

Capgemini 



CUSTOMER-CENTRICITY

Realizing the promise of connected
mobility

EXECUTIVE SUMMARY

Car OEMs are determined to achieve deeper, longer-lasting customer relationships by shifting away from their traditional role toward that of customer-centric connected car services provider. Their ambition is to generate new revenue streams amounting in a few years' time to several hundred dollars per customer per annum, while also safeguarding customer loyalty to their brand.

How has this new opportunity arisen?

Automotive customer expectation regarding mobility experience is evolving in response to factors such as connected user and consumer lifestyles, evolving mobility, and ownership model preferences such as leasing, rentals, and subscription-based mobility. In addition, new consumer travel preferences, and the desire to stay connected when traveling, are contributing to a shift in focus, away from just selling a car and toward the entire vehicle ownership lifecycle, from pre-purchase research to post-purchase services and maintenance. This shift to selling services is facilitated by the advent of software-defined vehicles.

OEMs' new role requires unprecedented innovation. As well as building stronger and more diverse partner ecosystems, OEMs themselves are continuously striving to offer the right service to the right segment. Their decisions must reflect a service's affordability, customers' willingness to pay, and the most appropriate payment model

(one time, freemium, and so on). At the same time, OEMs know they need to focus on improving user experience and building customer loyalty to increase the chance of re-purchase.

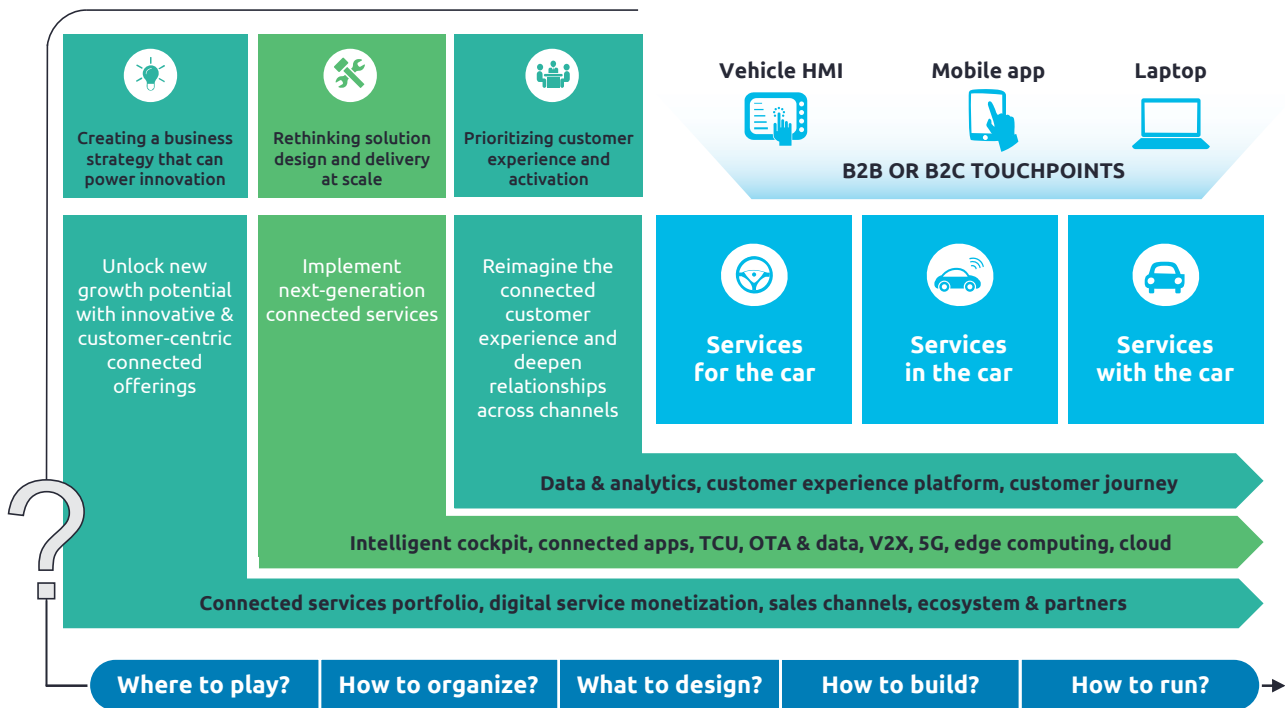
It all adds up to a major challenge. Unsurprisingly, many OEMs are struggling to unlock value from connected car services, especially recurring and increasing value. Even when dealers remember to offer customers participation in trials of early connected services, customers often fail to take advantage of the service. Of those who do participate in trials, only a minority typically convert to a permanent subscription – let alone renew it. As a result, the return on investment is disappointing for both OEMs and their automotive ecosystem partners.

To address this challenge, OEMs should adopt an end-to-end approach (Figure 1) that will empower them to reinvent connected mobility services, and at the same time complete their journey from manufacturers to tech mobility companies. This approach offers three levers for accelerating and de-risking change: first, prioritizing customer experience and activation; second, creating a business strategy that powers innovation; and third, rethinking solution design and delivery at scale.



Figure 1: End-to-end approach for realizing the potential of connected services

Levers for the end-to-end journey to connected mobility



To get their journey off to a flying start, OEMs can:

- Hold intensive workshops to bring new connected mobility opportunities into focus and explore all the ways connected mobility can benefit the brand and business.
- Collaborate on operating models that will achieve business goals.

Both these activities can be more productive when conducted in collaboration with insightful ecosystem partners who really understand the potential of connected car services business models and the realities of implementing them.



CONTENTS

INTRODUCTION:	5
THE RACE TO CONNECTED MOBILITY	
THREE LEVERS FOR SUCCESS WITH CONNECTED MOBILITY	9
LEVER 1:	9
PRIORITIZING CUSTOMER EXPERIENCE AND ACTIVATION	
LEVER 2:	12
CREATING A BUSINESS STRATEGY THAT CAN POWER INNOVATION	
LEVER 3:	16
RETHINKING SOLUTION DESIGN AND DELIVERY AT SCALE	
RECOMMENDATIONS	21

INTRODUCTION: THE RACE TO CONNECTED MOBILITY

The automotive market is facing a revolution triggered by evolving mobility preferences, intensifying sustainability commitments, and advancing connectivity, among other changes (see Figure 2).

Historically, the automotive industry has a proud legacy of achieving incredible feats of engineering, and then continuously evolving those achievements to keep pace with customer expectations. But in today's world, a great product isn't enough to drive deep customer loyalty the way it once did.

Already, many customers expect personalized, integrated experiences, as well as new mobility services and ownership models that are sustainable. Those expectations will strengthen in the future. OEMs now need to become mobility tech companies, differentiating themselves from competitors by creating engaging physical and

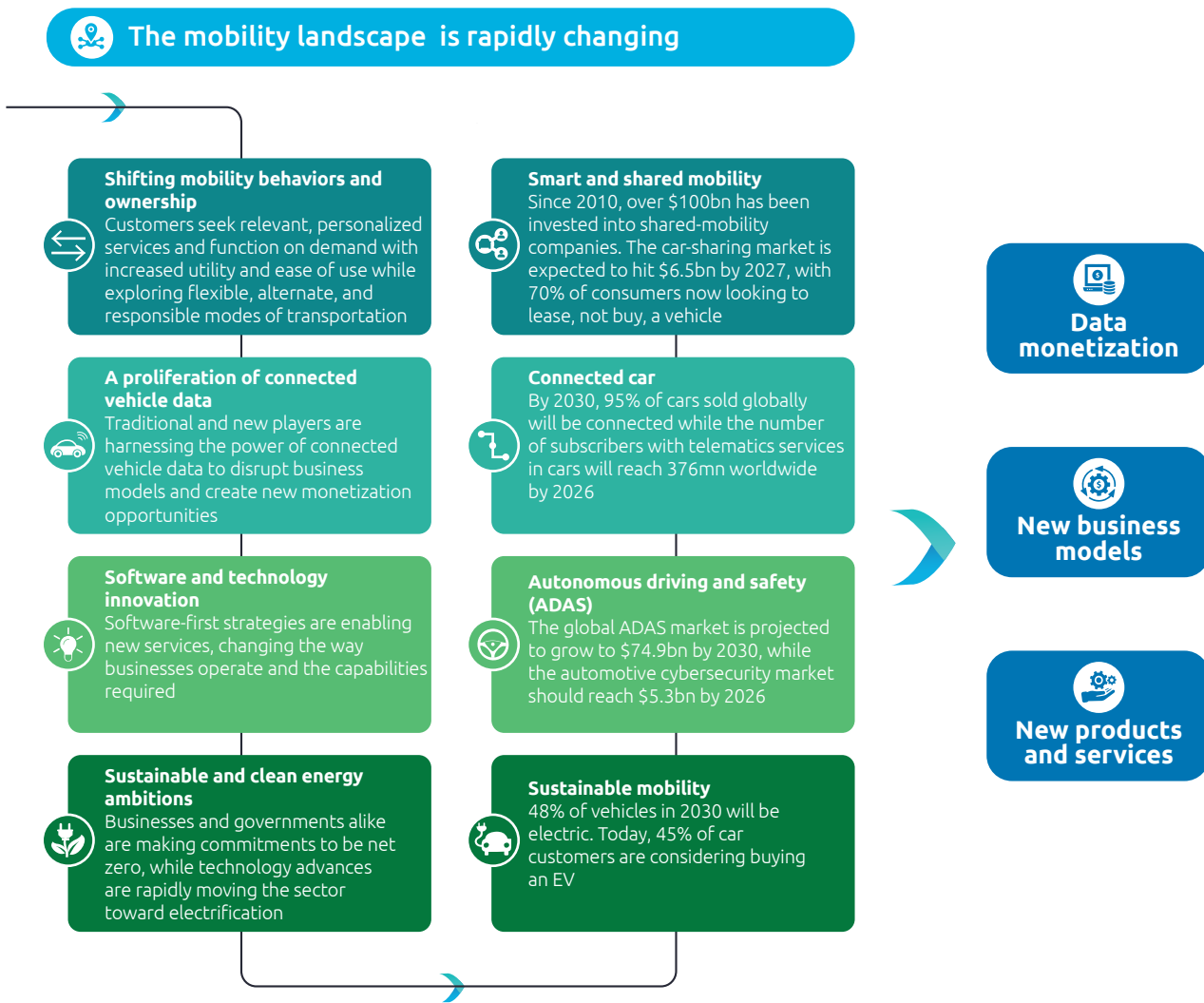
digital experiences that keep improving throughout the vehicle's life.

Overwhelmingly, it will be connected car services that allow them to create a unique brand experience. In this way, they can engage consumers and build long-term brand loyalty. The impact on consumers' behavior will uncover revenue streams that go beyond product sales and traditional services. With enhanced online services and CRM tools, OEMs will be able to create new revenue streams across the entire vehicle ownership lifecycle.

This connected mobility transformation presents OEMs with enormous opportunities: new partner ecosystems,



Figure 2: Rapid change in the mobility landscape



innovative services and products, and, most importantly of all, deep and long-lasting customer relationships – safeguarding their market position in an uncertain business climate and generating new revenue streams.

Leading OEMs are already realizing these opportunities, or preparing to do so. For example:

- Stellantis expects software-enabled product offerings and subscriptions to generate €4bn in annual revenues by 2026, and as much as €20bn by 2030.¹
- Renault’s target is for connected services to account for more than €10bn of the revenue from Mobilize (its EV business unit).

- Tesla has already generated \$1,177 per car per year from over-the-air updates.

It is worth mentioning that the attractions of optimal customer experience in connected cars are also relevant to connected trucks and other commercial vehicles. Truck fleet operators face intensifying driver shortages, and are realizing that offering a better experience will help them attract more applications including hitherto hard-to-reach groups such as women and younger people. In addition, these commercially minded customers are realizing that the same connected services that improve experience often help with business goals such as productivity, uptime, and fuel efficiency.



MANY OEMS ARE STRUGGLING TO UNLOCK THE VALUE OF CONNECTED CAR SERVICES

OEMs believe that connected services have the potential to deliver a continuous revenue stream that could increase in value steeply – perhaps even exponentially. But unfortunately this is not happening fast enough yet. There is evidence that OEMs are struggling to persuade customers to activate services in the first place, and when they do activate them, the signs are that satisfaction rates are low.

For example, research² shows that when dealers offer a free trial of a service, about 20% of customers on average don't enroll because they don't see the benefit of connected services. This lack of understanding means that there often is no tangible benefit when they do try them, and, perhaps unsurprisingly, only about 45% typically convert to paid subscription following a free trial.

So what's going wrong? Issues that our clients ask us to help with include:

- **Lack of knowledge.** When free connected services trials are available, dealers may not consistently offer them. Customers too may lack awareness. Therefore, an opportunity to enroll is missed.
- **Over-complex processes for activation, enrollment, or renewal.** Unless the process is straightforward and seamless, customers are likely to abandon it part-way through.
- **Design problems.** End-users who do try connected services sometimes express dissatisfaction with user interfaces and user experience.
- **Development and maintenance issues.** Bug-fixing and the introduction of new connected car features can be slow.
- **Unstable connections, with frequent disconnections.** Diagnosis can be hard, especially as it may not be obvious where in the network the problem is. The response time when using connected services can be poor owing to latency.

We believe, however, that there are other reasons for poor take-up of connected services, such as failure to identify what customers really want or offering them something that they would prefer to get from another provider or from their smartphone through screen replication. All these issues will be discussed later in this report.

¹December 7, 2021, Stellantis Targets ~€20 Billion in Incremental Annual Revenues by 2030 Driven by Software-Enabled Vehicles, press release.

²July 26, 2022, LexisNexis Risk Solutions Connected Car Study: 81% of Consumers Enroll in Free Trial When Offered, press release.

A STRUCTURED APPROACH TO GETTING BACK ON TRACK WITH CONNECTED SERVICES

As a result of low rates of activation, enrollment, and renewal, OEMs are finding that subscription revenues fall well short of the level they hoped for. Inevitably, they are not seeing the expected ROI, especially as costs remain high with respect to R&D, licenses, data consumption, and infrastructure. OEMs' partners, too, may become disenchanted with the relationships because they're not getting the business they were aiming for. But most seriously

of all, OEMs are failing to build the expected levels of long-term engagement with their customers, and so may miss out on the associated revenue streams.

This point of view document describes an end-to-end approach that automakers can take to focus on customer value and relationships in order to overcome obstacles and ensure that they and their customers enjoy all the available connected car technology benefits to the full.





THREE LEVERS FOR SUCCESS WITH CONNECTED MOBILITY

The software-defined vehicle transformation roadmap will vary between OEMs, but for every one of them, the top priority will be to provide customers with the experiences that they want and are willing to pay for – something that will only be achieved through deep connections to their customers and continuous innovation.

LEVER 1:

PRIORITIZING CUSTOMER EXPERIENCE AND ACTIVATION

...to realize the connected customer experience and deepen relationships across channels

OEMs now have to shift their focus from selling cars to selling a portfolio of services. They need to build connections with vehicle owners and mobility users to explore what they really value. And, in order to deliver experiences that will please customers (both inside and outside the vehicles), they need to replace individual decision-making with decisions that leverage data insights.

To do this, they should take the following actions.

ADOPT A CUSTOMER FOCUS AND GIVE THEM WHAT THEY WANT

Customers are not interested in buying technology; what people mainly want is a seamless experience with no friction. The smartphone is an example of what OEMs aspire to in this regard, in that it is highly integrated with the user's world. Adopting a customer-centric strategy and culture will enable OEMs to deliver a comparable experience via connected services.

USE METADATA TO FACILITATE CONTEXTUALIZATION AND PERSONALIZATION, AND CONNECTED DATA TO BUILD COMPREHENSIVE INSIGHTS

Information may not mean much to a user without context. For example, it's not useful to know that a facility such as a charging point is nearby if the charging point is unavailable or can't be reached from the road that you're on. Similarly, it's no use knowing a restaurant is near the next junction if it is not one that you would ever consider going to.

Providing this type of contextualization and personalization requires extra data about drivers – not just about what they do in terms of mobility, or how they do it, but also about why. Capturing and managing this type of data requires the right data metamodels, which implies advanced skills in information architecture.

To optimize customer experience, 360-degree insights are needed. It's not just about working out what services customers need to give them the experience they want, and delivering them seamlessly. As we've seen, the key to giving customers the experience they want, and to making information valuable, is contextualization and

personalization (which can be viewed as the next level of contextualization). Personalization is linked to matters such as consumption choices arising from individual socio-cultural values. Understanding all this makes it possible to meet people's true needs.

A wide range of skills – including leading-edge market research techniques as well as data management and analytics – are needed to build a full picture, but it's necessary to do so if an OEM is truly to meet customer needs and gain a competitive advantage through superior customer experience.

CREATE CUSTOMER EXPERIENCES THAT BENEFIT EVERYONE

Rather than primarily designing solutions or services, OEMs aiming for leadership in the mobility space should design customer journeys that engage drivers and passengers and that deepen relationships. The aim should be to create a compelling customer experience that is coherent across all the touchpoints.

This is true for the entire customer lifecycle. When it comes to sales, for example, OEMs should reimagine the customer experience across multiple channels, choosing the best technology to create a seamless experience as the customer moves from online research to a test drive at a dealership and maybe back to an online purchase.

Of course, not all customers want the same experience or have the same priorities. There is work to do to understand the needs of different segments, as well as of individuals. Clearly, the commercial vehicle buyer – typically a fleet operator – wants something different from the individual car buyer, although driver experience is becoming increasingly important for truck fleet operators in view of current driver shortages.



MEET EXPECTATIONS OF A FULLY SUSTAINABLE MOBILITY EXPERIENCE

Connected car solutions can help to facilitate and encourage sustainable vehicle use. Importantly, they can promote uptake of EVs by overcoming customer concerns about, for example, range and the availability of charging stations. It's not just that services can advise drivers about available charging stations and the conditions there (e.g. wait time). When the battery is getting flat, connected services can also conserve energy by adjusting engine parameters or air conditioning, or advising a change in driving behavior. This will help the driver to continue to the next available charging station, or even to the one after that if it has a shorter wait time.

There are many other examples where connected services can improve sustainability:

- Real-time route optimization can help to reduce overall energy consumption and emissions, as can services that coach customers to drive more sustainably, or help them to do so with ADAS features.
- With hybrid vehicles, services can help drivers to ensure that EV mode is used wherever possible, reducing their use of fossil fuels.
- When trucks are moving together in platoons, services can enable vehicle-to-vehicle communication to ensure that distances between trucks are such as to minimize aerodynamic drag – and hence fuel use.
- A vehicle can communicate with the grid to ensure it draws power for charging at the time when demand is lowest – and also, potentially, uploads surplus power at the best time.
- OTA service updates can upgrade vehicles with new connected car features, making used cars more acceptable to users, and bringing circular economy benefits.
- On the road, drivers can be advised about their most sustainable options in terms of experience outside the car such as restaurants and hotels.



LEVER 2:

CREATING A BUSINESS STRATEGY THAT CAN POWER INNOVATION

...to unlock the growth potential of customer-centric connected offerings

Many OEMs today are disadvantaged by their legacy burden, i.e. their historic structures and ways of working. For example, they used to have a strong focus on start of production (SOP), with an assumption that the vehicle produced and sold would be unchanged during its lifetime, with no subsequent upgrades. They also tended to work in complex, siloed hierarchies.

These OEMs are now striving to unlock new growth potential by switching their focus to the customer, and delivering customer-centric connected car solutions throughout the vehicle's lifetime, which calls for agile ways of working across all disciplines. But before they can do so, they need to overhaul their business strategy and approach to innovation.

This requires action in several areas:

IDENTIFY NEW CONNECTED CAR BUSINESS MODELS SUPPORTED BY INNOVATION – AND PLAN MIGRATION

OEMs need to identify new connectivity-powered business models that are customer-centric and last throughout the lifetime of the car and, where appropriate, beyond. This involves shifting the focus from products to services. Many OEMs are now thinking in terms of selling customers a minimal-value product initially, and then continuously personalizing it with services over time via feature on demand – or function on demand – concepts. In addition, they are conscious of the shift toward shared mobility, and know that drivers who use cars from a car club, for example,

may want to purchase services and take them with them from car to car.

Changes to the business model must be carefully planned. OEMs should define what in particular they want to gain from each investment. Is it greater customer loyalty, new revenue streams (for example from selling data), improved efficiency, reorienting their business toward services, or something else? It's also important to think about the role of innovation. Where does it fit into the new model? How can the model be designed to promote and reward innovation?

To answer these questions, companies should consider their desired overall position in the value chain. In general, how will they monetize, or otherwise benefit from, connected services in general? How do they want customers to view their brand in the future?

Having defined each new model, it's also important to carefully plan the transition from old model to new. Particularly in the case of a major transformation (for example to software-defined vehicles), think about how you and the customer can gain value early in the process, rather than waiting until it's complete.

SYSTEMATICALLY IDENTIFY THE SOLUTIONS TO BE DELIVERED

Companies should, once again, select the solutions to be offered by their connected vehicle program on the basis of what will improve customer experience, add value for customer and/or OEM, and potentially differentiate the brand. Our observation is that the services that achieve disappointing results often fail to address genuine customer pain points, or offer something that a customer would expect to obtain from another source. It is perhaps not surprising that not many customers buy concierge services from their OEM, for example.

When it comes to creating a portfolio of connected services, it is important to think about the reason for creating a given service. However beneficial a given service is, it should not be assumed that customers will pay for it – in some cases, such as navigation, customers will just expect the service to come with the car. (Of course, these services may still be worthwhile for the OEM: excellent digital services will be a strong differentiator in a future where the vehicles themselves are likely to

be increasingly similar regardless of brand.) Discovering who will pay for what is therefore a separate research exercise from establishing what services will improve customer experience.

Not all services will be provided by the OEM itself. The Apples and Microsofts of the world can only provide their rich selection of solutions by working with an ecosystem of partners.

CREATE AND MANAGE THE ECOSYSTEM

Building a mobility ecosystem and deciding how to work with it is a challenging task for a company that has not done it before. There is a case for making one of the first additions to the ecosystem a trusted partner with extensive knowledge of IT who can help with strategy and innovation. Indeed, leading automakers are finding that IT companies who were formerly one or two levels upstream in their supply chain are now effectively becoming tier 1s. The right partner should offer end-to-end support, including designing, building, and running the ecosystem.

The partner should also have a portfolio of accelerators for the creation of a connected mobility strategy. However, it should be understood that a strategy can't be bought off the shelf. It has to be carefully tailored to a company's specific needs and aspirations, as well as its current culture and capabilities.





Automotive ecosystem partners should be chosen for their ability to fill gaps in a company's own capabilities, but these gaps are not necessarily just technical ones. For example, a national company with its sights set on global expansion might want to choose partners who already have a global presence.

OEMs also need a strategy for deciding who should develop a given service – a question that can often be decided by thinking about which supplier is trusted by customers for what. For example, they are likely to trust the OEM to provide services relating to the vehicle itself, but for navigation aids they may prefer the supplier of the mapping app that is already on their phone.

Although the obvious ecosystem partners may be those who can develop connected car solutions, many other types of collaborators are needed. For example, if an OEM is seeking to monetize data from connected services, they may well want to work with data aggregators who already know how to put the data into a usable form and then sell it to those who need it. This is particularly true of standard types of data such as weather and traffic conditions.

Selecting and recruiting the right partners is only part of the challenge. Deciding how to work with them is equally vital. Companies need to think about how they can gain value from the ecosystem while also offering value to their partners.

Automakers can also attract and help third-party developers by publicizing APIs and sharing data. Once again, they can learn from the smartphone world, although the automotive industry has its own requirements: for example, in terms of the balance between collaboration and the need to safeguard data, IP, and customer relationships.

DESIGN AND IMPLEMENT A NEW OPERATING MODEL

Connected mobility businesses require a different operating model from a traditional automotive business. The model will feature agile, flexible, and cross-functional organizational structures. It will need different capabilities, for example in areas such as software development, data science, and user interface design. Thought must be given to where responsibilities should be assigned, and how capabilities should be obtained (hire, upskill, acquire, or create a company, partner, etc.) and organized (centers of excellence versus distributed small teams). And that's just the beginning.

It isn't only the models and structures for delivery of products and services that need a rethink. Moving to new sales models such as direct, agency, or online sales necessitates transformation of responsibilities, capabilities, and structures, as well as the provision of new tools.

MANAGE THE SERVICE PORTFOLIO

As ever, automakers should look to customer experience and preferences to guide their decisions – and complex data analysis will be required to understand that experience and those preferences.

OEMs also need a framework for managing and scaling the service portfolio – one that helps and encourages third parties to contribute services and themselves to manage how third-party services are offered to and used by their customers. The intelligent cockpit, function store, and user profiles can all be helpful here, as can developer portals and standardization. However, once again it's important to revisit the collaboration strategy and be clear about what you want to share.

CASE STUDY

FUNCTION ON DEMAND STRATEGY

A premium brand OEM has adopted the function on demand (FoD) concept, aiming to offer individual vehicle services (e.g., navigation, seat heating) for a limited, need-based period of time. Realizing this vision required a complex global rollout affecting sales models, sales processes, IT systems, call centers, and legal arrangements.

Capgemini helped this client to develop its FoD strategy for both private and fleet customers. We conducted workshops for a collaborative design of the FoD customer journey and created the implementation roadmap.

The result is a successful FoD implementation that has also given the client an opportunity to sell special equipment throughout the vehicle lifecycle. In this way, the FoD strategy has served as a catalyst for additional digital business in the future.

BRANDING VERSUS STANDARDIZATION

Standardization of software elements can be helpful in providing customers with a unified experience across all their in-car and other activities. It can also help OEMs to integrate in-house and third-party elements to provide a coherent service portfolio. Finally, it can help to make apps portable across operating systems so that the OEM's commitment to one OS is not irrevocable.

However, it's also important to consider the impact on branding and competitiveness. Can a generic service be tailored to the OEM's brand? This consideration will be an additional factor in the choice of suppliers to add to the ecosystem. Some suppliers will be more willing to consider using the OEM's brand than others, depending on whether they see themselves primarily as the OEM's collaborator or as their competitor in areas such as data monetization.

LEVER 3:

RETHINKING SOLUTION DESIGN AND DELIVERY AT SCALE

...to combine IT and engineering and accelerate implementation of next-generation connected services

When it comes to implementing next-generation connected services, OEMs' history and culture is once again getting in the way. They are still focused on products and technology, whereas what customers increasingly want is a seamless, engaging, and rapidly evolving experience.

OEMs still do very little OTA system updating despite the fact that it is actually not very challenging if the system is OTA ready. We believe that using OTA is a good way of improving profitability, provided the right technology is built into the vehicle at SOP.

With waterfall development processes, the time to market is too long to meet those expectations; agile is the solution. Connectivity itself is not yet a major aspect of most OEMs' capabilities. And when OEMs do create connected offers, they sometimes struggle to scale them across their product range, and instead provide features that are tailor-made for specific product lines or brands.

To overcome these problems, automakers need to develop the solutions that customers really want. We have already discussed ways to identify these services, but bringing them to market requires a number of actions.

PUT AN INTELLIGENT COCKPIT AT THE CENTER

Among numerous other benefits, the intelligent cockpit makes it easy to deploy and integrate new services and applications. However, the journey toward the intelligent cockpit has only just started. OEMs acknowledge that the cabin experience still needs to be dramatically simplified to bring a frictionless experience; the key principle here is "one glance, one click."

OEMs are working to turn the in-cabin user experience into an immersive one that delivers meaningful information to the driver, and entertainment content to passengers. The future of human-machine interface technologies (HMIs) is continuously growing, nowadays including voice controls, interior-facing cameras, touch-sensitive surfaces, and smarter, personalized platforms.

In-vehicle HMIs allow users to interact with a suite of intuitive in-car features, while providing real-time access to external information (e.g. traffic and weather reports, speed limit changes, predicted movements of other drivers on the road). Additional ADAS features (augmented surround view for



automated parking, driver drowsiness monitoring) can be integrated into cockpits to actively help the driver to avoid road fatalities, injuries, and accidents.

In-vehicle infotainment (IVI) systems and integrated in-vehicle apps are already among a car’s key selling features, while users are demanding more functionality and connectivity to gradually transform the vehicle’s interior from a driving space to a new kind of living space. Such features offer an enhanced in-vehicle experience to drivers and passengers, and provide OEMs with new monetization opportunities.

Along with the vehicle’s functionality, the connected car’s ecosystem is expanding to include everything from infotainment options to mobile devices integrated into the vehicle. It all increases the possibilities for using the car’s interior to enhance in-vehicle user experience. Personalization, better interaction, multimedia sharing, and extended information are just some of the possibilities.

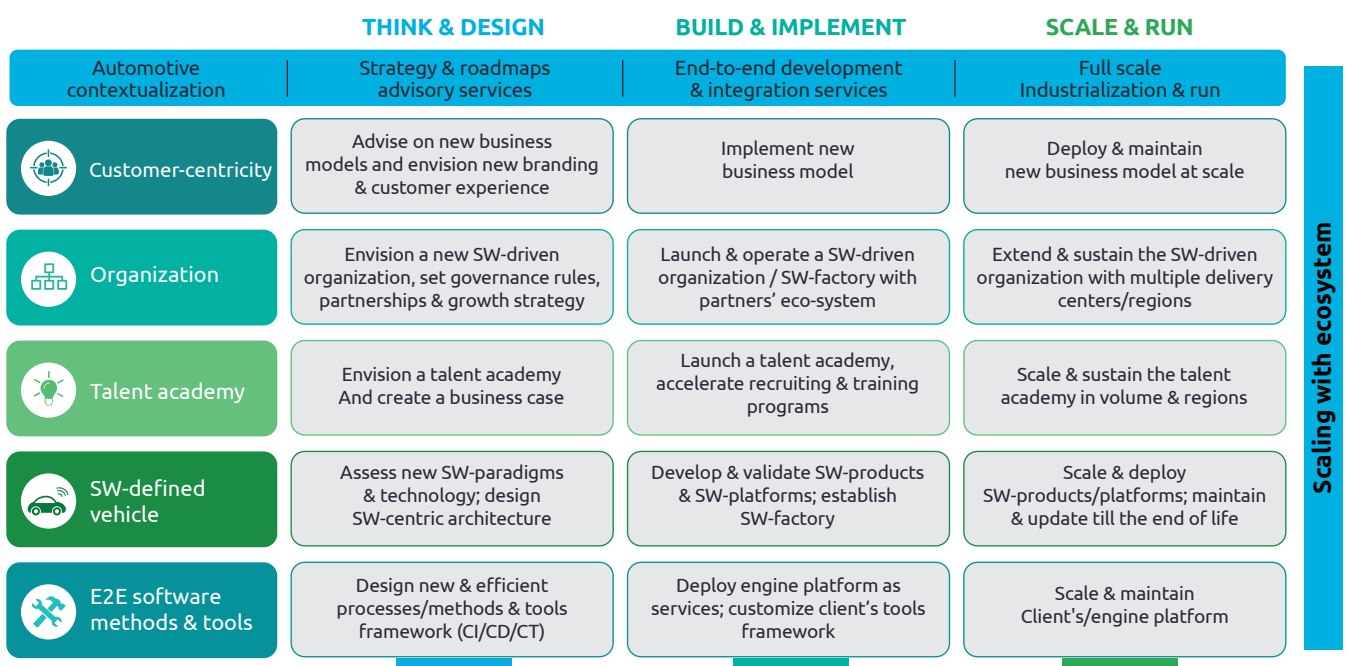
DEVELOP THE ENABLING TECHNOLOGY AND METHODOLOGY FOR THESE NEW SOLUTIONS

Developing the new solutions will entail implementation of new use cases linking vehicle, edge, and cloud through resilient and persistent connectivity. These implementation projects will enable the necessary in-vehicle connectivity, OTA updates, and data collection processes and platforms.

Naturally, these projects will require different development methods from those used in the past – methods that can bring the digital and physical together, and drastically reduce development time without introducing any risk. This implies adoption of agile methodologies, and the use of pre-written elements as well as the building of new ones.

A layered, composable, service-oriented architecture (SOA) will help to enable scalability and portability. This software-defined vehicle architecture should be a distributed one, with embedded edge to cloud capabilities so that data can be located wherever makes the most sense for a given service.

Figure 3: A framework for software-driven transformation



Architecture like this helps with the strategic goal of software-driven transformation, as well as facilitating interim goals such as better development, integration, and validation of software. While OEMs and suppliers are at different stages of this transition, and are adopting different approaches to it, they can all benefit from a framework such as that shown in Figure 3.

ADDRESS CYBERSECURITY ALONG WITH SAFETY

A shift of emphasis from products to services makes it more important than ever to address both cyber resilience regulations and functional safety requirements. With respect to cybersecurity, there's a larger attack surface; therefore, a more sophisticated approach to monitoring, preventing, and managing issues is needed. Indeed, tighter regulations and laws are likely to mandate investment in this area.

The same fundamental approach is needed for both cybersecurity and safety. Consider both from day one of development, and revisit them at each milestone to ensure all stakeholder requirements are being met.

CREATE CONNECTED CAR SOLUTIONS THAT PROVIDE THE RIGHT CUSTOMER EXPERIENCE

For each solution to be offered, the company needs to specify what is required and decide whether it will be developed in-house or by a partner, and if so which partner. Once the cost and development timescale are known, the OEM will naturally need to reassess the viability of the solution and the priority it should be given.

When development begins, the whole process – design, validation, and maintenance – should be driven by the needs of the customer. For example, the validation process needs to ensure not just that the solution works and is safe and secure, but also that it creates the right customer experience. It's also important to make the solution future-proof, and so design should be reviewed in the light of as many future scenarios as possible.

As well as the connectivity of the individual services offered, OEMs need to think about how they can be integrated to provide a seamless in-vehicle experience. An intelligent cockpit, complemented by a function store for convenient selection of services by the customer, could be a differentiator. In addition, OEMs should think about providing users with a mobility profile that will store their services and make them available when, for example, they buy a new car or rent one from a car club.

SCALE & BRING ENGINEERING AND IT CAPABILITIES TOGETHER TO CREATE HOLISTIC SOLUTIONS

Automotive companies can only get the holistic solutions they need today by drawing on deep engineering capabilities spanning areas such as connectivity and networks, semiconductors, embedded software, software product engineering, and testing and simulation, as well as traditional disciplines such as mechanical engineering.

Combining IT and engineering disciplines and approaches is a feat that some companies find challenging but that others are already achieving. It helps to put an intelligent cockpit (see page 16) at the center and integrate both engineering and IT efforts around that.

Also invaluable is appropriate assistance from a cross-sector partner ecosystem. Prominent in the ecosystem should be partners who already know how to combine IT and engineering disciplines. They should also be able to help the OEM to industrialize the combined approach to pave the way for rapid integration of new services and hence a shorter time to market.

Global automakers particularly need to partner with suppliers that are investing in key markets such as China, and are prepared to invest further on their behalf. For example, suppliers may be prepared to co-invest with clients to establish local centers of excellence. These can extend and showcase the parties' joint R&D capabilities in a given market and help local staff to leverage the latest engineering techniques to achieve connected mobility goals.

CASE STUDIES

A PIONEERING FUNCTION STORE

We helped one OEM to create a function store to bring together in-house and third-party functionality so that customers could access and use services in a standard, seamless way no matter where they were developed.

Together, we built a cockpit digital function store that increases the value of connected (and other digital) services for customers by making them more accessible and usable. This is particularly true of those customers using semi-autonomous vehicles since they tend to consume more services, both to support ADAS functionality and because they have more leisure time in the car.

The ease of accessing new connected car services, even on the road, has resulted in closer ongoing relationships between the OEM and both existing and new customers, together with new revenue streams. The store adds the OEM's branding to third-party services, meaning that the OEM can share the cost of developing services while maintaining its differentiation.



DEVELOPING EMBEDDED SOFTWARE FOR THE NEXT GENERATION OF FULLY DIGITAL INSTRUMENT CLUSTERS

We worked with a tier 1 supplier who needed to implement four instrument cluster variants, all fully digital, to be used by a major OEM in its next wave of high-end vehicles. We jointly adopted a software house approach to this requirement, combining both IT and engineering disciplines. Teams in Portugal, Tunisia, and India collaborated to develop an end-to-end solution complying with key standards ISO 26262 (functional safety) and A-SPICE L3 (best practice for embedded software).

This collaboration was rapidly launched and reduced development costs by more than 35% compared with traditional methods. The OEM was able to offer its customers an innovative intelligent cockpit that proved to be a valuable differentiator for the brand. The project exemplified high and fast scalability with an initial ramp-up of 100 FTE in three months.

INTEGRATING A NEXT-GENERATION INFOTAINMENT SYSTEM INTO EXISTING ARCHITECTURE

An OEM was struggling to manage five engineering service providers who had been retained to upgrade the infotainment system on existing vehicles to the next generation. The intention had been to enable the client to focus internally on new development projects, but this was not happening.

Capgemini took over the full project scope, implementing a “one-stop-shop” set-up with a highly skilled local front office project team managing best-cost countries’ engineering teams in back offices – a total of 250 engineers globally.

The result was more than 20% savings on engineering costs vs the client’s initial internal estimate, with a very competitive and efficient project delivery set-up. The solution freed up internal engineering capacity so that the client was able to focus on new development work.

RECOMMENDATIONS

We've argued here that connected mobility isn't just about connecting a car to the outside world, but is also about forging a deep connection between the OEM and the customer. We've put forward three levers for achieving both of these things. By following this approach, OEMs can steer a safe and rapid course toward realizing the full benefit of connected services.

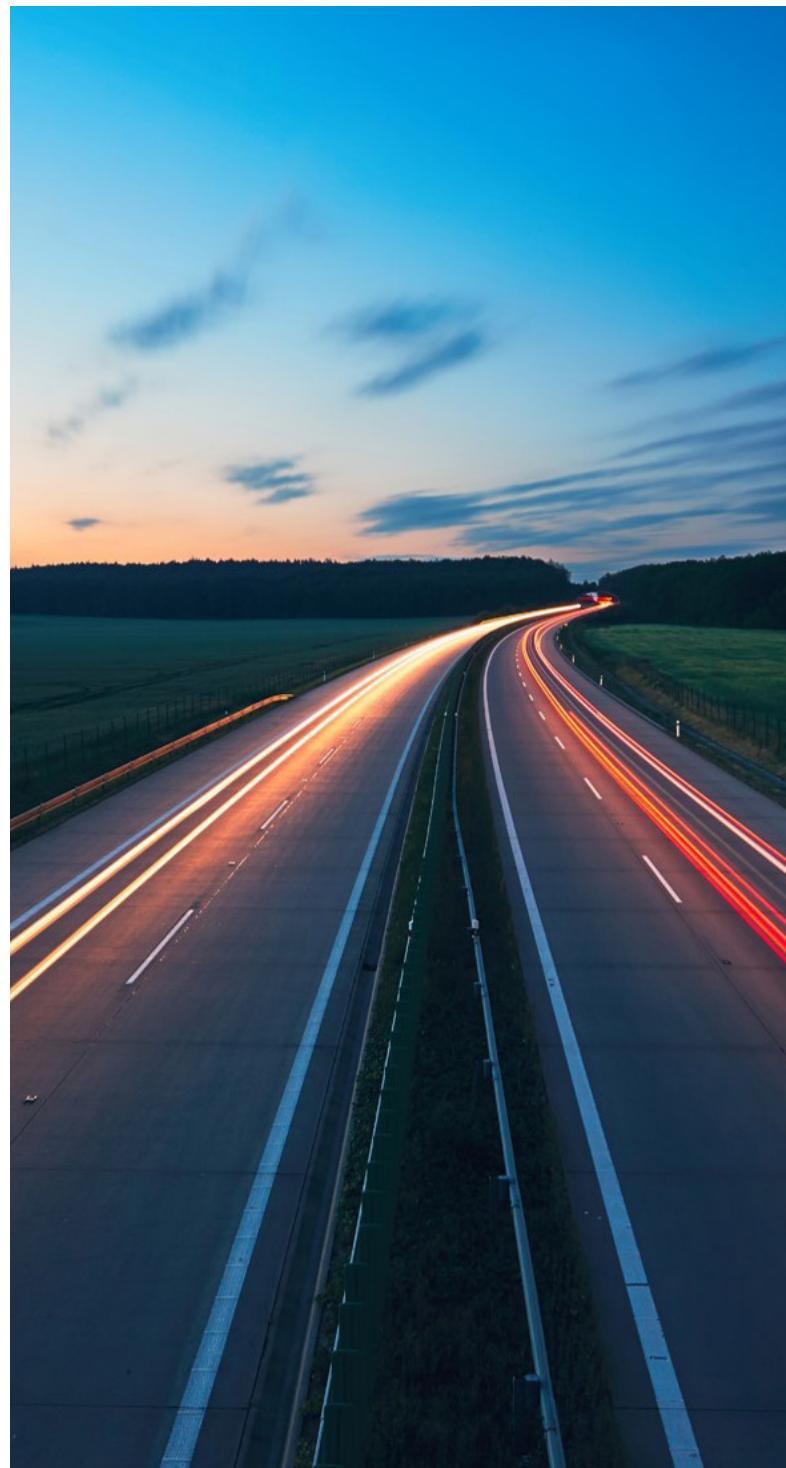
In this final section, we'll recommend two steps that automakers can take now to get started on this journey rapidly and see early benefits.

BRING NEW CONNECTED MOBILITY OPPORTUNITIES INTO FOCUS

Hold intensive workshops to launch (or relaunch) the whole connected services concept and explore all the ways it can benefit the brand. Kick-start the business strategy and innovation process, and show staff how connected mobility can enhance the business; this is best achieved through facilitated discussion. Consider holding design thinking workshops with multidisciplinary teams of experts on automotive and mobility trends, and on the technologies of tomorrow. The exercise will help the company define a winning position, business case, and realization strategy, positioning itself to seize the connected mobility opportunity.

COLLABORATE ON OPERATING MODELS THAT WILL ACHIEVE BUSINESS GOALS

Work with experienced partners to build the operating model, and the governance structure, that is needed – a process that should complement the team and provide it with the building blocks for sustainable innovation, rapid product launches, and reliable delivery of the required ROI.



AUTHOR



Fabienne Lefever

VP, Head of Automotive
Center of Excellence,
Capgemini Engineering

EXPERTS

Alexandre Audoin

EVP, Head of Global Automotive Industry, Capgemini

Pascal Feillard

Head of Business Transformation,
Capgemini Engineering

Philipp Haaf

eMobility Specialist, Capgemini Invent

Jean-Marie Lapeyre

VP and Chief Technology & Innovation Officer, Global
Automotive Industry

João Neiva

Mobility Experience Offer Leader, Capgemini
Engineering

Jayashree Ravichandran

VP and Software Leader - Automotive,
Capgemini Engineering

Michael Welsh

Chief Technology Officer Automotive Software
& Electronics, Capgemini Engineering

Leonardo Weiss Ferreira Chaves

VP, Intelligent Products & Services,
Capgemini Invent

Anuraag Bharadwaj

VP, Head Automotive Industry Platform, Capgemini





About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of over 360,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2022 global revenues of €22 billion.

Get the Future You Want | www.capgemini.com