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The connected car – overview of trends and services

What everybody should know about the eCall
emergency call service and the latest services
around mobility

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Summary

The automotive industry is undergoing dramatic changes – new technologies will revolutionize mobility in the coming years and decades. New services such as car sharing, automated vehicles and electric cars are developments of the near future, and as such are currently intensively being focused by a variety of players.

Connected cars are already conquering automotive markets worldwide. More and more car manufacturers are equipping their vehicles with connected technology. This allows them to provide services such as breakdown assistance faster and more directly.

The digitalization, and thus also the connectivity of cars is opening up numerous possibilities for developing innovative and intelligent products and services, including options such as app-controlled breakdown assistance, anti-theft protection or emergency calls in the event of an accident. Connected cars hence provide users of vehicles added value when it comes to safety and comfort. The issues of data protection and data security must have top priority in this regard. Companies that don't just want to be involved with digitalization but actually want to actively implement it are well-advised to obtain the support of a specialist provider of connected mobility services.



Introduction

A family sets off in their car in the late afternoon to visit relatives. They want to visit the grandfather who is celebrating his 75th birthday at the weekend. The children, aged five and two, are already asleep in their child seats after just a few minutes. The family sets off late in the evening as the parents had to work. The mother is already snoozing and the father is also fighting tiredness at the wheel. He doesn't pay attention for a moment – suddenly he loses control of his vehicle. The station wagon collides with the crash barrier. Its beveled edge acts like a ramp: the vehicle overturns and tumbles down the embankment. The car can no longer be seen from the road. The occupants of the vehicle involved in the accident are in a state of shock. They are all conscious. The children are crying, the woman has a cut on her head. The father's first thought is: "I must call the emergency service." He looks at the display on the car's dashboard and sees the notification "Emergency call active." Shortly after that a voice can be heard: "This is the emergency response center. We received a report of an accident." He says "Yes, we slipped down the embankment. We need help." The employee in the service center reassures the father.

"We have your position and will send the emergency service immediately. Who is in the car besides you? Is anybody injured?"

The man briefly outlines the condition of his wife and children. The service expert says that help is already on its way and offers to stay on the line until the emergency services arrives. He declines the offer but thanks the service expert, gets out of the vehicle and looks after his children. The ambulance arrives at the scene of the accident a few minutes later. The emergency service administer first aid and bring the family to the nearest hospital. The family had a guardian angel. Apart from the father getting whiplash and some bruises and his wife getting a cut, the family survived the accident with just a scare.



Today, two years later, the man says:

"My wife, the children and I – we got through the accident well. However, I never want to give up the eCall emergency call service. It helped us really quickly at the time."

1. The connected car as a challenge and opportunity

1.1 Current developments in the area of mobility

The mobility of the future will be shaped by fundamental changes brought about by digitalization. Various parties are currently working on developing innovative mobility services – not just traditional car manufacturers but also Internet companies such as Google and Apple as well as start-ups such as the U.S. service provider Uber: In less than ten years, this company, with its online platform for ridesharing, has gone from start-up to a corporate group worth billions operating worldwide. Uber's basic principle is simple: users can use a website or the corresponding app to book ride services, irrespective of whether these are hire cars with a driver, private cars with the owner as driver or conventional taxis.

The development of autonomous vehicles is going one giant step further. Particularly in urban areas, the number of private vehicles will fall dramatically – the ADAC automobile association in Germany, for example, estimates a decline of up to 30 percent by 2040¹. Instead, driverless cars, which passengers will simply be able to order and use via the Internet, will determine public passenger transport. Google's sister company Waymo is currently leading the way in autonomous driving. In October 2018, it announced that it had already completed ten thousand test miles on public streets with its vehicles. This development towards fully automated driving is taking place gradually and will initially make life easier for vehicle users in selected areas – for example through the use of solutions that enable cars in a parking garage to automatically drive to a free parking space and park there.

¹ <https://www.adac.de/verkehr/mobilitaet-2040/prinzipien/sharing-geteilte-mobilitaet/>

1.2 Connected driving – new opportunities

Before fully automated driving becomes available on a widespread scale, it is still mainly people who will sit behind the wheel for the next 20 years. The next direct step along this route is the not yet fully automated, but highly automated car. In parallel with advancing automation, the associated networking of vehicles is also steadily increasing. Correspondingly, large growth is being forecasted in the area of connected cars:

According to the management consultancy firm Counterpoint,
the number of connected cars will grow to 125 million by 2022.

This corresponds to a growth of 270 percent compared to today.²

Furthermore, the percentage of connected cars among new cars in Europe will be almost 100 percent by 2020 – also due to the eCall emergency call system, which, in accordance with EU regulation, must be fitted in all new vehicle models since March 31, 2018 in the EU. Accordingly, the expertise of car manufacturers has for a long time now no longer been limited to “just” building cars. More and more car manufacturers are working intensively on developing car connectivity as well as innovative mobility services. If car manufacturers can collect and process relevant usage data using smart technology in their vehicles, this provides considerable potential for additional services – and this potential is not only of interest to car manufacturers. For example, insurance companies can offer their customers innovative new products such as telematic rates, which reward a defensive driving style. Or fleet managers can manage their fleets more efficiently using telematics.

² <https://www.counterpointresearch.com/125-million-connected-cars-shipments-2022-5g-cars-2020/>

1.3 Telematics and data protection

While scenarios to do with connected cars engender enthusiasm among technology fans, many vehicle users get a queasy feeling in addition to a sense of fascination due to concerns regarding data protection and cyber crime.

Vehicle users consider the issue of data protection and data security to be extremely important. This must be taken on board. However, not by withdrawing from the challenge of connected cars – very soon that will no longer be possible. Instead, it is much more a question of going along the path of technical progress, providing the user with modern services for the networked car – and treating data protection as a very important issue in the process.



2. Mobility services for the connected car

2.1 The connected car as a competitive advantage

Besides future trends such as autonomous driving, car sharing, etc., which change mobility as an overall system, digitalization is also taking place at the level of the individual vehicle. New cars are already internally networked via elements such as on-board computers, driver assistance systems (e.g., anti-lock braking system, parking assist, cruise control, etc.) and on-board networks such as CAN, LIN or Ethernet. Sensors record data, corresponding software analyzes this data and initiates a response, e.g., illumination of the tank warning light or acceleration of the vehicle. In addition, many modern cars are linked with navigation and telecommunications services and are therefore externally networked: The navigation system, for example, receives GPS data or the hands-free system establishes a Bluetooth connection to the driver's cell phone. Driver assistance systems that are already commonplace today such as the electronic stability program (ESP) or emergency brake assistant will also be externally networked in the future, i.e., with other vehicles and with the infrastructure, which will further increase their benefits.



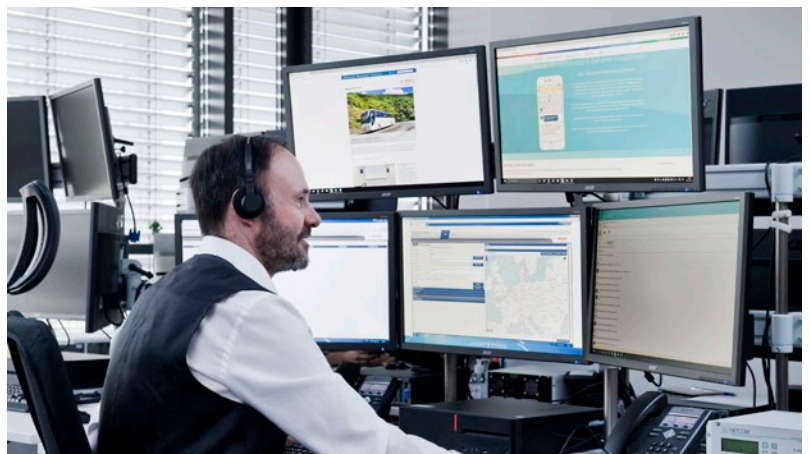
The degree of connectivity will continue to increase in the coming years.

It will then be crucial for market participants to use the development of new connected services for themselves and their customers. The challenge is to recognize the advantages that modern, connected technology in the vehicle brings to the driver – and to pack them into innovative products that are attractive to customers. Anybody who devotes himself or herself fully to this task today will gain a competitive edge, which will be crucial tomorrow. Providers of connected technology for vehicles are therefore developing new mobility services that are intended to make life easier for motorists in the future. There is a general distinction to be made between services that make driving safer and services that improve comfort. Drivers consider both to be very important – the comfort aspect should not be neglected by any means. This aspect can quickly become a deciding factor for users and determine the acceptance of a new product or a new service.

2.2 Support from specialist providers

As things stand today, connected vehicle data is predominantly the access area of the car manufacturer. Therefore for an organization, the fundamental question arises as to how it will obtain according telematics data. Political discussions are still ongoing as to whether other parties, such as insurance companies, should be allowed wider access to vehicle data in the future. At present a company that wants to provide smart services to drivers can do so for example in combination with retrofitted telematic technology. This way a direct connection with the driver's smartphone or a company's own data backend can be established. Companies thus gain access to the data produced by the vehicle and the driver, and can use this for corresponding mobility services – provided the customer or the vehicle user has given their prior consent for this data to be used. The complete approach is best executed hand-in-hand with a provider that specializes in mobility services and integration of these. This provider enables the creation of value throughout the entire value chain, from hardware and IT integration through to the operational provision of the service and, if applicable, the development of necessary service partners.

In order to implement such complex projects professionally and within the given time frame - from the implementation of the solution through to operating services -, extensive experience is necessary. Ideally, the provider has also a track-record in operating multilingual service centers. Service centers with experts in the area of mobility are currently an essential component of providing services in that field. For example, emergency call services such as eCall demand direct interaction with specialist, empathetic service experts for a sustainable service. In the field of comfort services, agent workstations are also technically upgraded through automation and artificial intelligence (AI) to make the provision of the service even more efficient.



2.3 Relevant mobility services

Various mobility services have the potential for new products and services with added value to be developed from them. The following services, among others, are relevant today and will continue to be in the coming years:



eCall

The eCall (“emergency call”) service may already be integrated in the vehicle. In Europe, for example, this is already mandatory for all newly registered vehicle models since March 31, 2018. In addition to the 112 eCall developed under the auspices of the EU, there are also what are known as Third Party Service Provider (TPSP) eCalls.



Roadside assistance

In the event of a breakdown or a slight accident, the driver can request rapid assistance via a connection to a service center. The service expert records the situation using the vehicle data that was sent and the information that the driver communicates to him and then dispatches the required assistance. The service expert immediately sends a tow truck that is in the vicinity to the GPS location of the vehicle that has broken down. If the breakdown cannot be fixed at the location, the service expert initiates additional services such as the immediate provision of a replacement vehicle and repair in a partner workshop. As an alternative scenario to the service center, it would also be possible for the driver to initiate the process independently via a smartphone app. The app, for example, shows the user tow trucks that are currently in the vicinity, the providers to which the tow trucks belong and the time at which they would arrive at the user. The driver then requests the required towing service at the press of a button. The towing service is automatically informed and is dispatched straightaway. In this case, the towing procedure is already fully digitalized. This saves time and tremendous effort at the driver’s end.



Stolen Vehicle Tracking

For newer vehicles, an anti-theft protection service enabling the location and recovery of the stolen vehicle is recommended. In addition to integrated solutions by car manufacturers, there are also systems that can be retrofitted. The latter may be of the form that a retrofitted telematic unit automatically sends a push notification to the driver's smartphone as soon as the car leaves the parking space in an unauthorized manner. The driver reports the theft to the police and receives an identification code from them. The driver then contacts the service center via the app; the service expert first checks the identity of the user and then in turn contacts the police, verifies the identification code and passes on the current GPS location of the vehicle. Finally, the police go out and, in the best case scenario, can recover the vehicle. The user himself therefore does not gain access to the GPS data, which means that he cannot attempt to get the stolen vehicle.



Concierge service

Many car manufacturers already provide their customers with a concierge service. At the press of a button, drivers can use on-board systems to establish a connection to a digital voice assistant or to a service center and obtain a wide range of information without interrupting the journey or even having to reach for the smartphone: The service expert provides information on the traffic situation, the weather forecast, on locations as well on the nearest restaurant or the closest 4-star hotel. The service expert can send the relevant address directly to the driver's navigation system as a point of interest and, if requested to do so, also immediately reserve a table or book a room. Even if a concierge service is first and foremost suited to the portfolio of car manufacturers, this service may also be of interest to other organizations such as insurance companies. If, for example, these offer their customers an emergency call service as well as a breakdown service and already employ service experts for this, a concierge service may also be a complementary service. The advantage for the customer: He receives all agent-based services related to the vehicle from a single source.

3. eCall emergency call service – intelligent protection for motorists

3.1 eCall emergency call systems at a glance

Since March 31, 2018, all new passenger car vehicle models and light commercial vehicles must, in line with EU regulation, be equipped with the 112 eCall emergency call system.



Based on various studies, it is estimated that eCall can save 2,500 lives each year in Europe alone – a fraction of the number of lives that could be saved worldwide.³

This corresponds to approximately ten percent of fatal accidents in Europe.

“112 eCall” is the name of the emergency call system developed under the auspices of the EU. In addition, various providers of mobility services have each developed their own eCall system. These TPSP (Third Party Service Provider) eCalls also meet the EU requirements. Both 112 eCall and TPSP eCalls are embedded systems installed in the vehicle ex works. The integrated eCall is triggered automatically in case of an accident and can also be triggered manually inside the vehicle. For older vehicle models that do not yet have an eCall that is installed ex works, several providers have also put retrofittable solutions into the market such as crash notification devices for the 12 V socket or the OBD port of the car.

³ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0434:FIN:DE:PDF>

3.2 How eCall works

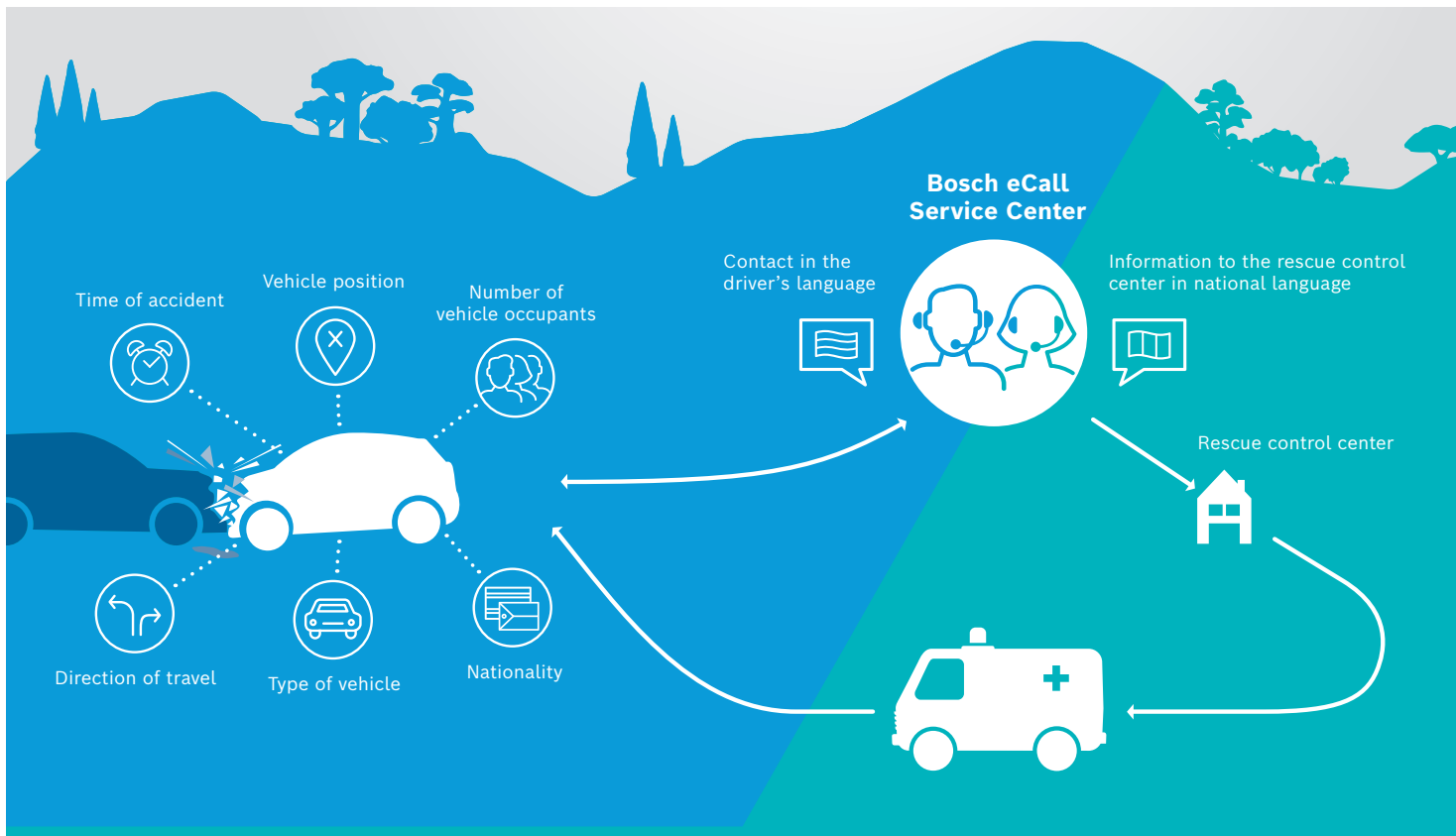
This is what happens when a vehicle with integrated 112 eCall has an accident: As soon as sensors in the vehicle – such as those of the airbags – register a collision, the integrated eCall control unit, which includes a GPS and GSM module as well as a SIM card, automatically triggers an emergency call to the phone number of the corresponding emergency call system. At the same time, it sends a minimum data set to the public rescue coordination center: This comprises the time of the accident, the GPS coordinates of the location of the accident, the vehicle identification number, a time stamp as well as the eCall qualifier indicating whether the eCall was triggered automatically or manually. In parallel, a voice connection is established to the rescue coordination center so that it can roughly assess the situation and initiate corresponding rescue measures. If, for example, none of the occupants responds, an emergency doctor is dispatched immediately; if, on the other hand, the occupants can be contacted and are uninjured, there is no need to send an ambulance.

3.3 Differences between eCall and TPSP eCalls

The way in which TPSP eCalls, i.e., the integrated eCall systems of private providers work, follows the same basic principle. Like 112 eCall, these systems also meet the requirements of the EU regulation but also offer additional features. Therefore, TPSP eCalls transmit not only the minimum data set to the coordination center but also additional data points for a more accurate assessment of the accident situation – such as the vehicle type or the presumed number of occupants based on the sensor technology in the vehicle's seats. A provider also enables contact to be made in the language to which the vehicle telematic unit is set, i.e., generally the driver's mother tongue. This can be of huge advantage if a driver has an accident abroad and, due to shock or lack of linguistic knowledge, is unable to communicate in the language of the respective country. For such a TPSP eCall, the emergency call is not put through directly to the local rescue coordination center but instead to the provider's service center, which in turn informs the PSAP (Public Safety Answering Point).

You might think that an additional link in the communication chain would slow down the process. The opposite is actually the case. The specially trained service experts gather up all of the required information and transmit this in bundled form to the coordination center.

In the case of accidents abroad, this even makes the rescue faster as the service expert can address the driver in his mother tongue and another service expert can pass on the information in the language of the country to the local coordination center. There are therefore no language barriers that could delay the rescue.



Infographic: Bosch eCall process

3.4 eCall and data protection

Although the eCall improves security of life and limb, many people are simultaneously worried about the security of their data. This worry is, however, unfounded as the eCall's SIM card is passive and is only activated in an emergency. The SIM card only dials in to a mobile phone network in the event of an accident or if the eCall is activated manually. Even then, there are precise legal definitions as to which data may be transferred to the service center or public coordination center, namely the data of the minimum data set and additionally only data such as vehicle type or number of occupants – in other words information that is important for assessing the accident situation.



The eCall system does not have the technical ability to spy on motorists or even create movement profiles.

This applies to integrated eCall systems, as these are strictly regulated by the corresponding EU regulation.

If a retrofittable eCall solution is used in combination with a smartphone app, the user's data must be reliably protected in accordance with the applicable regulations such as the EU's GDPR. To ensure this, the company that wants to use the eCall retrofit solution must choose a mobility service provider that attaches due importance to the issues of data protection and data security. This includes, not least, that the provider has high-performance, reliably available IT structures that are compliant with data protection regulations.

Conclusion



The changes brought about by digitalization have for a long time now also included the automotive industry. Connected vehicles will soon no longer be a question of „whether“ but rather a question of „how strongly“. Companies that want to benefit from the new opportunities must now devise a strategy of how they want to adjust their processes or business models in this context in order to continue to be successful. In light of increasing competition, new products and services that provide the target groups with added security and comfort must be developed and implemented.

A key factor for success is choosing the right provider of these mobility services. This provider must be able to provide a high-performance and reliably available IT infrastructure for networked services such as the eCall emergency call service or breakdown assistance. Not only that, a comprehensive service center infrastructure is also a definite advantage – as before mobility and the associated services can work in a fully automated way, human agents will still be indispensable in the next ten to fifteen years. In the case of the eCall, for example, the trained service expert offers emotional support to the driver after an accident by calmly giving instructions in the emergency situation. Artificial intelligence will not be able to replace this for a start. Furthermore, data protection is also a key topic in respect of which a company has to pay heed to absolute professionalism from its provider. Once all of this has been ensured, there is nothing else standing in the way of making use of the huge potential of modern services around mobility.

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