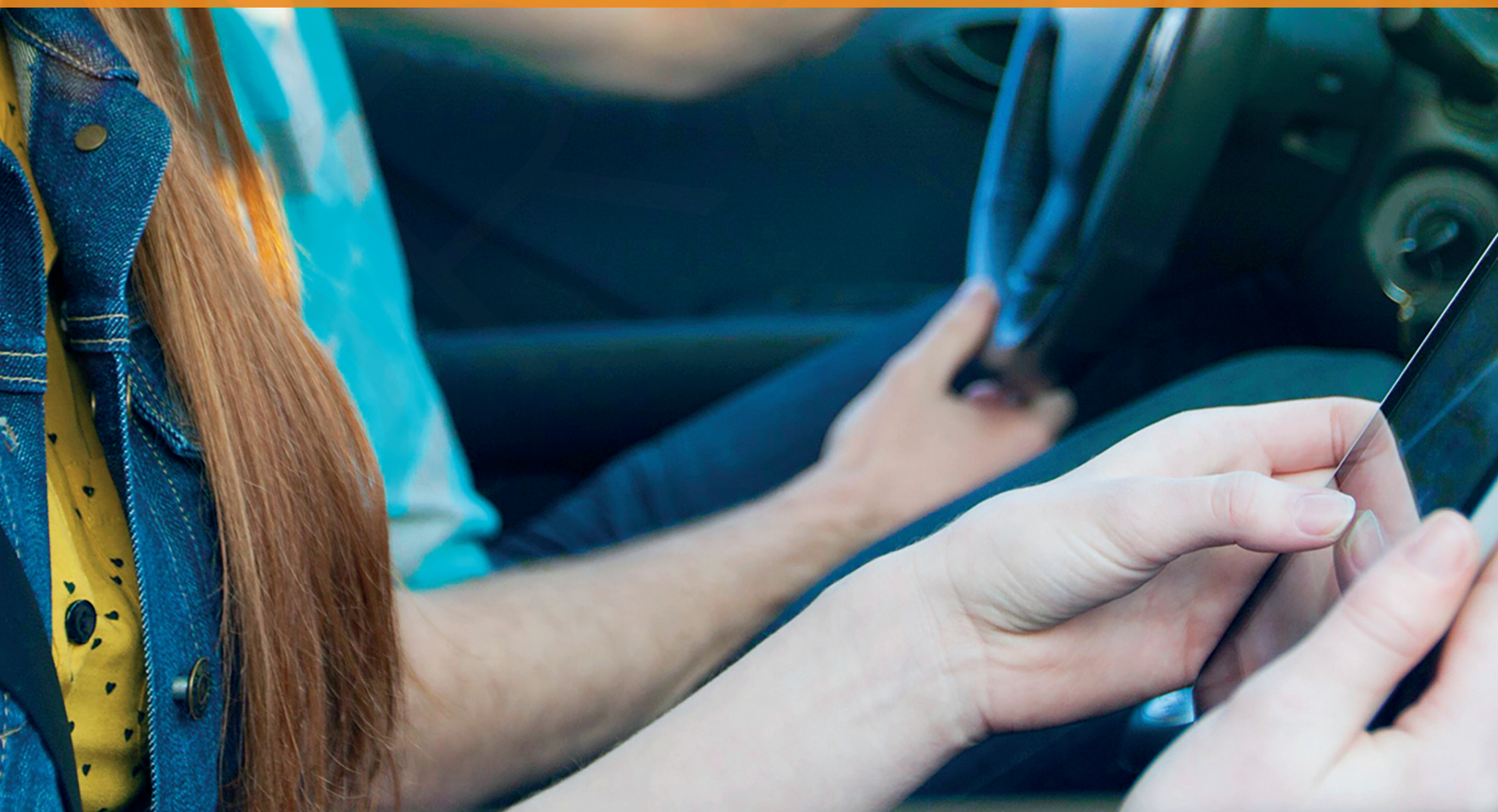




Winning the Connected Car Data Wars



Christian Markgraf, Principal Industry Consultant for Automotive, Germany
Martin Johnston, Senior Industry Consultant for Automotive, Sweden

09.15 AUTOMOTIVE

TERADATA

Table of Contents

- 1 Why Data is an Integral Part of the Connected Car
- 1 Four Data Challenges Posed by the Connected Car
- 4 Key Elements for Connected Car Data Strategies
- 6 Conclusion

Why Data is an Integral Part of the Connected Car

The connected car sees the convergence of the car with the connected consumer's new digital lifestyle resulting in an increasing array of choice in apps, mobile connectivity and services. The connected car brings opportunities for automotive manufacturers to create new services, and extend the value and life cycle of their products using new business models, some of which are outside the traditional automotive space.

However, the connected car has also attracted companies that have traditionally not played in this space to the already competitive automotive industry. It is not surprising then that Gartner has identified the connected car as one of the most disruptive business and technology trends facing the automotive industry today.

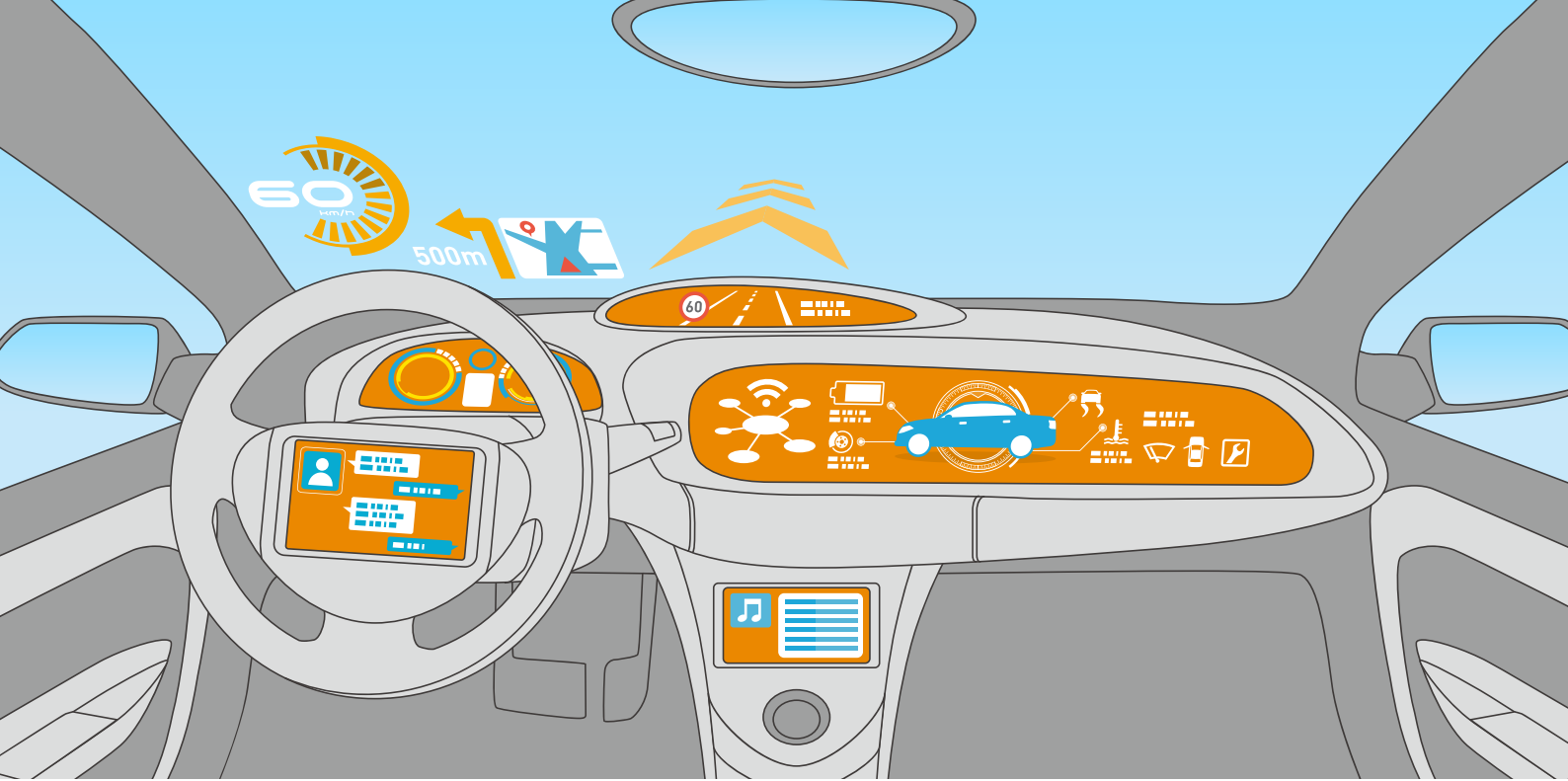
From driving new innovations in car design, and minimising warranty and defects, to enabling car sharing schemes and managing traffic congestion, the data transmitted from connected cars has wide-ranging applications that benefit automotive manufacturers, car users and society at large.

Four Data Challenges Posed by the Connected Car

As connected cars evolve from car-to-mobile connections to vehicle-to-vehicle and vehicle-to-infrastructure connections, it is clear that the data flowing through these connections is valuable to automotive manufacturers and their partners, but also a complex challenge to manage. Get data from the connected car right, and there could be great business opportunities; get it wrong and risk being squeezed out by the competition.

The Connected Car in Numbers

The five year compound annual growth rate for the connected car market is 45%! This is ten times faster than the overall car market.



Valuable Data Flows Through the Connections of a Connected Car

Understanding the Difference Between Big Data and Lots of Data

Since the introduction of on-board diagnostics and Controller Area Networks (CAN) to connect Engine Control Units (ECU) in cars, being able to collect data from cars has been paramount. Back in the late nineties, market leaders developed the capability to continuously collect in-service diagnostic read-outs to assure quality and function of the cars in the field. Car-generated big data by itself is nothing new to the automotive industry.

However, the expectation is that connected cars will produce exponentially large volumes of data that will need to be managed. Manufacturers today are downloading 100 - 200 kilobytes of data from a car, once a year, during its annual service. With the connected car, manufacturers will be able to download kilobytes of data every day. And there is also the remote diagnostics capability of recording data on-demand as needed to study anomalies in detail for vehicles when the need occurs.

With Gartner predicting that there will be 250 million connected cars on the road by 2020^{iv} the scale of the data challenge for automotive manufacturers becomes clear. Companies will need to evaluate whether it makes business sense to collect all the data available, considering the cost of transferring and managing the data. The ability to manage this over time as the business identifies the value in the different datasets is key.

The Connected Consumer

New entrants to the automotive industry, such as Tesla, have revolutionised customer relationships and interactions by selling direct to customers. The cars can be bought online, and the firm sends software upgrades directly to its cars, without the need for customers to drive to a service centre. This innovative approach has won over consumers, with Tesla being rated number one in customer satisfaction by Consumer Reports^v.

Consumers value this direct relationship with the manufacturers. As is already the case in the retail

250,000,000

By 2020, it has been estimated that 250 million vehicles, or one in every five cars on the road, will have some kind of wireless network connectionⁱⁱ.

Telematics devices in cars produce a data record every second.ⁱⁱⁱ Compared with the cars of yesterday, which generated 100 - 200 kilobytes of data for every service, the growth of data from the connected car has been explosive.

second



Enhance the Service Experience with Integrated Data

Servicing used to be straightforward. But in a competitive environment, automotive companies need to use all the data at their disposal to craft a compelling package that will entice connected car owners to have their cars serviced by them. Here are some of the questions that an automotive company needs to be able to answer about its demanding consumers:

- When was the last service and what was done during that service?

industry, the connected consumer wants to interact with the manufacturers on a channel of their choosing whether that is in the showroom, online, at the call centre, on social media, or in-car application.

For the industry, this means collecting data from new sources – tracking which customers browse and configure their ideal car online and then go on to buy it in the showroom, call centre voice records, interactions with in-dashboard or connected car apps on their smartphone. These new sources of data will provide automotive companies with that 360° view of the customer, which is necessary for delivering a seamless omni-channel experience to the consumer.

Privacy and Trust

According to a McKinsey study^{vi}, 51% of German, and 45% of U.S. consumers surveyed said they had reservations about using connected car services because they were worried about data privacy. The industry has started to address this issue, with the Alliance of Automobile Manufacturers and the Association of Global Automakers putting forward a set of privacy principles for vehicle technologies and services in November 2014^{vii}.

Before deciding how data from the connected vehicle should be treated, companies first need to understand what data is private. Data that transmits the condition of a vehicle's function and quality, or driving behaviour, could be valuable for the automotive manufacturer. This can be collected and analysed in an anonymised format.

Location data from a connected car can be used to provide services to the driver, for instance, advertising the nearest petrol station. For the connected car to be truly successful, automotive manufacturers have to convince consumers that location data like this will be kept securely and shared only if the consumer has opted-in to share it.

Automotive manufacturers have to adopt an approach where data is considered a customer asset, and just like banks, build consumer trust in their ability to store and share this data. And if manufacturers want to monetise that data, then they need to offer consumers something of value in return.

Business Value

The connected car has been called a “gigantic data-collection engine”^{viii}, and automotive manufacturers are investing in the collection, storage and security of this data because it can deliver future value to the business.

Within the automotive industry, product innovation is now taking place at such speed that it is no longer a differentiator. A unique innovation today can easily be copied and put into manufacturing by a rival firm soon after. This increasing commoditisation of innovations means that product specifications are no longer a unique reason for the consumer to choose one car model over another. Connected car data is invaluable in this instance as it can help automotive manufacturers understand how to create new services and experiences for their consumers that might distinguish their cars.

- What additional services would the car owner like to have?
- Is he loyal to his dealer for servicing or does he like to shop around?
- Are there critical problems that need to be fixed? Is the owner or customer call centre aware of this? Has a service action been activated based on this?
- Are there known issues with the configuration of that car or its software versions and do they need to be upgraded?
- Are there upsell opportunities such as cleaning or reconditioning the car, a bike mount, or a new

smartphone holder specific to the type of smartphone they use?

- Has the owner opted-in to receiving these offers?
- Has the owner already made a service booking? Or missed earlier bookings?

If automotive companies already have the answers to these questions, they will be able to increase the service revenue from the service visit, for the dealer and the manufacturer, as well as optimise the best possible experience for the car owner. Getting the answers though means integrating customer, product, service and connected car data.

Launching new services, such as, allowing car owners to receive shopping deliveries securely to the boot of their cars, is one such example. And with industry trends indicating that the nature of car ownership is changing, automotive manufacturers can position themselves to offer alternatives such as pay-as-you-drive insurance, car leasing or shared-usage schemes^{ix}.

Key Elements for Connected Car Data Strategies

The challenges described demonstrate the pressing need for automotive manufacturers to develop data strategies to deal with the influx of connected car data and convert this into value to differentiate their products as well as create services and experiences that engage the connected consumer. At the same time, they have to put in place systems and processes that ensure that sensitive consumer information is secured and protected.

Bringing Data Together

To meet many of the challenges – understanding the customer, investigating viable service offerings, evaluating the profitability of selling online – automotive companies need to have a full view of their business from every perspective. That means bringing together data, that might be held in various databases and applications used by different departments across the organisation. This could be finance data, supply chain data, car sensor data, or customer records.

As business gets ever more competitive and complex for automotive manufacturers, bringing together all the different data sources from across the company can help the organisation find and understand connections and relationships. Also, when an organisation's data is integrated, it can be queried multiple times, by multiple members of staff, and can be used to provide historical context to current events, enabling the true impact of current or future events to be known.

Accepting That Not all Data is Equal

The ability to bring together data sources from across the organisation is powerful, but equally powerful is the ability to treat data differently based on its sensitivity and value to the organisation. For instance, in order to foster trust amongst consumers, the automotive industry needs to store data that can be used to identify individual consumers behind the corporate firewall instead of in the cloud to ensure data security. Similarly, to keep a lid on costs, second-by-second breakdown of driving data based on position might best be kept in the cloud rather than behind the firewall. It will still be accessible to the manufacturer or a business partner, such as an insurance company, who might need to utilise this data for a service. This data can be kept for the duration where it creates value and then deleted.

Similarly, not all data has proven value to the organisation. Treating all data equally, regardless of its value to the organisation would quickly become expensive. With the unit cost of data storage at historical lows, many organisations have already adopted the best practice of storing big data sets that

How Analytics Performed at the Right Time Might Yield Actionable Insights for Automotive Manufacturers While Avoiding Unnecessary Costs

Sub-Seconds

Forward facing radars have faster reaction times to objects in front of the car than the human behind the steering wheel. As the connection of the vehicle to infrastructure makes it possible to see around corners and other cars, crashes can be prevented with seconds to spare.

Seconds to Minutes

Traction control systems sensing slippage on a wheel sends data to other cars approaching that location, warning them of the hazardous conditions.

Minutes

Transmitting alerts to owners via anti-theft devices if a vehicle is suspected to have been stolen, based on entry mode or location.

Hours

Detecting quality issues of cars in the field or targeting offers and services to connected owners as the car passes a certain position.

Days

Advice and proposals for pay-as-you-drive insurance users or to a car-sharing programme participant, based on usage patterns and behaviours.

are infrequently accessed or which are of unproven value in cheaper storage options.

Real-time vs Right Time Analytics

For automotive manufacturers, getting value from the data does not necessarily mean a need to perform real-time analysis of the data. Rather, it is more important to determine how the data could be used and to what benefit. Often organisations find that analysing the data minutes, hours, and days after the data is collected still yields actionable insights.

This approach, of performing analytics on the data at the right time, rather than in real time, has

important implications for automotive manufacturers. It enables firms to put the ability to query the data in the hands of the employees, not just strategic or middle-management levels. This means employees can get timely insights that inform decision making at an operational level. For call centre operatives, showroom sales staff, service centre repair engineers, this provides awareness of all the other touch points and conversations that a particular consumer has had with the organisation. This allows them to respond intelligently to the customer. In the long term, this promotes customer satisfaction and loyalty, maximises profitability and improves business efficiencies.

Focusing on Relevant Data to Decode Engine Faults

Running engines produce time series data, through the intricate network of sensors connected to the Engine Control Unit that sense how drivers accelerate, brake or cruise down the road. When a failure event takes place, engineers already collect detailed time-series sensor data, through the use of freeze frames.

Even when there are no faults with the engine, this data might still be valuable to the automotive manufacturers. By saving data from engine testing and normal certification cycles, companies can then

compare the patterns to the freeze-frames collected in failure events. In combination with other data around vehicle configuration, market data, service data, and engine software versions, manufacturers can understand not only the root-cause of the problem, but also the population of vehicles that might experience similar issues. They can then decide if this analysis should be done on a continuous basis or only until the corrective action is implemented and at the same time decide if there are further testing procedures needed for engines that are currently being manufactured or under development.

Months

Feeding usage information back to design teams, so that changes can be implemented, for instance, if sensor read-outs suggest that back doors of certain models are not often opened and closed, design teams can make a decision to only manufacture a 3-door version of that model instead of the 5-door version.



Conclusion

In the face of changing economic and operating conditions, automotive manufacturers need insights that can help them take action to face off challenges from new and old competitors, complement the product offering with services based on the connected car, as well as create a unique experience for every car owner and driver, generating value for the company over the lifecycle of the vehicle. Data from the connected car, when combined with other data, in a timely manner, and with the right technology, is what hands the industry its competitive edge. It is by using data that automotive manufacturers will continue to be top of mind for the next generation of drivers.

Christian Markgraf, Principal Industry Consultant for Automotive, Germany

Christian has spent more than twenty years at an automotive manufacturer, across their business, in Manufacturing, Engineering, Supplier Management, Supply Chain Management and Lean Management.

Martin Johnston, Senior Industry Consultant for Automotive, Sweden

Martin has worked in the automotive industry for more than ten years. He has been involved in projects to improve marketing, sales, business development and corporate performance management through the use of data and analytics.

Endnotes

- ⁱ The 'connected car' is creating a massive new business opportunity for auto, tech, and telecom companies, John Greenough, Business Insider UK, 11 Mar, 2015
- ⁱⁱ Gartner Says By 2020, a Quarter Billion Connected Vehicles Will Enable New In-Vehicle Services and Automated Driving Capabilities, Gartner, 26 Jan 2015
- ⁱⁱⁱ AUTOSAR (AUTomotive Open System Architecture); www.autosar.org
- ^{iv} Gartner Says By 2020, a Quarter Billion Connected Vehicles Will Enable New In-Vehicle Services and Automated Driving Capabilities, Gartner, 26 Jan 2015
- ^v How Smart, Connected Products Are Transforming Competition, Michael E. Porter and James E. Heppelmann, Harvard Business Review, Nov 2014
- ^{vi} Connected Car, automotive value chain unbound, Sep 2014
- ^{vii} Automakers Pledge to Protect and Respect Consumer Privacy, Auto Alliance, 13 Nov 2014
- ^{viii} Big Data Drives The Smart Car, Jeff Bertolucci, Information Week, 18 Mar 2014
- ^{ix} How Smart, Connected Products Are Transforming Competition, Michael E. Porter and James E. Heppelmann, Harvard Business Review, Nov 2014

10000 Innovation Drive, Dayton, OH 45342 Teradata.com/automotive

Teradata and the Teradata logo are registered trademarks of Teradata Corporation and/or its affiliates in the U.S. and worldwide. Teradata continually improves products as new technologies and components become available. Teradata, therefore, reserves the right to change specifications without prior notice. All features, functions, and operations described herein may not be marketed in all parts of the world. Consult your Teradata representative or Teradata.com for more information.

Copyright © 2015 by Teradata Corporation All Rights Reserved. Produced in U.S.A.

09.15 EB9000



TERADATA®