NTT DATA

Beyond the hype: GenAI and the strategic reinvention of the automotive industry

An executive insight report for automakers

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Executive summary

GenAI is more than simply the next wave in digital transformation. GenAI will reconfigure decision-making, operations and the workforce, redefining what is possible throughout the automotive value chain.

GenAI is top of mind for automakers as they look for ways to integrate intelligent models into core operations at scale. It promises to transform traditional operations with smart systems that improve production while fostering innovation, sustainability and workforce empowerment.

And, just as GenAI has performance-jumped more traditional AI, the rise of agentic AI is magnifying the impact of GenAI. Powerful autonomous decision-making, action execution and adaptability combine with orchestration, coordination and management to turbocharge GenAI.

To understand the opportunity and the impact of GenAI on the global automotive industry, we interviewed almost 200 automotive decision-makers and influencers from organizations spanning 33 markets around the world. Overall, our study found real excitement and positivity about GenAI.

- 63% of automakers already think GenAI is a game changer.
- 96% say it directly improves efficiency and bottom-line performance.
- 97% believe GenAI is delivering a new level of creativity and innovation.

In fact, satisfaction with GenAI efforts has surged to 76% (up from 46%) in a single year, and organizations with more established capabilities are reaping the benefits. This level of satisfaction reflects the progress automakers have made in evaluating GenAI and preparing their businesses to take advantage of the opportunity.

- 96% of automakers say that GenAI will have a material impact on improving their organization's research and development (R&D) efforts.

At the same time, the advent of AI-driven shopfloor assistants and autonomous agents can improve operations and minimize disruptions. In the automotive industry, these advances can boost resource use and lessen downtime. Shorter response times, fewer human errors, reduced stock waste and minimized work stoppages and reworks all contribute to greater efficiency and lower costs.

While excitement is high, progress may prove complex. Aligning AI and GenAI initiatives with business goals and infrastructure plans is key. However, connecting strategy and tactics can be challenging and expose new security risks, especially for those who have not yet integrated GenAI at an enterprise level.

- 94% of automakers say outdated infrastructure is critically hindering GenAI initiatives.
- Only 52% of respondents state that their GenAI strategy is fully aligned with their company's cybersecurity strategy.

Automakers are at an inflection point. To improve their competitiveness, they must focus on blending human expertise with GenAI capabilities in a way that elevates productivity, quality and innovation.

This report provides insights to help automakers responsibly:

1. Establish governance and decision-making frameworks for GenAI
2. Fast-track GenAI implementation and value realization
3. Prepare and empower the workforce to thrive with GenAI

The GenAI landscape in the automotive industry

The automotive industry is undergoing a profound transformation driven by the proliferation of electric vehicles (EVs), autonomous driving technologies and evolving consumer preferences. This transformation requires massive investment in R&D and new manufacturing infrastructure, as well as a fundamentally different approach to vehicle design and production.

Amid these sweeping changes, supply chains within the automotive sector are also becoming markedly more intricate. The transition to EVs, an increased reliance on advanced electronics, and globalized sourcing of critical components expose automakers to new vulnerabilities and logistical hurdles.

GenAI promises solutions to many of these challenges by improving design processes and manufacturing efficiency while personalizing customer experiences. Agentic AI accelerates the pace at which these solutions affect the industry.

At the same time, automakers must balance the need for rapid innovation with the strategic goal of improving sustainability. But only 52% of automakers say their GenAI strategy is fully aligned with their sustainability strategy, and 87% agree that their current GenAI ambitions are in conflict with or negatively affecting their sustainability goals. Balancing these ambitions and goals with an enthusiastic yet responsible-by-design approach ensures that sustainability impact assessments and audits become the norm.

This balance is crucial as the industry moves toward more environmentally friendly practices while remaining competitive. By adopting environmentally conscious GenAI and agentic AI practices, automakers can innovate while meeting their sustainability goals, ultimately leading to a more resilient and forward-thinking industry.

Top 3 challenges

facing automotive companies in the next two years

1. Establishing clear ethical and AI safety frameworks and ownership
2. Assessing complementary architectures (cloud, platform as a service, infrastructure as a service and more)
3. Multiple vendors and service providers (identifying preferred strategic or expert partners)

Although GenAI helps organizations address critical challenges, successfully integrating GenAI requires a human-centric approach. Automakers must seamlessly integrate AI and smart AI into their operations. They must also prioritize robust governance, ethical considerations, workforce development and the augmentation of human capabilities. The challenges are clear — and defining best practices requires the same clarity.

> “The timely convergence of EVs becoming mainstream and GenAI accelerating autonomy is redefining the entire automotive landscape.”

Cornelius Walter
CTO Automotive, Managing Director GenAI Global Automotive, NTT DATA

Governance and guardrails

As AI becomes an intrinsic part of daily life and is integrated into the DNA of automotive industry operations, balancing responsibility and innovation becomes both a moral imperative and a strategic necessity.

- 58% of automakers say there is a significant gap between innovation and responsibility.
- More than 1 in 3 say that a lack of robust internal guidelines for GenAI safety (compliance, ethics and more) affects their organization's ability to balance innovation with responsibility.

In addition to responsibility and ethical considerations, the automotive industry operates in a complex regulatory landscape that shapes every facet of vehicle design, production and operation.

- Emissions standards set stringent limits on pollutants, compelling manufacturers to design cleaner, more efficient powertrains.
- Safety regulations include rigorous mandatory testing protocols and the integration of advanced safety features.
- Global quality certifications play a pivotal role in ensuring consistent manufacturing excellence across the automotive supply chain.

As such, 95% of automakers say GenAI has caused them, or will cause them, to invest more in regulatory compliance. But navigating these regulations is not merely a matter of compliance. It is a strategic imperative that underpins public trust, market access and long-term competitiveness.

As new AI-driven technologies are woven into the fabric of the automotive industry, adherence to evolving regulatory frameworks will be central to the responsible deployment and acceptance of next-generation vehicles.

Case study: Better vehicle safety with GenAI

One of the world's largest automotive manufacturers was looking for ways to improve the safety of their vehicles. NTT DATA jointly developed an AI-enabled mobility platform and telecommunications capabilities to help prevent traffic accidents. The solution comprised high-speed, high-quality communication, powerful computing resources and robust AI models.

Get it right or get left behind

Many automakers are finding it difficult to keep up with the rapidly evolving regulatory landscape. Without strong internal frameworks and clear GenAI usage policies, they are falling behind in effectively managing risk, protecting intellectual property and ensuring operational efficiency.

Just
51%
strongly agree that their organization follows a robust framework that balances risk with value creation

81%
of automakers do not have a GenAI usage policy in place for employees (for example, to protect intellectual property)

Only
48%
strongly agree that they regularly review GenAI processes and their impact on user experience

Automakers need to establish common GenAI usage policies that allow production initiatives to thrive. These include using governance advisory services and proven techniques with secure repositories, as well as reiterating the importance of preparation, assessments and audits.

Doing so helps create AI frameworks that actively guide decision-making, which builds trust, accountability and strategic alignment.

From pilot fatigue to scaled impact

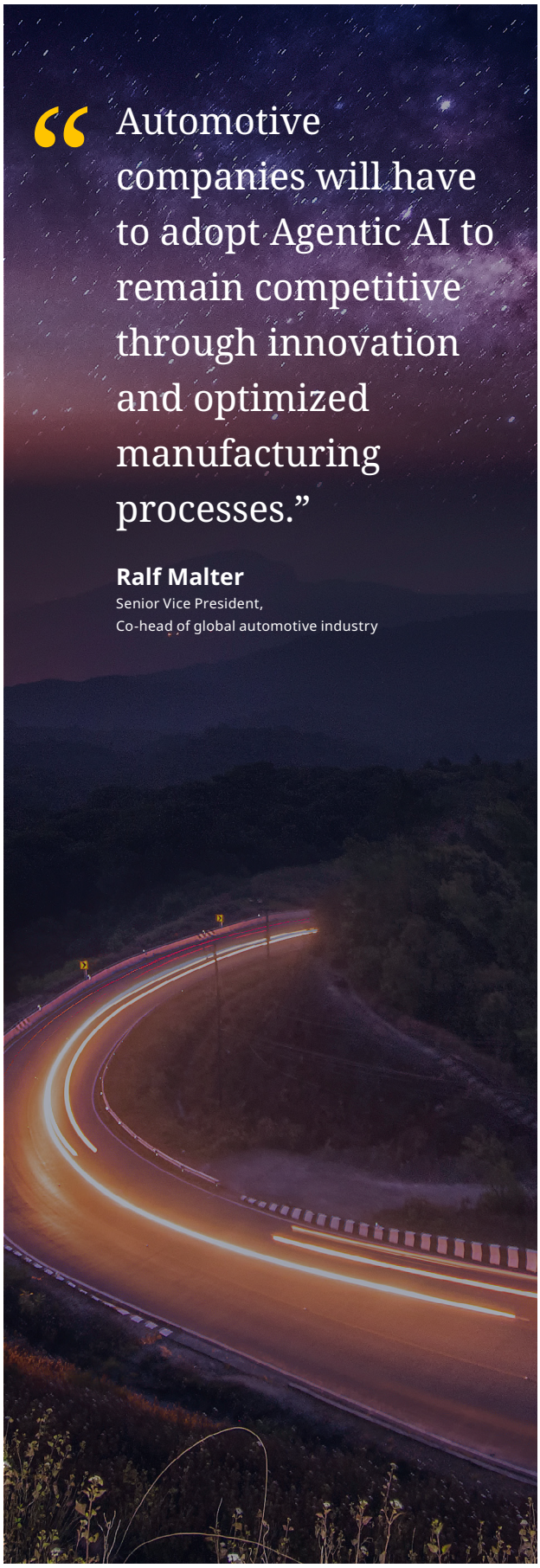
The most successful automakers already embed GenAI into core functions like supply chain forecasting, quality assurance and process automation. The industry is at a pivotal moment where the focus is shifting from proving the efficacy of GenAI to demonstrating its scalability and widespread impact.

Top use cases

1. **Supply chain and inventory management:** Warehouse optimization, demand forecasting and logistics
2. **Personalized service recommendations and knowledge management**
3. **Process automation:** Data collection, process mapping, predictive maintenance and enhanced robotics
4. **Product and service design and development:** Prototyping, design optimization, 3D modeling and simulation, and materials research
5. **Risk assessment and fraud detection**

Considering the needs of your industry, what are the top use cases for GenAI?

Basis: Automotive respondents, excluding "don't know" responses (n=194)



Act urgently to operationalize

As the automotive industry accelerates GenAI adoption, leaders face the challenge of balancing rapid value creation with sustainable growth. Achieving this requires a focus on solutions that not only deliver quick wins but also scale to unlock lasting results.

- 99% of automakers agree that while they seek short-term gains, they are also emphasizing GenAI’s long-term potential.
- 89% say investment in GenAI infrastructure is a given, but the return on investment will be unclear for the foreseeable future.
- 86% say it is crucial or very important to have a solution with proven scaling (in other words, it can accommodate growth).

By strategically selecting GenAI initiatives that deliver quick wins and can scale to deliver long-term gains, automakers position themselves for sustained success. Ultimately, results may materialize faster with hybrid solutions such as coupling GenAI with agentic AI.

The evolution of technology architecture in the age of AI

The evolution of technology architecture within the automotive industry has been marked by a transition from siloed legacy infrastructure to interconnected, intelligent ecosystems.

Traditional automaker manufacturing systems are increasingly enhanced by IoT devices, enabling real-time data collection and communication across vehicles, equipment and supply chains.

The advent of digital twins — virtual replicas of physical assets — has revolutionized scenario planning, proactive risk mitigation and greater transparency across the value chain, helping automakers anticipate and adapt to supply interruptions while maintaining production momentum and quality standards.

- 99% of automakers expect the integration of IoT data into GenAI models to significantly improve the accuracy and relevance of AI-generated outputs.
- 93% say the combination of GenAI and digital twins can improve physical asset performance and supply chain resilience

Seamless data integration now underpins these advancements, breaking down barriers between disparate platforms and ensuring that insights from AI, IoT and digital twins flow effortlessly through every layer of the automotive value chain.

Ensuring effective data management

Automakers say the number-one lesson they have learned from GenAI deployment is that high-quality, diverse and clean data is paramount for effective GenAI models.

To fully benefit from the power of GenAI, automakers must ensure that the data feeding their AI applications is organized, accessible, validated and of high quality. By proactively addressing data requirements, types, quality considerations and security measures, they can lay a solid foundation for success.

Only

48%

of automakers strongly agree that they have invested sufficiently in data storage and processing capabilities to support GenAI workloads.

Only

53%

have already assessed their organization's data readiness, and 94% plan to do so within the year.

1 in 3

identify poor-quality source data and unreliable information as a top factor that negatively affects employee adoption of GenAI solutions.

Making GenAI accessible across business operations

The number of GenAI tools and use cases is growing, offering an expanding variety. This increases complexity for organizations that seek to vet, integrate and implement these tools. As many automakers assess the AI readiness of their technology architecture, most are turning to the cloud for agile and affordable solutions.

95%

of automakers say cloud-based solutions offer the most practical and cost-effective means to support GenAI.

96%

have already assessed their organization's data readiness, and 94% plan to do so within the year.

97%

say the demand for GenAI solutions is driving a review of their network architecture (including edge).

Successful automakers solve these challenges by working with expert partners that offer integrated AI asset and accelerator capabilities, along with hyperscaler consulting and advisory services.

Partnering for successful implementation

The automotive industry is swiftly advancing AI adoption. However, the relative maturity of AI processes in organizations across the industry is diverse. Waiting it out is not an option. Choosing the right combination of vendors, suppliers and partners will have a material impact on success.

Partner selection

Top 3 factors for automakers when selecting a GenAI partner

1 **GenAI safety capability** (such as ethical, reliable and secure design)

2 **End-to-end GenAI service offerings** (full-stack capability)

2 **Relevant strategic** and technology partnerships

Which, if any, of the following are your organization's top 3 criteria when assessing GenAI technology partners?

Base: Automotive respondents, excluding "don't know" (n=194)

Implementation

Automakers' top 3 preferred approaches to GenAI implementation

1 **Dedicated team** (for the time that you need it)

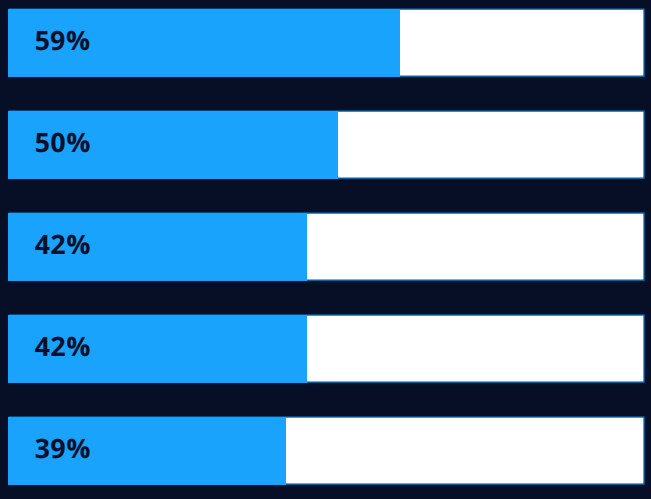
2 **Customized solution** (for a closed project or specific need)

3 **GenAI partnership** (high-level goal and fixed price and time)

How would your organization rank its preferred approach for implementing GenAI?

Base: Automotive respondents, excluding "don't know" (n=194)

Automakers' top 5 approaches to deploying GenAI solutions in the next 2 years



Which of the following statements best describe your organization's approach to GenAI deployments in the next two years?

Base: Automotive respondents, excluding "don't know" responses (n=194)

> "Moving beyond isolated AI wins to a fully AI-enabled enterprise requires a bold vision, clean data and decisive leadership."

Wendy Collins
Chief AI Officer, NTT DATA North America

A workforce at a crossroads

Significant opportunities remain for automakers to prepare and upskill the workforce for AI. Almost two-thirds of automotive respondents admit their employees don't have the skills to work with GenAI, and 54% say they have yet to assess the skills and capabilities needed to plan and execute their GenAI strategy. The future belongs to organizations that use AI to empower their workforce, not sideline it. Human-centric AI will be the norm. Automakers must proactively implement responsible GenAI practices that ensure fairness, transparency and accountability.

Plan to augment, not replace

Three key elements of a human-centric approach

1 **Investing in workforce development**

- 86% of automakers say it is very important to have the required skills in-house to deliver a GenAI strategy.
- Nearly half are implementing GenAI employee training platforms.

Automakers must lean into organizational literacy by fostering a culture of continuous learning and implementing comprehensive training programs that cover both the technical and ethical aspects of GenAI use.

2 **Fostering a culture of employee engagement**

- 94% are addressing the human–GenAI impact on employee roles and responsibilities.
- Only 46% strongly agree that IT and operations teams collaborate to define opportunities and design GenAI initiatives.

Involving employees in GenAI-related decisions is critical to creating a supportive environment fo human–GenAI collaboration.

3 **Prioritizing ethical AI development and deployment**

- 99% say it's important for leadership teams to provide guidance on balancing innovation with responsibility.

Top 3 responsibilities in developing GenAI

1 **Integrating responsible considerations into strategic decision-making**

2 **Educating and training on ethical GenAI use**

3 **Maintaining human oversight and regularly reviewing GenAI policies**

Which of the following should be key responsibilities for business leaders in developing GenAI?

Base: Automotive respondents, excluding "don't know" responses (n=194)

Case study: Transforming requirements analysis — from manual to AI-driven

A leading automotive technology company transformed their development process by integrating GenAI into requirements engineering. Previously manual and time-intensive, the analysis of thousands of technical requirements is now automated, significantly reducing effort and improving accuracy. The AI solution scans documents, identifies key elements and categorizes them efficiently, enabling faster decision-making and minimizing errors. This innovation accelerates project timelines and delivers higher-quality outcomes, showcasing the transformative potential of AI in complex engineering environments.

> "The question isn't whether AI can drive efficiency — it can — but how effectively we can align AI systems with human expertise to maximize their potential."

Prasoon Saxena
President, Manufacturing and Commercial, NTT DATA North America

Here are the four steps we recommend to boost your success:

01

Involve and unite complementary technologies

As automakers refine architecture and delivery model approaches, there must be greater focus on assessing and incorporating IoT, 5G, edge and GPUs into GenAI/AI infrastructure and solution development. Edge AI can deliver real-time operational efficiencies using always-on monitoring and analysis. It can also generate savings that would otherwise be missed in less advanced manufacturing strategies. The opportunities inherent in these technologies magnify with AI and GenAI. Successful adoptions are integrated into a full-scope strategic plan.

CEO to-do: Stay abreast of ancillary technologies critical to success on the floor and in the supply chain. Ensure a unified GenAI/AI business, technology and infrastructure strategy. Look to the experts ahead of you on the path for guidance. Use infrastructure modernization assessments, solution-ready platforms and next-level agentic AI systems advisory.

02

Responsibly innovate for competitive advantage

Waiting to be told how and when to implement ethical governance for AI and GenAI in automotive is not an effective strategy. Beyond regulatory mandates, projects and people will never produce optimal business outcomes if efforts are siloed, short-sighted and inequitable. Concise, proactive and judicious work to deploy AI in a responsible, thoughtful manner — from the bottom to the top of the stack and across the enterprise — is fundamental now and always. Ensure clear use policies. When bigger demands arise, you'll be ready.

CEO to-do: Maintain a corporate reputation for robust governance that exceeds regulations. Leadership must collaborate and be visible on the topic of responsible AI innovation within the business and the broader automotive industry. Be willing to address the topic on a global stage.

03

Sustain success with discernment

The pace of change in AI solutions is remarkable and can feel overwhelming. However, the tenets of success in the powerful new wave of GenAI and agentic AI remain the same. Take care to position the business for sustained success in a rapidly evolving automotive industry. Aim for measurable outcomes and continual improvement.

CEO to-do: Create a vetted and hybrid strategy that allows you and your business to innovate safely following a variety of milestones and timelines. Take advantage of service and solution partners and platforms. Keep the trifecta of business impact, responsible reinvention and scalable results as guides to every decision.

04

Honor, engage and adapt the workforce

Automakers must calibrate their workforce to the reality of AI across all areas. This includes factory assistants who help inform the workforce, multimodal language models that optimize IoT environments and engineers who create with newfound knowledge and speed. The priority must be upskilling, informing and managing staff in an ever-changing environment.

CEO to-do: Solve and re-solve what will be constant, wholesale shifts in workforce planning, roles and application. Focus on clear communication. Lead by example. And be sure the business and the workforce have a clear path forward. All while acknowledging an era of operational change as sweeping and fast-moving as the industrial revolution.

About the research

The research in numbers

A balanced sample of 194 GenAI decision-makers (97%) and influencers (3%) from the automotive sector participated in the research.

Coverage spans 33 countries in five regions.

Among respondents, 77% were from large enterprises with more than 10,000 employees.

Participants included 65% from the C-suite; 31% at the vice president, head of or director level, and 4% from senior manager or specialist roles.

Those in IT roles accounted for 45% of participants, while 55% held non-IT roles.

Research methodology

This report is based on independently sourced research data.

Participants were selected via random sampling on the basis that they had a direct or indirect influence on their organization's GenAI requirements or decision-making authority in that regard.

The research data was gathered via an online questionnaire that ran in September and October 2024. Research was conducted for NTT DATA by Jigsaw Research, an international strategic-insight agency with an exclusively senior team.

Data integrity, validation and analysis were performed by NTT DATA's specialist in-house Primary Research and Benchmarking Team in conjunction with Jigsaw Research. Data and outliers were validated in accordance with standard research-industry rules, disciplines and best-practice approaches. The data is presented at a 95% confidence level with a 5% margin of error.

Let NTT DATA help

Meet the mandate head-on. Find out how leaders around the world are mastering their GenAI destiny in 2025 with your own copy of our Global GenAI Report. Learn from data-led analysis and insights on GenAI-related strategy and transformation; technology and innovation; people and culture; and safety, ethics and responsibility.

Visit our website to download our report and chart a path forward with GenAI.

About NTT DATA

NTT DATA is a $30+ billion global innovator of digital business and technology services. We serve 75% of the Fortune Global 100 and are committed to helping clients innovate, optimize and transform for long-term success. As a Global Top Employer, we have experts in more than 50 countries and a robust partner ecosystem of established and startup companies. Our services include business and technology consulting, data and artificial intelligence, industry solutions, as well as the development, implementation and management of applications, infrastructure and connectivity. We are also one of the leading providers of digital and AI infrastructure in the world. NTT DATA is part of NTT Group, which invests over $3.6 billion each year in R&D to help organizations and society move confidently and sustainably into the digital future.

List of abbreviations

Abbreviation	Meaning
AI	artificial intelligence
GenAI	generative AI
CISO	Chief Information Security Officer
EV	electric vehicle
PaaS	platform as a service
MaaS	model as a service
R&D	research and development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