McKinsey&Company

FROM BUZZ TO BUCKS – AUTOMOTIVE PLAYERS ON THE HIGHWAY TO CAR DATA MONETIZATION

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EXECUTIVE SUMMARY

Several factors are contributing to the growing amount of available car data. An increasing number of sensors – present in vehicles and integrated into mobility infrastructure – means that information can be gathered on nearly every way a car is used by a driver, how that car functions (or malfunctions), and everywhere it goes. Organizations that use this connected technology to optimize their products and services on the basis of data or to develop new, in-vehicle experiences for drivers and passengers will be the ones to create a significant competitive advantage for themselves.

This value pool – comprised of more than 30 car-data-enabled use cases representing new features and services – is projected to reach USD 450 billion to 750 billion worldwide by 2030. Three value creation models underlie these use cases: revenue generation, cost reduction, and enhanced safety and security.

While the potential is clear, players in the car data market – OEMs, suppliers, technology and infrastructure players, service providers, and dealers – have yet to fully capture the value (in revenue, safety, or savings) of this onslaught of data. Our proprietary research involving over 60 industry leaders highlights three challenges that constitute the car data monetization (CDM) gap – the space between car data's value potential and the revenue and savings that mobility players actually generate from it:

Communicating the value proposition. No matter which features car data can make possible, capturing value from them is not feasible if consumers don't see the benefit; 84 percent of executives surveyed reported this as a highly relevant challenge for CDM, and only 50 percent of them believed their organizations were prepared to address it. In addition to understanding how these features might make their lives easier, customers must trust that the data they share will be stored and used responsibly. They must also be convinced that the exchange – whether via advertising or a direct fee – is worthwhile relative to the value of the feature.

Redefining the organization model. 77 percent of executives agreed that managing a diverse set (and vast amount) of data in ways that lead to the development of new connected services will require companies to take a different organizational approach. The difficulty of this challenge is underscored by the fact that 69 percent of executives surveyed felt that their companies would need to switch to a different organizational model in the long term, while still not having a clear view of what the ideal structure could be. Companies in this industry will need to embark on a challenging transformation that moves them away from rigid, isolated operations. Specifically, companies will need to become agile in order to continuously adapt to a quickly evolving market and commit to a higher degree of cross-functional collaboration for the entire organization to benefit from digital.

Establishing partnerships. The development of car-data-enabled features requires skills and resources that no single player has. To span this gap, collaboration will be key. Survey results show that players report a widely varying degree of readiness for establishing partnerships (ranging from 43 to 85 percent – a span of more than 40 percentage points), which does not create an atmosphere conducive to bi- and multilateral collaboration. Nonetheless, players in the CDM market will have to develop partnerships throughout the industry and along the value chain, the shape of which will vary based on whether they aspire to expand their reach in technologies or business models.

While applicable to the industry as a whole, these obstacles take on different parameters based on player type. Consequently, all players may head in the same general direction on the path toward increased CDM, but the exact route they take depends on their position in the value chain. Some player-specific challenges are:

OEMs. Moving from product-forward to market-back development; 58 percent of OEM executives indicated that they did not have a clear understanding of the benefits customers were looking for, underscoring the need to first define a vision for the connected customer experience and only subsequently develop the hardware and back-end solution to fulfill that vision.

Suppliers. Balancing the benefits and the tension of partnerships with OEMs by defining a mutually beneficial value proposition to gain access to vehicle data and build new capabilities, identified by 92 percent of supplier executives as prerequisites for success.

Technology and infrastructure players. Resolving their lack of readiness regarding forming partnerships, as reported by 42 percent of executives, and addressing OEMs' fear of the "tech unknown." This could be achieved by working closely to allay OEMs' concerns that they could be undercut by tech's unfamiliar business models and that their ability to gain direct access to customers through other digital touch points would be compromised.

Service providers. Ensuring brand visibility and relevance in the car, redesigning their services and experiences to best fit the connected car interfaces, and overcoming the challenge of communicating benefits to the consumer, which was designated by 90 percent of service provider respondents as highly relevant.

Dealers. Focusing on communicating connectivity's benefits in an engaging way while opening a direct dialog with OEMs on their future role as a customer contact point in the connected car era.

Players in the car data market should take an objective look at where they stand today with respect to the communication of benefits, organizational considerations, and partnership challenges that lie ahead. After assessing their starting points, it will be important to quantify the value at stake and devote the adequate amount of management capacity and resources to go "from buzz to bucks" on the highway to data monetization.

INTRODUCTION

Over the last few years, car connectivity has evolved from a theoretical concept to reality. As a global value pool, connectivity may reach USD 450 billion to 750 billion worldwide by 2030, but this depends on the ability of market players to use the data generated by cars, drivers, and mobility systems to develop products that create revenue, reduce costs, and enhance safety and security. While the potential is significant, monetizing this car data at scale remains a major challenge.

Many companies in the automotive and adjacent sectors are investing in their ability to extract value from car data; some are launching pilots and others have started to scale up their offers and capabilities. While optimism remains high, however, some critical challenges limit players' ability to capitalize on their growing access to data and profitably take CDM from paper to reality.

To take stock of these complex and diverse developments, McKinsey conducted research to explore attitudes and perspectives related to CDM and specifically looked into the status of players' CDM programs (Exhibit 1). The research involved both end users and industry insiders from across the globe and was comprised of:

- Interviews with experts to discuss CDM operational issues

- Surveys of industry experts representing OEMs, suppliers, service providers, industry analysts, and technology and infrastructure players, to identify key challenges and mitigation plans

- Modeling to quantify the CDM opportunity and validate use cases

- Roundtables with industry leaders to explore connectivity themes

- Clinics with end users to explore use case benefits

- Surveys of customers to assess preferences and concerns.

Exhibit 1 McKinsey engaged a diverse group of stakeholders around the world to develop a perspective on CDM

Industry participation

Interviews
1:1 interviews regarding future trends on connectivity and data monetization and main operative challenges

Expert surveys
Survey of 60+ experts representing OEMs, suppliers, service providers, research and industry analysts, and technology and infrastructure players

Models
Quantitative model to measure opportunity and validate use case scenarios and underlying assumptions

Roundtables
Structured roundtable sessions on key connectivity themes with leading industry players

End customer participation

Clinics
End user observations and interviews to understand practical use of features and services conducted by LUNAR[1]

Consumer surveys
Survey to assess preferences, trends, and concerns with >3,000 respondents across the US, Germany, and China

Detroit

Munich

Silicon Valley

Shanghai

1 Design clinics conducted by LUNAR (part of McKinsey)

SOURCE: McKinsey & Company

In Part I of this publication, which is intended as a follow-up to our seminal report *Monetizing car data – New service opportunities to create new customer benefits* from fall 2016, we draw on the results of our survey to introduce and discuss players' three current key challenges:

- **Benefits,** i.e., effectively communicating the value of car-data-enabled use cases to customers

- **Organization,** i.e., reshaping companies' organizational models to enable effective development and deployment of CDM use cases

- **Partnerships,** i.e., establishing effective partnerships on data and service delivery models.

In Part II, we build on these findings as well as on selected proprietary knowledge initiatives, case studies, and our own experience from client work in automotive and as well as adjacent industries. We then offer insights and outline pragmatic recommendations – specific to each of the player types along the CDM value chain – that companies can use to overcome the challenges their CDM programs are currently facing.

Part III offers focus areas for players as they embark on their CDM journeys and highlights strategic actions to consider in the future.

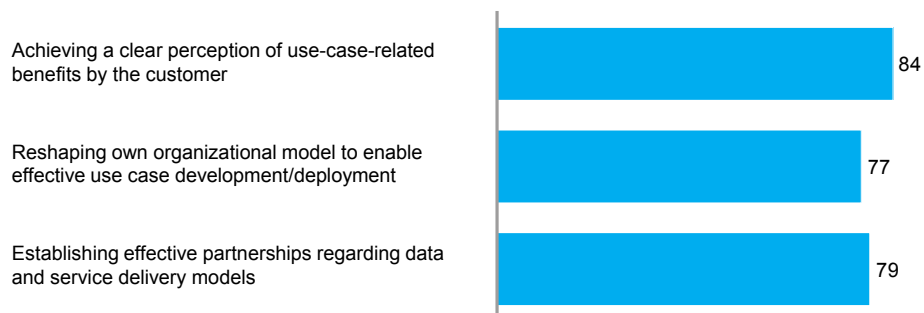# PART I: THE CURRENT KEY CHALLENGES OF CAR DATA MONETIZATION

The connected vehicle will generate massive amounts of data, and there is little doubt that the monetization potential of this data is significant. Industry experts, however, point to a set of obstacles – in both perception and structure – that need to be overcome if this potential is to be realized.

Our interviews and roundtable discussions with industry experts over the past 2 years have involved leaders representing OEMs, suppliers, technology and infrastructure players, service providers, and dealers. The insights gathered from these leadership-level conversations revealed the presence of three key CDM-related challenges (Exhibit 2).

Exhibit 2   **For industry leaders, matters related to communications, organization, and partnership top the list of CDM-related challenges**
Percentage of respondents selecting "Biggest challenge" or "Highly relevant" in each challenge, N = 61

How relevant is this challenge for your organization to succeed in data monetization?

Challenge	Value
Achieving a clear perception of use-case-related benefits by the customer	84
Reshaping own organizational model to enable effective use case development/deployment	77
Establishing effective partnerships regarding data and service delivery models	79

SOURCE: McKinsey Car Data Monetization Survey 2017

CHALLENGE NUMBER 1: COMMUNICATING THE VALUE PROPOSITION

Monetizing car data can only be a profitable venture if consumers are convinced of the benefit of its various use cases. The vast majority of the industry leaders we suveyed indicated that communicating the value of CDM use cases is important, i.e., 84 percent of respondents overall called it their "biggest challenge" or "highly relevant." There was some variation, however, in different player types, regions, and the management level of survey respondents as shown in Exhibit 3.

Exhibit 3   **The vast majority of players along the value chain consider communicating the value proposition a significant challenge**

Percentage of respondents split based on player type, N = 61

■ Biggest challenge   ■ Highly relevant   ■ Prepared   ■ Unprepared

	OEMs	Suppliers	Service providers	Research and industry analysts[2]	Tech and infrastructure players
Respondents selecting "Biggest challenge" or "Highly relevant" in each challenge	84 (26 / 58)	69 (23 / 46)	90 (90)	100 (100)	83 (8 / 75)
Respondents by level of preparedness[1]	53 / 47	54 / 46	60 / 40	71 / 29	17 / 83

1 Respondents selecting "Fully prepared" or "Somewhat prepared" in the survey   2 Perception of industry players they analyze
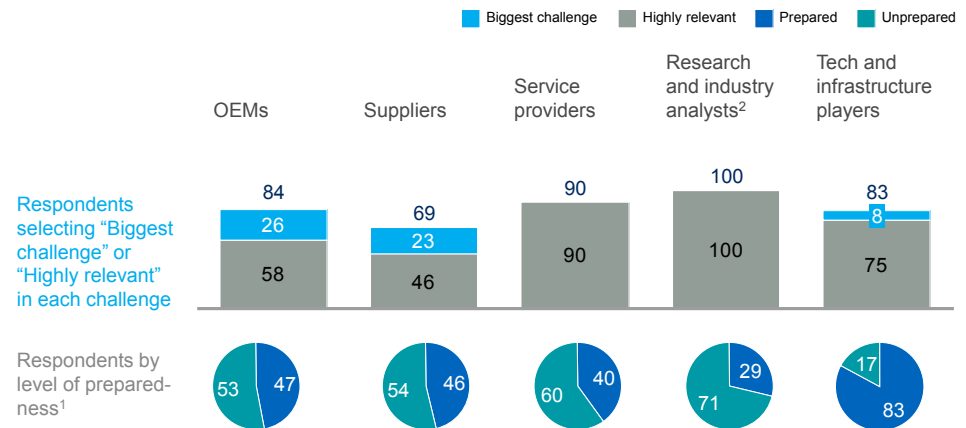
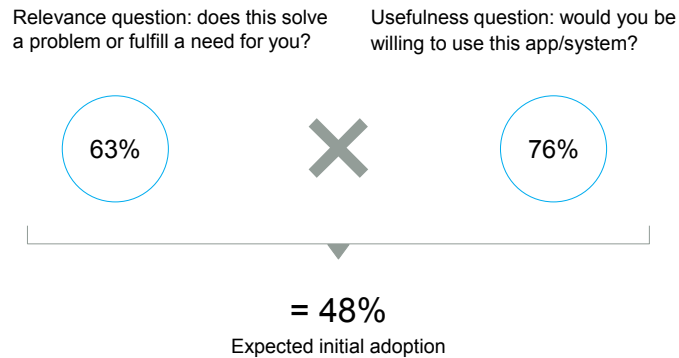SOURCE: McKinsey Car Data Monetization Survey 2017

- **Suppliers** ascribe less importance to the value proposition issue (just over two-thirds of respondents) than other player categories

- **Asia-Pacific players** were most likely to describe the value proposition issue as particularly challenging (91 percent of respondents from this region)

- **Middle managers** saw this challenge as more relevant than top management (95 versus 76 percent).

Overall, industry leaders do not see their organizations as particularly prepared to tackle this communication challenge. Less than half of the 61 respondents in the survey – in almost all player types – see their businesses as prepared to address the challenge of communicating the value proposition. The exceptions to this low level of self-reported readiness are technology and infrastructure players – of whom 83 percent reported being prepared – and the nearly two-thirds of middle management who declared their readiness for the challenge.

So, what is behind the challenge of delivering a compelling message on the benefits of car-data-enabled use cases? First, our earlier round of research shows that less than half of consumers have clarity on the nature, relevance, and utility of many connected car use cases (Exhibit 4).

Exhibit 4   Our consumer survey confirms the concern of industry leaders that a
perceived lack of value is a challenge to CDM
Percentage of respondents selecting "Probably" or "Definitely" for both of the questions
N = 3,186

Relevance question: does this solve
a problem or fulfill a need for you?

Usefulness question: would you be
willing to use this app/system?

63%   ✕   76%

= 48%
Expected initial adoption

SOURCE: McKinsey Car Data Monetization Survey 2016

Customers' willingness to pay will not be essential to the success of all use cases, as
many use cases lend themselves to other forms of monetization. However, when payment
from customers is the most feasible model – whether the cost is paid through a service
subscription, rolled into the price of the car, or structured in some other way – it is essential
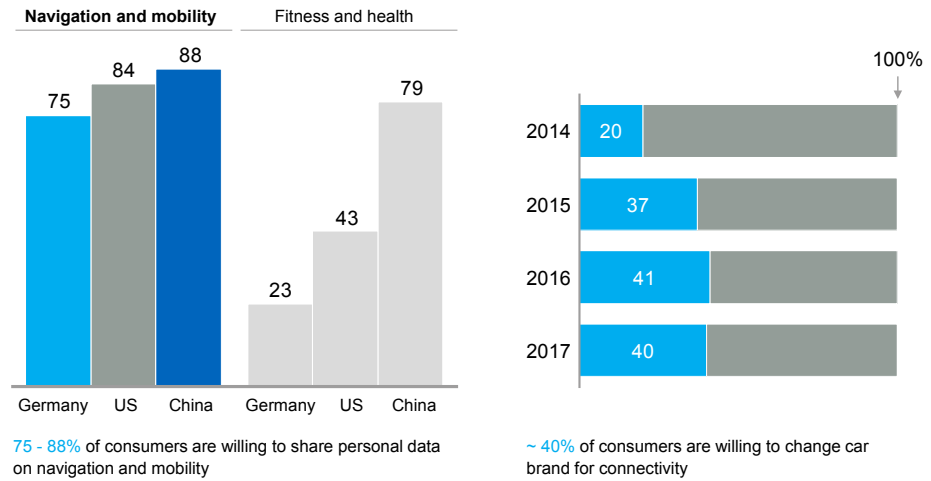that customers clearly understand the use case and see its value and relevance to them.

"
"The hardest person to sell to is the driver of a car."
*– Head of business development at a major automotive
service provider*

Regardless of how a car data feature is monetized, delivering a clear and compelling
message to customers regarding its benefit and value will be central to its widespread
adoption because all use cases require sharing information. The good news for players
in the car data market is that consumers are increasingly prepared to share data to gain
access to navigation and mobility-related features. In fact, these are the kinds of features
for which customers are most willing to share data; more so than for non-car data features,
such as those related to fitness and health (Exhibit 5). Customers say that when the contract
is fair and simple, they are willing to share a certain level of information for a commensurate
benefit; the more personal the information that is required, the greater the value the feature
must have.

With a compelling message, companies may be able to parlay customers' interest in
navigation features into excitement for new, adjacent car-data-enabled features.

Exhibit 5 **Consumers are much more willing to share data related to CDM use cases than they are for privacy-related personal data – especially in Germany and the US**

Navigation and mobility   Fitness and health

75 - 88% of consumers are willing to share personal data on navigation and mobility

~ 40% of consumers are willing to change car brand for connectivity

SOURCE: McKinsey; Connected and autonomous driving customer survey 2014 - 17

" "Customers are willing to share data as long as a fair value proposition is offered."
– Marketing executive of a major OEM

Exploring the challenge of communicating car data's value, industry leaders point directly to an issue of structure, comprehensiveness, and consistency. Specifically, 71 percent of the respondents in our research said that the lack of a structured value proposition spanning all customer touch points was a significant issue related to communicating car-data-related benefits to end customers (Exhibit 6). Furthermore, this issue was deemed significant for various player types and regions (Exhibit 7).

Exhibit 6   Industry leaders point to the lack of a structured value proposition as the key driver of low consumer interest in connected services

Percentage of respondents selecting "Very significant" or "Significant" for an issue, N = 61

Biggest issues players face in communicating car-data-related benefits to end customers

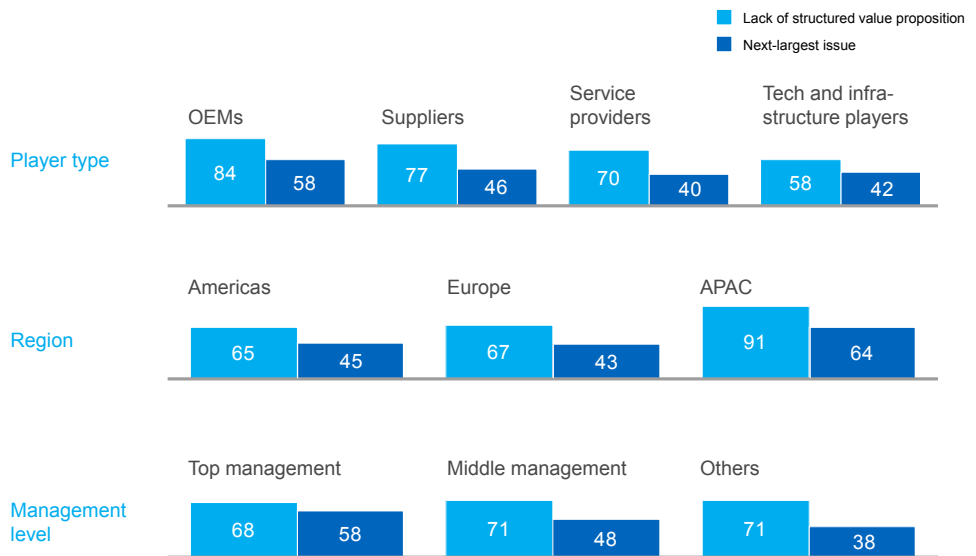| Issue	Value
Lack of a structured value proposition	71
Limited understanding of customer benefits within the organization	48
Lack of "demos" to provide consumers with a tangible experience of the benefits	33
Excessive complexity of the offer	31
Cybersecurity risks	28
Limited familiarity of the front line with the connected services offer	21
Lack of incentives for the front line to promote connected services	21
Limited geographic coverage of the offer	13
Others	7

SOURCE: McKinsey Car Data Monetization Survey 2017

Exhibit 7   This perception exists in various player types, regions, and management levels

Percentage of respondents selecting "Very significant" or "Significant" for a challenge, N = 61

■ Lack of structured value proposition
■ Next-largest issue

Player type

	OEMs	Suppliers	Service providers	Tech and infra-structure players
Lack of structured value proposition	84	77	70	58
Next-largest issue	58	46	40	42

Region

	Americas	Europe	APAC
Lack of structured value proposition	65	67	91
Next-largest issue	45	43	64

Management level

	Top management	Middle management	Others
Lack of structured value proposition	68	71	71
Next-largest issue	58	48	38

SOURCE: McKinsey Car Data Monetization Survey 2017

During our CDM roundtables, industry leaders consistently mentioned that many of their organizations have yet to fully quantify the value of connected services from the consumer perspective or develop personalized value propositions that attract various consumer segments. Most frequently, OEMs apply a one-size-fits-all method in developing and offering connected services to different customers. Compounding this is the complexity of the customer journey, i.e., multiple touch points, that can lead to missed opportunities for communicating value consistently and at every customer interface.

Industry players also understand that advocating for the relevance of use cases is still only half the battle, as interested consumers then need to be convinced that car-data-related features are not only worth having, but also worth paying for. When the time is right, players might explore a wide range of pricing models that vary in transparency (rolled into vehicle or service price versus separate), usage type (subscription versus onetime fee), and number of features (à la carte versus bundles) as tools to accelerate customer adoption.

> "Rule #1 is to not use the data against the customer."
> – Marketing executive of a major OEM

Central to the success of CDM is consumers' willingness to share their information. The good news is that, according to our survey, of the consumers who will likely use connected services, more than 90 percent are willing to share their information.

Another bright spot in the overall lack of readiness is a sense among industry leaders of what would help. They point to six success factors that would position them to better communicate the value of data-enabled use cases:

- An organization-wide vision for connected services founded on clear "end-game" design and deep understanding of customer needs

- Dedicated teams and processes to capture customer insights

- A fact-based customer segmentation built around connected services behaviors and preferences

- Segment-specific value propositions, communications, and pricing

- A clear map of data assets and a structured assessment of their value

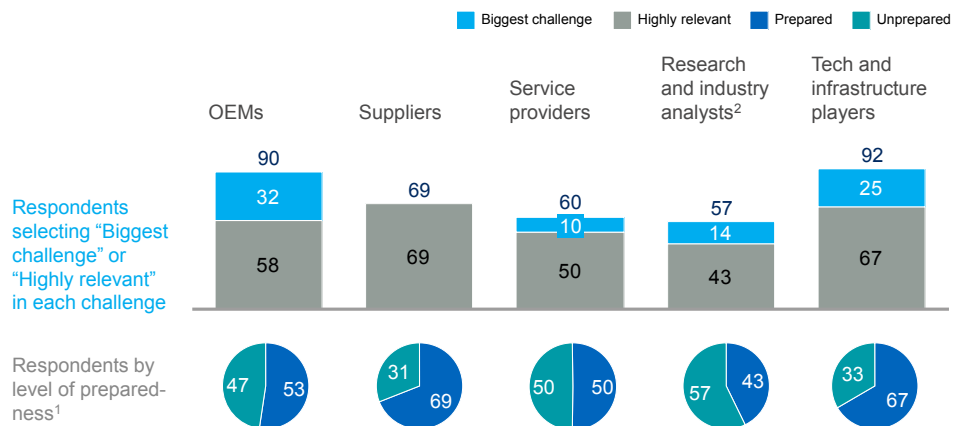- A performance management system defining clear metrics for CDM.

While few players feel equipped to deliver on these success factors, understanding their necessity is an important first step to getting there.

CHALLENGE NUMBER 2: REDEFINING THE ORGANIZATIONAL MODEL

The second challenge identified as a priority by industry leaders is developing the organizational capability to effectively manage the data collected and, in turn, create and efficiently deploy profitable use cases. The ability to gather vast amounts of data through connectivity is one thing, but we learned that industry leaders understand that moving to a new business model and redefining the organization to handle that model is something else entirely. More than half of the executives surveyed describe this lack of organizational capacity as either their biggest CDM challenge or a highly relevant issue (Exhibit 8).

Exhibit 8   All player types consider reshaping the organization to be a significant challenge

Percentage of respondents split based on player type, N = 61

Legend: Biggest challenge · Highly relevant · Prepared · Unprepared

Respondents selecting "Biggest challenge" or "Highly relevant" in each challenge

	OEMs	Suppliers	Service providers	Research and industry analysts[2]	Tech and infrastructure players
Total	90	69	60	57	92
Biggest challenge	32		10	14	25
Highly relevant	58	69	50	43	67

Respondents by level of preparedness[1]

	OEMs	Suppliers	Service providers	Research and industry analysts	Tech and infrastructure players
Unprepared	47	31	50	57	33
Prepared	53	69	50	43	67

1 Respondents selecting "Fully prepared" or "Somewhat prepared" in the survey   2 Perception of industry players they analyze
SOURCE: McKinsey Car Data Monetization Survey 2017

As with the challenge of communicating the value proposition of connected features, the perceived magnitude of the organizational challenge varies in a couple of key categories – region and management level of respondents:

- **European and American players** reported being less prepared to tackle the challenge of data management than their Asia-Pacific counterparts.

- **Mid-level managers** in automotive and related companies see themselves as more prepared to address the data management issue than top management (71 versus 47 percent).
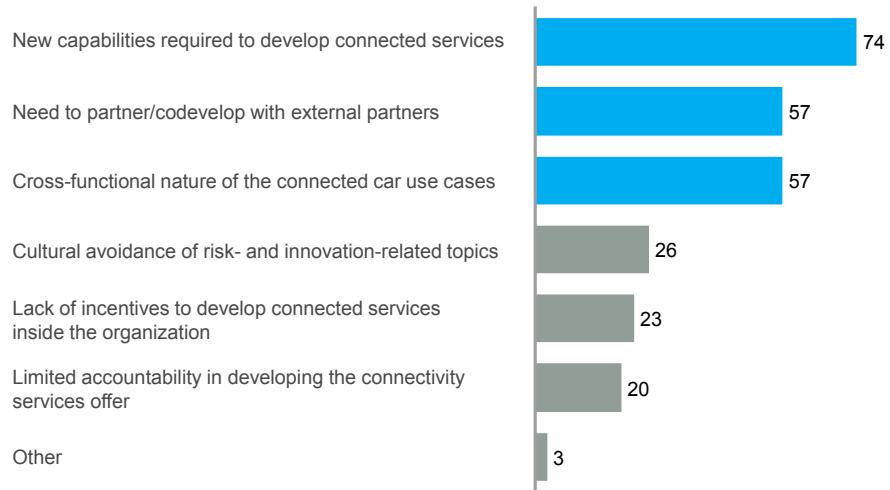
Irrespective of the variation in feeling prepared, there is widespread agreement that an organization must be equipped to manage data to achieve profitable monetization. From the industry leaders we surveyed, it is clear that three factors are central to this organizational model challenge: capabilities, cross-functional collaboration, and external partnering (Exhibit 9).

Exhibit 9 Executives in the CDM market point to the need for new capabilities, cross-functional collaboration, and external partnerships as their biggest organization-related CDM challenges

Percentage of respondents selecting "Very significant" or "Significant" for a challenge, N = 61

Biggest source of organizational model stress created by the CDM opportunity

New capabilities required to develop connected services	74
Need to partner/codevelop with external partners	57
Cross-functional nature of the connected car use cases	57
Cultural avoidance of risk- and innovation-related topics	26
Lack of incentives to develop connected services inside the organization	23
Limited accountability in developing the connectivity services offer	20
Other	3

SOURCE: McKinsey Car Data Monetization Survey 2017

Looking internally, executives in OEMs, technology players, and even insurers pointed to the importance of building new capabilities in order to create and deploy connected services. Developing these capabilities, which include digital, services development, and advanced analytics (among others), is seen as the biggest organization-related challenge on the road to CDM. The industry leaders in our research also noted the need for cross-functional collaboration to effectively manage data and develop connected services. This increased level of intergroup cooperation is seen as part of setting up the organization to handle new business models related to car data use cases. The idea that fundamental changes in their structures and ways of working are required also applies externally to leaders in the growing CDM market, highlighting the importance of external partnerships as well.
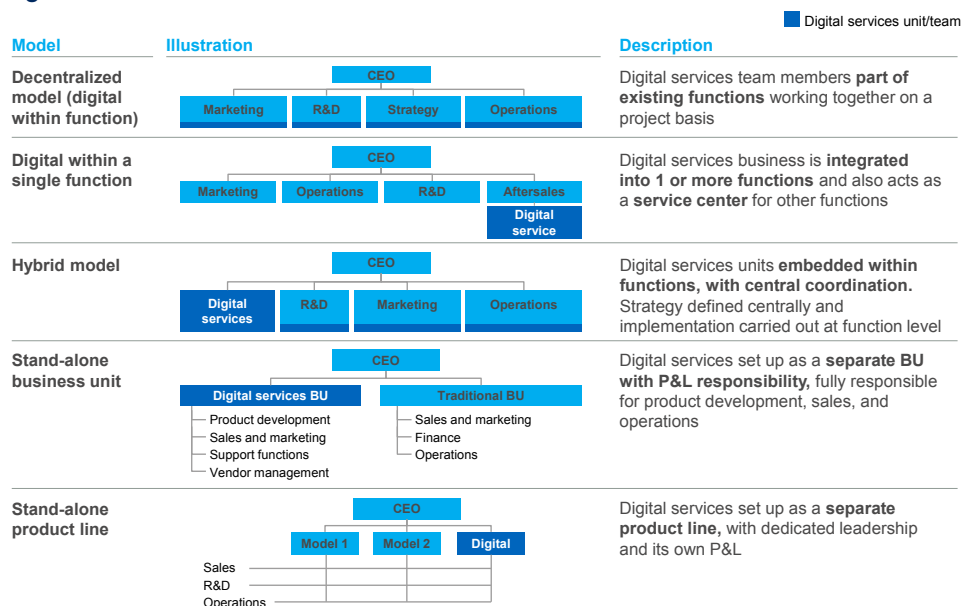
> "IT functions may have visibility on data availability and quality, but strategic business functions don't understand how to use this data so a cross-functional solution is needed."
> – *Senior executive at a major OEM*

Industry players are exploring a variety of organizational structures to facilitate the type of next-level collaboration and agility – internally and externally – they see as key to effective data management and, thus, developing and deploying profitable data-enabled use cases (Exhibit 10).

Exhibit 10   Industry players are using different organizational archetypes to deploy digital and connected services businesses

Model	Illustration	Description
		■ Digital services unit/team
Decentralized model (digital within function)	CEO — Marketing, R&D, Strategy, Operations	Digital services team members **part of existing functions** working together on a project basis
Digital within a single function	CEO — Marketing, Operations, R&D, Aftersales / Digital service	Digital services business is **integrated into 1 or more functions** and also acts as a **service center** for other functions
Hybrid model	CEO — Digital services, R&D, Marketing, Operations	Digital services units **embedded within functions, with central coordination.** Strategy defined centrally and implementation carried out at function level
Stand-alone business unit	CEO — Digital services BU (Product development, Sales and marketing, Support functions, Vendor management) / Traditional BU (Sales and marketing, Finance, Operations)	Digital services set up as a **separate BU with P&L responsibility,** fully responsible for product development, sales, and operations
Stand-alone product line	CEO — Model 1, Model 2, Digital (Sales, R&D, Operations)	Digital services set up as a **separate product line,** with dedicated leadership and its own P&L

SOURCE: McKinsey & Company

In our research, 69 percent of executives surveyed felt that their companies would need to evolve from their current short-term organizational solution to a different model in the long term. However, despite this view regarding the need for change, executives failed to form a consensus view of both the ideal short-term and long-term structure, underscoring the difficulty of the challenge.

Given this complexity and the need for players to customize the organizational solution to their specific context, companies will have to consider the unique set of trade-offs within each organizational archetype as they decide which would work best for them (see Text box 1: Structurally enabling CDM – five archetypes that prioritize digital).

Text box 1   **Structurally enabling CDM – five organizational archetypes to pursue data monetization**

The five models below describe the role of digital services, which is fundamental to an organization's ability to make profitable use of car data in unique ways. Each archetype represents a unique set of trade-offs.

Decentralized. The most integrated approach embeds digital services within and through-out multiple existing functions.

Pros: this model gives each function direct and dedicated access to the digital services it needs to address its own digitization requirements. This model grants digital services significant auto-nomy regarding resources for each function when it comes to capability building.

Cons: in this model, the risk of fragmentation in the organization is relatively high. It also limits the scale of funding and increases risk by making the organization dependent on a single vendor.

Single function. An organization may choose the function that would benefit the most from digital services and house the team within that function. This team's P&L responsibility would be with the function in which it is housed, but it could also be a resource (i.e., service center) for other functions.

Pros: a single line of reporting and accountability and ownership within just one BU simplifies this model and could help the digital business gain momentum.

Cons: this model could also limit cooperation with other functions and open the door to disputes on resource prioritization.

Hybrid. Creating a centrally coordinated function for digital services but embedding its resources within other relevant functions blends the two models described above. In this model, there is no P&L responsibility and the function's strategy is defined centrally.

Pros: this model affords a certain level of flexibility regarding resource allocation and helps ensure CEO-level agreement with the business strategy.

Cons: the hybrid model could increase the level of cumbersome bureaucracy in governance and lead to ambiguity when it comes to accountability. By its very nature, this model can also generate tension between two very different models, i.e., function-level independence versus central steering.

Stand-alone BU. Digital services might also be structured as a separate organizational unit with its own leadership and a mandate to either develop or source digital solutions. As a distinct business unit, digital services would have P&L, product development, sales, and operations responsibilities.

Pros: the relative independence within this model would free digital from bureaucracy, allowing rapid funding approval and quick momentum building that is typically associated with increased agility.

Cons: the distance of the BU from the core business could make it susceptible to outsized influence from headquarters and lead to problems associated with insufficient contact with the front line.

Stand-alone product line. Setting up digital services as a separate product line with individual P&L responsibility.

Pros: this model has the benefit of structurally aligning the digital strategy with the overall business strategy, which could drive momentum.

Cons: driving the digital agenda from a functional level can be difficult, and building digital capabilities in various functions can be challenging.

Several key actions can help companies prioritize digital and aid them in deciding on the organizational model that works best for them, such as:

■ Launching a CEO-level initiative to create a CDM model

■ Examining the data monetization model of direct partners and suppliers to identify value creation opportunities

■ Benchmarking the organizational models of high-tech players as well as those of direct competitors

■ Hiring managers with experience in agile, customer-oriented, and data-centric environments

■ Soliciting feedback from customers, suppliers, and partners on data-related services and business models

■ Developing multiple potential archetypes that build digital into the organization, as no single structure is agreed upon by all players.

There is no consensus among players in the CDM market on which organizational archetype is best, but a key difference in priorities between top and middle management might influence the organizational evolution. However, what is right for one player type may not be right for another as OEMs or directly competing suppliers and service providers prefer different organizational models; even separate levels in the same organization (e.g., senior executives versus operative managers) may disagree on the ideal archetype. Specifically, our conversations with businesses in the car data market show that top management tends to see the digital team as part of the corporate strategy team, whereas middle management views that as the least best fit and considers the team as either part of existing functions or as a separate unit altogether.

Regardless of the differences in beliefs on the optimal structure, organizational change is perceived as an enabler to unlock growth from CDM, as new business models must be developed in the next 3 to 5 years if industry players hope to be competitive in the area of car data. While the need for change is guaranteed, the type of change may evolve over time. Companies should be agile enough to adapt to shifts in the car data market.

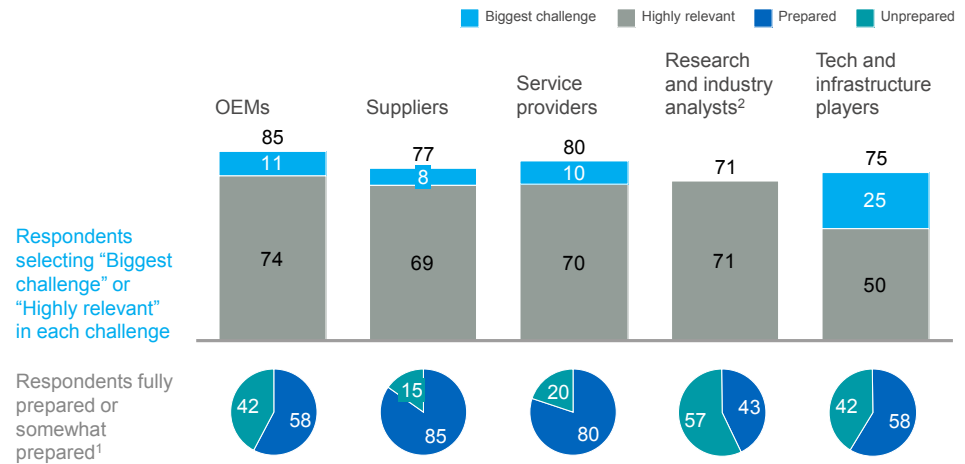“ "We keep spinning on CDM because it's tackled by 3 different departments with conflicting interests."
– *Senior executive at major OEM*

CHALLENGE NUMBER 3: ESTABLISHING PARTNERSHIPS
Given the challenges related to developing car-data-enabled products and services and the business models necessary to support them, it is clear to industry executives who were part of our research that success will require players across the board to join forces (Exhibit 11).

Exhibit 11   For many player types, executives see the formation of effective partnerships as relevant to CDM success

Percentage of respondents split based on player type, N = 61

Legend: Biggest challenge · Highly relevant · Prepared · Unprepared

Research and industry analysts[2]

Tech and infrastructure players

	OEMs	Suppliers	Service providers	Research and industry analysts[2]	Tech and infrastructure players
Respondents selecting "Biggest challenge" or "Highly relevant" in each challenge	85 (11 / 74)	77 (8 / 69)	80 (10 / 70)	71 (71)	75 (25 / 50)
Respondents fully prepared or somewhat prepared[1]	42 / 58	15 / 85	20 / 80	57 / 43	42 / 58

1 Respondents selecting "Fully prepared" or "Somewhat prepared" in the survey   2 Perception of industry players they analyze
SOURCE: McKinsey Car Data Monetization Survey 2017

Interestingly, players report a widely varying degree of readiness for establishing partner-ships (43 to 85 percent, a span of more than 40 percentage points), implying that an atmo-sphere that would be highly conducive for bi- and multilateral collaboration does not yet fully exist.

> "No single player can succeed on a stand-alone basis in establishing the digital ecosystem around the car, and multiple stakeholders need to work together."
> – *Senior executive at a premium OEM*

Two building blocks of developing and delivering car-data-related features are behind this requirement for partnership: huge investments and new capabilities.
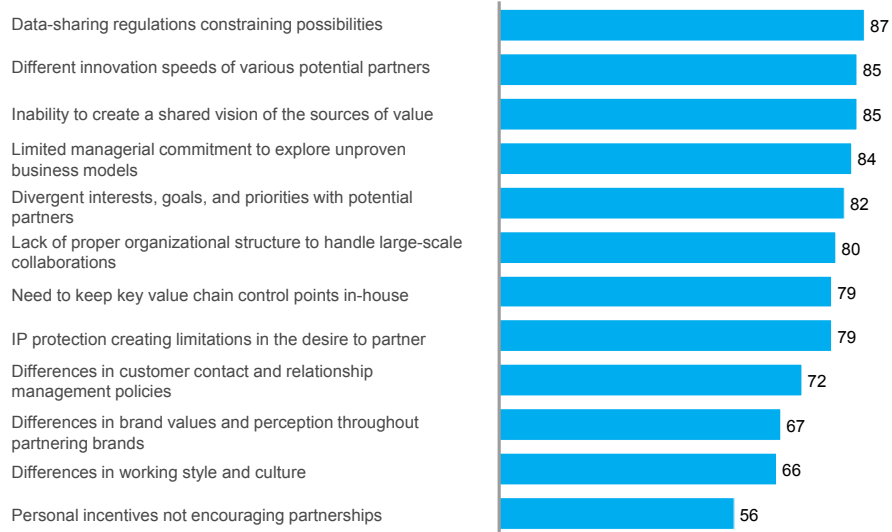
The scale of investment already taking place in connected services is tremendous; McKinsey's Start-up Investment Landscape Analytics (SILA) tool estimates that since 2010, approximately USD 28 billion has been invested in connected services technologies. In addition, monetizing the data gathered via connected services requires a set of capabilities that no single player possesses today. According to about four-fifths of the participants in our executive roundtable, making these necessary investments and building the appropriate skills can only happen in the context of partnerships. The biggest variation in the perceived importance of partnerships among industry players exists along regional lines. Over 90 percent of Asia-Pacific players see this issue as either their "biggest challenge" or "highly relevant" while only about two-thirds of companies in the Americas agree. Incidentally, it is also those companies in Asia-Pacific who see themselves as being most prepared to tackle the challenge.

Our research shows that several obstacles make successful collaboration a challenging proposition. The executives we spoke to pointed to several partnership challenges that span intraorganizational, interorganizational, and networkwide realities (Exhibit 12).

Exhibit 12   **There are multiple relevant obstacles when trying to establish partnerships**

Percentage of respondents selecting "Very significant" or "Significant" for a challenge, N = 61

Obstacles to establishing partnerships

Obstacle	Value
Data-sharing regulations constraining possibilities	87
Different innovation speeds of various potential partners	85
Inability to create a shared vision of the sources of value	85
Limited managerial commitment to explore unproven business models	84
Divergent interests, goals, and priorities with potential partners	82
Lack of proper organizational structure to handle large-scale collaborations	80
Need to keep key value chain control points in-house	79
IP protection creating limitations in the desire to partner	79
Differences in customer contact and relationship management policies	72
Differences in brand values and perception throughout partnering brands	67
Differences in working style and culture	66
Personal incentives not encouraging partnerships	56

SOURCE: McKinsey Car Data Monetization Survey 2017

Among the biggest challenges are:

Data-related regulation. Of all the issues linked to establishing partnerships, most respondents described data-related regulations as relevant. Specifically, as the landscape continues to change, questions on data concerning management rights, how it is collected and stored, and how it might be used add complexity to the possibilities for partnership.

Speed of innovation. The second-most relevant challenge is the difference in the pace of innovation between players. The concern here is that a partnership might be especially challenging if one player is slower than the other when it comes to decision making, execution, or technology development or is lacking in the area of digital knowledge.
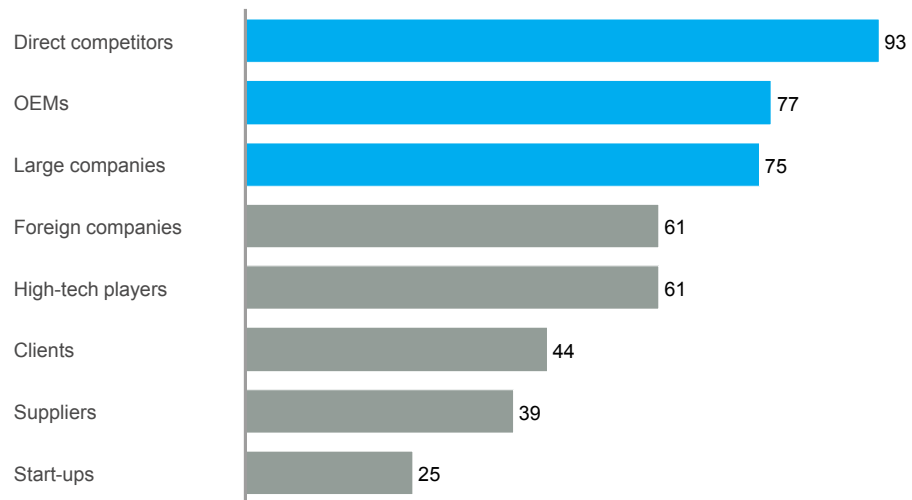
Values alignment. What is highly valuable about certain data on control points for one player type may be trivial to another. For one player, data insights may lead to the development of a use case that another player sees little use for. Industry leaders also see these differences in where the value lies as a barrier to partnership.

A core aspect of establishing any partnership is to set up the right operating model for collaboration and have mechanisms to manage the relationship between the partners. Our research shows that there are several player types which are perceived by industry executives to be challenging partners (Exhibit 13).

Exhibit 13   Direct competitors, OEMs, and large companies are perceived as the most difficult players to form partnerships with

Percentage of respondents selecting "Most difficult" or "Difficult" in the level of difficulty, N = 61

Perception of level of difficulty to form partnerships with different player types

Player type	Percentage
Direct competitors	93
OEMs	77
Large companies	75
Foreign companies	61
High-tech players	61
Clients	44
Suppliers	39
Start-ups	25

SOURCE: McKinsey Car Data Monetization Survey 2017

The most difficult players to partner with are understandably direct competitors, since incentives rarely align and a win-win proposition is difficult to forge. However, OEMs and large companies were also perceived by industry executives as quite challenging to partner with. The primary driver of this perception is the pace at which these companies tend to operate. Many executives shared frustration regarding the inability of OEMs and large companies to operate in an agile fashion, make decisions quickly, and explore new possibilities without imposing artificial constraints.

> "When we started working with a [major global mainstream] OEM, we could not navigate their organization and what we used to develop in 7 days suddenly took 7 weeks … our language and way of approaching them was not helping either!"
> *– Head of customer relations, US high-tech player*

Depending on their starting points and their strategic aspirations regarding the CDM opportunity, different players will benefit from partnerships in different ways. Our research has identified that there are two key determinants for the type of partnerships players in this market will pursue.

The first determinant focuses on the **aspiration of the partnership** as it relates to expanding reach in technologies or business models. Companies looking to increase their reach in technologies will want to make data and/or hardware and software the focus of their partnerships. In this case, a partnership could lead to the development of data infrastructure or platforms (or even technologies) that create new sources of value. A partnership could also help companies capture more of the existing technology value by improving current technologies or accelerating their implementation. For other companies, an expansion in business models will drive the shape of their partnerships with other industry players. In this case, business building will be the partnership strategy that yields the appropriate benefits. They can create new value together by developing brand new consumer offers or capture more value from existing offers by jointly working to expand and optimize consumer and channel access. Of course, partnerships also have the potential to help players expand both their technological and business model reach.

The second determinant focuses on the **value lens of the partnership** as it relates to creating and capturing new or existing value. Companies looking to create value will build partnerships that develop new technologies, business models, infrastructures, and investments that will spur innovation. These players will focus on using the power of partnership to go beyond what currently exists – and, indeed, beyond the individual partners. Alternatively, companies that want to capture value from existing sources will use the skills and resources of each partner for efficiency improvements as they relate to existing value, leading to mutual success. These partnerships would likely focus on increasing effectiveness, expanding access to consumers, and taking advantage of other cooperative effects of the partnership to improve economic returns.

In these two determinants of partnerships, our research into potential partnership archetypes shows that they can take one of several forms – 13 to be exact (Exhibit 14).

Exhibit 14   There are 13 partnership archetypes that players can use to create and capture value in different technology and business models

Types of partnerships most likely to unlock outsized growth

		Create new value		Capture (more) existing value
"What opportunities do I have to expand my reach in technologies?"	**Technology focus**	Co-creating new data infrastructures and platforms	Harnessing better access and processing of existing data sources	
	Hardware and software	Co-creating specific technologies (from scratch)		Accelerating and driving effectiveness and efficiency of existing technologies
	Can be both preconditions	Setting (new) industry standards	Building commitment for shared industry goals	Transfer knowledge and bridge competency gaps
	Exploration/ experimentation	Greenfield, high-risk, high-reward investments	Institutionalizing future winners and won bets	
"What opportunities do I have to expand my reach in business models?"	**Business model focus**	Co-creation of new business models and consumer offers	Offering synergetic products	Consumer and channel access
	Business building	Infrastructure investments for expansion of business		

SOURCE: McKinsey & Company

Of these, four of the partnership types create new technologies, platforms, and business models and set industrywide standards by which all players can operate. Given the potential for growth in economic value associated with CDM, these four partnership types are most likely to be used by players in partnerships to unlock outsized growth.

When they are ready, companies can follow six practical steps to form partnerships to monetize car data:

1. Needs identification: assess current capabilities vs. CDM targets and identify gaps to be filled within 6, 18, and 36 months

2. Regulations: develop a perspective on the implications of current and future regulations, which will require participation of company CDM executives in key regulatory roundtables

3. Partner selection: define structured criteria for partnership evaluation upfront, including management commitment and a record of previous successes

4. Agreement: outline modus operandi and working details of the relationship, such as defining mutual responsibilities, aligning team profiles and incentives, and establishing issue escalation processes

5. Management: monitor partnership performance and outcomes through joint meetings with clear KPIs to be monitored and qualitative, independent feedback collection from working teams

6. Portfolio review: evaluate status and performance of existing and potential partnerships on a quarterly basis.

In addition, in order to sustain value from the partnerships, companies should also ensure that an internal communications plan is in place that outlines management's commitment to and functional leads' involvement in the partnerships. Companies should additionally conduct training to support line resources in their partnership activities.

PART II: CAPTURING THE VALUE OF CAR DATA – PLAYER-SPECIFIC PERSPECTIVES

In addition to the research we conducted to gauge consumer sentiment and company readiness regarding car-data-enabled business models, we also built models to quantify the value and validate various use case scenarios. The overall value pool from CDM at a global scale has the potential to reach USD 450 billion to 750 billion by 2030. Beyond generating revenue, car data holds the value creating potential of improving internal processes and, thus, delivering significant cost savings. The earnings savings mix that comes from car data will vary by player type with some player categories benefitting more from car data's revenue potential and others from the savings that come from process optimization.

In this section we propose a set of actions that companies can take to capture that value. We break down these actions by player type – OEMs, suppliers, technology and infrastructure players, service providers, and dealers – to offer value-chain-specific recommendations to help companies deliver that value to their customers.

1. OEMS

Due to their integrative role in the automotive value chain, OEMs are positioned well to benefit from a variety of CDM use cases. As we quantified the economic potential of CDM for OEMs, some of the highest value use cases include enabling usage-based insurance, providing (predictive) maintenance recommendations to drivers, creating a platform to advertise and deliver on both mobility-related content and services (e.g., multimedia content for infotainment) as well as nondriving-related goods and services (e.g., allowing for online shopping through voice commands). In each of these use cases, the OEM's role is crucial for three control points:

- Enabling access to the human machine interface

- Enabling access to the data itself through the data gateway

- Allowing the identification of and direct outreach to customers onboard.

Regarding the CDM challenges described in Part I, OEM executives report being less prepared than suppliers, tech players, and other key counterparts as selected realities are seen as a barrier to CDM.

Communicating the value position is made difficult for OEMs due to a limited understanding of customer benefits within the organization. OEM executives attending our roundtables recognized how different parts of the organization might have conflicting interests to cater to (e.g., customer experience pushing for new features, engineering focusing primarily on quality and complexity reduction, controlling functions aiming to reduce costs). Even more interestingly, OEMs recognize that they do not have a clear vision of the connected customer experience to act as a beacon for their technical and business model development. Additionally, communicating the value of connected services to customers entails profound changes in human machine interface design, dealer processes, and customer care practices, significantly raising the bar for large, complex organizations.

"We are currently defining the hardware first, then asking ourselves how can we bring it all together to best serve customers … we should be doing it the other way around, starting from the problems customers want us to fix or the features they are willing to pay for!"
– Head of strategy, mainstream global OEM

To address these issues, OEMs might consider three actions:

- Define a clear vision of the connected customer experience and share it internally (i.e., within the organization) and externally (i.e., with relevant partners and parties) (see Text box 2: Deep dive – OEMs: changing the playbook to create and capture value)

- Articulate the dealer's role in engaging the customer in the connected car era, starting with the design of a customer engagement model to present connected services

- Revisit and revamp marketing and educational tools (e.g., website, sales pitch, etc.) at every customer touch point.

Redefining the organization model in ways that lead to the development of profitable data-enabled business models and use cases requires a level of cross-functional collaboration that OEMs see as particularly challenging. Additionally, OEMs understand that they need to develop capabilities in new areas. To address these challenges related to data and development, senior executives identified two actions as key priorities:

- Choosing and quickly deploying an organizational model that facilitates cross-functional collaboration and implementing mechanisms that ensure it

- Assessing the current level of capabilities and aggressively pursuing a hiring plan that addresses the gaps.

Establishing partnerships is perceived as particularly challenging by OEMs for two main reasons. OEMs own large, complex, and isolated organizations that struggle to present a single face to the counterpart, occasionally generating ambiguity and delays in decision making in large-scale collaborations. Executives also identify lack of aligned incentives in different OEM departments as an additional source of friction, which may also be combined with the vast array of regulations that govern the collection, storage, and ownership of data.

Three actions were identified by OEM executives as potential solutions:

- Set up project-based structures inside the organization in charge of managing large collaborations, working in a cross-functional manner and reporting directly to the senior leadership (e.g., head of strategy)

- Hold partnership boot-camps and other formal joint coaching programs with the counterpart in a structured yet personal manner for executives and operatives from both parties to ensure that the working relationship runs smoothly

- Develop a perspective on the evolution of data-related regulations, systematically analyzing the impact on existing and potential partnerships.

Text box 2   **Deep dive – OEMs: changing the playbook to create and capture value**

Historically, when it comes to in-vehicle connected solutions, OEMs have used a largely product-forward methodology, i.e., connected features are defined based on what is achievable using incremental enhancements to vehicle hardware and software.

The importance of connectivity features, however, continues to increase, and consumers are expecting much more in the way of connectivity when it comes to OEM products. In fact, connectivity has become so important to consumers that nearly half of those who participated in our 2016 survey reported that they would be willing to switch car makes for better connectivity features. With these growing demands – and a break from traditional drivers of brand loyalty – a product-forward methodology to connected feature development is unlikely to allow for sustainable CDM.

"
"Meeting expectations for only the average of the market is not enough; there is a clear need to have solutions or options that are tailored by age, income, living situation."
– Marketing executive at a major OEM

Automotive leaders clearly recognize the threat posed by not having a strong understanding of how customers interact with vehicle features and what benefits they are looking for: in our survey, 58 percent of OEM executives reported this gap as one of the most important challenges for OEMs to overcome.
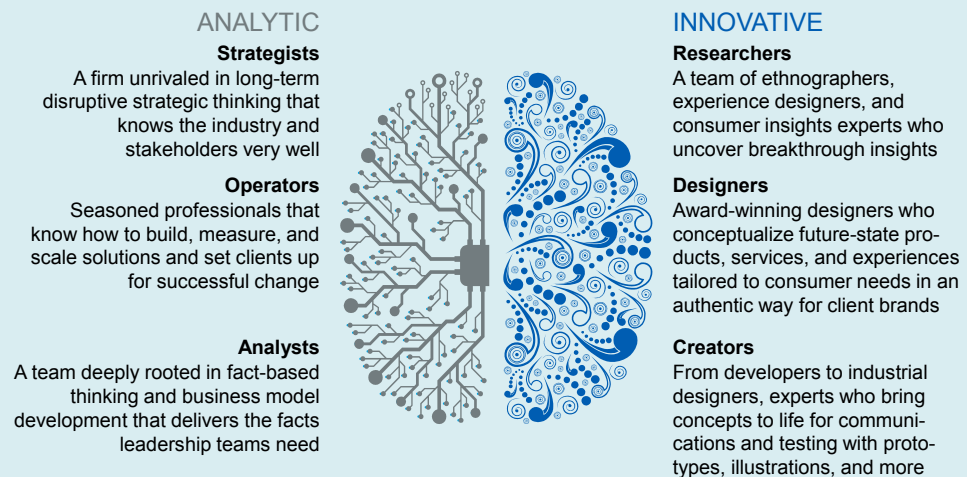
The playbook for future success will be to flip this product-forward notion on its head. Companies in other industries, such as banking, insurance, and consumer goods, have already begun to invest in customer experience design. OEMs will need to follow suit and pivot towards a methodology that starts with a true understanding of customer pain points in order to design an effective connected vehicle solution.

Elements of this market-back methodology include:

1. Gaining a deep understanding of what benefits customers are looking for in a connected car experience, distinguishing customers' willingness to use and adopt a service from their readiness to pay for it

2. Developing an end-state vision of that experience

3. Articulating how the OEM will provide these benefits to the customer through new products, features, and services

4. Mapping the players in the network that would provide the best viable option to satisfy customer benefits, e.g., music streaming services, hotel bookings on the road, roadside assistance services

5. Communicating these benefits to customers in all touch points, including dealers, website, apps, and the car itself.

In order to successfully pursue this market-back methodology, OEMs will need to use a new suite of approaches and tools that are rooted in customer-centric design, such as those used by VeryDay, a design consultancy firm acquired by McKinsey (Exhibit 15 and 16).

Exhibit 15 The market-back methodology requires both left-brain and right-brain approaches to be successful …

ANALYTIC

Strategists
A firm unrivaled in long-term disruptive strategic thinking that knows the industry and stakeholders very well

Operators
Seasoned professionals that know how to build, measure, and scale solutions and set clients up for successful change

Analysts
A team deeply rooted in fact-based thinking and business model development that delivers the facts leadership teams need

INNOVATIVE

Researchers
A team of ethnographers, experience designers, and consumer insights experts who uncover breakthrough insights

Designers
Award-winning designers who conceptualize future-state products, services, and experiences tailored to consumer needs in an authentic way for client brands

Creators
From developers to industrial designers, experts who bring concepts to life for communications and testing with prototypes, illustrations, and more

SOURCE: McKinsey & Company

Exhibit 16   … and should use customer-centric design tools to develop a nuanced understanding of customer interactions and desired benefits

	Opportunity mapping	Journeys and experience models	Narratives and scenarios
Tool	Combining customer insights with an analysis of key stake-holders, megatrends, and market analyses to develop and visualize the current and future networks of the product or service offer	Customer journeys and experience models define current and ideal experiences. They are used to design attractive and user-friendly products and interactions for all touch points	The future will be highly personal. Consumers will react to, adopt, and experience new products and services in different ways that will need to be tailored to their specific contexts
Context of use	Gain a fresh perspective on the potential opportunities that lie ahead. Fuel discussions, provoke reactions, benchmark strategies, test ideas and prototype solutions	Understand the entirety of an experience and all its touch points. Scope out and enlighten stakeholders on all relevant touch points and issues to address	Visualize future experience stories that take into account personality preferences of individuals and social, cultural, economic, or technology drivers. Narratives lead to targeted concepts, messaging elements, and holistic user experiences

SOURCE: McKinsey & Company

OEMs looking to use innovative ways to execute this approach can also examine best practices from successful service sector companies. For example, leading financial service institutions are investing time and resources in observing and understanding customer behavior, running agile product development sessions with cross-functional teams, and executing product design hackathons to rethink customer experiences. These tools, and others, can be deployed by OEMs to reexamine all aspects of the onboard customer experience as part of a comprehensive strategy to monetize car data while providing connected car benefits to their customers.

2. SUPPLIERS

CDM use cases for suppliers include capturing value through the use of predictive maintenance data, enabling warranty cost reduction by increasing failure mode diagnostic capabilities, and improving next-generation designs through faster data/feedback-based R&D optimization. In each of these use cases, suppliers will use additional data on individual component performance as well as its interaction with other vehicle systems.

To realize the CDM potential, matters related to the value proposition, data management and organization, and partnerships are at the top of the issues list for suppliers too, although compared to OEMs, executives from automotive suppliers struggle specifically with the first challenge.

Communicating the value proposition presents challenges for suppliers similar to those faced by OEMs, i.e., undeveloped understanding of what benefits customers are looking for and lack of a structured communication of those benefits. An additional element of complexity though, is driven by the fact that suppliers must address:

- End-customer needs regarding connectivity

- OEMs' preferences on features, service delivery models, and (critically) data access

- Internally conflicting views in different departments and executives on the best monetization model of software and traditional products and services.

In our dialog with suppliers' executives, we identified two main actions aimed at addressing the value proposition challenge:

- Define a two-tiered approach to capturing and using data for use cases – one for internal clients (various departments and units) and one for B2B clients along the value chain (see Text box 3: Deep dive – capture and use: a supplier's guide to monetizing car data)

- Develop a list of prospective use cases and define a detailed implementation road map with clients to get the timing right and balance investments with use cases that can generate cash in the short term versus longer-term, game changing bets. In this perspective, best-practice suppliers are increasingly involving the CFO and corporate finance resources in the structured evaluation of the portfolio of innovations vis-à-vis the expected returns profile to best balance the risk-return profile of the company.

Redefining the organization model comes with a unique obstacle for suppliers. While suppliers and OEMs share the challenge of needing to develop new capabilities in order to build an organization that can effectively turn data into connected services, suppliers must partner with external players in order to do that. Two key actions were identified as priorities:

- Launch a CEO-level initiative to redefine the business and organizational model on data monetization and connected services

- Map external relations with partners and benchmark direct competitors to identify possible organizational model archetypes.

Establishing partnerships presents a unique set of challenges to suppliers. Research reveals that, unlike OEMs, the obstacles suppliers face in building effective partnerships are less about structure and more about mindset and orientation. First, suppliers see a lack of agreement when it comes to their own interests, goals, and priorities and those of their potential partners – mainly OEMs. Second, they report that the absence of proven business models makes leadership reluctant to venture into partnerships designed specifically around data-related services. Executives from the most progressive and successful suppliers in partnerships identified select, concrete steps to overcome these barriers:

- Creating a shared vision for the main sources of value for all partners, aligning interests and priorities with the counterpart

- Mapping customer control points and determining which will be jointly developed and which will remain under their sole control can also help suppliers see that complete agreement of interests isn't a requirement for successful partnerships

- Engaging partners only when there is true conviction to act and when concrete monetization is in sight, as limited drive in the initial phase of the collaboration and inability to generate value in the first 18 to 24 months can often spoil the relationship.

Text box 3   **Deep dive – capture and use: a supplier's guide to monetizing car data**

Given the intensity of competition in the automotive supplier industry, a variety of CDM use cases would allow suppliers to both directly capture economic value as well as provide a source of differentiation relative to competitors. It is no wonder then that suppliers are in some ways at the forefront of developing connected vehicle features and innovative business models.

Nevertheless, suppliers must walk a fine line – there is potential for conflict with the OEM since the goals of the two parties might not always agree. For example, if a tire supplier incentivizes customers to go to specific service locations for tire replacement, and these locations are not part of a broader OEM service partner network, the two entities will be at odds. Similarly, if a vehicle operating system provider uses vehicle data for customer advertising targeting, the OEM might claim a share of the generated value. Unsurprisingly, executives from OEMs openly stated their hesitation regarding sharing data with or providing unlimited access to suppliers.

Another confounding reality is that suppliers often have limited brand relevance and legitimacy with consumers, both as a result of supplier proliferation and the fact that the two parties are usually separated by multiple other parties in the value chain. These factors complicate a supplier's ability to reach consumers directly; therefore, suppliers often rely on existing interfaces (i.e., via the OEM) to engage the vehicle user before looking to set up their own dedicated channels to the end consumer.

Suppliers can take two approaches to car data monetization: going through the OEM or taking a direct-to-consumer approach (Exhibit 17).

Exhibit 17   Suppliers can monetize car data through two approaches, both of which have associated trade-offs

Trade-offs (illustrative)	Approach 1: through the OEM Reach the consumer as part of the OEM's network of connected services	Approach 2: direct-to-consumer Reach the consumer independently through separate connected services infrastructure
Data	Access to a **broader dataset,** enriched with vehicle and driver metadata	Access to a **custom dataset** focused on prioritized parameters
Interface	Uses **existing vehicle architecture** (i.e., OEM interface, OEM infrastructure)	Requires **additional interface** (e.g., in-vehicle device, smartphone app, etc.) and support infrastructure
Flexibility	Requires **multiparty coordination** for development of features	Uses **proprietary infrastructure** that can be optimized for a specific use case
Communication and monetization	Uses **existing** OEM marketing channels and monetization schema	Requires **investments** to convey value proposition and manage monetization
Value attribution	Requires **multiparty negotiation** (OEM, suppliers, service providers, etc.)	**100%** to supplier

> *The 2 approaches are not mutually exclusive; depending on the supplier's context, 1 or both could be used*

SOURCE: McKinsey & Company

Suppliers who choose to go through the OEM and use the OEM's interface with customers must work to define a joint value proposition that is mutually beneficial to both players. An example of such an arrangement would be for an engine supplier and an OEM to partner in collecting data on engine performance. The engine supplier could use the data to understand the performance of its components in the field and use this knowledge to make improvements, either in terms of output or cost. This would create a win-win situation for both parties. For such arrangements to be successful, it is crucial to ensure that: (a) the mutual value proposition is clear, (b) sufficient resources are allocated by both parties, (c) all elements of the data exchange are adequately mapped and priced by both parties, and (d) there is a mutual sense of fairness and transparency underpinning the collaboration. These arrangements often take time to develop, and so, if suppliers choose to use OEM interfaces to capture connected vehicle data, they should take immediate steps to formally establish these relationships.

An alternate approach is to use direct-to-consumer initiatives, where suppliers choose to largely bypass the OEM and obtain vehicle data via a dongle, partnerships with fleet management companies, or other means. In these instances, the supplier must have a clear understanding of the value it creates for the consumer and use this understanding to create the business case for pursuing this path by quantifying the associated benefits and costs. It should be noted, however, that having an independent data channel can sometimes limit both the amount and type of data that the supplier can access – for example, a tire supplier may be able to collect data on deflation warnings from the TPMS (tire pressure monitoring system) but may not have access to other potentially useful data from the vehicle, such as ABS/ESP warnings, vehicle mileage, typical driving style of the vehicle owner, etc. This trade-off emanates from the fact that suppliers are often limited in how they can interact with the end user.

It is important to note that the two approaches are not mutually exclusive and, depending on the supplier's specific context, one or both could be used to monetize car data.

3. TECHNOLOGY AND INFRASTRUCTURE PLAYERS

Technology and infrastructure players (such as high-tech firms, telecommunication firms, etc.) are undoubtedly playing a major role in CDM. The first CDM use cases that these firms tackled were primarily related to infotainment (e.g., music streaming, navigation apps), while they are now rapidly moving towards targeting drivers and passengers with tailored advertising (onboard or offboard) and pushing their onboard platforms to purchase a wide array of goods and services (e.g., in-vehicle integration of Amazon's Alexa). These players will play an important role in ensuring that the connected car is well integrated into the technology networks of the future for a seamless user experience across all devices and platforms.

Given the relative maturity of technology and infrastructure companies in digital business models and agile operating methodologies, the "big 3" challenges take on a unique shape for these players.

Communicating the value proposition is not as significant a challenge for technology and infrastructure players as it is for OEMs and suppliers. Most players in the tech world have had to take steps to clearly communicate the value proposition of their technology offers

through innovative ways that provide differentiation from other players in a highly competitive network. That said, executives from the tech world believe that there is room to improve targeting; they expect to increase their effectiveness in tailoring their communication to customers by expanding artificial intelligence to engage car occupants in a two-way dialog to create a significantly higher perception of benefits.

Redefining the organization model presents a clear challenge for technology and infra-structure players. While these players are accustomed to launching and scaling agile and cross-functional organizations, there is a clear realization that, to be successful, tech players need to continue building new capabilities to develop connected services – more than 90 percent of technology and infrastructure respondents in our survey flagged this area as a significant issue to be addressed to solve the organizational challenge. Given this realization on the organizational and capability gaps to be filled, it is our belief that technology and infrastructure players will need to move beyond their organizational identity as providers to that of supporters in delivering the connected experience for OEMs, thereby using the combined assets of the two entities (among others) for connected car solutions.

Establishing partnership models that openly address the concerns of other players on data ownership and customer contact policies is a particular challenge for technology and infrastructure players (see Text box 4: Deep dive – bridging the trust gap between tech players and OEMs).

| Text box 4 | **Deep dive – bridging the trust gap between tech players and OEMs** |

Deep dive – bridging the trust gap between tech players and OEMs

Technology and infrastructure players, such as high-tech companies and telecommunication firms, are already at the forefront of bringing new and innovative solutions to customers across a spectrum of devices. Millions of users interact with these brands, and the nature and frequency of these interactions has forced such players to develop strong capabilities in, e.g., advanced analytics, artificial intelligence, cloud services, and customer experience design.

Despite their expertise and strong customer relationships, technology and infrastructure players still have room to grow when it comes to being able to deliver a truly seamless in-vehicle experience for their users. To achieve the high bar that consumers will demand from these brands, further integration into vehicle software and functionality will be needed.

From the OEM's perspective, discussions with executives show that OEMs have a clear gap in technology and knowledge on the technology and infrastructure players, and that the two parties should be collaborating to bring the use cases to reality. The assets and capabilities that the technology and infrastructure players bring to the table, when integrated with vehicle functions and optimized for user experience, have the potential to create significant customer pull and be a source of competitive advantage for both parties.

However, in interviews with OEM executives, there is clear reluctance when it comes to working very closely with these technology and infrastructure partners; OEMs do not fully understand the variety of business models that these players can execute. To underscore this point, consider for a moment how many different business models are covered by players like Alphabet, Apple, or Amazon today – and there remains a fear that these players could undermine the OEM's value creation mechanisms once they have full access to the vehicle and its data.

> "If [high-tech players] get hold of our client relationships, it will destroy the strong bonds we created. It is something we cannot risk lightly."
> *– OEM executive*

> "The high-tech players are just better than us at understanding and deploying data-related business models."
> *– OEM executive*

> "We could definitely use help from the high-tech players in defining our data management approach."
> *– Supplier executive*

Interestingly, OEMs and suppliers also perceive a knowledge gap on digital business models vis-à-vis high-tech giants that might cause further threats.

High-tech executives themselves struggle to engage with OEMs due to differences in innovation cycles, decision making processes, and modus operandi.

Despite all the challenges, both OEMs and high-tech players agree that only a mutual collaboration will allow for the capture of the full potential from CDM. During our CDM roundtables, five golden rules were agreed on by the relevant parties as being essential for facilitating OEM engagement by high-tech players (Exhibit 18).

Exhibit 18 Key actions that high-tech players can take to facilitate OEM engagement

Support OEMs in their journey while being 1 step ahead in understanding opportunities and challenges

Explain your value creation model clearly – speaking the OEM's language and tying back to their customer touch points

Openly and directly address any concerns about data management and customer engagement that the OEM has

Co-create a few concrete data use cases, building on your own distinctive capabilities

Think more holistically about the challenges faced by the OEM, from quality to logistics and dealer management, and how you can help

SOURCE: McKinsey & Company

4. SERVICE PROVIDERS

Service providers also stand to capture a share of CDM economics through a broad variety of use cases, spanning from roadside assistance to networked parking services and from concierge services to trunk delivery of purchased goods.

In our research, service providers assessed their readiness for the "big 3" CDM challenges at levels similar to those of suppliers, which may have to do with their similar positioning vis-à-vis the OEMs and end customers. Only about half of the respondents in this category report being prepared for issues related to the value proposition and establishing organizational mechanisms and structures that facilitate the value creating use of car data. When it comes to establishing the necessary partnerships, however, 80 percent of service providers feel ready for the challenge, reflecting their strong capabilities in establishing commercial relationships with third parties.

Communicating the value proposition of third-party data-enabled services is difficult for providers given that: (a) they do not control the customer interface and have limited flexibility in adapting it to their needs, (b) service providers must get data through OEMs, and (c) service providers struggle to meaningfully translate their engagement strategies to the car as an environment, just as fast food chains are unable to entice drivers by showing them images of a succulent hamburger while they are driving.

Executives from service providers have identified the following actions as priorities for resolving this challenge:

- Finding ways to establish direct contact with end customers and directly demonstrating brand distinctiveness (see Text box 5: Deep dive – brand awareness: service providers connecting directly with in-vehicle consumers)

- Redefining branding throughout customer touch points, adapting the communication strategy to the in-vehicle interface

- Tracking and rapidly adapting to customer feedback on the effectiveness of the customer engagement strategies in cars, given their novelty for most service providers and the limited direct contact with customers they are allowed to have by the OEMs.

Redefining the organization model presents service providers with a key issue similar to that faced by OEMs and suppliers: facilitating internal cross-functional collaboration to develop capabilities required to engage customers in a new environment, the car. Executives from service providers that are currently winning this challenge have launched CEO-level initiatives, putting the car at the center of their customer engagement strategy by:

- Mapping the new capabilities required to deploy their services through cars

- Completely redesigning customer journeys in order to satisfy customer needs in the car environment

- Quickly piloting service models, adjusting them in an agile way.

Establishing partnerships is seen as a critical strategic goal by service providers as well and it is especially challenging for them due to differences in the speed of innovation between them and their potential partners, along with regulations that determine data ownership and govern its use (see Text box 5: Deep dive – brand awareness: service providers connecting directly with in-vehicle consumers).

Text box 5 **Deep dive – brand awareness: service providers connecting directly with in-vehicle consumers**

Service providers will have an essential role to play in the connected car network of the future. Today's end-customer offers are largely limited to select vendors, providing information about product availability and some standardized purchase points. Alerting drivers to the location of the nearest coffee shop along their route and allowing them to preorder coffee from that location is already a reality in some vehicles.

It is not difficult to imagine, however, that consumers will demand far more in terms of information and functionality from new in-vehicle interfaces. Service providers will have the opportunity to be key partners in enhancing and enriching the onboard experience, which will quickly grow in relevance as both autonomous vehicle functionality and shared mobility increase. This partnership will create mutual value for service providers and OEMs and can be used by the latter as a point of differentiation.

"

"We will need to allow vendors to interact with our customers while they are in the vehicle, in a contextually relevant way."
– Senior executive at a major OEM

There are of course some limits and risks if this offer is not executed well; consumers are unlikely to be satisfied with an experience that isn't optimized specifically for the vehicle interface – for instance, having an icon on the vehicle interface that links to a standard mobile webpage will leave consumers thinking of what might have been.

Similarly, using car data to target consumers and trigger consumers' decisions can result in a significantly improved customer experience and business results (see Exhibit 19).

"

"Being able to engage car passengers knowing who they are, what they are looking at outside of the window, and leveraging bi-directional voice conversation can improve conversion rates by 100 times or more."
– CEO of a digital targeting and advertising agency

Exhibit 19

Car data-based service offers facilitate significant improvements in both customer experience and business results

Value-creating mobility experience

Based on the time of day, length of time since the last stop and distance to the destination, Anna and Tim's vehicle suggests a stop by promoting a lunch offer at Ideal Restaurant (IR).

The vehicle interface optimizes which IR to navigate, based on factors such as the time detour, the rating of the particular restaurant location, and how busy the location is, and selects a location 5 minutes away. The interface also allows Tim to navigate the menu, see the special offer(s), and place an order in advance.

Anna and Tim get to the restaurant and are immediately seated. The meal arrives within 5 minutes, since the order was automatically confirmed when the vehicle was a specific time away from the restaurant.

The vehicle knows that Anna is driving and Tim is in the passenger seat; Anna and Tim hear an abridged advertisement, after which Tim is given a prompt to open the video advertisement using the screen in the passenger console. Anna and Tim decide to stop at IR.

Anna and Tim enjoy their experience at IR and leave, feeling confident that they will reach their destination on time.

Impact	■ No additional time spent on unnecessary travel and waiting
	■ A great experience customized for their needs, leading to stronger brand perception and likelihood of future visits
	■ Linking the advertisement and the response gives IR data on marketing effectiveness, enabling offer optimization through advanced analytics

Traditional mobility experience

Anna and Tim hear an advertisement on the radio promoting a lunch offer at Ideal Restaurant (IR).

Anna and Tim hear an effective advertisement; both passengers decide to stop at IR.

Tim looks up the nearest IR, estimates the time detour that will be involved, and navigates to the nearest IR, not knowing that the IR he has picked is not the optimal choice and will take 15 minutes to reach.

Anna and Tim get to the restaurant and find out that the restaurant is busy and there is a 5-minute wait to be seated. They place an order and the meal takes 25 minutes to arrive; the waitstaff seems overwhelmed.

Anna and Tim eat quickly and do not have a good experience at IR. They leave, having spent more time than they expected and knowing they will be late to their destination.

Impact
- 10 additional minutes of unnecessary travel
- 25 additional minutes of waiting
- Stressful and bad experience at IR, leading to a loss of potential future revenue
- No ability for IR to measure effectiveness of the marketing offer

5. DEALERS

The role of dealers has always been crucial for connecting end customers with OEMs, illustrating new vehicles' features, and providing customers with assistance and value-added services that require direct field presence. Car data can generate a significant stream of information that can help inform and improve those interactions significantly. As such, dealers would significantly benefit from gaining remote vehicle diagnostics, using in-vehicle targeted advertisements and promotions to drive traffic to their businesses, and collecting driving style and user preferences to gain an even better understanding of current and prospective customers.

OEMs and dealers both want to remain relevant to the consumer in the post-purchase experience, including in service requests, emergency support, or new vehicle offers. In order to concretely make that happen, both official and independent dealers should ask OEMs a set of very concrete questions (Exhibit 20).

Exhibit 20   6 key points on CDM for dealers to address with OEMs

What will be the dealers' role in selling (and profiting from) connected services?

What organizational capabilities are being built by the OEM to support dealers in benefitting from connected car data?

How will the OEM share hot leads from the connected cars? What is going to be the economic model for lead sharing?

What will the customer contact policy be regarding connected cars (e.g., in case of breakdown, inquiries)?

How will the CRM system be enriched by external sources (e.g., OEM website, online profiles, connected car usage profile), and what triggers will be defined to help the dealer sell better?

How could data improve the overall aftersales experience at each POS, using input and feedback from connected cars and customers?

SOURCE: McKinsey & Company

However, in order to play a significant role in the connected car network, dealers will have to do more than just use the data (see Text box 6: Deep dive – getting data alone will not be enough to close the deal).

Text box 6

Deep dive – getting data alone will not be enough to close the deal

The shift to increased availability of car data presents dealers with potential advantages and disadvantages. On one hand, dealers will have the chance to demonstrate new, increasingly complex features and functionality to potential customers, and they can benefit from the opportunity to strengthen customer relationships by getting superior insights even before customers are physically present in the dealer location. However, communicating connectivity-related features and services is not straightforward and, in multiple cases, OEMs and dealers have not entirely agreed on the future role of dealers in the data value chain.

In our conversations, large dealer group leaders identified three priorities:

1. Launching specific training sessions on clearly and simply selling and communicating the benefits of connectivity features and services. As more than 40 percent of car owners globally report that they would consider switching to another car brand for a significantly better set of connectivity features, a huge opportunity to gain new customers is already available. To close the deal, getting the communication right from the beginning will be critical.

2. Redesigning the customer engagement strategy to capitalize on all data available. Dealers already collect very little data for most steps of the customer purchase decision journey. They might consider redesigning processes to both capture and use vital data from all available sources, e.g., mining data from their website and CRM system to rapidly segment customers based on their preferences and defining a next-product-to-buy action set, linking online leads and in-store visits to a single customer profile.

3. Collaborating with OEMs to define their future role in the data value chain, as getting data access is not enough to satisfy customers. One of the key findings of our study is just how complex it could be to solve real customer issues. Accessing customer data is often not enough for dealers to satisfy those needs. Let's take the simple example of supporting a customer that has a breakdown on the road: in order to provide a truly stress-free experience, a huge number of different players, systems, and processes should be coordinated – most of which are beyond the dealer's reach (Exhibit 21).

Exhibit 21 Solving for customer needs requires data sharing and coordination among multiple parties and touch points – breakdown call use case example

A breakdown occurs while the vehicle is in motion. Sensors identify the problem, a warning message is indicated on the dashboard, and the driver is instructed to safely bring the vehicle to a stop.

The customer center is notified and an agent places a call to the vehicle to check on its condition and provide support to the customer

The vehicle app transmits the details of the issue and the nearest available repair shop that is covered by the insurer is contacted automatically

A towing service is notified with the vehicle's location as well as contact details of the customer (and vice versa) so that the towing of the vehicle can be coordinated. The customer is also provided with alternate means of transportation where necessary, either in the form of a courtesy car or credit towards use of shared mobility services

The repair shop's booking system reserves a slot for the repair of the vehicle automatically and confirms the reservation based on live data from the towing service

The vehicle app transmits the details of the issue to the repair shop and the parts inventory is automatically checked, with an order placed for any out-of-stock parts

The customer is able to track the vehicle's status while it is being repaired

Once the repair is complete, the bill is generated and, with the customer's approval, a claim is submitted to the insurer. The customer is notified of the completed repair and is allowed to select across a set of options to get possession of the vehicle on preferred terms

The CRM system that links to the vehicle app is notified of the incident and its resolution and subsequent follow-ups are planned to proactively check on the vehicle's condition and manage the relationship with the customer

PART III: THE ROAD TO CDM BEGINS WITH A CLEAR ASSESSMENT OF YOUR COMPANY'S STARTING POINT

As the CDM opportunity is growing significantly on an annual basis, action is required to effectively mobilize large organizations on the road to concrete monetization and support them in finding their way in a still rather heterogeneous landscape.

As a first step, industry players are thus recommended to immediately assess their organization's ability to capture the available potential from this value pool when it comes to the three priority challenges:

- Understanding of and ability to communicate car data's benefits to customers

- Ability to structure their organizational model in ways that accelerate data monetization

- Effectiveness in establishing productive partnerships and assessing benefits, risks, and modus operandi compatibility with other market players.

Exhibits 22 and 23, located on the following page, provide a degree of orientation concerning both the relevant criteria for this self-assessment and the range for each criterion. While Exhibit 22 lists a set of 21 critical elements – seven for each of the "big 3" challenges – for which companies should investigate their level of preparedness, Exhibit 23 dives deeper and, using the challenge of redefining the organizational model as an example, illustrates a framework for assessing the level of preparedness for this challenge on a spectrum derived from our market insights. Similar frameworks for the other two challenges mentioned have been developed and can be used as a starting point to evaluate a company's level of preparedness for addressing the CDM opportunity.

□   □   □
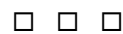
The excitement building around the prospect of monetizing the growing amount and diversity of car data is matched only by its complexity. No two players will follow the exact same path on the road to CDM.

Nonetheless, action is required and all players in this market can get started today by developing a comprehensive plan for defining and communicating car-data-related benefits, solidly incorporating digital into their organizations, and setting the stage for effective partnerships.

Exhibit 22

Players can assess their readiness with a set of 21 critical elements across the 3 key challenges

Communicating the value proposition	Redefining the organizational model	Establishing partnerships
Connected services end game vision	CDM organizational and business model	Make vs. buy vs. partner analysis processes
Customer segmentation	Organizational effectiveness and capability assessment	Collaboration readiness scoring
Customer needs and benefits identification	Short-term and long-term organizational plan	Partner identification processes
Data type mapping and use case prioritization	External relations management	Partnership organizational setup and fit
Customer value pro-position and pricing strategy	Cross-functional collaboration	Counterparty risk assessment
Communication strategy across touch points	Incentive structures	Team incentive alignment reviews
Benefits perception and adoption rate tracking	Span of control/span of accountability	Internal and external communications

SOURCE: McKinsey & Company

Exhibit 23

Each of the critical elements should be assessed on a performance spectrum – example deep dive on organizational model challenge

Level of preparedness

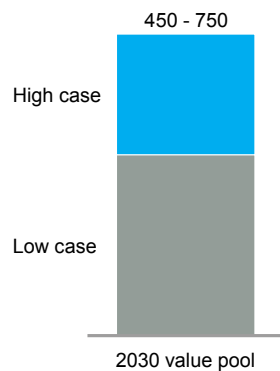|	Question	Low	High
1.	Has the **organizational and business model been redefined** to capture the opportunities from data monetization?	Organizational and business models based on existing structures and practices, with limited tailoring that could enable new ways of working	Organizational and business model tailored to pursue specific data monetization opportunities, with regular reviews to improve alignment and efficiency
2.	Has the **organizational effective-ness been assessed, including capabilities required** for connected services?	Process and capability gaps understood at a high level	Capabilities assessed through a tailored diagnostic, with gaps identified by function and monetization opportunity and a clear action plan to address them
3.	Has the organization structure for data monetization been created with a **strategic long-term view**?	Organizational structure designed to enable pursuit of near-term opportunities, with limited understanding or alignment on long-term structure	Organizational structure deliberately designed to scale and evolve to meet long-term strategic ambitions
4.	Is the organization structure for data monetization **suited to tackle external relations**?	External relations conducted via existing corporate function, with limited customization of approach	External relations empowered to pursue custom approaches to manage brand(s) and establish partner relationships
5.	Are the organization archetype and processes for data monetization designed to ensure **cross-functional collaboration**?	Limited cross-functional involvement beyond team assignment and stakeholder reporting channels	Agile cross-functional operating model in place, with all critical functions represented in the team and clear roles and reporting structures
6.	Are the right **incentive structures** in place for the development of connected services?	Standard incentive structures for the rest of the organization that apply to the connected services team	A mix of economic and noneconomic incentives, tailored to the connected services team, are in place
7.	Has the **right team** been identified and the **right authority** been dedicated?	Team members allocated on an ad hoc basis and requiring multilayer approvals to make significant progress	Dedicated team with the right skill levels in place, empowered to take rapid action or obtain expedited approvals where necessary

SOURCE: McKinsey & Company

APPENDIX

Key exhibits from our seminal report *Monetizing car data – New service opportunities to create new customer benefits* are included below, outlining the car data value pool (Exhibit 24), value creation models (Exhibit 25), core car data use cases (Exhibit 26), and key technology enablers for car data monetization (Exhibit 27).

Exhibit 24   Car-generated data may become a USD 450 - 750 billion market by 2030

Overall value pool (including additional revenue, savings, and societal benefits)
USD billions

Breakdown of value pool by value creation lever
Percent

450 - 750

High case

Low case

2030 value pool

Increasing safety and security

15

Generating revenue

45

Reducing costs

40
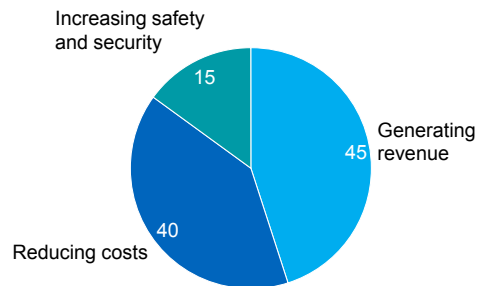
> Car-generated data will create a new and large value pool that will become an important battleground for all players in the automotive value chain

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Exhibit 25   Car data can be monetized through 3 main value creation models

Value creation models

Generating revenue	**Direct monetization** Selling products, features, or services to the customer
	Tailored advertising Using car data to present individual offers to customers
	Selling data Collecting, analyzing, and reselling big data to third parties
Reducing costs	**R&D and material costs reduction** Gathering product field data for development cost reduction and warranty and recall cost avoidance
	Customers' cost reduction Analyzing actual usage patterns to reduce repair and downtime costs
	Improved customer satisfaction Better tailoring products/services to customer needs
Increasing safety and security	**Reduced time for intervention** Collecting and forwarding warnings in real time, pointing customers in the right direction

    From buzz to bucks – automotive players on the highway to car data monetization

Exhibit 26

Each value creation model incorporates multiple potential use cases

● "Enhanced value" by autonomy ● "Reduced value" by autonomy ● Autonomy not relevant xxx = core[1] xxx = enabled[1]
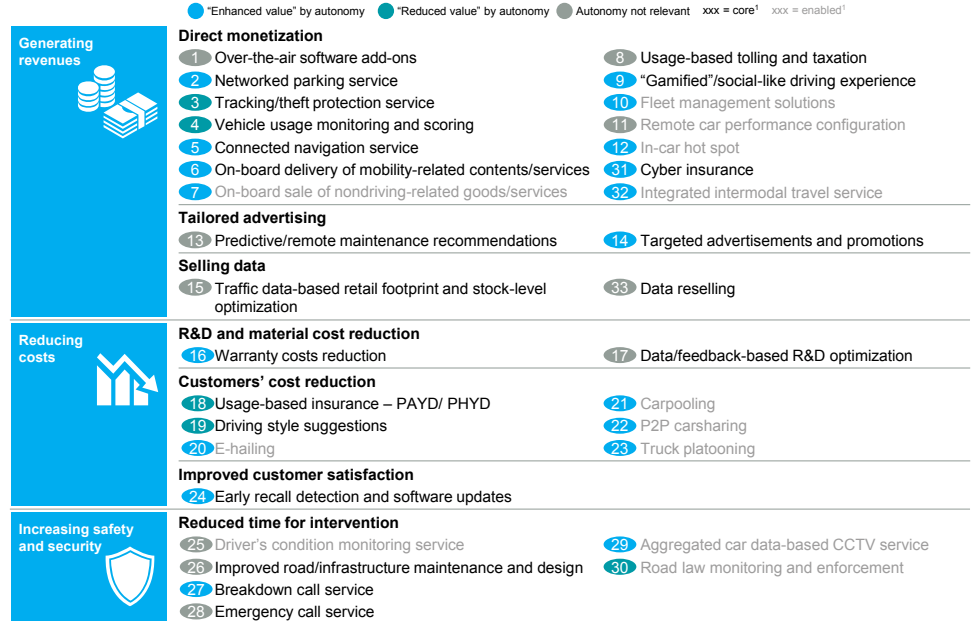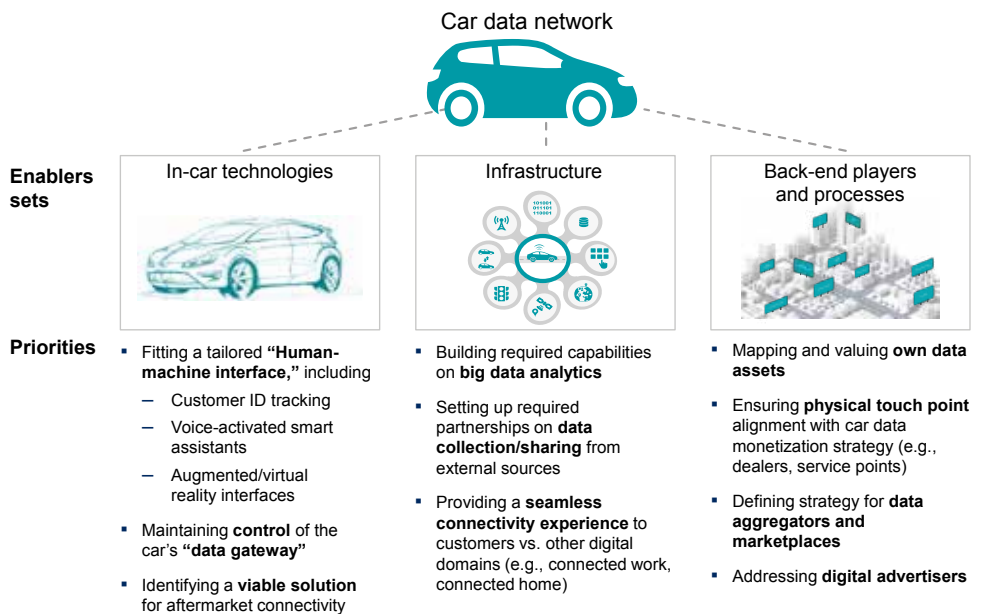
Generating revenues

Direct monetization

1	Over-the-air software add-ons	8	Usage-based tolling and taxation
2	Networked parking service	9	"Gamified"/social-like driving experience
3	Tracking/theft protection service	10	Fleet management solutions
4	Vehicle usage monitoring and scoring	11	Remote car performance configuration
5	Connected navigation service	12	In-car hot spot
6	On-board delivery of mobility-related contents/services	31	Cyber insurance
7	On-board sale of nondriving-related goods/services	32	Integrated intermodal travel service

Tailored advertising

13	Predictive/remote maintenance recommendations	14	Targeted advertisements and promotions

Selling data

15	Traffic data-based retail footprint and stock-level optimization	33	Data reselling

Reducing costs

R&D and material cost reduction

16	Warranty costs reduction	17	Data/feedback-based R&D optimization

Customers' cost reduction

18	Usage-based insurance – PAYD/ PHYD	21	Carpooling
19	Driving style suggestions	22	P2P carsharing
20	E-hailing	23	Truck platooning

Improved customer satisfaction

24	Early recall detection and software updates

Increasing safety and security

Reduced time for intervention

25	Driver's condition monitoring service	29	Aggregated car data-based CCTV service
26	Improved road/infrastructure maintenance and design	30	Road law monitoring and enforcement
27	Breakdown call service		
28	Emergency call service		

1 A "car data core use case" is defined as a use case that can only exist through car data (e.g., predictive maintenance) 2 A "car data-enabled use case" is defined as a use case which either does not strictly need the car environment to exist (e.g., in-car hot spot) or needs car data to function, although car data is not the key enabler for the existence of the use case

SOURCE: McKinsey & Company

Exhibit 27

Establishing the car data network entails 3 enabler sets

Car data network

Enablers sets

In-car technologies	Infrastructure	Back-end players and processes

Priorities

In-car technologies
- Fitting a tailored **"Human-machine interface,"** including
  - Customer ID tracking
  - Voice-activated smart assistants
  - Augmented/virtual reality interfaces
- Maintaining **control** of the car's **"data gateway"**
- Identifying a **viable solution** for aftermarket connectivity

Infrastructure
- Building required capabilities on **big data analytics**
- Setting up required partnerships on **data collection/sharing** from external sources
- Providing a **seamless connectivity experience** to customers vs. other digital domains (e.g., connected work, connected home)

Back-end players and processes
- Mapping and valuing **own data assets**
- Ensuring **physical touch point** alignment with car data monetization strategy (e.g., dealers, service points)
- Defining strategy for **data aggregators and marketplaces**
- Addressing **digital advertisers**

SOURCE: McKinsey & Company

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OTHER PUBLICATIONS

Our latest insights into automotive industry trends are also available on McKinsey's Automotive & Assembly Extranet and on the McKinsey Insights app, our flagship digital publishing platform.

For further information on the future of mobility, please also refer to the following McKinsey publications:

Monetizing car data
Connected cars generate lots of information, but are automakers and other industry players taking advantage of all the revenue making potential this data represents? To find out, McKinsey conducted an extensive survey and research initiative regarding this global phenomenon.

Shifting gears in cybersecurity for connected cars
Connectivity has the power to transform but is not without its risks. In automotive, cybersecurity threats are real, and OEMs are facing a unique challenge given the increasing complexity of products. This report aims to help OEMs face this risk and develop a holistic approach for an adequate set of cybersecurity solutions.

The automotive revolution is speeding up
For more than 2 years, the industry has been talking about the four disruptive trends changing the rules in the mobility sector: autonomous driving, shared mobility, connectivity, and electrification. Our report from January 2016 integrated the impact of these trends into a single picture for the first time.

Artificial intelligence—automotive's new value-creating engine
What opportunities does AI open up for mobility, and how can OEMs capture them in the short and long run?

Savvy and sophisticated: Meet China's evolving car buyers
Chinese car buyers continue to change rapidly, from primarily first-time buyers just a decade or so ago to today's far more knowledgeable shoppers. To keep up with the latest shifts in consumer behaviors and attitudes, McKinsey recently interviewed approximately 5,800 consumers who purchased cars in the past year. The results suggest major changes ahead for the industry.

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