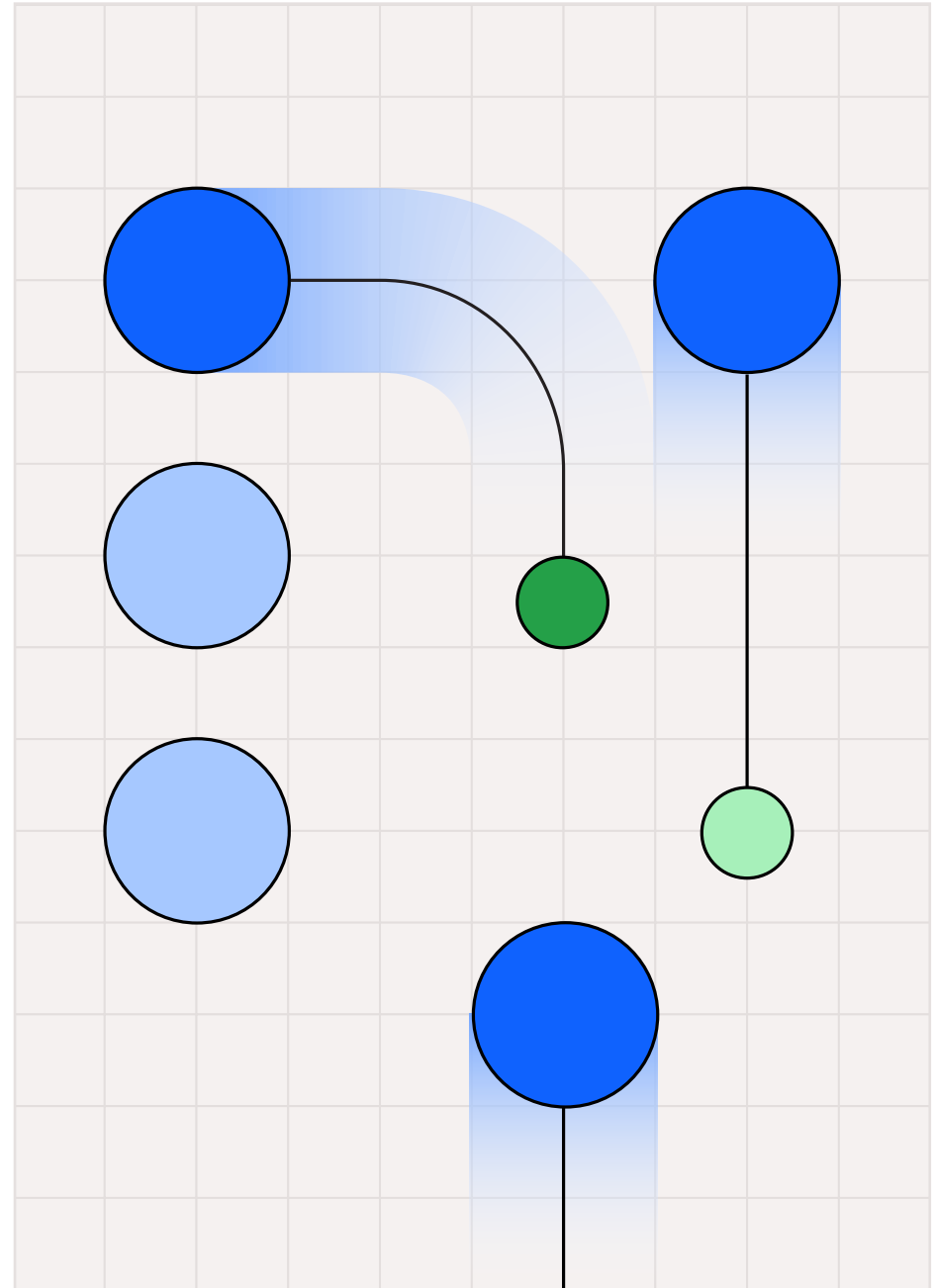# Automotive in the AI era

How AI is turbocharging

business opportunities

IBM

Foreword

The term "paradigm shift" is often overused these days. But it's very applicable to what is happening right now in the global automotive industry. We are witnessing a profound transformation from manufacturing traditional motor vehicles to developing software-defined vehicles (SDVs). Recent IBM Institute for Business Value (IBV) research found that 74% of industry executives predict that cars rolling off the assembly lines will be software-defined and AI-powered in the next decade.[1]

Meanwhile, transformative changes, unforeseen macroeconomic developments, geopolitical tensions, and trade policy events are generating uncertainty and new challenges for the global economy.

However, this is not the first time that automakers have been in the hotspot of global trade conflicts. As with earlier periods of economic turmoil, innovative operational approaches are necessary. In fact, this is an opportunity to double down on transformation and reimagine the role of your enterprise in the automotive industry of the future.

As the SDV trend builds momentum, the industry is reinventing its century-old business model. New revenue streams from digital services and experiences are beginning to emerge. From differentiated customer experiences to predictive maintenance and digitally enabled in-vehicle services, automakers are looking to AI software to create more value for customers and more revenue for their businesses. Bottom line: Automakers expect to generate 51% of their revenue from digital and software services by 2035.[2]

AI is a key element of this profound transformation. In a recent IBM survey of automotive OEM CXOs, 61% say AI will contribute significantly to their revenue in the next three years and 63% believe investing in AI will deliver clear and measurable competitive advantage. Moreover, 64% say they have a clear strategy for integrating AI into their long-term innovation strategy and 79% say AI investments are strongly supported by senior leadership teams. In short, the automotive industry is ready to be reimagined, powered by AI.

However, opportunities for innovation, fueled by AI, will not arrive by themselves. Concerted and deliberate action is required, whether you use AI to reengineer your organization's mobility experiences, amplify your technology and software development capabilities, or accelerate the transformation of your operating model.

Many of the world's leading automotive organizations partner with IBM as they adopt AI to meet business objectives for growth and profitability. This, along with deep auto industry experience, provides insights into what AI can deliver and how automakers can pivot to AI-driven business models. Our combination of AI expertise, technology understanding, and consulting capabilities makes IBM unique in the ability to accelerate your SDV innovation journey.
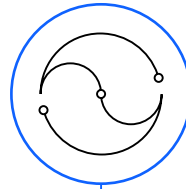
Rami Ahola
Global Industry Leader
Industrial Manufacturing
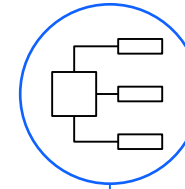IBM Consulting

Key takeaways

Cars are shifting into software platforms

Cars are rapidly becoming platforms to deliver software-driven mobility. AI will be an essential motor for driving this transformation. 79% of automotive OEM executives expect their software-defined vehicle efforts to progress in the next three years, and 76% believe AI will contribute to this progress.
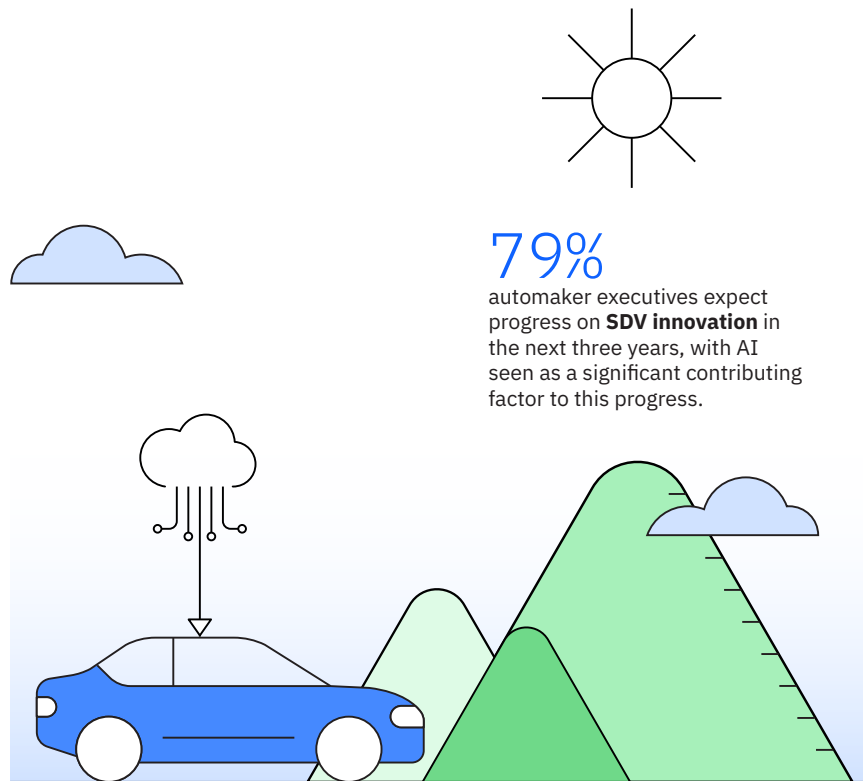
Drive your revenue growth with AI

OEM executives expect the share of total revenue attributable to AI to increase from 5% today to 9% in three years. Overall, auto executives are looking to AI to increase the perceived value of products by 22% and the value of digital services by 37% over the next three years.

Tap an AI-enabled operating model for growth and innovation

As cars become increasingly software defined, automotive companies are transforming their operating models and incorporating AI for greater innovation. 65% of auto OEM executives say they have a clear approach to integrate AI into their long-term innovation strategy. 79% also say that AI investment is strongly supported by senior leadership.

Driving mobility to new destinations

79%

automaker executives expect progress on **SDV innovation** in the next three years, with AI seen as a significant contributing factor to this progress.

In many ways, the automotive industry has been at the forefront of AI deployment, from autonomous driving features to electric vehicles. Cars are rapidly becoming platforms to deliver software-driven mobility.

As SDV development picks up speed during the next 10 years, AI will be an essential motor for driving this transformation. 79% of automotive OEM executives expect their SDV efforts to progress in the next three years, and 76% believe AI will contribute to this progress.

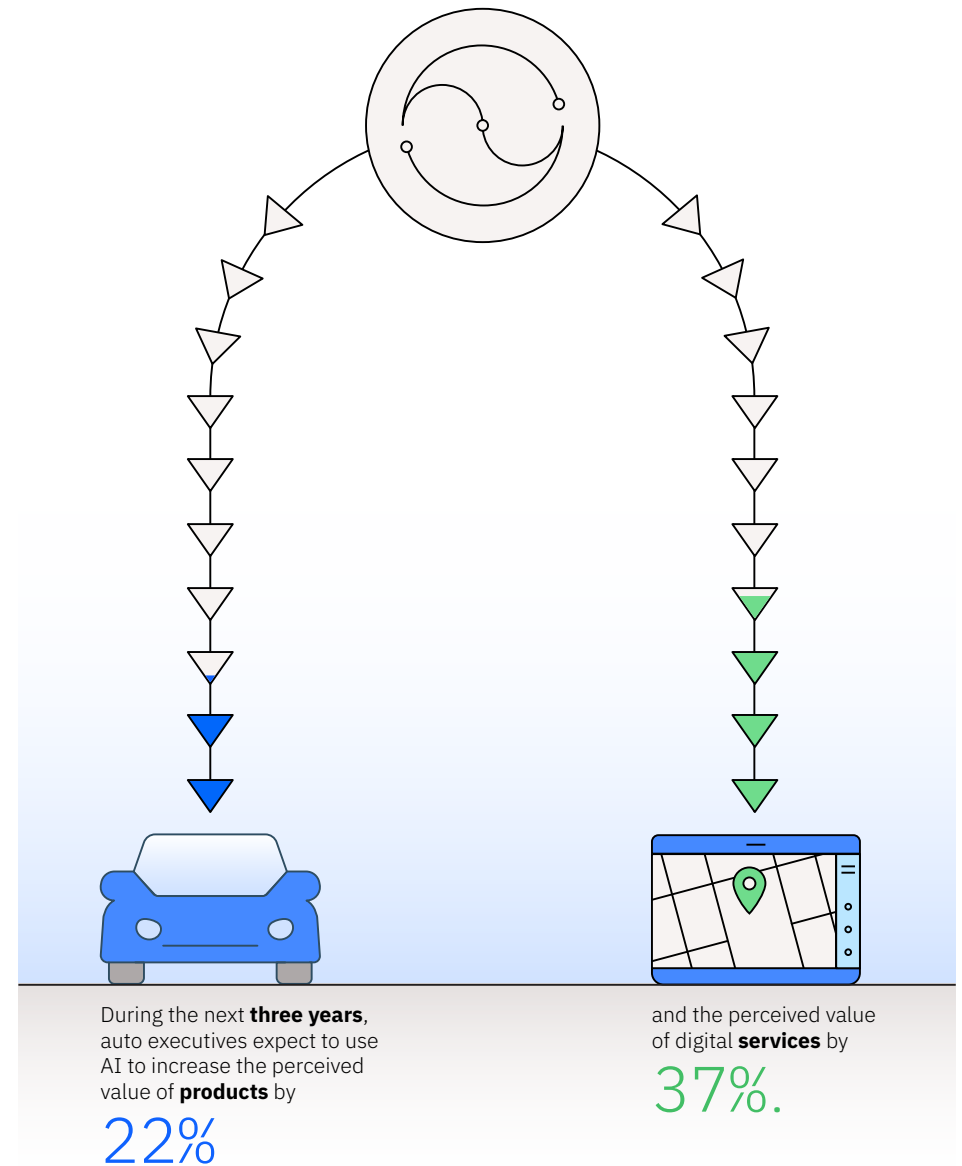## Steering product innovations and new revenue models

A software-enabled customer experience will be the key brand differentiator in the automotive industry, with the industry poised to generate more recurring digital revenue from experience and move beyond selling vehicles and aftermarket parts. Digital and software related revenue is expected to be 51% of total revenue across the industry by 2035, up from 15% today, and the industry is directing its financial resources accordingly.[3] Of course, this major shift won't happen overnight, and we have not seen many successful examples in the market yet, but there is a strong commitment by industry leaders.

Autonomous driving may be the most prominent use case of an AI-enabled driving experience, with 64% of industry executives saying it will be one of the top customer expectations by 2035. The industry expects to generate $269 a month per vehicle in recurring revenue, in current dollars, from autonomous driving or advanced assisted driving systems (ADAS) in 2035.[4] Executives are also envisioning new in-car experiences, such as immersive entertainment and concierge services.

However, since it is difficult to predict customer expectations in 10 years, most companies are focusing on building SDV technology and process foundations. This includes re-architecting vehicle electrical and computing platforms, updating product development processes, introducing new software development tools and methodologies, and creating regulatory compliance processes. AI is integrated in all aspects of this long-term innovation strategy, according to 65% of executives.

In the more immediate future, OEM executives expect the share of total revenue attributable to AI to increase from 5% today to 9% in three years. One particularly promising area is fleet management services, such as predictive maintenance and service subscriptions. Among new services for consumers, voice assistants are viewed as an immediate revenue opportunity.

Overall, auto executives are looking to AI to increase the perceived value of products by 22% and the value of digital services by 37% over the next three years. And they are committed to move at speed, expecting to reduce time-to-market for digital services by 21%.

During the next **three years**, auto executives expect to use AI to increase the perceived value of **products** by

22%

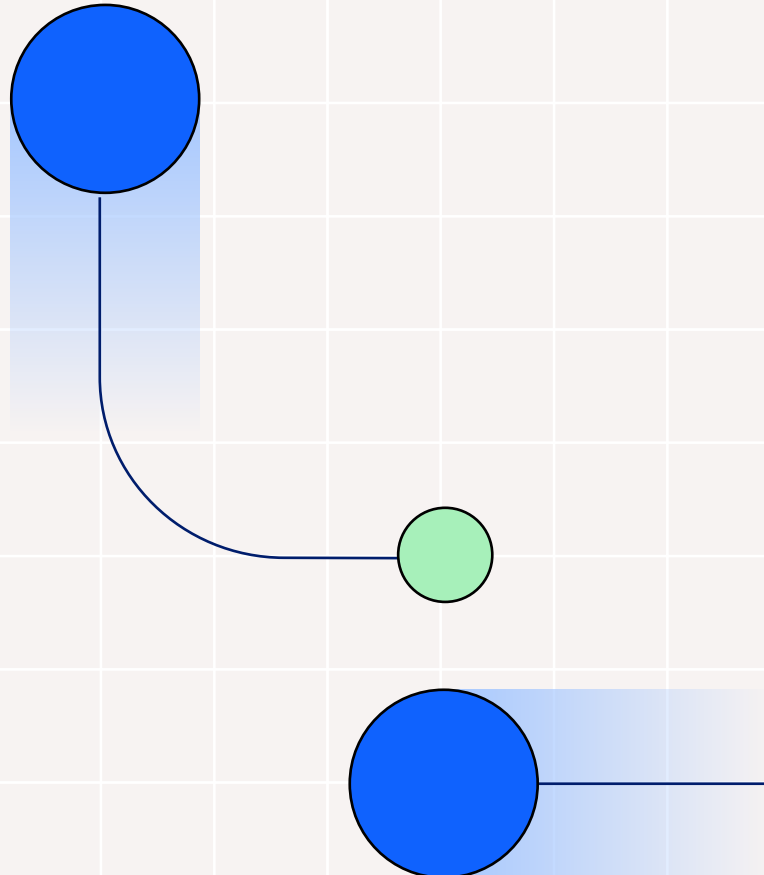and the perceived value of digital **services** by

37%.

Running AI on the edge

One promising area of AI-driven product innovation is in-vehicle edge AI applications. Cars do not always have stable connectivity, and on-board computing has limited capabilities compared to cloud-hosted computing resources. But running small AI models in the car—processing critical AI workloads at the edge—allows for more efficient use of cloud-backend AI intelligence.

Edge AI can process simple voice commands, local personalization, immediate vehicle status alerts, and real-time driver monitoring. Many brands already offer in-car virtual agent services, but monetization strategies vary. While some bundle the cost of the service into the vehicle purchase price, others include it in their premium digital or connectivity services. Finding the best ways to create recurring revenue streams is an ongoing challenge.

Going further, cloud-based AI can perform more sophisticated tasks, add more contexts, provide deeper personalization, and offer higher value services. To this end, fine-tuning a hybrid approach with the right balance between in-vehicle and cloud-based AI workloads is essential.

Small AI models running in vehicles can process simple voice commands, local personalization, immediate vehicle status alerts, and real-time monitoring of driving behavior.

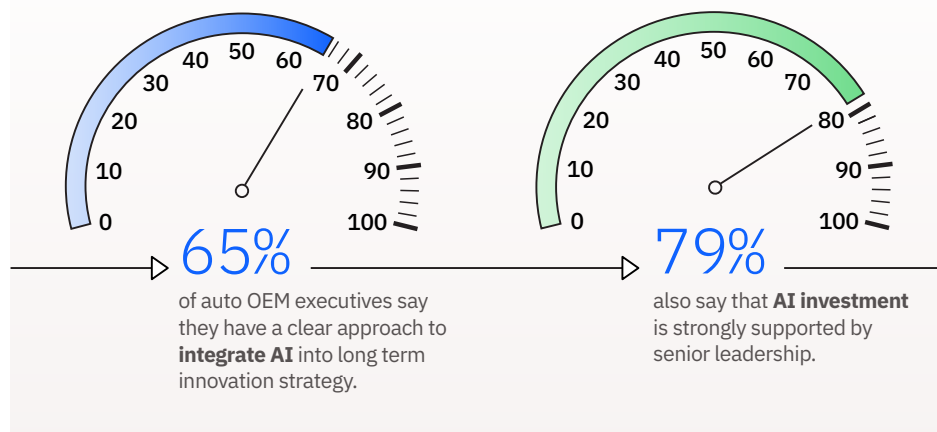# Building innovative operating models to drive growth

Innovation and digital reinvention are recognized as essential for competitive advantage in the automotive industry.

But while the industry strives to move faster into the software defined future, 74% of auto executives agree that this transition will not be easy. Standing in the way is a strong, mechanically driven culture, based on over 100 years of operational success.
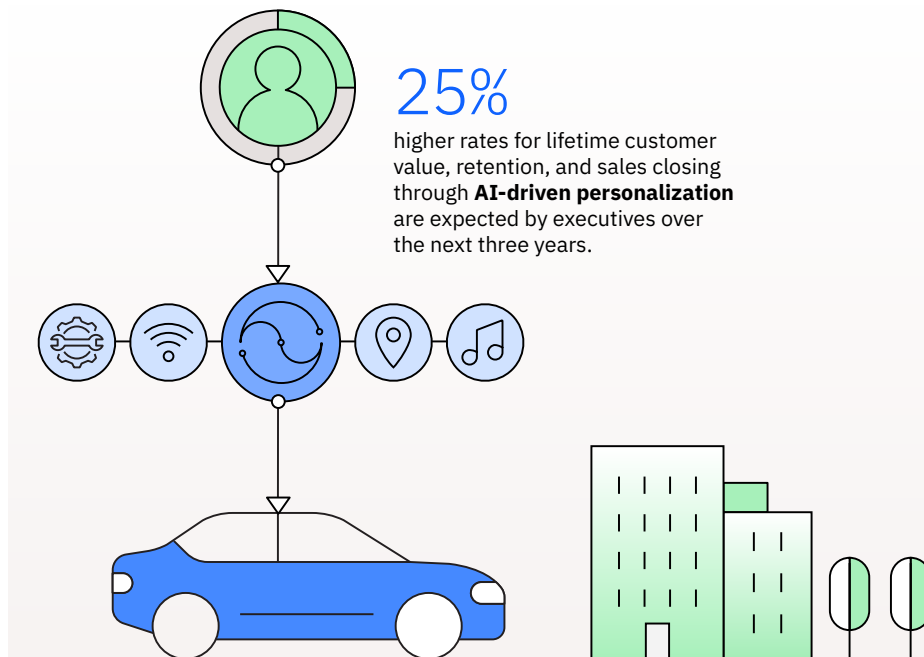
To illustrate the challenge ahead, the percentage of SDV related spending per vehicle program is expected to increase by almost 50% over the next 10 years. Without significant productivity gains, total product development costs will increase, resulting in cars being priced higher than many people can afford. But this is where AI can play a significant role in driving greater efficiency and enabling new ways of operating.

For example, AI is projected to be a source of significant efficiencies in the massive testing and simulation workloads required for making autonomous systems safe, reliable, and secure. Overall, generative AI is expected to improve software-defined-vehicle workload productivity by nearly 40% in three years.[5]

There are also great expectations for AI-powered robotics and automation in manufacturing operations. As cars become increasingly software defined, automotive companies are shifting to software-defined manufacturing. But this will require changes in job roles and skills. In fact, a shortage of AI talent and skills is cited as a top challenge for the industry. Access to AI skill competency will be key to unlocking tangible results from AI investments.[6]

65%
of auto OEM executives say they have a clear approach to **integrate AI** into long term innovation strategy.

79%
also say that **AI investment** is strongly supported by senior leadership.

Putting new ideas on the road for sales, marketing, and aftermarkets

25%
higher rates for lifetime customer value, retention, and sales closing through **AI-driven personalization** are expected by executives over the next three years.

Automotive companies are increasingly leveraging AI to enhance their sales and marketing activities.

Industry executives anticipate productivity gains of 7% in customer support and a 5% improvement in overall marketing budgets and customer acquisition metrics. The most promising areas for AI application include AI-powered customer insights and digital marketing.

Executives are also focused on fostering more enduring and valuable relationships with customers. AI-driven personalization is expected to boost customer lifetime value, sales closing rates, and retention rates by 25% over the next three years. However, more complex sales and marketing transformations, such as virtual showrooms and AI-optimized dynamic pricing, which require dealer engagement, may take longer to implement.

As cars become increasingly software-defined, they can be updated with new features and secured throughout their lifecycle. To this end, implementing software over-the-air update processes and developing new service and aftersales operations will be essential. These changes not only require closer relationships with customers over an extended period but also create opportunities for automakers to transform the customer experience.

Honda streamlines knowledge transfer with AI to accelerate innovation[7]

Honda, headquartered in Japan, is the world's eighth largest automaker. As the auto industry shifts gears toward a future powered by electrification and intelligence, Honda is navigating this change by transforming complex data into actionable insights, paving the way to greater efficiency and performance.

A key initiative involved implementing an Advanced Expert System (A-ES) to transfer skilled engineers' knowledge to younger colleagues. The sheer amount of time to create knowledge models posed a challenge for wider business development, so Honda used generative AI to extract database knowledge from technical documents. An IBM pilot validated the feasibility of this approach using a large multimodal model (LMM) to convert graph and diagram content into text to improve the reuse of valuable knowledge.

With a conventional A-ES approach, an experienced engineer would take three years to create a handbook and one year to create a model from the handbook. The time savings achieved through A-ES were 30% for development and 50% for planning and management. Using gen AI, Honda's technical documentation can now be modeled as sentences, reducing modeling time from three years to one.

This approach expands document utilization areas, boosts business efficiency, and opens up many more opportunities for AI-fueled innovation in the future.

"The platform securely leverages our vast amount of development information and contributes to our dream of delivering more value to our customers."
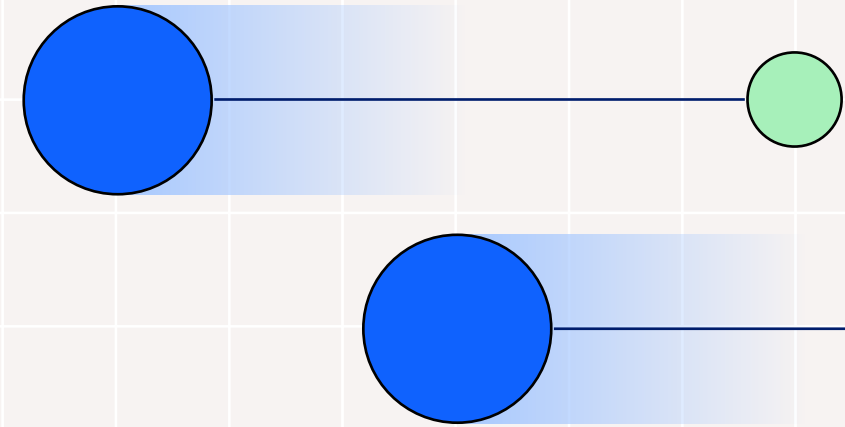
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Action Guide

Safety, reliability, security, and privacy are standard equipment when it comes to the future competitiveness of any OEM. But a brand also needs to stand out from the rest of the pack—and that's where AI can provide a differentiating edge in the marketplace.

New mobility experiences are in high demand. Meet them with AI.

– Use AI to achieve business results on a faster timeline, including delivering superior AI-driven customer experiences in promising applications such as voice assistants and fleet management services.

– Make first impressions count. They are critical for generating meaningful revenue.

– Digital marketing with AI tools is also proving its value, right now.

Ramp up building SDV technical and process foundations.

– Kickstart SDV progress with AI to improve software development productivity in autonomous driving, design and engineering, simulation, testing, code generation, and regulatory compliance.

– Develop AI, software, and SDV skills together and anticipate that product development cost may go up in the short term, due to increased software workload and introduction of new SDV processes, methodologies, and architecture.

– Focus on building a strong foundation now that pays off in the long term.

Speed up innovation across operating models and ecosystems.

– Engage with dealers and suppliers for deep operating model innovations and greater business impacts.

– Tap vehicle electrification and software defined products for opportunities to transform operating models and reevaluate the entire value chain.

– Embed AI, automation, and agentic AI operating models to redefine processes and workflows, improve productivity, and create new revenue sources.

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Russell Gowers.

Research methodology

IBM IBV, in partnership with Oxford Economics, surveyed 101 automotive OEM executives from in the US, UK, Germany, and India to understand their current use and expectations about AI and innovation in their industry. Participants were asked a range of questions in various formats including multiple choice, numerical, and Likert scale. The survey was conducted in March 2025.

In addition, the findings in this paper draw on insights from a survey of 1,230 C-level automotive executives in nine countries conducted by IBM IBV, in partnership with Oxford Economics, in Q3 2024. 40% of the sample represented automotive OEM traditional and EV companies, 40% auto suppliers, and 20% ecosystem players. Participants were asked a range of questions in various formats including multiple choice, numerical, and Likert scale. They were asked about their organization's expectations, results, concerns, and barriers for the industry's movement toward electrification, software-defined and autonomous vehicles, and markets where connected mobility will be in operation.

How IBM can help

A new software-centric paradigm demands automakers rethink how they operate and serve customers. As automakers become more connected, predictive, automated, and intelligent, IBM can help them modernize, optimize, and innovate faster. Applying governed AI for insights and automation, combined with a hybrid cloud strategy and zero-trust security, automakers can update and upgrade to keep pace with the constant evolution of vehicles. For more information, please visit: ibm.com/industries/automotive

Notes and sources

1. Automotive 2035: Taking the pole position for software defined success. IBM Institute for Business Value. December 2024. https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/automotive-2035

2. Ibid.

3. Ibid.

4. Ibid.

5. Ibid.

6. Ibid.

7. "IBM helps boost Honda's efficiency with AI-driven knowledge extraction, expecting to slash documentation modeling time by 67%." IBM case study. 2024. Accessed April 7, 2025. https://www.ibm.com/case-studies/honda-watsonx

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