The Transforming Mobility Landscape

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THE TRANSFORMING MOBILITY LANDSCAPE

There’s a bright future ahead for the global automotive industry and the broader mobility market, although executives might find it hard to see it through the current wave of disruption.

Yes, the automotive and related industries are being challenged as never before, as sophisticated new technologies and tectonic changes in consumers’ expectations place enormous pressure on traditional business models. But those same forces are opening up compelling new opportunities in mobility for automotive and many other companies that think boldly about the future and their role in it.

Mobility is a rapidly converging industry encompassing a vast web of various players—including automotive original equipment manufacturers (OEMs), original equipment suppliers (OESs), Mobility Service Providers, technology innovators, and utility companies. Everyone is asking the same question: What strategic direction should I take now to avoid missing out on the mobility market’s tremendous future opportunities?

OEMs, in particular, are struggling to define their best path forward. Do we invest heavily in mobility start-ups? Launch our own mobility service? Forge alliances or partnerships with others to scale our new business more quickly?

Based on extensive work with automotive and other mobility enterprises, as well as years of ongoing mobility research, Accenture has developed deep insights on where mobility is headed and what the industry’s players should be thinking and doing to prepare themselves for a future that’s vastly different from today.

We anchor our insights around a framework we’ve developed that illustrates the four megatrends that are currently roiling the automotive world (connected cars, autonomous vehicles, shared mobility, and eMobility) as well as four issues that will play a key role in the transformation required of every company that wants to play and thrive in the mobility market of the future (cost effectiveness and efficiency, customer centricity, digitization, and analytics) (Figure 1).

Figure 1: Our priority topics for the automotive industry

<table>
<thead>
<tr>
<th>CONNECTED CAR</th>
<th>AUTONOMOUS</th>
<th>SHARED MOBILITY</th>
<th>eMOBILITY</th>
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<tr>
<td>Cost Effectiveness and Efficiency (e.g., Zero-based)</td>
<td>Customer Centricity (e.g., eCommerce)</td>
<td>Digitization (e.g., Industry X)</td>
<td>Analytics (e.g., AI and Data Monetization)</td>
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The first topic is a fundamental megatrend: the future of mobility. Technological, consumer, and regulatory trends all point to a dramatic shift in how people prefer to get around—from accessing vehicles, to accessing mobility, and ultimately, to expecting mobility On-demand (or “invisible” mobility). This shift has profound implications for not only vehicle design and production, but also how all players in the industry make money.

The second topic pertains to another mobility megatrend—the electrification of vehicles, or eMobility. With the calls to eliminate the combustion engine only growing stronger among a majority of consumers and most governments, an eventual all-electric vehicle future is inevitable. But significant uncertainty remains around when that future becomes reality. Equally cloudy is exactly what’s required by each of the industry’s players to accelerate eMobility adoption so it reaches the mass market.

IN THIS PAPER, WE TACKLE FOUR OF THE TOPICS WITHIN OUR FRAMEWORK, EACH OF WHICH IS CRITICAL TO ALL PLAYERS IN THE MOBILITY INDUSTRY.
The third topic involves the end customer—specifically, the role of the ecommerce sales channel in the overall customer experience.

As consumers increasingly value shopping convenience and transparency, automotive companies that don’t provide the opportunity to purchase vehicles online will be leaving millions of dollars on the table and will lose customers to more digital-savvy competitors. To compete, auto companies will need to develop a robust, seamless digital marketplace that provides a personalized shopping experience across the customer journey.

The fourth topic is one that all companies are grappling with: how to use analytics and applied intelligence to transform the business.

While most companies agree AI has substantial promise, they haven’t been able to establish the business case to drive widespread adoption of the technology. But a compelling business case does exist—to the tune of €1 billion a year in new value for the typical large industrial manufacturer. Our analysis quantifies where automotive companies can invest in AI and the returns they can expect.

We trust that the insights we explore on the following pages provide some valuable context for executives across the mobility ecosystem as they develop the road map for their business in the years to come.
How people move around—by foot, bike, car, bus, or train—has been continually evolving since the invention of the wheel, spurred by waves of disruptive innovation that have given us progressively more sophisticated and effective ways to get from Point A to Point B. But the advancements seen thus far pale in comparison with what’s in store in the decades ahead.

Over the next 25 to 30 years, the consumption of mobility will change dramatically, and the automobile itself will also undergo rapid and widespread change. As a result, entire industries will be compelled to rethink their business models and how they make money.
DRIVERS OF CHANGE

From how consumers expect to get around, to their perceptions of vehicles, to vehicle technology and design—everything about mobility will be dramatically different. The convergence of three key factors will be the driving force behind this change (Figure 2).

**MARKET PULL**
Consumers’ mindsets and behavior regarding cars are already substantially different from a decade ago and will continue to evolve over time, forcing companies to innovate to meet changing demands. In China, for example, more than 80% of the population think that owning a car will be much less important and car sharing much more convenient. Similarly, consumers in Western countries believe that in the future, cars will no longer be seen as status symbols, and consumers will be more willing to use car sharing or even share their own car. Yet the full change to “as-a-service” business models will take time—it’s going to be an evolution rather than a revolution.

**TECHNOLOGY PUSH**
The proliferation of technological advancements is transforming the vehicle itself—from connected to electric to, ultimately, autonomous. The connected revolution is nearly complete: By 2025, all new vehicles will be connected vehicles, and 40% of them will have embedded telematics, putting software at the center of the driver’s experience. By 2030, 30% of all new vehicles will be electric. The true game changer comes by 2045, when half of newly sold cars will be partially or fully autonomous—which will have a massive impact on current consumption patterns by turning drivers into riders. As vehicles and their accompanying technologies evolve, they will continue to disrupt mobility-related industries, making possible entirely new mobility-related industries, making possible entirely new business models and spurring even greater inventions.

**REGULATION PUSH AND PULL**
By 2050, about two-thirds of the global population will live in cities, more than double the figure in 1970. Without government action, this will mean more cars and trucks on the streets, forcing commuters to spend more time in traffic jams and generating more pollution that threatens both people’s health and the environment. Regulators need to rethink how they address traffic to fulfill their mission to make worry-free and clean, sustainable mobility available to a city’s inhabitants. We’re already seeing cities taking steps to that end, such as new regulations to meet sustainability targets, additional tolls or fees for personal vehicles, and restrictions on goods delivery by trucks in the city center. As such actions become more widespread, they will create greater incentive for people and businesses to find ways other than driving their own vehicles to get around increasingly populous cities.

Figure 2: Driving forces of the mobility evolution
THREE ERAS OF MOBILITY

As the preceding forces evolve, we’ll see a corresponding evolution in mobility itself—embodied by three distinct eras (Figure 3).

**CONNECTED MOBILITY ERA**
In the first, the Connected Mobility Era, consumers still place a priority on access to vehicles themselves. However, these vehicles will grow increasingly intelligent, enabling new service models. Car sharing also will continue to expand, encouraged by government regulations to limit private cars and reduce congestion on city streets, as well as the more favorable economics of vehicle usage compared with ownership.

**EARLY AUTONOMOUS MOBILITY ERA**
As new autonomous vehicles become viable for the masses, we’ll enter the Early Autonomous Mobility Era, when consumers prefer access to mobility-as-a-service over access to a vehicle. Cities and public institutions, in turn, will have to respond by investing in their infrastructure and putting in place the right regulations to encourage the deployment of autonomous technology that boosts access to mobility.

**SYSTEM ECONOMY ERA**
When fully autonomous cars become commonplace, the System Economy Era begins to take shape. Through the emergence of various forms of mobility services, mobility moves to the background. Consumers will see mobility as a utility, available on-demand without much thought about how it happens—much like they view electricity in their homes today. In this era, cities and public institutions will have to fully regulate mobility to accommodate this “invisible” utility. Furthermore, automotive OEMs will need to adapt not only their marketing and sales strategies, but also the way vehicles are designed.

**THE VEHICLE MOBILITY MIX AND INFLUENCING FACTORS**
What does all this mean to the mobility ecosystem’s players and how they make money? To be sure, the mobility evolution will create massive challenges for traditional OEMs and their current business models. But it also opens up tremendous new opportunities, not to mention compelling new revenue streams for any company willing to think boldly about how and where it can play as these eras unfold.

In the future, companies will generate revenue from mobility in three primary ways:

- **Vehicle Sales**: the traditional automotive business of designing, building, and selling cars to consumers and companies to satisfy long-term mobility needs
- **Vehicle-as-a-Service**: the vehicle (such as cars, bikes, or scooters) is offered as-a-service to consumers to satisfy short- and mid-term mobility needs
- **Mobility-as-a-Service**: mobility itself is offered as-a-service—whereby the consumer is no longer the driver, but the rider—to satisfy short- and mid-term mobility needs

When analyzing the respective development of each business model, one must consider five main influencing factors clustered around customers, the public sector, and mobility industry players (Figure 4).
From a customer perspective, three big factors will drive the choice of mobility mode: customers’ willingness to pay for mobility; the convenience they expect from the service; and other customer preferences, such as environmental values or desire for predictability. A general openness to new ways to get around also will be critical to the success of innovative new business models.

The public sector also plays a vital role in the future success of new forms of mobility. This includes delivering the required infrastructure (be it roads or 5G networks), creating the appropriate regulatory environment, and orchestrating the mobility mix in countries and cities (the last of which is also key to defining the availability and supply of mobility modes).

Last but not least are the mobility industry players, which will need to drive the technological progress needed to make new business models possible and to determine how to make those models profitable (which means operating cost management will be key to long-term business success).

Although each factor on its own can significantly influence mobility’s future, the interplay of all factors—as well as geographical and regional differences in customers and public sector players—will ultimately decide what tomorrow’s mobility mix actually looks like. The real game-changer will be autonomous technology. When autonomous vehicles reach Level 5—full automation—driverless cars will be able to operate on any road and in any conditions a human driver could negotiate. This will make robo-taxis technologically and, at some point, economically feasible, which could spell the end for other mobility services based on Vehicle-as-a-Service (VaaS) and Mobility-as-a-Service (MaaS) (Figure 4).
Let’s look in more detail at the three dominant types of business models we can expect to see in the coming years, how they’ll likely evolve, and their projected revenue trends over time (Figure 5).
VEHICLE SALES
Regardless of the era, vehicles will still be needed and a business model that includes producing vehicles for sale will remain viable. In fact, vehicle sales will still account for the largest proportion of total revenue generated by mobility players across all three eras, and global new car sales will grow by 1.6% annually until 2050, spurred by economic and global population growth. Revenues from new car sales also will increase throughout the Connected Era, peaking during the transition to the Early Autonomous Mobility Era (2030) before entering into a slow, gradual decline back in line with today's figures.

However, the types of vehicles made, who buys them, and the revenue generated will certainly change (Figure 6). In 2050, vehicles will mainly be sold to corporate fleets and mobility fleet operators to provide short-, medium- and long-term mobility on-demand. Privately owned vehicles will remain the primary mode of transportation in rural and suburban areas. Because they’ll be those consumers’ primary mode of transportation and will have greater comfort features and superior technology compared with vehicles used in fleets, they’ll likely command a premium price.

VEHICLE-AS-A-SERVICE (VaaS)
As connected vehicles become increasingly autonomous, VaaS will become increasingly popular. VaaS business models will emerge to provide vehicles and the necessary infrastructure to flexibly book and share vehicles that fulfill short- and medium-term mobility needs. The most prominent of these business models will be business-to-consumer (B2C) car sharing and micro-mobility (akin to today’s electric scooters), with people-to-people (P2P) car sharing playing a minor role due to people’s reluctance to let strangers drive their vehicles.

However, despite strong growth between 2020 and 2040, VaaS will only play a minor role in the new mobility environment (accounting for less than 10% in 2050) (Figure 7). Among the factors that will impede further growth of VaaS are asset-heavy operations within B2C car sharing, lack of trust between P2P car sharing members, high turnover needs in micro-mobility, high operations and insurance costs, overall regulation, and a general difficulty in scaling. Hence, VaaS can be characterized as a transition stage toward full-fledged mobility-as-a-service (MaaS) offerings and, importantly, a big step toward getting consumers more familiar with and confident in mobility services.
MOBILITY-AS-A-SERVICE (MaaS)

MaaS business models will disrupt and transform the way people consume mobility—becoming the option of choice for short-term mobility needs, turning drivers into riders, and effectively relegating mobility to the background by making it a passive rather than active pursuit. MaaS will come in two “options”: Individual MaaS will include initial business models such as ride hailing, which eventually will give way to the more-economical “robo-taxis.” Group MaaS will be primarily focused on-demand-responsive transit, whose value proposition is effectively and efficiently organizing ride pooling and which, with effective partnering, can serve as a complement to or even replace existing public transportation networks.

As MaaS becomes more prevalent, the revenue it generates will grow accordingly—increasing more than fortyfold between 2020 and 2050 (Figure 7), when it will comprise 40% of the mobility industry’s total revenues. The MaaS market will be characterized by a high degree of development and be highly dependent on technology advancements and regulation. For instance, fully autonomous driving will be key to driving down MaaS’s marginal costs, enabling cost and price leaders to dominate the market.
In their pursuit to fulfill the various mobility needs of customers everywhere, companies are plowing massive investments into all kinds of new mobility services—from some form of vehicle sharing to mobility-as-a-service offerings such as ride hailing. Yet it’s apparent that mobility providers continue to have a hard time creating a profitable and sustainable business for a number of reasons. These include the sheer amount of money needed to run a VaaS business, high operational costs related to MaaS business models, and intense pressure to reach a critical scale. Complicating matters is competition for licenses to operate in limited spaces within cities regulated by municipalities and governments, which only leads to more uncertainty.

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Accompanying the evolution of mobility from ownership to on-demand is another massive challenge the mobility ecosystem must address.
eMOBILITY ECOSYSTEM AND ADOPTION

With sustainability concerns continuing to be top of mind for both consumers and governments, the trend toward vehicle electrification is inescapable. Yet the exact route to fully electrify cars and trucks is far from certain—or, for that matter, easy or inexpensive.

For electric vehicles to become a genuine and obvious competitive alternative over combustion engine vehicles for the mass market, ecosystem players have to simultaneously address three interdependent factors (Figure 9).

For starters, to achieve a true sustainable environmental advantage over traditional combustion engines, everyone involved must go beyond focusing simply on the benefits of eliminating emissions from the vehicles themselves and look at electrification from a total vehicle lifecycle perspective. In other words, one must factor in the holistic environmental impact—from battery production, to the energy mix needed to charge the vehicles, to end-of-life component recycling. Only if the CO2 balance of this entire footprint is positive will the technology truly be better than the combustion engine, environmentally speaking.

Furthermore, it’s also essential that eMobility becomes more attractive to customers from both a purchase price standpoint and a total-cost-of-ownership perspective. And, electric vehicles need to achieve use case parity—i.e., being just as convenient to drive and recharge, and with a range comparable to a combustion engines.

Addressing these challenges is not the job of a few companies or an individual industry. True success will require tight collaboration across all relevant dimensions and participants of the product and service ecosystems and multiple industries, all of which are affected by ongoing trends, over the coming years (see Fig. 10).

Figure 9: Plug-in electric vehicles will only attract the mass market if three key issues are solved

DEPENDENT ON SUPPLY CHAIN AND INFRASTRUCTURE
- Battery production and toxicity of key materials
- Smart charging with green energy
- Battery recycling at the end of the lifecycle
- Local noise and air pollution already a clear advantage

TO BE ACHIEVED BY 2025-2030
- Purchase price parity (psychological)
- Total cost of ownership (rational)
- Retrofitting of energy distribution grids

HINDERED BY TECHNOLOGY AND BUSINESS MODELS
- Increases in battery capacities
- Fast charging infrastructure
- Ubiquitous availability of infrastructure
- High investment in energy distribution grids
In this context, some regulatory players are taking a leading role in shaping the future eMobility environment by setting and enforcing aggressive emission standards OEMs must meet. In the EU, for example, by 2021 the average passenger car CO2 emission must not exceed 95g/km; otherwise, OEMs will have to pay steep penalties (€95 for each gram exceeding, per car). On top of that, the European Parliament has declared a further emission reduction of another 37.5% for passenger cars, 31% for vans, and 30% for trucks by 2030.

**CRITICAL TIPPING POINT FOR ADOPTION**

To hit these ambitious CO2 targets, all OEMs are set to launch a blizzard of electrified cars in the coming month and years. Volkswagen, for example, just announced plans to launch nearly 70 new electric vehicles by 2028—with the goal of having electric vehicles comprising 40% of the company’s fleet in the EU and China.

But is that 40% target realistic? At the moment, it’s hard to say it is, given that today only 2% of all vehicle sales are electric. Current market adoption of plug-in hybrid electric vehicles (PHEVs) and battery-electric vehicles (BEVs) is driven primarily by consumers’ environmental values, not use case or cost parity—hence, need governments’ heavy subsidies and regulations to accelerate adoption.

Three examples are China, Norway, and the Netherlands, in which consumers and industries are and were heavily subsidized and efficiently regulated to increase electric vehicle ramp-up.

Electric vehicle adoption will begin to truly accelerate when it reaches a tipping point beginning in 2025 (Figure 11): Large-scale battery production will significantly drive down battery costs—to less than €100/KW/h—thus, enabling BEVs to reach cost-parity from a total-cost-of-ownership perspective with a traditional combustion engine. Ultimately, more than 30% of vehicles sold in 2030 will be either BEVs or PHEVs.

From 2030 onward, a combination of comparable total-cost-of-ownership and use case parity with traditional powertrains will drive the continuous growth of electric vehicle share across all markets. We foresee BEVs nearly reaching market share levels of combustion engines by 2040 and becoming the leading powertrain by 2050. As BEVs grow in prominence, PHEVs are expected to decline and eventually disappear after 2030, given their unfavorable use case and cost comparisons with BEVs. PHEVs’ demise will be further accelerated by new technologies such as hydrogen powered vehicles, which are also expected to gain market share as production and charging scaling effects begin to trickle down to consumers.
Figure 11: A 2025 tipping point in eMobility adoption (Vehicle sales in TSD)*

From 2025 on, the adoption of eMobility will take a turning point and accelerate – in the late 2030s and early 2040s, EVs and BEVs become the primary modes of transportation.

![Graph showing a 2025 tipping point in eMobility adoption](image)

CHARGING INFRASTRUCTURE IS STILL LACKING

With OEMs adding more and more electric cars to their portfolios, consumers will have many more options to choose from. But this bevy of choices still doesn’t overcome one the biggest current obstacles to eMobility adoption: the lack of a widespread charging infrastructure in all markets.

And the charging challenge differs depending on what specific consumers need, which is largely a function of where they live and how they use their vehicle (Figure 12). It’s obvious that the current charging situation—which features a mix of home charging, slow public charging, and fast public charging—presents a number of roadblocks that must be overcome to build an appropriate charging infrastructure.

Home charging is one of the most frequently used charging infrastructures for home owners because of its easy access and its potential to be part of a much bigger home storage energy system, in which the ability to balance and control energy demand and supply via a vehicle’s bi-directional battery in interplay with the grid might lead to overall lower consumption costs. Yet home charging requires significant consumer investment, and can be difficult to implement for non-home owners—especially those in urban areas, where legal barriers and building requirements can be significant obstacles. Furthermore, because home charging is tied to a single location—i.e., a person’s residence—other charging alternatives are necessary for mass-market adoption.

Figure 12: How people charge their vehicle depends on the space they are moving through

<table>
<thead>
<tr>
<th>SPACE</th>
<th>TODAY</th>
<th>OUTLOOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home owner</td>
<td>On-street</td>
<td>Integrated solar solutions</td>
</tr>
<tr>
<td>Commuter</td>
<td>Parking garages</td>
<td>Fast charging locations</td>
</tr>
<tr>
<td>On-street parking garages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-distance traveler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban car sharer</td>
<td></td>
<td></td>
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<tr>
<td>Rent a car user</td>
<td></td>
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<tr>
<td>Commercial driver</td>
<td></td>
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<tr>
<td>Pool car user</td>
<td></td>
<td></td>
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<tr>
<td>Condensed cities</td>
<td>On-street</td>
<td>Fast charging locations</td>
</tr>
<tr>
<td>Clustered metropolitan areas</td>
<td>On-street</td>
<td>Fast charging locations</td>
</tr>
<tr>
<td>Suburbia</td>
<td>Home/Work</td>
<td>Integrating coverage</td>
</tr>
<tr>
<td>Off-the-grid rural areas</td>
<td>Home/Work</td>
<td>Integrating coverage</td>
</tr>
<tr>
<td>Intercity connections</td>
<td>Highway</td>
<td>Fast charging parks</td>
</tr>
<tr>
<td>International</td>
<td>Hotel</td>
<td>Roadmng or direct payment</td>
</tr>
</tbody>
</table>

*Please Note: These forecasts may vary based on governmental regulations and other macro-economic factors.*
One of these alternatives, slow public charging, is emerging but currently unattractive due to slow speeds and low geographic coverage. It’s simply not a reliable solution because drivers can’t be sure a charging station will be available when needed during a trip. Massive subsidies might be required to build a dense network of charging points to meet customer demands.

Similarly, while offering much quicker “refueling,” fast public charging also has yet to be established at a sufficient scale. An added concern is the extreme demand that fast charging places on the energy distribution grid. As with slow charging, fast charging will require a massive investment to establish the kind of coverage consumers can count on when traveling.

**BUILDING THE CHARGING ECOSYSTEM**

Clearly, building a reliable public charging infrastructure with widespread availability will require cooperation among and investment from all eMobility players. But it also will require different kinds of players with different capabilities (Figure 13), all working tightly together to make pervasive public charging a reality. Four such players will be key.

The Charge Point Operator (CPO) will own and operate the publicly available charging infrastructure and will collect and integrate charge point data in a back-end system. The CPO’s main objective is to increase utilization of charge point capacity. However, CPOs will generally have no direct interaction with end-customers.

Building that customer interface is the job of the Mobility Service Provider (MSP), which contracts with end users and provides the authorization and payment options to charge their vehicles (likely in the form of an RFID chip and app). The MSP typically won’t own the charge points, but instead, will aggregate the existing infrastructure through partnerships with various CPOs.

E-roaming platforms will enable customers to access charging stations regardless of who owns them. These platforms will provide the communication protocols that enable MSPs and CPOs to exchange authorization, charge transaction, and charge point data—allowing MSPs and customers to operate seamlessly across the charging network.

Finally, energy companies will supply the energy needed to power the charging infrastructure. An energy company in many cases will also act as the CPO and, when it doesn’t, will bill whoever is the CPO for its energy usage.

This new public charging framework offers many new service and business model opportunities. The question is, who will capitalize on them? Those roles could be filled by existing players or the myriad startups that have their eyes on what could be a very lucrative market. The key will be to establish a business case that makes sense.

**Figure 13: Four types of players necessary to build and operate a large-scale public charging infrastructure**

To reduce the fragmentation of CPOs, roaming platforms and MSP are aggregating data
OUR TAKE

To achieve Battery-Powered Electric Vehicle (BEV) cost and use parity with the combustion engine—and accelerate the adoption of electric vehicles—ecosystem players, especially energy distribution grid and public charging infrastructure providers, need to work together on critical prerequisites needed for eMobility to become commonplace.

Being part of such an evolving ecosystem, it is imperative that OEMs remove uncertainty by fostering partnerships and continuing to invest in new technologies, such as fuel-cells, to stay the course towards a sustainable mobility of the future.

KEY TAKEAWAYS

1. Batteries must get cheaper and offer a range that’s almost or as good as the combustion engine. This will likely happen within the next few years as greater R&D and scaling bear fruit.

2. A pervasive charging infrastructure must be established to fuel and to support eMobility growth, and that will require significant investments from a lot of different players.

3. Furthermore, the overall energy transmission grid and energy storage capabilities must be improved to reliably cope with the new peak loads driven by millions of people charging their cars, especially given the industry’s push toward more renewable sources of energy.

4. Governments need to prepare to allocate necessary investments alongside those of private companies and public-private partnerships to help to fund the needed infrastructure, and design efficient investment models during the early stages of adoption to achieve cost parity for consumers as quickly as possible.

5. All required players need to define future standards to make the eMobility infrastructure as efficient and seamless as the current infrastructure and to drive down costs in what will be a low-margin business. Always keep in mind any country specific regulations of the regulatory authorities.

6. Finally, customers must open their minds to using new technologies to meet their daily mobility needs, even if the range of BEVs is not yet comparable to traditional cars.

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It’s no secret that the most successful companies put the customer at the heart of everything they do. In fact, according to Accenture research, creating and delivering a superior customer experience is one of the biggest keys to differentiation, competitiveness, and growth.
For most companies today, a critical element of such an experience is ecommerce. Most consumers today enjoy the convenience of buying goods without leaving their home or office, as well as the accompanying price and product information transparency. That’s clearly evident in the numbers: In 2019, retail ecommerce sales worldwide amounted to US$3.53 trillion, a figure that’s expected to grow to US$6.54 trillion in 2022.¹

The fact is, to be truly customer centric (and, hence, relevant and competitive), companies must deliver a seamless omnichannel experience, across the customer journey, that includes a robust ecommerce capability (Figure 14).

Yet in the automotive industry today, ecommerce is largely limited to small, easily shippable and inexpensive products, like car accessories and components, or by third-party online used car marketplaces.

As consumers grow increasingly accustomed to buying what they want online, OEMs need to extend online sales to used and new vehicles. Doing so will not only boost customer engagement, but also enable OEMs to meet demand that’s set to see explosive growth in the next five years. (Figure 15).

**Figure 14: The customer journey**

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Consideration</th>
<th>Purchase</th>
<th>Usage</th>
<th>Loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know Product</td>
<td>Collect Info</td>
<td>Visit Dealer</td>
<td>Test Drive</td>
<td>Car Order</td>
</tr>
<tr>
<td>Classic Sales</td>
<td>Digital Engagement</td>
<td>Online Sales</td>
<td>Dedicated Gross-Channel Assistance</td>
<td>Personalized Driving Experience</td>
</tr>
</tbody>
</table>

NOTE: In the chart above, we understand automotive ecommerce to include not only online purchases of automotive cross-assortment products and services—e.g., new cars, used cars, accessories, and parts—but also the activities leading up to and following the purchase transaction. This holistic view, including relevant up- and down-stream processes, is vital to comprehend influential online and offline sales funnel elements and online-to-offline (O2O) integration possibilities.
DRIVING FACTORS: CONVENIENCE AND TRANSPARENCY

Two major trends—shopping convenience and transparency—are accelerating the digital disruption of automotive sales channels.

Convenience

In today’s era of free shipping and returns, same-day-delivery, extremely intuitive interfaces, and personalized customer journeys, customers have gotten used to the extreme convenience of online buying. And crucially, these expectations for convenience, as well as customers’ buying behavior, don’t vary much across different industries. In fact, recent research shows that business buyers expect an Amazon-like buying experience regardless of industry.² This includes the automotive industry. Customers expect the same seamless cross-channel customer journeys with personalized offers that they already receive from established digital marketplaces. This presents both a threat and an opportunity for OEMs. It’s a threat because of high customer expectations and cross-industry comparison, and an opportunity because a compelling ecommerce experience increases customers’ willingness to buy online (and offline). Today, 47% of people younger than 30 prefer online as the favored next car purchase channel, Accenture research shows.³ Tesla is one OEM that’s capitalizing on the “convenience opportunity” by offering free vehicle delivery to the customer and a one-week testing period after which unsatisfied customers can return the vehicle.⁴

Transparency and Trust

Customers increasingly value the opportunity to avoid having to negotiate with sales personnel, an exercise that often leaves customers uncertain whether they secured the best deal. In fact, car sales personnel are regarded as the least trustworthy profession in the United States, with one recent study finding only 1% of respondents think of car sales personnel as trustworthy.⁵ Such perceptions have spurred General Motors and Tesla to offer fixed prices to customers in the U.S.⁶ Amplified transparency and higher levels of trust also can shape customers’ purchasing process in a beneficial way. For example, customers are willing to pay more to purchase a vehicle from a trusted vendor than from a less-trusted one. And customers often make purchase decisions more quickly when they trust a vendor. Recent sales data from Tesla’s Model 3 backs that up: 82% of customers have purchased the vehicle without even taking a test drive.⁷

WHO ARE THE ECOMMERCE PLAYERS?

Both trends, convenience and transparency are driving customers’ demand for ecommerce in the automotive industry—demand that will be filled by three distinct groups.

Emerging OEMs

New car-maker entrants such as Tesla, Byton, and NIO have seized on consumers’ shift away from the traditional car-buying experience by not establishing...
a complex and costly retail network and, instead, relying on a strong digital presence. Their greatest ecommerce advantage is the lack of legacy processes and systems. In contrast to existing OEMs with heterogeneous system landscapes and dispersed digital competencies, these entrants can approach ecommerce with a clean sheet and a more holistic and customer-centric mindset to appeal to increasingly digital-savvy buyers.

**Marketplace Providers and E-tailers**

Also vying for car-buyers’ online business are broker-like marketplace providers such as Amazon, Autoscout24 and Carvana, which operate open platforms available for external parties, as well as closed marketplace providers offering proprietary products and services. These mostly non-producing intermediaries often offer a cross-assortment and multi-brand—and sometimes even cross-industry—portfolio.

Typically, marketplace providers are highly digital and have a strong and established online presence with an open ecosystem, which delivers a transparent and simple user experience. Accordingly, they have experienced significant growth as customers have come to appreciate the seamless and transparent way to sell and buy used vehicles.

**Incumbent OEMs**

The online sales focus of new entrants and the success of third-party platform providers should serve as a wakeup call for OEMs that they need to get into ecommerce game in a serious way if they hope to avoid losing sales to these competitors. Initial pilots for single shops (e.g., only used cars or parts sales) are currently live in selected markets, but no OEM has yet established a globally scaled ecommerce marketplace across its entire portfolio of products and services. This lack of progress stems from OEMs’ inability to overcome a number of existing organizational legacies that impede the development of a successful ecommerce presence:

- Established retail networks and dealer contracts
- Complex organizational structures and processes
- Heterogeneous and incompatible system landscapes
- Dispersed or minimal digital competencies
- Lack of integration into the existing salesforce

These factors, among others, contribute to the slow progress of OEMs to offer seamless and unique digital customer experiences. To respond to pressing new customer demands and shape the future of ecommerce, OEMs need to rethink their approach and understand the key enablers they must master to be successful.
For a company to excel in ecommerce, it must create a Seamless Digital Marketplace that comprises all relevant interfaces with customers and supports the holistic online-to-offline (O2O) customer journey. A Seamless Digital Marketplace is empowered by three key enablers: data management, platform technology and operating model (Figure 16).

The first enabler is data management. Ecommerce needs to operate as a data-driven business that relies on key performance indicators (KPIs) to optimize the end-to-end sales funnel.

The second enabler, platform technology, refers to the tools and technologies, both hardware and software, required to build an ecommerce experience and operate a successful online business.

The third enabler is the operating model, which provides the operations, target setting, and skills necessary to operate an ecommerce business that meets specific customer needs and preferences within each respective market where the company does business.

These enablers must be tackled concurrently and collaboratively as they are deeply interconnected, and their success depends on one another. Falling short on just one element will negatively affect ecommerce success. Additionally, the marketplace must be informed by a thorough, holistic ecommerce strategy that clearly articulates that ecommerce is a new, promising business.

Accordingly, clear business targets for regions and markets also need to be defined and tracked, while accounting for the profoundly divergent requirements and circumstances (e.g., a less-digital-savvy population or low sales numbers) across those regions and markets.
OEMs’ ability to successfully create and operate a Seamless Digital Marketplace will determine which OEMs can leverage ecommerce as a business catalyst for long-term competitive advantage, and which will end up being forced to sacrifice sales and market share to better-equipped competitors. A four-step approach can help guide OEMs’ ecommerce journey.

KEY TAKEAWAYS

1. It starts with the vision.
A clear vision articulates the ultimate objective: Setting up and operating a cross-product, customer-centric ecommerce marketplace. Leaders must communicate this vision statement to all stakeholders from functional and business areas to gain their commitment. Flowing from the vision should be a holistic yet tangible ecommerce strategy that includes overall objectives and milestones.

2. Analysis of the current business helps set the direction.
Once a vision and strategy are defined, OEMs should evaluate their current sales ecosystem by answering the following questions:
• How is the company’s current digital channel organized and operated?
• What functionalities does the channel already offer (e.g., single login)?
• What ecommerce pilots or single shops is the company currently building or operating?
• What kind of customer data does the company generate and collect?
• What pain points do customers and dealers encounter when dealing with the company?

Questioning the sales landscape and understanding the problems and pain points of customers, dealers, and market organizations is essential for OEMs to refine their initial ecommerce strategy and begin dedicated planning.

3. A comprehensive plan lays out where the company is going and how it will get there.
Planning for a successful ecommerce presence must consider multiple dimensions.
• Team: A dedicated, cross-functional team is critical to charting the course and keeping the effort on track. Building and bringing to life an ecommerce platform takes considerable effort and requires skilled and committed people.

• Development: The platform’s specifications should define the technical features required and whether they are standardized features or optional modules that are developed in cooperation with regional or market units. The platform also should be designed to enable an O2O customer journey, based on a single customer ID.
• Governance: A formal collaboration model is needed to ensure cooperation between headquarters and market organizations, as well as define a joint approach and build up dedicated resources, if necessary. Dedicated, target-driven teams (including pricing and marketing) in the markets should be established to operate the marketplace.
• Data: Data is key. It’s important to identify which data the company wants to collect and whether it’s technically feasible to do so, and to use this data to define specific KPIs for managing the business centrally as well as in the markets. Additionally, because a seamless and personalized customer journey is possible only with continuous improvement and evolution, tracking the customer end-to-end will be necessary to understand and address pain points across the customer journey.
• Enabler: Dedicated analytics and programmatic capabilities will be needed to leverage data accordingly, and to generate insights on how to scale the platform to other markets or products.
• Control: Defined KPIs must be part of internal, standardized processes—such as financial planning—so they get the necessary management attention. Additionally, business KPIs should be assigned to each market organization to boost markets’ commitment to bring ecommerce to life.

4. A full rollout of the new ecommerce business is the culmination of the efforts above.
Once all the prerequisites are in place and thorough planning is complete, the new marketplace can be introduced across the business.

OUR TAKE

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Building and operating successful new mobility business models will require generating deep insights on where and how to improve specific business processes and reduce costs, as well as how to more effectively monetize the vast amounts of data the businesses will generate and collect. In most cases, Applied Intelligence (AI) will play a central role in these efforts and will be one of the most critical factors for success in the future.
Like most companies, OEMs today have begun to use AI, but typically in very specific uses cases, such as quality improvement or customer analytics. They could generate much greater value from AI if they used it more holistically and systematically. How much more value? How about €1 billion a year for a large automotive manufacturer with €50 billion in revenue.

According to Accenture research, nearly seven out of 10 companies say AI is one of their top three strategic priorities currently or within the next year. Within three years, that figure rises to nine in 10. Yet despite this perceived importance, only 45% of companies surveyed have deployed a sustainable AI program, and only about one in 10 have already started to exploit the value of AI across different departments systematically.

Why the limited progress? For many companies, a big obstacle is identifying the return AI can generate. While they conceptually buy into AI’s promise, companies continue to struggle to establish the strong business case that’s necessary to rally organizational support—and the funding—required to get AI off the ground. That’s why Accenture recently embarked on a new research effort to identify where AI can have the biggest impact on companies and, more important, quantify that impact in terms of actual new value created. Our findings can provide a helpful guide to executives who are grappling with which AI initiatives to fund and the results they can expect from them.
WHERE’S THE VALUE?

An Accenture study conducted with Frontier Economics Analysis found that AI could add $3.7 trillion in gross value to the automotive sector between 2019 and 2035. That’s an impressive figure. But it doesn’t say what AI can do for an individual company, which is why we took it a step further. We engaged 34 Accenture experts to verify AI’s value to a hypothetical automotive OEM—one with €50 billion in revenue and €5 billion in EBITDA—and where value could be unlocked within that enterprise. These experts, representing six European countries and the United States, provided insights they’ve gleaned through their work with numerous automotive OEMs on AI and other strategic initiatives.

Our analysis revealed that AI’s impact could be massive. If AI were applied across the enterprise of this hypothetical car maker, it could generate a possible 20% increase, or a total of €1.055, in EBITDA.

This breaks down into four distinct value levers:

**Enhanced judgement:**
€535 million (51% of total impact) by using AI capabilities to augment human intelligence on core human-driven processes, which improves the quality, effectiveness, and creativity of employees’ decisions.

**Augmented interaction:**
€290 million (27% of total impact) by using AI to help deliver a superior customer and user experience through hyper-personalization and curation of real-time information which, in turn, drives growth in customer acquisition, retention, and overall satisfaction.

**Secured risk:**
€140 million (13% of total impact) by using AI to help fortify cybersecurity, improve fraud detection, strengthen financial controls, more effectively manage risk, and elevate governance and transparency.

**Intelligent automation:**
€90 million (9% of total impact) by using AI to enhance traditional automation solutions with cognitive capabilities, which enables an enterprise to automate complex processes and tasks that require adaptability and agility.

As Figure 17 illustrates, the biggest beneficiary of this new value created would be the supply chain side of the business, followed by sales and marketing and post-sales operations. The lowest overall impact would be in corporate functions and research and development.

**Figure 17: The impact of AI**

Starting from today, AI represents an opportunity of 1 B€ impact on EBITDA, i.e. 20% increase.
However, there’s more to the value impact than initially meets the eye. For instance, the new value created in sales and marketing and post-sales operations is overwhelmingly in the form of new revenue, while in all other areas of the organization, it’s cost reduction. Furthermore, new value in corporate functions is created disproportionately in human resources and procurement which, combined, account for €55 million of the €65 million in total corporate function cost savings AI could generate for our hypothetical €50 billion car maker. In the case of HR, the bottom-line impact from AI represents a full one-third of the HR function’s overall cost.

Interestingly, within each area of the enterprise, this new value is created largely from a handful of AI use cases—most prominently, hyper-personalization of offers in sales and marketing (€150 million); flow path optimization (€135 million) and inventory optimization (€125 million) in the supply chain; and customer retention in post-sales operations (€100 million).

**THE COMPLEXITY OF AI USE CASES**

But it’s also not just about value potential. The complexity involved in capturing that value (as measured by the technology itself, data access and availability, and scalability) is another important element of the AI story (Figure 18).

For example, the four use cases representing the biggest pools of long-term value (numbers 11, 14, 15, and 21 in the upper right of the figure below) are also the most complex to master with AI. On the other hand, sales forecasting (€30 million, number 17) and virtual sales agents (€20 million, number 18) are smaller value pools but are comparatively easier to infuse with AI. Arguably the most attractive starting point is connecting manufacturing workers with an AI-powered digital enabler (number 37), which represents €10 million in value that can be captured relatively easily. The point is, while the “size of the prize” is arguable the most compelling factor in deciding where to apply AI, time to value and ease of capturing it also have to be strongly considered.

Another factor that could influence a company’s approach to AI is the potential synergy among different initiatives. Synergies exists when uses cases share the same or similar data sets, technology, or purpose, or when the output of one use case can be used as the input for another. Such synergies enable a company to speed time to value, reduce complexity, reduce costs, and boost overall ROI.
For example, our analysis found there are strong synergies among three supply chain use cases that collectively represent a massive €320 million value pool: supply chain planning, flow optimization, and inventory optimization, which use the same data and have the same basic objectives. Potential synergies also exist across pricing optimization and cost modelling, virtual sales agent, intelligent lead indicator, and post-sales AI agent (a combined €120 million target)—which, while having parallel objectives, leverage the same data sources.

In sum, when thinking about AI's ROI, it’s important to evaluate the value and complexity of use cases from both the relative impact (for stakeholders) and absolute impact (for the larger enterprise)—while considering how to use AI to break down organizational silos by identifying use cases that share a common goal.
It’s clear from our analysis that AI is not just a hot new trend, but a seamless enabler of business transformation that can deliver tangible, sustainable benefits. The value figures we’ve identified can help OEMs better understand the return they could expect from AI, as well as how to prioritize their AI initiatives. To exploit the full value of AI for an automotive OEM a real paradigm shift is necessary. AI needs to be seen holistically and systematically as the important prerequisite to generate additional value—in terms of reduced costs and increased revenue—to support the transition of the entire organization.

**KEY TAKEAWAYS**

1. First and most important, top management commitment for AI in the company is essential. Use cases are always generated from the bottom-up in different departments, but they should be evaluated from the top-down to generate optimal value for the larger enterprise.

2. A central organization should be assembled to help evaluate and prioritize the various AI use cases and related business cases across departments.

3. An accompanying technology platform is highly recommended. Serving as the future backbone for all types of AI use cases, the platform can help drive the required change and reduce complexity.

4. An AI factory for the entire company is vital to ideating, prioritizing, and realizing use cases. Incorporating business owners and operating in an agile way, this factory enables a company to concentrate critical capabilities so it can quickly realize and scale use cases.

5. It’s not easy to build all the required capabilities from scratch. Therefore, it’s important to have a formal plan in place for sourcing those capabilities through hiring or partnering with external parties.

6. A “value office” can provide critical oversight, regularly observing and monitoring the business impact of use cases to ensure the associated value is being realized.

7. A process should be implemented to not only fuel the overall transition and improve AI itself, but also to industrialize the use cases over time.

There’s no better time to start the AI journey than now. With fewer than half of companies having a sustainable AI program, the competitive window of opportunity is still wide open—and more than €1 billion in new value awaits.⁸

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With massive disruption comes opportunity for those willing to make bold moves—now is not the time to be timid. Accenture is happy to lead you on your journey.

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