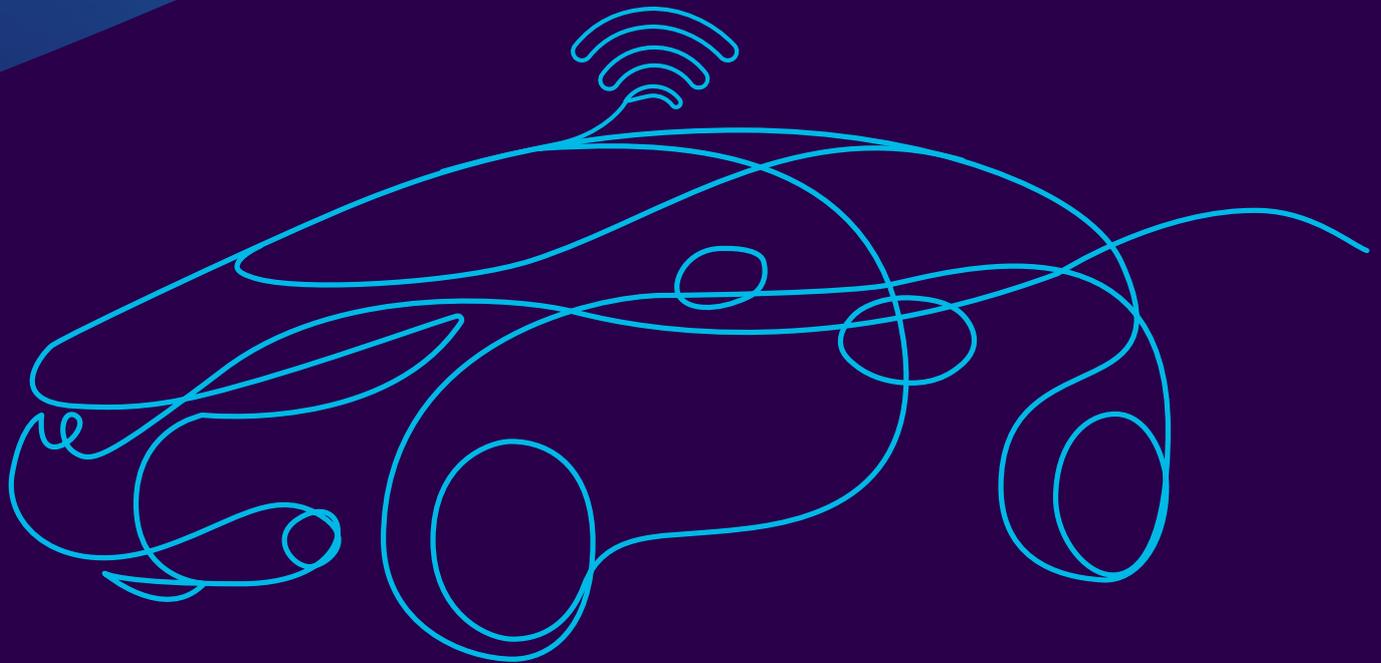


ISSUE 2 . 2020

CONNECTED VEHICLE TREND RADAR 2

The road towards profitability for
automotive connected services







Capgemini Invent is delighted to introduce the second issue of the Connected Vehicle Trend Radar.

We will publish regular Trend Radars, each of which will be an entertaining and thought-provoking read for automotive experts but also everyone who's interested in automotive. The series aims to keep you abreast of some of our latest research and insights into this fast-evolving market in order to help you maintain your competitive edge. Each issue will highlight a specific topic, with deep dives into important aspects.

MANAGEMENT

SUMMARY

For this second Connected Vehicle Trend Radar, Capgemini Invent set out to explore how OEMs can make the most of connected services in terms of monetization. We surveyed more than 3,000 customers worldwide to find out their views on current services. A series of expert interviews helped us interpret the findings.

Our research shows that OEMs have yet to exploit the full potential of connectivity. Usage of OEM-provided connected services is generally low (44% of customers do not yet have any connected services in their cars, and only about half of those who do have them are frequent users).

This suggests that most OEMs have yet to penetrate the connected services market effectively. Unlike traditional OEMs, Tesla has strong brand awareness for connected services, holding the #1 position in the EU, the US, and China, and continues to reinforce its lead over traditional OEMs in this area.

OEMs have tended to assume that they can deliver services in much the same way as they deliver cars – doing most of the work themselves and simply assembling elements from suppliers instead of working alongside best-in-class partners. With smartphones heavily used in cars, technology companies such as Google and Apple could gain control of the customer interface. As a result, they are losing the pole position for connected services and, more seriously, starting to lose customers' loyalty too. They risk missing out on revenue and, at worst, ending up as suppliers to tech companies.

Any OEM that wants to regain a leadership position in connected services must address three revenue streams:

ACTING AS A PROVIDER OF VALUABLE SERVICES IN ITS OWN RIGHT

INTEGRATION OF NECESSARY THIRD-PARTY SERVICES

MONETIZATION OF DATA GATHERED

While data monetization has the greatest long-term profit potential, the other two streams have to be tackled first to attract the critical mass of users – and frequent usage – required for data monetization.

OEMs must therefore ensure customers are offered services they see as relevant. Research shows that, out of 23 use-case categories investigated, safety- and security-related services are valued most while in-car delivery and commerce are valued least. Apart from offering the right services, OEMs can also increase demand first through pricing and sales strategy – accepting that most services will not be profitable in the short term – and second through portfolio strategy.

The OEM should enable third parties to provide certain services, acting as orchestrator/integrator to ensure a seamless and safe customer experience. This way, the OEM can regain customers' loyalty and access to their data, because customers will use the OEM's front end to access their preferred services rather than relying on smartphones alone.

Capgemini Invent therefore recommends that OEMs:

- Determine their strategic approach and positioning within the connectivity ecosystem, and thus define their core contributions to connected services. This approach might range from purely independent operations to partnering or even leaving the field to others. Regardless of that decision, safety and security-related functions must remain at the core of the approach to value creation.
- Make sure that they provide the services that customers value and use most – even via third parties.
- Provide an infrastructure that ensures a consistent, secure, and up-to-date service experience across the entire fleet.
- Build or buy strong software and analytics capabilities to develop relevant services and to learn from customer behavior. They should use these learnings to improve services and decide when to withdraw them.
- Monetize their strongest asset – users – by striving for a critical mass of users and continuously motivating them to intensively use the connected services offered. This maximizes the data and insights gathered, which can be monetized by selling them to others and more importantly by realizing internal cost efficiencies.
- Remember that the car is just one entity in the consumer's digital environment. It is not enough to merge connected services into a seamless in-car experience. That experience must also fit seamlessly into their whole digital lives.



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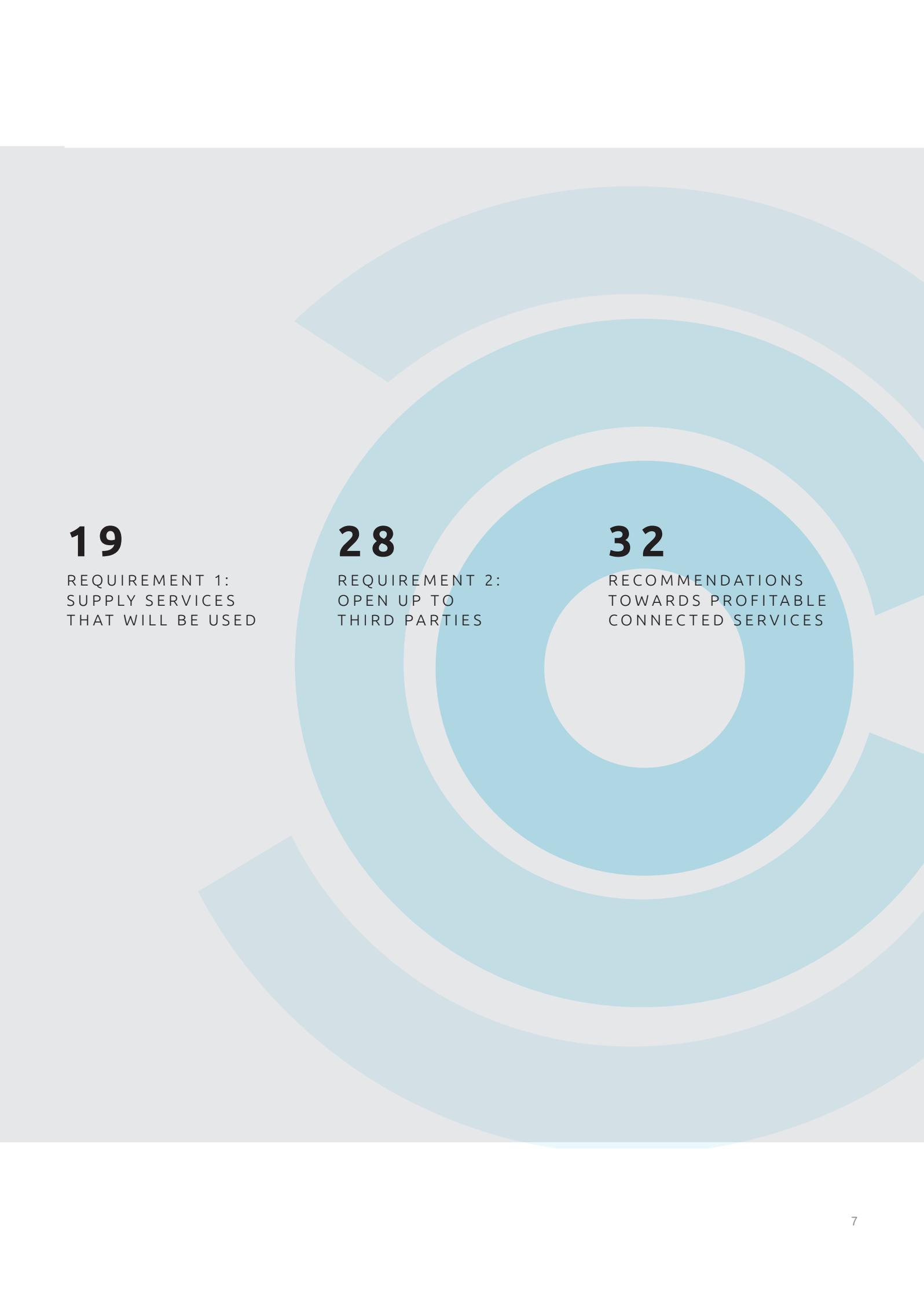
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INTRODUCTION

Welcome to Capgemini Invent’s second Connected Vehicle Trend Radar. The previous issue analyzed customer insights and market data with a focus on new players within the ecosystem (especially cross-industry players and startups). We also discussed the range of use cases for connected services, and the technological enablers for them.

Since then, we have continued to monitor the four main aspects of connected vehicles: market, customers, technology, and new players. For this Trend Radar, we are focusing on the connectivity ecosystem and what it takes for OEMs to make money. We have carried out a worldwide survey of more than 3,000 car users to find out what services they really want and see as relevant. We have also conducted a series of expert interviews to guide our research and help us analyze the findings and their implications for OEMs and their customers, both individuals and businesses.

Our analysis addressed questions such as:

- Are OEMs offering customers connected services that they are interested in using?
- How does OEMs’ success in this area compare with that of new players?
- What revenue streams are available to OEMs from connected services, and which have the highest potential for profitability?

- Which connected vehicle use cases are most valued by customers, and is the sustainability angle important?
- How can OEMs become the provider of choice for digital services in the car?

We would like to thank all our participants for their valuable input. We are confident that anyone with an interest in the future of the automotive industry will be interested in the findings, and sometimes surprised by them. Please contact connectedvehicles@capgemini.com if you would like to discuss any of the issues covered in more detail.

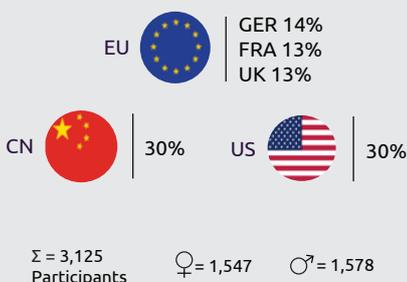
DEFINITION OF CONNECTED VEHICLES

In the first Connected Vehicle Trend Radar, we defined connected vehicles in terms of six connections to the environment: to infrastructure, service providers, drivers/passengers, other vehicles, the home, and OEMs/dealers. This gives a good understanding of what connectivity is about from a customer perspective. To understand the topic better from a business perspective, we have added four dimensions to the figure on page 9: data, enabler/technology, player/stakeholder, and services. This enhanced definition helps us analyze the connectivity ecosystem, revenue stream, and use cases. In this Trend Radar, we are especially interested in the data and services dimensions.

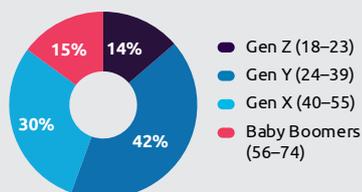
FIGURE 1

SURVEY SAMPLE

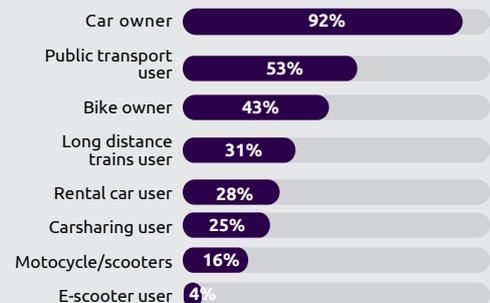
Sample size



Age distribution



Transportation modes





Player/stakeholder

Customers (B2C/B2B)
OEMs/suppliers
Cities
Infrastructure provider
Telcos
Startups
Tech firms
Data providers
Service providers
Regulatory instances

Enabler/technology

AI
Data/app platforms
5G
Cloud/blockchain
eCommerce



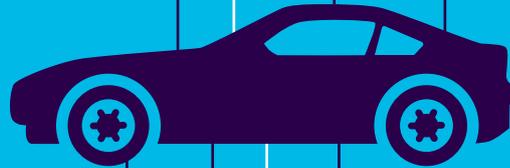
SERVICE PROVIDERS



INFRASTRUCTURE



HOME



OEMs AND DEALERS



OTHER VEHICLES



DRIVERS & PASSENGERS

Data

POI/service locations
Vehicle data
Customer preferences
Infrastructure
Traffic/maps

Services

Intelligent vehicle
Sustainability
Vehicle safety
Mobility
Infotainment

THE CONNECTED VEHICLE

WHY OEMS ARE MISSING THE MARK WITH CONNECTED SERVICES



TAKE-UP OF OEM-PROVIDED CONNECTED SERVICES IS DISAPPOINTING

The potential of connected vehicles for the industry is clear. The number of connected cars is set to increase to 352 million by 2023,¹ and this growth is expected to be associated with a rapid proliferation of data, from 33 zettabytes in 2018 to 175 zettabytes in 2025² – data that can be monetized by OEMs. However, this data growth depends on customer take-up of connected services.

Unfortunately, our survey suggests that take-up is disappointing so far. Around 44% of customers do not yet have any connected services in their cars, and only about half of those that do have connected services use them frequently.

Low usage rates are cause for concern. As we shall discuss shortly, data monetization is a major potential revenue stream for OEMs. To gather sufficient data to exploit it, OEMs need an adequate customer base that is using their services heavily. At the moment, neither the customer base nor the usage level is sufficient.

Another concern is that poor take-up of connected services could affect overall vehicle sales. Two out of three of our respondents said that connected services increase the value of a car and improve driver experience. In addition, around half of the respondents said they would be willing to switch to another car brand for better connected services, and most of them said they would do this even if the new brand cost more.

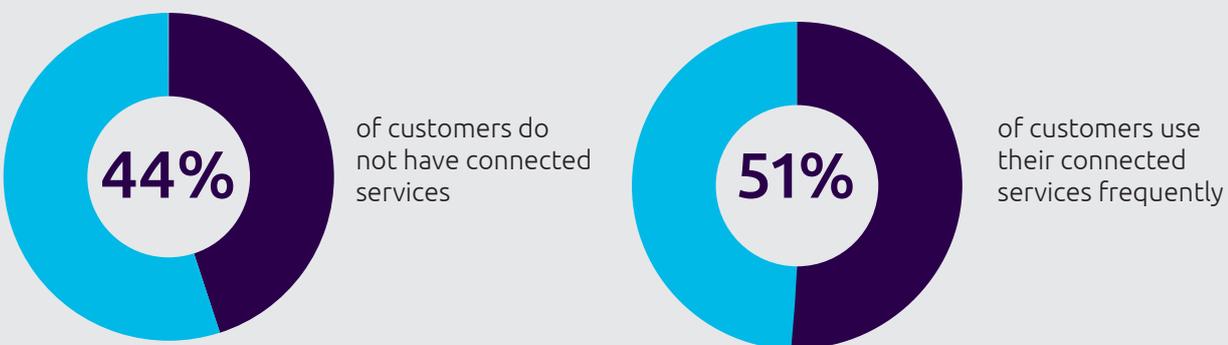
SERVICES FROM OTHER PROVIDERS ARE OFTEN PREFERRED

We might expect built-in services provided by OEMs to offer ease-of-use advantages over those available on smartphones. However, players such as Google and Apple offer a familiar user interface that can be directly integrated into the car via CarPlay or Android Auto interfaces, so that the customer's digital life can continue uninterrupted. These companies have the advantage that they know how to gather insights from customers and use those insights to create services that customers want. They treat the car as just another entity in the digital network and ensure that connected services fit in seamlessly.

OEMs' obligation to share vehicle data with third parties ("extended vehicle" in the EU, similar developments in China) has made it easier for the third parties to provide vehicle-based and highly customized services (such as location-based services, pay-as-you-drive (PAYD) insurance, improved service planning and preparation in workshops). Customers do not seem to be put off by the fact that these services are not directly provided by the head unit but instead require the connection of a phone.

FIGURE 2

CONSUMERS' PERSPECTIVE ON CONNECTED SERVICES



Source: Capgemini Invent, global customer survey, 2020.

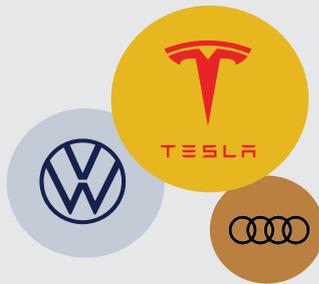
FIGURE 3

WHICH BRAND DO YOU SEE AS LEADING IN CONNECTED SERVICES?

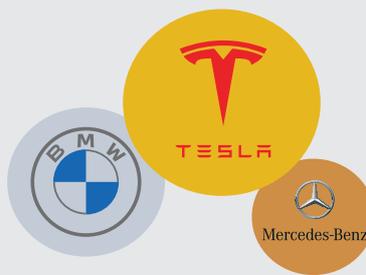
OVERALL



CHINA



EUROPE



USA



FRANCE



GERMANY



UK



Source: Capgemini Invent, global customer survey, 2020.

In addition, OEMs' dominance of the customer interface is challenged by other relative newcomers. Asked who is the best OEM for connected services, respondents in all regions mentioned Tesla as #1, followed by BMW and Mercedes. These rankings are illustrated in Figure 3.

Other contenders include Sony and LG, both of which are likely soon to present "whole concept cars" with connected services, based on their showings at the Las Vegas CES in early 2020.³

OEMs' connected services are not yet sufficiently attractive to customers, then. Although reasonably satisfied with individual services, respondents in our survey told us that the customer experience is still too complicated. They do not see added value from built-in connected services provided by OEMs compared with using their smartphones.

As a result, not only are the services unprofitable, but more importantly the OEMs risk losing control of customers and their valuable data. They could completely lose the battle for the customer interface, failing to stay relevant as a supplier of connected services. At worst, they may end up as no more than suppliers to technology companies.

SO WHAT HAS GONE WRONG?

The problem, our experts believe, is that most OEMs have tried to treat services as the identical twin of hardware, with the OEM in the center as sole provider. However, this approach cannot succeed because of the far-reaching differences between the development and provisioning of services and those of cars.

VOICE OF THE CUSTOMER: CURRENT CONNECTED SERVICES

"It doesn't always work"

"I don't know how to use it"

"I just don't really need or use it"

"Not enough capabilities without
using a cellular device"

"Not enough offered in my vehicle"

"I would prefer more"

Source: Capgemini Invent, global customer survey, 2020.



Clearly, OEMs are good at making cars and at optimizing the associated supply chains. They have tended to outsource activities outside their core competences, including most software and electronic control unit (ECU) components.

Understandably, they have applied a similar approach to connected services, with services and data mostly sourced from third parties, collected within the backend of OEMs and integrated into the vehicles' head units. While services have been given a seamless look-and-feel over time, they cannot usually be updated after the car is on the road. Worse, the services available vary widely from model to model within a given OEM's range.

Reviewing what OEMs are currently offering to customers, we can see that some OEMs have neglected to rethink their role within the connectivity ecosystem sufficiently to stay relevant. OEMs often tend to see new players purely as competitors and have not found ways to collaborate with them – but nor have they succeeded in keeping them away from the customer interface. A range of approaches to developing connected services is currently seen:

- Some are leaving the field to the technology companies and encouraging their drivers to use the proprietary smartphone integrations (Apple CarPlay and Google's Android Auto) while they themselves focus entirely on the provision of the hardware. This is especially true of mass producers such as SEAT but is also seen in smaller OEMs. Citroën's AMI One Concept car seamlessly integrates the driver's smartphone with the head making it easy to access services and apps regardless of whether they are provided by Citroën or third parties.⁴

- Some are trying to team up with one another to develop their own operating systems to counter the sheer power and speed of the technology companies. Daimler is reportedly discussing such a collaboration with both VW and BMW.⁵
- Some are letting technology companies provide everything including their operating systems. For example, Volvo subsidiary Polestar is launching an electric car running Android Auto.⁶ In China, Audi is developing a solution based on Android's infotainment operating system.⁷

The approach taken will depend on the individual OEM's strategy with regard to connected services. Clearly, certain approaches limit the opportunity to monetize connected services but that will be a deliberate decision for some companies.

For a while, drivers had to accept what they were given by OEMs but, as we have seen, OEMs no longer have a monopoly. It is not surprising that customers are unwilling to accept connected services that fall short of the "premium" and are looking elsewhere. As a result, most OEMs have lost their pole position with respect to connected services and the all-important customer data. This report discusses how to put that right.

“THE RACE FOR THE FUTURE OF THE CAR IS REALLY OPEN.”

Dr. Herbert Diess, Chairman of the Board of Management Volkswagen AG

Source: Automobilwoche, April 25, 2020

THE TESLA ADVANTAGE

OEMs face the challenge of rebuilding their fleets and organizations whereas Tesla was able to start from scratch. This means that Tesla has been able to rethink the car as a shell around the software and applications inside, creating a “smartphone on wheels” that can easily be adapted and updated over the air. Flexible vehicle and software architecture makes it possible to constantly change the setup and even deliver options-on-demand. When Florida was threatened by Hurricane Irma, Tesla was able to unlock extra battery life instantly with an over-the-air (OTA) update, temporarily extending vehicles’ range to help drivers evacuate.⁸ Many other OEMs struggle to do this type of update.

Tesla has been described as essentially a software company that also builds hardware. It is unencumbered by the legacy that hampers traditional OEMs: the siloed organization and traditional suppliers and supply chains.

Another key advantage is that different units within the car can interact with each other, facilitating OTA software updates and “engine” upgrades. Its software architecture further facilitates remote software updates.

These features help to make Tesla highly responsive to customers. It can often incorporate customer feedback into OTA updates in a matter of weeks. In addition, it uses data collected from vehicles to improve its software, particularly onboard AI systems such as its traffic-based navigation system.

Tesla is also extremely responsive to customer input, as this Twitter exchange between two customers and the CEO shows.



Source: Twitter.com

Regular over-the-air software updates emphasize customer-requested enhancements. For example, the company has rolled out a range of updates such as activation of the cabin camera fitted to some of its models and improvements to locking and battery management.



REALIZING CONNECTED SERVICES' POTENTIAL

OPTIMIZE REVENUES FROM CONNECTED SERVICES: THE THREE STREAMS

For OEMs who regard connected services as a strategic revenue source, we suggest viewing customers primarily as an asset for the future rather than a profit pool for today. This is because our survey shows that customers' willingness to pay is generally low, as we'll explain in the next section, where we examine various use case categories. The greatest value of these services lies in the exploitation of the data to provide insights about customer behavior.

To understand this point further, consider the three major revenue streams that an OEM can exploit with respect to connected services:

- 1. Service provision**, where the OEM offers, operates, and maintains the service itself. As we'll see, this does not bring much revenue directly, but it can influence sales: of our survey respondents, 67% think that connected services increase the value of a car and a similar proportion believe that connected services improve driving experience.
- 2. Service integration**, including the integration of services created by third parties, either into head-unit functions or via an app store. This can provide commission and enable

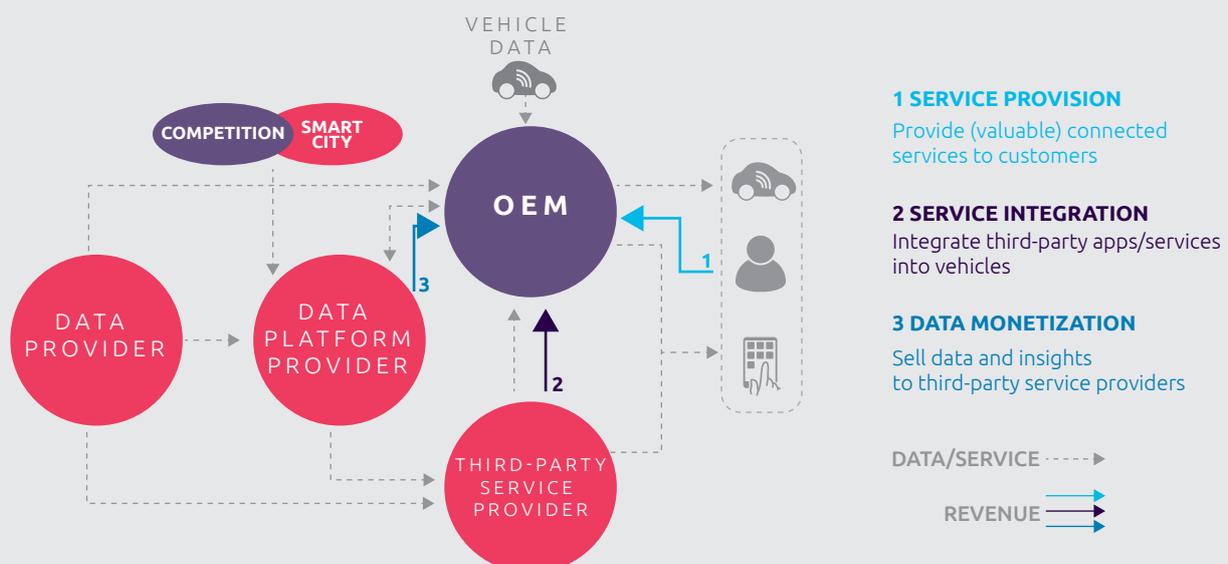
the OEM to offer premium services at minimal cost while keeping control of the relationship with the customer.

- 3. Data monetization.** This is achieved in two separate ways. First, OEMs can supply service providers with either raw data (via suitable platforms) or insights into driving and commuting behavior, biases, and locations as a basis for better services. Second, OEMs can use the data internally to help them to reduce costs, to optimize R&D, products and services, and CRM, and to limit emissions, among other uses. For example, predictive failure analysis saves money by allowing multiple maintenance tasks to be carried out at the same time and also by allowing parts to be ordered on a just-in-time basis. Many issues can be resolved remotely via OTA updates supported by analysis. This reduces the need for manual labor in garages and dealerships along with the cost of providing replacement cars and so on – costs that would often have to be covered by the OEM since many software-related issues are covered by warranties.

Figure 4 depicts the type of value network that should link these three streams together. It shows how data platform providers aggregate data from various sources, including multiple OEMs and also smart cities. This data can be used by service providers and OEMs alike to improve the services. The OEM's role in the network will be discussed in more detail below.

FIGURE 4

CONNECTIVITY VALUE NETWORK



1 SERVICE PROVISION

Provide (valuable) connected services to customers

2 SERVICE INTEGRATION

Integrate third-party apps/services into vehicles

3 DATA MONETIZATION

Sell data and insights to third-party service providers

DATA/SERVICE

REVENUE

All these activities are important, and their success is interdependent. We expect data monetization to yield by far the greatest revenue, but success in that stream is conditional on having a critical mass of users who use the services not just occasionally but heavily enough to build up data volumes. Service provision and integration are key to building up that critical mass, because offering relevant services attracts more customers and greater use levels. Hence, it creates more data and attracts more third-party providers to integrate their services. Figure 5 shows how this process should work.

- **Relevance:** The OEM must ensure that the services offered are relevant to customers.
- **Opening up:** The OEM must allow different players to provide services while providing a seamless experience for customers. Paradoxically this will enable the OEM to regain control of the user interface, because instead of using their smartphones in the car to access their preferred services from third parties, customers will use the OEM’s interface to access those services.

The rest of this Trend Radar discusses how these requirements can best be met.

MAKING THE CUSTOMER INTO A FUTURE ASSET

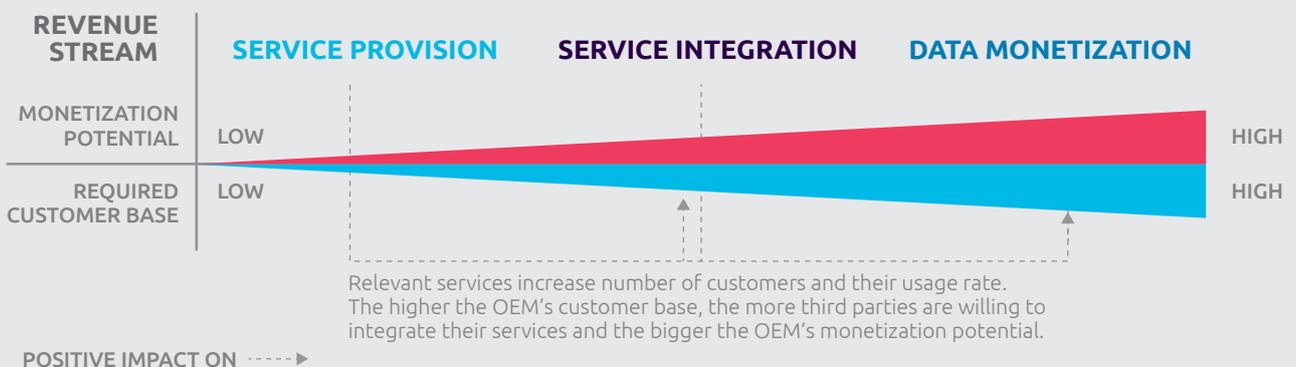
To make the most of customers as an asset for the future, OEMs need to position themselves to exploit all three of these revenue streams, with an initial focus on service provision and integration. As noted in our first Trend Radar, there are two main requirements:

“OUR CORE EXPERTISE LIES IN PREMIUM VEHICLES – OPTIMIZED FOR THE DESIRES OF OUR TARGET GROUP AND THEIR CONNECTIVITY NEEDS...VEHICLE CONNECTIVITY IS AN IMPORTANT PURCHASING CONSIDERATION FOR [CHINESE] CUSTOMERS.”

Oliver Zipse, Chairman of the Board of Management BMW AG
 Source: BMW Group, Corporate Communications, November 6, 2019

FIGURE 5

REVENUE STREAMS



Our [Monetizing Vehicle Data](#) research will provide insights into the specific levers that OEMs can use to exploit the monetization potential.

REQUIREMENT 1: SUPPLY SERVICES THAT WILL BE USED

FOCUS ON THE MOST VALUED SERVICES

As we have seen, OEMs must offer relevant connectivity services in order to remain attractive to customers and (if required by their strategy) be able to exploit the monetization potential of connected services. It is not enough to sell connected vehicles. To acquire the critical mass of users needed for monetization, OEMs must retain control of the data generated by the connected services used within those vehicles. And for that, it is necessary to provide services that customers will use.

So which services do customers value most? To find out, we asked our respondents how useful they find services in a number of use case categories, and how much they are willing to pay for them. Figure 6 charts the responses.

The responses show that the most highly valued connected services relate to safety and security, while the least valuable are in-car delivery (e.g. parcel delivery staff get access to the

trunk with remote locking and unlocking) and in-car commerce (processing of payment transactions such as tolls, refueling, charging, online shopping directly from the car).

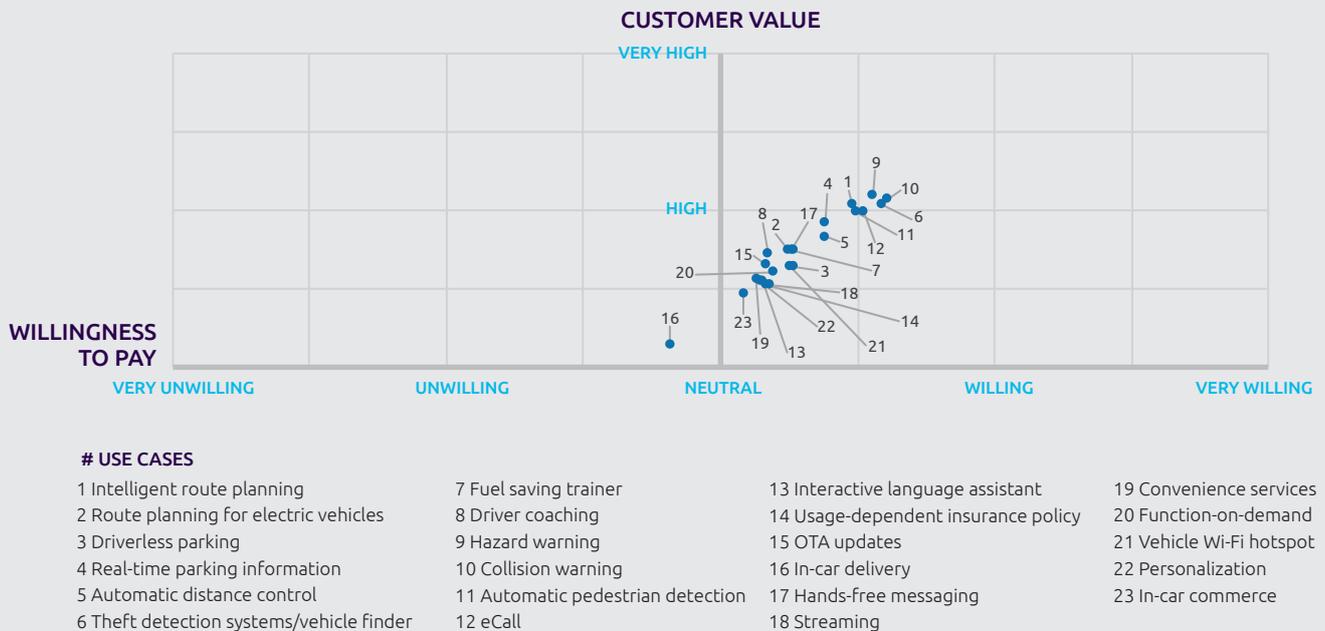
Willingness to pay for services is, however, relatively low in all categories. When we asked why, 41% said services offered are too expensive and 39% that the services are useful but not sufficiently developed. Another 23% of respondents have not used connected services before and do not know their benefits.

Within those findings there are interesting regional variations as shown on the next spread.

Variations between generations are also seen, older drivers see less value than younger ones with the services currently on offer, and less likely to use them (64% of Baby Boomers use them compared with 84% of Generation Y – interestingly, Generation X falls in between, with 75% usage).

FIGURE 6

GLOBAL SURVEY RESULTS – USE CASE MATRIX, TOTAL ACROSS REGIONS



Source: Capgemini Invent, global customer survey, 2020.

VOICE OF THE CUSTOMER: WILLINGNESS TO PAY

“Some of these services are not needed by me or are currently offered for free via smartphone apps”

“I think it should be a choice to have or opt out of all services”

Source: Capgemini Invent, global customer survey, 2020.

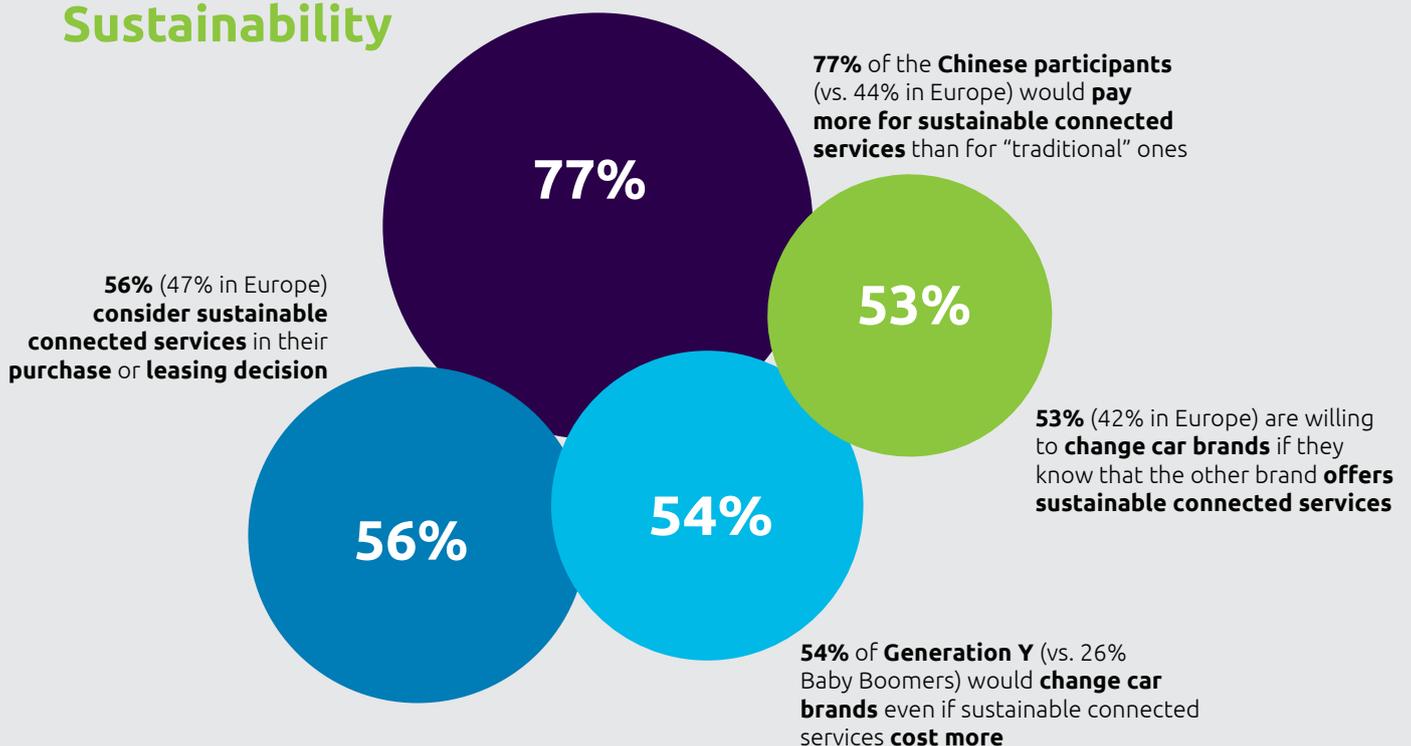


KEY INSIGHTS FROM OUR CUSTOMER SURVEY

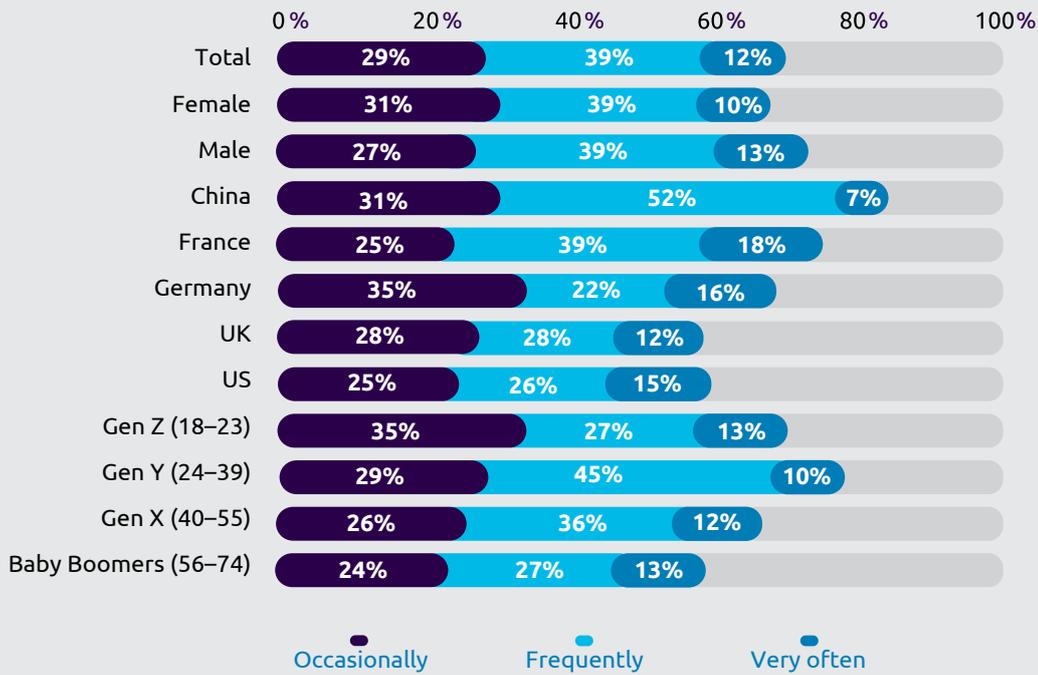
Question: What are the most valuable use cases?



Sustainability



Question: How often do you use the offered connected services in your car?

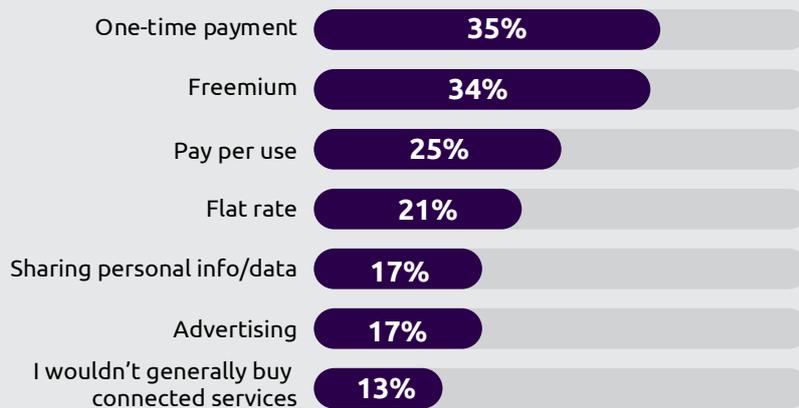


4 out of 5 use the available connected services in their car



Only 51% use connected services **frequently**

Question: How would you like to buy and pay for connected services?



Consumers want **flexibility** when it comes to **paying** for connected services

Source: Capgemini Invent, global customer survey, 2020.

FACTOR IN SUSTAINABILITY

Sustainability is an important aspect of the connected services portfolio. Consumers are very interested in services that increase sustainability – though, as we shall see, they are probably not willing to pay for them.

Overall, 60% of our survey respondents believe that connected services can have a positive impact on the environment, and we believe they are right. To understand how connected services can make vehicle usage more sustainable, we'll consider three dimensions: people, profit, and planet. A good example is intelligent route planning, where ultra-accurate positioning and instant updates help drivers opt for the route with the lowest environmental impact. This has a positive influence on the planet aspect (i.e. the environment), but also on the people aspect (less time lost in traffic jams) and on the profit aspect (less fuel consumption means less money spent on gas).

As can be seen from this example, connected services enable sustainability by making a car's resource consumption transparent, and by suggesting ways for drivers to achieve more sustainable behaviors, for example alternative routes.

However, our research suggests that despite their interest, most customers will not use sustainable connected services unless there are personal benefits such as incentives or gamification. As one of our experts said, *"From the user's point of view ... the creation of success or added value in terms of sustainability always requires a convenience or financial aspect."*

Some early initiatives by OEMs show how these benefits can be provided:

- A BMW Plug-in Hybrid car automatically recognizes when it enters a low emission zone and switches to emission-free, purely electric operation. For every electrically driven kilometer within these "eDrive zones," the driver collects "BMW Points" which can be exchanged for rewards. In a gamification angle, users can compare themselves with other drivers and take part in competitions to see who can cover the most purely electric kilometers.⁹
- Toyota's MyT App provides contextual coaching based on previous journeys to improve hybrid driving, make the best

use of the EV-mode, reduce fuel consumption, and minimize environmental impact. A score tells the user how their driving behavior improves over time.¹⁰

Sustainability is likely to be increasingly important as younger customers worldwide (particularly Generation Y) place a higher value on sustainable services, as do customers of all ages in China. Like other connected services, sustainable ones could be the reason a customer changes brand: 56% of all respondents said their purchasing decision will be influenced by connected services with a positive influence on the environment, though it is probably not the deciding factor. In time, and perhaps with the help of some education by OEMs, customers may even become more willing to pay for this type of service.

As well as including sustainable services (with suitable benefits attached) in their service portfolio, OEMs would therefore be well advised to highlight sustainable aspects of their connected services in marketing communications. Different approaches will be needed for different target groups: for premium vehicle customers, sustainability may be valuable per se, whereas for other target groups financial aspects may be more important. It makes sense to attach the "green" label to connected services in vehicles targeting Generation Y.

Recommendation: communicate the "green" impact of connected services

That impact can be a differentiator and attract customers to buy the brand. But note that customers also expect additional incentives such as cost savings, alongside the ecological benefits.

"CONNECTIVITY IS THE MAIN ENABLER [FOR SUSTAINABLE VEHICLE USAGE] BECAUSE IT LINKS DRIVING BEHAVIOR... WITH SUSTAINABILITY TARGETS."

– expert interview



SUSTAINABILITY



PEOPLE

The positive or negative **impact on the stakeholders** of an organization's actions



PROFIT

The positive or negative **impact on the economy** of an organization's actions



PLANET

The positive or negative **impact on the natural environment** of an organization's actions

Triple Bottom Line = Environmental Responsibility



Transportation accounted for almost a quarter (24%) of global CO₂ emissions in 2018, with 18% of these emissions caused by road traffic.¹¹

USE PRICING AND PORTFOLIO STRATEGY AS THE TWO LEVERS TO INCREASE DEMAND

Apart from offering services that customers see as relevant and valuable, OEMs have two main levers for increasing demand for, and use of, services: first, pricing and sales strategy and second, portfolio strategy.

Pricing and sales strategy

OEMs should shape the pricing and sales model according to customer preferences. This means, above all, satisfying the demand for flexibility, and also setting the right prices, since, as we have seen, 41% of respondents in our survey said that services currently offered are too expensive.

Another key aspect is when and how customers can buy. In our survey, 61% of respondents want to be able to purchase connected services at any time, 71% would like to be able to decide on individual services or packages, and 69% would like to be able to choose between different versions, e.g. basic or premium connected services.

Customers also want flexibility about payment. "One-time payment" and "freemium" are the most popular options, followed by "pay-per-use" and "flat rate." It makes sense for OEMs to offer a range of payment options. Freemium is an important one; as we have seen, 23% of customers have not experienced connected services yet, so this is an opportunity to encourage them to find out about the benefits.

Recommendation: Offer flexible purchasing options and attractive pricing

Flexible purchasing: Offer a choice of single services or service bundles, different service versions (e.g. basic or premium), and purchase methods (one-time payment or freemium, as a minimum). Allow customers to purchase services at any time. Additionally, regional preferences and needs must be considered when deciding what purchase and payment options to offer, as well as in deciding what services should be in the portfolio.

Pricing considerations: Remember that the most profitable revenue stream is data monetization, and so building a critical mass of users is the priority. To achieve that critical mass, consider offering services at unprofitable prices, at least in the regions that are less willing to pay for connected services.

Portfolio strategy

The second lever for increasing demand is broadening the portfolio. This will also please many customers: 39% of our respondents said that connected services are basically useful, but that the current offer is not sufficiently developed.

OEMs' main tool here is to open the gates for third-party applications – a topic we will discuss in detail in the next section.

They should also design the portfolio with care to achieve their main objectives. For example, our research suggests business-to-business (B2B) services may be more lucrative than business-to-consumer (B2C). Our experts believe that around half of B2B customers are willing to pay for predictive maintenance, recognizing its big cost-saving potential.

Approximately a quarter of B2B customers are believed to be willing to pay for fleet management services such as live tracking of locations, cost management, vehicle reservation, and routing documentation. Our survey shows that, in general, remote and telematic services have the highest revenue potential.

The main reason that businesses are more willing to pay than consumers is the cost savings they expect from connected services. For instance, charging management services, with data displayed on dashboards via telematics and CRM tools, can both optimize costs and reduce idle time. A service that tracks and monitors a fleet's emissions makes it possible to reduce its carbon footprint and thereby avoid financial penalties.

Nevertheless, OEMs' current focus is mainly on B2C services, and they certainly need to continue to offer connected services to consumers. These services are now seen as a commodity (an essential part of a car) and if superior may be a differentiator and a decision factor influencing customers to choose one brand over another. Of our respondents, 49% are willing to change the car brand for better connected services and 45% are willing to do so even when the services cost more.

In addition, it makes sense to shape portfolios to emphasize certain types of service (whether B2B or B2C) that are valuable to the OEMs themselves. These might include services that enable direct data monetization, such as usage-based

Our [Commercial Vehicles Study](#) will give detailed insights on connected services from a B2B perspective.

insurance, where insurance companies buy data either directly from the OEM or via an aggregator and use it to develop new services. Obviously this is conditional on customers' consent, but in return they can benefit from insurance offers that recognize their driving behavior and car usage, such as pay-as-you-drive (PAYD) and pay-how-you-drive (PHYD).

An additional important aspect of portfolio strategy is updating. OTA software updates bring benefits for both OEM and customer. They enable fast bug fixing and ongoing product optimization. That reduces the risk of costly recalls for the OEM and saves time and effort for customers because they do not need to visit a garage to get a fix or new feature.

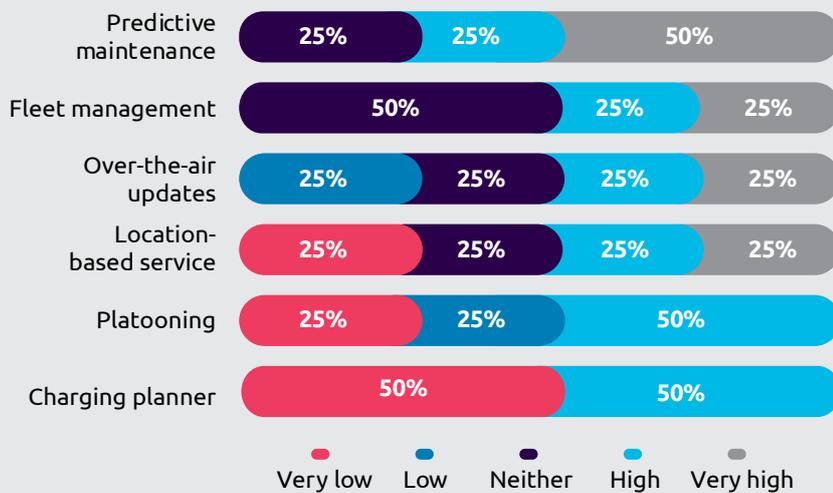
OTA updating also allows "function-on-demand" (retrofitting of additional service options). This brings the OEM an extra revenue stream from aftersales, since customers can add vehicle options at any time. At the same time, customers benefit from increased flexibility: They do not have to choose all their options up front when ordering a car but can add them later, renting options for a period at any time. Function-on-demand also increases the resale value of a vehicle because buyers can simply add any additional options that they want.

OTA updates also make sure that all vehicles are equipped with the same service portfolio, so that the entire fleet has the same look and feel and everyone is using the latest version of each service.



FIGURE 7

B2B SERVICES WITH BEST MONETIZATION POTENTIAL



REMOTE AND TELEMATIC SERVICES have the highest monetization potential for OEMs

Source: Capgemini Invent research, 2020.

REQUIREMENT 2: OPEN UP TO THIRD PARTIES

OPEN UP TO COLLABORATION

Capgemini Invent firmly believes that opening up the service portfolio to include third-party applications is the best way for OEMs to regain pole position with respect to connected services, assuming that this is part of their strategy. One of the strongest arguments is that users are already using third-party applications from the likes of Apple and Google, so making these applications accessible via the car's interface is an easy way to bring customers, and their data, back into the fold.

But there are other arguments too:

- Willingness to pay is relatively low for connected services but development costs are high.
- Working with third parties enables faster time to market for connected services.
- OEMs cannot compete with third parties in certain areas such as streaming entertainment services, either in terms of functionality and content, or of market dominance.

Expanding on this last point, the automotive world has parallels with the consumer electronics market. A major driver when choosing a TV is the ability to integrate streaming services such as Netflix, Amazon Prime, and Spotify. No TV manufacturer would think of trying to create their own content – instead they offer a platform where other service providers can create an app through which to offer content.

We should also note that experience in the consumer electronics world is totally seamless. A customer watching a Netflix movie on a phone can press pause, turn on the TV, and simply continue watching. That truly seamless experience is what drivers increasingly expect when they get in their car.

BE AN ORCHESTRATOR, NOT A MONOPOLIST

Gone are the days when an OEM could expect monopolistic control of in-car services. It is time to allow third parties to provide services alongside the OEM's own services – but the OEM must take overall responsibility for providing a seamless customer experience.

WHAT SHOULD OEMS BUILD THEMSELVES?

Although there's a strong case for using third-party services, certain functions cannot be left to partners, and it is important to understand from the outset which these are. Clearly, decisions will depend on the individual OEM's strategy and what it wants to achieve with connected services.

Recommendation: Carefully identify services that should be built in-house

Core contributions: Identify which elements of the connected vehicle landscape your company needs to contribute itself. Focus on connected services where you have a USP and/or that access critical vehicle functions. For other areas, consider integrating third-party services, especially those that consumers already value.

Safety and security: These services must be provided by you. If someone else infiltrates your system and takes control, customers' trust will be destroyed and extremely difficult to get back (see Facebook's work with Cambridge Analytica). To keep customers' trust, third parties need to be kept away from critical vehicle functions. These services are the ones customers value most, so they also have the greatest revenue and demand potential.

In this way, OEMs can regain control of the user interface and customers' data. Instead of using their smartphones in the car to access their preferred third-party services for functions such as navigation, customers will use the OEM's interface. The result is a value network, where the OEM acts as an orchestrator/integrator of services. As such, the OEM will combine all the services (its own and third parties') into a single seamless experience using its own intelligent layer.

Recommendation: Provide the necessary infrastructure for profitable operations

Intelligent layer: Build an intelligent service delivery layer handling common issues across core and third-party services that covers three dimensions: (1) Cybersecurity must prevent infiltration, which could irretrievably destroy customer trust. (2) Integration, including harmonization and synchronization, must guarantee customers a seamless experience. (3) Insight generation via intelligent algorithms must make it possible to enrich services and monetize data.

The OEM should enrich all the services provided with vehicle data, and identify and realize synergies between different services. The OEM must also set standards for quality and look-and-feel for the services offered, and must ensure that all apps comply with the requirements for publication in Apple and Google app stores. In addition, the OEM should constantly give service providers feedback data that enables them to improve their services.

BUILD MISSING CAPABILITIES

Making this happen will require considerable effort on the part of OEMs. They must rethink the way a car is built, especially in terms of software and vehicle architecture, and develop the necessary capabilities – of which the most important, but also the most challenging, is software-based thinking.

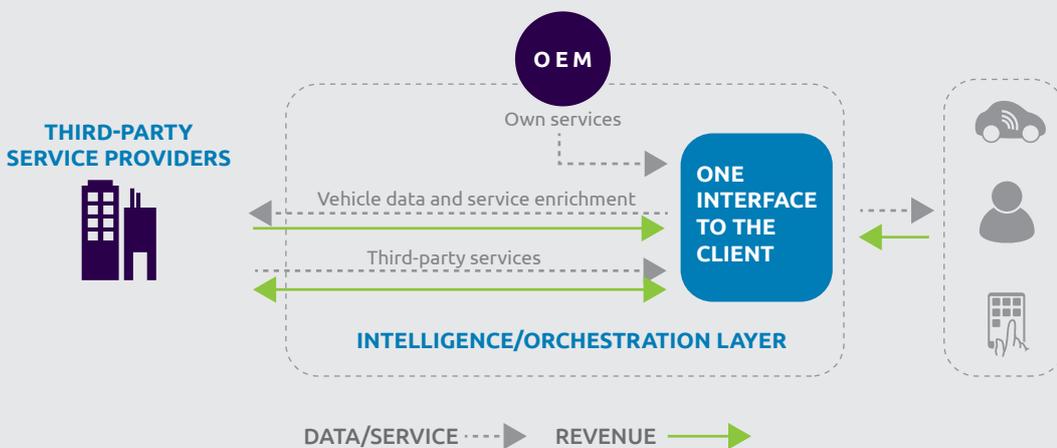
Recommendation: Develop the building blocks for effective orchestration

Foundations for data monetization: Create a strong data refinery and data architecture that allows customer insights generation. Even though current margins are low, this investment is vital to long-term profitability. These insights can be monetized in several ways. On the one hand, they can be sold to third parties. On the other hand, it allows optimized cross- or up-selling and more individualized offers. Most importantly, it will facilitate internal savings (e.g. through predictive maintenance and targeted development) and thus boost profitability.

Flexible vehicle architecture: Enable your fleet for continuous OTA updates. Operating systems, control units, services and vehicle functions should remain up to date throughout the vehicle's life to provide a consistent customer experience across all models. Therefore, implement a stable, high-performing infrastructure that can keep up with the resulting data traffic.

FIGURE 8

INTELLIGENT LAYER



When Renault leases car batteries to electric car customers, battery usage and data are tracked remotely through embedded sensors. Once a battery has been depleted to an optimal level, it lets Renault and the customer know that it is ready for retrieval. Thanks to features like this, Renault is able to recover and remanufacture a high proportion of parts, and the resultant raw material savings enable customers to benefit from price reductions.¹²

Strong capabilities: Check you have the necessary expertise in all essential areas: service, software and operating system development (e.g. VW's Car.Software organization), data analytics, cybersecurity, service orchestration, etc. Decide when to rely on the competencies of partners based on consideration of your brand image, overall strategy, core competencies, and USPs. Business and technology service providers like Capgemini are potential partners on the journey towards software company.

As orchestrator, the OEM must take overall responsibility for the customers' experience. Among other things, this means thoroughly testing all services. This requires techniques such as the use of a minimal viable product (MVP): a rapidly built and easily modifiable early version that helps to elicit customer feedback. The insights generated should inform go/no-go decisions for both new and existing services.

In addition to developing the elements and capabilities necessary to ensure a seamless customer experience, it is also vital for an OEM to equip itself for successful data monetization. For example, it will need to develop the data analytics skills to provide customized services that save money and improve ease of use (see Renault example).

PARTNER STRATEGICALLY

OEMs must simultaneously form the right partnerships to buy or co-develop the rest. These partnerships can be at any level. Companies could, for example, follow Daimler, VW, and BMW in looking at joining forces to develop a new shared operating system. Alternatively, they could adopt an existing operating system as Audi is doing with Android in China.

They could also partner with suppliers of a specific service – whether a brand-new one or an established favorite such as Google Maps or Microsoft Office: Mercedes Benz already offers In-Car Office in collaboration with Microsoft, for example.¹³ Or, again, OEMs could partner with one another to obtain the technology needed for new services: An example here is Audi, Mercedes, and BMW's joint purchase of Here to obtain the precise mapping services needed to support autonomous driving.¹⁴

It is important not to think just in terms of service integration but also in terms of the development of new capabilities. We are looking at a journey away from being a hardware provider towards becoming a kind of software company, and that needs a lot of changes in the OEM mindset, together with development of software and analytics competencies. It may make sense to rely on external support from companies that are experienced in big data, analytics, and the creation of customer insights.

RECOMMENDATIONS TOWARDS PROFITABLE CONNECTED SERVICES

By rethinking the way you deliver connected services, you, the OEM, can regain control of the content seen by customers, make them loyal users of OEM connectivity functions, and regain power over information about the behaviors and preferences of a vast number of drivers, paving the way for data monetization.

A| DEFINE YOUR POLE POSITION IN THE CONNECTIVITY ECOSYSTEM. Determine the contributions that should be at the core of your connected services offering based on customers' expectations, your (desired) brand image, potential user numbers, and your ability to scale up the necessary capabilities. Will you develop and provide these core services on your own, partner with others, or remain a pure hardware provider and leave service development to third parties? Regardless of your strategy, safety and security-related services must be provided by you. These are critical features – don't risk customers' trust by granting others access to them. Make sure you offer the services that customers value most highly and use most frequently throughout their digital life – even if they are provided by third parties.

B| DEVELOP THE CAPABILITIES TO SUCCESSFULLY BOOST CUSTOMER LOYALTY. Build or buy strong software and analytics capabilities, plus the infrastructure and architecture to provide a consistent service experience across all vehicles. Ensure a safe and secure environment, especially when cooperating with partners on service provision. Analyze customer behavior to discover when you can increase usage by improving a service – and also when you should withdraw a service.

C| MONETIZE YOUR STRONGEST ASSET – USERS.

Strive for a critical mass of users and make sure they use services as often as possible. This way, you can keep attracting additional third-party providers, and maximize the data as well as insights you gather. Focus on monetizing these insights, both by selling them to others and, more importantly, through internal cost reductions. This is the way to achieve profitability.

Remember, though, that the car is just an entity in the consumer's digital environment. To regain pole position with customers, it is not enough to merge connected services into a seamless experience: that experience must also fit seamlessly into their whole digital life.



“THE FUTURE HANGS ON THIS QUESTION: WHO IS CAPABLE OF FURTHER DEVELOPING THIS HIGHLY COMPLEX AND DIGITALLY CONNECTED PRODUCT TO BENEFIT CUSTOMERS AND MEET LEGAL AND SOCIAL REQUIREMENTS?”

Oliver Zipse, Chairman of the Board of Management BMW AG

Source: Statement and Presentation, 100th Annual General Meeting in Munich on May 14, 2020





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