

Study Report

Connected Car – Consumer Expectations, Opportunities and Challenges for the Industry

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teknowlogy | PAC

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PREFACE

Dear reader,

Digital transformation is impacting many aspects of our everyday life. Because of new technological advancements and changing customer expectations, digital transformation is fundamentally reshaping all industry sectors – with the automotive industry being no exception.

Using technologies such as cloud computing, the Internet of Things (IoT) or advanced analytics, cars have become hyper-connected; sharing and receiving information with passengers, other cars, and their surrounding environment. As these underlying technologies advance, connected cars offer an opportunity for a safer riding experience, as well as a chance to satisfy our increasing need for greater convenience. Most importantly however, connected cars function as an enabler and catalyst for game-changing technologies and concepts, such as autonomous driving, mobility services and sustainability.

The connected car topic is not a new one – it has occupied the thoughts of automotive manufacturers and suppliers for many years. However, OEMs continue to invest billions into R&D in order to provide vehicle users with a level of value that will influence their choice of brand, their purchasing decisions and eventually, leverage connected car services to establish new sources of revenue. In addition, the collected customer information can be used for further product development, personalization, improvements in service quality or customer loyalty.

However, does this scenario correspond to reality? Are end users actually utilizing the potential of connected cars? How do customers benefit from connected car solutions?

Against this background, NTT Group, in collaboration with teknowlogy | PAC, conducted a survey of more than 3,000 drivers in Europe to evaluate today's drivers' experiences, expectations and concerns regarding connected car services and technologies. In addition, 20 expert interviews with automotive experts from OEMs, automotive suppliers, IT and insurance providers as well as the public sector were conducted.

For an overview of the study's results, please visit the website: www.connectedcarstudy.com

I wish you a pleasant reading experience that I hope will provide food for thought for your own organization.

Yours sincerely,

Jens-Uwe Holz



Jens-Uwe Holz

**Head of Automotive
NTT Europe**

KEY FINDINGS



Close to a half of all drivers state that new and innovative connected car services matter more in their choice of brand than traditional criteria such as engine power.

47% of consumers would be willing to switch brands in order to access new and innovative connected car services. Younger drivers in particular see greater value in connected services over traditional factors.



The more mature connected car services become, the more likely drivers are to use them.

Services such as real-time traffic information or remote services are among the most widely adopted services. More cutting-edge services (such as concierge services and digital assistants) will require more marketing efforts and maturity to reach the same level of acceptance.



Lack of usability is the main reason for a bad experience.

Among those users that have suffered at least one bad experience with connected car services, almost half (46%) complains about the complexity of services and poor usability.



Additional costs remain the main drawback of connected car services.

More than half (51%) of consumers regard additional costs created by connected car services as a major obstacle to adoption, with 39% stating they are not willing to pay any additional service fees. At the same time, fewer premium car drivers perceive additional costs as a major obstacle (44%).



Consumers are comfortable with sharing vehicle-related data.

While 89% are comfortable with sharing their vehicle diagnostic data, almost the same percentage (86%) of consumers are deeply concerned about the prospect of their personal data being shared with third parties.



External manipulation of the vehicle is a central point of concern for the majority of consumers.

83% of consumers are concerned that increased connectivity means that their vehicle will be manipulated or hacked.



STATUS QUO – CONSUMER AWARENESS AND EXPECTATIONS

Digitalization is moving ahead at an unprecedented rate, with our everyday lives becoming increasingly connected. While smartphones have become our ultimate connectivity device in recent years, our cars are now taking on a similar role. By leveraging the power of the internet, drivers today are confronted with a number of new services and functionalities which are made accessible via digital touchpoints, such as the web, in apps, digital voice assistants, smart watches or inside the vehicle.

Across all connected car services examined, on

average 56%

of them are not yet available to drivers.

CONNECTED CAR AVAILABILITY AND ADOPTION LEVEL

A number of common connected car services and features have been reviewed in our study. These range from traffic- and driver-safety-related features (street condition warning) to services targeted at improving the level of convenience (remote services, offboard journey planning) and comfort (digital personal assistant, concierge services).

When it comes to the availability of connected car services and technologies, it is the most established use cases (such as remote services, real-time traffic information and street condition warnings) that are also the most prevalent.

“ [Webasto] prioritizes features that target the actual driving experience and give tangible added value to the customer. ”

(Dr. Karl Kolmsee, Director PPM Energy/Charging, Webasto Group)



Which of the following connected car services and technologies have been available to you in one of the cars that you are currently using or have used in the past?

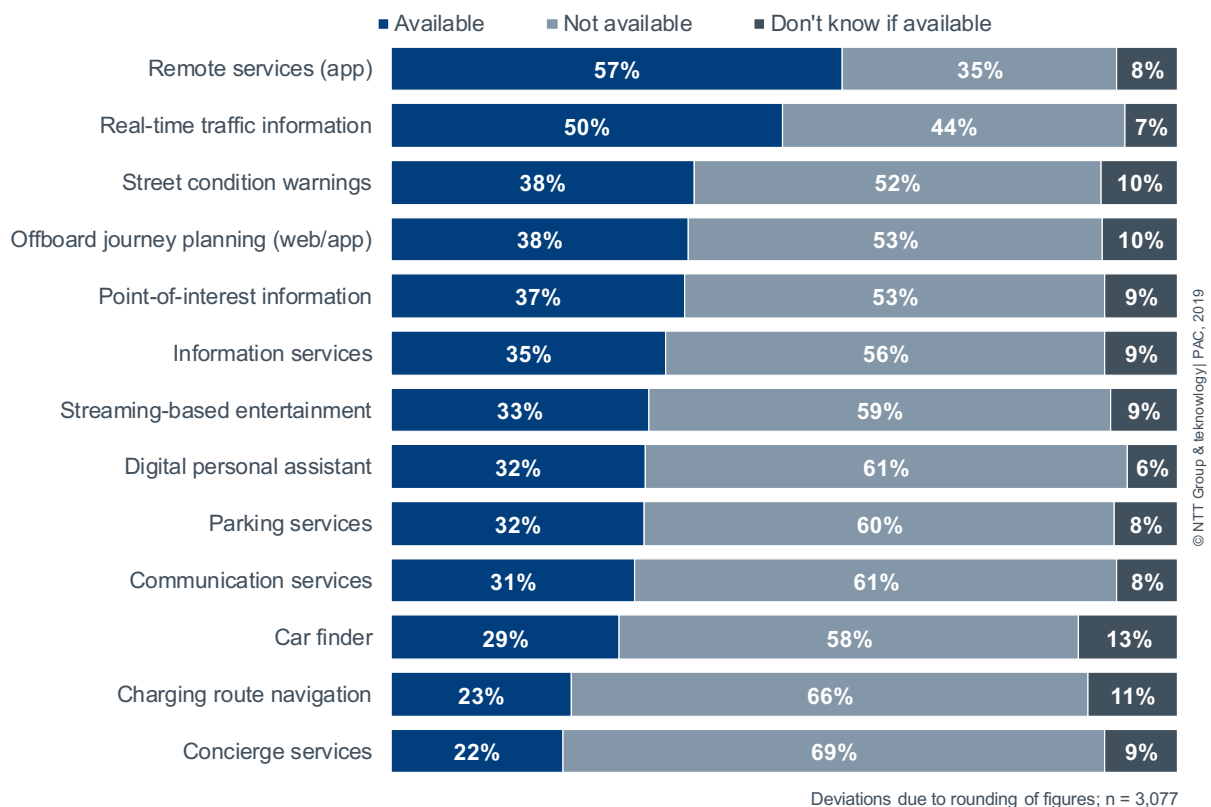


Fig. 1: Availability of connected car services/technologies

Most respondents say that the full range of today's connected car services are not yet available to them. This is especially the case for "premium" use cases (e.g. concierge services are not available for 69% of respondents).

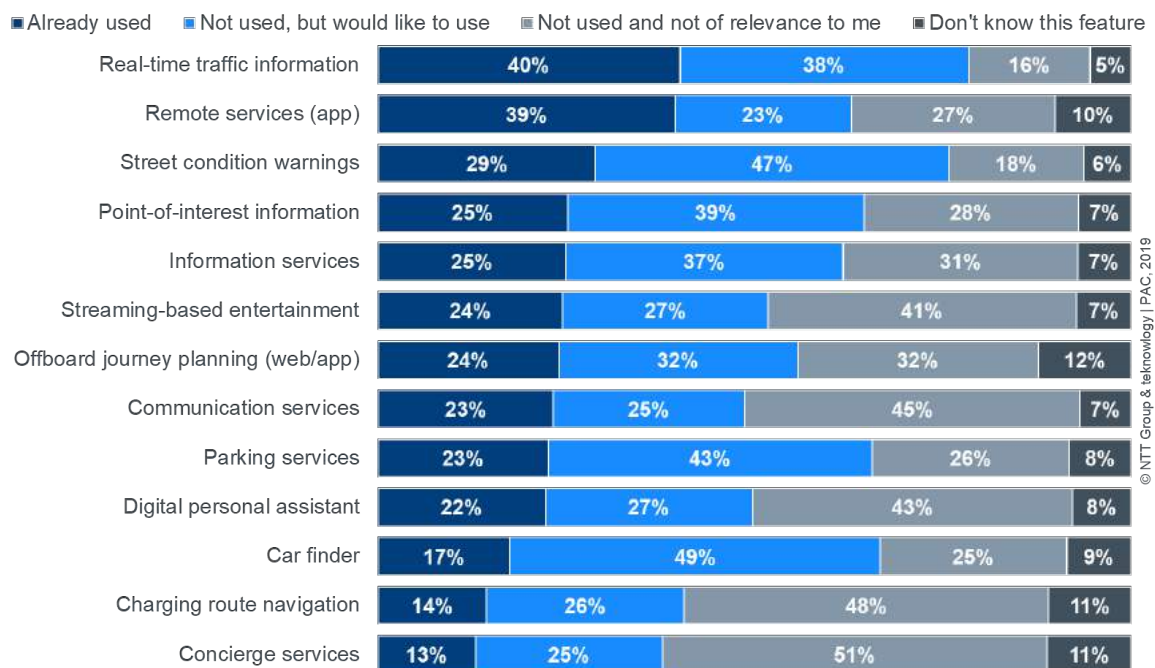
However, the availability of services increases proportionately with the price of the vehicle. Many more connected car services are available to premium vehicle drivers than they are to mini and compact car drivers.

“Safety is the top priority. Everything that has to do with improving safety, e.g. IT security, is already experiencing high demand.”

(Dr. Robert Nahm, Industry Executive, Automotive Sector, Microsoft)



Which of the following connected car services have you already used or would you like to use?



Deviations due to rounding of figures; n = 3,077

Fig. 2: Connected car adoption level

The study found that connected car services which have been available for some time are also the ones which are more likely to have already been used by drivers. For example, real-time traffic information is already available to 50% of respondents, and with 40% adoption, this is certainly one of the more mature connected car use cases and clearly be seen as a differentiator in influencing purchasing decisions. Indeed, almost half of all drivers would base their purchasing decision on the availability of connected car services (see figure 5).

German drivers in particular appear to be more practical in their thinking. While they have either used or would like to use connected car services that target the actual driving experience (e.g., parking services, real-time traffic information), on-top features (e.g., digital personal assistant, concierge services, streaming-based entertainment) have been rated as significantly less relevant to German respondents than those in other countries.

Depending on the connected car service,

60-87%

of drivers have not yet used it, as examined in this study.

On average and depending on the use case, about 10% of respondents are still unaware of specific connected car features. This would suggest that as the availability of connected car features increases, manufacturers will have to improve their communication on the range and benefits of their services.

NTT's recommendation:

Connected services are clearly influencing vehicle purchasing decisions. A lot of customers are interested but are not yet convinced by the added value. OEMs should view connected services as an opportunity to differentiate from the competition, but they need to clearly communicate how they can enhance customers' in-car experience.

The complexity of some services is cited by a significant number of drivers as a turn-off. Usability must be a critical aspect from design through to production.

CONSUMER OBSTACLES TOWARDS THE CONNECTED CAR

Today's vehicles provide an incredible range of potential value-added services for customers, which at the same time gives manufacturers a great opportunity to develop new revenue streams.

At the same time, they need to be careful about their commercial model. The study found that any additional costs that might be created are perceived as the biggest obstacle associated with connected car services.

51%

see additional costs as a major obstacle to them using connected car services.

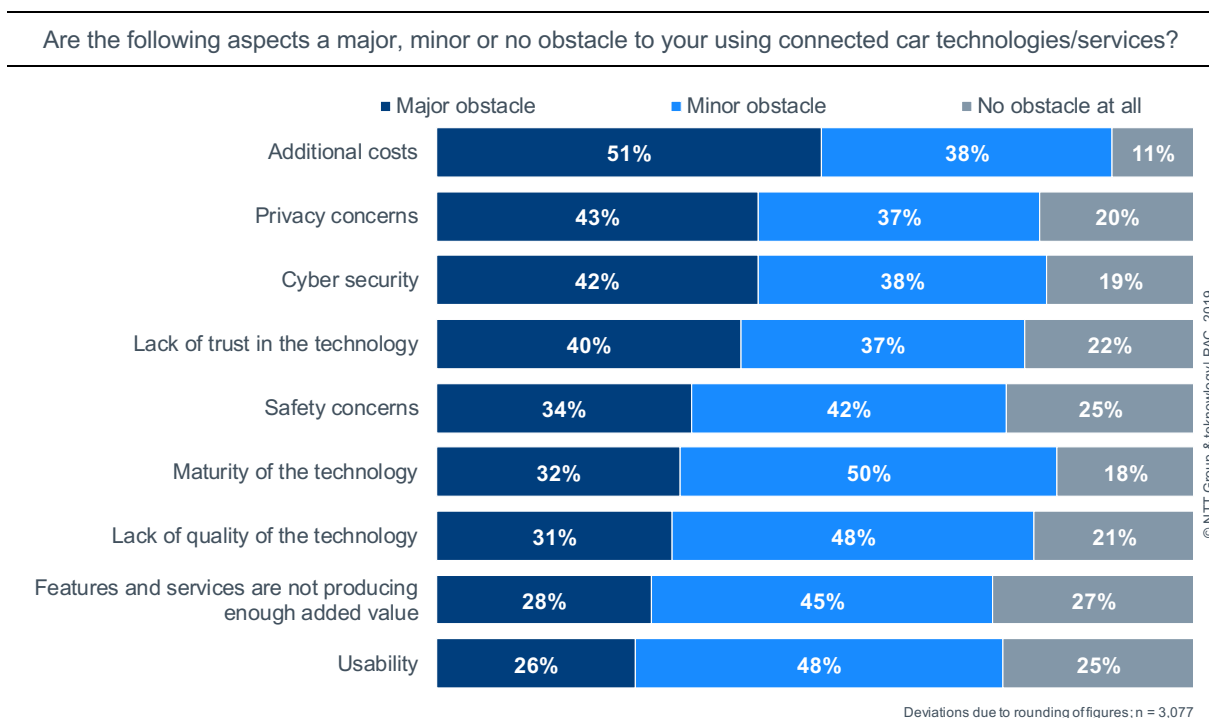


Fig. 3: Major obstacles

Drivers of mini and compact cars are particularly sensitive towards any form of additional costs.

A large number of respondents also view issues such as data privacy (43%) or cyber security (42%) as significant challenges. However, manufacturers are still cautious when it comes to communicating about security in their marketing. Making connected cars “more secure” from a data and cyber security point of view would certainly reduce overall consumer misconceptions and potentially produce a competitive advantage. However, as with all connected car services and technologies, the problem that remains today is that consumers do not believe in paying additional fees for add-on services.

In comparison, the maturity and quality of the technology is perceived as a much smaller challenge than one would expect. Indeed, 68% of respondents consider the former as only a minor obstacle or no obstacle at all, while less than one third (31%) consider the quality of the technology as a blocking point. Consumers appear comfortable with the fact that connected car technologies and services are still developing and that it will take time for these functionalities to be truly mature.

A lack of trust in the technology - especially in combination with autonomous driving - is perceived as a minor obstacle or no obstacle by 59% of respondents. For premium car drivers in particular, concerns over the technology represents only a minor obstacle, which shows a strong level of trust.

NTT's recommendation:

OEMs must ask themselves why customers are not willing to pay for the services. Is there no (awareness of) customer value of a service? Are services too complicated to use and therefore not attractive? Are services overpriced?

They could learn from digital companies on how to sell additional services and functionalities through a variety of different cost models (subscription model, freemium model, pay per use, trade time/ data/ convenience/ advertisement for usage and vice versa).

“Privacy concerns will become more and more an issue; comfort benefits will trump privacy concerns, however in the long term.”

(statement by a tier-1 supplier)

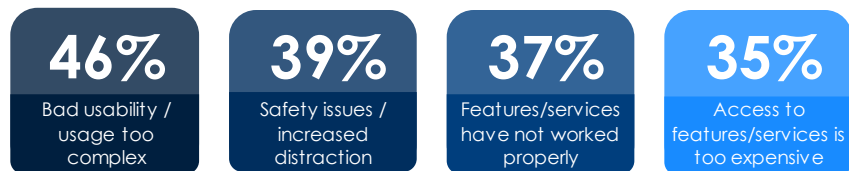


Among those drivers that have already used connected car services, poor usability has been named as the major reason behind their negative experience with these services and features. Some 46% of respondents cited the complexity of using connected car services as a turn-off, while 37% of respondents complained that features or services were not working as well as they should.

Can you give the reason for your negative experience with connected car services and technologies? (multiple choice)



Drivers of bad user experience
based on multiple choice question



Deviations due to rounding of figures; n = 3,077

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Fig. 4: Reasons for negative experiences

Factors such as data privacy (28%) or data security (27%) are much less likely to cause a negative experience than one might expect. This would suggest that topics which may be perceived as requiring significant marketing effort are actually not as negatively perceived by consumers as widely thought.

From an industry perspective, the common theme is that manufacturers have to improve the customer experience of their connected services in order to create real added value for consumers and increase the adoption rate. For example, drivers will continue to use their smartphones for navigation purposes if the built-in navigation system in their car does not become much smarter. At the same time, it is almost impossible for OEMs to develop connected features all by themselves (especially in terms of costs and time to market). As a result, we expect the number of industry partnerships to increase in the long term.

“The closer (connected car services) impact the vehicle and the actual driving experience, the more customers expect developments to come from the manufacturer; the further away (e.g. surrounding entertainment), the less – here, (digital) partners are accepted.”

(statement by a premium OEM)



NTT's recommendation:

OEMs need to find a well-considered response to the challenge posed by market entrants such as Google & Co. Manufacturers should focus their investments on services that offer high value to the customer and give themselves a strategic advantage. Replicating services already provided by rival OEMs even though they do not generate any customer benefit should be avoided.

Choose wisely when to invest in new services. The key in convincing customers is not the quantity of services, it is the quality that matters. The user experience is the most important driver of customer loyalty. OEMs need to create an outstanding user experience in order to truly differentiate.



OPPORTUNITIES FOR THE AUTOMOTIVE INDUSTRY

The pace of technology change is accelerating, but how much is this innovation shaping the purchasing decisions of today's drivers?

The study found that almost half of all drivers (47%) would be willing to switch brands in order to get new or innovative connected car features and services. This challenges the perception that drivers value "classic" technologies (such as engine power, gas consumption) over "new" ones is wide of the mark. However, based on the results of our study it is clear that services need to reach a certain level of maturity before they become truly influential.

“ The ability (of the vehicle) to be connected has gained in importance and will continue to increase. It is less an additional feature, but will rather become more and more common...”

(statement by an automotive services company)

47%

are willing to switch brands to get new/innovative connected car features and services



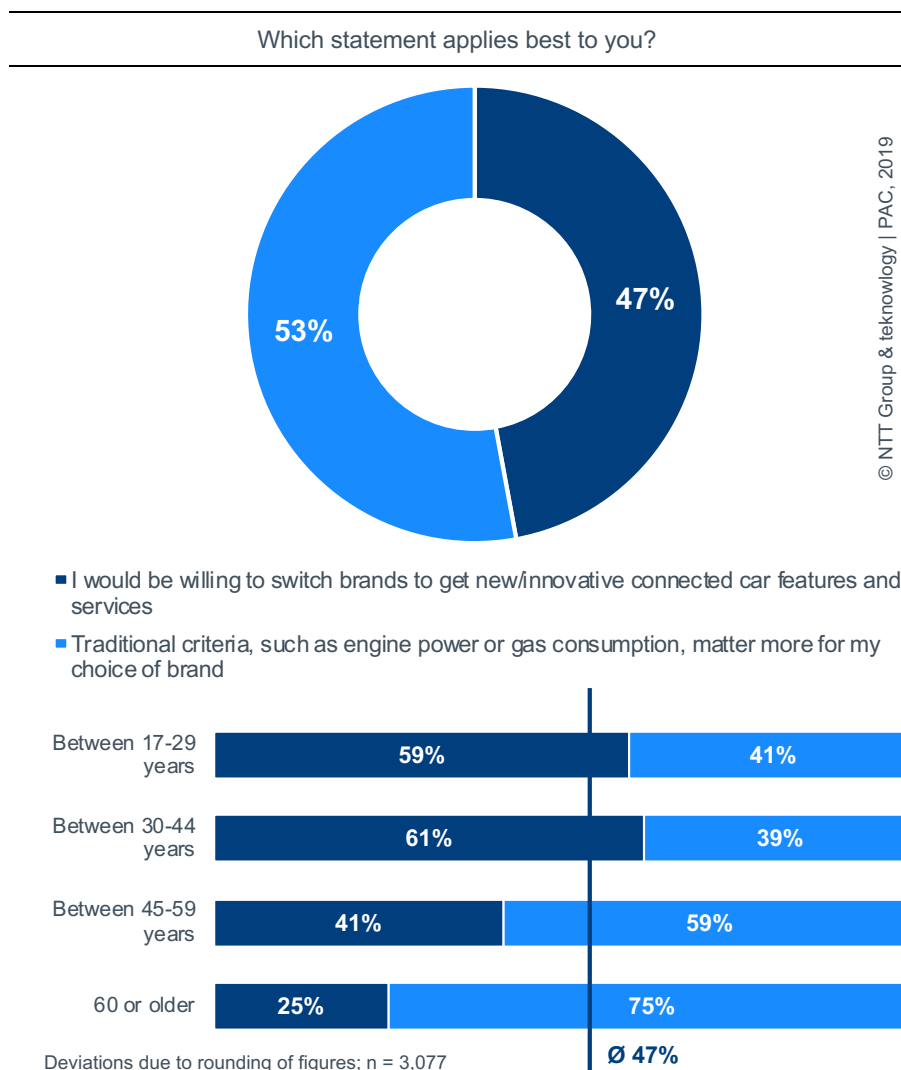


Fig. 5: Brand loyalty

Detailed analysis shows that the younger generation of drivers (17-29 years old) in particular are more likely to base their choice of brand on connected car features, whereas Generation X (+45 years) more frequently base their choice of brand on traditional criteria.

When considering the differences by vehicle type, premium car drivers are also more likely to base their choice of brand on the availability of connected car features than on traditional criteria (58%). At the same time, premium drivers are more likely to regard connected features as a necessity, justifying higher prices, rather than as true differentiators.

From a country perspective, the study has shown that German drivers are more traditional in their decision-making than their counterparts in the UK, Spain and Italy, as they place more value on traditional criteria than on connected car functionality and services.

NTT's recommendation:

Customers want to seamlessly integrate their existing digital life into the car and bring a lot of digital services already with them. Limiting them in doing so or providing chargeable alternative solutions is no added value.

Digital services are a possibility for an OEM to differentiate with own added-value services. Finding out when to leverage partnerships to be able to concentrate on core competencies in the connected services landscape is one key to customer experience.

Adding an open architecture for the provisioning of third-party services even speeds up added value by using the worlds' creativity.

This would suggest that while there is a growing number of people that measure a car's value not only by criteria such as performance or consumption level, the majority still do not perceive a vehicle as a fully connected device in the same way they look at devices from the consumer electronics sector.

FUTURE DIRECTION OF THE CONNECTED CAR

With the topic of the connected car advancing further, so does the availability of ever more possible use and business cases. The underlying themes of these services, for the largest part, focus on improving comfort and efficiency. Or in other words, how can the driving experience be made more comfortable and enjoyable and how can the time spent driving be used more effectively?

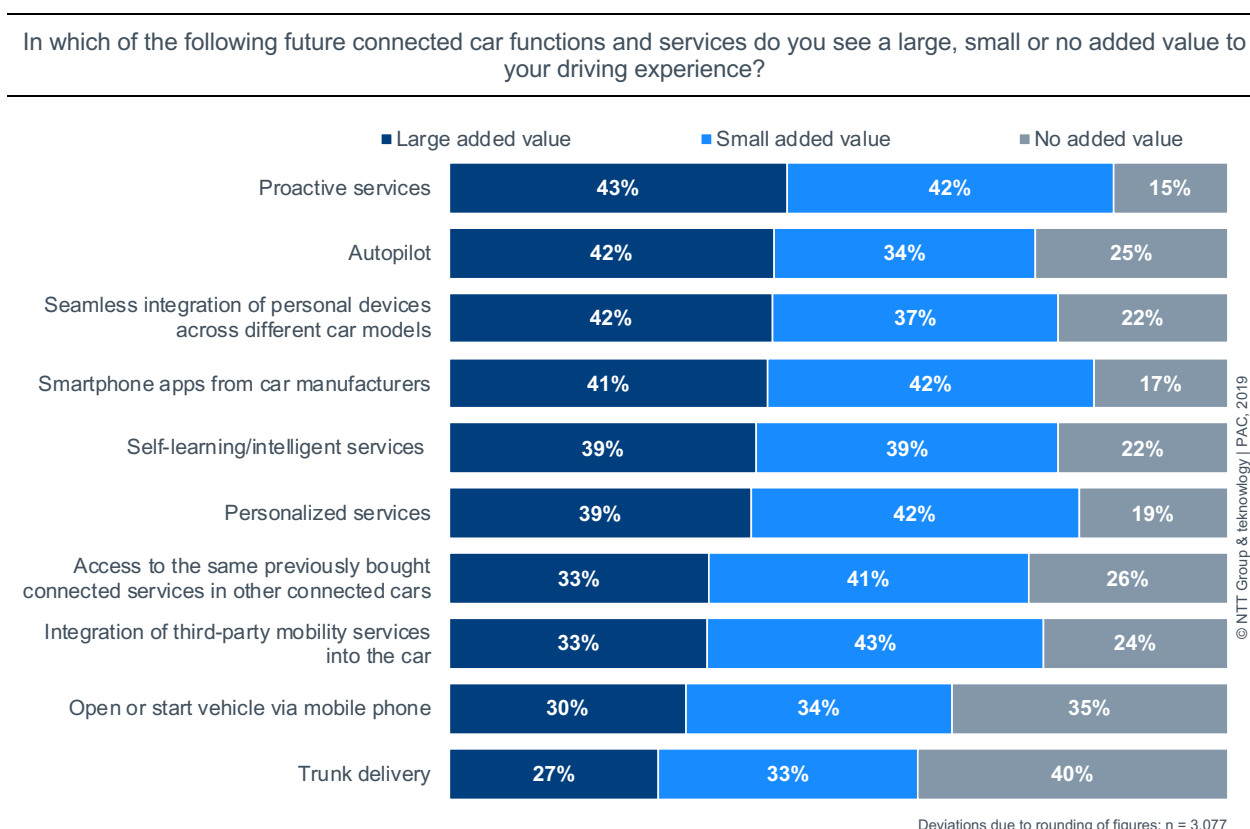


Fig. 6: Acceptance of future connected car services

Results have shown that at this point, the market is still awaiting “the next big thing” – a connected car service or feature in which consumers see an extraordinary level of perceived value.

Proactive services such as a car suggesting the cheapest nearby gas station or favorite restaurant, as well as detecting a driver's level of fatigue, are regarded as the most potentially valuable future connected car functions by 43% of study participants.

A similar proportion (42%) view self-driving and autonomous driving capabilities as potential game-changers. However, this number is likely to increase significantly in the future as more people actually experience some form of autonomous driving.

The seamless integration of personal devices is considered by 42% of respondents as producing a large added value. However, the industry expects this to gain in significance over the next few years as the vehicle will be seen more and more as another digital touchpoint rather than just a tool for transportation.

Features such as trunk delivery or being able to open the vehicle via smartphone are not yet generally regarded as generating significant added value, although the former does appeal to premium vehicle drivers.

From an industry point of view, a key focus will be on advancing driver assistant features, especially with regards to increasing the level of autonomous driving.

NTT's recommendation:

As customers' digital ecosystem continues to grow and transform at a quick pace, OEMs will have difficulty to follow by offering self-made solutions or by manually integrating external services.

OEMs should focus their resources on those connected services with the most customer value and strategic relevance, and which are not yet or cannot be offered by third parties; for example, services that offer additional functionalities in the car itself.

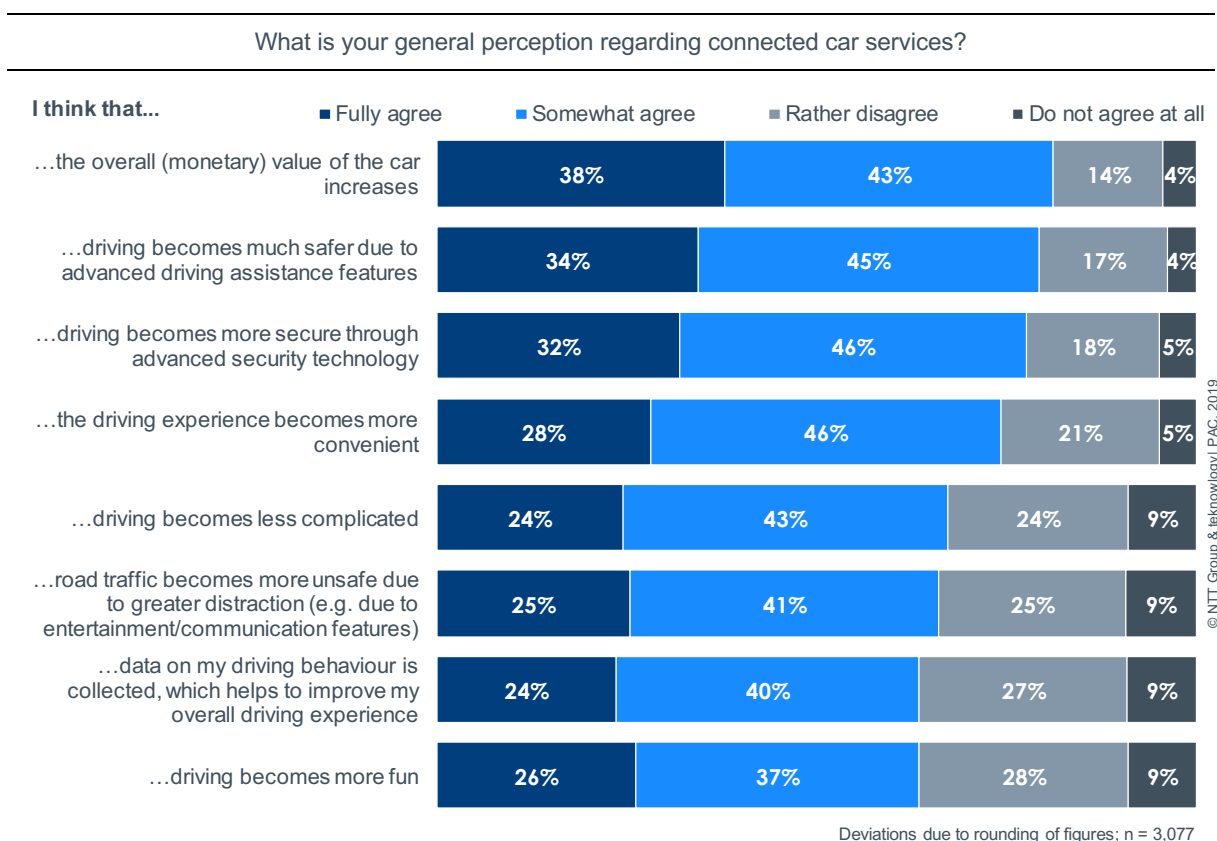


Fig. 7: Consumer perception of connected car services

The vast majority of consumers (81%) across all considered countries agree that, with the addition of connected car services, the overall monetary value of their car increases. At the same time, a similar level of respondents (80%) believes that the connected car services improve vehicle safety. Drivers of premium and economy vehicles both believe that the greater convenience provided by connected car services also improve the overall driving experience.

While two thirds (66%) of respondents agree that driving becomes more unsafe due to increased distraction, almost the same number of drivers (63%) believe that with the addition of connected car services, the driving experience will also become more enjoyable.

German drivers are a bit more skeptical when it comes to the collection of behavioral data in order to improve the driving experience. Only 45% of German drivers would agree to this, whereas the average European driver is much less concerned (64%).

“ As the vehicle turns more and more into a wallet, the question arises who will have to pay for the (connected) services? The owner or the driver of the car? ”

(statement by a premium OEM)



MONETIZATION OF CONNECTED CAR SERVICES

Connected car services have until now been very cost-intensive special features, especially in the area of driving assistance systems. In response, car manufacturers have started to offer various payment options for the usage of connected car services.

While we have observed that additional costs are seen as the major challenge for access to connected car services, the question that remains is how willing are tomorrow's drivers to pay for access to connected car services?

Overall, we have seen that two thirds of all consumers surveyed would only be willing to pay 3% on top for comfort-related features (e.g. concierge services, real-time navigation, apps usage) and even less for driving assistance systems.

39%

are not willing to pay for connected car services.

“ Older people may pay once or twice for services and then not pay any more. Younger people will directly use services from Google. ”

(statement by a tier-1 supplier)



Which payment model do you prefer in general for connected car services?

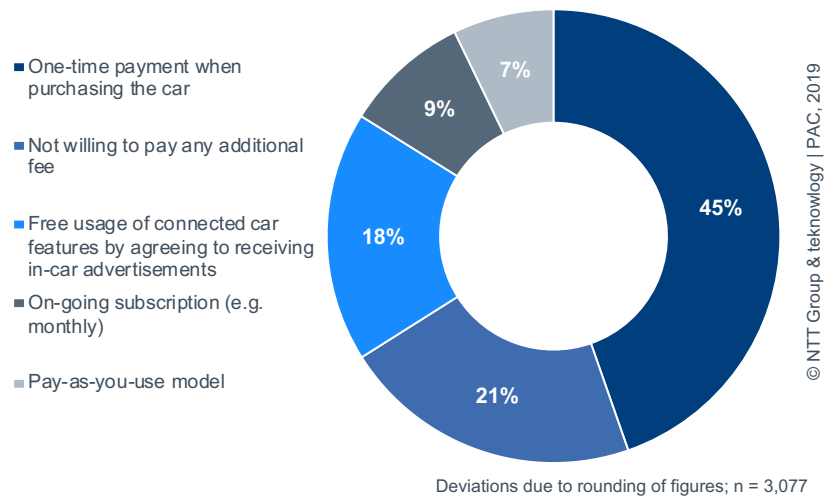


Fig. 8: Payment model for connected car services

However, 39% of participants in the study said they were not willing to pay any additional fee or accept in-car advertisements for access to connected car features. Industry experts agree that as long as the user experience is not as smooth and intuitive as Smartphone applications, the willingness to pay for connected car services will remain low.

At the same time, almost half of drivers (45%) would prefer a one-time payment for connected car services when purchasing the car. This is even more pronounced among premium car drivers, who already have to accept higher prices for a vehicle and are even less willing to pay for services on a monthly basis.

Moreover, the older the respondents, the less likely they would be to pay for connected car services. However, younger drivers in particular (17-44 years) are more likely to accept in-car advertisements in exchange for free usage of connected services. It can be assumed that the majority of younger car drivers do not see any significant added value in these offers, as they already have corresponding functions on their smartphones and will use them simultaneously while driving. This would suggest that while connected car services may be seen as a factor influencing the purchasing decision, the added value is not clear yet, which is why consumers would abstain from subscription or pay-as-you-use models.

While automotive manufacturers see additional sources of revenue in connected car services, the reality is not so clear. Instead of driving new sales opportunities, connected car services are more of a defense topic which manufacturers are forced to offer to prevent losing market shares to competitors.

NTT's recommendation:

OEMs will require deeper concepts to monetize connected services than just considering the revenue from the sale of connected car services; for example, concepts for the use of the direct customer relationship or the data gained from it.

“It's not surprising that the willingness to pay for (connected services) is still low, if the user experience is still in need of improvement.”

(statement by a tier-1 supplier)



DATA SECURITY AND SECURITY CONCERNS

Car connectivity does not only increase drivers' comfort and safety, but it also produces an enormous amount of data. In the connected car, data is continuously recorded, processed and shared with the environment. This not only generates information about the location, speed and condition of the vehicle, it also collects information about driving behavior, habits and interests of the driver, for example through the use of entertainment or concierge services.

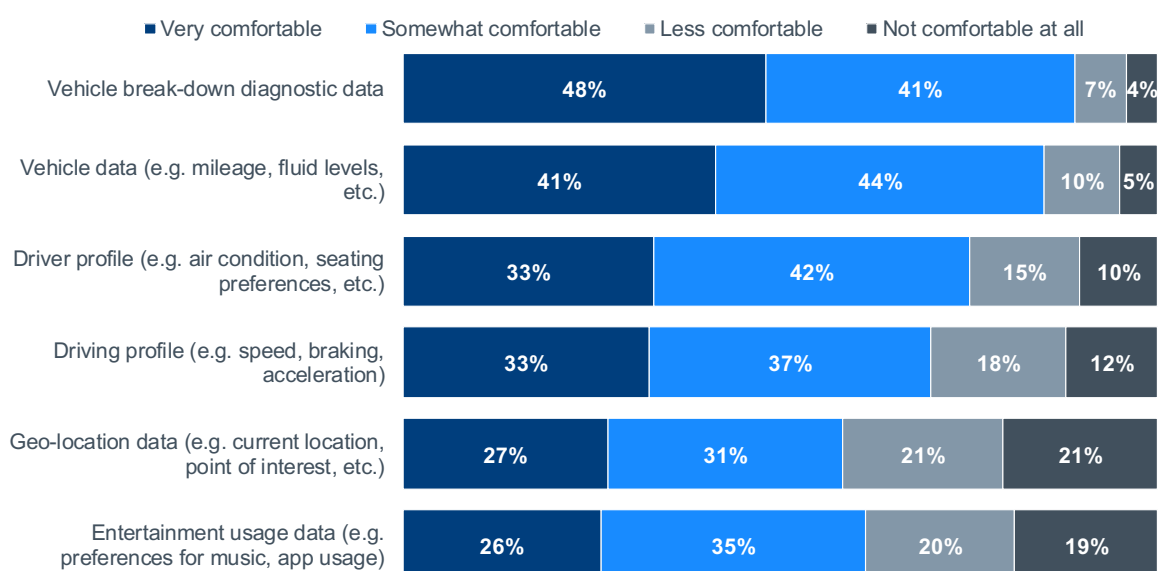
Of course, there is tremendous interest from various parties for this data, be it from the car manufacturer, insurance providers or advertisers. The usage and protection of this data is not yet sufficiently clarified, and it remains rather ambiguous who this data belongs to – the manufacturer, the driver or the highest bidder?

“In addition to vehicles, OEMs will also offer digital services and, with the consent of vehicle owners, will also market data directly to insurance companies, for instance.”

(Dr. Robert Nahm, Industry Executive, Automotive Sector, Microsoft)



When it comes to connected car features, how comfortable are you with sharing the following vehicle data with the car manufacturer?



Deviations due to rounding of figures; n = 3,077

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Fig. 9: Acceptance of data sharing

Public awareness regarding data protection has significantly increased in recent years and consumers have realized that they may have to share their personal data with third parties in order to access specific types of services.

With this in mind, it is still quite surprising that the majority of respondents feel comfortable about sharing their data. More than 80% of drivers feel comfortable about sharing their vehicle-specific data (89% would share vehicle break-down diagnostic data and 85% would share vehicle data). Even when it comes to personal data (e.g. location, entertainment preferences), the majority of consumers is still comfortable or somewhat comfortable with giving away their data.

What is also interesting is the fact that the willingness to share personal data (e.g. location, entertainment preferences) with the manufacturer is significantly higher with premium car drivers than it is with non-premium car drivers. Two thirds (66%) of premium car drivers feel comfortable about sharing their location data, whereas 53% of non-premium car drivers feel comfortable about sharing this data. Similarly, 68% of premium car drivers would share their entertainment preferences, whereas 57% of non-premium car drivers feel comfortable doing so.

However, German drivers in particular are much more concerned when it comes to sharing their data with the manufacturer. For example, only 55% of German drivers feel comfortable about sharing their driving profile, whereas in the other countries considered, more than 70% of drivers feel comfortable with doing so.

Generation X drivers feel very comfortable about sharing their personal (35%) and location-based data (33%). Although still at the lower end, this tendency is much more pronounced here than it is for younger or older drivers.

“The connected car has many (service) advantages. For example, cars can directly call the police in case of danger. But we give a lot of personal information away in order to use these advantages.”

(Andreas Krohn, Department Manager IT, Christoph Kroschke GmbH)

89%

are willing to share their vehicle break-down diagnostic data.

NTT's recommendation:

OEMs should learn from the mistakes of digital companies and establish trust by providing transparency on what data is collected for what reason with what benefit for the customer.

On the other hand, OEMs will need to establish strategies to be able to collect data, e.g. free usage of service in return for trading data.



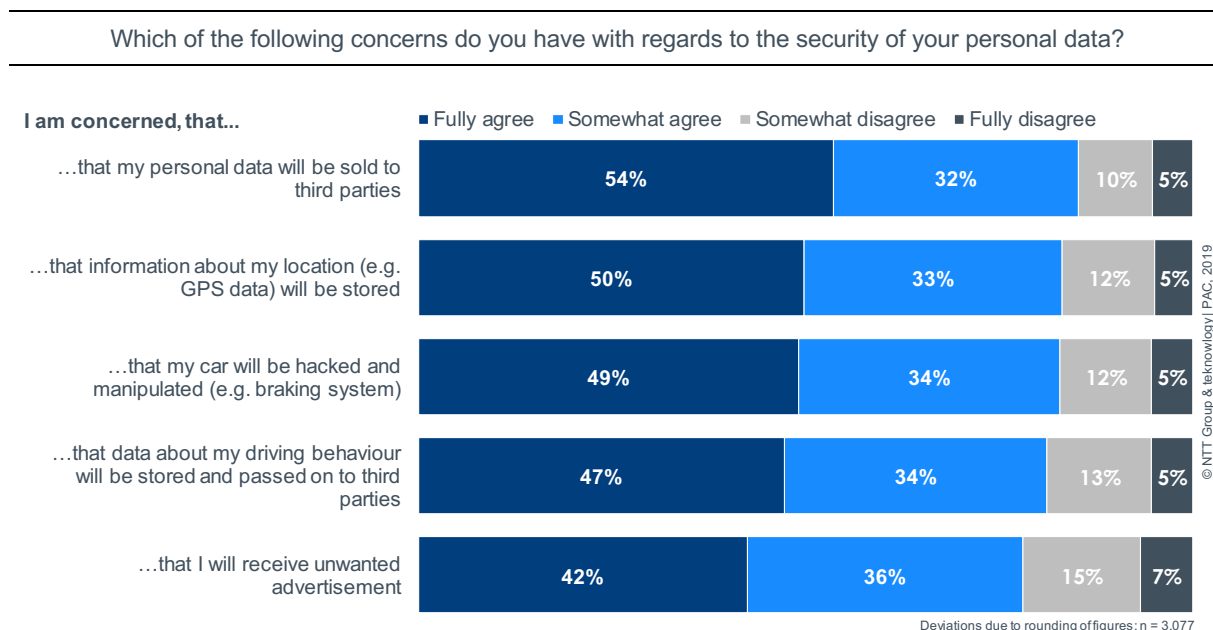


Fig. 10: Data security concerns

Although the majority of respondents have no major concerns about disclosing their data, there are some fears about the subsequent whereabouts and usage of their data. Consumers are particularly concerned about the idea that their data could be shared with third parties (89%). A large number of respondents (83%) are concerned that their vehicles might be hacked and manipulated. Many respondents (70%) are concerned that data about their driving behavior might be stored and passed on to third parties.

Surprisingly, the study showed that overall, there are no significant differences across age categories. This would suggest that both young and old value data protection to the same extent and are equally concerned that their data might be sold or passed on to third parties.

These findings would suggest that consumers are still very much concerned about sharing their data. Moreover, the basic idea that the less data I give away, the better, is still very much present. However, the industry expects that, over time, a certain “data culture” will manifest itself, in which consumers may be willing to “pay” with their data in order to access certain connected services.

83%

of drivers are concerned that their vehicle will be hacked and manipulated.

NTT's recommendation:

There is not just one way of securing vehicles. In fact, a secure vehicle from an IT perspective requires an overall concept composed of individual components and process steps to provide in-depth security.

IT security must be ensured along the entire product lifecycle and security testing is mandatory for each OEM and supplier.

Threat detection systems need to be established to detect attacks early on and respond quickly. Therefore, OEMs must strike a balance between customers' privacy concerns and OEMs' concerns about protecting their products.

“Free access to data is the central point for the further development of connected services.”

(Dr. Christoph Lauterwasser, Director, Allianz Center for Technology)





CONCLUSIONS

The connected car is one of the great milestones in automotive history. This study has shown that while the fundamental interest of customers in the technology is there, most connected car services examined in this study have not yet firmly established themselves in the drivers' minds. This is due to the fact that connected services have only been available to a minority of drivers so far, and that the added value of these services are, to some extent, not yet fully apparent to consumers. Moreover, issues such as lack of usability or additional costs associated with the usage of connected services remain main obstacles which have to be overcome.

In order to actually establish a new source of revenue from connected car services, automobile manufacturers are required to provide an attractive and innovative offering that is tailored to the needs of their various customer groups. At the same time, as the competitive situation gains in complexity and where development times are becoming ever shorter and more expensive, manufacturers as well as suppliers are challenged to find intelligent solutions and to establish scalability in a short period of time.

While the study has shown that there is great interest from drivers in connected car solutions and services, and that particularly the younger generation is looking for greater availability, OEMs and suppliers will have to develop services which cannot or will not be developed by third parties, and which essentially will offer additional functionalities to the car itself. Support for this comes from our finding that, especially with "newer" connected services, so far not a single service has really been able to assert itself. Consumers are still missing the added value of these services – a fact that, if properly addressed, will likely pave the way for acceptance for current obstacles such as additional costs or data sharing.

“[German] OEMs have always had the urge to advance already existing technologies... Today we have to look through the customer's eyes: What does the customer really want? How can I improve the driving experience?”

(statement by a tier-1 supplier)



Ready to connect? The key findings

47%

would be **willing to switch brands** in order to access innovative connected car services.

56%

on average of all connected car services examined, are **not yet available** to drivers.

46%

of users who have had bad experience with connected car services, **complain about complexity** and associate poor usability with an overall bad experience.

51%

regard additional costs created by connected car services as a **major obstacle**.

39%

are **not willing to pay** any additional fee for connected car services.

89%

are **comfortable with sharing their vehicle diagnostic data**.

86%

of consumers are **deeply concerned** that their **personal data will be shared** with third parties.

83%

are **concerned**, that their vehicle will be **manipulated or hacked**.

Fig. 11: Ready to connect? The key findings

Understanding diverse markets



Germany

- Certain services are often not available and are considered to be less relevant
- More emphasis on fuel consumption and engine performance
- Lack of confidence in technology is biggest obstacle
- Do not want to pay additional costs



UK

- Services do not add enough value
- More emphasis on fuel consumption and engine performance
- Lack of confidence in technology is biggest obstacle
- Fear that data will be sold to third parties and receive unwanted advertising
- Prefer one-time payment



Italy

- Gain in value and driving pleasure through connected features
- New and innovative features and services are important purchase criteria
- Prefer free usage of features by agreeing to in-car advertisements



Spain

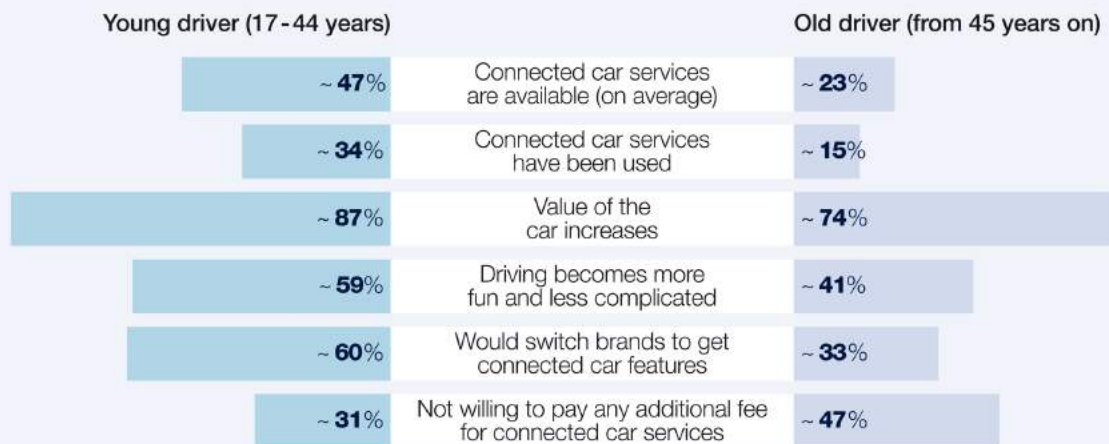
- Gain in value and driving pleasure through connected features
- New and innovative features and services are important purchase criteria
- Prefer subscription as payment model

Cross-border opinions

- Uncomfortable sharing their vehicle and usage data
- See additional costs, usability and safety concerns as challenges

Fig. 12: Understanding diverse markets

Bridging a generational gap

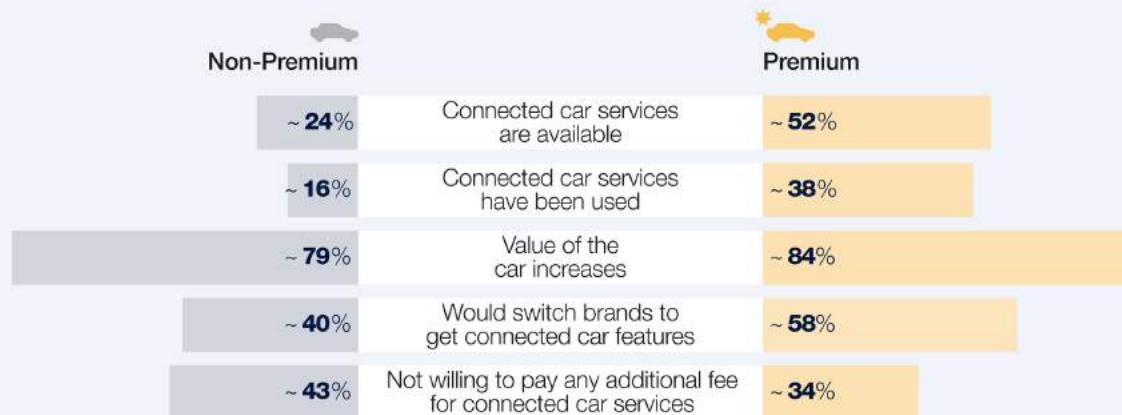


Common features

- Regarding security concerns, the age groups are in agreement
- The exception is receiving unwanted advertising – concerns here grow with the age of the respondents

Fig. 13: Bridging a generational gap

Addressing different customer segments



Common features

- Premium and non-premium users perceive the advantages of connected car services in a similar way
- With regard to data security, there are no differences between the customer groups. Both groups have high expectations regarding data security

Fig. 14: Addressing different customer segments

METHODOLOGY

The results of this study are based on an online survey with more than 3,000 drivers (excluding commercial drivers) from Germany, Spain, Italy and the United Kingdom.

In addition, a number of telephone expert interviews were conducted with representatives from the automotive industry (including manufacturers, suppliers, insurance providers and public sector institutions).

The field research was undertaken during the second quarter of 2019.

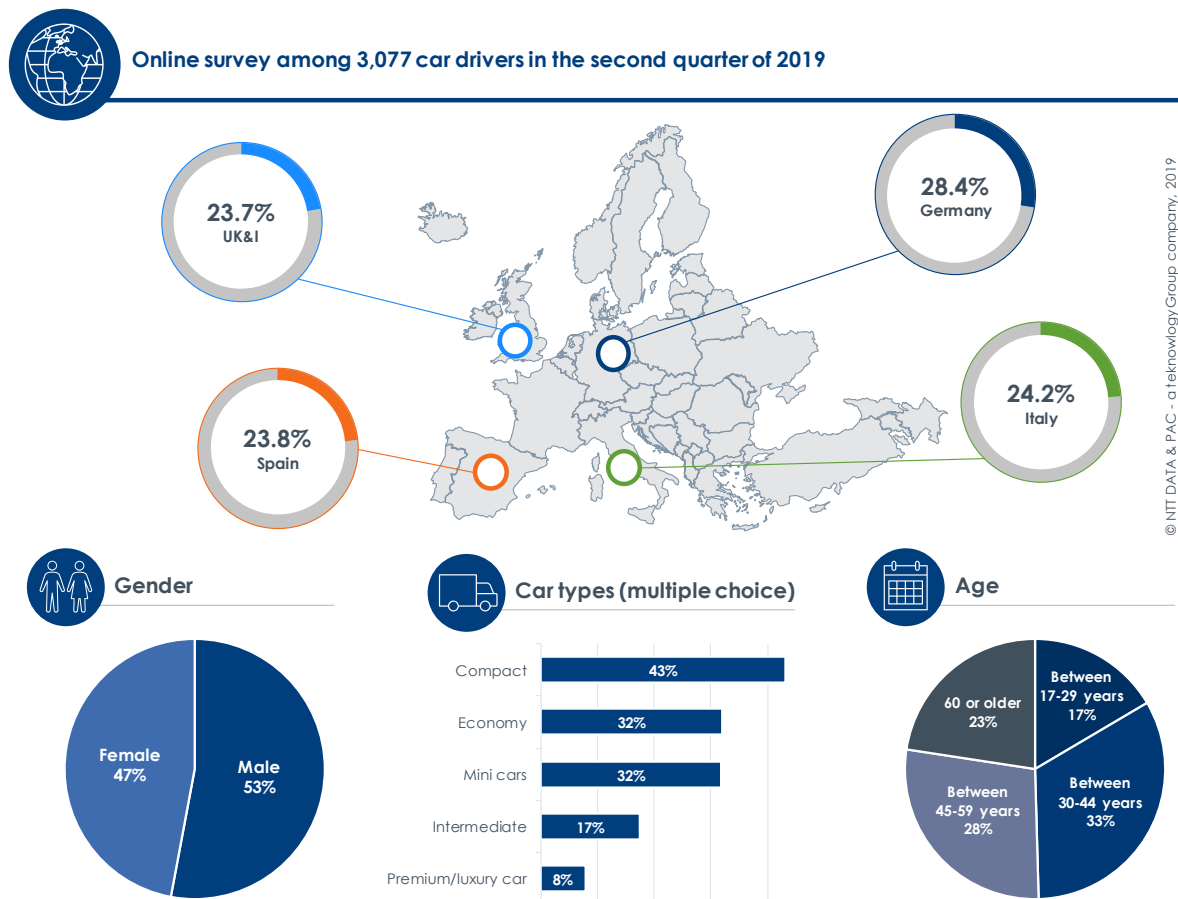


Fig. 15: Methodology and statistics

ANNEX

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The creation and distribution of this study was supported by NTT Group.

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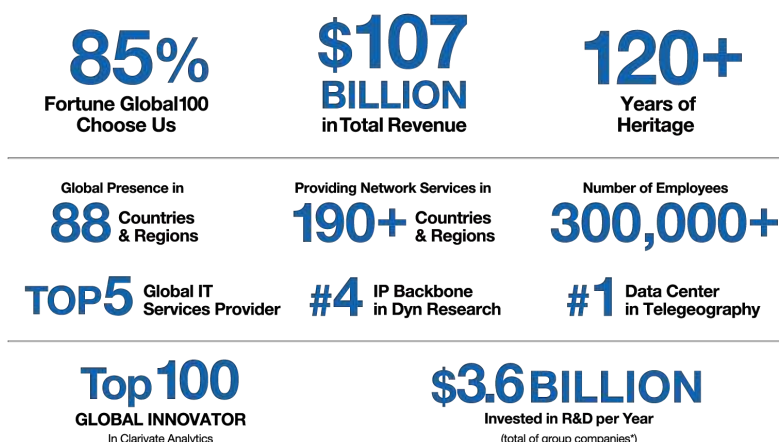
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