KPMG

The future of automotive

Changing the way cars are built, used, and sold in a connected world

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Foreword

In the past few years, automakers and everyone in the automotive ecosystem—from component manufacturers to design engineers to marketing and finance executives to investors, dealers, and customers—have been confronted with massive change. In my 30 years in the industry, I've never seen anything like it.

As this paper shows, pretty much everything is changing:

How cars work. The shift to electric power trains leaves traditional internal combustion engine (ICE) automakers furiously pursuing electric vehicle (EV) strategies—and facing new competitors. Cars have become connected, with processors that improve vehicle performance and provide a new kind of experience—including driverless rides.

How cars are built. The shift to EVs requires new ways of building cars—with completely different components and technologies. Plants and processes optimized for ICE vehicles need to be revised, and new and different partnerships are emerging.

How cars are used. New ownership and usage models like ride hailing, ride sharing, and subscriptions continue to gain traction, with vehicles used on an "as-a-service" basis.

How cars are sold. Consumers have been shopping for cars online for years. Now they want to complete all their other vehicle-related transactions online, too. New EV players are skipping dealers and selling direct—and ICE OEMs are keen to follow suit.

How the industry is regulated. Policy and regulatory changes are critical to EV transition. Countries and states have set deadlines for ending ICE vehicle sales. The U.S. has made significant commitments to charging infrastructure. Tax incentives remain an important factor for EV buyers.

In this paper, we look at how these changes create eight strategic imperatives for automakers:

1. Organize for the EV transition
2. Rethink manufacturing, supply chains, and partners
3. Monetize the connected vehicle experience
4. Build out as-a-service models
5. Create a seamless direct sales experience
6. Harness data to boost customer lifetime value
7. Finance mobility
8. Attract talent to the sector

To fulfil these strategic imperatives, we believe that companies will need to become "connected enterprises"—organizations that use data and digital technology to function more smoothly, develop innovative products, connect with customers and suppliers, make rapid decisions with confidence, and give employees the tools to succeed. They will have to be trusted stewards of customer data and continue to develop driver-assist technologies that save lives. In the final section of this paper, we discuss how automotive players can apply eight essential "connected capabilities" to make this happen.

It's a lot of change and a lot of challenge. But change is also opportunity. We know automotive leaders are up for the challenge and are eager to pursue new opportunities. Enjoy the ride—I know I shall.

Gary Silberg
Global Automotive Leader
KPMG International

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Key takeaways

The EV transition is changing how automotive firms are organized. Increasingly, automotive companies are reorganizing to manage the EV transition, through investments and partnerships—and recently by separating ICE and EV businesses.

Manufacturing and supply chain operations are being reinvented. OEMs are adopting modular manufacturing—including multi-use chassis design—and lightweight materials. They are also striving for supply chain resilience, sourcing new battery materials and other key components closer to home.

Finding ways to monetize the connected vehicle experience. Supplying software, content updates, and components for the connected in-car experience can create new revenue streams.

Consumers are ready for a fully connected in-car experience. Consumers are increasingly enjoying personalized infotainment, driving assistance and technical help.

Harnessing data for better performance and new revenue streams. Data on performance, safety, and design, via multiple IoT sensors, enables new ways to make cars safer and more reliable. Usage data can also be used for increasing customer lifetime value. But makers of connected vehicles also must guarantee data security and data privacy.

Decarbonization is getting serious. New zero-carbon policies and fresh incentives will likely accelerate adoption of EVs and the winding down of ICE models. Countries and U.S. states are setting deadlines for the end of ICE vehicle sales.

The dealer role continues to evolve. Car buyers are accustomed to shopping online and buying at dealerships. And EV upstarts have adopted direct-to-consumer approaches. As alternative ownership and as-a-service models catch on, the dealer role will change.

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What's inside

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Signals of change

Future success for automakers will be determined by their ability to adapt to five categories of change that require strategic responses and changes in business and operating models.

By acting on these new strategic imperatives and becoming truly connected enterprises, automakers can respond to customer demands, manage supply chains and talent, and make data-driven decisions.

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How automobiles work

1 The switch to electric power trains

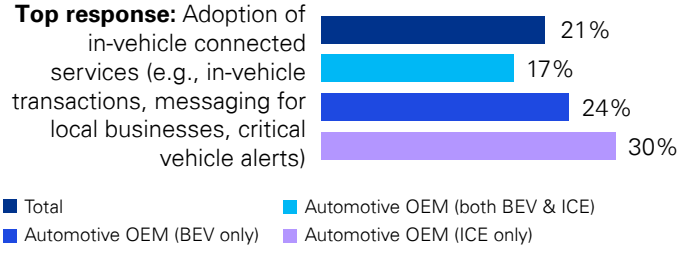
The shift to EVs is accelerating. It is estimated that half of automobiles sold in the U.S. in 2030 could be electric; Chinese officials say that 70 percent of Chinese autos sold in 2030 will be electric. Globally, unit sales of EVs are expected to grow by 12.8 percent annually from 2022 to 2034.[1]

This acceleration is driven by increased focus on the transition away by growing support for decarbonization, high fuel prices, and government actions to encourage EV purchases and prohibit sales of ICE vehicles. However, there remain barriers to adoption, including high purchase prices, range anxiety, and lengthy charging times. Strategies to reduce manufacturing costs include innovations like modular platform architectures, and in-house battery manufacturing.

Grid capacity also needs to rise significantly to satisfy EV demand. In one study suggesting that national electricity production would have to rise by 25 percent if the entire population switched to EVs, requiring US$125 billion in grid investment.[2]

Exhibit 1. Enhancing the customer experience is seen as the biggest game changer

Question: "Which factor (related to connected cars/business models) has the greatest potential to change the landscape for the automotive industry?" (By type of OEM)



Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

2 Towards a fully connected experience

Connectivity is transforming the driving and ownership experience. Data gathered from an array of onboard sensors and processors, enable new maintenance, upgrades and customization, and insights for improving performance, safety, and design.

By 2028, it is forecast that over 70 percent of global sales will be connected.[3] More than half (56 percent) of the OEMs surveyed by KPMG are investing in connected services in vehicles or plan to within two years. Nearly a third view technology-driven customer-experience enhancements as a key competitive differentiator.[4]

Infotainment and other services are also seen as a source of recurring revenues. Manufacturers of connected vehicles will also be challenged to assure consumers that the electronics that control their vehicles (eventually including autonomous driving systems) are reliable and safe from cyber attacks. Automakers must also be trusted not to misuse driver data and ensure data is safe from cyber-attacks.

Connected to hackers?

A connected car sends and receives data via the internet, which makes it as vulnerable (or invulnerable) to cyberattacks as any other connected device. In 2015, Chrysler was forced to recall 1.4 million vehicles due to a bug that could have enabled remote access to brakes and transmission. GM cars and trucks were found to be vulnerable to remote interference that could have disabled brakes. Tesla's Model S infotainment system carried similar weaknesses for four years.[5] In 2021 BlackBerry software used for driver assistance and other functions was found to have a flaw that potentially exposed it to hackers.[6] And global automotive supplier Eberspaecher had to temporarily halt production in 2021 after a major ransomware attack.[7] The cybersecurity challenge will only grow as vehicles become more reliant on data communications, including for autonomous driving.

[1] Source: "Global Hybrid & Electric Vehicle Forecast," News & Insights, LMC Automotive, 2022

[2] Source: Will Englund, "Plug-in cars are the future. The grid isn't ready," The Washington Post, October 13, 2021

[3] Source "Vehicle Connectivity is Surging, but Consumer Paid Subscription Share is in Sharp Decline," ABI Research, April 13, 2022

[4] Source: "Connected Enterprise Automotive Survey 2022," a commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

[5] Source: "Cyber security best practices for modern vehicles," Press Releases, National Highway Traffic Safety Administration, United States Department of Transportation, September 7, 2022

[6] Source: Manojna Maddipatla and Radhika Anilkumar, "BlackBerry Software Flaw Could Impact Cars, Medical Devices - U.S. Agencies," Reuters, August 18, 2021

[7] Source Catalin Cimpanu, "Workers sent home after ransomware attack on major automotive parts manufacturer," The Record, October 27, 2021

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How automobiles are built

1 Modularizing for cost efficiency

Chassis modularization can dramatically cut costs, speed up production and reduce vehicle weight. Canoo, the U.S.-based startup, has developed a modular EV "skateboard" chassis designed to fit multiple body styles. Ford, GM, Volkswagen, and Kia have all announced platforms for their EV lineups.[8] UK-based Williams Advanced Engineering is developing EV platforms for high-performance "hypercars" as well as crossovers and sedans."[9]

2 New entrants shake up competition

Electric vehicle makers account for a quarter of all automotive startups[10] and Rivian—with its electric trucks—Lucid, China's Nio and Vietnam's Vinfast are all making inroads.[11]

3 A tilt towards Asia

ASEAN light vehicle sales accelerated after the pandemic lockdowns of 2020[12] and the EV market has grown even faster.[13] These trends signal the strength of Asia's OEMs, who have the technology and ambition to challenge traditional auto companies' global dominance. Consequently, many established Western brands are expanding their Asia footprint, often in tandem with emerging competitors.

4 Supply-chain challenges

Supply chains have suffered from component and raw material shortages, COVID and the war in Ukraine.[14] A shortage of microchips and lithium (essential to batteries) reduced planned EV production by almost 4 million in 2021, or approximately US$110 billion in sales.[15, 16]

Overall global vehicle production (across all powertrains) was down by almost 10 million in 2021, with Europe and Asia the worst affected regions.[17]

Supply chain constraints may increase suppliers' negotiating power and lead to higher prices for automakers—not helped by rising energy prices further squeezing margins. Just-in-time manufacturing could be another casualty, with Toyota's largest supplier Denso, increasing its inventory levels from 38 to 50 days in the past decade.[18]

5 Attracting digital talent

As automakers seek to win the innovation battle, and technology becomes ubiquitous, they are in a battle with other sectors for software engineers and other technologists, which is pushing up salaries and driving new recruitment and employment tactics.

[8] Source: Paul Lienert and Ben Klayman, "Ford reportedly launching two new dedicated EV platforms by 2025," Reuters, May 25, 2021

[9] Source: Jonathan Ramsey, "Williams Advanced Engineering reveals EVR electric hypercar platform," 2004 - 2022 Autoblog News, September 9, 2022

[10] Source: Sarwant Singh, "Over 2000 Auto Industry Start-Ups Are Disrupting The Industry And Stealing Investments," Forbes, January 27, 2021

[11] Source: Paul A. Eisenstein, "Here are the electric vehicle startups vying for your attention this year," NBC News, January 4, 2022

[12] Source: "Global Light Vehicle Sales Update," LMC Automotive, October 14, 2022

[13] Source: "Global Hybrid & Electric Vehicle Forecast," LMC Automotive, 2022

[14] Source: "Autocrat auto costs," Automotive News, March 14, 2022

[15] Source: Jeanne Whalen, "Semiconductor shortage hammering automakers, costing billions in lost production and sales, "The Washington Post, July 28, 2021

[16] Source: Jed Graham, "Why A Lithium Battery Shortage May Wreck The Great EV Race," Investor's Business Daily, April 18, 2022

[17] Source: Ilaria Grasso Macola, "Automotive production plunges as industry builds 10 million less cars," City A.M., December 27, 2021

[18] Source: Violeta Keckarovska, "Automotive industry shifts from JIT manufacturing," Briefs, TI Insight, May 18, 2021

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How automobiles are used

Mobility-as-a-service on the road to mainstream

Car ownership is unlikely to become a thing of the past, but consumers are becoming more open-minded about mobility services. KPMG's global automotive research finds that 63 percent of OEMs are investing in, or plan to develop, alternative ownership models such as ride-sharing and peer-to-peer "micro-sharing" within two years.[19] Subscription services are another growing trend: U.S.-based Autonomy offers a Tesla Model 3 for a flat monthly fee,[20] while Hyundai has a monthly or annual subscription plan.[21]

A recent study suggests that 25 percent of car buyers would switch to subscriptions,[22] while Frost & Sullivan forecasts that more than 16 million new and used cars globally will be driven on a subscription basis by 2025.[23]

[19] Source: "Connected Enterprise Automotive Survey 2022," a commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

[20] Source: "Vehicle subscription services provider NextCar rebrands as Autonomy, launches with Tesla," Retail, Automotive News, January 21, 2022

[21] Source: Carsubscriptions.org

[22] Source: Michelle Krebs and Rebecca Rydzewski, "Car Buyers Balk at Paying Monthly Fees for Features and Services," Data Point, Cox Automotive, April 21, 2022

[23] Source: Sarwant Singh,d "Your Next Car Could Be A Flexible Subscription Model," Frost Perspective, Mobility: Automotive and Transportation, Frost & Sullivan, June 4, 2018

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How automobiles are sold

1 The push for direct sales intensifies

Pressure is rising on established automakers to create direct sales channels—upending the traditional dealer model, which has long prevailed and is protected in the U.S. by state laws.

Tesla has pioneered direct-to-consumer sales in the U.S. and other EV suppliers are following a similar strategy. Luxury EV startup Lucid is fast expanding its direct sales footprint in the U.S.[24] and Ford says it wants to sell electric cars exclusively through direct channels at fixed prices.[25] EV company executives in our global automotive survey say that direct sales have the greatest potential to transform the EV market.[26]

But established players in the U.S. are constrained from jumping into direct sales due to franchise and licensing laws in about two-thirds of U.S. states, that prohibit or limit direct sales. These laws are being challenged, particularly by EV makers, but only 11 states permit any direct sales of new cars.[27] In Europe, where such restrictions don't exist, Audi aims to sell electric models directly to customers, with delivery and service through traditional dealers.[28]

In the U.S. used car market, where state franchise laws do not limit direct sales, platforms such as Carvana enable customers to shop, buy and finance their vehicle purchase and pick up the car at multi-story sites or have it delivered direct to their home.[29] Cazoo, Carvago and Vroom are pioneering the European direct sales experience for second-hand automobiles, as are Uxin, Guazi and Souche in China.

2 Dealer consolidation concentrates power—but direct sales remain a threat

The surge in retail acquisitions is giving dealers greater purchasing power and potentially endangering automaker margins. It also provides a platform for dealers to compete in the fast-growing charging market and build new revenue streams. Recent figures suggest that 2021 was a record year for M&A in dealerships, up by a quarter on 2020.[30] However, direct sales by OEMs are challenging dealers' traditional role, potentially relegating them to service and delivery centers.

[24] Source: Lisa Martine Jenkins, "As EV Startups Enter the Market, They Say Dealerships — and a Decades-Old Legal Structure — Stand in Their Way," Morning Consult, March 22, 2021

[25] Source: Chris Randall, "Ford aims for direct sales model in the USA," Automobile, Electric, June 7, 2022

[26] Source: "Connected Enterprise Automotive Survey 2022," a commissioned study conducted by Forrester Consulting on behalf of KPMG, July 2020

[27] Source: Liam Denning, "Car Dealership Laws Aren't Fit for the Electric Age," Opinion, Articles, Bloomberg, January 5, 2022; Kirsty Hartman and Laura Shields, "State Laws on Direct-Sales," National Conference of State Legislatures, 2021

[28] Source: Chris Randall, "Audi to switch to agency sales model in 2023," Automobile, Electrive, July 1, 2021

[29] Source: Kirsten Korosec, "Carvana acquires Adesa US auction business for $2.2B to jump-start used car sales," Transportation, TechCrunch, February 25, 2022

[30] Source: Jim Henry, "Dealership Acquisitions Bound for Record-Breaking 2021," Dealers, WardsAuto, November 23, 2021

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How the automotive business is regulated

1 Accelerating the zero-emissions push

Significant and increasing regulation is forcing OEMs to accelerate their shift to EVs. More than 20 countries have already signaled a full phase-out of ICE car sales over the coming decades, with the EU banning sales of new combustion-powered cars by 2035.[31, 32] China has mandated that, by 2030, 40 percent of all new cars sold must be electric,[33] and the US state of California is prohibiting sales of new ICE cars by 2035.[34]

2 Incentives and government funding

The EV market has benefited enormously from incentives, but programs are continually evolving. In the U.S., for example, after Tesla and GM sold 500,000 EVs, federal tax incentives for consumers expired. Toyota, Nissan and Ford are closing in on the 500,000 mark.[35] However, the recently enacted Inflation Reduction Act has extended incentives for EVs, albeit with price and income caps.[36] China is slashing subsidies on new energy vehicles by 30 percent.[37] But the EU has pledged US$20 billion to boost clean vehicle sales and create charging stations and hydrogen filling facilities—in addition to subsidies and investments by individual member countries.[38]

3 The bumpy road to autonomous driving

According to a recent KPMG global auto executive survey, 45 percent of automakers are investing in autonomous technology or plan to do so within the next two years.[39] VW has plans for a self-driving taxi,[40] and Toyota is launching an operating system that could handle autonomous driving and which it will make available to other companies.[41] For widespread deployment of autonomous vehicles, automakers still need to demonstrate more reliable technology to win regulatory approval. Amid reports of guidance-system failures, consumer groups and unions have pushed regulators to withhold approval for autonomous vehicles on public roads.[42, 43, 44] However, GM's Cruise and Alphabet's Waymo have both won permits for passenger service in autonomous vehicles in California, but only with drivers onboard.[45]

[31] Source: "EU lawmakers endorse ban on combustion-engine cars in 2035," AP News, June 9, 2022

[32] Source: "Here's how EU legislation accelerates the EV revolution," Blog, Virta, 2022

[33] Source: Nancy W. Stauffer, "China's transition to electric vehicles," MIT Energy Initiative, MIT News, April 29, 2021

[34] Source: Nadia Lopez, "California phases out new gas cars — so what's next for electric cars?" Environment, Cal Matters, August 26, 2022

[35] Source: Tim Plouff, "Push for tax credits comes off arrogant, 2021," Letter to the Editor, Automotive News, May 31, 2021

[36] Source: Sarah O'Brien, "Buying a car and want to go electric? Inflation Reduction Act extends $7,500 tax credit — but with price, income caps," Personal Finance, CNBC, August 10, 2022

[37] Source: Reuters, "New energy vehicle subsidies to be reduced 30% in 2022," China, Automotive News, December 31, 2021

[38] Source: "Here's how EU legislation accelerates the EV revolution," Blog, Virta, May 30, 2022

[39] Source: "Connected Enterprise Automotive Survey 2022," a commissioned study conducted by Forrester Consulting on behalf of KPMG, July 2022

[40] Source: Nathan Eddy, "VW is planning a self-driving taxi, delivery van based on ID Buzz," Automakers, Automotive News Europe, April 5, 2022

[41] Source: Staff Reporter "Toyota to launch self-driving-capable operating system", Articles, Automotive News, February 4, 2022

[42] Source: Reuters and Alastair Talbot For Dailymail.com "Nearly 400 car crashes in the US within ten months were caused by driver-assistance technology, including 273 Teslas operating in full self driving mode, bombshell report reveals," News, Articles, Daily Mail, June 15, 2022

[43] Source: Audrey Laforest, "NHTSA asks Tesla if it plans to issue recall after Autopilot update," Regulation-Safety, Automotive News, October 13, 2021

[44] Source: David Shepardson "Autonomous vehicles need stricter rules -U.S. safety group labor unions," Business, Auto Transportation, Reuters, February 3, 2022

[45] Source: David Shepardson, "California issues permits to Cruise, Waymo for autonomous vehicle service," Technology, Reuters, March 4, 2022

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Strategic imperatives

A combination of changing competitive dynamics, evolving consumer expectations, economic challenges, and regulatory changes are impacting the automotive landscape. Automakers, technology companies, parts manufacturers, dealers, energy companies, and financial services organizations are all jostling to own the customer interface and win brand loyalty as a mobility provider. We see eight strategic imperatives to address these challenges:

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1 Organize for the EV transition

The shift to EVs also has important implications for how auto manufacturing companies are organized. EVs and ICE vehicles have different labor and capital requirements, different growth rates, and different rates of return. And the market values pure-play EV shares far more highly than shares of incumbent automakers. [46]

As a result, some automakers are separating their vehicle businesses into distinct segments like EV, ICE, and commercial, with specialized manufacturing and marketing centers of excellence. In March 2022 Ford announced plans to run its EV and ICE units as separate businesses.[47] In November, Renault announced plans to spin off its EV unit and form a joint venture for ICE engines and hybrid technology with China's Geely.[48] Connected services businesses are also being separated to increase market value, boost profitability, and achieve legal, and tax benefits.

The shift to EVs could also pull automakers into new adjacencies. In October 2022, GM announced the formation of a new division, GM Energy, which will offer EV charging systems, solar panels, storage systems and related products to consumers and businesses. The division will include Ultium, a joint venture with LG Energy Solutions announced a year earlier, when GM said it would invest US$750 million in charging infrastructure at truck stops and gas stations in the U.S. and Canada by 2025.[49] Products and services include battery packs, EV chargers, and software to help customers optimize their vehicle charging and cope with electric grid disruptions.[50]

The GM-LG alliance is only one of many joint ventures that have been created to share the cost of EV development. GM has also teamed with ABB to produce fast chargers capable of 15- and 20-minute charges respectively.[51] Ionity (a joint venture involving BMW, Ford, Volkswagen, Mercedes-Benz, and Hyundai) and VW (in partnership with BP, Enel and Iberdrola) are also rolling out ultra-fast chargers.[52] Honda is teaming up with GM to develop affordable EVs and mobility services.[53, 54] VW is partnering with Microsoft to strengthen its automated driving capabilities, and Ford and Google are collaborating on enhanced cloud connectivity and AI-powered customer experience.[55]

2 Rethink manufacturing, supply chains, and partners

Traditional OEMs are rethinking their role in the automotive value chain. As cars become "computers on wheels," with electric powertrains, more and more of the value comes from digital technology design and software. Manufacturing, on the other hand is set to become modular; automakers will design and fabricate fewer components in-house and may wind up acting increasingly as designers and assemblers, like consumer electronics companies. This has implications for how capital is used by automotive brands.

The shift to EVs—as well as the supply-chain problems that have hampered production since the pandemic began—compel automakers to rethink manufacturing footprints and supply chains. Mercedes-Benz is shifting to cheaper (but less powerful) batteries for its smaller electric models, betting that customers will accept the accompanying shorter ranges.[56] GM is investing in low-cost lithium extraction in California to ensure supplies for its EV batteries,[57] while Tesla has material-sourcing agreements around the world, including a long-term deal to buy nickel from Vale's Canadian mines.[58]

[46] Even after dropping more than 40 percent during 2022, Tesla shares still traded at more than 30 times forward earnings vs. about six times for GM. Source: Yahoo Finance

[47] Source: Paul Lienert, Ben Klayman and David Shepardson, "Ford set to announce plans to run EV, ICE as separate businesses -sources," Charged, Reuters, March 2, 2022

[48] Source: Nick Kostov, "Renault to Separate EV Unit in Sweeping Overhaul," Wall Street Journal, November 8, 2022

[49] Source: Dan Mihalascu, "GM Will Invest $750M In EV Charging Infrastructure Through 2025," General Motors, News Inside EVs, October 7, 2021

[50] Source: John Rosevear and Michael Wayland, "GM is launching a new business to connect homes and businesses with EV chargers, energy storage," Autos, CNBC, October 11, 2022

[51] Source: Reuters, "ABB launches world's fastest EV charger," Suppliers, Automotive News Europe, September 30, 2021

[52] Source: Ryan Fisher, "Automakers Develop Charging Networks for Greater EV Cred," Technology, Bloomberg News, 2022

[53] Source: Hannah Lutz, "GM, Honda plan EV crossovers under $30,000 amid record high transaction prices," Mobility Report, Automotive News, April 8, 2022

[54] Source: Christian Wardlaw, "Honda and Sony to Build Electric Cars Starting in 2025," Car News, Edmunds, March 7, 2022

[55] Source: "KPMG US Automotive Monthly Health Monitor," Industries, Automotive, KPMG Global, March 2022

[56] Source: Bloomberg, "Mercedes bets entry-level EV buyers will accept shorter range," Technology, Automotive News, October 27, 2021

[57] Source: Hannah Lutz, "GM invests in Calif. lithium sourcing for EV batteries," Suppliers, Automotive News, July 2, 2021

[58] Source: Neil Hume, "Vale strikes nickel supply deal with Tesla," Industrial metals, Financial Times, May 6, 2022

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3D printing is also gaining momentum. A number of automakers and component manufacturers are working with 3D printing partners. VW has partnered with Siemens to produce 100,000 3-D printed components by 2025.[59] Research institute Fraunhofer IAPT says 3D printing can cut costs of parts by as much as 80 percent.[60]

Automakers also rely on 3D printing to accelerate design and product development. GM, for example, used the technology to speed up development of the Hummer EV.[61] and Subaru's new R&D center will enable cooperation with suppliers and academics, including 3D-printing and VR capabilities. 3D printing of spare parts at the dealership is seen as an opportunity to cut inventory costs and provide faster service.[62]

3 Monetize the connected vehicle experience

In a recent study of European drivers, almost half say they would be willing to switch brands in order to get access to new or innovative connected car features and services.[63] Connected vehicle services offer a range of potential revenue streams for OEMs. The cars they sell can be platforms for selling various services, including maintenance and repair services based on connected-car sensor readings.

Stellantis has announced that, by 2030, it expects to earn US$20 billion annually through connected technology—with a 40 percent gross margin.[64] Ford has a similar ambition and expects revenue from "always-on" relationships to also reach US$20 billion per year.[65] And GM anticipates annual software and services revenue opportunities in the $20 billion to $25 billion range, from a projected 30 million connected vehicles by the end of the decade.[66]

In addition to creating a new source of revenue, automakers can strengthen their customer relationships through these touch points. Connectivity also brings competition from software providers who want to own the in-car customer experience the way they do with PCs and phones.

Among the potential services are "infotainment" offerings such as navigation, music and video, shopping, and vehicle-to-vehicle communication. These services may be bought outright or on a subscription basis—although some consumers have indicated a reluctance to paying extra for in-car, software-driven extras.[67] VW, Tesla, Toyota, and others offer over-the-air software updates and, in some cases, repairs,[68] and BMW, in partnership with software company Blitzz, enables video chat roadside assistance.[69]

B2B revenue opportunities include fleet management technology and tax and expense management, and software upgrades, enabling fleet managers to track usage and performance and manage costs. Data from connected vehicles can also be monetized and sold to insurers, advertisers, and other relevant users, so long as this fits within protection and privacy laws.

It's likely that various packages will emerge, containing different levels of add-ons, and the option to trade up and add or exclude services. Key to success will be the partners involved in supplying the connected services, who must be innovative and customer-oriented—there should be demand for genuinely superior services like enhanced satnav.

Delivering connected services is a big cultural change for established automakers, who must encourage employees to adopt a customer-centric and customer lifetime value (CLV) mindset that stretches beyond making and delivering physical vehicles, while also bringing in new people with software backgrounds and an as-a-service mindset. Another important requirement for the connected-car customer experience will be taking utmost care to protect customer data.

[58] Source: Joris Peels, "Fraunhofer Iapt Slashes Car Part Costs By 80% Using 3d Printing Technology," 3D Printing, 3D Printing Research, Automotive 3D Printing, Featured Stories, Metal 3D Printing. 3D Printing Industry, January 19, 2022

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[60] Source: Hannah Lutz, "Hummer EV is the model for GM developing vehicles faster", Manufacturing, Automotive News, October 4, 2021

[61] Source: Hans Greimel, "Subaru steps up R&D to meet age of EVs," Manufacturing, Automotive News, August 14, 2021

[62] Source: "Ready to connect? Consumer expectations towards connected cars," Blog Post, Sitsi Market Research Services, February 4, 2020

[63] Source: "Stellantis Long-Term Strategic Plan," Investors, Events, Strategic Plan, Stellantis, March 1, 2022

[64] Source: Mich Dearborn, "Accelerating The Transformation Of Ford+" News, Ford Media Center, Ford Motor Company, March 2, 2022

[65] Source: David Leggett, "GM outlines business strategy and plans to 2030," News, Just Auto, October 8, 2021

[66] Source: Sam Mceachern, "Just 25 Percent Of Car Buyers Willing To Pay For Subscription Services," Blog, GM Authority, April 21, 2022

[67] Source: Nathan Eddy, "VW launches over-the-air software updates for electric ID family," Automakers, Automotive News Europe, July 6, 2021

[68] Source: Mark Elias, "Face-to-face roadside help available to BMW drivers," Fixed Ops Journal, Automotive News, May 1, 2022

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4 Build out as-a-service models

In the new as-a-service world, subscription models are set to proliferate, with a range of options, including time- or mileage-based pricing, and comprehensive packages that include insurance and maintenance costs. Some OEMs will offer subscriptions to ride-sharing and/or mobility services, while owners could also have the option to lend their vehicles to public ride-sharing services—possibly including autonomous driving technology.

For those customers not wishing to commit to a vehicle, micro-ownership subscriptions are available on a monthly basis—especially for those cautiously considering an EV. Widening the range of ownership models gives customers greater choice and potentially extends the brand to new groups of buyers. Within this model, one of the big challenges for OEMs is retaining brand loyalty, which places an emphasis upon a seamless and convenient customer experience across all mobility services.

As OEMs contemplate these models, the ability to monetize them via revenue streams, and build customer loyalty, is paramount. There are a host of new entrants into the mobility services market, and the challenge for automakers is to create and manage new partnerships with these players, while retaining customer loyalty.

A recent report predicts a significant rise in car subscriptions, with the market set to grow annually by more than 25 percent to surpass US$35 billion by 2029.[70] But paying for services on subscription is a relatively new trend, and one that customers are still considering. Some subscription trials, notably by Audi and BMW, have been suspended or abandoned. One hurdle has been getting customers to pay monthly for a bundle of services they believe should be part of the initial purchase.[71]

Using data to increase customer lifetime value

Automakers traditionally have focused marketing efforts on vehicle sales, financing, parts, and warranties. Because various functions often worked in silos and because dealers had the direct contact with buyers, automakers lacked a single view of the customer to help expand selling opportunities. The emergence of connected vehicles and different ownership models changes that. Automakers can now more easily tap after-sale revenue streams—including from used vehicles.

A global automaker is pursuing a new strategy to use data from connected cars and new revenue streams to maximize customer lifetime value (CLV). As part of this effort, KPMG in Italy worked with the client to change its marketing operating model, using customer relationship software to get a comprehensive view of customers. Using this data, the company created a CLV program to measure and predict behavior, which was then rolled out across the entire organization.

With this new visibility into customer behavior and needs, the company is now in a position to improve the customer experience at each touchpoint, maximize revenue streams, and offer new ownership options, such as subscriptions. This strategy can only succeed, however, if the vendor can be trusted to use customer data with discretion.

[70] Source: Adroit Market Research, "With 25.8% CAGR, Vehicle Subscription Market Size to Surpass USD 35.83 billion by 2029 - Strategic Initiatives, Size, Segment Analysis, Latest Trends, and Future Opportunities," Yahoo Finance, August 15, 2022

[71] Source: "Car Subscription Market 2021-2026," Market Research Report, Mobility Foresights, January 2021

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5 Create a seamless direct sales experience

Both traditional automakers and EV suppliers are seeking to get closer to the customer via online shopping platforms and, where possible, through direct sales. Automakers may also opt for a platform "agency" model where customers buy direct but vehicle fulfilment is through the dealer—which may also offer additional services. Recent consolidation in the U.S. has led to the rise of the brand-agnostic digital mega-dealer, with a complete customer experience encompassing online and retail. These powerful dealer groups continue to grow through acquisition and exert increasing influence.

In addition, consumer and, especially, commercial, and fleet vehicles may be sold through an OEM/dealer network, or alternatively to software suppliers, who would provide custom software for vehicles used by electricians or plumbers, for example.

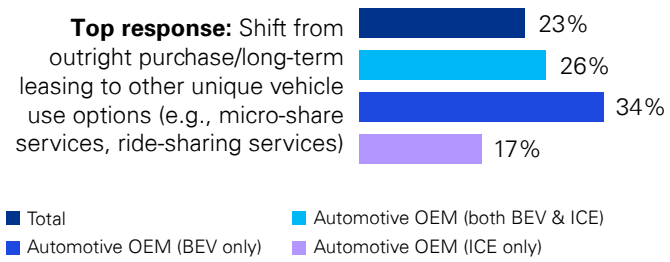
Shifting from a traditional dealership model to one where some or all vehicles are bought directly from the manufacturer is a major change, both operationally and culturally. Dealers need to be convinced of the value of becoming more of a delivery and servicing hub, rather than just the place where drivers buy their cars. Financial incentives could be used to push dealers to adopt the new mode. Automakers could also reward dealers that embrace the new approach by giving them priority access to high-margin, in-demand vehicles.

OEMs will also have to adapt their marketing to customers, emphasizing an enhanced experience offering greater speed and convenience, targeting appropriate segments who are open to new channels.

For both OEMs and dealers, direct delivery to the customer is another priority, to enhance the purchasing experience. This calls for a digital platform and accompanying logistics that can manage the process seamlessly from order to receipt of vehicle. In some geographies, regulatory change may be necessary to permit direct sales.

Exhibit 2. Traditional automakers are most likely to expect big impacts from alternative ownership

Question: "Which factor (related to vehicle use/ownership) has the greatest potential to change the landscape for the automotive industry?" (By type of OEM)



Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

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6 Harness data to boost customer lifetime value

There is an increasing recognition that the initial sale is only the start of the customer relationship, with a need to invest in lifetime value. Aftermarket services are all about a heightened customer experience, with remote, online services including routine and predictive maintenance, and spare part orders, increasingly delivered either at home or at convenient vehicle servicing hubs, where engineers have a full digital history enabling more accurate decisions on issues like oil changes, repairs, and replacements. And with the rapid advances in 3D printing, parts can be available faster, and closer to the customer. Automakers could own the entire aftermarket experience or outsource pieces to third parties.

A seamless customer experience does not just happen. Sales and service teams need to work together more closely and see themselves as contributing to customer lifetime value, with appropriate training, to ensure that service professionals own the customer relationship. By viewing the service team as a sales channel and creating targeted loyalty programs—like free vehicle servicing, or discounts off spare parts—customer "stickiness" can increase. Subscription services can be a part of this, offering packages of benefits.

According to KPMG's global survey of automotive executives, digitization of after-sale functions for EVs has the greatest potential to change the landscape.[72]

Creating a frictionless customer experience

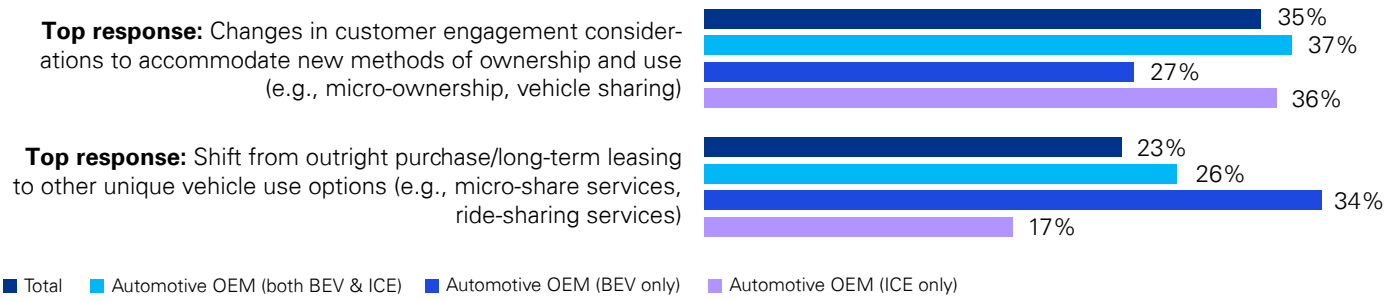
A maker of luxury sports cars was launching a new product that extended the brand to a different target audience, but the company feared that its retail experience would not meet customer expectations. There were particular concerns about inconsistent processes across the global dealership network.

With a focus on customer-centricity, KPMG plotted a complete customer roadmap and created a new, standardized process from first point-of-contact through to purchase, collection and after-sale. Our customer experience dealer assessment tool helped us evaluate every dealership and come up with customized improvements.

With a purchase experience that matches the brand promise, the launch proved highly successful, helping the manufacturer increase its previous year's sales by more than 50 percent and elevating its market position.

Exhibit 3. Consumers are anticipating new modes of ownership

Question: "Which factor related to vehicle use ownership has the greatest potential to change the landscape for the automotive industry?" (By type of OEM)



Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

[72] Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

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7 Financing mobility

With a rising need for financing in the automotive sector, automakers have an opportunity to grow their captive finance businesses. They also risk losing finance business to banks or specialty lenders.

Financing will remain a valuable source of revenue for dealers and, increasingly, OEMs as they sell more vehicles online direct to customers—and seek to become one-stop-shops for all the services associated with a vehicle. Add to this financing for private and/or autonomous fleets, mobility services like ride sharing, and assets such as batteries and charging stations—for both individuals and corporate clients. Consumers may also seek finance for connected services, on-demand in-vehicle functions, and car and battery insurance—on a subscription or pay-as-you-go basis.

Other potential sources of revenue are fleet management services, vehicle insurance, extended warranty, and payment processing—often made through the vehicle itself. So-called "balloon" payments are a growing trend, where consumers have a lower monthly repayment and a larger payment at the end of the loan period. Although this reduces the monthly cost of high-ticket items like batteries, there is a higher risk that customers won't be able to pay off the significant final instalment.

How can auto players extend the brand experience by delivering a compelling customer experience via captive finance that binds the customer and creates opportunities for financing batteries, software, and other products and services? Part of the answer lies in a frictionless approach to doing business, via apps that integrate with partner systems, which may mean collaborating with partners on new systems architecture.

8 Attract talent to the sector

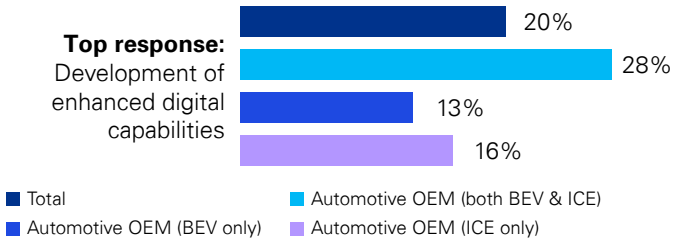
As their businesses change, automakers struggle to attract and retain the talent they need to design and build connected, electric vehicles. Ford and GM have set up R&D and design shops in Silicon Valley and Ford has also poached leading Apple engineering executive Doug Field, who had reportedly headed a secret car project for the tech giant and was previously at Tesla.[73]

But automakers have struggled to compete for top talent. One way is to adopt Silicon Valley mindsets and ways of working. Both GM and Ford are offering greater flexibility and improved employee benefits, for example.[74] But these organizations, which were built and managed to optimize production of ICE vehicles, may need a broader cultural makeover to attract and retain the best people.

Our global survey of automakers found that 87 percent of those that we classify as "future-focused"[75] rated themselves as "above average" in configuring their organization and culture around customer centricity, agile working, and a digital mindset. Also, according to our survey, enhancing customer and employee experience through digital transformation is the top strategic goal for auto executives.[76]

Exhibit 4. Automakers see the importance of improving digital capabilities

Question: "Which (digital transformation-related) factor has the greatest potential to change the landscape for the automotive industry?" (By type of OEM)



Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022

[73] Source: Kirsten Korosec, "Ford hires Apple executive who led its secret car project," Transportation, TechCrunch, September 8, 2021

[74] Source: Michael Martinez, "How Ford plans to woo top tech talent," Executives, Automotive News, March 2, 2022

[75] Source: "Connected Enterprise Automotive Study 2022," a commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2022; "Future-focused" companies are those making near-term investments in trends aligned to automotive signals of change and scoring highly on a number of technology innovation measure

[76] Source: "Connected Enterprise Automotive Survey 2022," a commissioned study conducted by Forrester Consulting on behalf of KPMG, May 2020

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Building connected automotive enterprises

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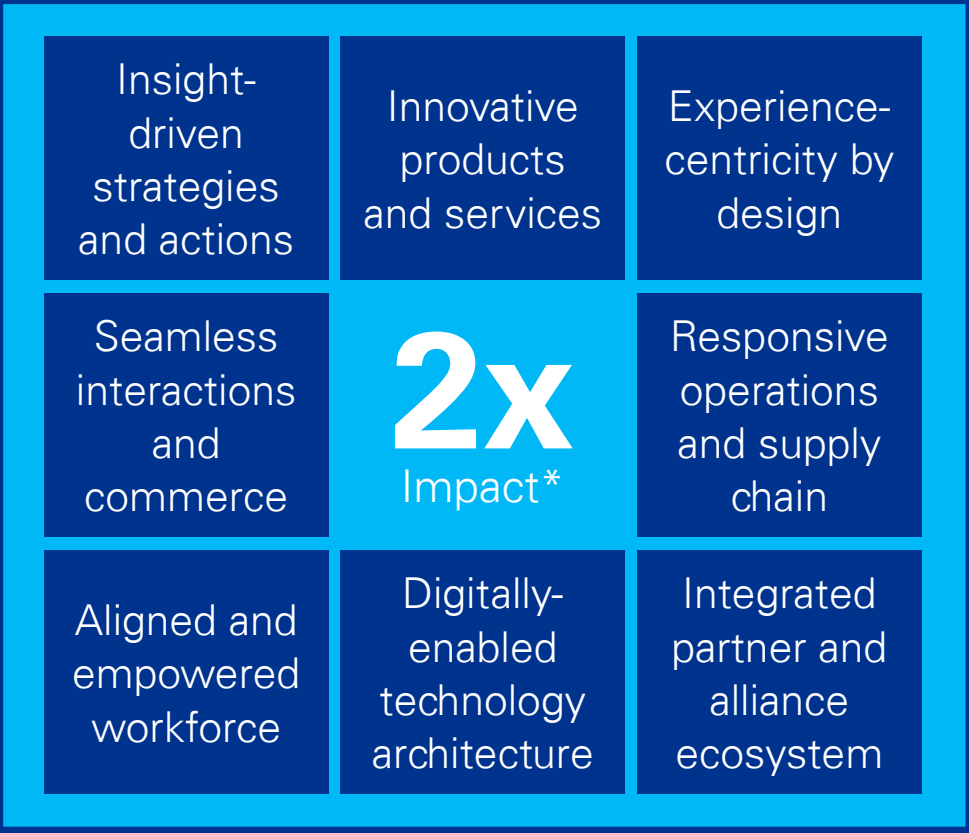
The eight capabilities of the KPMG Connected Enterprise

As we have seen in the previous chapters, automotive companies will need to move on many fronts to take full advantage of the changes in the industry—and tackle the challenges. This will only happen if automakers learn to operate in new ways. They must become more agile and flexible. Like their products, they need to be more connected, both internally and with suppliers, partners, and customers. The KPMG Connected Enterprise model can help automotive organizations build the capabilities they will need in future. These capabilities range from designing great user experiences for drivers of connected cars to providing seamless transactions for acquiring cars (or signing up for a car as a service). The connected model can help automakers and parts suppliers better integrate operations with partners. Data-driven decision making can help leaders adapt to the changes in the competition, customer preferences, and technology that will keep coming.



*Base: 1,299 professionals involved with customer strategy decisions. A commissioned study conducted by Forrester Consulting on behalf of KPMG, 2018. The research was conducted on a sector-specific basis.

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In the following table we show how the eight connected enterprise capabilities can be applied to the strategic imperatives described above:

Exhibit 5. How connected capabilities apply to automakers

Insight driven strategies and actions	• Leverage customer lifetime value and voice of customer data to better understand and anticipate customer expectations across channels • Apply CLV principles and segmentation to enhance aftermarket services revenue • Incorporate CLV into the mobility business model to drive recurring revenue across different mobility touchpoints and build brand loyalty/ customer ownership • Understand customer insights through their behavior and relationship with brands • Use (real-time) insights from analytics across the value chain to personalize the customer journey and make faster, better-informed decisions
Innovative products and services	• Use a CLV lens to anticipate and respond to customer preferences, to speed up services and expand choices • Invest in traditional and new channels to market • Develop a robust, easy-to-use connected platform, to link with new and existing partners and enable new revenue streams • Develop new services that satisfy shifting ownership trends, and help customers manage changing costs of ownership/mobility, such as battery replacement and connected services
Experience centricity by design	• Work with internal customer-facing teams and external partners to deliver a seamless, personalized, experience across mobility and connected services, via multiple distribution channels • Offer tailored, timely offerings and easy-to-access products and services • Develop a platform that integrates legacy systems with partner technology platforms, including dealers • Make aftermarket services easy to access, with convenient locations close to the customer, and on-demand or virtual support • Bring together OEMs and partners to forge a frictionless captive finance experience for customers, adaptable to changing demands
Seamless interactions and commerce	• Provide omnichannel engagement options across channels, fully aligned to customer expectations • Create a fully aligned, integrated, digital-first customer experience, working closely with mobility, connectivity and captive finance partners • Integrate the connected experience into multiple ecosystems, with fast, simple payment options

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Responsive operations and supply chain	• Use realtime data to fine-tune production schedules • Streamline dealer distribution by using hubs to pool inventory • Collaborate with partners to drive efficiency through AI and automation—and manage complex operations • Proactively engage with suppliers and customer-facing teams/partners, to focus on fast, responsive services and quick resolution of problems • Gain strong control over tier 1 and tier 2 suppliers to ensure the right parts arrive in the right place at the right time
Aligned and empowered workforce	• Align talent around common strategic goals to drive transformation • Embed a culture of innovation and agility alongside a growth mindset, to foster innovation and entrepreneurialism • Empower staff to use technology transformation to provide innovative new mobility options, also exploring and working closely with new partnerships • Shift the culture from the traditional "moving metal" mindset to one that is more focused on software-based solutions
Digitally enabled tech architecture	• Transition from legacy platforms to new digital technology, to deliver enhanced client experience, greater flexibility and reduced costs • Deploy "wrapper" solutions to build new experiences on core legacy platforms, such as DMS and CRM, and integrate with new systems and tools • Create an ecosystem and architecture that lets third parties use the connected vehicle platform
Integrated partner and alliance ecosystem	• Continue to invest in existing partnerships, while educating partners on emerging cross-channel engagement model • Extend licensing of 3D printing capabilities to new partners in locations closer to customers—speeding up service, lowering prices and reducing investment in inventory • Work closely with partner mobility firms, to fulfil a shared transportation vision • Enable third parties to seamlessly provide services through the connected platform • Develop a platform that integrates legacy systems with partner's technology platforms, including dealers

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Case studies

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1 More sources of customer lifetime value

Global

The growing importance of connected services means that OEMs now get revenue streams throughout the customer lifetime—including from used vehicle—and a global automaker wanted to maximize these opportunities to build both income and loyalty. Traditionally, the client's sales and marketing had focused on vehicle sales plus associated loans and warranties. Because various organizational functions often worked in silos, the company lacked a single view of the customer.

KPMG in the U.S. worked with the client to change its marketing operating model, using customer relationship software to get a more holistic view of customers. Using this data, we created a customer lifetime value (CLV) program to measure and predict behavior, which was then rolled out across the entire organization. Equipped with a new level of visibility, the company is now in a position to improve the customer experience at each touchpoint, and capture connected revenue streams beyond vehicle sales, including subscription services, in-car purchases and new ownership and financing models.

2 A great and consistent customer experience

Europe

A sports car maker was keen to maintain its high-quality sales experience through the after-sales period, to build satisfaction and create further selling opportunities. KPMG in the U.S. carried out a thorough assessment of both the dealer operations group and the dealerships, discussing how to build a seamless experience and producing a roadmap to transform digital retail capabilities.

The shift to frictionless engagement has been pronounced, as interactions have been made simpler and more convenient for the customer, with a highly digital experience supported by fast, attentive, and responsive services. Critically, these improvements have been achieved across the dealer network, with a uniform aftersales experience regardless of geography. The client has seen a rise in customer loyalty and retention, as well as increased after-sale revenue.

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Transformation never stops. Neither do we.

At KPMG we believe that business transformation is too good an opportunity to miss. Combining the right tech and the best processes with people whose insight is as broad as it is deep, are essential ingredients to successfully transform. KPMG has worked at the heart of global businesses for many decades, helping our clients realize the full potential of their people and technology and working together to achieve real-world outcomes. Because when people and technology are in harmony great things happen.

Making a world of difference:

KPMG people can make all the difference on your transformation journey. Together we can help you to orient your business around the customer, optimize functions for a new era, manage enterprise risk and regulation for a safer future, rise to a new level of value creation, and create an environment for managing ongoing change.

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