Rover.

Harings: Novelis is the sole supplier of aluminum sheet for the all-new Range Rover. The all-aluminum body structure allows significant weight savings on the full model of 925 and 397 pounds (or 39%) on the body-in-white (BiW) over the outgoing model.

AI: What benefits does your technology bring to the structure of the new model?

Harings: Novelis offers innovative aluminum sheet for lighter vehicles, enabling reduced CO_2 emissions that help JLR improve its carbon footprint and meet regulatory requirements. The use of the all-aluminum BiW triggers significant secondary weight savings, combined with a weight reduction on many parts of the vehicle leading to a maximum total weight saving of 925 pounds and 22% lower CO_2 emissions. Therefore, the Novelis aluminum platform helps JLR improve the fuel economy in the new Range Rover and delivers significant enhancements in performance, handling and agility.

The new Range Rover, the world's most refined Sports Utility Vehicle (SUV).

Ac-300 T61 crash reinforcement

AI: What are the core properties and surface characteristics of the new alloy Ac-300 T61?

Harings: The use of Ac-300 T61 enables high incoming and in-service strength combined with good formability and high energy absorption without cracking. It can be used for crash dominated structural components such as long crash members or bumper beams – an application which has previously been dominated by steel.

AI: What performance benefits do you offer with the new alloys in terms of design and functionality that are not achievable with standard aluminum?

Harings: Novelis is continuously pioneering new alloys, treatments and finishes to enable automakers to create lighter, fuel- and cost-efficient cars with increased performance characteristics. One new product, also used in the New Range Rover, is Anticorodal®-600 (Ac-600 PX) which can be used for inner and outer panels or structures. It is a 20% stronger material than typical 6xxx BiW alloy, so the gauge can be reduced by as much as 15%, which implies further weight and cost reductions by using less material.

Beyond the alloy itself, Novelis also develops new solutions to optimize the way aluminum components are manufactured. One of the latest innovations is the remote weldable alloy Anticorodal®-200 RW (Ac-200 RW), which is an innovative multi-layer aluminum sheet product based on Novelis Fusion™. It enables customers to remote-weld without using filler material, typically required in welding conventional sheet, thereby improving customers' welding speeds.

AI: What is the future of Novelis Fusion technology?

Harings: Novelis Fusion™ will remain an important technology enabling step changes in how aluminum hang-ons and BiW are built in specific areas, where the specific multilayer characteristics are required.

AI: How is Novelis positioned globally, and what expansion plans do you have for the future?

Harings: Today, Europe is the biggest market for body-in-white aluminum, but demand is growing in other areas as well. North America, and especially Asia, where European OEMs are starting to build the same vehicles with the same technology as they use in Europe. In Europe, a 55 pound/vehicle aluminum content increase is expected by 2025, as more manufactures seek to gain weight reduction to improve their green credentials. Therefore, a big step forward in all market segments, ranging from compact to SUV, is expected over the next five years. To this end, Novelis has recently announced three significant investments that will expand its capacity to respond to escalating demand for the automotive sheet. It will invest approximately US$200 million to expand by 200 kilotons its rolling operations in Oswego, NY, a further US$400 million to expand aluminum rolling capacity and recycling infrastructure in Ulsan, Korea and a US$100 million to build its first manufacturing plant in China, which will have a capacity of 120,000 metric tons per year and is expected to be commissioned for operation in 2014.

Meanwhile, Novelis has opened its first Chinese offices in Shanghai and has put in place a Global Automotive Organization to reinforce our commitment and service to automotive customers. Globally, our current capacity for automotive sheet will more than double to more than 500,000 metric tons per year with our expansion in Oswego, New York and the announced plant in Changzhou, China.

AI: What efforts do you make to meet the growing demand for aluminum sheet in the automotive industry?

Harings: Through our extensive expansions, Novelis continuously increases capacity in order to meet the growing demand. Global standards are set and followed in order to offer high quality automotive sheet products to a global customer base. Novelis is continuously trying to improve, and to become even more efficient. Therefore, standardization of processes and product portfolio optimization are on-going key activities.

AI: What is your approach to recycling, and what programs do you have in place with OEMs?

Harings: Novelis' strategy is that, by 2020, 80% of its aluminum will come from recycled material – that's a big impact on the company's CO_2 footprint and will help its customers meet their sustainability objectives. To achieve this goal, Novelis is working closely together with its customers to include agreements to buy back scrap metal not used during the stamping process and facilitate closed loop recycling. AI

innovation

Improved **solar control glazing** keeps occupants **cool**

By: Nick Palmen

Improved solar control windshields are keeping the interior of cars cooler, which in turn reduces the demand on the air conditioning, and helps bring down interior temperatures faster – all of which makes for a "greener" car by reducing fuel consumption in hot weather.

Dr Volkmar Offermann, marketing director of Saint-Gobain Sekurit International (SGSI) and Dr Ann-Katrin Glüsing, communications manager of SGSI explain the benefits of the new technology in the company's new CoolCoat technology to Automotive Industries readers:

Dr Volkmar Offermann, marketing director of SGSI.

Optimised comfort

"It is an endless cross making good glass," the glass maker's maxim says. Good glass is no longer only a protective shield against wind and weather, but today incorporates many additional functions. The trend started with the first mass laminated security glass in 1927, and has continued ever since. Currently, thermal comfort and fuel efficiency are becoming increasingly important for OEMs and consumers. The SGSI products start with green tinted anti-heat glazing in almost all cars, allowing 65% of the heat to enter the car. In comparison to green tinted glass, today's heat reflecting products achieve a further reduction to 51%. The SGS CoolCoat technology reduced heat transferal to 40%, half as much as today's heat-reflecting products. Interior cabin temperatures are kept around 5 Kelvin lower than those where standard heat reflective glazing is fitted.

Greater fuel efficiency, less pollution

Advanced solar control glass assists OEMs to meet the challenges of sustainable mobility as legislation in Europe and the US pays more attention to off-cycle fuel consumption. Higher fuel consumption to drive air conditioning systems has been identified as contributor.

Keeping drivers cool

Generally speaking, heat-reflecting technologies are based on a multilayer coating on the inner glass of the laminated glass sandwich. The main component of the invisible coatings is thin metal components. Multiple layers act as a mirror for infrared rays, and reflect the heat from the sun directly to the outside. The novelty of CoolCoat compared to existing heat-reflecting technologies is that it lets only 40% of solar heat radiation into the car compared to 65% for a standard green tinted glazing. For the given glass combination the AC fuel consumption can be reduced by 30%.

Heat management test

Even though it is well known that windows have a high influence on heating up a car, very few measurements are available regarding the real benefit in terms of fuel consumption reduction. To demonstrate quantitative results of the fuel consumption reduction with solar control glazing a measurement was carried out in a climate wind tunnel with solar simulation. A standard green glass set and a heat management glazing package were tested with and without air conditioning running (automatic mode, 21°C target temperature). The heat management glazing package consists of a CoolCoat windshield, green glass front door glazing, and dark grey glass behind the B-pillar.

In the test, a sunny summer day was simulated with a solar load of 1000 W/m², a temperature of 35°C, and a relative humidity of 40%. The driving cycle included a pre-conditioning phase, a heating up phase, the NEDC, and a supplementary stationary cycle, which was performed three times. During the test, the fuel consumption is determined with an external fuel tank. Temperatures were recorded at various positions inside the cabin and the motor compartment.

Compared to standard green glazing, the results show a significant decrease of the fuel consumption of the air-conditioning system if a CoolCoat windshield in combination with dark tinted glazing behind the B-pillar is combined. Thanks to the glazing the AC fuel consumption can be reduced by 30% for the given design of experiments. For the NEDC cycle a saving of 0.7 l/100 km is measured, which is equivalent to 19.1 g CO_2/km. Even more the saving for an urban tour enhances up to 1.3 l/100 km or 35 g CO_2/km.

To complete the test results the average benefit of such glazing in Europe over the full year were calculated. The calculations show that for an annual EU average the heat management glazing car set provides a reduction of the vehicle's CO_2 emission by 3.8g CO_2 /km. For the specific car geometry used, 1.6 g CO_2/km of this reduction is attributed to the SGS CoolCoat windscreen.

CoolCoat can reduce the temperature of the instrument panel during the heat-up phase by 12 Kelvin, which has a very positive impact on the subjective comfort perception. Direct sun radiation onto the driver's arms and legs is also strongly reduced.

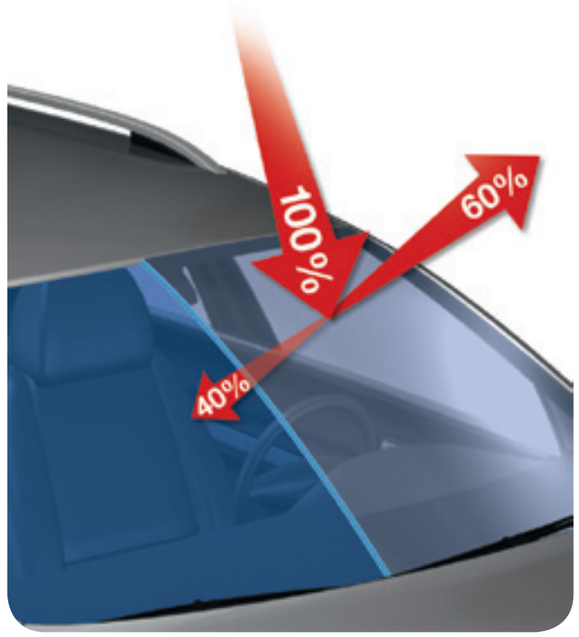
Conclusion

Driver and passengers benefit from the CoolCoat technology as cars become more and more like living spaces. The feeling of well-being in this mobile living space is highly influenced by the glazing, which contributes to the positive notion of openness, and can also enhance comfort through advanced solar control functions. CoolCoat windshields or heat management glass packages combined with CoolCoat and dark tinted glazing lower the temperature of the instrument panel by 12 Kelvin after parking in summer conditions. This means that the air conditioning can bring the temperature down to more comfortable conditions 30% faster. Finally, with a SGS CoolCoat windshield and dark tinted glazing, the fuel consumption of the air conditioning system can be reduced by approximately 30%, which results for the tested vehicle in a reduction of CO_2 emission by 3.8 g CO_2/km on European annual average. As an efficient thermo management tool for future sustainable cars, CoolCoat will be soon essential for cars with conventional combustion engine and for electric cars. AI

	Consumption [l/ 100km]				Δ	Consumption [g CO_2 /km]				Δ
Cycle	Green tinted glass		Anti heat glass package (CoolCoat + dark grey glass)		CoolCoat + dark grey glass vs. green tinted glass (w. AC)	Green tinted glass		Anti heat glass package (CoolCoat + dark grey glass)		CoolCoat + dark grey glass vs. green tinted glass (w. AC)
	w/o. AC	**w. AC**	w/o. AC	**w. AC**		w/o. AC	**w. AC**	w/o. AC	**w. AC**	
City	8.0	**12.3**	7.7	**11.0**	-1.3	210.0	**322.9**	201.7	**288.1**	-34.8
Highway	6.8	**8.4**	6.7	**8.0**	-0.4	178.9	**220.4**	175.4	**210.0**	-10.4
NEDC	7.3	**9.9**	7.1	**9.2**	-0.7	190.3	**259.6**	185.1	**240.6**	-19.1

Glass properties being tested in a climate tunnel.

60% of the sun's heat is reflected to the outside, and the cabin stays cool as only 40% adds to the heat build-up of the car.



A CoolCoat windscreen in action.

Demand for **catalysts** outstripping market growth

By: Nick Palmen

Market conditions for original equipment manufacturers continue to be challenged in many areas of the world, but for Tier 1 suppliers in the catalysts segment, there is a breath of fresh air.

Automotive Industries (AI) asked Xavier Susterac - Vice President Mobile Emissions Catalysts BASF, how the market situation is affecting BASF.

Susterac: While automotive production in Europe has declined year over year, our business remains strong, and we expect continued robust growth for the catalysts business in the years ahead. This will largely be driven by new regulations such as Euro 6, which will drive increased demand for new and advanced emissions catalysts despite the current market weakness for light duty vehicles. The same situation applies for heavy duty vehicles, which generally require larger and more sophisticated emissions control solutions to meet increasingly stringent regulations. Looking ahead, based on prevailing industry estimates, we expect the European car market to return to growth, by approximately 5% in the light duty market and 3% in the heavy duty market over the next five years, on average.

Xavier Susterac - Vice President Mobile Emissions Catalysts BASF.

AI: How do you see the catalytic technology developing?

Susterac: As I noted, the light duty selective catalytic reduction (SCR) market is going to grow with the introduction of Euro 6, and we are investing heavily in this technology. To mention two examples: We've identified a need in the market to combine some catalytic technologies into a more advanced solution, such as our SCR on Filter System. We anticipate being a major player in this new market. Another, more recent, example is gasoline particulate filters. Euro 6C, which starts in 2017, is likely going to make filters necessary for many gasoline engines. The question now is how to combine the function of the three-way catalyst and the filter. This is a good example of innovation for the future.

AI: What does BASF's portfolio include?

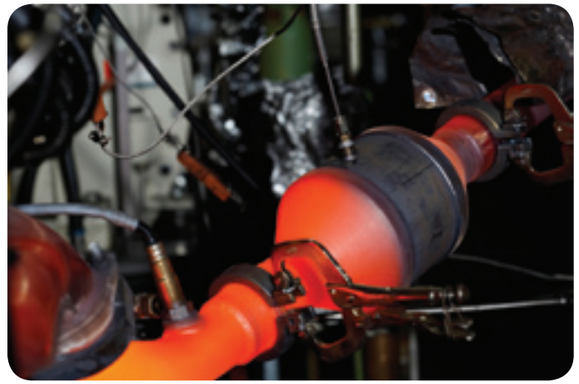
Susterac: Our portfolio of products and services covers everything for coated products. We are the catalyst producer in the value chain. We develop the catalytic formulation to meet the specifications of the OEM. We produce the precious metal slurry, coat it on a substrate, send the catalytic solution to a canner to be prepped for installation in the vehicle. Basically, we cover the full portfolio of gasoline, diesel light duty and diesel heavy duty solutions. In terms of services, ours is a technology business. We work closely with our OEM customers to drive innovation. I think this industry is all about partnerships. All of our engineers spend a lot of time with customers, and together they come up with solutions to meet increasingly stringent emissions requirements in the most effective and efficient manner.

AI: What efforts do you make to meet OEMs stringent quality standards?

Susterac: For us it is very important to have the right processes in terms of manufacturing and development. When you create a new product or solution in this field it takes a while to move into full production. There are a lot of steps, and in the end it is all about quality to ensure that we always meet or exceed the required standards. We have quality engineers in all our labs globally. And we make sure that the quality for a given customer product is the same around the world.

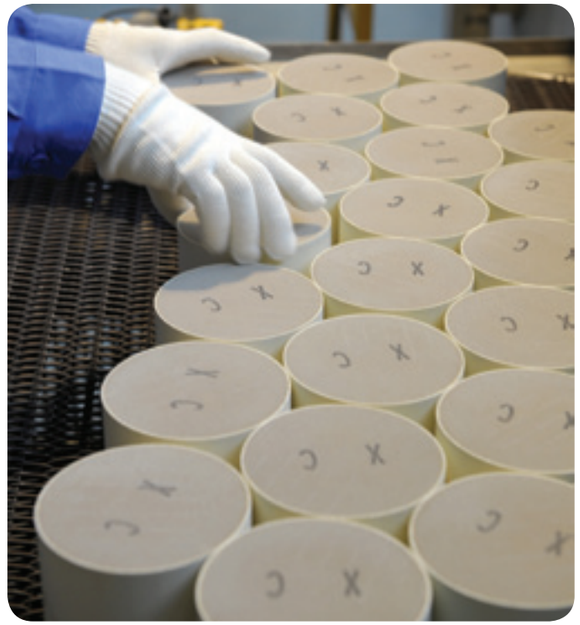
AI: What are your investment plans for the future?

Susterac: For us there are different levels of investment. First is people, and then production lines and capacity. As the business continues to grow there is the need for more capacity, new lines if you like. We have already announced two major investments for a new SCR line, and we also are also investing in the world of filters – a new CSF (catalyzed soot filter) line. We are also investing massively in heavy duty. But, as I said, our investments are not just about lines. They are also focused on people – our commitment to the people and the region of Lower Saxony. At the same time, our business continues to invest in other areas as well, including additional production capacity for specialty zeolites – a key raw material for our diesel catalysts solutions – at a new plant being built in Ludwigshafen, which will come on line in 2014.



The BASF catalyst testing facility in Union, New Jersey.

A catalyst on the test bench in Union, New Jersey.



BASF three-way catalysts on the production line.

AI: How important is the automotive market for BASF?

Susterac: It is big, very big. In fact BASF is the largest chemical provider to the automotive industry globally. Approximately 13% of our sales in 2011 were generated by the automotive sector – amounting to the published figure of 9.5 billion Euros. There is an objective to reach 17 billion Euros by 2020.

AI: What are the expectations for the new Global Business Unit Battery Materials?

Susterac: In 2020, the global market potential for batteries for electromobility alone could be 20 billion euros, about a quarter of which relates to our strategically relevant market of cathode materials and electrolytes, as we are not a battery producer, but a materials producer. We estimate the sales potential for BASF to be at least 500 million euros by 2020. BASF's goal is to take a leading position in the future in the battery materials market.

AI: What is your strategy for a sustainable future?

Susterac: The catalyst business is built around sustainability, with emissions control at its core. In fact, our mobile emissions business invented the catalytic converter and, since 1974, our technologies have prevented more than 1 billion tons of pollutants from reaching the atmosphere. AI

Catalyst ready for canning.

Android driving vehicle **connectivity**

By: James Hilton

Android has gained undisputed leadership in the Smartphone world. It is an open platform which enables the community of applications developers to collaborate on a single implementation of a shared product. This collaboration has led to a large applications ecosystem that is unmatched by any other product or device in the world today. Making the Android suitable for the automotive industry is currently a hot topic among car manufacturers.

Automotive Industries (AI) asked Eric Riyahi, Executive VP at Parrot, whether he believes Android is the right choice for infotainment systems.

Riyahi: The infotainment platform is one of the key factors that influence car purchase. Either the OEM and technology supplier have developed a strong partnership over many years on a given platform - as in the case of certain premium car brands - or the OEM can take a shortcut to advanced infotainment with the implementation of the Android platform adapted to the car environment.

AI: What do you mean by an Android platform adapted to the car environment?

Riyahi: On the one hand, an automotive infotainment platform should include fundamental features such as voice recognition, media management, digital signal processing and tuners. These are Parrot's longtime-proven know-how, which was recently strengthened with the acquisition of DiBcom (DAB, and TV tuners). On the other hand, Android is an open platform which enables the community of applications developers to collaborate on a single implementation of a shared product. This collaboration has led to a large applications ecosystem that is unmatched by any other product or device in the world today. Parrot works at combining its automotive know-how with the Android apps framework in order to offer the most relevant automotive connected infotainment open platform.

AI: How do you envision such a connected infotainment open platform?

Riyahi: An open platform should aim at reducing engineering costs and time-to-market without compromising reliability. It rests on the following elements:

- A large community of applications developers
- A shared framework: here we are talking about the Android SDK (software development kit) which is widely available
- A systems integrator: its task is to ensure the overall relevance and compatibility of all the apps and libraries involved in the said infotainment platform

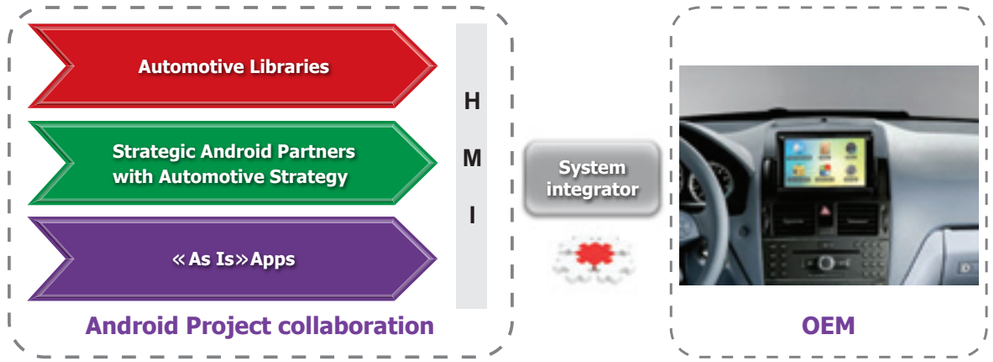
The ultimate goal is shortening development time for infotainment features. To do so implies combining automotive software libraries, third-party applications and Android applications while coordinating with HMI specialists, under the responsibility of a strong system integrator.

AI: What are the different types of apps and libraries to combine in your vision of an open platform?

Riyahi: In order to leverage Android in an automotive environment, certain libraries have to be implemented. Examples of such libraries are Voice Recognition, Bluetooth, Digital Signal Processing for hands-free acoustics (Acoustic Echo Cancellation and Noise Reduction) and support for media connectivity and tuners. It is important that these replacement software libraries be proven automotive software libraries which can be trusted to meet automotive quality standards for reliability, compatibility, and security. Other libraries can be sourced from partners that have both an Android and an automotive strategy. These partners understand automotive requirements in regards to reliability, performance and maintenance. The apps they develop can run on the Android environment with Automotive standards. Examples of Android apps using libraries that meet automotive standards are: Navigation, Internet radio, and Media Playing.

In addition, certain types of apps, native in the Android OS, can be used directly « As is », such as Google Maps, Weather, Points of Interest (POI) search, etc. These are apps the end customer is familiar with, and they are often already used in the vehicle via an Android Smartphone. It would not make sense to consume time and money to develop them from scratch for the automotive environment. The end user would have the possibility to remove those apps and replace them by more recent alternatives.

Another advantage of Android is the flexibility and ease of creating a custom HMI. Each vehicle OEM can create a look and feel which is unique, well-suited to its brand image, and adapted to in-vehicle usage with minimized driver distraction. The Android framework allows a custom HMI to be created with a development environment that is already familiar to a wide community of developers. The vehicle OEM has access to a vast variety of HMI partners to choose from.



Schematics of an infotainment open platform project leveraging the Android framework.

There is significant leadership involved in combining proven automotive software libraries, 3rd party apps and native Android apps while coordinating with HMI specialists. This requires a strong system integrator to set up partnerships and coordinate all hardware and software suppliers on a given project. This is where Parrot's expertise comes into play to ensure the best performance and reliability for the overall project.

AI: In which form factors will Parrot implement its strategy for Android-based open infotainment platforms?

Riyahi: Parrot offers a range of Infotainment products in a different form factor. For example, as a standalone box or it can take the shape of a head unit, either with or without a center console. Besides, this platform is also applicable to Rear Seat Entertainment.

AI: To what extent is Parrot affected by the legal disputes regarding Apple and Samsung, which uses the Android OS?

Riyahi: These disputes refers mainly to the mechanical design and the user interface of handsets.It has nothing to do with Android apps and framework that Parrot is using.

AI: Where will your technology be displayed soon?

Riyahi: Parrot will be at CES Las Vegas, on 8-11 January 2013 at booth 31112 in South Hall 3. We will be glad to give demos of both the Ironbox (standalone ECU) and the N.I.S. (1-DIN head unit). AI

Examples of HMI customizations allowed by the Android framework.

Range of Parrot solutions for connected infotainment.

innovation

Focus on... challenges facing **telematics** rollout

By: Esther Francis

A number of critical developments which will directly affect the rollout of telematics in cars and trucks are at play – and many are outside the control of the industry.

Passenger car producers and their suppliers are asking whether the Telematics car business case is profitable enough, and whether road safety legislation restricting the number of potential distractions facing drivers - as well as integrity issues - make it impossible to deliver the infotainment services the market seems to be demanding. On the commercial front, factory-fitted telematics technology in trucks has the potential of disrupting the Fleet Management System Market.

These two subjects were debated at Telematics Valley International Conference in Gothenburg on October 9 and 10, 2012. Telematics Valley is a non-profit organisation supporting its members to do more business within the Telematics area as well as also related ITS and M2M areas.

Jan Unander, Executive Director of Telematics Valley.

Automotive Industries (AI) asked Jan Unander, Executive Director of Telematics Valley, what the challenges are in the car market.

Unander: Infotainment in cars has never been a gold mine, and never will. Today I hope and believe that most car manufacturers have adopted a completely different view - that connectivity and infotainment are important to position the brand to sell more cars. I also hope that they have accepted that the internal business case alone justifies the investment of technical infrastructure in the car. The internal business case focuses on creating income from the aftermarket that actually generates 60-80% of the profit for a car manufacturer. On top of that, it delivers savings in lower warranty cost, lower cost on leasing/ hire contracts, shorter and better product development, reduced marketing cost and improved efficiency in the branded workshops to mention some of the benefits.

AI: So what's the problem?

Unander: To quote Ray Lahood - United States secretary of Transportation, "Every single time you take your eyes off the road or talk on the phone while you're driving – even for just a few seconds – you put yourself and others into danger!" Is it really true that barring drivers from making any calls at all or consuming any infotainment services while driving will influence that figure significantly? Researchers have found that there are positive ways to alert (not distract) a driver, and voice controlled commands are improving the safety.

Another factor that can put a blanket over the infotainment business case is not having respect for personal integrity by revealing/using geographical position and other sensitive information for commercial or regulatory purposes. Should car manufacturers offer integrity proofed services that might reduce functionality and the user experience to position themselves, or is it the "open world" that rules ?

AI: What about trucks?

Unander: Most major truck manufacturers are starting to factory fit Telematics to be able to reach the trucks to collect and make use of diagnostic data. But, that also means that they will have the communication channel for the Fleet Management Systems (FMS). These could be either their own or a third-party solution.

This can be seen as a threat to the established third-party Fleet Management System providers as sometimes an important part of their income is generated from the technical infrastructure they install to enable their customers to use their solutions. Truck manufacturers have standardized the data/information accessibility, and third party FMS providers might find it difficult to argue for proprietary solutions in the future.

AI: How will this change existing business models?

Unander: I strongly believe that if there was a closer dialogue between the truck manufacturers, third party suppliers of FMS solutions and other suppliers of data/ information from the vehicle, trailer and the cargo, higher value for the transporters will be created. There are opportunities for partnerships. Many of the big third-party FMS suppliers are internally organized to offer total solutions including the technical infrastructure. Truck manufacturers have a limited access (and often limited interest) to information from the goods and goods terminals, but deep insight of fuel consumption and other vehicle-related data.

Logistics specialists should be able to focus on their applications and services around improving efficiency in the transportation flow. If, for example, suppliers of trailers, refrigeration equipment and components for the vehicles also provide their data and information in a commercial win-win way, the source for more and more reliable data can be created. AI

- Global Presence, Local Expertise
- Innovative Smartphone Integration
- Online Support for Content and Services

NNG

Connected Navigation Solutions for All Leading Platforms

NNG is now active in automotive line-fit with units such as this.

NNG – **Navigation** beyond borders

By: Jon Knox

At the dawn of the economic crisis, many believed the Hungarian-based NNG would struggle to find its place in the navigation market with its then primary focus on developing solutions for personal navigation devices (PNDs).

The company, which is best known for its award-winning iGO Navigation software, shifted its business strategy in 2006-2007 from a focus on consumer electronic devices to the automotive OEM and wireless market. This move from B2C to B2B client portfolio has positioned NNG as one of the leading white label suppliers of navigation software for Tier 1 providers, and among the biggest names in the automotive navigation and services industry.

NNG believes its international success can be attributed to timing - realizing ahead of its competitors when it was time to find a new market in which to apply its technology and generate demand. In 2008 – seeing that the PND and personal navigation assistant (PNA) market had consolidated and sales had shifted to regions where populations were just getting acquainted with car ownership – NNG made a bold statement: "navigation will be an elementary onboard solution in every vehicle's infotainment system".

This then radical view lead the company to focus on automotive line-fit, targeting Tier 1 providers with its iGO Navigation product. Partnerships have been developed and strengthened with influential hardware brands like Alpine, Clarion, Fujitsu TEN and Pioneer. These essential business relationships find NNG with commitments under contracts for over eight million units for OEMs in different parts of the world.

Its success can also be linked to the company's conscious efforts to thoroughly interview and test its applicants, with a goal of having the highest level of competency of any of the Hungarian technology companies: 80% of employees are software engineers who go through a rigorous test before being accepted into the company.

"Nobody believed that our small company could enter such a saturated and austere international environment, where product lifecycles follow a typically comfortable pace. Today our navigation software is running in seven out of the top 10 selling auto manufacturers' cars and we have supplier agreements with a total of 25 car brands" says Peter Balogh, one of the founders and the CEO of NNG.

"The resources and assets that we have brought to bear in the market will continue to propel us toward our goal of shipping more than 20 million navigation engine licenses during the next three years."

PND, NNG's original core business.

All major OS's supported.

One of NNG's unique selling points is the capability to offer its partners a wide range of flexible navigation solutions. The iGO Navigation engine – the heart of all navigation solutions – can be customized and composed to provide either 100% turn-key, custom-built or one of a selection of comprehensive SDKs. NNG continues to invest heavily in the aggregation of a wide selection of content and services in the industry, enabling the company to deliver not only navigation solutions but also content and location aware solutions.

NNG also offers a user-friendly end-to-end solution to meet consumer expectations for up to date content, as well as connected services. With the Naviextras.com portal NNG created and deployed a full ecosystem for aggregating content and services from nearly 80 map and other content providers globally, with coverage of over 115 countries. After compiling the content and services, the NNG delivers them through a flexible commercial environment directly into the embedded software in the car. This portal offers online map and content updates to over 1.4 million users worldwide, providing support for more than a thousand different device types from more than 220 brands around the world. In the first half of 2012, Naviextras.com posted a significant 102% increase in revenue compared to the same the period in 2011.

Through a recent global partnership with Vodafone, NNG has extended its services range for the automotive industry. NNG can now bundle a Vodafone M2M SIM card with its software products. This solution includes software, content, services and global localization. Next to the development of connected features – such as Online Traffic, Online Alert Points and Local Search – NNG is now able to deliver a complete connectivity solution to its OEM partners.

Highlighting the company's resourcefulness, NNG's Senior VP of Automotive OEM Sales, Jim Nardulli says: "We saw early on that it's one thing to find content and services, but it's another thing to be able to go out and actually deliver those all the way. Not just stop at some point. We handle the commercial side on both ends: managing contracts around the world at the wholesale level and managing the e-commerce on the consumer level on the delivery. All of this is done on a white label basis – we do it for some of the largest brands on earth, which allows us to maintain our direct-to-OEM relationships".

This strategic shift helped to perpetuate a solid path for NNG, with a total of 20 million licenses expected to be shipped to partners in the next three years - the majority connected to automotive sales. Eighty percent of NNG's business comes from the automotive industry and the company forecasts a 60% increase in gross margin for 2012, confirming the upward trend due to sales to automotive industry partners.

Despite the declining global demand for PNDs, the company has maintained its legacy revenues from consumer markets, with a strong focus on emerging markets. NNG has also expanded its global footprint to react more quickly to market demands. Asia markets are now directly in the company's focus, with new regional offices in India and China which provide localized expertise in those markets.

The company plans to enter the Japanese market as its next step in its' globalization effort. This fast-growing company has also moved this fall to a new headquarters building in Budapest to accommodate its expanding number of experts in software development. The software company starts 2013 with 400 highly competent employees in a bright and shiny new office – ready to take on the next challenge, it says. AI

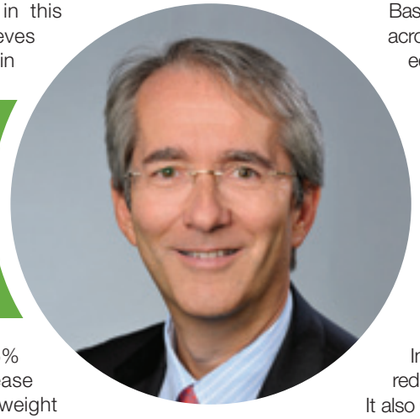
"Vehicle electrification offers us a unique growth opportunity, and some examples of these new applications can be seen in our high-performance housing materials used in battery systems and charging stations."

Future materials for **e-mobility**

By: Lenny Case

Major motor manufacturers, governments and other organizations have announced their deeper commitments to a future of e-mobility, and some predict that 10% of the world's cars will be powered electrically by 2020.

Much effort is being directed to improving the performance and life of batteries, but innovative materials hold an additional key to unlocking the potential. Plastics will play a big part in this mix due to their light weight, efficiency, durability, and appearance. One company active in this area is Bayer MaterialScience, which believes the percentage of polymer materials in automotive applications will rise from 15% today to at least 25% by 2020. This increase will come from the use of more lightweight materials in construction, and from automotive manufacturing advances which are producing better quality components, as well as improved safety and comfort.



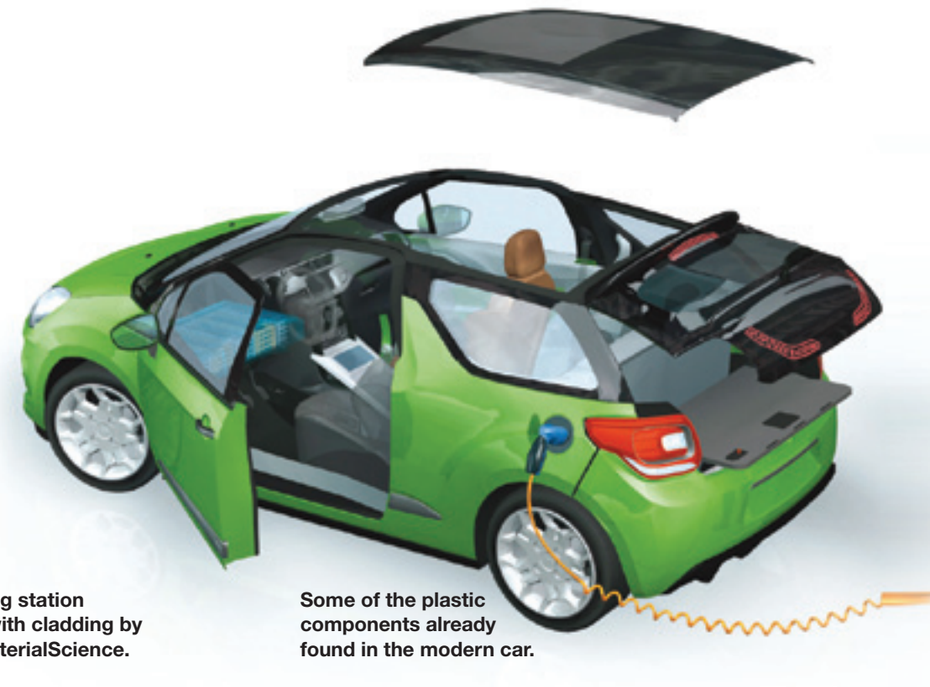
Patrick Thomas, CEO
Bayer MaterialScience

Bayer MaterialScience expects the percentage of plastics in automotive applications will rise because of the composition of new features such as advanced driver assistance systems, cameras, sensors and features for pedestrian safety in conventional and e-vehicles. The rise will not come only through the incremental introduction of innovative materials and applications. Moves to e-mobility, the company says, will automatically see an increase in the use of plastics. It predicts that e-vehicles will not need the metal used in today's conventional engines, gearing mechanisms and exhaust systems, for example. This automatically increases the percentage of plastics, independent of their increased use through other innovative applications in e-vehicles.

Based in Germany, with 30 production sites across the globe and nearly 15,000 employees, Bayer MaterialScience focuses on the manufacture of polymer materials and the development of sustainable solutions for products used in various industries. Its automotive materials are used in composite underbodies, roof modules, load floors, exterior body panels, window glazing, headliners and interior components. Bayer MaterialScience is committed to e-mobility through its development of high-performance housing materials for battery systems and charging stations. Insulation solutions from the company help reduce heating and cooling loads in e-vehicles. It also supplies a range of flame-retardant polycarbonate blends, crash-absorbing polyurethane structural foams, and carbon-fiber composites in battery systems.

Chief executive officer of Bayer MaterialScience's since 2007 is Patrick Thomas, who is also president of the European plastics manufacturers association PlasticsEurope, and chairman of the steering committee of the Oxford University Business Economics Programme.

A charging station column with cladding by Bayer MaterialScience.



Some of the plastic components already found in the modern car.

Automotive Industries (AI) asked him what role he sees Bayer MaterialScience playing in the electric mobility arena.

Thomas: Electric mobility fits together perfectly with the energy efficiency theme we are addressing at Bayer MaterialScience. Vehicle electrification offers us a unique growth opportunity, and some examples of these new applications can be seen in our high-performance housing materials used in battery systems and charging stations.

AI: What are some of the challenges facing automakers in the electric vehicle sector?

Thomas: Even though EVs are clearly superior to conventional cars in powertrain efficiency – more than 90% compared to 22% – their energy source cannot compete yet with fuel in energy density. Our insulation and lightweight solutions can help to maximize the energy available for driving by reducing heating and cooling loads, or increase the capacity of the battery installed by compensating battery weight.

AI: What role do polycarbonates have in the battery system?

Thomas: Charging infrastructure is generally recognized as being one of the key areas that needs attention before EVs become widely accepted. Here, Bayer MaterialScience offers different polyurethane and polycarbonate material grades covering a broad field of charging station housing applications, from the wall-box in your private garage to the charging column in a public area.

AI: Tell us a little about your e-mobility research.

Thomas: We want to be a solution provider to the global automotive industry – that's why we are focusing on the automotive industry as a whole, covering all degrees of drive train electrification – ICE, HEV, PHEV, BEV and FCEV. Most of our solutions can be applied to non-EVs as well, contributing in various ways to fuel savings.

AI: How has this translated into e-mobility product development?

Thomas: The higher the degree of vehicle electrification, the more relevant the impact of heating and cooling loads becomes. This is because there is no longer waste heat/power from the internal combustion engine, and energy taken from the traction battery heavily shortens driving range. That's why we are developing thermal management solutions such as polyurethane insulation foams and polycarbonate glazing – very similar to existing approaches in, for example, buildings and refrigerators.

AI: What breakthroughs can we expect soon?

Thomas: One thing about breakthroughs is that you don't know about them before they happen. A potential candidate currently being discussed in the industry is carbon-fiber reinforced plastics (CFRPs). In the past, the use of this ultra-lightweight composite material has been limited for cost reasons. With polyurethane, we are offering a fast-curing resin material that could help to reduce cycle times and therefore production costs. This represents an interesting alternative to the current epoxy material and production process. AI

"We want to be a solution provider to the global automotive industry – that's why we are focusing on the automotive industry as a whole, covering all degrees of drive train electrification."

innovation

TPE and **PVC compounds** made to order

By: James Hilton

Ongoing research into advanced materials coupled with experience built up over decades means that OEMs and Tier suppliers can have products made to order.

A leading example of the capabilities of suppliers is Teknor Apex, an international custom compounder of plastics headquartered in Rhode Island, U.S.A. It has a database of more than 40,000 compound formulations, and has amassed company-wide expertise in major markets for compounds markets, including the automotive sector.

Ger Vroomen, Senior Automotive Market Manager at Teknor Apex.

Automotive Industries (AI) asked Ger Vroomen, Senior Automotive Market Manager at Teknor Apex, how the company's TPE and PVC divisions continue to rise to meet the challenges of the auto industry.

Vroomen: The company consistently invests in research to develop new products and help customers meet challenges arising from emerging regulations or changes in the marketplace. We enjoy long-term relationships with many customers. These relationships enable us to anticipate the changing needs of the industry.

AI: How customized are your products?

Vroomen: Instead of relying on what is already available in our product range that might provide a solution for a customer, we ask the customer to specify the requirements of an application and then seek to develop exactly the right compound formulation for it. A timely example of solving customer problems involves our Nylon division. There has been a worldwide shortage of polyamide 12, a polymer whose largest application is in fuel-handling components of automobiles. On behalf of a customer we formulated two compounds based on polyamide 6 / 12 that provide comparable chemical resistance—a critical property in fuel systems—and minimal moisture absorption. One of the new compounds is reinforced with carbon fibers, whose electrical conductivity provides antistatic properties; the other has glass fiber reinforcement, for the strength and stiffness required in the bodies of fuel line connectors.

AI: Tell us a little about Teknor Apex' expertise in the automotive sector.

The BYD M6 multi-purpose vehicle for which Teknor Apex developed new TPV seals to replace EPDM rubber.

A typical window seal.

Boots and bellows made with compounds developed by Teknor Apex.

Vroomen: Automotive has long been a major market for all of our many product families, and in the case of vulcanizate elastomers and nylon compounds, it has been the largest market by far. In serving automotive customers, we take a coordinated approach that embraces all of our product capabilities, as well as our worldwide network of compounding plants, engineering support centers, and testing laboratories.

AI: What makes your Sarlink® TPE's so effective?

Vroomen: As olefin materials, Sarlink TPVs permit coextrusion and over-molding applications with rigid substrates, making possible innovative designs that save costs and weight. And as thermoplastics, they provide greater design freedom and productivity than thermoset rubber, plus the advantage of recyclability.

We have developed a new range of TPE materials for all kind of sealing system applications. These products will result in further system cost reduction in combination with robustness processing. In addition, the product engineer will enjoy more design flexibility.

Our production-grade prototype equipment enables us to run everything from a simple single-durometer extrusion to complex multi-extrusions with end-of-line finishing or corner molding, duplicating any real processing condition. By proving out concepts utilizing our time and equipment, customers can greatly reduce the launch burden for a new product.

As an example of how we work with automotive sealing customer is a the roof seal on a multi-purpose vehicle built by the Chinese OEM BYD. The company came to help save weight and reduce manufacturing cost. In a two-year cooperative program between BYD and our Sarlink team in Shanghai, we developed BYD's first TPV seals. The seals produced from Sarlink TPV weigh 25% less, saving a total of 0.15 kg per vehicle over EPDM rubber. At the same time, the TPV seals provide the economic and environmental advantages of using a thermoplastic. Sarlink TPV has been replacing EPDM because it eliminates the labor- and energy-intensive vulcanization step required in the processing of thermoset rubber. Another important advantage is the recyclability of both process scrap and finished components.

> "Rather than sell the customer a certain type of compound because it's the only type we offer, we can select among multiple types to ensure that what we offer is exactly the right compound for the job."

Sarlink TPV compounds also provide outstanding rubber-like elasticity with physical properties superior to those of many commonly used TPEs for under-hood applications. These properties include excellent long term resistance to heat, automotive fluids, oils, and road grime. Typical applications are plugs and fasteners, boots and bellows, bumpers and mechanical stops, air management systems, and mechanical cable and line jackets.

AI: What are some of the features of Tekbond®?

Vroomen: The Tekbond range of TPEs for over-molding is based on a variety of proprietary chemistries, enabling Teknor Apex to provide compounds for adherence to a variety of styrenic and engineering thermoplastic substrates, such as polystyrene, ABS, polycarbonate, polycarbonate/ABS alloys, nylon, PBT, and COPE. Customers can combine elasticity and rigidity in a single part, producing innovative designs that save weight and eliminate assembly. A simple example is that of a rigid housing with a molded-in TPE gasket. I should add that two of our other broad TPE families, Monprene® and Sarlink®, include compounds that function effectively in over-molding and adhere to polyolefin substrates such as polypropylene and polyethylene.

AI: What are some of the future technologies for the automotive sector?

Vroomen: Teknor Apex is one of the few TPE compounders which has access to the relatively new OBC products. In cooperation with Dow Chemical we are exploring the use of these new TPE materials for all kinds of automotive applications. The acquisition of Sarlink from DSM provided Teknor Apex with state of the art dynamic vulcanization technology. This technology, combined with existing compounding technology combining different chemistries, has provided interesting new TPE materials for a wide variety of markets.

There are clear interests in bio based TPE materials in the automotive industry. Teknor Apex already anticipated on this and a relatively new business unit within the company is currently developing several bio based concepts. The first bio based PVC is already active in the market.

AI: How do you fulfill customers' requirements across the globe in the shortest possible time?

Vroomen: We coordinate our efforts in all of the world's regions. This enables us to draw on the company's extensive automotive industry experience in Europe, the Americas, and Asia to utilize engineering support and laboratory resources in all three regions, and to manufacture any compound anywhere, providing the same formulation for a customer no matter where in the world that customer operates plants. AI

From **lighting** breakthroughs to **traffic management**

By: Alan Tran

Car manufacturers are making greater use of ambient LED lighting as a differentiator to enhance the driving experience. OEMs are able to support their car brand via the color and styling of the interior lighting, while dealers can offer consumers the option of customizing the lighting settings.

In a recent technological breakthrough to support this trend, the Netherlands-based NXP Semiconductors introduced a compact integrated UJA1018 chip that supports cost-efficient and flexible LED ambient lighting applications in vehicles. "With the UJA1018 and its unique Node Position Detection technology based on LIN switch, NXP enables car OEMs to offer personalized ambient lighting solutions to end consumers. At the same time, it saves system costs and simplifies logistics for both OEMs and Tier1 suppliers," says Toni Versluijs, general manager of In-Vehicle Networking, NXP Semiconductors.

NXP has also started testing a next-gen congestion management system in Singapore. Cars equipped with NXP's 3.5G telematics solution ATOP (Automotive Telematics On-board unit Platform) are piloting a solution for wirelessly collecting real-time traffic data via 3.5G mobile broadband. NXP technology can wirelessly communicate with other cars and traffic signs to warn drivers of dangers ahead and advise on optimum speed.

Drue Freeman, Senior Vice President, Global Automotive Sales and Marketing at NXP Semiconductors

Automotive Industries (AI) asked Drue Freeman, Senior Vice President, Global Automotive Sales and Marketing at NXP Semiconductors, to tell our readers more about the Connected Key concept.

Freeman: The Connected Key is an important element in the NXP Connects the Car strategy to effectively enable remote car management. The launch of NXP's KEyLink Lite was timed to take advantage of the growing popularity and availability of NFC (near field communication) in many smartphones. With KEyLink Lite, drivers are able to simply wave their car key over an NFC-compliant mobile device to access essential and useful car data. Here's a few examples:

- Car Finder – The car key records the GPS coordinates of your car's last parking position, which can be read by an NFC-compliant mobile phone
- Route Planner – Enter your destination while sitting comfortably in front of a PC at home and transfer the data into the car key via NFC. Once you are inside the car, your destination will be automatically uploaded to the in-car navigation system.
- Car Status and Service Data Management – Before stepping out from your home or office, you can find out how much fuel is in your car for your next journey – by simply waving your car key over your NFC-compliant mobile phone. And, your car service history is saved on your KEyLink Lite-powered 'smart' car key.
- Fleet Management – Report trip computer data and mileage to the counter personnel, by simply reading the data from the key.
- Car Self-Diagnosis – Transfer diagnostic data from your car to a PC via the car key, then upload it to a service website and run a diagnostic analysis in seconds.
- Car Personalization – Car manufacturers can pre-fit cars with upgraded services, which can later be unlocked in the field.

And this is just the beginning. There will be many more convenient applications to come in the future for connected car keys.

AI: NXP has just launched the world's smallest car key chip – give us some details.

Freeman: Our new NCF2960 is indeed the world's smallest combo solution for automotive keyless entry with immobilizer functions. The chip is 44% smaller than previous units, requiring only 4-mm x 4-mm of board space. This provides key fob manufacturers with maximum design freedom. The chip features maximum reliability through RF multi-channel capability for frequency hopping. And, NXP's NCF2960 features stabilized output power in order to minimize the impact of varying battery voltage and temperatures.

AI: What do you see as the biggest challenges facing connected mobility?

Freeman: First, connected mobility requires a complex infrastructure. It cannot be achieved by one or even a few companies, but needs a whole ecosystem – along with technology partnerships, extensive field trials, and standardization. All of these requirements are currently being addressed and are underway in the industry, but solutions will not be found overnight. As cars become increasingly connected to infrastructure, the "cloud" and even to each other, new players start to enter the automotive ecosystem. IT, networking, wireless infrastructure, telecom providers, software, and back-office infrastructure companies are all becoming part of the ecosystem and bringing changes in the traditional supply chains. Another big challenge is security. Eventually, every newly built car will have full internet access. This means that cars will become increasingly vulnerable to attacks and manipulation attempts. Secure identification of car drivers is a must for payment applications, such as in tolling or parking systems, or with EV charging stations or car sharing. Other functions that need to be protected against illegal access include remote software updates, personal data, and GPS information.

Stylized ambient lighting differentiates this Passat from the rest of its sector.

The NXP Automotive Telematics On-board unit Platform (ATOP).

AI: What have been some of the developments with the Ethernet consortium co-founded by NXP – the "OPEN Alliance"?

Freeman: NXP co-founded OPEN Alliance in order to roll out the BroadR-Reach automotive Ethernet technology and establish it as a de-facto standard. BroadR-Reach enables 100 Mbps Ethernet over one single unshielded twisted pair cable, thereby meeting both cost and EMC criteria of carmakers. OPEN Alliance has grown within nine months from a handful of promoters to an international alliance with over 70 members, including car makers from around the world. The OPEN Alliance has Technical Committees that are addressing specification, cables, connectors, common mode chokes, and many other system requirements. An IEEE working group for a reduced-pair Gigabit PHY has just been initiated.

AI: What makes your new chip for ambient lighting unique?

Freeman: It boils down to a very simple answer: we make the lives of LED ambient lighting module makers a lot easier. Up to now, lighting modules have had to be programmed during the assembly process. Not only does this irrevocably "fix" the modules' colors, it also means complex and costly logistics for manufacturers. Our new chip UJA1018 for LIN networks uses a LIN switch which enables LED modules to be individually programmed AFTER being installed in the car.

AI: What about your SSL IC drivers for exterior lighting?

Freeman: Up to now, car manufacturers had to rely on complex, expensive driver ICs which had been primarily designed for the consumer industry. The ASL10xxNTK and ASL10xxPTK LED driver ICs from NXP integrate the required core functionality such as direct LED temperature feedback, LED fault detection, internal pulse-width modulation control for dimming, and short circuit protection – all on an automotive-qualified analog mixed-signal platform in a compact 14-pin package.

AI: How important is the Singapore traffic congestion management trial?

Freeman: Singapore's world-class infrastructure is the ideal test bed for intelligent traffic solutions as it faces the mobility challenges of today's global megacities and aims to reduce pollution and congestion. During the Singapore trial, cars equipped with ATOP – NXP's telematics on-board unit platform - wirelessly collect real-time traffic data via 3.5G mobile broadband. Globally, we see enormous interest in such traffic management solutions – from simple road pricing to complex traffic management systems. Asia, with its enormous traffic challenges, is a key driver for making these concepts a reality. Next to traffic management, governments around the world are seeking to improve road safety. The technologies to achieve this – such as telematics and car-to-car and car-to-infrastructure communications - already exist today, and NXP together with other companies have been demonstrating this capability under real-world conditions in global field trials, such as simTD in Germany, ScoreF in France, or the "Safety Pilot Model Deployment" project sponsored by the U.S. Department of Transportation. NXP closely works with Cohda Wireless on these solutions. Longer term, I am absolutely convinced that cars will be in constant communication with each other and with the roadside infrastructure via IEEE 802.11p wireless networks, thereby drastically reducing the number of road accidents. Safety applications enabled by car-to-car and car-to-infrastructure communications include forward collision warning, emergency brake light warning, blind spot or lane-change warning, do not pass warning, control loss warning, and many more.

I am personally very excited that NXP is participating in these trials because they will ultimately contribute to saving lives and reducing traffic congestion and energy consumption. This is what NXP Connects the Car is all about. What can be more important than that? AI

Compressors supplying clean air to a plant.

innovation

Sustainable air for the auto industry

By: James Hilton

Advances in the design of air supply systems are helping auto assemblers and component manufacturers to reduce costs and their carbon footprint through savings on power.

An example is the new-generation compressors from Atlas Copco which are designed to use less electricity. The demand for compressed air in production and assembly lines is constantly fluctuating. Through a combination of fixed and variable speed drive compressors, linked to a central controller, air fluctuations can be optimized and idle time eliminated. Demand-based controllers ensure that all consumers are supplied with an optimized air flow. Further overall savings are made by using the heat generated by the compressors for shower water and other applications.

Another of Atlas Copco's innovations is the development of oil-free air compressors for applications such as the painting of car bodies, where the presence of any oil in the air can cause beading and negatively affect the quality and finish of the paint. Oil-free air is also used for surface preparations prior to applying other types of finishing layers. The robots connected to the Atlas Copco oil-free air compressors monitor air quality, as the presence of oil and sludge in the compresses air can hamper their operations, resulting in production stoppages and other problems.

Stephan Kuhn, President, Compressors Technique, Atlas Copco Airpower N.V.

Automotive Industries (AI) asked Stephan Kuhn, President, Compressors Technique, Atlas Copco Airpower N.V. to briefly describe some of the services and products offered to the auto industry.

Kuhn: Atlas Copco is probably the only supplier able to offer almost every compressed air solution for the automotive industry – from compressors to complete Airnet systems, power tools and assembly systems. The extensive product and service package we offer is built on a strong tradition of innovation in combination with our many years of experience. Atlas Copco is a business built on nearly 140 years of innovation, and we remain an innovation leader. Our oil-free compressors serve as good examples of this. The advantages of our oil-free technology have proven very hard to beat. Another strong point is our global organization. We are always close to our customers, serving them out of well over a hundred of own customer and service centers around the world.

AI: What are some of the latest products you have developed that will help the automotive sector?

Kuhn: Atlas Copco's compressors offer outstanding performance in oil-free air efficiency An example of this is the innovative high-speed drive centrifugal compressor ZH350+ designed to meet the high demands and specific needs of the automotive industry, and which offers outstanding performance and energy savings compared to conventional turbo compressors.

The newly introduced GA 37-90 VSD oil-injected screw compressor range is extremely interesting to the automotive industry. The compressors, ranging from 30 to 90kW, and are equipped with a dedicated Variable Speed Drive (VSD) motor which matches the compressor's output to the actual demand. This way, the compressor can achieve on average 35% energy savings and a life cycle cost reduction of up to 22%. In compressor design, sustainability is not only producing energy-efficient products, it also involves the manufacturing process and customer productivity. Sustainability in design translates into the use of sustainable components. The GA's integrated dryer makes use of R410A, an environmentally-friendly refrigerant that does not contribute to ozone depletion. This type of refrigerant also reduces the dryer's power consumption by 50%.

GA 37 Compressor. This state-of-the-art oil-injected screw compressor, including a Variable Speed Drive variant.

But, it's not always the heavy equipment that makes the difference. Compressors and dryers can be connected to central controllers by means of a widely used CAN network. The controller regulates the air net pressure by starting/stopping the different sizes of machines and selecting their optimal operating points. Furthermore, it helps to keep the air net pressure on the lowest possible level in order to gain additional energy savings. For example: lowering the air net pressure by 1 bar reduces not only the energy consumption by 7% but also air leakages by 13%.

AI: What are some of the advantages for automotive OEMs in using Atlas Copco's compressed air products and services for applications such as painting?

Kuhn: Our customers in automotive industries demand the highest availability and, especially for painting, a 100% oil free air supply. Oil-free air is an area where we have an unmatched offer that really makes the difference for customers. In addition, our engineers and application experts offer a vast pool of knowledge and expertise to our customers.

AI: What are some of the challenges facing automotive OEMs today and how can your company help them meet these challenges?

The ES 16 controller can be connected with up to 16 compressors.

Kuhn: To make sure that all processes are as efficient as possible in terms of energy use will be of key importance for companies in order to stay competitive, but also in order to comply with pollution legislation and secure sustainable operations. At Atlas Copco we have set aggressive targets both for our products and our own operations in terms of energy efficiency. If you compare today's average energy consumption to run an Atlas Copco compressor, it is only 10% compared to the technology in the beginning of the 20th century. The need for even better solutions will not stop – and we are working at high speed, and with a constant eye towards the future.

AI: Your company's motto is 'committed to sustainable productivity' – please tell us how Atlas Copco achieves this goal.

Kuhn: We always take the long-term view in everything we do. Our customers need to know that they will be productive not just today or tomorrow, but also 10 years from now. Being committed to sustainable productivity covers many areas: interacting with our customers, developing innovative products, having a good, safe workplace for our employees, investing in competence development, being a good corporate citizen and developing superior products and solutions with the smallest possible environmental impact. This is why we made it again into the top 100 companies of the Dow Jones Sustainability index. We work hard every day to remain in this league. AI

Atlas Copco

Atlas Copco offers a wide range of compressed air and industrial fastening system to fit the specific needs and requirements of the highly demanding automotive industry.
Every third new car in the world is assembled with fastening tools from Atlas Copco.

Swedish-based Atlas Copco was founded in 1873 in Stockholm. It is an industrial group with world-leading positions in industrial compressors, gas and process compressors, equipment for air and gas treatment as well as air management systems. The company offers construction and mining equipment, power tools and assembly systems, specialty rental services and has an extensive global service and support network. The company has major development and manufacturing units in Sweden, Belgium, Germany, the US, Brazil China and India. Atlas Copco has a turnover of 9 Billion Euro and a global reach spanning more than 170 countries, with a workforce of 37 500 people. AI

innovation

Just in time management information helps drive business

By: Jon Knox

Software management systems are increasing in capability to help manufacturers keep pace with the fast-changing global environment in which they have to work.

An innovation leader in management software is Saphran, which was founded in 2004. The company develops software products for the automotive, aerospace, defense, high-tech, electronics, construction, industrial and general manufacturing sector. It's systems are designed for original equipment manufacturers with sales from $50 million up to $20 billion.

According to the company, some of the benefits suppliers and manufacturers have enjoyed using Saphran systems include over $10 million capital investment reduction within two months of launch, improved part level forecast accuracy 12 months in advance of actual orders, enterprise agility of less than one week to respond to disruptive events in the supply chain. Customers have also seen global customer portfolio management transformation in less than one year across 17 plants; merger and acquisition of multi-billion dollar global integration in less than three months; and business plans installed and functional in two weeks.

Kenneth Q. Bassey, founder and CEO of Saphran.

"Our systems narrow the gap between business planning and actual performance. We provide senior executives with comprehensive global business-management capabilities for forecasting, planning and quoting," says Kenneth Bassey, founder and CEO of Saphran. The systems align multiple views of historical data, future sales, production outlooks, market analysis and internal metrics for quotes, forecasts, orders and shipments.

"The real innovation is the ability to integrate market intelligence and future forecasts real-time with internal operations data in order to model various business scenarios. Management has the ability to evaluate and track those optional scenarios including key predictive performance indicators (KPPI™'s) in order to address future changing business conditions and meet future opportunities with agility," he says.

Saphran's software programs can be implemented quickly, and typically pay for themselves within three to six months. They also help protect and increase profit margins. Key products include PartBase™ active demand forecasting, ConnectBase™ real-time integration, CostBase™ margin management, IntelligenceBase™ DW/Cube Analytics, the Saphran Dashboard powered by Qlikview, as well as various other "add-on tools" for specific customer needs. The Real-Time Management Dashboard provides drill down access to elements that impact a corporation's business performance.

PartBase™ enables automotive suppliers and OEMS to optimize profitability and manage risk by improving the process of planning, and by forecasting throughout the entire life cycle of a supplier's product portfolio. QuoteBase™ enables automotive suppliers and OEMS to reduce cycle time, decrease errors, and increase their ability to efficiently quote, manage change requests, and perform cost planning.

Saphran's Closed-Loop Commercial Management (CLCM) strategic business planning software combines the benefits of its PartBase™ forecasting and cost planning module with its QuoteBase™ job costing and quotation module, and then layers on a suite of additional control and integration modules to create the ultimate manufacturing enterprise management tool to predict margins while reducing risks.

Another capability is the ability to produce a composite forecast which aligns market trends and market share coupled with current customer orders and actual sales to date. An interactive management dashboard powered by QlikView is created through Saphran's Dynamic Intelligence Layer, which is built on a framework of external market share projections, internal operating data and proprietary algorithms.

This enables a company to achieve its profit plans and reduce risk through intelligent monitoring of key predictive performance indicators on the management dashboard. The management dashboard has drilldown capability, which allows deeper investigation into causal factors and forecasts by plant, product category, platform or part level.

Saphran prides itself on helping its clients gain significant advantages.

Automotive Industries (AI) asked Kenneth Q. Bassey, founder and CEO of Saphran Solutions, what is the secret of Saphran's double digit growth over the past few years.

Bassey: Staying focused on the future with enhancements to meet our clients' and the market needs.

AI: How do your products help automotive OEMs in managing their supply chains? Please give us some examples.

How the Saphran system integrates into the business cycle.

> "Our systems narrow the gap between business planning and actual performance."

Bassey: With Saphran in place, automotive original equipment manufacturers OEMs have the unique ability to view market intelligence in an "active" vs. passive manner in parallel with their internal operations and planning data. They can develop working scenarios that allow them to be more reactive to dynamic business conditions and benefit from new opportunities.

AI: What are some of the challenges faced by automotive OEMs that Saphran has helped solve?

Bassey: Saphran's clients continue to address margin and market share challenges. Our software allows the OEMs to view the current changes and sense future trends in order to actively adjust business course in order to meet the business plans and objectives.

AI: How do the issues faced by the automotive sector compare to those faced by other industries?

Bassey: Saphran finds that the other industry sectors have many of the same challenges. Most sectors are in either a growth stage or are reformulating by merging or acquiring new businesses. Their systems are inflexible and costly to enhance. The organization becomes constrained based on the systems in place, and what it takes in time and resources to consolidate/synchronize.

AI: Tell us about your Dynamic Intelligence Layer™ and Closed Loop Integration & Predictive Analytics™ solutions. What makes them unique?

Bassey: The systems of record that are in place for running operations can be many different enterprise systems that do not communicate with each other. Saphran extracts key content out of those systems and reconciles and synchronizes it with forecasts and future orders. We call that aggregated view the new intelligence layer that enables managers to quickly adapt and manage new opportunities. Saphran's solution helps companies to focus on making informed decisions without being bogged down by manual data manipulation.

AI: How can Saphran help in controlling supply chain disruptions?

Bassey: Disruptions are a new normal in our environment, and Saphran brings together the external market intelligence with the internal planning and operating plans to drive scenario analysis. Saphran allows those scenarios to provide pessimistic and optimistic views of business. The company experts monitor those business conditions for trends/shifts and quickly bring this to management for further decisions on adjustment. With external market intelligence of exchange rate changes, regional commodity prices, market data coupled with internal status our clients can quickly make better informed decisions.

AI: Please explain the concept of a 'management dashboard' – and what are some of the future improvements Saphran plans for this concept.

Bassey: The management dashboard is powered by an analytics cube representing data current to the operations and future plans of the company and the market. Saphran's dashboard allows management to better understand the change in business conditions by providing an interactive drilldown for answers. This helps quickly to spotlight the elements of the business impacting business performance. AI

Saphran strengthens team

Saphran has added senior industry experts to the management team and has expanded product development to meet client requests for new demand components such as an interactive management dashboard and expanded cost and margin analysis.

Noelle Schiffer is the new vice president of sales and business development at Saphran Solutions - she was previously the director of marketing for OESA, the trade association for suppliers. Schiffer was responsible for automotive parts for Magna International and headed up sales efforts for the Engineering Society of Detroit.

Susan Lines is the new vice president of operations at Saphran Solutions. She was previously a senior manager at Deutsche Telekom's T-Systems North America with previous experience at Cummins Engine Company and gedas, Inc. the IT Division of Volkswagen NA. Lines is responsible for analyst relations, alliances, marketing communications, and operational support.

Earlier, Joe Borruso was appointed to the advisory board of Saphran to assist the company in the areas of strategic planning and new business development. Borruso's previous experience includes serving as CEO, HELLA NA and SVP of sales for the Bosch Automotive Group.

In May 2012 Jack Szczepaniuk was named business development manager at Saphran. Szczepaniuk was a global marketing and sales analyst for ArvinMeritor's Light Vehicle Systems group. AI

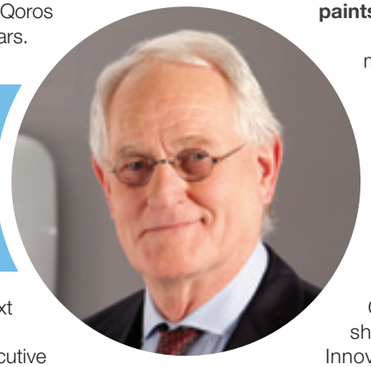
> “Out of the existing paint shop suppliers we chose Geico due to their willingness to cooperate closely with us and to aggressively work towards our cost target.”

Finding **the right formula** in China

By: Jon Knox

A new generation of Chinese automotive manufacturers is moving onto the global automotive market grid. Some – like Qoros Auto – are being established as greenfields operations. Unencumbered by legacy plant and equipment, they are installing the latest and best in manufacturing technology.

One of the suppliers is Geico, which three years ago turned its focus towards penetrating the Chinese automotive market. A leader in the field of paintshop design, the firm analyzes both the painting process and the paint shop as an integrated system. Geico’s focus on China paid off, and within a short space of time, the company had formed a partnership with Qoros Auto Company – a new automotive manufacturer formed through a 50:50 joint venture between Chery Automobile and Israel Corporation. Headquartered in Shanghai, Qoros currently has an annual capacity of 200,000 cars.



Volker Steinwascher, Vice Chairman of Qoros.

This will increase to 350,000 units over the next two years.

According to a former Volkswagen executive Volker Steinwascher, who serves Qoros as vice chairman, the company is currently developing three compact vehicles. The brand is expected to hit the market in 2013 in China and Western Europe. Qoros engines are being designed by Chery, optimized by AVL in Austria, built and delivered by Chery. According to Qoros Auto, the new fully automated paintshop in Changshu, designed by Geico, is one of the most modern in the world, with 33% saving of energy consumption and CO_2 emissions. Many of Geico’s eco-friendly solutions were developed together with its customers, amongst which, J-Flex (rotating dipping system) and Dryspin (dry scrubber) are used at Qoros plant.

Automotive Industries (AI) spoke to Friedrich Major, Executive Director of Manufacturing & Logistics at Qoros, and asked him what makes the newly installed paintshop one of the most modern in China.

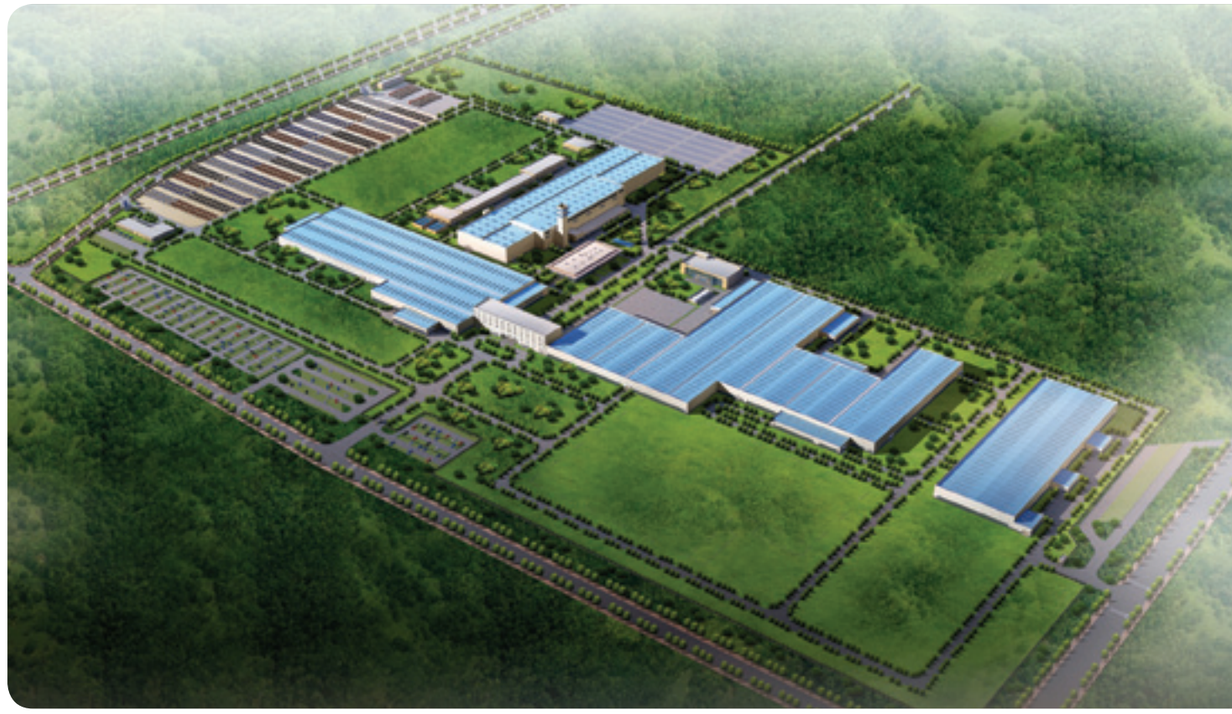
Major: As a new auto company it was mandatory for us to launch state of the art equipment which is highly energy efficient and environmentally friendly. These requirements were made clear to all suppliers during the planning stages of the new plant. Out of the existing paint shop suppliers we chose Geico due to their willingness to cooperate closely with us and to aggressively work towards our cost target. Technology wise, Geico proved their innovative capability and showcased new technologies in their Pardis Innovation Center.

Within our new paint shop, we feature several new technologies in a combination which - to the best of our knowledge - is unknown in China so far. As state of the art requires, we run waterborne instead of solvent borne. We operate the J-FLEX technology from Geico, which rotates the vehicle body in the PT/ED bath. The avoidance of primer allows for a compact process using less space and energy. Geico’s dry scrubber solution Dryspin, a powder-based eliminator, cleans the waste air instead of using water, which gives us another advantage.

AI: What influenced you most in the choice of Geico as Qoros’s partner?

Major: Although Qoros was a new company with no sourcing history, under Volker Steinwascher’s leadership we assembled a highly experienced team of international executives mainly from the European and North American car industry. This team knew what criteria to use in order to get the best package for our needs. We went into the market with an open request for proposal (RFP) and a clear statement of our target cost. Our requirement for the three paint shop applicants was to deliver a concept that would be innovative, efficient and environmentally friendly as well as fall within the cost target we set.

Geico met our expectations best, especially the balance of innovation, efficiency and cost. After working together during the proposal phase, both parties developed a significant trust base to contract the project, although the final price was only adjusted after a detailed engineering phase. Beside these specifics, the total cost of ownership was a clear deciding factor including potential cost of expansion, maintenance, running cost, as well as training and education of the workforce.



An aerial view of Qoros Plant.

Friedrich Major, Executive Director of Manufacturing & Logistics at Qoros.

AI: What makes a Qoros car a green car?

Major: From the production side, we emphasize energy efficiency through the smart use of natural resources such as water and gas. An important contributor to the green character is the paint shop with all the measures already mentioned. On the waste management side, we collect centrally and recycle on site. We have also created a comfortable, environmentally friendly environment with trees and flowers outside the plant, and a central canteen to satisfy the workforce needs. When it comes to heating and cooling the workshops, we went for compromise in favor of energy efficiency – we use the steam from a nearby power plant for heating up our water.

AI: What are the parts of the Qoros plant that impact most on energy saving?

Major: Clearly the paint shop, as already mentioned, but also the utility center which provides the plant with all necessary media. AI

The car terminal in the port of Tangier, Morocco.

Morocco plugs into **global supply** chains

By: Michael Stewart

A five-year boom in automotive investments has put Morocco on track as a leading destination for automotive investments.

They are led by a billion euro Renault plant in Tangier, which is assembling the new Dacia Lodgy, and the utility vehicle Dacia Dokker. Current capacity is 170,000 vehicles, with the potential to grow to 400,000 units a year.

In a testimonial posted on the Moroccan Investment Development Agency (AMDI) website, Jacques Chauvet Leader of the Management Committee of the Euromed Region at Renault says: "The decision to install the Renault project at Tanger Med in Morocco was based on several factors: prospects related to the automotive sector in Morocco with a rapid growing equipment rate and an attractive domestic market; the wide trade zone to which Morocco provides access because of its geographical proximity to several European and African countries and opportunities offered by the Agadir Agreement; and good infrastructure conditions through primarily the Tangier Med port and the dedication of space to the exportation of Renault vehicles."

Adil Chikhi, Development Director, Moroccan Investment Development Agency (AMDI)

AI: Automotive Industries (AI) asked Adil Chikhi, Development Director, Moroccan Investment Development Agency (AMDI), what Morocco offers automotive suppliers.

Chikhi: Morocco is an ideal base from which to supply car manufacturers. There is already a market in the form of a major Renault car production plant with expected capacity of 400,000 vehicles a year. More than 40 Tier 1 and Tier 2 manufacturers are already established in Morocco. The country is geographically well situated - their market includes 27 assembly plants in the region – all within a 48 hour delivery window. Morocco also offers access to a market of a billion customers free of any custom fees thanks to 55 free trade agreements signed with the EU, the USA and Arab countries.

AI: Tell us a little about automotive investments by major OEMs – after Renault, are there any other big ticket investments on the horizon?

Chikhi: Morocco could be considered as potential destination for all major automotive OEMs. We are in constant and advanced talks with certain car manufacturers. The development of Renault's project and its second phase will attract other OEMs.

AI: What makes Morocco an ideal destination for automotive investments?

Chikhi: Agencies such as AMDI are here to help investments from the automotive sector. Investment is supported through free trade zones, or dedicated industrial parks, combined with road, rail and sea links to the major markets in the region. Add to that the availability of skilled labor, fiscal incentives and the support of banks and financial institutions. Advanced services such as engineering, logistics, and recycling are also offered.

AI: Tell us about the free trade zones such as the Tanger Free Zone – what makes them good investment destinations?

Chikhi: The Moroccan free zones offer an ideal environment for project development with regards to the presence of the potential suppliers, customers and partners that evolve under the same conditions. A free zone is an Export Processing Zone, determined from the customs territory where industrial activities and services are tax exempt – subject to certain conditions.

For example, income generated by operations located within the export free zones enjoys full corporate tax exemption during the first five years from the commencement of operations. It is then taxed at 8,75% rate for the next 20 years.

AI: What about infrastructure and services?

Chikhi: Real estate is packaged to fit the needs of investors in terms of deployment and implementation of an industrial platform. Options include:

- Rental / sale of vacant land,
- Rental / sale of buildings ready for use,
- Rental / allocation of space and office floors
- Rental / sale of bespoke buildings.

AI: What makes the Tanger Free Zone (TFZ) geographically an ideal location for automotive manufacturers?

Chikhi: TFZ, which is just 20 km from the port of Tanger, was voted the best port zone as well as the sixth best overall free zone by the FDI magazine in 2012. Tanger Automotive City is intended to be the home of Automotive OEMs in Morocco. It is part of the development of the existing industrial cluster that welcomes more than 40 tier 1 & 2 automotive suppliers covering the value chain (wiring, stamping, plastic injection) in addition to Renault's 400,000 vehicles per year capacity plant.

TFZ also offers major advantages for global players: exceptional geographical position, access to regional market with direct vicinity (27 assembly sites in less than 48 hours transit time), outstanding infrastructures meeting international standards, and attractive fiscal incentives.

AI: What are some of the government incentives for automotive investments?

Chikhi: Morocco's strategy as far as the automotive sector is concerned revolves around boosting investments from automotive suppliers who are looking to invest in low-cost countries. In addition, the country wants to establish itself as a manufacturer of specialty vehicles such as trucks, buses and coaches. This includes attractive incentives such as a 5-year corporate tax exemption for automotive companies setting up shop in the country. The government offers aid worth up to 15% (the Hassan II Fund) of the total investment to help automotive facilities set up. The government also has set in place training programs tailored to the needs of the automotive sector. AI

Moroccan investment incentives quick reference

Investment Promotion Fund:

Conditions:
- Investment above 200 million dirhams
- Creation of at least 250 permanent jobs

Incentives:
- Land assistance : a contribution up to 20% of acquisition costs
- External infrastructure : assistance of up to 5% of the total amount of the investment
- Training : a contribution of up to 20% of training costs

Hassan II Fund: maximum total assistance 30 millions dirhams and 15% of the total cost of the investment.

Conditions:
- Investment of over 10 million dirhams (excluding import duties and taxes)
- Investment in goods and equipment over 5 million dirhams (excluding import duties and taxes)

Sectors concerned:
- Manufacturing equipment for the automotive industry
- Manufacturing of components and assemblies of electronic subassemblies

Incentives:
- Land assistance : 30% of costs of land acquisition and development
- Equipment: 15% of costs of new equipment and of used equipment for the automotive sector but only for the following activities: collision materials, plastic injections and manufacturing of tools and molds (excluding taxes and import duties).

System of Free zones:

Conditions:
- At least 70% of income must be derived from exports:

Incentives:
- Corporate tax: 0% for 5 years and 8.75% for 20 years (normal rate 30%)
- Income tax: 0% for 5 years then tax reduction of 80% for 20 years
- Business tax: exemption for 15 years

General tax code:

Value added tax: exemption for 36 months for imports of capital goods, machinery and equipment for an investment above 200 million dirhams.

Import duties: exemption for 36 months from the commencement of the trading company for import duty of capital goods, machinery and equipment for an investment above 200 million dirhams.

Vehicles rolling off the Renault production line in Morocco's Tanger Free Zone.

Serving a **market** of a **billion people**

By: James Hilton

Serbia is building on its geographic position and preferred access to global markets to attract investors from the automotive sector looking for cost-effective, high-quality manufacturing bases.

The East European nation has positioned itself as a manufacturing hub for duty-free exports to a market of a billion people. The market includes the European Union, the United States of America, the Russian Federation, Kazakhstan, Turkey, South East Europe, the European Free Trade Agreement members, and Belarus. Serbia also has a vibrant local market – with a population of 7.5 million people, the country is the second-largest market in South East Europe.

Over the past 12 years, Serbia has attracted 1.6-billion Euro in foreign direct investment (FDI) into the sector, according to the Serbia Investment and Export Promotion Agency (SIEPA). The country is highly rated by international agencies. The Economist Intelligence Unit, in its forecast for Eastern Europe from 2009 to 2013, predicts that Serbia will be leading the 16 countries in the region in terms of business reforms by a wide margin. PricewaterhouseCoopers ranks Serbia as being the third-most attractive in terms of manufacturing, and seventh for services as a FDI destination among emerging economies. Ernst & Young recorded nearly 150 inward investments in Serbia in 2007, 2008 and 2009 - the second-best performance in the south-east Europe region.

New YURA plant in Nis: The new YURA plant in Nis, Serbia.

Automotive companies like the Tier 1 Streit Group have been quick to take advantage of Serbia's investor-friendly climate. The French company, which has eight production facilities worldwide has invested 6-million Euro in Serbia – with more planned – including a robotic manufacturing unit. Streit's client list includes PSA Peugeot, Citroen, Daimler, Valeo and Honeywell. Similarly, TPV Sumadija, a Slovenian company which makes parts and components for Renault, BMW, Bosch, Cimos and other leading car manufacturers, has invested 4-m Euro in Serbia since 2005. The company aims to develop a full passenger seat production facility..

The first OEM in the country is Fiat Automobili Srbija (FAS), which was established in 2008 as a joint venture agreement between Fiat Group Automobiles (67%) and the Republic of Serbia (33%). The Fiat Group invested 940-m Euro in Serbia. The Serbian government ceded the ownership of the land and the property of its Zastava plant in Kragujevac, as well as a building in Belgrade to FAS. By 2010, FAS was employing 1,000 workers, and had produced 16,000 Punto Classic units.. In 2011, FAS invested in new plant and machinery to produce two new car models, with a capacity of 200,000 units a year. Fiat 500 L cars have since started rolling off the production line.

Automotive Industries (AI) asked Bozidar Laganin, Director of the Serbia Investment and Export Promotion Agency to mention some recent successes.

Laganin: In the two years since it first set up in Serbia, South Korean company Yura Corporation has opened its fourth factory. Bosch plans to invest over 70-m Euro. Another major German company, Continental, has also started manufacturing in Serbia, We expect more German companies to follow.

FIAT 500L cars roll off the assembly line in the company's Serbia Plant.

AI: How has the global economic downturn impacted investment?

Laganin: It has affected the Serbian economy and industrial performance. But, when it comes to investment, last year Serbia attracted 2.1-bn Euro,. This is more than any other country in the region.

AI: What is the Serbian government doing to counteract the gloomy economic prognosis for Europe?

Laganin: It is aiming to further improve conditions for doing business by simplifying the procedures for investment, and providing new incentives to support industrial sectors where investment has been slower.

AI: What technological advantages does Serbia offer automotive investors?

Laganin: Serbia offers a combination of low operating costs, free trade possibilities, financial incentives and labor availability. Investment security is fully guaranteed through the Law on Foreign Investment. Important progress has been made in enabling cooperation with universities and institutes of higher learning. Serbia was granted a loan of over 200-m Euro to enhance its capacities in the domain of science and technology. The country has a long tradition in the automotive industry, which has been active in Serbia for 70 years, which means there is a quality workforce available, as well as abundance of potential suppliers to support new investors. Companies investing in high-tech, capital-intensive projects, may qualify for incentives as high as 10,000-Euro for each new job created.

AI: Will the FAS model of investment (that is, a JV between a foreign company and the government) be repeated with other automotive majors?

Laganin: The Government is definitely willing to implement the same model. Serbia holds significant potential to foster such projects and position another car producer in the Serbian market. Due to that potential, government will continue to focus on attracting another company similar to Fiat.

AI: Tell us a little about the quantum of automotive exports from Serbia, and how you see this figure growing in the future.

Laganin: As the number of investments in automotive industry in Serbia is growing, exports are following the same trend. Germany has traditionally been the biggest export destination. However, in recent years, exports have been growing in the emerging markets, such as the Russian Federation. Exports grew by 20% in 2011, and 10% for the first six months of 2012. It is expected growth will be higher than in 2011, as Fiat has started production of the 500L.

AI: How do Serbia's trade agreements with other countries benefit automotive investors?

Laganin: Through its free trade agreement with Russian Federation customs union on one side, and European Union on the other, Serbia is the only country in Europe which offers custom free export possibilities for automotive parts to both of these huge markets. Logistically, Serbia is well positioned to serve the clients from Turkey, as well, especially due to the fact that Serbia has a Free Trade Agreement with Turkey. Moreover, there are a number of free trade zones established in Serbia, where companies are exempted from paying VAT. Outside of these zones, companies may also engage in the export and import of semi-finished and finished goods without any restrictions. AI

> "Through its free trade agreement with Russian Federation customs union on one side, and European Union on the other, Serbia is the only country in Europe which offers custom free export possibilities for automotive parts to both of these huge markets."

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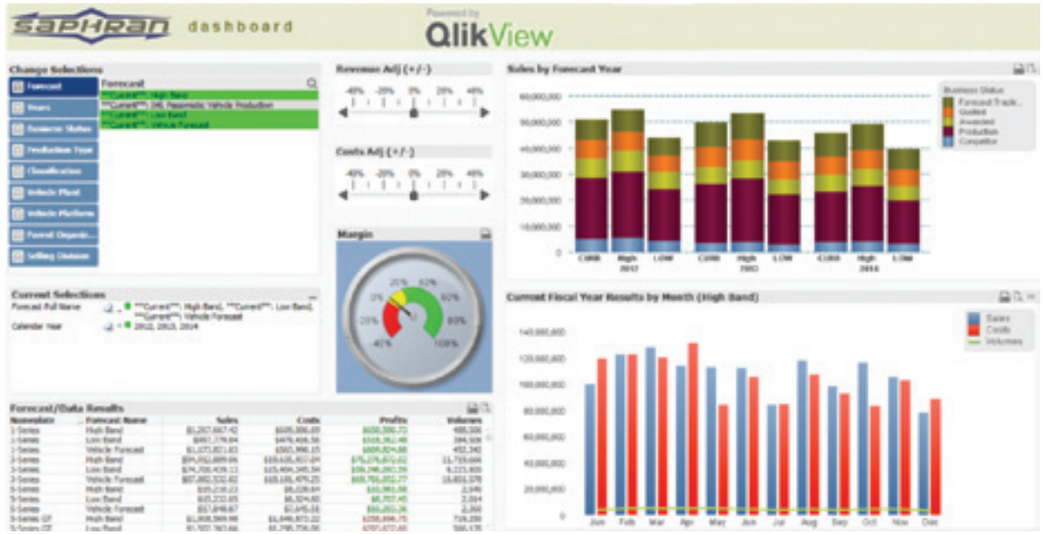

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