

Connected Car

INFOTAINMENT / TELEMATICS / INTERNET OF EVERYTHING

Issue 1 / April 2015  Video Enabled



JAGUAR LAND ROVER EMBRACES THE SMARTPHONE PLATFORM

An interview with JLR's Head of Connected Technologies & Apps, Infotainment



FORD LAUNCHES SYNC3

Interview with Ken Williams, Global HMI Supervisor, Ford



CONNECTED CAR: FLEET OPERATOR PERSPECTIVE

Talking with the people who buy most cars



2015 CONSUMER ELECTRONICS SHOW REVIEW

Is the car taking over the world's largest tech show



INTEROPERABILITY FOR THE CONNECTED CAR

Enabling the interface between the smartphone and the car

NextGen

INTRODUCTION FROM THE EDITOR

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Hello and welcome to the first issue of Connected Car magazine, which will be published quarterly from Q2 2015. This magazine will cover the area where the mobile Internet and the automotive sectors cross paths and provide news and insight in this fast developing space.

This is the right time to launch Connected Car magazine. Today, the Connected Car is a vital component of the Internet of Things, or the Internet of Everything as some call it, touching the lives of consumers across the world on a daily basis.

The connected car is, then, an exceptionally hot topic within the technology world. Every major car company understands the need to deliver connectivity, infotainment and telematics services across their range of cars – from city cars to luxury and supercars – and smartphone makers, network operators and service providers see the opportunities enabled by connecting the car to the Internet.

However, meshing the automotive and mobile technology worlds is introducing many new challenges. NextGen has developed specialised expertise that is called upon by the world's largest car companies, and helps those companies deliver the services their customers want. Therefore NextGen, as launch partner of Connected Car magazine, provide a valuable industry insider viewpoint. In the coming months we will deliver topical news and insight to our subscribers that will be interesting, informative and helpful.

Connected Car will cover news, views, reviews and features on developments in the connected car industry. This first issue includes interviews with Ford's Ken Williams, Jaguar Land Rover's Peter Virk, and Peter Cakebread, the chairman of the British Vehicle Leasing and Rental Association, a body whose members buy 50% of all the new cars registered in the UK each year.

As Andor Miles Board of NextGen comments, "Connected Car magazine provides the opportunity for Nextgen to share some of the market research we undertake globally, providing valuable insight into the key devices being launched in every global market. Furthermore our partnerships with many of the world's best known automotive brands mean we can share insights into developments at the cutting edge of infotainment and the connected car and also the trends that will shape the driving experience of tomorrow".

We will attend key events, and in this issue we include a review of automotive/connected car activity at the 2015 Consumer Electronics Show (CES), which takes place in Las Vegas each year. This show started out, as the name suggests, covering the latest developments in consumer electronics – TVs, audio systems etc. Now, cars are everywhere at CES, which cements the car's place at the world's largest electronics trade show.

We will also make regular use of streaming video content. We make plenty of our own video features – see the NextGen feature/movie on Pages 16-17 – but we will also keep a finger on the pulse of online automotive video. We will regularly share what we think are good and/or interesting connected car web video presentations.

I very much look forward to you coming along with us for the ride.



Vince Holton
Editor
Connected Car

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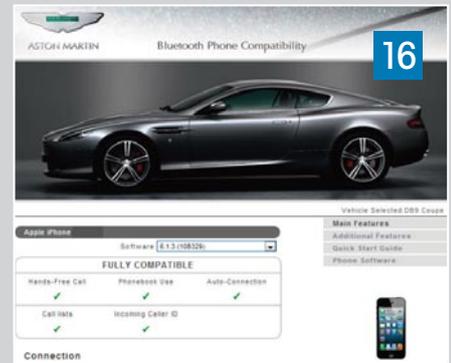
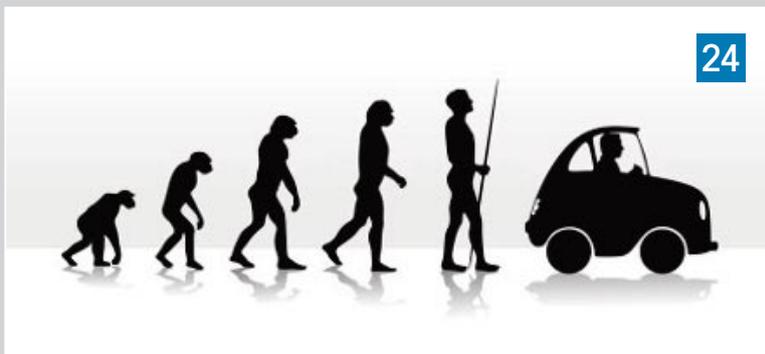
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NEWS

NEARLY EVERY CAR IS VULNERABLE TO HACKING

A new report released by US Senator Ed Markey: 'Security & Privacy Gaps Put American Drivers at Risk' highlights that only two of 16 major automotive manufacturers were able to "describe any capabilities to diagnose or meaningfully respond to an infiltration in real-time." Therefore, the report suggests, almost every new car on the market includes wireless technology that makes it vulnerable to hacking.

Markey's revelation comes soon after experts from ADAC (the German Automobile Association) announced that they managed to hack BMW's ConnectedDrive. This further justifies, says the report, an urgent need to develop new standards that will protect the data, security and privacy of connected car owners at a time when industry practices are alarmingly inconsistent and incomplete.

The report recommends these standards:

- Ensure that vehicles with wireless access points and data-collecting features are secure.
- Validate security systems using penetration testing.
- Include measures to respond real-time to hacking events.
- Require that drivers are made explicitly aware of data collection, transmission, and use.
- Ensure that drivers are able to opt out of data collection.
- Require the removal of personally identifiable information.

Mike Parris, Head of Secure Car Division at IT management support services company SBD commented: "It is good to see the call for cyber security standards within the automotive industry gaining traction. My only concern is that the development of those standards is struggling to keep up with the rapid development of connected vehicles. It is not acceptable to wait for the development of those standards before taking action. Vehicle manufacturers and their suppliers should seek out and adopt good practices wherever possible."

FIRST HACKATHON DEDICATED TO "DIGITAL MEDIA IN THE CONNECTED VEHICLE"

Bosch has also been looking into hacking, and together with the Axel Springer company Media Entrepreneurs, staged a joint hackathon during March dedicated to the connected car. "Connected Car MediaHackDay" brought together more than 120 independent software developers, designers and product visionaries at the Axel Springer Plug and Play Accelerator in Berlin. Together with Bosch and ten other interface partners, they considered new ideas to bring digital media into the car and onto the street. A jury that included Dr. Dirk Hoheisel, member of the board of management of Bosch responsible for vehicle connectivity, among other things, awarded prizes for the best app development.

Bosch granted the participants access to the mySPIN system's data interface for developing their ideas. mySPIN can integrate apps from iPhones and Android smartphones into the car. All compatible apps on the smartphone can then be displayed and operated via the vehicle's touchscreen. The onscreen design and control concept adjusts to the driving situation. By integrating the smartphone and all relevant apps into the vehicles it manufactures, Bosch suggested that an automaker can offer customers a range of services that are always up to date.

After a successful trial hackathon last fall, Bosch said it was taking advantage of this event to further pursue connected driving and collaborative product development. "It allows us to tap into the potential of innovative ideas outside Bosch and actively drive vehicle connectivity forward. This includes partnering with others across traditional industry boundaries," Hoheisel said. He noted that the joint collaboration with Axel Springer Media Entrepreneurs is proof that Bosch is thinking beyond purely technical solutions for vehicle connectivity. "Our objective is connected mobility solutions, which also include digital content," Hoheisel added.

CONNECTED CARS UNDER THE SPOTLIGHT AT NEW SMMT EVENT

There is evidence that the connected car is becoming a bigger blip on the radar for more and more people, including governmental representatives. UK automotive industry trade body the Society of Motor Manufacturers and Traders (SMMT) recently brought together automotive industry experts and government ministers for the first time to debate the future of the connected car.

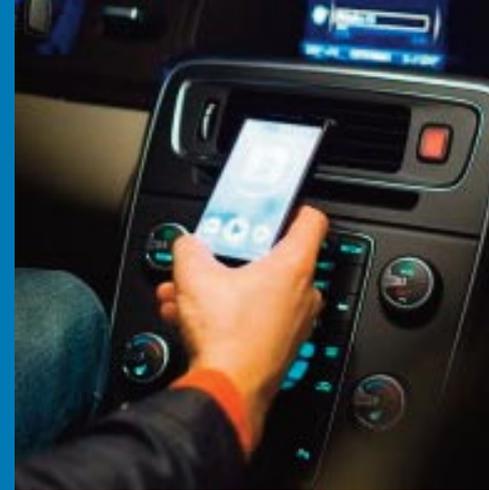
SMMTConnected, which took place at the QEII Conference Centre, London, on Thursday 26 March gave delegates a chance to hear from industry experts about the vast opportunities and challenges presented to the UK and the wider automotive sector by the rise of the connected car.

The event brought together vehicle manufacturers to showcase and discuss their latest developments in connected technology. Attendees also saw the latest connected features in action with cars on display from the likes of BMW, Jaguar Land Rover, Mercedes-Benz and Nissan.

The release of a new KPMG report into the potential future economic and jobs impact to the UK of connected and autonomous vehicles was also announced at the event.

The impressive line-up of speakers included:

- Ed Vaizey MP, Minister of State for Culture, Media and Sport
- Robert Goodwill MP, Parliamentary Under Secretary of State for Transport
- Mike Hawes, SMMT Chief Executive
- Stephan Stass, Senior Vice President, Business Unit Driver Assistance Systems, Chassis Systems Control, Robert Bosch GmbH
- Glenn Schmidt, Head of Steering and External Affairs, Sustainability Communications, BMW Group
- Dr Wolfgang Ziebart, Group Engineering Director, Jaguar Land Rover
- Takashi Shirakawa, Senior Vice President for Research and Development, Nissan Group of Europe



FORD SETS OUT CONNECTED CAR STRATEGY AT CES 2015

Mark Fields, president and CEO, Ford Motor Co used his opening keynote address to announce Ford's new Smart Mobility plan, which promises to solve today's global transportation challenges.

The plan will leverage today's connectivity, mobility and big data to operate 25 experiments around the world. Through Ford's open source hardware and software, OpenXC, Fields suggested that developers will be able to help Ford create solutions that provide a better customer experience, more flexible user-ship models and social collaboration.

"Even as we showcase connected cars and share our plans for autonomous vehicles, we are here at CES with a higher purpose," said Fields. "We are driving innovation in every part of our business to be both a product and mobility company – and, ultimately, to change the way the world moves just as our founder Henry Ford did 111 years ago."

Fields also unveiled Ford's future plans to develop the next-generation of fully autonomous cars. The company is currently testing Fusion Hybrid, a fully autonomous car that uses existing technology from Ford's semi-autonomous cars and includes LiDAR sensors to sense objects and advanced algorithms to help predict vehicle and pedestrian traffic. "Our priority is not in making marketing claims or being in a race for the first autonomous car on the road," said Fields. "Our priority is in making the first Ford autonomous vehicle accessible to the masses and truly enhancing customers' lives."

TESTING "CITY" FOR CONNECTED VEHICLES AND AUTONOMOUS DRIVING GOES OPERATIONAL

In January 2015, University of Michigan (U-M) officials announced that a US\$6.5M 32-acre simulated city centre dubbed "M City" will go operational this spring and

formally open in July 2015. M City has been expressly designed to test how automated, autonomous, and connected vehicles respond to traffic events and road conditions. The facility is a tightly controlled research environment and includes many of the structures commonly found on city roadways, including a four-lane highway, merge lanes, stoplights, intersections, roundabouts, road signs, railroad crossings, building facades, construction barrels, and eventually a mechanical pedestrian. Michigan's Department of Transportation completed M City's roadways in December 2014.

U-M officials describe M City as one-of-a-kind testing environment. The facility is being built and will be operated under the auspices of U-M's Mobility Transformation Centre (MTC), which itself is a research group within University of Michigan's Transportation Research Institute (UMTRI).

The MTC is working with government and industry groups to create a commercially viable ecosystem of connected and automated vehicles. In September 2014, a number of industry heavyweights including Toyota, Bosch, Econolite, Ford, General Motors, and Xerox, became members of the MTC's Leadership Circle. Each Leadership Circle member will contribute a total of US\$1 million over 3 years to support the MTC and its programs.

BROADCOM GROWS CONNECTED CAR PORTFOLIO WITH AUTOMOTIVE NFC CHIP

Broadcom has expanded its connected car device offerings with the introduction of a new automotive-grade Near Field Communications (NFC) chip. The highly-integrated chip with tap-to-connect technology is claimed to simplify the set-up process for mobile device connectivity within the vehicle and enables comfort and convenience applications such as keyless entry and vehicle settings.

Wireless connectivity inside the car is a critical requirement in transferring content

from mobile devices to vehicle infotainment systems. Using NFC technology, drivers can pair a mobile device by simply tapping it against the dashboard, rather than navigating menus on two separate screens. In addition, integration of NFC in a windshield allows an NFC-enabled digital key to exchange data such as authentication, user profile and vehicle information - an application that will be especially useful in simplifying the car rental process. NFC-enabled digital key use can also be extended beyond the vehicle for tasks such as mobile payments and access to restricted buildings or parking garages.

The BCM89095 NFC chip is claimed to reduce power consumption by 60 percent, uses 30 percent fewer components and a 35 percent smaller board area than previous generation devices. The automotive-grade device is optimized to meet the stringent requirements of the automotive industry including extreme temperature tolerance, and manufacturing guidelines.



CONNECTED
CAR
INTERVIEW



Ken Williams

FORD SYNC DELIVERS CONNECTED CAR FOR THE PEOPLE

Vince Holton talks to Ken Williams, Supervisor,
HMI Product Development, Ford Motor Company

WHILE VIRTUALLY EVERY MAJOR CAR COMPANY IS WORKING HARD TO STAKE ITS CLAIM DURING THE CONNECTED CAR LAND GRAB, FORD MOTOR COMPANY CAN, WITH SOME JUSTIFICATION, SAY THAT IT HAS BEEN DOING MORE THAN MOST, AND FOR LONGER.

While providing connectivity solutions before that year, Ford really stepped up to the plate when it introduced the first version of its SYNC platform in 2008. I personally filmed an interview at the 2011 Consumer Electronics show with Paul Aldighieri, one of Ford's HMI experts, as the company introduced a later iteration of SYNC – MyFordTouch. Now, with more than 10 million SYNC-equipped cars on the road, and SYNC 3 recently announced, I decided to catch up with Ford again and to find out how Ford had been coping with the evolution of the connected car.

I spoke with Ken Williams, the supervisor in charge of Ford's HMI product development group.

VH: Tell us a little about the SYNC timeline, Ken, from the beginning up until today.

KW: When we introduced SYNC in the Focus back in 2008 it provided the car user with the ability to play music over a Bluetooth link, or via a USB connection from a phone, music player or thumb-drive, and with some voice control.

When MyFordTouch was launched in 2011 for the 2012 model year cars the main enhancement was added touchscreen control. And bringing things completely up to date, SYNC 3, which we launched at the end of 2014, builds on everything we've learned so far, and aims to be more seamless and user-friendly than anything that has come before. We have incorporated a capacitive touchscreen that allows the car driver to use the same gestures he uses on his smartphone or other touchscreen device, including swipe, pinch-to-zoom etc.

For iPhone users we've also implemented Siri Hands-Free. All SYNC users can initiate voice commands by one press of the voice

command button on the steering wheel, but all an iPhone user needs to do is press and hold the button to initiate a Siri session.

Where our apps are concerned, we learned from our customers that they really didn't like things like segmented navigation – too many steps to enter a destination. We've made all search functions and things like destination input much simpler.

VH: I understand you have also embraced apps, too?

KW: Yes indeed. Ford was first to bring voice control to in-vehicle apps with AppLink, and the experience is further improved with SYNC 3. AppLink allows customers to connect their smartphone to their vehicle and control their compatible apps using voice commands or buttons on the vehicle display screen.

Ford has actively encouraged developer support for AppLink, providing an API that is available on the app stores. As a result of the broad support AppLink has enjoyed from the developer community, and with more than 40 apps supporting it, AppLink now automatically discovers smartphone apps including Spotify, Pandora, Stitcher, NPR One, SiriusXM Radio and iHeartRadio Auto, and displays their graphics and branding. Music and news apps are automatically displayed along with other media sources, just like AM/FM or SiriusXM.

All of these steps mean that many more of the features the car driver uses on a smartphone can now be used in the car too, with a very similar look and feel.

VH: Am I right in thinking that Ford is promoting AppLink as an open standard?

KW: Yes indeed. We released the source code for AppLink, and our goal is for this to become an open standard that is adopted by other manufacturers.

VH: That's a challenge – good luck! But I believe you are now using SYNC for more than just apps and systems controlled by the driver.

KW: That's right. We've now enabled Over The Air (OTA) updates. A customer's car can be connected to the house's Wi-Fi network while on the drive of the house or in the garage, and we can send updates as and when needed. These might be new features for existing apps, or could be system performance improvements. This is one way that we can get around the substantial difference in development cycles between the car and other tech devices. Previously, the customer either had to live with the fact that his car would often be a long way behind the portable device he carried around with him, or, if he was lucky, he might be able to take his car into the dealership and have updates installed. More often than not, even when this was available, it didn't happen. Now, we can carry out OTA updates automatically without the customer needing to do anything. Alternatively, he or she can still opt to do it at the dealership.

VH: Ford has been blazing the connected car trail for a long time now. What challenges have you faced along the way?

KW: The main one has been to provide what the customer wants, not what we think he or she wants. That is why we have carried out a continual market research programme, which has been helped by the fact that we have a very enthusiastic user base. When we were developing SYNC 3, we were able to draw upon 23,000 customer comments and suggestions, which we supported with insights from research clinics, market surveys and tech industry benchmarking.

VH: Hasn't the need to support multiple operating systems in the car – Apple Car Play, Android and Windows Phone - created challenges?

KW: Not really. Ford is operating system agnostic and bases its systems on the QNX CAR Platform. This is very well established and we find that it provides our development teams with a variety of

options for building systems that keep pace with ongoing advancements in the mobile device market.

VH: OK, so, Ford has a long track record with SYNC. Would you regard it as having been a success, and have your customers been enjoying using it?

KW: Ford has done a lot to democratise connected car systems, as we make SYNC available across our entire range, and at virtually every trim level. As a measure of its success, SYNC enjoys a 70% take-up in one version or another, and we have found that customer response has been overwhelmingly good. The feedback we get is that what our customers want more than anything else is seamless integration, and that they judge SYNC to be delivering that.

VH: So, SYNC is doing well, and SYNC 3 moves the game forward a long way. What developments are we likely to see in the next few years?

KW: We will continue development of SYNC based on the research we do with our customers. We will make SYNC do what they want it to do. Possible developments could include Head Up Displays (HUDs) and bigger touchscreens. We are watching this carefully.

VH: Hasn't HUD development stalled? It seemed to be a focus area for car companies a while back, but we haven't heard much for a while.

KW: Perhaps it is the fact that, unlike touchscreens, people don't know they need a HUD. It seems that when they have experienced a HUD, they realise that they want one. Our primary goal is to have happy customers, so we will give them what they want.

VH: Finally, what is likely to govern development of connected cars? Will it be customers voicing what they want? Will it be rules introduced by regulators and governments? Will it be commercial considerations pushed by the likes of the network operators, insurance companies and so on as they seek new revenue streams?

KW: Undoubtedly it will be a combination of all of these things. As I said before, its happy customers Ford is interested in, but, inevitably, we will have to be mindful of factors such as government regulations. We are already working with new directives in mind that will be introduced in 2018/2019, though they are not so much regulatory requirements as they are guidelines. These will cover such things as how much content a user can access in the car while on the move – how many pages you can go through, how much data you can enter, font sizes, pictures on screen/no pictures etc. I think the goal is to make sure that a driver's eyes are not off the road for any more than one and a half seconds at a time.

VH: Good luck with those goals, Ken. We will stay in touch and review developments again in a while.

Click on the movie screen to see Ken Williams talk us through SYNC 3.





THE CONNECTED CAR AT CES 2015



Qualcomm - Cadillac XTS concept.

The Consumer Electronics Show (CES), which takes place in Las Vegas in January each year has, for many years, been the world's most important technology showcase.

TRADITIONALLY, CES WAS THE VENUE AT WHICH THE MANUFACTURERS OF TV'S, MUSIC SYSTEMS AND ELECTRONIC TOYS WERE SHOWN. Then along came computers, which catalysed the process of CES taking over from another 'Vegas-based show called Comdex (now defunct). This was followed by phones/smartphones, and CES became a truly broad-based electronics show. It is a trade show, by the way, and not open to the public, much to the chagrin of geeks living within a viable transit zone of Las Vegas.

But in the last 2-3, perhaps even 5 years, another product group has infiltrated CES. That is cars and car-based technology. It started with one or two car companies (Ford being an early trailblazer), and now cars are everywhere at CES. Audi, BMW, Chrysler, Ford, GM, Hyundai, Mazda, Mercedes, Toyota and Volkswagen all showcased their latest technologies. General Motors (GM) remarked that there's so much auto news at CES 2015 that it should be renamed the 'Car Electronics Show'.

The growth in car company presence at CES has tracked the increasing amounts of technology that have been embedded in cars, and the concurrent development of relationships between cars, phones and other mobile devices, communication networks and clever bits of software that make life better, more convenient and just plain cooler for car users. For the car companies, it has been a case of 'embed connectivity or die' as one manufacturer after another has developed systems that not only make customers more likely to buy their cars, but which also enable new business models that will make the car company money and keep them more connected with the customer once he or she leaves the showroom floor.

Connected Car walked the show floor at CES 2015, and presents here a review of some of the announcements, trends and demonstrations that were shared across the various venues in Las Vegas. What seems sure is that CES' place is now firmly cemented in the calendars of the major car companies.

FORD

Acknowledging CES' importance to automotive manufacturers, Ford took centre stage at CES with one of the primary keynote sessions. Mark Fields, Ford's President and CEO, shared Ford's almost one hour presentation session with colleagues Raj Nair – Group VP and CTO, Global Product Development, Ken Washington – VP, Research and Advanced Engineering and Erica Klampfl, Global Future Mobility Manager.

Notably, none of the Ford execs spent much time talking about technology in terms of hardware, sensors, wireless technologies etc. This was a little surprising as SYNC is currently the most popular infotainment system in the industry with more than 10 million SYNC-equipped vehicles on the road. Fields did tell us that the recently announced SYNC 3 has a more smartphone-like appearance with faster performance and more conversational voice activation commands.

No, Ford's keynote was all about social mobility, global gridlock and the realities of urbanisation. Fields acknowledged that global infrastructure cannot cope with expected numbers of vehicles. The future roadmap must include smarter roads and cities, as well as smarter cars. ▶



Above:
BMW - remote valet pickup watch.

Right:
Audi Tablet - which takes the in-dash infotainment screen and puts it in the hands of the cars passengers.



Fields also recognised changing consumer attitudes and priorities, noting that 'Millennials' (people born in the late '80's to early 2000's) think/behave very differently to those of previous generations. Millennials are delaying marrying/house purchases/having children, and are thinking very differently about car ownership, with 'mobility on demand' seeming to suit many people, rather than established full-time ownership/lease options. Apparently, 47% of Americans today like using their smartphones to plan their transportation, while 39% say they travel by bus, train or taxi rather than car so that they can multi-task. Ford has a long term plan to meet their needs called 'Ford Smart Mobility', and this covers connectivity, mobility, autonomous vehicles, big data and flexible user ship models such as Dynamic Social Shuttle, which is a car-sharing model based around smartphones.

Ford is very keen to support and encourage developers to find ways to create a better customer experience, and a fundamental part of the way it is doing so is with OpenXC, Ford's open-source research platform that is used to gather data about how customers use their car during the day, which is then provided to developers. Fields quoted a somewhat mind-blowing stat, which was that cars provide upwards of 25GB of data per hour.

Ford will continue to foster the SYNC developer community and will continue to grow the number of embedded connections in Ford vehicles. Ford will also focus on software and sensor technology. An important part of this is Ford's Innovate Mobility World Challenge, This global programme is open to developers (www.fordsvl.com/innovatemobility) and allows those developers to engage directly with Ford and to explore/develop apps and systems together. Ford is currently supporting 25 experiments/projects across the world.

One crucial aspect in the field of connecting cars and the Internet of Everything is privacy and ownership of data. In connection with this, Fields referenced Ford's Big Smart Data programme, which he said will play a critical analytical role in determining Ford's future.

According to Fields, Ford 100% believes that customers own their data rather than the car company or network operators. Ford is apparently committing to being a trusted steward of data its cars collect, and will only use that data based on customer opt-in and guaranteed security of data.

 [Watch the full Ford keynote speech here](#), video courtesy of International CES

BMW

BMW demonstrated a number of features at CES including the possibility of entirely collision-free driving. The company says that the platform for 360-degree collision avoidance is secure position and environment recognition. The research vehicle was a BMW i3. Four laser scanners recorded the environment and reliably identified impediments such as columns, for example in a multi-storey car park. If the vehicle approached a wall or a column too quickly, the system braked automatically to prevent the threat of collision. The vehicle was brought to a standstill very precisely with centimetres to spare. If the driver steered away from the obstacle or changes direction, the system released the brakes. Like all BMW assistance systems, this research application can be overridden at any time by the driver.

Engaging with the smartphone/smartwatch generation, BMW also showed fully automated parking in multi-storey car parks. A fully automated Remote Valet Parking Assistant in a BMW i3 research vehicle combined information from the laser scanners with the digital site plan of a building, for example a multi-storey car park. If the driver used the smartwatch to activate the fully-automated Remote Valet Parking Assistant app, the system would steer the vehicle independently through the car park, with the driver already out of the car and on his way to his appointment. The Remote Valet Parking Assistant recognises the structural features of a car park and steers round any obstacles that appear unexpectedly – such as incorrectly

parked vehicles. Once the car has arrived at the parking space, the vehicle locks itself and waits to be called by smartwatch and voice command. The app then calculates the exact time until the driver arrives at the car park and starts up the BMW i3 so that it arrives at the car park exit at exactly the right time.

BMW claims to have succeeded in achieving fully automated control of the vehicle by connecting up vehicle sensor systems and a digital site plan. This avoids dependence on a GPS signal, which is not at all precise in multi-storey car parks. Alongside the laser sensors, the research vehicle also had the processing units and necessary algorithms on board and this meant it could determine its exact position in the car park, monitor the environment perfectly, and carry out independent and fully automated navigation. This means that it isn't necessary to provide car parks with complex infrastructure in order to allow cars to orientate and navigate around the area safely.

AUDI

'The Next Chapter' was the motto for Audi's presence at CES, which was centred on the car's communication with its surroundings.

Audi will apparently introduce new technologies for piloted driving before the end of this decade. These can take over driving in certain situations if the driver wishes them to do so. Showcasing its work in this area, an Audi A7 piloted driving concept car featuring a range of standard and close-to-standard sensors drove itself to CES from Stanford in Silicon Valley via Bakersfield and on to Las Vegas.

Contributing to Audi's piloted driving is the central driver assistance controller (zFAS), which processes information gathered by the sensors to create a detailed impression of the car's surroundings. Audi's online connection routes this data to a cloud based IT backend. There, the data is processed using machine learning algorithms and artificial intelligence before it is transmitted back to the car. In this way the car continually expands its intelligence as it drives, improving its performance in complex situations. At the same time, other users of this technology can also benefit from the data gathered.

Audi was promoting the concept of 'all-round networking' based around its Audi connect technology. The term Audi connect covers all applications and developments networking the car with its owner, the Internet, public infrastructure and other automobiles. A central hardware element, the Audi connect module, connects the car with the internet via LTE. The car's passengers can connect their mobile devices to a WLAN hotspot, which also provides the driver with customized online in-car services from the Audi connect portfolio. One of the innovations in this area is Online Media Streaming, which offers access to Napster and Aupeo! music services, and online updating of the navigational map.

Additional services will apparently be available in cars to be launched this year, among them the Audi smartphone interface. Depending on whether a customer connects an iOS or an Android device, the interface will call up the Apple Car Play or Android Auto platform onto the car's MMI monitor. In addition, both platforms provide navigation and messaging functions and appointment reminders.

Future car to X technologies are another key element of Audi connect. These will enable Audi models to interact with traffic lights in a city to navigate traffic faster and more efficiently. Another solution will permit cashless payment in a parking garage or at a kerbside meter, a third one will identify speed limits and spot dangers and also relay the corresponding information to other cars.

Audi also introduced the Audi Tablet, which takes the in-dash infotainment screen and puts it in the hands of the cars passengers.

One more innovation presented by Audi at CES was the Audi mobile key. Here, a smartphone or a smartwatch provides access to the vehicle, making them highly flexible complements to existing keys. The mobile key uses Near Field Communication (NFC), which is available even when the mobile device's battery is empty.

MERCEDES-BENZ

The German company caused some jaws to drop with its outlandish-looking F 015 concept car. Mercedes-Benz (MB) suggested that the F 015 'Luxury in Motion', a self-driving luxury sedan, shows how the automobile is changing from a means of transportation to a private retreating space. A key aspect of the research vehicle was the continuous exchange of information between vehicle, passengers, and the outside world.

Progressing from the self-propelled ("automotive") to the self-reliant ("autonomous") vehicle, Mercedes-Benz sees itself as a pioneer, going far beyond the purely technical realization of automated driving.

The pivotal feature of the interior concept is the variable seating system, with four rotating lounge chairs that allow a face-to-face seat configuration. All four passengers can use their time aboard to work, to relax or to communicate.

The exchange of information between vehicle, passengers and the outside world is facilitated by six display screens integrated into the instrument panel and the rear and side panels, which turn the interior of the F 015 Luxury in Motion into what MB calls a digital arena.

Passengers can interact with the connected vehicle through gestures, eye-tracking or by touching the high-resolution screens. Employing laser projection and LED displays, the electrically propelled F 015 Luxury in Motion establishes contact to the outside world and is, says MB, a 'real social partner in traffic'.

 MB F 015 – Is it a car, a lounge, or an office? You judge.

HYUNDAI

Hyundai was championing the Head Up Display (HUD) concept at CES. The HUD found inside the 2015 Genesis includes driving information, such as Smart Cruise Control status, navigation, Blind Spot Detection, and Forward Collision and Lane Departure Warnings. All this information is projected at a perceived virtual distance approximately six feet ahead of the driver for maximum legibility while driving.

Hyundai showcased a production-ready augmented reality HUD concept. This system presented more driver information in the form of animations, which describe road conditions ahead. Hyundai predicts that on the augmented reality HUD, drivers will see warnings when a car is about to unexpectedly enter their lane, arrows leading to exit ramps, highlighted street signs, Smart Cruise Control distance bars and one-way street markings.

Hyundai had linked the augmented HUD to a wearable band. This band will vibrate when the Lane Departure Warning System is activated or when the car is about to unexpectedly enter the driver's lane. It is also a heart rate monitor that can notify 911 if a driver's heart rate changes rapidly.

Hyundai's display also considered future connectivity, with its 2015 Cockpit Concept demonstrating driver alertness monitoring, blind spot and safe following distance warnings, advanced low fuel level warnings, advanced turn-by-turn navigation and navigation transfer from inside the car to a mobile device for walking to a final destination.

THE COMPONENT SUPPLY CHAIN

It wasn't only the car companies that were promoting automotive technology solutions at CES. Someone has to supply manufacturers with components, and amongst many other suppliers, the tech industries chip companies were active too. Here we look at some of the announcements from a couple of the big names.

QUALCOMM

The US semicon company showed an HD infotainment system in the Qualcomm Concept Car – a Cadillac XTS. This modified infotainment

system and instrument cluster ran on the Android operating system and was powered by Qualcomm Snapdragon automotive solutions, which include a Qualcomm Snapdragon processor, Qualcomm Gobi 3G/4G LTE modem, Qualcomm VIVE Bluetooth and Wi-Fi, and Qualcomm IZat GNSS . The components all work together behind the scenes to allow the onboard computer to become a hub for both safety and entertainment on the road.

The technology concept car highlighted a number of technologies that showcase advanced safety features. In order to curb distracted driving, for instance, head-tracking software alerts drivers should their gaze wander for more than a few seconds, while a gesture-sensing camera allows them to control music at the wave of a hand. At the same time, Snapdragon processors are designed to support driver assisted lane detection and navigation by processing incoming data from a camera plus GPS and graphic overlays in order to let drivers know where they're heading and when to make a safe lane change.

AllJoyn – the open-source software framework from the AllSeen Alliance and which is designed for interoperable device discovery, connectivity, and communication of relevant notifications - integrated the infotainment system with an app on a mobile device. For shared vehicles driven by multiple family members, individual driver profiles make the connected driving experience personalized. Based on which phone is paired with it, the car will detect who is driving and adjust the seat, windows, mirror positions, and climate based on that individual's preferences. And, with always-on voice recognition technology listening, you don't have to use manual controls; a simple "Hey Snapdragon, close all windows" will suffice.

The Qualcomm AllPlay smart media platform syncs with both the driver and passenger devices, so you can listen to music stored on multiple phones, media players, or tablets through the car speakers. Because multiple devices can be active at any time, you and your passengers get personally preferred song options. You don't have to fight over who dominates the music on a road trip anymore.

The Snapdragon processor also supported the capability to demonstrate LTE Broadcast, providing CES attendees the ability to watch live streaming channels from four live video channels integrated with the car's infotainment system. LTE Broadcast allows for one content stream to go to multiple devices - much like old-fashioned over-the-air TV - maximizing the efficiency of the airwaves.



[Qualcomm connected car demo.](#)

NXP AUTOMOTIVE

NXP focussed on car to car and car to infrastructure communication, and has been working in this area with Delphi and General Motors. The company's CTO Lars Reger also pointed out that it is not just car drivers that need help, but also vulnerable road users such as motorcyclists, who probably have an even more acute need to be aware of obstacles or dangers on the road ahead. NXP demonstrated a Marben system that presented advance information to the motorcyclist on a handlebar-mounted display.

NXP was also excited about what it claims is the first implementation of radar implemented in RF CMOS, and showed an all-car solution intended to simplify car communication systems and to reduce reliance on copper wire.



[Watch the NXP Automotive presentation here.](#)





Peter Virk



JAGUAR LAND ROVER KEEPS CUSTOMER INCONTROL

Vince Holton talks to Peter Virk, Head of Connected Technologies & Apps, Infotainment, Jaguar Land Rover

A COMPANY THAT SEEMS TO BE THRIVING UNDER THE OWNERSHIP OF INDIAN COMPANY TATA, Jaguar Land Rover has demonstrated that not only can it develop and manufacture world-beating off-roaders and luxury/sports cars, but it also has a strong grasp on the connected car zeitgeist. Connected Car editor Vince Holton spoke with Peter Virk, who, despite youthful looks, has a very long track record at JLR, having started with the Midlands, UK-based manufacturer straight out of high school. Virk admits to being a tech geek at heart, as well as being a died-in-the-wool JLR man. It's hard to imagine a more suitable individual to be at the helm of JLR's connected car development.

VH: Talk us through JLR's connected car history

PV: The process started when we began looking to provide docking facilities for mobile phones, but really took off when we added Bluetooth handsfree in the mid 2000's. Concurrent to this – actually, slightly later in reality – we added USB and iPod media connectivity. Things evolved as more Bluetooth profiles were supported, and a lot of work was done in the background to improve Bluetooth interoperability. All through the process, the goal has been to add convenience, ease of use and to enhance the safety aspects of using mobile devices in the car.

A major step forward was taken last year, when we launched InControl. This phase was not about simply adding features, this took JLR and it's customers onto the next level, which was bringing the Internet into the car.

VH: Can you give us an overview of InControl today? What does it offer, and –crucially – are your customers liking it and is it being used?

PV: We launched the first generation of InControl at the 2014 New York Motor Show. This delivered InControl Remote, InControl Secure and InControl Wi-Fi. These are downloadable iPhone and Android apps that run on a customer's smartphone. InControl Remote enable functions such as checking your car's status – where it is, how much fuel is in it, whether any windows have been left open, and to heat or cool the car before you get to it. InControl Secure is a tracking system that will tell you if your car has been stolen (or an attempt has been made), where it is, and will alert the police and tell them where it is. InControl Wi-Fi turns your car into a 3G hotspot, and up to 8 people can connect and work or be entertained while the car is in motion.

The most recent addition – InControl Apps – is a major enhancement to our system. JLR customers now have access to apps they have been using on their phones, but mirrored on the touchscreen in the car. The same apps, with the same, recognisable interface. The key is that while the customer controls the app via the touchscreen in his car, it is the smartphone that is doing the work. This is crucial as it means that as smartphones are continually updated and replaced, the customer's car system will not become out-dated. We have opened up our platform to the app developers, and have an ever-growing number of collection of apps available to the customer, including well-known services such as Parkopedia, Cityseeker, Pandora, Ardio, Spotify and many others. We are also able to notify our customers when new apps become available. ▶

JAGUAR LAND ROVER CONNECTED CAR TIMELINE



VH: Is this system common across all Jaguar and Land Rover models?

PV: Yes it is. Obviously, it is rolled out across each model range as life-cycles permit, but the core system is common across all JLR vehicles.



Click the movie screen to watch Jaguar Land Rover's video overview of the InControl system'

VH: Has JLR developed InControl Remote/Secure/Wi-Fi/APPs in-house?

PV: It has all been developed by JLR in co-operation with key partners such as Bosch SoftTec. We want to make this system as open as possible to developers, and have made an open API and Software Development Kit (SDK) available. Our focus, though, has been to make available to our customers the key apps that are already out there in the market, which we can deliver to them in recognisable format, but which have been optimised for safe and convenient use in the car.

VH: Who will emerge as the principal developer of automotive apps – the car manufacturers or third parties?

PV: I can't speak for the whole industry, but in JLR's case we will continue to support the incredibly dynamic and versatile app developer community and to provide apps that are already available in the market. Why should a car company compete? That said, if something we see as a very useful app is not available on the App Store or on Google Play, then, yes, we could decide to develop it ourselves.

VH: Could you see there being 10 different automotive app stores – for each primary car company

PV: I think it is unlikely, for the reasons I've stated. JLR currently has no intention of building its own app store. We will continue to present to our customers great apps that have been developed by third-parties, and which have been enhanced by adding compatibility with JLR connected systems.

VH: How closely do you monitor customer reaction to the systems you introduce?

PV: Very closely. In fact, the process starts long before any system is launched in our cars. We carry our research to establish what the customer wants in the car, and how it should work.

While there is still work to be done by all car companies in this area, here at JLR our customers are certainly providing very positive feedback to the systems we have introduced to date.

VH: What is today's driver's expectation of the connected car?

PV: One of the key 'asks' has been that the transition from the way systems work outside the car to the way they work once inside the car should be as seamless and as easy as possible. The days of car companies being able to impose complex, baffling and effectively proprietary systems on their customers are behind us.

This links into personalisation. A person's smartphone is very personal to them, and they want their car to be personalised in the same way. We need to be able to mimic the way smartphone systems work, and to extend the personalised experience into the car. A key goal, then, is to enable the situation whereby the car assumes personalised preferences based on who is driving the car, with the 'personality' derived from the driver's smartphone.

VH: What is JLR's view on driverless cars?

PV: Well, obviously this is something we are thinking about

continually, and will be ready to address when the time is right – the future has to be embraced. You know - JLR drivers love their cars, perhaps more so than many other brands, and we recognise and cherish the fact that our customers want to keep driving their cars. However, with today's congested roads we are aware that there are times for everyone when would appreciate the car being able to take over and to allow the driver to spend his or her time more usefully or more entertainingly.

VH: How do you think the connected car landscape will have changed in 5 years time?

PV: To be truthful, I think that 5 years is too far to be considering at the moment. I'd rather think about what will be happening in 2-3 years. Today, basic processes involve launching apps and then acting on data that is provided. Before too long I think the emphasis will be on predictive services, and linking services, perhaps between the car and the home, for example, or the car and other services

Say, for example, the car senses that a tyre is deflating. The car will be able to alert the driver, but it will also be able to call a breakdown service and provide the car's location. It could direct the driver to the nearest garage that is open, and will provide that garage with information about the problem.

It will be all about providing personalisation, comfort, flexibility and ease of use as the car takes its place as a key component within the Internet of Everything.

EDITOR'S NOTE: As this issue was published, Jaguar Land Rover was on the verge of making major announcements regarding updates to its in-car systems. Teaser information released by Jaguar prior to a New York press event suggested that part of the update will be larger – 10.2" – touchscreens in JLR cars. We will report further on this announcement in the next issue of Connected Car.

More information: www.landrover.com/ownership/incontrol/index.html

CONNECTED CAR SMARTPHONE VIDEO



From time to time we get the opportunity to capture video content guerrilla-style, and here's a great example. Jaguar Land Rover's Mehul Shewakrami demos InControl for Vince Holton at a recent connected car event in London. Click on the screen to view.

CURRENT JLR SYSTEMS & FUNCTIONALITY

InControl REMOTE – Check your fuel levels remotely, find your vehicle in a busy car park and even check that you haven't left a window open – all through a handy smartphone app.

InControl SECURE – InControl Secure uses tracking technology to alert you to an attempted theft, and signals your vehicle's location to police, for a timely recovery.

InControl Wi-Fi – This provides in-car access to a 3G hotspot, enabling up to eight devices to be used simultaneously. Passengers can work or be entertained throughout the journey.

InControl APPS – Land Rover InControl Apps enables you to use a variety of smartphone apps on your vehicle's touch-screen by connecting your device to the InControl Apps USB port.



CONNECTED CAR VIDEO REVIEW

We browse web video presentations on the subject of connected car technology on an ongoing basis, and each issue will include a selection that we have reviewed.



Click the movie screens to watch the videos



NextGen – Interoperability for the connected car.



SAP & BMW bring you the connected car.



Connected Cars with Ford's OpenXC and Splunk.



VISA: The connected car is here.



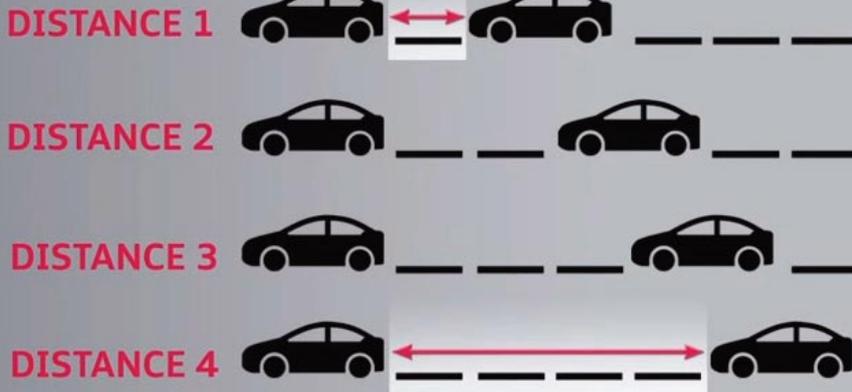
IBM Internet of Things: Connected Cars. Connected Homes. Connected Lives.



Connected Car – Telefonica and Geotab at MWC 2015.



AT&T Connected Car vision.



NEWS

GLOBAL ADVANCED DRIVER ASSISTANCE SYSTEMS (ADAS) MARKET TO EXCEED US\$90 BILLION BY 2020

Market research firm ABI Research forecasts that the market for Advanced Driver Assistance Systems (ADAS) will grow from US\$11.1 billion in 2014 to US\$91.9 billion by 2020, passing the US\$200 billion mark by 2024.

ADAS packages have long been available as optional extras on luxury and executive vehicles, but recent years have seen the more popular systems penetrating through to affordable family cars and even superminis. Research Analyst James Hodgson told Connected Car, “Toyota’s planned rollout of the Safety Sense P and Safety Sense C packages is just one example of the drive by OEMs to bring ADAS to the mass market.”

ABI predicts that one of the most popular systems on high-end vehicles, adaptive cruise control (ACC), will continue to gain popularity across all vehicle segments, with shipments experiencing a CAGR of 69% between 2014 and 2020. Systems with a lower perceived customer value, such as night vision (NV), will remain the preserve of luxury vehicles for the immediate future, with NV shipments totalling less than one-tenth of ACC shipments in 2020.

Safety rating agencies, such as NCAP, are continuing to devise tests which demonstrate the contribution of active systems to public safety. “These tests augment the organic growth of consumer acceptance, while OEMs strive to update their models in order to secure those all-important five star ratings,” Hodgson explains. The timetable for the introduction of these tests differs by region, which means ADAS availability and adoption will vary geographically—this effect will be further compounded by localized legislative changes.

But who leads?

According to ABI, Mercedes-Benz, Volvo, and BMW continue to comprise the top three players in the consumer ADAS market. They outperform competitors either in terms of the degree and significance of their innovation, or in how effectively they make their systems available to consumers – sometimes in both.

As mass-market OEMs have striven to offer affordable ADAS solutions to their customers, luxury brands have sought to distinguish themselves either by increasing the sophistication of their systems, or by offering their systems across more of their model range. Most have adopted a combination of these approaches.

Western Europe maintains its position as the largest market for ADAS, due in no small part to the inclusion of such systems as criteria in Euro NCAP ratings. As a result, OEMs whose sales are strong in this region demonstrate the largest market share. Mercedes-Benz, Volvo, and BMW are estimated by ABI to account for over 50% of consumer vehicles sold with at least one ADAS in Western Europe during 2014.

A CONNECTED CAR DRIVES MORE PROACTIVELY THAN ANY PERSON

According to Bosch, cars still have their best days ahead of them, and connecting vehicles to the internet makes them safer, more fun to drive, and reduces fuel consumption. Speaking at the 17th Technical Congress of the German Association of the Automotive Industry (VDA) in Filderstadt, Germany, Dr. Volkmar Denner, chairman of the Bosch board of management pointed to the connected electronic horizon. In the future, he suggested, Bosch technology will provide real-time information about mobile construction zones, traffic jams, and

accidents. On this basis, further improvements to existing functions such as start-stop coasting will be possible. At the same time, it will enable a predictive operating strategy for plug-in hybrids. Technologies such as this reduce CO2 emissions by up to 10 percent or more. “These efficiency-enhancing measures should be recognized as ‘eco-innovations’ by the EU,” Denner said.

The reductions to consumption brought by start-stop coasting and an optimum operating strategy are most noticeable in real traffic conditions. In the New European Driving Cycle (NEDC), however, they have no effect. “A connected car drives more proactively than any person,” Denner said. Using up-to-date maps, cars can precisely calculate their remaining range in addition to the most efficient route. At the same time, intelligent connectivity increases the suitability of electrified vehicles for everyday use. “In only ten years, more than 15 percent of new vehicles worldwide will be electrified,” Denner said. Of these, more than 13 million new vehicles will be able to run on electricity alone, at least in urban traffic. To further increase the electric range of hybrids and electric cars, Bosch is working on improving electronic battery management. This can increase the electric range of a car by up to an additional 10 percent and give electro-mobility a further boost.

Bosch believes that technically-sophisticated components make vehicles more economical and efficient, allowing them to meet the strict CO2 targets set by the European Commission.



MESHING SMARTPHONES WITH CARS TO ENABLE MOBILE CONNECTED SERVICES

Vince Holton and Andor Miles-Board's thoughts on what to do when two tech worlds come together

It's PROBABLY NOT A RULE THAT IS WRITTEN DOWN ANYWHERE, BUT IT APPEARS THAT IN THE MINDS OF DEVELOPERS IT HAS BEEN ASSUMED THAT THINGS WILL FUNCTION THE WAY THEY WERE SUPPOSED TO, STRAIGHT OUT OF THE BOX.

Yes, that they would just work. This has been the case since the first item that could be described as 'technology' was invented, whether that was the flint axe, the wheel, the internal combustion engine or, perhaps, as some would have it, the iPod.

In fact, in simpler times, and as products were pushed out of factory doors during the '50's, 60's, 70's, 80's and 90's, the technology industry considered it acceptable to make many large assumptions

about fitness for purpose. It seemed to have been deemed OK to ship products that had worked OK once, somewhere, on a bench in a lab. Perhaps twice. It also seemed to be OK to believe that the consumer who had bought the product could be considered part of the test team, helping the manufacturer with the final Q&A process.

This may not have been good practice, but, for a long time, consumers really didn't know any better. Crucially, there wasn't this thing called the Internet, where grievances could be aired, consumer-based support groups created, and where irresponsible manufacturers could be named and shamed and forced to face up to their responsibilities. It's true – for a long time, ▶

there was somewhere the manufacturers could hide.

This was as true in the automotive world as it was in the tech or any other sector, though perhaps, there were some campaigners who did more to call the car companies to order than there were people championing the cause of people who were unhappy with the functionality of their washing machine. Ralph Nader and his book *Unsafe at any Speed*, published in 1965, springs to mind.

Things are very different today, and the omnipotence of the Internet means that the hiding place for 'can't really be bothered to make it work properly' tech companies has been taken away. Consumers today have not only come to expect products to be properly tested, they know exactly what to do if their latest acquisition fails to work as it should.

NOT SO FAST....

Yet, there are still areas today where delivering 'straight out of the box' functionality is hard to achieve, and the car has re-entered this space. Not because cars today don't work properly. By and large they do, as the car companies have mostly perfected the process of building reliable, comfortable and economical vehicles that get you where you want to go. No, things have changed because the car today is a crucible or melting pot, meshing two extraordinarily complex areas – automotive technology, which combines big lumps of moving metal controlled by sophisticated electronics systems, with mobile computing, communications technology, the Internet and the connected world.

In isolation, both of these technology sectors generally provide consumers with solid, reliable products that do what they are supposed to do. Each does so as a result of extended periods of research, development, testing, more testing and then some more testing.

And they do work. Smartphones today have more computing power

than the Apollo 11 moon rocket, and deliver services to their users that cover a multitude of needs – communication, entertainment, information, navigation and location-based services and an endless stream of apps. And the car, from the point of view of delivering transportation services, has essentially reached 'white appliance' levels of multi-year reliability.

THE EQUILIBRIUM HAS BEEN UPSET

The goal of enabling a complete panoply of connectivity and transportation services involves marrying together two very different partners. These are the smartphone/mobile device manufacturer community, which develops products at the speed of light and which replaces whole ranges inside a year, and the automotive manufacturers, who deliver highly complex transportation devices, and whose products have development and in-use life cycles measured in years or decades rather than months.

Two sets of experts, two sets of technology. Can we assume everything will work straight out of the box? Essentially, no. Despite the excellent work done by boffins on both sides of the fence, making the connected car work as the consumer wants/expects it to do is enormously complex, and needs special expertise. NextGen Technology, whose footprint extends across engineering and development facilities in the UK, USA, India, China, Japan and South Korea, has built a global business working with the major car manufacturers to ensure interoperability between the cars we drive today and the smartphones and mobile devices that we carry with us. NextGen's expertise is now called upon by major car manufacturers including Ford, General Motors, Jaguar Land Rover, Bentley, Aston Martin, Peugeot, Citroen, Kia and Hyundai.

The movie here tells the NextGen story, and explains how the company has addressed the challenge of providing in-car systems interoperability services. Click the screen to view.



www.nextgen-technology.com



CONNECTED
CAR
INTERVIEW

THE VIEW OF THE LARGE FLEET OPERATORS

Vince Holton talks to Peter Cakebread, Chairman of the British Vehicle Rental & Leasing Association, and Managing Director, Marshall Leasing

WHEN CONSIDERING THE FUTURE OF THE CONNECTED CAR, PEOPLE IN THE INDUSTRY – CAR MANUFACTURERS, APP DEVELOPERS, BIG DATA SYSTEMS COMPANIES, ANALYSTS, INSURANCE COMPANIES ETC. – COULD BE FORGIVEN FOR SPENDING MOST OF THEIR TIME CONSIDERING THE NEEDS OF THE CAR DRIVER – THE CONSUMER.

However, this overlooks the fact that in many (most?) countries, new cars are predominantly bought by companies, not individuals, and are subject to lease or hire agreements. You would imagine, therefore, that the needs of large fleet operators would be pretty close to front of mind for all of those system developers. However, we don't hear much about how this important sector is to be catered for. Time to put this right, I thought.

I spoke to Peter Cakebread, Managing Director of Marshall Leasing, a company based in Huntingdon, Cambridgeshire. His job qualifies him to be a spokesperson for this industry as Marshall is one of the UK's most respected leasing companies, operating more than 6,000 funded vehicles on its fleet, across all of the mainstream franchises. However, Cakebread wears two hats, and his second – Chairman of the British Vehicle Rental and Leasing Association (BVRLA) gives him an even broader, and, for Connected Car, very helpful perspective. The BVRLA is

the UK trade body for companies engaged in the rental and leasing of cars and commercial vehicles. Its members operate a combined fleet of 3.4 million cars, vans and trucks, buy nearly half of all new vehicles sold in the UK, support around 184,000 jobs and contribute more than £14bn to the UK economy each year.

I launched the conversation by asking about levels of awareness in the fleet sector.

VH: How aware of the connected car concept are members of the BVRLA, and how interested or concerned are they?

PC: That's a little tricky to answer, as the area is not particularly well-defined. There are systems that are useful for the car driver, and there are systems that are useful for the fleet operator – telematics, essentially. I think that fleet operators are more interested in the latter. In terms of levels of awareness, yes, our members are aware of connected car and the need to engage, but it is early days yet.

VH: OK, then is connected car seen as a way of selling more cars – growing fleets - or perhaps a way of better managing cars and fleets? ▶

PC: On some level, I think that fleet operators might be attracted to one car over another as a result of that car having more user-pleasing features, but I think the reality is that they would be more interested in using connected car technology for hard commercial reasons. There is already an awareness that Big Data – the information gathered continually by the car – can be used for purposes such as driver behaviour reporting, for example. This is a perhaps a contentious use of this type of data, but it can certainly be used to resolve disputes. The data is there as to how a car has been driven, when, where etc. We are in a position to supply this to the fleet operator, then they can choose whether to use it, or not. The advantage of a good telematics system is that a fleet manager can go into the system and look at the way all of his drivers are using their cars, and, if action is necessary, he can do something about it.

On a less contentious basis, we are able to gather service information from all cars. If an engine warning light comes on in a car, or some other warning, then the system alerts the fleet operator as well as the car driver.

VH: From what you have said it sounds like you are gathering this information today?

PC: We can do. Some of the car manufacturers already have this capability, but we look at the situation from the fleet operator's point of view. They can't have a situation whereby, depending on what makes of car they have on their fleets, some cars are providing data, and some aren't. They need a universal solution. While it remains the case that not all cars from all manufacturers currently provide us with the option to capture data, and until and unless all of them settle on one common platform, we have made available to our customers a third-party developed telematics solution that plugs into the on-board diagnostics (OBD) connector on any car. This is available as an option now and has been taken up by some of the fleet operators that we work with – the early adopters.



Another important element that interests the fleet operators is the connected car's ability to report back in the case of an accident. Again, this is a situation whereby there might be the need to resolve a dispute, especially where liability is in question. There's no doubt that the ability to report where a car was at a given time, what speed it was travelling at the point of impact, etc., can be extremely valuable. While the police may well like to be able to gain access to data collected by a car in the case of an accident, the question needs to be resolved as to who owns that data, and who has the right to access it.

It does raise data protection issues, and the question of whether these systems are on all the time or only during working hours. That is a very big discussion that has yet to be resolved.

VH: There is a lot of talk about insurance companies being interested in connected car technology. Are they in dialogue with the fleet operators about this?

PC: Yes, they are. Both the insurance companies and the fleet operators are aware of the potential of connected cars to provide them

with benefits. From the fleet operator's point of view, for example, if they can demonstrate good driving habits then they are in a strong position to negotiate better terms with the insurance companies.

Once again, though, this is an area where data ownership and privacy issues come into play.

VH: This is an area where we might expect governments and lawmakers to step in and take control. The BVRLA presumably keeps a finger on the pulse of such matters. Are you aware of much governmental influence or involvement at this time?

PC: Not really. The UK's Society of Motor Manufacturers and Traders (SMMT) is staging a connected car conference in the UK later this month, and I am aware that some government ministers are speaking at the event. But real-time action to control, regulate or whatever? I am not really aware of this.

VH: I guess that one thing that could impact upon the effect of driving habits and insurance premiums is the possibility of autonomous driving – driverless cars. Is this something BVRLA members are thinking about?

PC: Yes, they are certainly aware, but with the complex infrastructure that needs to be put in place, I would say that most of our members consider this to be some way off – something to consider further down the road.

VH: Bringing the conversation back around to the benefits of the connected car to the driver rather than the fleet operator, would you say that today's infotainment systems do what the driver wants them to do – in other words, do they work properly, and what elements are most appreciated by drivers?

PC: Generally I think that things are much better than they used to be. Cars, phones and most mobile platforms are better, Bluetooth works better and today's drivers are just much more ready to connect their phones to their cars.

In terms of what drivers most value, I think that navigation is pretty near the top of the list. Emergency Assist is very desirable and is approaching becoming a standard fit.

“The irony is that we are hearing drivers lamenting the fact that their cars no longer have CD players in them!”

VH: You mention Bluetooth connectivity. As we wrap up this conversation, can you tell me whether many drivers are streaming music in their cars, and are they using mobile apps?

PC: As far as music streaming is concerned, it seems not. The irony is that we are hearing drivers lamenting the fact that their cars no longer have CD players in them! Some of the more tech-savvy drivers have their music digitised and accessible to them in today's cars, but a surprising number don't, and complain bitterly that they have no way to play their CD's. And, no, we are not aware of many drivers who have managed to get their heads around transferring apps that they use on their smartphones into the car.

VH: Wow – drivers missing CD players! That will come as a shock to the car companies, I'm sure. It certainly does to me. I guess it is a reminder that the tech world develops at a very rapid rate, and that the human race sometimes just doesn't keep up. An object lesson for all of us, and something the automotive ecosystem perhaps needs to keep in mind.

PC: Indeed. Here at the BVRLA we will continue to monitor trends and developments in connected car. There is no doubting the significance to both our members and their customers, the fleet operators.

www.bvrla.co.uk
www.marshall-leasing.co.uk

THE CONNECTED CAR MARKET – PREDICTIONS FOR 2015 AND BEYOND



THE BEGINNING OF EVERY YEAR SEES GURUS ACROSS THE GLOBE MAKING THEIR PREDICTIONS FOR THE COMING MONTHS, YEAR, DECADE ETC. We all like to think that we can anticipate trends, and yet, that doesn't stop us being slightly worried that we might have missed an impending development, and so we are happy to see what others are forecasting. This base principle applies across politics, global socio-economic activity, and, of course, technology development.

The connected car market is no different. Here at Connected Car we took the opportunity to do some research, and gathered together interesting views from across the digi-sphere. In each case we link to the original source.

If you have views, or comments on any of these forecasts that you would like to share with us, then get in touch using the contact details on page 2.

GARTNER: Connected cars will form a major element of the Internet of Things

SOURCE: <http://www.gartner.com/newsroom/id/2970017>

By 2020, there will be a quarter billion connected vehicles on the road, enabling new in-vehicle services and automated driving capabilities, according to Gartner, Inc. During the next five years, the proportion of new vehicles equipped with this capability will increase dramatically,

“in-vehicle wireless connectivity is rapidly expanding from luxury models and premium brands, to high-volume midmarket models”

making connected cars a major element of the Internet of Things (IoT).

Gartner forecasts that 4.9 billion connected things will be in use in 2015, up 30 percent from 2014, and will reach 25 billion by 2020.

“The connected car is already a reality, and in-vehicle wireless connectivity is rapidly expanding from luxury models and premium brands, to high-volume midmarket models,” said James F. Hines, research director at Gartner. “The increased consumption and creation of digital content within the vehicle will drive the need for more sophisticated infotainment systems, creating opportunities for application processors, graphics accelerators, displays and human-machine interface technologies,” said Mr. Hines. “At the same time, new concepts of mobility and vehicle usage will lead to new business models and expansion of alternatives to car ownership, especially in urban environments.”

Gartner forecasts that about one in five vehicles on the road worldwide will have some form of wireless network connection by 2020, amounting to more than 250 million connected vehicles. The proliferation of vehicle connectivity will have implications across the major functional areas of telematics, automated driving, infotainment and mobility services.

Gartner made a series of further IoT predictions, including suggesting that through 2018, there will be no dominant IoT ecosystem platform; IT leaders will still need to compose solutions from multiple providers.

While companies are busy building out their IoT ecosystems, Gartner believes that there is still no coherent set of business or technical models for the IoT. Standards remain nascent and most IoT projects will entail custom elements. This is further complicated by the lack of dominant technology service providers (TSPs) in the IoT.

“Many standards and ecosystems for the IoT are still in development and some of the vendors and ecosystems may fail during the working lifetime of current IoT projects,” said Alfonso Velosa, research director at Gartner. “CIOs will need to ensure their prime system integrator has a strategy to future-proof their project. This is especially critical if the project involves infrastructure that may be in the field for decades. A gateway-based architecture will be a key approach to future-proofing IoT projects.”

JOE BARKAI: Product and Market Strategist and Catalyst

SOURCE: <http://joebarkai.com/2015-connected-cars-predictions/>

AUTOMAKERS CONTINUE TO CONTROL THE CONVERSATION

Don't let the announcements about technology collaboration with Google, Apple and Microsoft mislead you. In the near term, the uncomfortable status quo will persist: OEMs will resist opening up the vehicle platform and will be slow to let outsiders into the fold, especially when it involves giving them access to critical vehicle data. Whether driven by fear of exposing critical information to competitors and regulatory bodies, refusal to relinquish opportunities to deliver value-add services, or just traditional thinking, OEMs will continue to dictate the trajectory and cadence of the conversation.

OEMs will respond to potentially threatening moves by industry outsiders such as Google's autonomous car prototype. While Google's innovation continues to capture headlines, expect OEMs, in particular Mercedes and Audi, to push the envelope with advanced active safety and autonomous driving features. Traditional OEMs will leverage their strengths in global manufacturing and supply chains to gain an advantage over outsiders such as Google and Tesla.

MISALIGNMENT WITH CONSUMER'S MOBILE DIGITAL IDENTITY SLOWS DOWN ADOPTION

Since the early days of telematics, connected car technology and affiliated services such as OnStar were built into the car, and consumers were limited to those services that were offered with the car (and had to pay subscription fees the OEM thought the market will bear).

But with the ubiquitous popularity of smartphones and plethora of mobile services, many of them free, consumers find built-in vehicle-centric IVI devices technologically inferior, costly, and slow to keep up with technology advancement available on consumer products.

Consumers prefer using their smartphones not only because they offer a wealth of useful apps and information that are always up to date, but because the personal data and personalized services delivered via the user's smartphone are the proxy for the user's mobile digital identity. This identity offers consumers an uninterrupted modality-independent digital presence: same experience and services independent of the location and the mode of transportation being used.

“the in-vehicle experience for drivers and passengers is becoming more complex and requires re-learning and re-personalisation”

Automakers will continue to offer built-in technology and vehicle-centric services. But as they continue to add options and features to out-innovate the competition, the in-vehicle experience for drivers and passengers is becoming more complex and requires re-learning and re-personalisation - a stark difference from the smartphone experience.

Consumers may be willing to pay a premium for certain technologies, for example, a larger touch screen, especially if they are able to replicate the small handheld screen onto it, but they are not likely to agree to pay an additional monthly fee for services they can already access through their smartphone. So while innovation in built-

in IVI will continue to grab headlines and offer some brand differentiation, OEMs will have only a limited success selling new services to consumers.

CONCERNED CONSUMERS TAKE A WAIT AND SEE ATTITUDE

Concerns and ongoing discussions relating to connected car security and data privacy are top of mind among regulatory agencies, automotive industry insiders and the general public.

In addition to concerns about possible hacking into car electronics and disrupting vehicle to vehicle communication, there are lingering fundamental questions about car data ownership: OEMs, service and content providers and consumers see it somewhat differently, especially when it comes to sharing and using information collected and transmitted by connected cars.

The lack of consensus, adequate regulations and common standards is not going to slow down innovation and technology evolution. In fact, it's going to be the other way around, as the playing field for the time being is open and less restrictive. However, in the short term, the open innovation space will also result in poor systems interoperability and market fragmentation.

Concerned consumers will take a wait and see attitude, expecting further proof that connected car technology is robust and that their personal information is not being exploited.

ALLIANCES AND PARTNERSHIPS WIN

While OEMs were busy trying to sell telematic services through proprietary and closed business offerings, the aftermarket was much more diligent. In recent years, a plethora of consumer-grade plug-in OBD II modules appeared in the market from companies like Automatic, Dash, MetroMile, Plex Devices and Zubie. These devices plug into the car's OBD II port and connect, either wirelessly or via Bluetooth, to a consumer cell phone and, voilà, a DIY connected car.



Third parties, from mainstream insurance companies to app developers to do-it-yourselfers and hackers are exploring new service options leveraging the treasure trove of data flowing from the car's OBD II port, cutting the OEM out of the loop. Much of this activity will come from startups and established companies that aren't from the mainstream automotive business. Leveraging inexpensive off-the-shelf technologies, these companies offer consumers connected cars gadgets, apps and business services (many free of charge) such as gas station locations and prices, charging station locations, parking information, traffic updates, car data monitoring, and many others.

2015 should see the continuation and acceleration of the wave of M&As and partnerships activity in the general Internet of Things (IoT) space and in "connected mobility". In addition to the headline grabbing acquisitions of ThingWorx and Axeda, we witnessed Kore

buy RACO Wireless, and Sierra Wireless buy Wireless Maingate. Of particular interest was the new partnership formed between Jasper and Telenor Connexion. And while I was editing this document, Harman International announced the acquisition of Red Bend.

WIRELESS CARRIERS WILL BE THE BIGGEST LOSERS, UNLESS...

Wireless carriers are hungry to capitalize on the promise of connected cars and the always-connected consumer lifestyle. This is quite logical, considering, for example, estimates by CTIA that by 2017, 60 percent of all cars sold in the U.S. (about 10 million vehicles) will have built-in wireless connectivity.

Indeed, wireless carriers have been providing automakers with telematic connectivity services for over two decades. However, connectivity has become an interchangeable commodity, differentiated primarily by price.

Recognizing the business risk in becoming a commodity supplier, wireless carriers have been and will continue to make significant investment in developing and demonstrating not only next generation 4G LTE global wireless voice and data networks, but also in mobile and IVI technologies such as voice recognition, driver distraction reduction, and car-home integration. AT&T is probably leading the pack with AT&T Drive Connected Car Platform, which is at the center of the company's global connected car strategy.

But despite these efforts, wireless carriers will not be able to reach significant traction beyond the current vehicle-embedded SIM card based data services. However frustrated by the protective practices of auto OEMs, carriers will continue to compete for exclusive contracts with automakers.

Wireless carriers are torn between the old business model which is driven by data volume and average revenue per user (ARPU) and the desire to be a strategic partner but not having a sustained strategic value. Carriers need to think differently about how to leverage global connectivity infrastructure and expertise as the platform upon which to provide OEMs and consumers greater value. This value is more likely to come from partnerships and acquisitions rather than new technologies that attempt to compete with OEMs and suppliers.

SCOTT FRANK: Vice President of Marketing, Airbiquity



SOURCE: <http://www.airbiquity.com/news/blog/three-connected-car-predictions-2015/>

What's in store for the connected car in 2015? As an industry pioneer and leading provider of connected car technology and cloud-based service delivery to global automakers we believe there are a few trends that will drive the connected car market in the year to come.

1. LEADING AUTOMOTIVE MANUFACTURERS WILL EMBRACE BOTH PROPRIETARY AND THIRD PARTY PLATFORMS

Early in 2014 Apple announced the roll out of its CarPlay connected car infotainment delivery solution at the Geneva Motor Show following similar announcements to enter the market from Google with Android Auto in late 2013. These announcements were proof that both Apple and Google see the connected car market as a ripe and maturing opportunity into which to extend their brands, technologies, and content ecosystems. Meanwhile drivers are increasingly becoming aware of connected car technology, what it can do for them, and expecting safe and seamless integration between their mobile devices and their overall driving experiences.

After months of meetings, reviews, and analysis it's becoming clear not all automakers are willing to cede control of the centre console - and more importantly the valuable data being generated by the vehicle and consumers driving them - to third-party technology providers like Apple and Google with their own interests in mind. Connected car technology in today's leading automobiles represents much more than just another feature - it's an increasingly important aspect of the in-car ownership and usage experience that automotive brands are now recognizing as critical to maintaining post vehicle purchase customer engagement and building loyalty for the next vehicle sale. Moreover, infotainment delivery solutions are just one dimension of the connected car experience that automakers need to bring to market to meet the needs of their consumers today and tomorrow. Safety and security features like remote vehicle location/immobilization and driving optimisation features like battery charge management for EV/PHEV/Hybrid vehicle owners represent significant opportunities for automotive manufacturers to leverage connected car technology to improve vehicle design while delivering added value to their customers.

“Will leading automakers cede control of the infotainment connected car experience to companies like Apple and Google?”

So will leading automakers cede control of the infotainment connected car experience to companies like Apple and Google? Given the high stakes, we believe it's not an either/or proposition, but rather most automakers - with the strategic intent and means - will deploy a “triple stack” with their own branded proprietary platforms and third-party platforms like Apple CarPlay and Google Android Auto to cover their bases.

2. THE CONNECTED CAR WILL BECOME THE “INTELLIGENT CAR”

No one seems to question the growth potential of the connected car market. However, many industry observers are working hard to figure out the economic potential of the connected car, and how automakers will benefit financially from increased investments in technology and services over the long term. One area that will eventually contribute meaningful revenue to automakers and their chosen ecosystem of content and services providers will be the evolving concept of the “intelligent car.”

Intelligent car is about a vehicle - and the connected car platform it's connected to - leveraging multiple data streams with driver preferences, habits, and physical locations to dynamically and proactively serve up real-time, highly relevant communications and promotional offers from ▶

local businesses and service providers. The technology is coming together fast to make this a reality - integrated GPS is available in most new cars, and local points of interest and traffic data can be sourced from various cloud-based applications and service providers. What's missing is the data management and analytic capability, and most importantly new user interfaces for presentation of multi-channel content to the driver in centre stack head units, driver instrument clusters, and heads-up windshield displays.

We believe that 2015 will see the beginning of this new wave of next generation apps and user interfaces which will demonstrate the value of intelligent car to the automotive industry. An important aspect of powering this next wave of technology and user value that cannot be overlooked will be consumers' willingness to share their vehicle and

personal information as they become increasingly aware of what's going on behind the scenes from a data perspective. We believe this won't be an issue for a portion of consumers that are already sharing data in other aspects of their lives as long as there's a clear benefit for what they get in return (i.e., a coupon to a local Starbucks on their drive home from work as an incentive to stop in and make a purchase). However, an equal number of consumers will likely be very wary to sacrifice their privacy until they more fully understand the implications and get first hand exposure to the benefits. To overcome this, automakers and their ecosystem partners will need to tread carefully in the wake of recent high-profile privacy scandals to ensure they do what's right for the consumer and provide the necessary assurances and safeguards to build trust.

Connected Car

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NextGen



CONNECTED CAR EVOLUTION: WHAT'S NEXT?



THE CONSUMERS' WORLD IS FAST BECOMING A CONNECTED ONE; from cell phones to cars all the way to refrigerators. Folks at Cisco believe there could be up to 50 billion things connected to the Internet by 2020. The world as we know it is changing, and with each year that passes every aspect of a person's day-to-day life will be increasingly connected.

All industries will have to adapt to this emerging reality to stay relevant, and the automotive industry is no exception. Automakers, mobile network operators and content and service providers alike; every area of the industry will need to focus on this trend. Changes will need to be made in the short-term to meet a new demand for connectivity, and long-term to stay ahead of where the connected-car will go.

SHORT-TERM: EVOLUTION OF CONNECTED CAR CONTENT AND SERVICES

The demand for connected cars is growing rapidly. In fact, a recent report from Park Associates stated that connected car features would dramatically influence a purchaser's decision when buying a new car. Over 75% of U.S. car owners with at least one connected car feature – be it access to social media channels like Facebook or streaming music like iHeartRadio – will look for similar features when they shop for their next car.

In 2015, driving-centric apps and services will begin to appear and eventually become as important as infotainment content in the consumer purchasing process. The current automotive manufacturer's focus on providing infotainment delivery (streaming music, social media channels etc.) reflects their desire to meet the expectations of digital lifestyle consumers who are heavy users of smartphones and want to use their favourite apps and services inside their cars. This is a logical first-step, but these savvy consumers will increasingly value apps that are truly useful and relative to the driving experience. An example is an app that proactively and dynamically recommends modifications to a driver's high frequency routes to help them optimize fuel consumption, lower CO2 emissions, minimize engine wear, and avoid road hazards. As a result apps that don't add to the consumer experience relative to driving will eventually die off from lack of use, and automotive manufacturers will replace them with more and more driving-centric apps to satisfy their customers and differentiate themselves from competitors.

To make driving-centric apps a reality, automotive manufacturers and their connected car service providers must develop new use cases that leverage diagnostic data drawn from the car, consumer data about driving behaviour and preferences, and other relevant data sets from app and service providers. Cars are increasingly being fitted with sensors to capture more and more information and cloud-based connected car service delivery platforms will play a central role by continuously connecting the car and driver to the outside world and managing the

data and analytics to power driving-centric apps. For example, vehicle and driver data can be dynamically stored, updated, and analysed in the cloud to determine when a vehicle service offer should be presented to the consumer by a local dealer including a promotional incentive for taking immediate action – a true "win-win" for all involved.

LONG-TERM: EVOLUTION OF CONNECTED CAR CAPABILITY AND INTEGRATION

The European Union (EU) has a government mandated eCall initiative in motion that will require all new cars to be equipped with technology enabling automatic emergency calls in the event of an accident. This mandate will necessitate technology solutions such as embedded SIMs – versus smartphones – to ensure a consistent and reliable connection between the vehicle and wireless communication networks.

Similar discussions are underway in the U.S. for mandates on backup cameras and other safety oriented features. However, automatic crash notification and backup cameras are only the tip of the iceberg.

Innovative companies are working hard and fast to create technology that will enable 100% self-driving or "autonomous" cars. These first steps towards autonomous car can be seen in existing vehicle safety and convenience features like lane departure warning, automatic braking, and self-parking. As these features continue to evolve towards true autonomous cars – where there is no need for a steering wheel and pedals – governments will need to be increasingly involved to set minimum standards, regulations, and guidelines for technology adoption and integration into existing and new public infrastructure like roads, traffic signals, and transit systems. In the not too distant future automotive manufacturers will increasingly be pressured – and in some cases required – to comply with and participate in government sponsored policies and infrastructure initiatives. In the end this is a good thing and needs to happen, but it will take an exponentially larger amount of time, money, and technology to enable the evolution of the connected car as we know it today to the autonomous car of the future than anything the automotive industry has faced before.

LOOKING FORWARD

Tactical issues aside, these changes are certainly coming, and will dramatically impact both the automotive industry and related ecosystem of technology and service providers and the consumer driving experience. The connected car is here to stay. Companies that want to play a central role in seizing the business opportunity associated with it will need to embrace the technical challenges and be willing to sponsor and create the new and innovative technology that will make it happen.

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AUTOMOTIVE SEMICONDUCTORS NEWS

STMICROELECTRONICS EXHIBITS LATEST AUTOMOTIVE SOLUTIONS IN JAPAN

STMicroelectronics showed its latest automotive solutions at the 7th International Automotive Electronics Technology Expo, which took place in Japan during January. These included technologies essential to achieve autonomous driving include Advanced Driving Assistance Systems (ADAS), which raise driving safety by detecting obstacles around the vehicle such as other vehicles and pedestrians, as well as traffic signs and lane markings to automatically operate brakes or control speed and following distance.

In connected cars, where vehicles are connected to networks, the market attention is focused on the vehicle-to-everything (V2X) communication technology that enables vehicle-to-vehicle and vehicle-to-infrastructure interaction. ST hosted a demo where a V2X-enabled vehicle automatically controlled brakes by communicating with traffic signals, as well as an automotive-security solution that protects networked vehicles from security threats.

A vehicle cockpit on the ST booth was equipped with various types of sensors that detect environmental conditions in the car. In this demo, UV, temperature/humidity, and barometric data, as well as the driver's heart-beat detected with a watch-type optical heart-rate monitor were displayed in the cockpit. Proximity sensors used for gesture control were also placed at the center of the demo cockpit. Furthermore, a MEMS microphone that enabled operation of the car audio system (play/stop) by voice was integrated in the seatbelt.

ST also exhibited other automotive products and solutions including its Teseo family of single-chip positioning ICs that can receive signals from multiple satellite positioning systems, dynamic NFC tags that enable communication between smartphones/tablets and automotive-infotainment systems, and a wireless power-supply solution.

BROADCOM INTRODUCES EFFICIENT AUTOMOTIVE ETHERNET CHIP

Broadcom has announced its next-generation BroadR-Reach automotive Ethernet chip, optimized for use in low-power automotive applications. Delivering 100 megabit per second (Mbps) performance over a single, unshielded twisted pair wire, Broadcom says that the chip combines the functionality of multiple discrete devices in an ultra-small package (6x6 mm).

While Ethernet has long been used as an IT network technology, its application in the connected car is on the rise. Broadcom's press release states that the low power features of new BCM89811 physical layer transceiver (PHY) enable new use cases for automotive Ethernet beyond infotainment and Advanced Driver Assistance Systems (ADAS) into telematics, shark fin antennas, instrumentation clusters, head unit and center stack module applications.

"As the deployment of more sophisticated connectivity features continues to ramp at a rapid pace, so does the need for higher bandwidth and scalability," said Dr. Carsten Kromke, Head of E/E-Architecture and Networks, Volkswagen AG. "Automotive Ethernet delivers the scalable bandwidth needed for multiple applications while providing full control over the configuration of the in-car network."

Broadcom is a founding member of the OPEN (One-Pair Ether-Net) Alliance Special Interest Group (SIG), an industry consortium focused on driving wide scale adoption of Ethernet-based automotive connectivity as the standard in automotive connectivity.

TI AND FORD WORK ON SYNC 3

Ford's SYNC automotive infotainment solution has been around for some time now and has been through a few iterations. Based on our own experiences in Hertz

rental cars in the USA, early systems were rather unfathomable. However, our rental wagon for the CES 2015 trip was a Ford Explorer, and SYNC in that car seemed to work pretty well.

Now we learn that Texas Instruments (TI) and Ford Motor Company have collaborated on the new Ford SYNC 3. The system uses TI's OMAP 5 processor, a member of the "Jacinto" family of automotive processors, the WiLink 8Q platform, a single-chip combining high performance Wi-Fi, Bluetooth 4.0 and GNSS, as well as power management and FPD-Link III serializer/deserializer (SerDes) wired connectivity solutions.

TI claims that together the devices provide improved performance for enhanced voice recognition and navigation, quality hands-free Bluetooth connectivity, Wi-Fi enabled software updates and enhanced driver interactivity.

Curt Moore, Automotive Processors general manager, TI, told Connected Car, "When Ford selected TI as a strategic partner in the development of this innovative system, we saw this as an opportunity to work with an industry leader to leverage our long standing history in automotive. Through our expansive technical support we were able to quickly deliver a game-changing product Ford customers will use today."

CONSUMER SATISFACTION AND THE CONNECTED CAR

Every year the automotive industry waits upon the latest findings on consumer satisfaction of the car. Consumers make purchase decisions based upon the recommendation of surveys, such as the one from J D Powers. As such, the automotive industry focuses its attention on the latest results and consumer opinion. The J D Powers vehicle dependability study is a consumer satisfaction survey that polls buyers and amasses data on the level of consumer satisfaction – or otherwise – with the leading car marques.





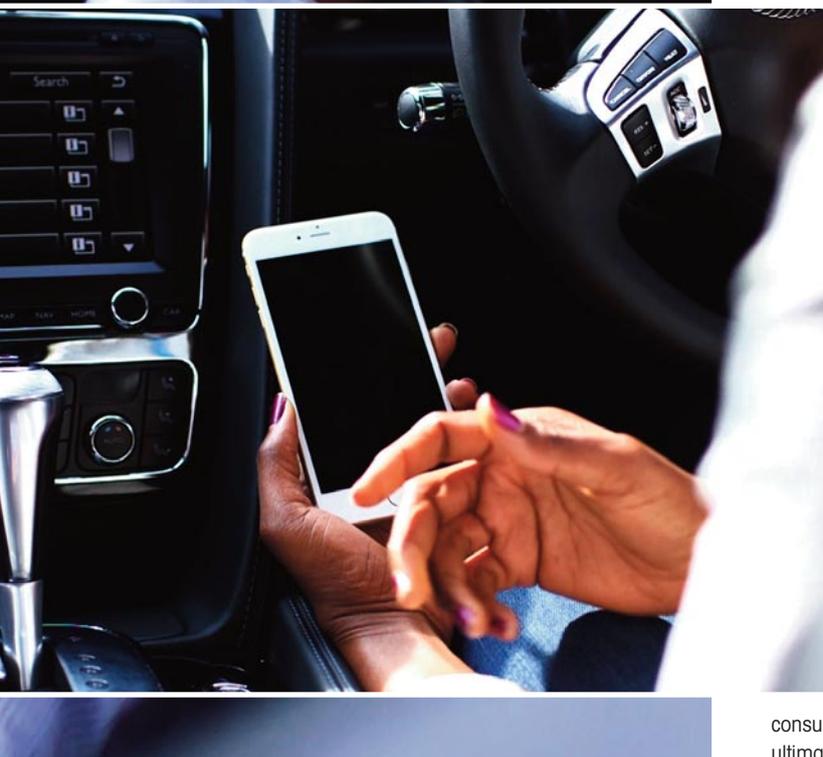
The most recent 2015 report has just been released for the USA and it makes sobering reading for the automotive infotainment industry. For the majority of car owners today, the top issue in the car is Bluetooth pairing and connectivity, followed by the performance of built-in voice recognition. 55% of owners who had Bluetooth connectivity issues stated that the car system would simply not recognise the phone, while 31% stated that the auto-connection failed.

In the connected car, the consumer devices being brought into the car play an essential role in this user experience. NextGen recognises that this experience can vary greatly according to where the consumer is located and what devices they will use. While a particular car model will likely have the same in-dash systems installed in all markets across the globe, mobile phones can vary in specification and capabilities between regions.

NextGen provides solutions to help car makers understand the end consumer's interoperability experience on a global and regional level. Both the devices and their data connections are factors that vary by region and can play a pivotal role in the consumer experience. As an Interoperability test provider, NextGen creates metrics for the performance of global mobile devices with the in car systems we analyse.

Key to this process is the requirement for a detailed understanding of the devices themselves. As such, part of the challenge is to map devices in every global market. Identifying these devices also requires some very specific research and intelligence. It is possible to identify popular models from historical sales data, but for interoperability testing the latest device data is needed - sales data will typically lag by six months or more from launch. For NextGen's customers it's vitally important to identify and test key devices upon release. NextGen aims to test all key devices and have consumer-facing data available during the first few weeks after launch. So NextGen has created a comprehensive analysis system which can identify the most important devices per region for user experience validation and testing. See pages 28-29 of this issue for examples.

It's an ongoing and continual process. NextGen's dedicated market research teams monitor and survey all countries and regions of the globe, from Russia to Indonesia and from USA to Japan, capturing device offerings from hundreds of operators and retailers around the world. NextGen records and maps this data for our customers in order to recommend device tests programmes that represent all the key devices by region for test. NextGen then provides highly targeted test programs for customers who can specify key regions for testing in the knowledge that NextGen's research highlights the key devices for every region. This approach allows NextGen to provide up to the minute data via consumer facing websites. These help consumers pair and utilise the latest technology and devices, and ultimately increase the car purchasers satisfaction with their car.



TOP HANDSET RELEASES BY REGION – Q2 2015

NextGen Technology continually researches cellphone and mobile device releases across the world, and regularly publishes lists of the most important devices to test at any given time for car companies and systems developers.

For further market specific data, or detailed regional summaries please contact NextGen online at www.nextgen-technology.com or use the contact details here:

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EUROPE Q2

MANUFACTURER	MODEL
HTC	Desire 620
HTC	One M9
LG	G Flex 2 H955
Microsoft	Lumia 535
Microsoft	Lumia 640 XL
Samsung	Galaxy A3 A300FU
Samsung	Galaxy A5 A500FU
Samsung	Galaxy S6 Edge G925F
Samsung	Galaxy S6 G920F
Sony	Xperia E4g E2003



NORTH AMERICA Q2

MANUFACTURER	MODEL	CARRIER
HTC	One M9	AT&T
HTC	One M9	Verizon
LG	G Flex 2 H950	AT&T
LG	G Flex 2 LS996	Sprint
Microsoft	Lumia 640 XL	AT&T
Samsung	Galaxy S6	AT&T
Samsung	Galaxy S6	Verizon
Samsung	Galaxy S6 Edge	AT&T
Samsung	Galaxy S6 Edge	Verizon
Sony	Xperia Z3v D6708	Verizon



CHINA Q2

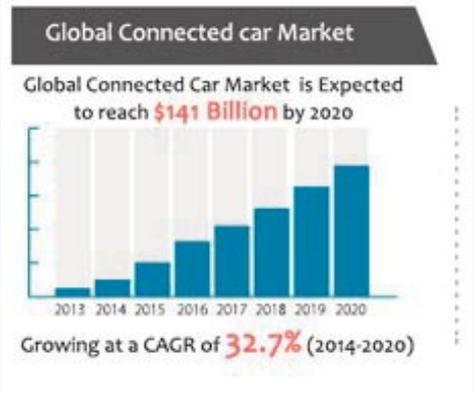
MANUFACTURER	MODEL
HTC	One M9
Huawei	P8*
Meizu	M1
Meizu	M1 Note
Nubia	Z9 Max
Samsung	Galaxy S6 Edge G9250
Samsung	Galaxy S6 G9200
Xiaomi	Mi Note
Xiaomi	Mi Note Pro
Xiaomi	RedMi 2

*device details are subject to confirmation



JAPAN Q1

MANUFACTURER	MODEL	CARRIER
Samsung	Galaxy Note Edge SCL24	au
Sony	Xperia Z3 SOL26	au
Fujitsu	Arrows NX F-02G	docomo
Samsung	Galaxy Note Edge SC-01G	docomo
Samsung	Galaxy S5 Active SC-02G	docomo
Sharp	Aquos Zeta SH-01G	docomo
Sharp	Disney mobile SH-02G	docomo
Sony	Xperia Z3 Compact SO-02G	docomo
Sony	Xperia Z3 SO-01G	docomo
Sony	Xperia Z3 401SO	Softbank



NEWS

MERCEDES-BENZ UNDERLINES LONG-TERM COMMITMENT TO AUTONOMOUS DRIVING

Mercedes-Benz (MB) is celebrating 30 years of commitment to autonomous driving, and suggests that an autonomous future is closer than it has ever been before with a range of semi-autonomous technology available across the MB line-up.

This semi-autonomous technology – under the banner ‘Intelligent Drive’ – is apparently available across the range from the C-Class to the S-Class. Examples include DISTRONIC PLUS with Steering Assist and Stop&Go Pilot – the vehicle automatically brakes and accelerates based on the car in front and can even follow the car ahead without any steering input from the driver, whilst Active Parking Assist with PARKTRONIC helps detect suitable parking spaces and can automatically manoeuvre the vehicle into the space.

While this technology brings Mercedes-Benz one step closer to an autonomous future this mobility revolution has to take place in a series of steps. In line with this, MB lays claim to having demonstrated autonomous driving capabilities since 1985 with the EUREKA-PROMETHEUS research project, S 500 INTELLIGENT DRIVE and F 015 Luxury in Motion.

Daimler-Benz and a group of European Manufacturers kick-started the research into autonomous cars in 1985 with the EUREKA-PROMETHEUS research project (Project for European Traffic with Highest Efficiency and Unprecedented Safety). The project – over an eight-year period – addressed issues surrounding the future of mobility and suggested ways to improve vehicle safety, efficiency and traffic flow. The result was the VITA-vehicle (Vision Technology Application) which used miniature video cameras behind the front and rear windscreens to capture the traffic around the vehicle enabling it to brake, accelerate and steer accordingly. The origins of a broad range of innovations, such as lane-change,

parking assistance and navigation systems can all be traced back to this research project.

Coming up to date in 2015 with the F 015 Luxury in Motion, Mercedes-Benz told Connected Car it is demonstrating what form ‘Intelligent Drive’ might take in the future. The car’s role, the company says, is evolving from merely a means of transport towards a comfortable place for passengers to utilise their new-found free time.

The F 015’s electric-hybrid system has a total range of 684-miles and can operate in manual or autonomous modes. The driver is connected to the outside world via a choice of six screens integrated throughout the interior, controlled via eye-tracking, gesture recognition or touch. The F 015 – designed from the outset as an autonomous car – was launched at CES in Las Vegas (see report elsewhere in this issue), with the first press test ‘rides’ taking place during March in San Francisco.

This autonomous concept car is based on MB’s future scenario – ‘Vision 2030+’ – where the already limited space in today’s cities becomes ever more restricted and autonomous driving is socially accepted. MB predicts that a major part of everyday trips will be covered in autonomous mode – creating a new driving culture – freeing up time for the driver and creating a retreat for passengers.

CONNECTED CAR MARKET CONTINUES TO GROW AT RAPID SPEED

The connected car market is expected to generate a revenue of \$141 Billion by 2020, according to analysts at Allied Market Research (AMR). Advanced infotainment systems and a fast connection to the wireless network are the two prominent features that potentially enhance the market growth. Technology agreements and collaborations are the key strategies adopted by the market players to enhance their market share. For instance, AT&T is working with automotive manufacturers to provide contextual voice

controls, which would help to create a safer driving experience. TomTom has launched the online turn-by-turn navigation service for customers, making it feasible to connect over a network.

Based on connectivity technology, AMR says that the global connected car market is segmented into 2G, 3G and 4G/LTE. The 2G service used for providing connectivity will gradually fade out in the next few years, which would be replaced by LTE and 3G technology. Some of the prime reasons for this technological shift should be the rapidly changing telecommunication technology and the advent of faster & reliable communication networks.

On the basis of connectivity solutions, AMR’s view is that the connected car market is segmented into integrated, embedded and tethered solutions. In 2013, embedded connectivity solutions lead the market with almost 40% of the global connected cars market share, followed by integrated and tethered connectivity. However, this scenario could change in 2020, as integrated solutions are expected to occupy approximately 45% of the market share. The reason for this drastic change can be attributed to the consumer’s freedom of choice in customizing their connectivity devices and data plans.

Geographically, the market is segmented into, North America, Europe, Asia Pacific and LAMEA. The Asia-Pacific region indicated a prominent growth and will go on to grow at a CAGR of 35.9% over the forecast period. In the years to come, AMR predicts that Asia-Pacific should be a prominent automobile market, owing to the rapidly growing population, rising disposal incomes and a large presence of youth. This in turn should indirectly boost the market for connected cars.



AUTOMOTIVE INDUSTRY EVENTS

Connected cars feature at events all over the world, and not just at traditional car shows. Connected Car maintains a list of significant shows. If you are aware of events we have missed, please feel free to let us know.

2015

14-15 April 2015

Bluetooth World

Santa Clara, CA, USA

Official Bluetooth SIG event. Innovation

Sponsor: NextGen Technology

<http://bluetoothworlddevent.com/>

22 April 2015

OpenAutomotive

Stuttgart, Germany

<http://openautomotive.genivi.org/>

1-2 June 2015

Automotive Linux Summit

Japan

<http://events.linuxfoundation.org/events/automotive-linux-summit>

1-4 June 2015

Bluetooth SIG UnPlugFest 51

Hanoi, Vietnam

<https://www.bluetooth.org/en-us/news-events/upcoming-events/testing-events/unplugfest>

3-4 June 2015

Detroit Telematics

Novi, Michigan, USA

<http://www.tu-auto.com/detroit/>

24-25 June 2015

Connected Car World

Amsterdam, The Netherlands

<http://connectedcarsworld.com/speakers/>

1-2 July 2015

AutomotiveIT International Congress

Paris, France

<http://congress.automotiveit.com/>

18-20 August 2015

Bluetooth SIG 2015 Automotive Test Event

Auburn Hills, MI, USA

<https://www.bluetooth.org/en-us/news-events/upcoming-events/testing-events/automotive-test-events>

15-16 September 2015

Bluetooth World Europe

London, United Kingdom

<http://bluetootheuropeevent.com/>

12-15 October 2015

Bluetooth SIG UnPlugFest 52

Berlin, Germany

<https://www.bluetooth.org/en-us/news-events/upcoming-events/testing-events/unplugfest>

14 October 2015

OpenAutomotive

Seoul, Korea

17-19 November 2015

Connected Car Expo/ LA Auto Show

Los Angeles, California, USA

<http://connectedcarexpo.com/>

2016

6-9 January 2016

Consumer Electronics Show

Las Vegas, Nevada, USA

<http://www.cesweb.org/>

3-13 March 2016

Geneva Motor Show

Geneva, Switzerland

<http://www.salon-auto.ch/en/>

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