



# DRIVING TOWARD THE POST-DIGITAL FUTURE

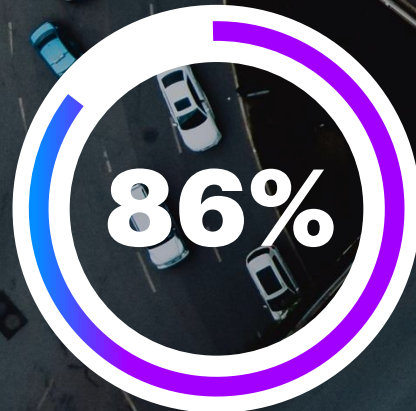
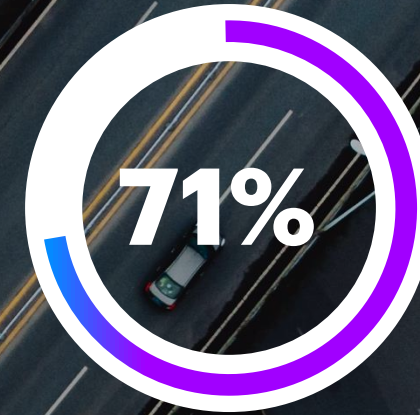
Accenture Technology Vision 2020  
Automotive



**What happens when people's expectations for technology are at odds with the automotive industry's ability to meet them?**



**People's perceptions of and relationships with technology are changing. 71% of consumers say that technology is ingrained in almost all aspects of their lives.**



**The importance of technology's impact (and potential) is not lost on automotive executives. 86% of them acknowledge that technology has become an inextricable part of the human experience.**

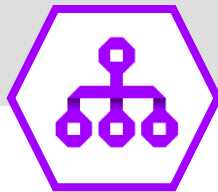
The way automotive companies have created customer experiences in the past are now becoming roadblocks.



Automakers' legacy **operating models** and **organizational structures** aren't geared to scale innovations quickly.



Legacy **IT architectures** do not adequately support the integration of new technologies or the development of microservices and APIs.



A lack of **agile working methods** and **data sharing** make it difficult for them to respond to liquid expectations for new experiences or conveniences.

These and other obstacles will soon have automotive companies fall out of sync with people's needs and expectations.

**The automotive industry isn't seeing a backlash against technology but a tech-clash—a collision between old models that are aren't aligned with people's liquid expectations.**



## Move off the collision course

To manage or avoid the tech-clash, automotive companies must rethink how they use technology to boost the experiences of all people—from customers and dealers to internal stakeholders. When automotive companies put people at the center of their technology models, they will do more than meet expectations.

**They'll set the new standard that every competitor will strive to meet.**



# Trust Your New Roadmap

Disruptive technology has given automotive companies more influence in shaping consumers' experience of the world. Digitally enabled products and services will take them on new adventures.

Every company must:

- Take its role seriously.
- Make decisions wisely.
- Hold itself accountable.

In a world in which digital is everywhere, **trust** becomes currency.

**What are automotive companies doing to earn that trust?**





# Accenture's 2020 Tech Vision Trends

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In a post-digital world now characterized by a looming tech-clash and fraying trust, how can automotive companies chart a course forward?

## ACCENTURE'S 2020 TECH TRENDS POINT THE WAY



### The I in Experience

Helping people choose their own adventure



### AI and Me

Reimagining the business through human and AI collaboration



### The Dilemma of Smart Things

Overcoming the "beta burden"



### Robots in the Wild

Growing the enterprise's reach—and responsibility



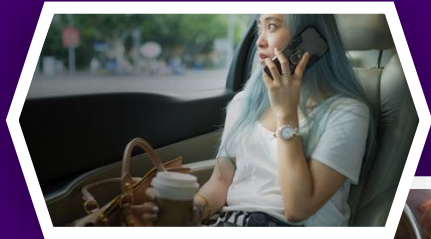
### Innovation DNA

Creating an engine for continuous innovation

# The I in Experience

Consumers want customized experiences. But they don't want their experiences overly determined for them without their knowledge.

## What can automotive companies do?



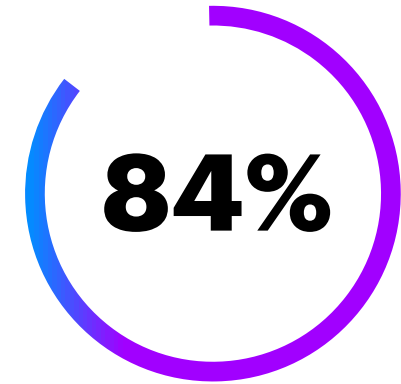
Turn consumers into co-creators. Initiate two-way communication to gather input and feedback to design experiences together.



Meet consumers where they are. Online reveals of new car designs, virtual negotiations, and at-home test drives/sales are likely to stay. Improve upon those experiences.



Continue democratizing luxury and safety in all vehicle classes, with digital experiences that amplify personal agency.



**84%**  
**of automotive executives believe that to compete in a post-digital world, organizations need to elevate their relationships with customers as partners.**



# AI and Me

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Automotive companies are realizing only a fraction of their AI potential by focusing on automation. Now, they have the chance to use AI to transform not just *how* they work, but *what* they do.

**77%**

of automotive organizations are piloting or adopting AI.

**BUT...**

**ONLY 31%**

are preparing their workforce for collaborative, interactive, and explainable AI-based systems.

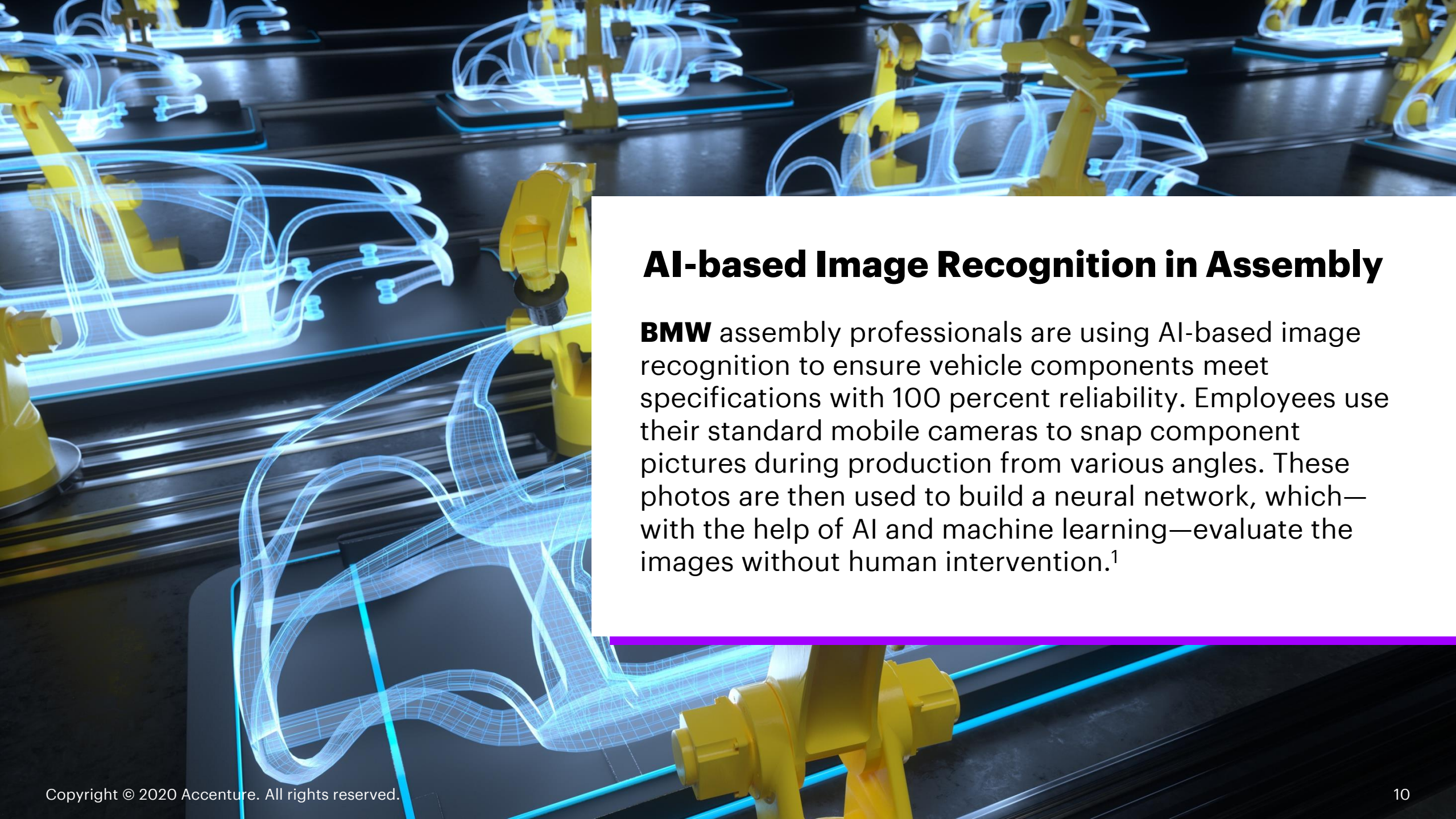
## WHAT CAN AUTOMOTIVE COMPANIES DO?

**Use AI to bring out the full power of people.**

**Move beyond deploying AI for automation alone. Push into the new frontier of co-creation between people and machines.**

**Continue developing AI algorithms to revolutionize the driving experience.**





## AI-based Image Recognition in Assembly

**BMW** assembly professionals are using AI-based image recognition to ensure vehicle components meet specifications with 100 percent reliability. Employees use their standard mobile cameras to snap component pictures during production from various angles. These photos are then used to build a neural network, which—with the help of AI and machine learning—evaluate the images without human intervention.<sup>1</sup>



# The Dilemma of Smart Things

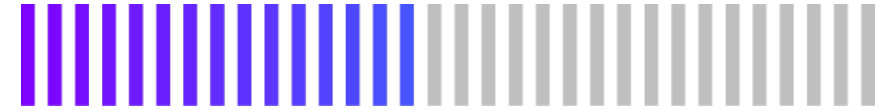
Automotive companies and suppliers continually update their products, systems, services and experiences. This creates a “beta burden” and forces customers to constantly play catch-up. It’s no surprise they are growing weary of what’s around the corner.

## What can automotive companies do?

- Design updates to be seamless and easy.
- Design over-the-air software updates to occur automatically, when the car is not in use.
- Design features that enable drivers to get more from their vehicles when needed—such as more battery range or better clearance when navigating rough terrain (or urban parking structures).

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**47%**



of consumers agree that software updates are increasingly burdensome.

**65%**



of automotive executives say their organization’s connected products and services will have more—or significantly more—updates over the next three years.

**Tesla** customers have seen their cars transform without ever visiting a mechanic. New functions like autonomous driving, climate control features for pets, and enhanced safety features are all pushed through firmware updates.<sup>2</sup>

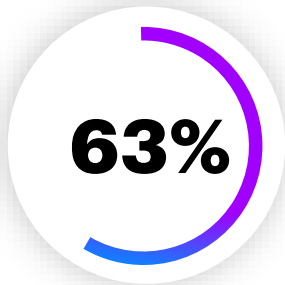


# Robots in the Wild

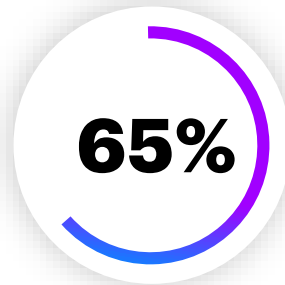
Advances in robotics, sensors, speech recognition, 5G and computer vision—combined with falling hardware costs—are pushing the intelligence of the digital world into the physical one.

## What can automotive companies do?

- Build new models of interaction and impact as robotics move beyond the walls of the enterprise.
- Unlock new opportunities by introducing robots to the next frontier: the open world.



**of automotive executives expect their organizations will use robotics in uncontrolled environments within the next 2 years.**



**say their employees will easily figure out how to work with robots.**



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# Innovation DNA

Automotive companies must continue to drive and connect innovation across the entire organization and an extended ecosystem. The ability to accelerate innovation will be key.

## What can automotive companies do?

**Redefine** operating models to be more experimental—and deliver scalable innovations faster than ever.

**Tap into** disruptive technologies (AI and extended reality) to identify, build and deliver new solutions.

**Strengthen** research partnerships to gain access to new insights and know-how.

**Build** the capabilities and ecosystem relationships necessary to assemble a unique innovation DNA.

**71% of automotive executives believe that the stakes for innovation have never been higher. Getting it right will require new ways of innovating with ecosystem partners and third-party organizations.**



**Waymo** has made its autonomous vehicle data available for academics and others to use. The high-resolution sensor data—collected across a wide variety of driving conditions—is intended to help the research community further advance machine perception and self-driving technology.<sup>3</sup>



# AN INDUSTRY ON THE MOVE

WHAT'S NOW? WHAT'S NEXT?



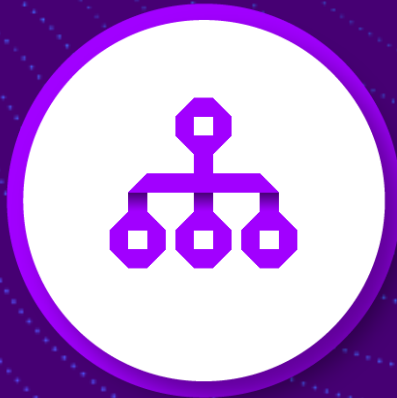


# An Industry on the Move

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The automotive industry is facing an increasing level of disruption. Industry leaders are already using new technologies across the lifecycle to create better products, services and experiences and to navigate industry opportunities and challenges.

**The 2020 Tech Vision trends are poised to accelerate these transformations...**



## Challenges & Opportunities

- Digitalization
- Sustainability
- Urbanization
- Liquid customer expectations



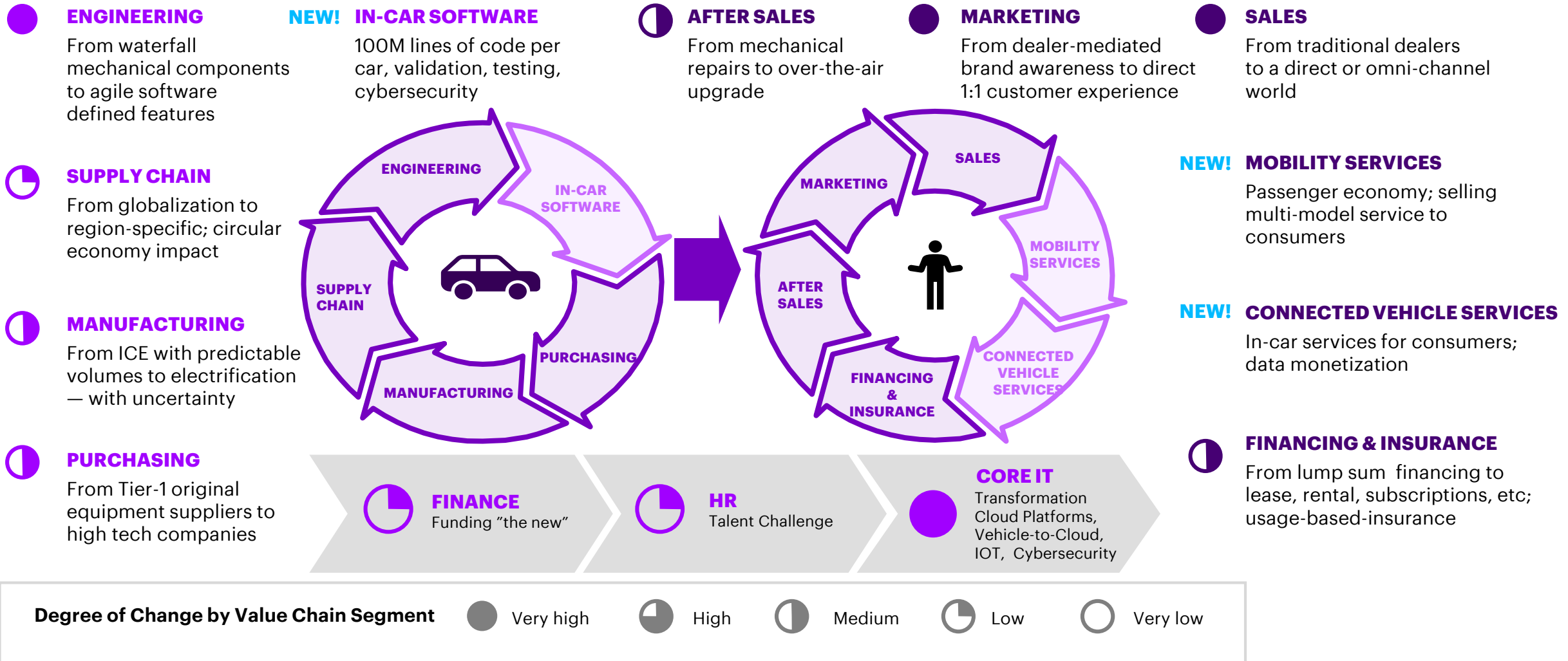
## Industry Trends

- Connected
- Autonomous
- Shared mobility
- Electric/emission-free (CASE)



# An Industry on the Move

Industry leaders are redefining the value chain, creating new business segments and transforming traditional activities.



## Then came COVID...

The COVID-19 pandemic has had an unprecedented negative impact on the automotive industry. After shutting down, the industry is now open again...but facing a recession of massive proportions.

In this environment, there's huge pressure on liquidity. As companies work their way out of the crisis, cash is king once again. Cost optimization is essential. So is rebooting sales.

Survival and recovery strategies will differ from one company to the next.

**IHS Markit predicts global vehicle sales will decline by 22% in 2020 to 70.3 million units.<sup>4</sup>**





Accenture has identified

# 6 IMPERATIVES

that automotive companies should consider pursuing.

Our Tech Vision trends shed light on how companies might bring these imperatives to life.



# The Industry Imperatives

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6 imperatives will help automotive companies outmaneuver uncertainty and enter a period of recovery stronger than ever.



**1. Cost Transformation**



**2. New Reality Sales & Marketing**



**3. Core Mobility Transformation**



**4. Data Driven Mobility Enterprise**



**5. Mobility Services & Connected**



**6. Engineering & Embedded Software**



# 1. Cost Transformation

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All OEMs are under pressure to significantly cut their legacy costs in order to invest in their respective CASE-enabled futures. They have launched numerous initiatives in recent years to do just that. But there are technology-enabled approaches and advanced analytics that can help them identify new opportunities to take waste out.

## Characteristics of an automotive company successfully attacking costs



Widespread use of analytics to identify opportunities to slash costs; availability of shared OEM data can fuel advanced analytics.



Commitment to process innovation—and scaling new ideas fast.



Widespread use of AI and machine learning in warranty management, issue detection, incentive spend optimization and other areas to improve customer satisfaction.



Variable cost structures, monetized services, and outsourced business operations.



Standardized equipment to reduce variance and achieve economies of scale.

# Cost Transformation

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Accenture's 2020 Tech Vision trends can facilitate and accelerate efforts to attack and variabilize costs.



## Use AI and Me and Robots in the Wild to improve workforce efficiency

**Audi** uses machine learning and AI to help operators carry out welding quality inspections.<sup>5</sup> Its collaborative robot (or cobot), Walt, uses deep learning to assist workers in vehicle assembly. Walt's AI-based capabilities are so advanced he can recognize his human colleagues and greet them by name.<sup>6</sup>



# Cost Transformation

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There are several things automotive companies can now do begin variabilizing costs and tackling their cash flow and liquidity challenges:

01

**Apply a zero-based mindset** to spending, organization, supply chains and commercial opportunities.

02

**Use advanced analytics** to identify opportunities to simplify vehicle configurations.

03

**Embark/continue the journey to cloud** to improve innovation speed and variabilize costs.

04

**Outsource** functional activities— from IT and HR to supply chain and even R&D.

05

**Build innovation DNA** by looking for insights from non-traditional sources—including competitors.

## 2. New Reality Sales & Marketing

Consumer preferences are evolving. Yet, OEMs have used the same business models and sales channels/dealer networks for decades. Covid-19 has accelerated the need to meet consumers' demands for new experiences. Some companies have moved to digital channels and "contactless" sales. But data-driven interactions and personalization across the buying journey are still limited. Experiences remain fragmented.



### Characteristics of New Reality Sales & Marketing

- An "experience engine" powered by mass personalization, automation and a real-time sales funnel.
- API-driven marketing and sales interactions with real-time virtual content and contactless experiences.
- Omni-channel sales models (even direct-to-consumer, where allowed).
- Positioning as a technology company that delivers transportation solutions.



# New Reality Sales & Marketing

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Accenture's 2020 Tech Vision trends can facilitate and accelerate the new reality.



## Use Innovation DNA to explore new and more convenient vehicle-ownership models—including for after-sales services

Several OEMs, including **Volvo and Porsche**, are experimenting with subscription models of ownership that include various service options—insurance, roadside assistance and maintenance, even concierge services. All costs are included in the subscriber's monthly payment.<sup>7</sup> **Daimler** has partnered with RepairSmith to make car repair more convenient and transparent. Through this service's innovative pricing and booking platform, customers can schedule at-home service by certified mobile technicians.<sup>8</sup>



## Use Extended Reality to customize customers' visual experiences

At the Automechanika show in Frankfurt, **Delphi** used augmented reality to educate customers on the company's range of products found in a Honda Civic that was on display.<sup>9</sup> **Hyundai** uses augmented reality to overlay technical data onto its vehicles. The company has gone further by developing an AR sales tool for dealerships in Australia. That innovative solution helps sales agents show off the features and performance of Hyundai's new i30 hatchback that would otherwise be difficult to showcase in a dealer showroom.<sup>10</sup>



# New Reality Sales & Marketing

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There are several things automotive companies can now do begin the process of transforming their sales and marketing capabilities to better align with customers' needs and expectations:

**Share** data among functional teams to create a 360-degree view of customers.

**Build** an omni-channel presence to reach customers in as many ways as possible.

**Digitize** after-sales functions to extend and strengthen the customer relationship.

**Tailor** the buying experience (not the vehicle) to the shopping preferences of the consumer.

**Free time** and expertise to focus on brand-building by outsourcing content management and marketing to trusted third-party providers.



# 3. Core Mobility Transformation

The core IT landscape in any OEM typically has considerable inertia and a significant amount of technical debt. In the post-digital world, OEMs need to position IT as a strategic asset. Cloud + Collaboration + Connection (3Cs) will be key.

## Characteristics of an automotive company successfully transforming core IT

- 3Cs are used to build Innovation DNA and take advantage of the power of data and actionable insights.

- Extensive use of cloud and 5G to enable Vehicle-to-X Connection, thereby introducing a host of new services.

- Use of market-leading platforms to accelerate digital transformation of the core OEM value chain, resulting in reduced complexity, increased standardization and step-change simplification.

- Ecosystem of IT partners to leverage Innovation DNA and accelerate the industrialization of automotive use cases.



# Core Mobility Transformation

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Accenture's 2020 Tech Vision trends can facilitate and accelerate efforts to transform core IT.



## Use emerging technologies to build Innovation DNA (and speed) in production

**Toyota** is partnering with Microsoft to develop digital twins that simulate how an autonomous forklift will navigate an environment and handle encounters with other pieces of equipment. The solution allows Toyota to dramatically reduce the time the company would otherwise spend on automated guided vehicle implementation.<sup>11</sup>



## Pivot from AI and Me to AI and US

**BMW** recently released its algorithms for automated image recognition and image tagging software to the public. By doing so, BMW hopes that the global developer community will improve the code. In accordance with the spirit of open-source approaches, those using the algorithms will remain anonymous.<sup>12</sup>



# Core Mobility Transformation

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There are several things automotive companies can now do to transform their core IT systems:

- Identify gaps in the existing IT landscape that prevents end-to-end digitalization of customer experiences, user journeys or critical business processes and create a roadmap to address them.

- Activate the 3Cs. Leverage cloud to scale innovation, drive velocity and efficiency, and enable better collaboration, DevOps, predictive maintenance, automation, analytics and more--all while keeping a close eye on data gravity and the cost of cloudification.

- Design future-proof platforms with modular IT architectures to accommodate a digital core (complemented by microservices) and an API- first mindset (powered by AI and robotics).

- Build capabilities in cybersecurity and edge computing to manage the exponential growth of data volumes that will come from connected services and will be necessary to facilitate new business models.



# 4. Data Driven Mobility Enterprise

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Technology is at the heart of the new experiences that the automotive industry offers—whether those experiences take place in the vehicle, in a physical or online showroom, or in a dealer’s service/repair center.

**Data sharing** and **data analytics** will underpin every imperative to improve experiences in the coming years. They are the essential building blocks needed to not only understand customers’ needs and preferences, but also create the platform companies that distinguish themselves via a host of connected products and services. Car data and customer data will be tightly linked.

**74% of automotive executives agree they need to dramatically reengineer the experiences that bring technology and people together in more human-centric ways.**



# 5. Mobility Services & Connected

Automobiles are increasingly powerful mobile IoT devices that not only sense their surroundings, but also share data, download software, and communicate with other devices. This opens up a world of possibilities in terms of new features, consumer experiences and business models. Open innovation will be key.

## Characteristics of an automotive company successfully staking their claim in connected services

- A shift in mindset and operations from being a product company to a service company
- An operating system and architecture that supports rapid testing and development of connected services, enabled by AI and analytics.
- Innovation ecosystems that create differentiating experiences—with a steady focus on people's safety.
- Monetized digital functions and services.





# Mobility Services & Connected

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Accenture's 2020 Tech Vision trends can facilitate and accelerate efforts to build connected solutions and services:



## Putting the I in Experience with connected services

Many OEMs are experimenting with solutions that provide drivers unique and memorable experiences. **Porsche**'s Charging Planner acts as a digital co-pilot for EV drivers. It calculates when the vehicle needs to be charged, plans the stops, and calculates the fastest routes—all in real time.<sup>13</sup> **BMW** takes connected services a step further by bundling a consumer's most-used apps—from calendars to messaging apps—to create a home-away-from-home experience.<sup>14</sup> And **Tesla** offers "Premium Connectivity" subscription packages that include everything from live traffic visualization to movie streaming. It even offers Caraoke, an in-car karaoke experience with song lyrics from favorite playlists displayed on screen.<sup>15, 16</sup>

# Mobility Services & Connected

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There are several things automotive companies can now do to ramp up their connected service offerings:

**Put the I in Experience.** Identify the connected (and differentiating) services that customers want and can be feasibly monetized.

**Use data** gathered from the connected vehicle to continually improve and extend the customer experience—and the value proposition.

**Build the Innovation DNA** that is needed by engaging with third-party developers.

**Create a culture** of experimentation, enabled by cloud and DevOps.



## 6. Engineering & Embedded Software

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Automotive OEMs are transitioning from hardware-designed vehicles to hardware- and software-defined vehicles. This requires evolving their vehicle architectures from a collection of dozens of electronic control units that communicate via specialized BUS networks to a standard operating system, from which connected services, drive train electrification, automations, subscription services and more will be managed.

### **Characteristics of an automotive company successfully transitioning to software-defined vehicles**

- Agile approaches to product and service development.
- Decouple hardware and software development cycles.
- Seamless over-the-air updates, third-party integration.
- Ecosystems focused on software engineering.
- Talent strategies that are as focused on attracting/retaining computer scientists, as well as mechanical engineers.



# Engineering & Embedded Software

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Accenture's 2020 Tech Vision trends can facilitate and accelerate efforts to master on-board software architectures and agile approaches to product development:



## Use AI and external collaborations to drive software innovations

**Mercedes-Benz** has joined forces with Nvidia to eliminate the complexity of dozens of electronic control units in its vehicles. Together they have developed a software-centric computing architecture that includes a full stack of software designed for AI-enabled, automated driving applications. Moving forward, Mercedes and Nvidia will use the new supercomputing architecture to develop applications that cover all sorts of driver assistance functions, including automated parking. The architecture is expected to be standard in Mercedes' next generation of vehicles, beginning as soon as 2024.<sup>17</sup>

# Engineering & Embedded Software: Next Steps

**Automotive companies must accelerate their transition to software-designed cars through six actions:**

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Decouple vehicle and vehicle-function development cycles.

Eliminate the Dilemma of Smart Things by enabling software and hardware updateability and upgradability.

Choose the areas/domains of your vehicle's operating system you want to control and/or monetize (e.g., speech control, account log-ins, customer data, etc.) and those you will relinquish.

Choose your platform partner(s) wisely. Automakers will rarely be able to become software-driven alone. AWS, Google, Microsoft, Tencent and Baidu are just some of the main platform providers looking to occupy this space.

Understand geographical differences to determine which software platforms offer the most versatility and security.

Focus your talent strategy to attract the best data/computer scientists.

# About the Research

Each year, the Accenture Technology Vision team partners with Accenture Research to pinpoint the emerging IT developments that will have the greatest impact on companies, government agencies, and other organizations in the coming years. In 2020, the process included a global survey of 6,000 business and IT executives from around the world. Survey respondents included 124 leaders in the automotive sector from 12 countries. This report's findings are based on analyses of their responses.

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