



Research Insights

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Automotive 2030

Racing toward a digital
future

IBM Institute for
Business Value



By Daniel Knoedler,
Dirk Wollschlaeger,
and Ben Stanley

Talking points

Reinvigorate the brand

Both consumers and automotive executives put less emphasis on the brand in an autonomous, mobility-as-a-service paradigm. Brands need to prioritize in-vehicle digital experiences over driving features to differentiate.

Reinvent the experience—for both consumers and employees

Applying digital technologies to optimize processes and reduce costs isn't enough. Using these technologies to reinvent experiences, focus, and ways to work is essential to bringing previously unattainable value.

Reinforce the expertise

The shortage of expertise already impacts the automotive industry today—and poses a greater challenge in the future. Finding the right skills in house while also accessing them throughout the ecosystem are critical to a company's success.

Your morning commute in 2030

It's a sunny Monday morning and you're ready to head to work. The vehicle—let's call it "ACES" (Autonomous, Connected, Electrified, and Shared)—that you ordered Sunday night arrives, so you get in. The first thing ACES does is wish you a happy birthday. Next, it plays "Happy Birthday to You" and shares social media greetings from family and friends through its infotainment center.

As you are enjoying the messages, ACES starts driving you to your destination while alerting you to upcoming traffic issues. It suggests alternative routes and asks if you want to pick up dry cleaning en route.

While this is happening, ACES quickly scans your health vitals and coordinates with your fitness app. It checks your house in case the TV or other appliances were left on, and downloads the audio book you listened to earlier. ACES suggests you might want to walk the last mile because you missed your exercise target last week.

ACES communicates with local businesses on your personal approved list. You pass the theater that has a concert your spouse wants to attend. ACES checks both your schedules, ticket prices, and availability, then asks if you want to make the purchase. While ACES executes the transaction, it puts the event on both of your schedules, and arranges for a vehicle to transport you to and from the concert.

When you arrive near your destination, ACES drops you off to walk the last mile. It stores new learnings or personal preferences in your mobility profile before wishing you a good day. ACES then sets out to pick up its next scheduled customer, setting up their personalized experience along the way.

Does this all sound a bit far-fetched? In fact, thanks to digital technologies, these and many other vehicle capabilities and mobility services are expected to be readily available by 2030.



48%

of consumers say the vehicle brand wouldn't matter to them in an autonomous, mobility-as-a-service paradigm, but **cost and convenience** would



50%

of automotive executives say that to succeed or even survive, their **organizations need to digitally reinvent themselves**



33 billion

Automotive executives **expect the industry to spend over USD 33 billion** to reskill their employees by 2030

Many predictions about the automotive industry in 2030 support this vision:

- Every person will own 15 connected devices.¹
- Up to 15 percent of new cars sold could be fully autonomous by 2030.²
- Software will account for 90 percent of innovations in the vehicle and lines of code will be a hundredfold what they are today.³
- Car-sharing could make up 26 percent of global miles traveled.⁴

Clearly, technology advancements and consumer expectations are the constant drivers of change over the next 10 years (see Figure 1). Sustainability is driving the focus on electric cars and the need for new skills is causing shortages in the workforce. Personal mobility serves as an even greater influence as the sharing economy grows. At the same time, the influx of outside competition delivers new value and displaces traditional automotive companies.

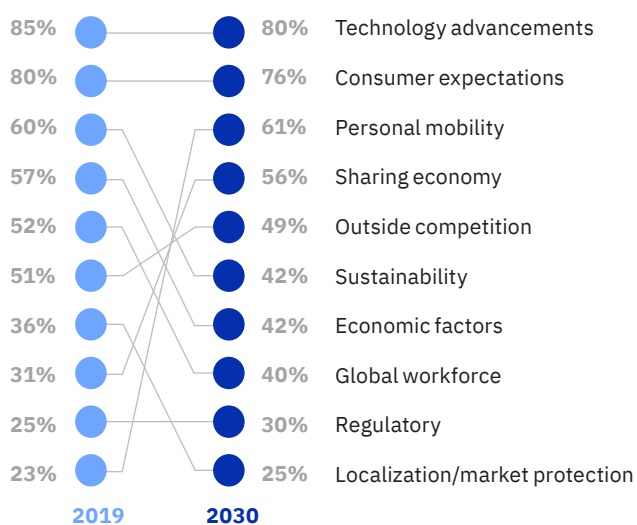
Regardless of how quickly the future materializes, two things are certain. First, digital technologies create entirely new ways to foster seamless touchpoints with consumers. They provide insights that deliver personalized services and integrate the vehicle with various aspects of a person's life. And second, consumers expect the digital experiences they get from the vehicle to be as good or better than those they get from their other smart devices.

“Digital reinvention will bring immense competition within the automotive industry in order to deliver the best products and services to meet customer needs.”

Senior Executive, Supply Chain and Logistics,
Original Equipment Manufacturer (OEM), Italy

Figure 1

Influencing the industry



Source: Automotive 2030 Executive Survey. Q: What are the most important external influences that will impact the industry today and in 2030? Select 5 for today and 5 for 2030.

The automotive industry was born and has operated for the past 100 years on a single business model—producing, selling, and servicing vehicles. But radical change is coming fast for the global automotive industry. What actions can the industry take to accommodate this change? How can an automotive organization evolve to operate and innovate like a high tech company that centers its business around digital and data? And how can automotive companies distinguish their brands by developing and conveying an ability to execute faster, more flexibly, and at greater scale than competitors?

To glimpse into the future, the IBM Institute for Business Value (IBV) conducted the Automotive 2030 Consumer Survey with 11,566 consumer respondents, as well as the Automotive 2030 Executive Survey with 1,500 automotive executive respondents (see “Methodology” on page 22).

Fifty percent of surveyed automotive executives say that to succeed or even survive, they need to reinvent their organizations with digital technologies. And 42 percent have a high sense of urgency. Even something as sacred as the vehicle brand could lose importance in the mobility-as-a-service world—unless the digital experience earns consumer loyalty.

Digital in the driver's seat

Traditional descriptions of how consumers experience the vehicles focus on aspects of driving their cars. Automotive companies talk about features such as “handling,” “horsepower,” or “styling.” And within the current single ownership model, these attributes often work.

But vehicles are transitioning to being more automated and autonomous. Less time is spent driving and more time is available for occupants to do other activities. Their focus inevitably turns from driving the car to the digital experience inside the vehicle. Attributes such as “connected,” “personalized,” and “seamless” become more viable.

For many people, getting into a car and going somewhere is a waste of time. They stop what they are doing, travel to their destination, and then return to their previous activity or start something new. One estimate shows Americans spend an average of 51 minutes per day in their vehicles.⁵ This time could be used for other tasks such as online shopping, making vacation reservations, or watching personalized news reports. Virtually all of these options and more could be accessible directly through the vehicle.

Automotive companies have a tremendous opportunity to create in-vehicle digital experiences that can attract consumers to their brands. With the ability to learn from, configure to, and personalize occupants' preferences, vehicles become the most sophisticated smart device consumers use. Now occupants can focus on what activities they want to pursue while in the vehicle. The interruption of traveling changes from “time wasted” to “time well spent.”

Gauging interest in digital mobility

An important indicator of the consumer's desire for mobile digital experiences is their overall adoption of digital technologies. And while in-vehicle digital technologies can remain complicated, consumers who use the technology typically have embraced other forms of digital.

Another factor is whether people live in urban or rural settings (see “Methodology” on page 22). People who live in urban settings have more mobility options. And the cost and convenience of owning a personal car is higher due to space constraints and traffic congestion. People who live in rural settings often do not have alternative convenient mobility options, so they prefer to own a vehicle.

From our results, we see that consumers living in urban settings tend to be higher users of digital technologies than those residing in rural areas. Sixty-two percent of urban consumers regularly use social media, compared to 55 percent of rural users. Also, 60 percent of urban consumers use multiple digital devices each day, as opposed to 50 percent of rural users. And finally, 48 percent of urban consumers have a digital assistant in their homes, with only 30 percent of rural users using these devices.

Urban and rural consumers also differ in their attitudes toward sharing personal information in exchange for value. Fifty-four percent of urban versus 44 percent of rural consumers are willing to share their medical information in an emergency. Fifty-one percent of urban users will share their mobility information in return for better products and services, compared to 35 percent of rural consumers. Forty-one percent of urban consumers will share financial information during e-commerce transactions from vehicles—almost double the 21 percent of rural users.

The consumer's mobility digital expectation includes cognitive capabilities of the vehicle. While most of the discussion is about the ability of the vehicle to drive itself, digital technologies such as artificial intelligence (AI), Internet of Things (IoT), and cloud can fuel many other features. Vehicles will be able to recognize occupants and personalize the content displayed to them. Vehicles will also continuously learn and offer new suggestions based on consumer interests. And most significantly, vehicles will be able to engage their occupants in natural conversation.

The ability to talk, understand things in context, and help people can be a great advantage for those who are not as technically astute or comfortable with the technology in

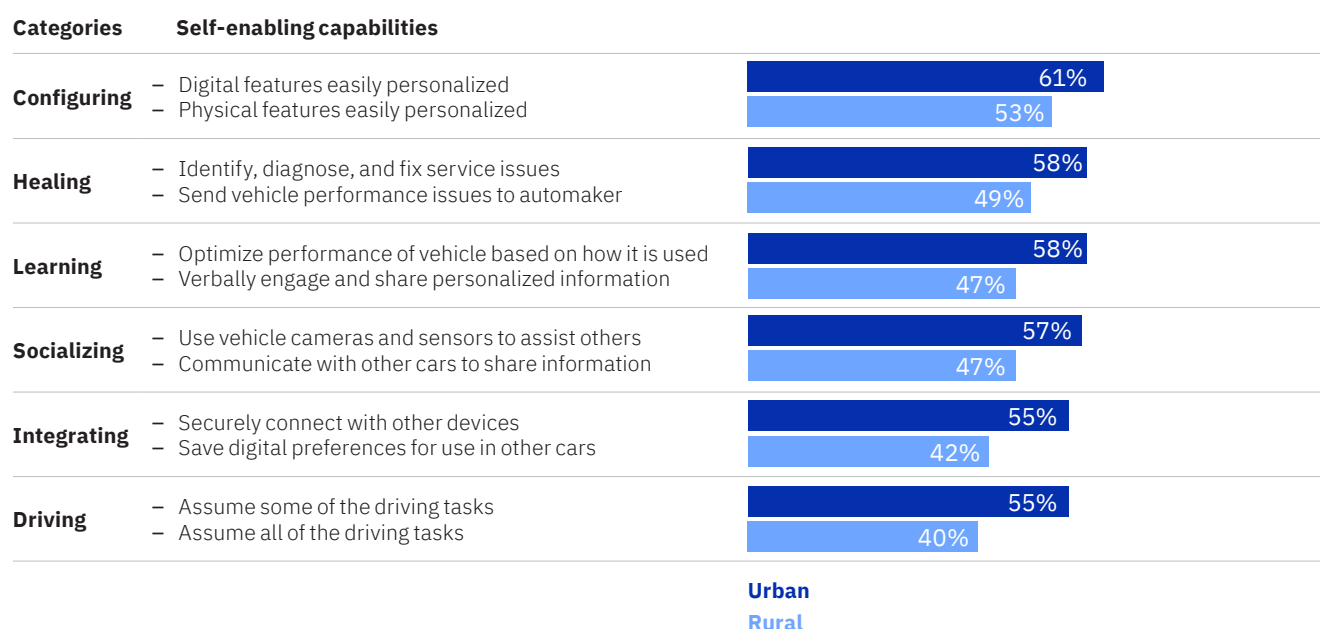
the car. Figure 2 shows the interest level consumers have in the cognitive capabilities of future vehicles, with urban users once again outpacing rural.

With people having time on their hands for other tasks besides driving the car, mobility services are a critical consideration. For consumers who are health conscious or have a medical condition, the vehicle will be able to monitor their health, alert them of issues, and share the information with other health-related devices.

Concierge capabilities can assist in locating and reserving the nearest hotel, or make dinner reservations at a favorite restaurant based on estimated travel time.

Figure 2

The ultimate digital device



Source: Automotive 2030 Consumer Survey. Q: How interested would you be in the following capabilities in future vehicles? Rank 1 to 5. 4/5 responses.

Location-based marketing and sales promotions will be available. Connected life services allow the vehicle to preheat the oven and turn on the lights while traveling to the consumer's home. In Figure 3, urban and rural consumers report the services they are most interested in.

Besides the cognitive functionality in the vehicle and the mobility services consumers can use *while* they move around, they are also increasingly interested in *how* they move around using non-ownership models of transportation.

Once again, urban and rural users express different preferences. Forty-eight percent of urban consumers are strongly interested in “e-hailing” compared to 32 percent of rural. Forty-five percent of urban consumers are strongly interested in ride-sharing versus 25 percent of rural. Thirty-nine percent of urban consumers are strongly interested in peer-to-peer car sharing, more than double the 18 percent of rural respondents who shared this interest.

Figure 3

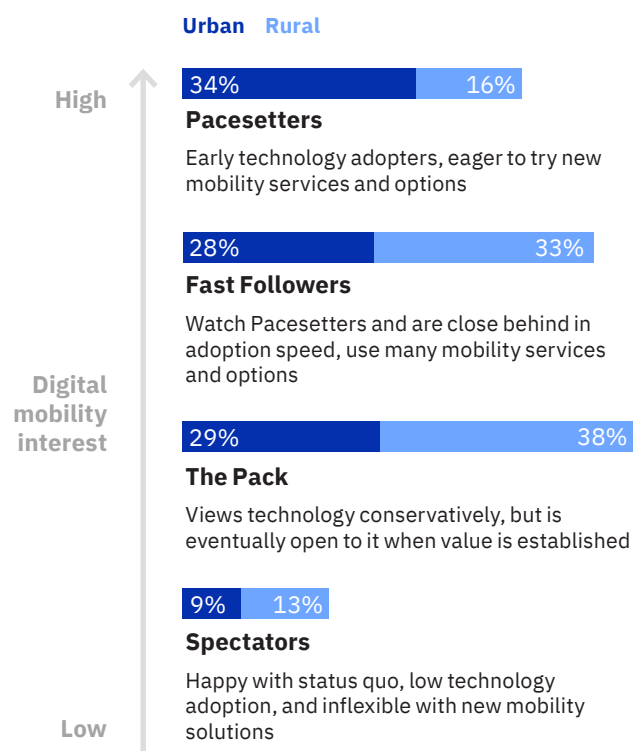
When drive time becomes thrive time



Source: Automotive 2030 Consumer Survey. Q: How interested are you in being able to do other things from your car while moving from one place to another? Rank 1 to 5. 4/5 responses.

Figure 4

Digital mobility adopters



Source: Automotive 2030 Consumer Survey. IBM IBV analysis.

The ability to hail a taxi, share a ride, or borrow your friend's car has been available for a long time. But doing it "on demand," where the car comes to you through an integrated digital mobility platform, has caused consumers to reconsider owning a car at all.

Looking at each of these mobility components—digital maturity, vehicle capabilities, services, and transportation modes—can give us insight into consumer desires. Analyzing these components allows us to create four distinct clusters of consumers with similar digital mobility interests (see Figure 4).

The Pacesetters and Fast Followers groups are the most technologically advanced and together represent 62 percent of urban respondents and 49 percent of rural respondents. These groups are users of technology and have indicated a strong interest in different mobility options.

The Pack, which represents 29 percent of urban respondents and 38 percent of rural, is somewhat hesitant about future mobility capabilities and services. But this group could be influenced once they better understand the potential value of these services. Finally, Spectators are happy with the status quo and generally inflexible about exploring new mobility solutions.

Automotive companies should pay close attention. Being able to personalize the experience based on these consumer groupings can encourage greater interest and adoption.

Survival of the brand

One critical question that looms is what happens to the brand in an autonomous, mobility-as-a-service world. As electric, autonomous vehicles start roaming the streets, fuel and driver charges could disappear, drastically reducing the cost-per-mile. One study estimates the cost-per-mile could be as low as 6.8 cents.⁶ How can automotive companies prevent their vehicles from becoming nothing more than nondescript, cheap transportation vehicles—with the brand, which was once the company's identity, sinking into irrelevance?

Forty-eight percent of consumers say the brand wouldn't matter to them—cost and convenience are most important. *But consumers are willing to look beyond cost and convenience if the brand can provide other experiences—especially digital (see Figure 5).*

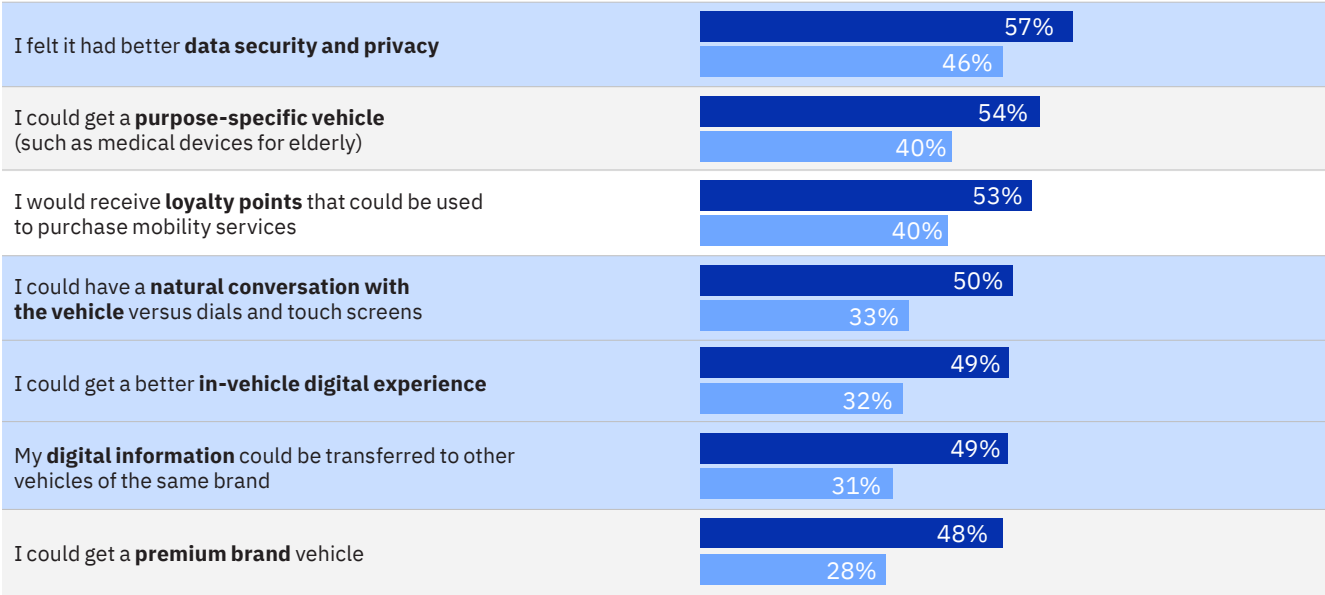
Consumers expect their personal data to be secure and kept private. This becomes even more complicated when using an e-hailing or car sharing service where the personal data must only be accessible during the time physically spent in the vehicle. This data cannot be shared with vehicles from competing brands. *But the ability to transfer personalized digital information from one vehicle to another within the same brand can create loyalty regardless of the mobility platform used.*

Digital experiences are not the only differentiators that motivate consumers to stick to a brand. Purpose-specific vehicles are also desirable. A parent with two children would want a vehicle with car seats. An elderly person with medical needs may want a vehicle equipped with their required medical devices. A person with disabilities needs easy access and the ability to store equipment such as a wheelchair. Finally, the automotive industry could seek inspiration from industries such as travel, and introduce loyalty programs.

Interestingly, the ability to have in-vehicle digital experiences is rated higher than procuring a premium brand. And the consumer's latest, best experience becomes the gold standard, regardless of what industry that experience was from. Automotive companies should look at other industries to benchmark, learn, and emulate.

Figure 5
Brand magnets

I would request a specific brand if...



Functionality Digital Physical Other Urban Rural

Source: Automotive 2030 Consumer Survey. Q: When thinking about an e-hailing service that uses self-driving cars, how important is the brand to you? Rank 1 to 5. 4/5 responses.

“Sustainable growth should be a major concern for the automotive industry.”

Senior Executive, Manufacturing, OEM, Japan

New routes to growth

As discussed earlier, the traditional single vehicle ownership business model has been the industry mainstay. Automotive companies have built large and successful businesses from this model. And the industry plays a significant role in global economies. For example, according to 2017 estimates, the automotive industry was responsible for 12 percent of the gross domestic product (GDP) in the US, 12 percent of the GDP in Japan, 14 percent of the GDP in Germany, and 10 percent of the GDP in South Korea.⁷

For many, the traditional ownership model will continue to be a valid option in 2030. But a growing opportunity exists for automotive companies to exploit new routes to growth through mobility. One estimate shows revenues from on-demand mobility and associated services growing from USD 30 billion in 2016 to USD 1.5 trillion in 2030. This is potentially an additional 30 percent in revenues and a tremendous opportunity for automotive companies—or at least for those with a renewed focus beyond traditional manufacturing and marketing.⁸

Innovation is the differentiator

For automotive companies to differentiate their brands, innovation continues to be of paramount importance. Seventy-two percent of surveyed automotive executives say innovation is one of the most significant attributes for defining their competitive advantage.

The importance of innovation drives reinvention across multiple aspects of automotive organizations. Eighty-three percent of executives say *strategy innovation* is critical to creating the agility to address rapid change and opportunities. Strategy innovation is also critical as companies explore and pilot new business models for

ownership, mobility services, and data. For companies working to create more operational efficiencies, 81 percent say *process and operations innovation* is very important. Of course, *products and services innovation* remains high with 75 percent of executives identifying it as a key driver of success.

For organizations looking to redefine or even create new industries, *industry model innovation* is essential, according to 74 percent of executives. And even the different roles a company can play in the multiple ecosystem networks is important, with 67 percent of executives citing *enterprise model innovation*. Sixty-six percent of executives say innovation will play a strong role in new revenue models. This is especially true as automotive companies expand their portfolios beyond traditional vehicle sales to include data revenue and more.

Reviving the entrepreneurial spirit

The automotive vehicle was born from an entrepreneurial spirit and a desire to create a better, safer way to move people around. And the industry has been a global leader in research and development spend over the years, continually improving the performance of its vehicles. Yet until now, little has been done to introduce fresh, new ways for people to travel.

Thanks to digital technologies, that has changed. Nontraditional companies have disrupted the marketplace with new business models and new ways to move people from one point to another. Industry executives have taken notice and now realize if they don't reignite their entrepreneurial passion, they might be left in the dust. This could be why 82 percent of executives expect a culture of entrepreneurialism and new ideas to significantly contribute to their success and growth.

When asked which routes to growth were most viable, executives rated new business models, including digital platforms, the highest (see Figure 6). Executives also see entering new geographic markets as critical, with global companies continuing their push into growth markets. And conversely, automotive companies based in growth markets are making their presence known globally. This is particularly true as electric vehicles become more mainstream over the next 10 years.⁹

When we looked at specific countries, executives in Brazil (83 percent), South Korea (79 percent), and the US (73 percent) rated “collaborating with other industries” as one of their top opportunities for growth. India (80 percent), Brazil (76 percent), China (76 percent), Mexico (76 percent), and Germany (74 percent) were above the average for other respondents in selecting “creating new mobility services.”

The explosion of on-demand mobility and associated services over the past several years—and the expectations for these services in the future—is creating new revenue streams for the automakers that take advantage of them.

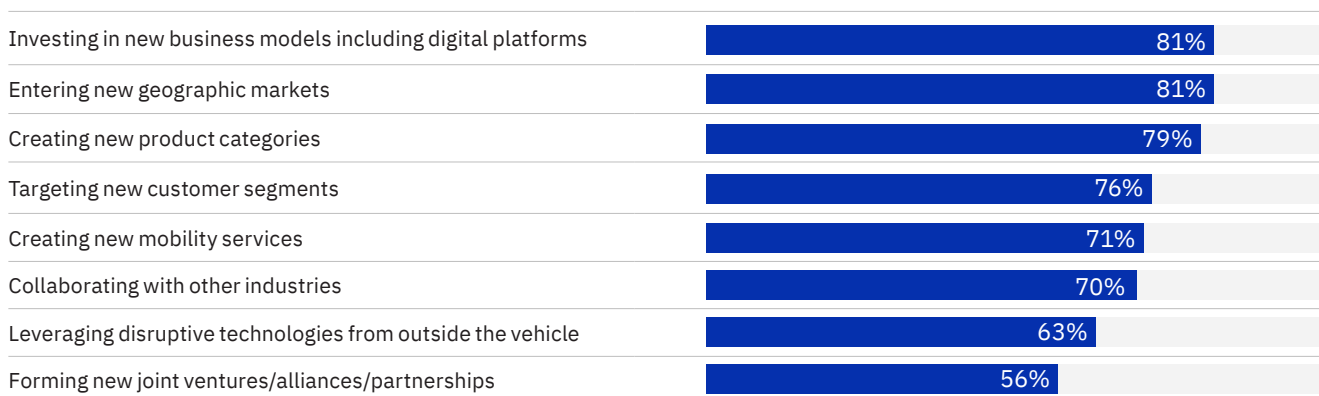
To determine the potential impact of mobility services on overall revenue pools, we asked executives how their portfolios could change by 2030. We delineated the revenue portfolio into three groups: traditional one-time vehicle sales, mobility services, and other services (for example, aftermarket, captive finance, and insurance).

Executives reported an average of 84 percent of their revenue comes from traditional sales, 5 percent from mobility services, and the final 11 percent from other services. Projecting to 2030, the average percentage from traditional sales dropped to 78 percent, mobility services doubled to 10 percent, and other services stayed about the same at 12 percent. For a company with total revenues of USD 100 billion, this would be a USD 5 billion increase for mobility services, not taking into account overall revenue growth between 2019 and 2030.

Of note is that 48 percent of the executives we surveyed generate revenue from mobility services today. Based on their expectations, 80 percent of executives anticipate they will do so by 2030.

Figure 6

Routes to growth



Source: Automotive 2030 Executive Survey. Q: Where do you see the best opportunities for your organization's growth looking toward 2030? Rank 1 to 5. 4/5 responses.

“The major value creator will be the customer experience and digital initiatives, which will help us to improve our brand value.”

Senior Executive, Digital Services, OEM, Japan

Branding for safety and personalization

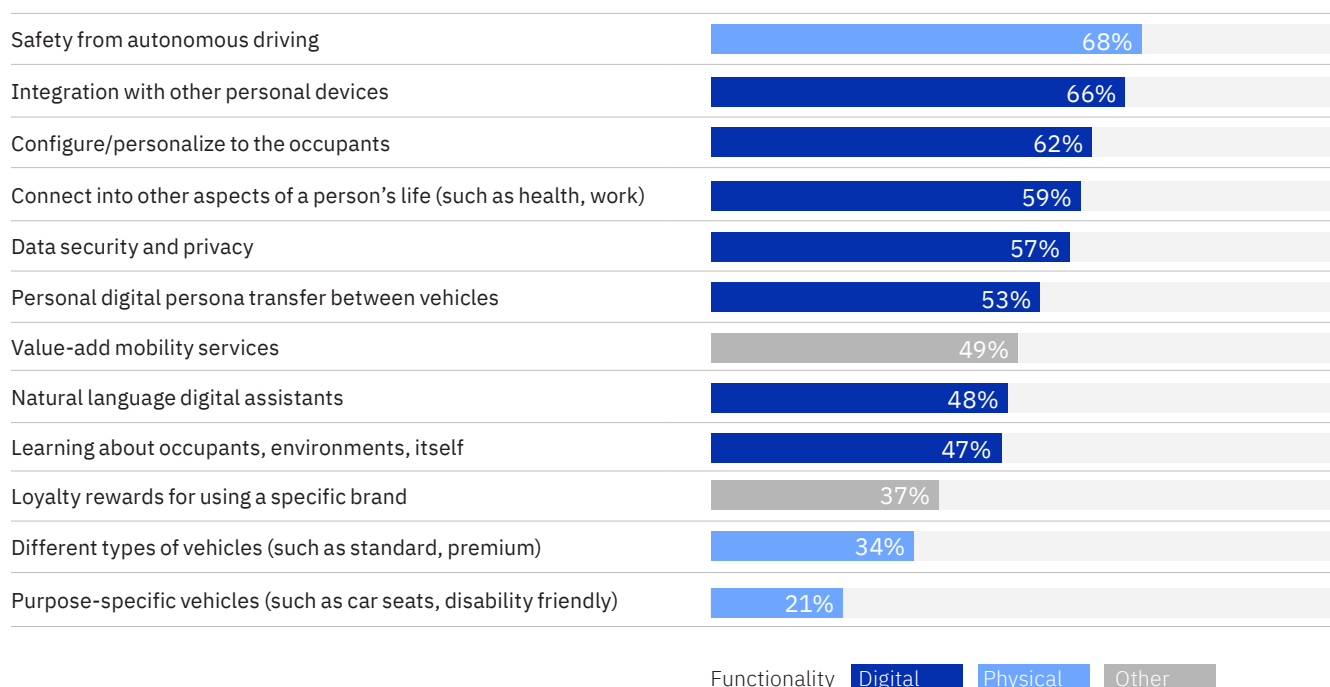
Today, 69 percent of automotive executives say the brand is a competitive advantage. But only 46 percent expect this to be the case by 2030. *This is a decrease in brand confidence by 33 percent.* If automakers don’t find a way to attract consumers, their brands could become irrelevant. How can automotive executives enhance the value of their brands and retain customer loyalty?

Sixty-eight percent of executives identify safety as a brand differentiator for autonomous vehicles (see Figure 7). This makes perfect sense, because a brand perceived as unsafe will not survive in the autonomous world. Following safety, digital in-vehicle experiences comprise the next seven of eight highest-rated attributes.

Figure 7

Experiences that stick

Brand loyalty attributes



Source: Automotive 2030 Executive Survey. Q: What will be the most important differentiating attributes for creating customer loyalty and “stickiness” to a vehicle brand when using on demand mobility services? Select 6.

In fact, 80 percent of executives expect customer experiences to be greatly enhanced by digital services. The vehicle's abilities to learn about its occupants, integrate with other devices, protect and share personalized information within the brand, and have a natural conversation can all lead to greater brand eminence and loyalty.

Brand loyalty drives choices that transcend business models. Imagine a scenario in which a young couple is using an on-demand e-hailing service. It provides them with not only the cost and convenience they desire, but also with the vehicle brand that can give them the personalized, digital experience they've become accustomed to. Now this couple starts a family and may want the convenience of a personal car. They could conceivably buy a vehicle from the same brand used for e-hailing.

And the perceived value of a premium brand? Executives have low expectations, with only 34 percent anticipating different categories of vehicles (such as premium) will be brand differentiators.

One category where executives seem to disconnect from the consumers we surveyed is with the purpose-specific category of vehicles. Only 21 percent of executives say this is a differentiating attribute. But 54 percent of urban consumers and 40 percent of rural consumers indicate they would select a brand with purpose-specific capabilities over another. Automotive executives should reconsider their positions on this.

Loyalty points are another way to create brand stickiness. Automotive executives seem less optimistic than consumers on this option and may want to take it more seriously.

“Agile and dynamic business processes will help our company implement the changes in the market smoothly over the next 10 years.”

Senior Executive, Mobility, OEM, Mexico

New ways to work

Today’s automotive companies face intense competition from startups and internet ventures. These nimble organizations are becoming successful in mobility with new business models, agile processes, rapid releases, and laser-sharp focus on the customer. To innovate and scale, industry leaders need to combine the creative capabilities and skills of a startup with the traditional strengths of an industrial enterprise.

Eighty-two percent of executives say incorporating new ways to work will contribute to the success of their companies. These include integrating design thinking, co-creation, agile processes, and data-driven decisions into their organizations’ cultures. Seventy-eight percent of executives agree that promoting agile and flexible business processes and technical architectures are critical to their success.

The ability to build dynamic cross-functional teams that can quickly learn from market experiences is important for 76 percent of executives. Seventy-three percent say agile teaming will foster the ability to rapidly transfer skills and knowledge development as an idea transitions from pilot to production.

Dynamic, cross-functional teams are not bounded by the organization. In today’s world of rapid development and co-creation, these teams need to expand beyond the organization into the ecosystem and even cross-industry.

Companies that have traditionally been fierce competitors are now collaborating to quickly bring new mobility products and services to market. Often, these products and services would be too time-consuming and costly to pursue separately.

For example the BMW Group and Daimler AG are pooling their mobility services to create a new global player that provides sustainable urban mobility for customers. The cooperation comprises five joint ventures: REACH NOW for multimodal services, CHARGE NOW for charging, FREE NOW for taxi ride-hailing, PARK NOW for parking and SHARE NOW for car-sharing.¹⁰

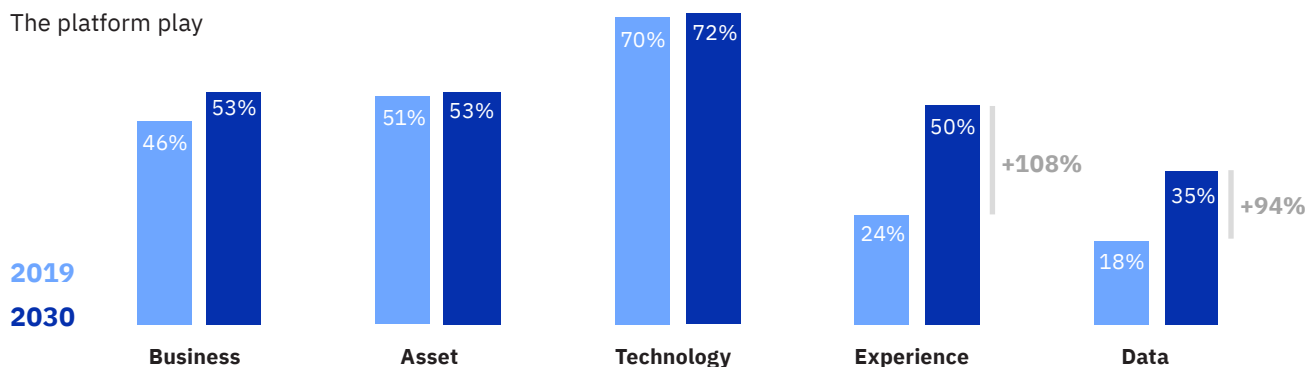
Partnering through platforms

Automotive executives are enthusiastic about the benefits digital platforms can bring to their organizations. Eighty percent say platforms enable greater innovation of products and services, while 79 percent say platforms enable greater personalization for the consumer. Seventy-one percent say platforms contribute to lowering industry barriers of entry and 68 percent say platforms facilitate greater value from data and information. Digital platforms drive greater collaboration and trust between partner organizations, according to 75 percent of executives surveyed.

Five types of digital platforms are providing value today (see sidebar, “Driving new growth” on page 14). Business, asset, and technology platforms are the most active (see Figure 8). This fits with the product-focused business

Figure 8

The platform play



Source: Automotive 2030 Executive Survey. Q: What types of digital platforms will your organization operate or participate in? Select all that apply.

“The focus is shifting toward developing platforms that can create high growth opportunities for automakers in the coming years.”

Senior Executive, Manufacturing, OEM, China

model that the industry currently embraces. Multiple businesses are brought together, collaborating with technology, facilities, and expertise to design, build, sell, and service vehicles.

But as we look toward 2030, we see that experience and data platforms become much more relevant. This supports the shift to a greater digital focus that creates more personalized, seamless experiences with consumers—and takes advantage of the huge amounts of data accessible to automotive companies. One estimate has an autonomous vehicle, driven an average distance, generating up to 4,000 GB of data per day.¹¹

But today, the use of multiple platforms remains relatively immature. Only 15 percent of executives say their organizations are operating or participating in three types of platforms. This is expected to grow to 30 percent in 2030.

Similar to our analytical approach with customers, we also looked at specific digital strategies of automotive businesses to establish three distinct groups (see sidebar, “Digital clusters” on page 15).

A look at the more digitally progressive companies shows 51 percent of Accelerators expect to operate or participate in four to five platforms by 2030, compared to only 24 percent of Cruisers and 10 percent of Laggards. Cruisers and Laggards need to accelerate use of multiple platforms to take advantage of the products, services, and expertise that a greater number of partners in a broader ecosystem can provide.

By 2030, executives in our survey estimate revenue from platforms will be 15 percent of their total. For an industry expected to reach USD 6.7 trillion in total revenues by 2030,¹² this equates to USD 1 trillion coming from digital platforms, a 67 percent increase over today’s platform revenue. To accomplish this, industry executives expect to have an annual investment budget of over USD 126 billion by 2030. This is a 38 percent increase in the investment budgets for platforms today.

Driving new growth with five types of digital platforms

Business platform

Creates integrated environments that support and enable ecosystems to operate.

Asset platform

Provides or manages physical assets used for production either within supply chains or networks, or other critical activities within ecosystems.

Technology platform

Provides technological capabilities that cannot be sourced affordably elsewhere.

Experience platform

Creates and orchestrates the end-consumer experience.

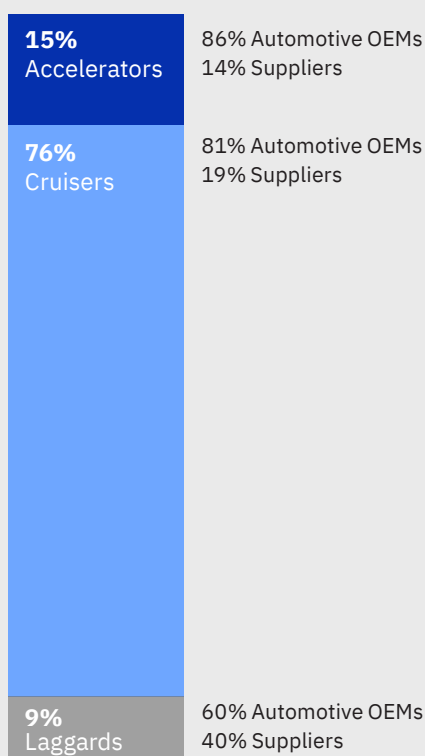
Data platform

Provides critical or essential data in the ecosystem.

Digital clusters

We analyzed the respondents based on the value they see from three areas:

- New business models, including digital platforms as a path to growth
- Innovation as a competitive advantage
- Digital innovation as a strategic advantage and key contributor to organizational success.



Source: Automotive 2030 Executive Survey. IBM IBV analysis.

“Data is very crucial and capturing the right data will play a very important role.”

Chief Financial Officer, OEM, Germany

Data-driven strategies

Automotive companies are sitting on a treasure trove of data—data generated by their businesses, products, services, customers, and other external sources. The potential uses of this data are tremendous—from greatly improving industry and company practices to personalizing consumers’ in-vehicle experiences to creating new mobility options. Eighty-three percent of executives say their organizations understand the strategic value of data.

Automotive executives recognize many opportunities where insights from data could create a strategic advantage. They report some more progressive ways data insights could drive value, including:

- *New experiences.* Creating personalized touchpoints with consumers (cited by 86 percent of executives).
- *New expertise.* Developing opportunities with other industries (cited by 84 percent).
- *New focus.* Defining and testing new business model ideas (82 percent).
- *New ways to work.* Enabling a responsive organization (76 percent).

When asked where their organizations are today in terms of data usefulness, executives indicate they are using data to create value in how they work. Eight-five percent say their organizations access both structured and unstructured data that come from a variety of sources. These sources could include IoT devices in plants, vehicle sensors, and cameras, or dealer technician reports that include handwritten analysis. Eighty percent of executives report the ability to extract and link data from these and many other sources. Seventy-six percent are creating actionable insights from the data they collect.

Also, 74 percent of executives report they are applying AI and other emerging technologies to uncover new insights. These could include identifying undefined or unmet consumer needs and sharing data with business partners to uncover product and service opportunities.

“The digital disruption will affect and play a significant role in the entire automotive industry.”

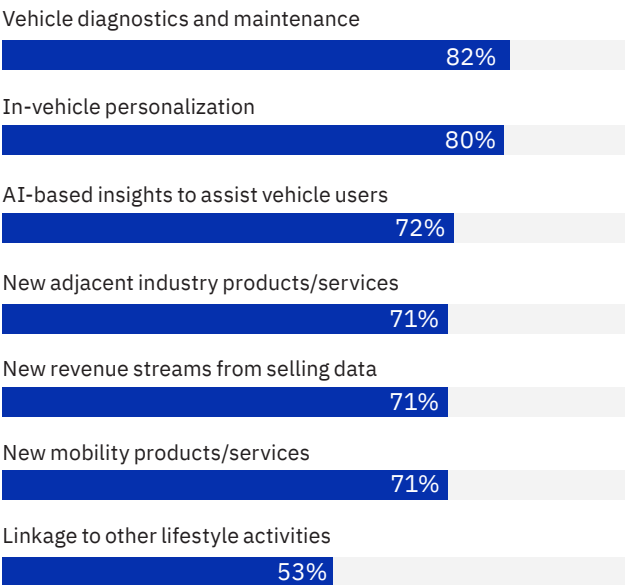
Senior Executive, Research and Development, OEM, Germany

The analysis and use of vehicle-specific data will also bring new value to organizations and consumers. Figure 9 illustrates the different ways executives expect vehicle data to contribute to their organizations’ value.

As expected, vehicle diagnostics and maintenance top the list. Being able to proactively diagnose and fix issues using insights from data is especially valuable because the cognitive vehicle handles more maintenance situations on its own. Other consumer experience opportunities such as personalization, AI-based insights about occupants, and linkage to lifestyle activities are digital capabilities that can create brand loyalty. New mobility and adjacent industry products and services, along with the ability to sell data, create new income streams for automotive companies and their business partners.

Figure 9

Data-driven value



Source: Automotive 2030 Executive Survey. Q: Where will vehicle usage data drive the most value in your organization? Rank 1 to 5. 4/5 responses.

While 77 percent of executives we surveyed say their organizations are making the most out of the data they collect, the truth is, most companies may not be doing so. One recent prediction is that up to 73 percent of data in an enterprise will go unused for analytics.¹³ Yet paradoxically, companies reinvented through digital technologies will be powered by data. Mining data from all business facets, including data that describes how products and services are used and data that customers allow access to, facilitates deep context and insights. These can support new growth for companies and new experiences for both employees and consumers.

Dominance of digital

Two-thirds of executives agree that OEMs will significantly outsource their vehicle production operations to focus on becoming digital companies.

Digital initiatives are expected to bring high value across the business functions of the organization, with those functions directly impacting the consumer rated the highest. Digitized products and services (74 percent) enable the brand transition from functions and features to experiences. Digitized marketing and sales (66 percent) can allow multiple, seamless touchpoints with consumers during the use of the vehicle, as well as giving marketing and sales executives continuous feedback on what consumers want. New personalized products and services can be offered up in a subscription or pay-as-you-use model.

Sixty percent of executives expect new business models to be enabled through digital initiatives. The ability to integrate the vehicle to other aspects of a consumer’s life gives automotive companies the opportunity to explore new business models in industries such as insurance, finance, and health.

On the other end of the spectrum, 57 percent say supply chains will be significantly impacted through the use of digital technologies such as sensors, IoT, and AI. The ability to have actionable insights into the movement and condition of material and goods throughout the supply chain allows companies to proactively predict and

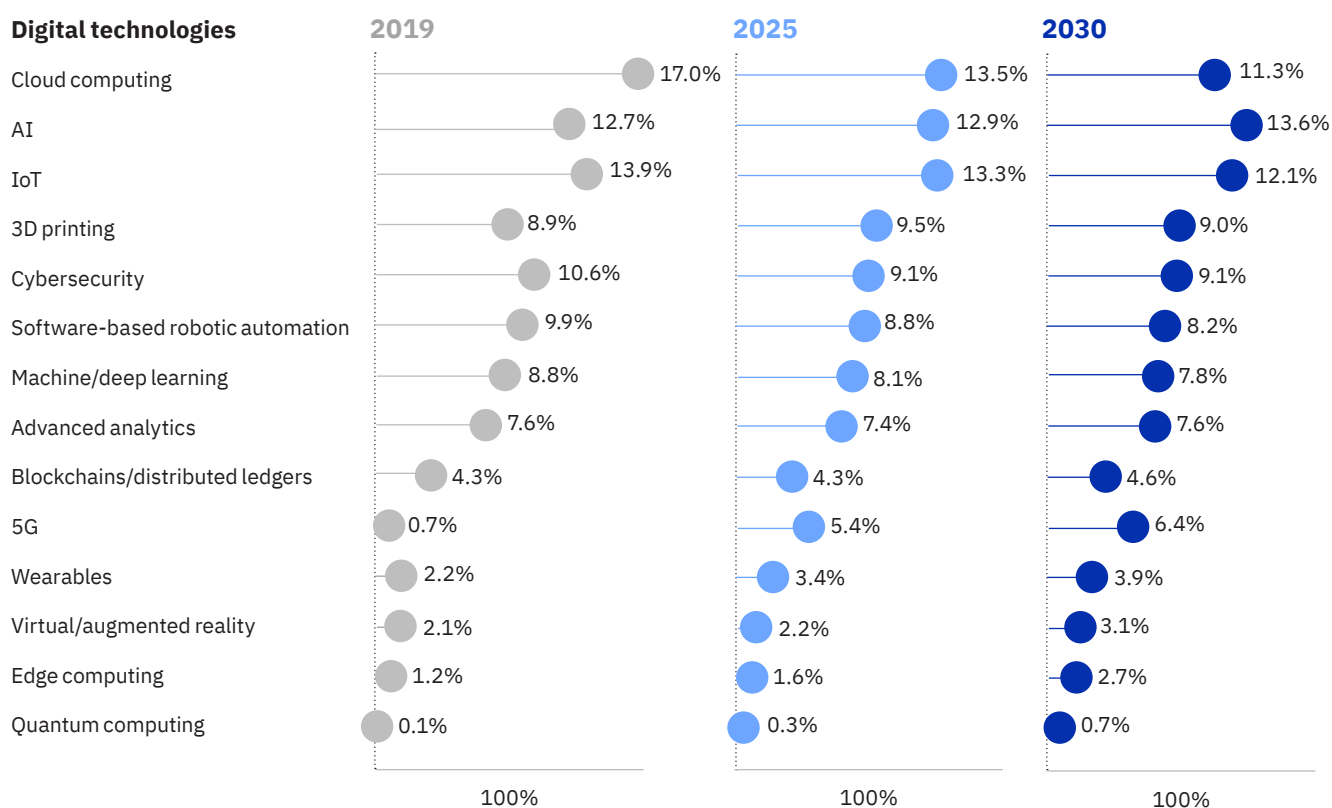
respond to issues—instead of reacting after the fact. And technologies such as software-based robotic automation, virtual and augmented reality, and wearables assist workers in finding new ways to improve and optimize the plant floor, according to 49 percent of executives.

When asked how they saw their organizations allocating their investments in digital initiatives over the next 10 years, cloud computing, AI, and IoT are cited as the highest investments (see Figure 10).

Certain technologies are ascending in industry importance. With improvements in printing technologies and materials, 3D printing is expanding beyond just creating prototypes to low-volume production and re-manufacturing. Accessing 5G communications means faster vehicle connectivity, facilitating high-speed video or gaming applications that demand heavy bandwidth. Blockchain is gaining momentum in the industry, helping to provide trust and authenticity within the supply chain. In fact, Ford is using blockchain to help ensure ethical sourcing of cobalt, which is used in lithium-ion batteries for electric cars.¹⁴ Even an emerging technology such as quantum computing is expected to see an increase in investment over the next 10 years.

Figure 10

Divvying up the digital investment portfolio



Source: Automotive 2030 Executive Survey. Q: Of the total amount of investments planned for the following digital initiatives, what will be applied to each? Assign a percentage to each for a total of 100%.

Note: Technologies are ordered based on the highest to lowest average across 2019, 2025, and 2030.

“Major instability in the automotive industry will be created due to lack of skills.”

Senior Executive, Connected Vehicle, OEM, India

Expertise becomes the enterprise

With the fast pace of industry change, skills grow obsolete quickly. More recent analysis shows the half-life of skills is now only five years.¹⁵ This means the skills learned today are only half as valuable five years from now—and we don’t even know what we don’t know yet.

The pace at which new jobs are added, especially in the autonomous mobility ecosystem, will have automakers scrambling to fill them. Imagine a “Mobility Traffic Controller” to help navigate autonomous cars in complex scenarios. Or a “Personal Mobility Advisor” who works at a dealership and helps families determine the most appropriate mobility solution for their needs.

Reinventing the digital automotive enterprise requires new skills, and not just skills that help workers do things faster. These new skills enable the workforce to perform the digital tasks that can support—and create—new ways to work.

Companies face a critical decision: which skills to keep in house and which can be provided by outsourcing and partnering. Seventy-two percent of executives report that using digital platforms to match skills and demand would contribute to organizational success.

Reskilling the workforce—repeatedly

On average, automotive executives estimate 16 percent of the workforce will need to be reskilled by 2030 to meet the digital needs of their organizations. One out of five executives reports that more than a quarter of their workforce are candidates for re-skilling. Three percent of executives report that more than one-third of their workforce will require retraining. These numbers do not consider the five year half-life of skills and the possibility of new jobs, so the final numbers are probably much greater.

For a direct workforce population of over eight million people,¹⁶ this would mean the industry would spend over USD 33 billion throughout the next 10 years to bring their workforce up to digital speed. To achieve this, executives expect their training/reskilling budgets to increase by 31 percent.

From a functional perspective, manufacturing, marketing and sales, and connected vehicle executives report the highest need to reskill. From a location perspective, executives in the US, India, China, and the UK have the highest urgency.

Executives rated automotive “hard” skills such as engineering or software development as most critical to their organizations’ success (see Figure 11). These technical skills necessary to design and build a high-quality vehicle have traditionally been essential. But now alternative power, autonomous capabilities, and connectivity are adding to vehicle complexity. Automotive companies don’t readily have the related skills at their disposal.

At the same time, automotive process and transformation skills are essential as companies reinvent themselves into highly efficient high tech companies.

Not all skills will be or should be hired directly in house. The strategic value of having the skills on staff, the urgency of the need, and the length of time the skills are needed can dictate which of the multiple strategies companies use to fill skill gaps.

Hiring directly is most preferred, with 83 percent of executives using this approach. Next, 65 percent indicate they would use outsourced resources on a temporary basis. Forty-six percent say their companies would purchase other companies that have the sought-after skills. And finally, 43 percent will outsource the responsibility of the work itself to another company.

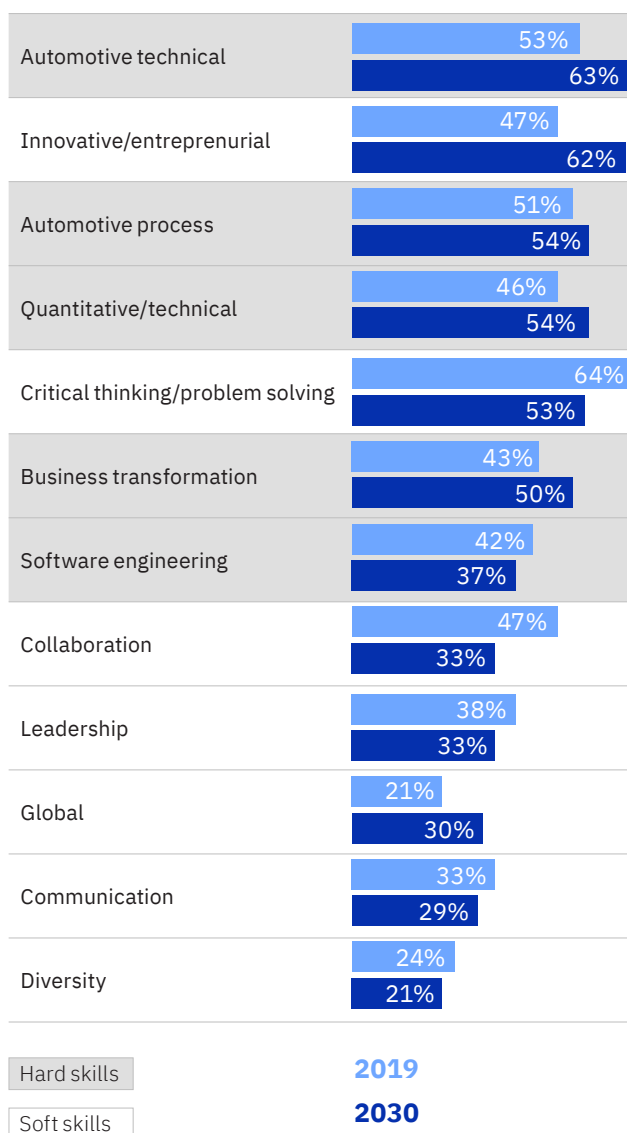
The eclectic automotive ecosystem

When we published our 2008 study, “Automotive 2020: Clarity beyond the chaos,” the focus was industry optimization.¹⁷ Companies were rushing to sell their vehicles in emerging markets such as China and determining how to globally optimize their product development, manufacturing, and skill-based footprints. Limited natural resources and being “green” were beginning to drive investments into alternative fuel solutions. The connected vehicle was just starting to show potential and the term “personal mobility” was seeing use but not necessarily understood.

Figure 11

Skills for success

Workforce skills



Source: Automotive 2030 Executive Survey. Q: What workforce skills are/will be critical to your organization's success? Select 6.

In 2015, when we introduced our next study, “Automotive 2025: Industry without borders,” digital disruption was in full swing.¹⁸ The invasion of nontraditional companies was offering new ways for people to move around. Consumers were rethinking even owning a car, and automotive companies were scrambling to figure out where they fit in the mobility ecosystem. Consumers were calling the shots now and demanding experiences over functions and features.

For this 2019 study, digital is dominant, consumers are king, and automotive companies realize the need to reinvent themselves as high tech companies within a vibrant ecosystem to stay relevant. Autonomous, connected, electrified, and shared is the mantra for the future. The automotive industry ecosystem is expected to be a mixture of technical, agile, high performance companies from multiple industries, each bringing their own specialization and value to the mix.

The 1,500 executives we surveyed reveal some interesting—even paradoxical—observations:

- 64 percent say significant consolidation will occur in the industry due to the expected decrease in personal ownership sales.
- 75 percent expect the value of dealers to diminish and that the number of dealers will be greatly reduced.
- At the same time, 75 percent agree that dealers will expand their value by developing new services to support mobility.
- 39 percent say an automotive company will purchase a technology giant (for example, Amazon or Google) for their digital expertise.
- At the same time, 43 percent expect a digital giant to purchase an automotive company for their automotive expertise.

Will these predictions manifest themselves? Time will tell, but they are something to ponder in the meantime.

Recommendations

The industry is once again at an inflection point, but this differs from prior crossroads. Previously, the driving factor for change came from the business itself. Expansion to new markets, optimization of global footprints, and sustainable operations caused automotive companies to develop new strategies, products and services, and skills to succeed. The fundamental single ownership business model stayed the same.

Now, digital technologies and consumer expectations are having a profound impact on all aspects of the business. Even the core business model, one that has sustained the industry for over a century, is under attack. To add to the confusion, an industry that was once closed to others is now open to any entrepreneurial venture that can provide a mobility experience of value to consumers.

Automotive companies have a decision to make. They can seize the opportunity to reinvent their organizations through digital technology—unleashing new experiences, new focus, new ways to work, and new workforce skills. Or they can continue down their current path, running down the clock and risking obsolescence.

We recommend executives take the following actions:

1. Create loyal customers with personalized experiences that “stick.”

- Align digital vehicle profiles with consumer digital profiles to deliver consistency and cross-brand stickiness.
- Use cognitive capabilities to combine personal information with vehicle usage and environmental information to learn, predict, and optimize the consumer experience.

- Integrate with other aspects of the consumer’s life to create a brand experience that transcends beyond the vehicle.
- Instill a sense of consumer confidence and trust through unparalleled data security and privacy.

2. Innovate don’t isolate—build platforms to promote purposeful collaboration.

- Identify what is strategically core to the business. But also embrace collaboration by crafting a value proposition for platform-derived ecosystems.
- Leverage deep expertise, open workflows, and data synergies to seize the expansion potential within that ecosystem.
- Create “fast and frictionless” entry points for platform participants so they can quickly add value.

3. Get agile and change fast.

- Implement design thinking, co-creating, and agile processes, together with the customer, for rapid idea creation and testing.
- Define and test specific minimum viable products (MVPs). Conduct rapid proofs of value (POVs) using an agile approach. Select successful POVs and scale to the enterprise.
- Use automated processes and self-learning, self-correcting workflows to deepen customer relationships and change the nature of work for employees.

4. Exploit and share data.

- Continuously uncover new data sources from all facets of the business, the vehicles, mobility services, and customers to gain new insights and opportunities.
- Use AI technologies to curate and enrich data that “thinks” and “acts” to meet specific business needs. Remember, one view of the data does not fit all.
- Relentlessly share data and insights within your enterprise and across your ecosystem to co-create new business models and revenue streams.

5. Boost brain power and skillsets with AI-driven educational ecosystems.

- Implement skills identification initiatives to uncover new expertise requirements.
- Create a learning platform ecosystem to allow all types of content, functions, and multiple parties to connect and interact. Add content to the learning platform at speed and scale, and dynamically personalize learning for every employee.
- Reimagine the learning function powered by AI. Use artificial intelligence to create human intelligence.
- Discover insights in your data to predict the critical skills of your business and drive new content creation.

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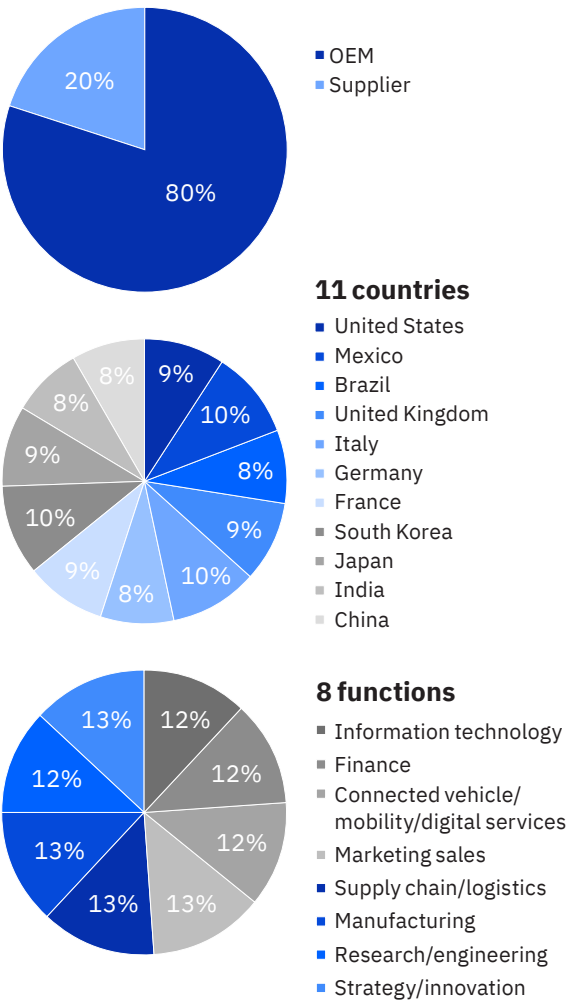
Are you ready for the digital automotive future?

- How will you provide exceptional, personalized in-vehicle experiences that create brand loyalty in an autonomous, mobility-as-a-service environment?
- By what metrics will you determine your organization’s desired platform participation level—participant, owner, or both? How will you set expectations accordingly?
- How can you create a nimble organization that competes with new mobility startups and internet ventures? What is your roadmap for integrating design thinking, co-creation, agile processes, and rapid releases?
- What is your plan to establish a data-driven culture? Remember, this includes a willingness to infuse insights into virtually every action, interaction, and decision.
- What is your strategy to continuously re-skill your organization to take advantage of digital technologies that power new ways to work? How will you leverage business partners and other channels to fill skill gaps?

Methodology

Automotive 2030 Executive Survey

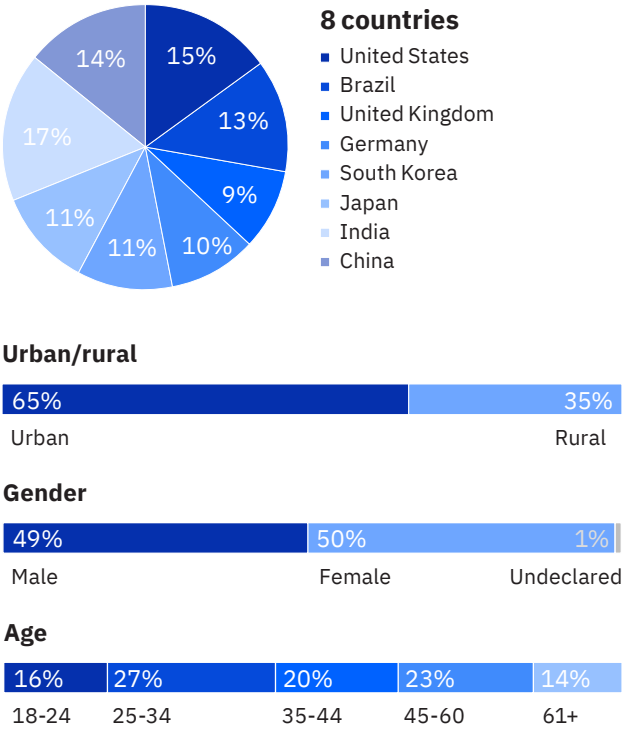
In collaboration with Oxford Economics, the IBV surveyed 1,500 automotive industry executives equally distributed across 11 countries. The objective was to better understand their vision of reinvention—a reinvention their organizations need to make in the next 10 years to be relevant in the world of future mobility. These individuals included C-suite officers (CEOs, CIOs, CFOs, CMOs, COOs, CHROs, and others) as well as managing directors, executive VPs, senior VPs, VPs, and directors.



Automotive 2030 Consumer Survey

In collaboration with Survey Monkey, the IBV surveyed 11,566 consumers across 8 countries to better understand their digital mobility interests. These interests include the cognitive capabilities of the car, digital mobility services, and various transportation modes such as e-hailing and ride sharing. We also explored the importance of the brand in on-demand, autonomous e-hailing services.

Urban respondents were from Brazil (Sao Paulo, Rio de Janeiro, Brasilia); China (Beijing, Shanghai, Chongqing, Chengdu); Germany (Berlin, Hamburg, Munich); India (Delhi, Mumbai, Bangalore); Japan (Tokyo, Osaka, Fukuoka, Nagoya); South Korea (Seoul, Busan, Incheon); the UK (London, Birmingham, Leeds); and the USA (New York City, Los Angeles, Dallas, Phoenix). Rural respondents were from urban centers with populations less than 15,000 people.



About the authors



Daniel Knoedler

KNOEDLER@de.ibm.com
[linkedin.com/in/
daniel-knoedler-b91860170](https://www.linkedin.com/in/daniel-knoedler-b91860170)

Daniel Knoedler is the Director of Global Sales in IBM's Automotive, Aerospace, and Defense organization. Daniel has a broad industry and services background and has been working with IBM for 20 years. In his IBM career, Daniel has worked with globally operating automotive and aerospace clients throughout Europe, Asia Pacific, and North and South America.



Dirk Wollschlaeger

dirk.wollschlaeger@de.ibm.com
[linkedin.com/in/
dirk-wollschlaeger-a91392/](https://www.linkedin.com/in/dirk-wollschlaeger-a91392/)

Dirk Wollschlaeger is the General Manager for the Global Automotive, Aerospace, and Defense industries at IBM. He has more than 25 years of professional experience. Dirk is working with all major automotive OEMs and suppliers, helping them transform their businesses.



Ben Stanley

ben.stanley@us.ibm.com
[linkedin.com/in/benjaminstanley](https://www.linkedin.com/in/benjaminstanley)

Ben Stanley is the Automotive Research Leader for the IBM Institute for Business Value. He is responsible for developing thought leadership content and strategic business insights for the IBM Automotive industry practice. Ben has over 40 years of automotive experience and has worked with major automotive clients around the world in business strategy and business model innovation.

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