



Rewiring automotive product development

How organizations can pull ahead in the AI race

Table of contents

04

Executive
summary

09

Who should read
this report and why?

14

Organizations are
turning agentic AI into
engineering advantage

32

Agentic product
development remains
an untapped growth
opportunity

58

Scaling agentic AI requires
a stronger control plane



78

Scaling agentic engineering
requires a mature approach
to AI ecosystem collaboration

90

Rewiring automotive product
development – at AI speed

96

Conclusion

97

Research methodology

106

Appendix

Executive summary

The automotive industry is embracing AI at pace, but in many cases, the technology is advancing faster than the processes, expertise, and integration needed to apply its outputs effectively in product development. Software has become the primary vehicle for change after the start of production, and the pace of the industry is increasingly set by how fast software can move and be trusted.

Our research finds that many organizations are still building the data, governance, and operating foundations required to turn AI-generated outputs into trusted engineering decisions and measurable outcomes at scale. Value is shaped by how effectively engineering work, data, decisions, and accountability come together across the product lifecycle.

These findings draw on our survey of 800 senior executives at manufacturers, tier-1 suppliers,

and the technology providers that serve them, across 12 countries, and through interviews with engineering leaders at Renault, Jaguar Land Rover, Lucid, Audi, Bosch, Michelin, NVIDIA, Siemens, SAP, Dassault Systèmes, Oracle, Aptiv, and AWS.

How to accelerate. In organizations that are struggling to make progress, the same issues keep surfacing. The findings in our survey make one thing clear: the choice of AI model is rarely one of them. These issues can be divided into three areas. The first is trust and governance: agents will only be given work that engineers can stand behind, and only 5% of organizations describe their AI governance as fully mature. The second is controls that rest on evidence rather than on access: most organizations restrict what AI may touch, few can show what it did and why. The third is decision rights: the industry has not settled who decides what between engineers and agents.

19% vs. 5%

reduction in time-to-market for high-value realizers vs. low-value realizers, from the use of AI

The five actions at the end of this report respond to these three issues – scale AI across all six dimensions on which it changes product development, from the individual engineer to the ecosystem, in parallel rather than in sequence; build an agentic control plane that puts the controls on evidence; make engineering data machine-interpretable, not just machine-readable; manage the lifecycle on three KPIs; and close the loop with vehicles in service, not only into the next program. The findings below help explain why.

Executive summary

AI is already paying, and leaders are pulling away. A distinct group of organizations realizes two to three times the gains of its lower-performing peers: 17% faster development cycles against 7%, 19% higher engineer productivity against 6%, a 19% reduction in time-to-market against 5%. What separates them is not more AI – their use of agentic and Gen AI is no higher. They are twice as likely to have a business case and cost-value model for agentic AI (66% against 32%), far more likely to monitor the quality of lifecycle-critical data (82% against 54%), align incentives with AI adoption (53% against 35%), and much less likely to report engineers overburdened with non-core work (50% against 77%).

Software has provided the early proof points, because software engineering does not have to wait for a physical product to validate its work: around seven in ten (73%) software-focused

environments report significant value, with shorter payback. Mechanical and E/E engineering follows a different route, with agentic use expected to grow 2.6 times over the next two to three years, faster than software's 2.1 times, and it takes hold first where the validation loop is already digital: calibration, simulation-led refinement, and test analysis.

Agentic AI is further along than assumed, and it is becoming the connective tissue of the lifecycle. We found that 35% of OEMs and suppliers already use agentic AI (“using extensively” or “using to a limited extent”) in engineering processes and tasks, and a further 33% are actively piloting it, while 65% report Gen AI in use.

35%

of OEMs and suppliers already use agentic AI (“using extensively” or “using to a limited extent”) in engineering processes and tasks

Executives see agents’ greatest value between engineering activities rather than within them: 83% expect them to return engineers to core engineering work, 76% to cut manual effort, and 71% to speed up decisions. Use across the supporting tasks that link the lifecycle – documentation, coordination, knowledge management, data preparation – is expected to rise from 26% to 68% within three years; across

Executive summary

software tasks from 36% to 75%; and across mechanical and E/E tasks from 22% to 57%. For vehicles in service the constraint is no longer collection: 68% say the data they capture after launch reflects real-world use, but only 54% can turn it into engineering action. Inside engineering, data itself remains the most-cited barrier – 58% point to gaps in the availability, quality, or consistency of engineering data.

The industry believes agents can do the work.

It does not yet believe they can prove it. Trust in agentic AI falls the closer it gets to the engineering artifact: 59% in upstream research and concept work, 49% in design, 44% in testing and validation, and 40% in development. Only 55% believe AI can strengthen traceability across requirements, design, development, testing, and compliance evidence – the lowest of the six capabilities assessed.

The controls organizations have built reflect that doubt: 69% restrict what AI may access and 68% require human approval for high-impact decisions, but only 41% can trace the data, assumptions, and rationale behind an agent-influenced outcome, and only 22% escalate on the impact of a decision rather than on a model's confidence score. Requirement traceability – the task an ISO 26262 safety case depends on – is where agentic AI is least used today: 11% of AI-using organizations, against 51% for documentation.

Organizations are putting guardrails in place before the evidence is fully established. The challenge is less about who creates the work and more about whether people are willing to accept it.



Executive summary

Everyone is rolling out agents. Far fewer have made it clear who owns the decisions those agents influence, or who is accountable for the outcomes. Only 5% of organizations (OEMs and suppliers) describe their AI governance and ownership model as fully mature and 38% as advanced or better – the weakest of the capabilities we measured. 45% OEMs don't yet have a comprehensive, cross-functional AI strategy. Leadership is committed: 71% encourage experimentation and 66% report alignment on AI's role.

But when asked whether their organization is clearly redefining decision-making authority between engineers and agentic systems, 43% agree and 43% disagree – the only statement in the survey where the two sides are exactly level. Just 41% have aligned incentives with AI adoption and 27% provide approved, reusable workflow

patterns. 60% say their delays are caused by process rather than technology, yet only 41% have rebuilt their engineering workflows from sequential stage-gates to iterative development at scale.

45%

OEMs don't yet have a comprehensive, cross-functional AI strategy

Vehicles receive content. They do not yet receive behavior. In most software industries a developer learns within days whether a change worked, because the change reaches the product. In automotive that complete loop is still the exception: by public account only a few manufacturers run it, and the survey shows why. 81% collect vehicle telemetry and 72% capture signals from over-the-air updates, but the updates themselves are mostly content: security (84%) and navigation (78%) are near-universal, while updates that change driving functions reach 36% of organizations and assisted driving 30%, while 64% say what they learn from vehicles in use informs the next program rather than the vehicles already on the road.

Executive summary

72%

capture signals from over-the-air updates

The market has already forced a split – 65% intend to decouple hardware and software lifecycles within 18 months and 55% are designing architectures for safe post-SOP updates over the air – yet organizations that have moved to iterative development are no more likely to deliver new vehicle behavior over the air.

Software development has sped up and become more flexible. The mechanisms needed to validate, approve, and deploy those changes to vehicles at scale are still catching up. As a result, software can

evolve quickly, while the path to getting it into the fleet often moves at a very different pace.

No one scales alone – and sovereignty now runs through the update pipeline. Across all 800 executives surveyed, 40% report active collaboration with ecosystem partners, 30% report co-development with shared KPIs, and 10% shared lifecycle accountability. Among OEMs and suppliers, 36% rate their practices for detecting model manipulation or AI-driven cyber events as no better than ad hoc, 73% are strengthening sovereignty for regulatory reasons, and 68% will segregate AI workloads by sensitivity, yet only 11% say they hold end-to-end control of over-the-air management and deployment within their own or trusted environments, with minimal external dependence – and that is the mechanism through which AI-enabled functionality reaches the customer.

The organizations that scale AI fastest will not be those with the most agents. They will be those with the clearest decision rights, the cleanest data, the strongest validation evidence, and the fastest governed path from insight to action.

30%

report co-development with shared KPIs

Who should read this report and why?

Decision-makers must understand where AI is creating value in the product development lifecycle. They should also be conscious of how leading organizations are scaling from experimentation to enterprise-wide impact. This report examines how AI is accelerating development cycles, improving decision-making, and helping organizations manage growing product and software complexity. It is essential reading for automotive executives, particularly chief technology officers, chief engineering officers, heads of R&D, chief digital and AI officers, and product strategy leaders.

The findings are equally relevant to engineering and product development leaders, software and systems architects, and transformation teams modernizing development processes. Suppliers, engineering service providers, technology firms, and AI solution vendors will also gain insight into emerging collaboration opportunities. We pinpoint the organizational, data, and governance foundations that enable successful adoption, the practices that distinguish frontrunners, and the use cases generating the greatest momentum and value.

This report is based on a comprehensive survey of 800 automotive executives from organizations with annual revenue exceeding \$500 million, including 400 original equipment manufacturers (OEMs), 160 suppliers, and 240 technology providers serving automotive organizations, across 12 countries in Asia-Pacific, Europe, and North America, and 24 in-depth interviews with selected executives. See the research methodology at the end of the report for more details on the organizations surveyed.

We extend
our sincere
thanks to
the industry
experts who
shared their
insights
with us



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"The next automotive advantage will come from applying AI across the product development lifecycle. In my view, that means moving beyond engineer productivity to an agentic transformation of product development. Combined with an agentic control plane for governance, trust, accountability and human-AI decision-making, this can rewire automotive product development for speed and scale."

Laurence Noël

Executive Vice President,
Global Head of Automotive,
Capgemini

01

**Organizations are
turning agentic AI into
engineering advantage**

Automotive product development is under unprecedented pressure. As vehicles become increasingly software-defined, connected, electrified, and autonomous, stakeholders are pushing engineering leaders to simultaneously accelerate software delivery, improve engineering productivity and design quality, shorten development cycles, and maximize returns on R&D investments.

Our research shows that automotive organizations are targeting substantial gains across every major product development metric. **AI is now a critical enabler of automotive product development**, accelerating execution, reducing the need for manual effort, and improving outcomes across the engineering lifecycle.

Dr. Jochen Härdtlein, Head of Software Development Powertrain Solutions at Bosch, comments: *"We have already seen significant advancements in development efficiency, and over the past two years AI has become a major enabler across multiple engineering activities."*

Frontrunners are already turning AI into a strategic source of engineering advantage. For example, Nissan is targeting to halve its vehicle development cycle from 55 months to 30 by using AI, simulation, and digital engineering tools. Skyline, its first global model to be delivered under the new approach and slated for launch by the end of 2026, was developed in just 26 months.¹ Similarly, Continental has reduced

requirements analysis effort by up to 80% using an AI tool that automates the identification, extraction, and assignment of requirements, enabling engineers to focus on higher-value activities.²

Norm Marks, Global Vice-President - Automotive Industry, NVIDIA, corroborates this: *"From cutting software defects by up to 50% to reducing simulation times from weeks to seconds, [AI] is accelerating both execution and decision-making."*

Leaders are realizing significantly higher gains

The strongest gains are realized in areas that directly influence engineering performance. Productivity and development speed have become critical determinants of competitiveness. Agentic AI executes engineering work more efficiently, accelerates delivery, and improves overall development performance.

Sebastien Pacchini, Head of Data & AI Operations – Engineering Performance & Innovation, Renault, comments: *"We have seen significant productivity improvements across engineering activities, helping teams accelerate development cycles, streamline reviews, and improve validation efficiency through AI-enabled solutions."*



"We have already seen significant advancements in development efficiency, and over the past two years AI has become a major enabler across multiple engineering activities."

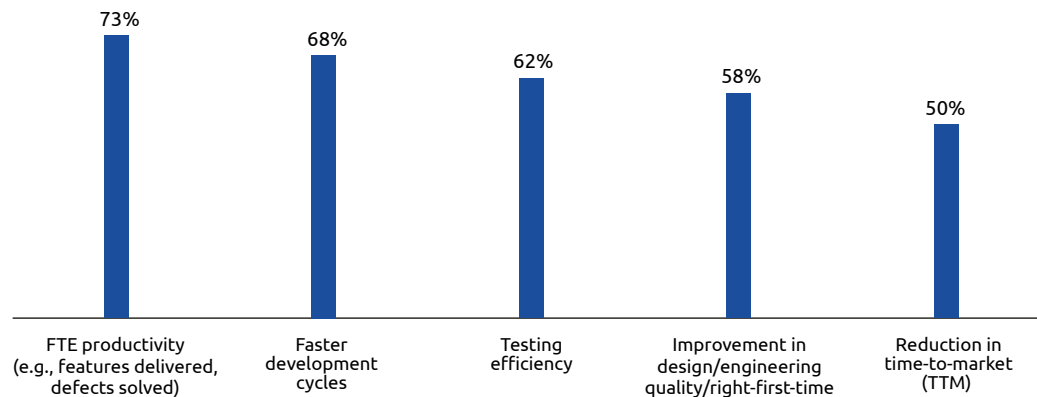
Dr. Jochen Härdtlein

Head of Software Development Powertrain Solutions, Bosch

Figure 1.

Most executives report productivity and speed as top benefits of agentic AI

Percentage of executives reporting key benefits of agentic AI



Our analysis identifies a distinct group that is pulling ahead in AI value realization, which we term high-value realizers. These OEM executives report measurable gains of more than 5% across all five selected benefit areas and an average benefit magnitude of at least 15% across those benefits.³ In contrast, low-value realizers report an average benefit magnitude below 7%. High-value realizers are concentrated in a small group of automotive markets. The US, Germany, China, India, and the UK account for 79% of high-value realizers, despite representing 67% of the OEM sample. Germany and India are particularly overrepresented, while China and France account for a greater share of low-value realizers relative to their presence in the sample.

Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 396 executives from automotive OEMs and 155 executives from tier-1 suppliers.

19%

gains in engineer/fulltime equivalent (FTE) productivity, compared with 6% among low-value realizers

17%

improvement in development cycle time for high-value realizers, more than double the 7% achieved by low-value realizers

We see that while most organizations report productivity and speed benefits from agentic AI, leaders ('high-value realizers') realize value 2–3 times greater than that of their lower-performing peers ('low-value realizers') by more effectively scaling and operationalizing AI across engineering workflows.

- High-value realizers report 19% gains in engineer/full-time equivalent (FTE) productivity, compared with 6% among low-value realizers
- Development cycles improve by 17% for high-value realizers, more than double the 7% achieved by low-value realizers
- High-value realizers achieve 19% reduction in TTM, versus 5% for low-value realizers





“From cutting software defects by up to 50% to reducing simulation times from weeks to seconds, [AI] is accelerating both execution and decision making.”

Norm Marks

Global Vice President - Automotive Industry,
NVIDIA



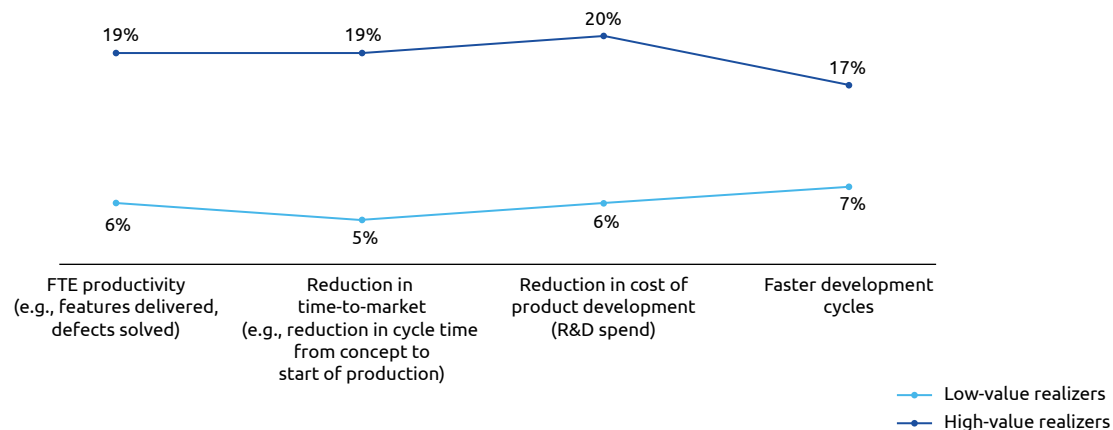
“We have seen significant productivity improvements across engineering activities, helping teams accelerate development cycles, streamline reviews, and improve validation efficiency through AI-enabled solutions.”

Sebastien Pacchini

Head of Data & AI Operations - Engineering
Performance & Innovation, Renault

Figure 2.

The leaders are pulling ahead

Quantum of improvement

High-value realizers distinguish themselves through a disciplined approach. They build **stronger value-led AI strategies, more trusted data foundations, greater engineering effectiveness, and more disciplined governance**. High-value realizers are more effective at managing complexity through stronger **cross-team alignment, clearer governance, and more disciplined operating models**. For instance, they are more effective at **freeing engineers from labor-intensive activities** and reducing organizational friction. This reduces development-cycle overruns and sustains the pace of innovation. By freeing engineering capacity for higher-value problem solving and product development, high-value realizers enjoy superior business outcomes and deliver greater improvements in productivity, development speed, and TTM.

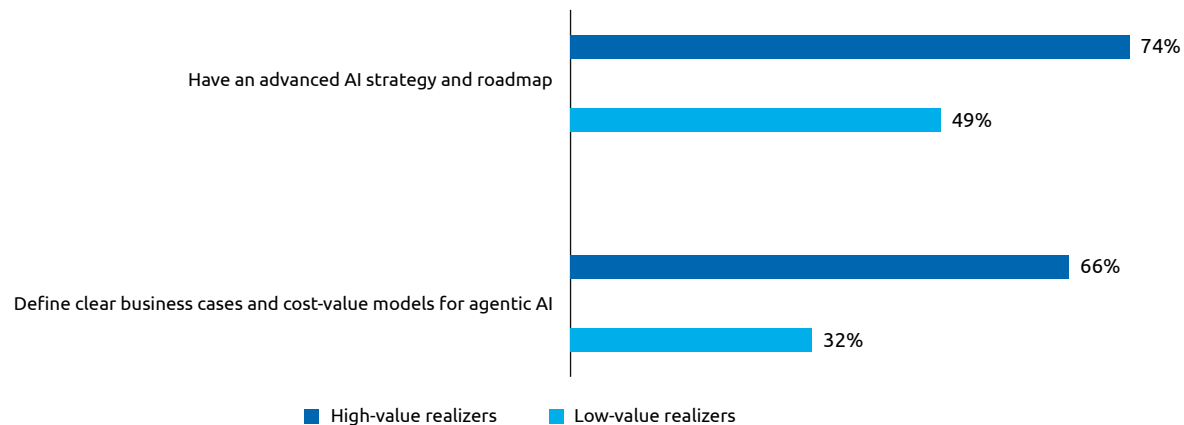
19%

reduction in time-to-market for high-value realizers

Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs.

Figure 3.

High-value realizers adopt a value-led AI strategy

Percentage of high-value realizers vs. low-value realizers that...

Source: Capgemini Research Institute, AI in automotive product development, July 2026. N = 400 automotive OEM executives: 38 High-value realizers and 57 Low-value realizers.

Value-led AI strategy

High-value realizers treat AI as a catalyst for business-transformation, and also embedding agentic AI capabilities into products, services, and customer experience (CX).



Data and decision foundations

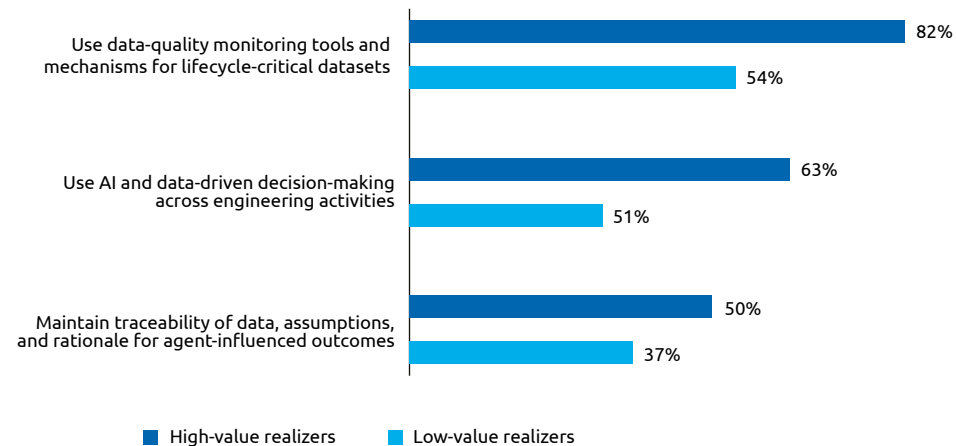
High-value realizers invest in foundations for trusted, traceable engineering data to make faster, more reliable decisions.



Figure 4.

High-value realizers have strong data and decision-making foundations

Percentage of high-value realizers vs. low-value realizers that...



Source: Capgemini Research Institute, AI in automotive product development, July 2026. N = 400 automotive OEM executives: 38 High-value realizers and 57 Low-value realizers.

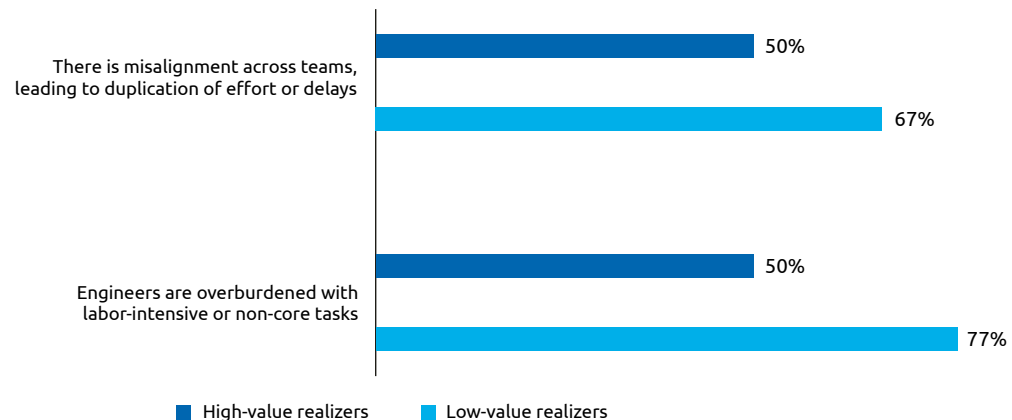
Engineering productivity and operational effectiveness

High-value realizers are more effective at containing engineering complexity, reducing organizational friction, and freeing engineers from labor-intensive work to focus on innovation and product development, though there is some potential for improvement to reduce the overall burden on engineers for high-value realizers as well.

Figure 5.

High-value realizers lead on engineering productivity and operational effectiveness

Percentage of high-value realizers vs. low-value realizers that agree...



Source: Capgemini Research Institute, AI in automotive product development, July 2026. N = 400 automotive OEM executives: 38 High-value realizers and 57 Low-value realizers.

Governance and readiness to scale

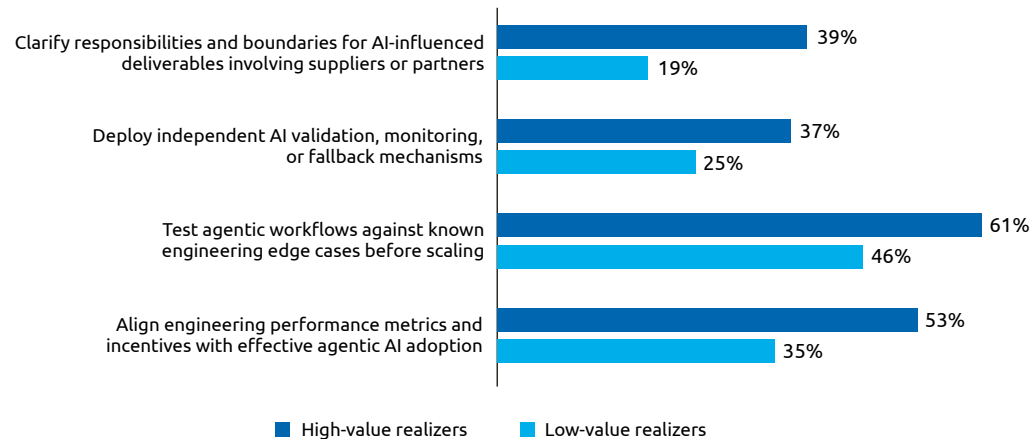
High-value realizers have a structured and strong program management and steering model in place. They complement AI adoption with better governance mechanisms such as clearly defined supplier and partner boundaries, metrics and incentives, and independent validation and monitoring mechanisms to scale AI consistently across teams, programs, and ecosystem partners. High-value realizers complement strategy with disciplined execution across teams and programs. This requires a structured steering model, clear accountabilities, and leaders empowered to translate AI ambition into operational change.

Jay Bellissimo, Senior Vice President, Intelligent Systems, Software and Services at Aptiv notes: *“Organizations that thoughtfully embed AI across their organization from product development and engineering to customer engagement and lifecycle management will be able to scale innovation, improve decision quality, and generate measurable business value, while companies that fail to make this shift will struggle to remain competitive in an increasingly dynamic market.”*

Figure 6.

High-value realizers pair AI adoption with governance, incentives, and safeguards

Percentage of high-value realizers vs. low-value realizers that...



Source: Capgemini Research Institute, AI in automotive product development, July 2026. N = 400 automotive OEM executives: 38 High-value realizers and 57 Low-value realizers.

Software has delivered early AI success, while mechanical and E/E engineering also present significant opportunities ahead

As per our survey, 73% of respondents from software-focused environments report deriving significant value from their agentic AI initiatives, compared with around 66% from mechanical and E/E-focused environments. Software-focused organizations also report shorter expected payback periods and stronger near-term returns on AI investments (Figure 7).

Established use cases across coding, testing, code review, documentation, and knowledge management, combined with highly digitalized and iterative workflows and abundant, well-integrated development data, have enabled organizations to deploy and scale AI more rapidly, with earlier returns. For example, Nissan's software-defined vehicle (SDV) initiative uses cloud-native development environments to reduce software-development cycles from months to hours.⁴ Mechanical and E/E-focused environments are progressing in the same direction but often face greater complexity.

Tina Wang, Head of Product and Engineering at Lucid Motors, agrees: *"Hardware development still depends heavily on human judgment and physical validation, and much of the resulting information cannot yet be transformed into measurable datasets for reliable AI use. This is why AI-driven progress is occurring more rapidly in software than in hardware."*

Engineering data is frequently fragmented across computer-aided design (CAD) systems, simulation environments, product lifecycle management (PLM) platforms, manufacturing systems, laboratory testing environments, and physical processes. Realizing AI value therefore requires not only AI adoption but also ongoing investment in digital engineering foundations, interoperability, and data integration. The **higher cost of errors** in physical product development has also slowed adoption.

But it is important to note that, although value realization is currently higher in software-focused environments, **mechanical and E/E engineering presents substantial opportunities for cost-reduction, efficiency gains, and accelerated product development.** Many organizations have adopted **a shift-left engineering strategy**, bringing validation and testing activities forward in the

development lifecycle and from physical prototypes into digital environments. AI-augmented technologies such as digital twins, simulation, and virtual validation, support this trend. (The survey instrument used the term "hardware engineering" for mechanical and electrical/electronic engineering and the figures retain that wording).

Research from the University of Michigan found that simulation-based approaches could virtually eliminate autonomous-vehicle testing requirements, significantly lowering both production time and cost.⁵ BMW has reported reducing vehicle-launch validation activities from four weeks to three days through its Virtual Factory initiative and is targeting reductions in production-planning costs of up to 30%.⁶ Ferrari uses simulation-driven engineering to address complex powertrain-electromagnetic challenges while reducing physical prototyping requirements by 40%.⁷ Cummins has also demonstrated the potential of virtual engineering, reducing prototype requirements for engine development by 50%.⁸



"Organizations that embed AI across their organization from product development and engineering to customer engagement and lifecycle management will be able to scale innovation, improve decision quality, and generate measurable business value, while companies that fail to make this shift will struggle to remain competitive in an increasingly dynamic market."

Jay Bellissimo

Senior Vice President, Intelligent Systems, Software and Services at Aptiv

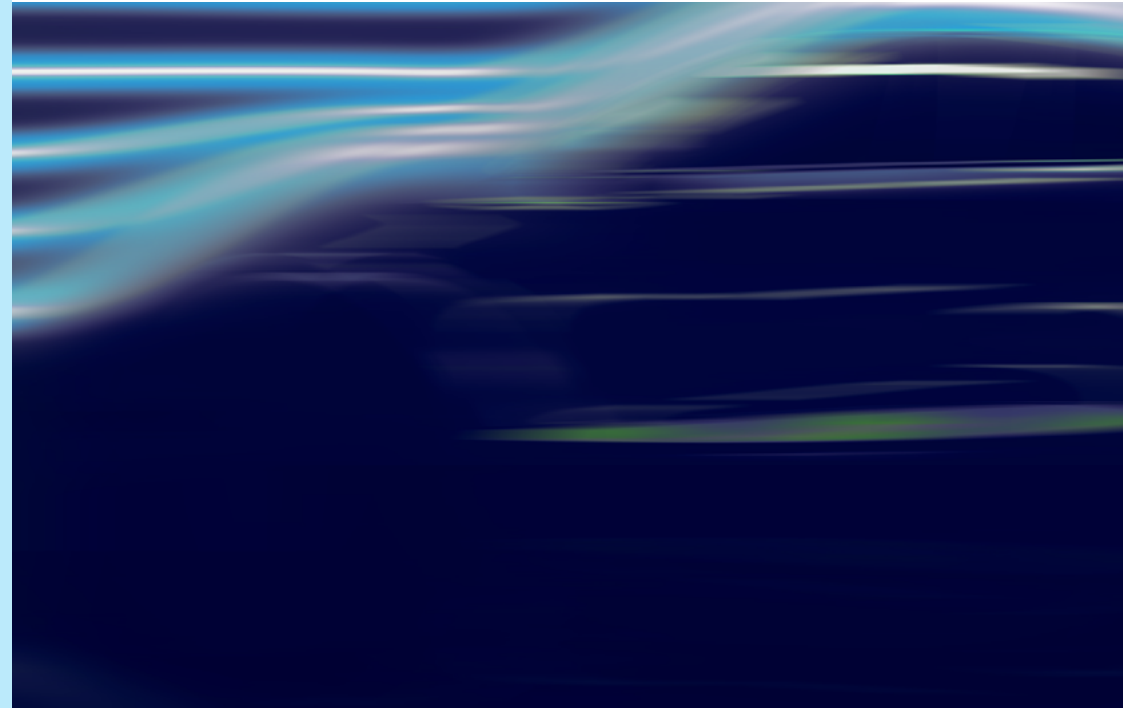
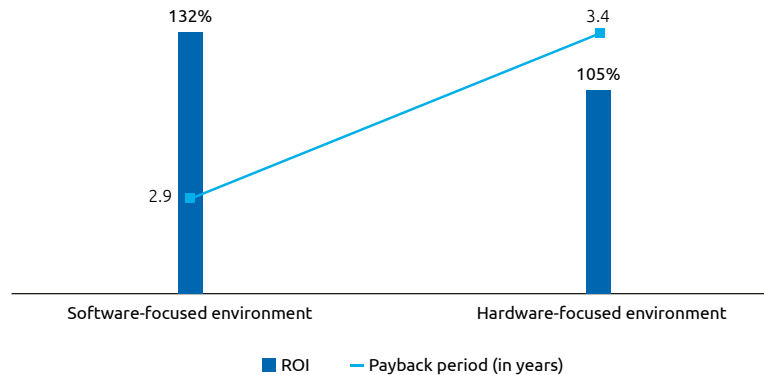


Figure 7.

Currently software-focused environments target higher ROI and faster payback from AI

Target ROI and payback period of AI investments in software and hardware-focused environments



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 528 mechanical and E/E engineering executives from automotive OEMs and tier-1 suppliers who say they are using or planning to use agentic AI in product development, N= 513 software engineering executives from automotive OEMs and tier-1 suppliers who say they are using or planning to use agentic AI in product development.

Greater value governance is required to scale benefits

Value governance: the practice of managing an organization's projects, data, products, or services so they align with core goals and deliver measurable results.

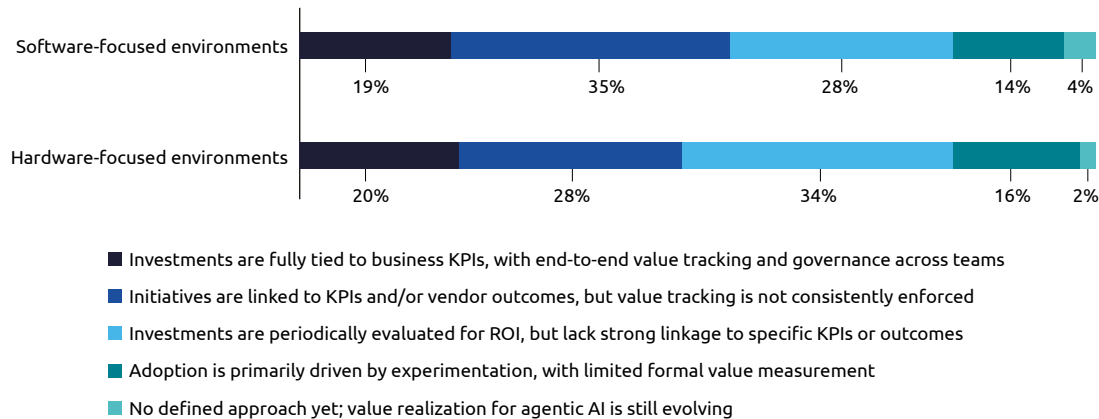
Growing confidence in this technology is not matched by maturity in value governance. Relatively few organizations have the mechanisms to systematically measure, track, and scale value creation. As investment levels increase, the challenge becomes ensuring that outcomes can be consistently quantified and managed.

Our research reveals a significant governance gap. **Only about one in five executives reports their organization's AI investments being fully linked to business KPIs and supported by end-to-end value tracking and governance processes.** By contrast, while many have begun linking initiatives to KPIs or periodically evaluating ROI, value tracking is often inconsistent or weakly connected to business outcomes. This makes it difficult to determine which initiatives are delivering the greatest impact, where organizations should prioritize investments, and how value can be replicated and scaled across the organization.

Figure 8.

Most organizations still fail to track and govern AI investments adequately

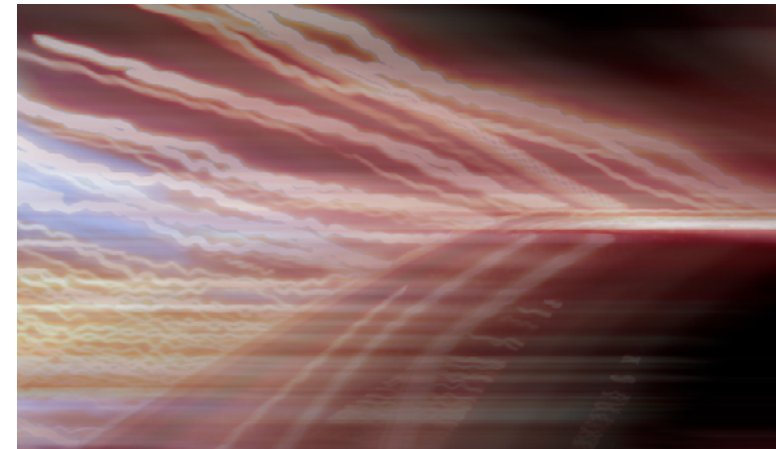
How structured is your organization's approach to realizing and reinvesting value from agentic AI initiatives?



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 528 mechanical and E/E engineering executives from automotive OEMs and tier-1 suppliers who say they are using or planning to use agentic AI in product development, N= 513 software engineering executives from automotive OEMs and tier-1 suppliers who say they are using or planning to use agentic AI in product development.

Automotive organizations continue to struggle to translate technical and automotive gains into measurable business value, primarily due to **management and operational issues**.

Moritz Maier, CEO & Co-Founder, Synera comments, *"In my experience, the technology is no longer the primary barrier to adopting agentic AI. Most organizations already recognize its potential. The real challenge is redesigning processes, decision-making structures, and ways of working so that AI can be scaled effectively and deliver measurable business impact."*





A discussion with **Norm Marks**

Global Vice-President - Automotive Industry,
NVIDIA

How is AI transforming vehicle product development and engineering?

AI is transforming vehicle product development by creating a connected, end-to-end engineering workflow that spans design, simulation, software development, validation, and manufacturing.

Leading OEMs use AI-driven simulation, digital twins, and engineering automation to accelerate product development. JLR increased computational fluid dynamics (CFD) simulation throughput from 50 to 1,500 jobs per day, while GM reduced design iteration times from two weeks to just over a minute. Similarly, Honda achieved a 34 times computational speed-up. These capabilities enable faster design evaluation, improved engineering productivity, and quicker decision making.

What are the AI priorities for automotive product development over the next 12–18 months?

The leading OEMs are pursuing an end-to-end transformation that connects AI-powered design, simulation, engineering validation, manufacturing, and quality management. The ultimate objective is to significantly speed up product development cycles to remain competitive.

What has changed in recent times in how OEMs evaluate AI-enabled engineering platforms?

The focus has shifted from evaluating individual tools to assessing integrated ecosystems. OEMs increasingly want AI embedded across PLM, simulation, digital twin, and engineering environments, enabling consistent intelligence throughout the product lifecycle.

How are leading OEMs achieving competitive advantage?

By moving beyond isolated AI pilots and adopting an end-to-end transformation approach that connects design, engineering, simulation, validation, software development, and manufacturing.

Hyundai is pursuing an integrated AI strategy across product development and manufacturing, while Jaguar Land Rover (JLR) has achieved significant engineering efficiency gains through AI-powered simulation. Their common advantage is the ability to scale AI across processes and deliver measurable business outcomes.

How are leaders overcoming obstacles to scaling AI?

They are moving beyond what many describe as 'pilot paralysis,' where organizations run isolated AI pilots with limited impact. Instead, they are scaling AI across the product development and manufacturing lifecycle.

This approach is supported by strong executive commitment, ecosystem partnerships, and a long-term transformation vision, enabling AI to deliver measurable outcomes at scale.



“Hardware development still depends heavily on human judgment and physical validation, and much of the resulting information cannot yet be transformed into measurable datasets for reliable AI use. This is why AI-driven progress is occurring more rapidly in software than in hardware.”

Tina Wang

Head of Product and Engineering
at Lucid Motors



“In my experience, the technology is no longer the primary barrier to adopting agentic AI. Most organizations already recognize its potential. The real challenge is redesigning processes, decision-making structures, and ways of working so that AI can be scaled effectively and deliver measurable business impact.”

Moritz Maier

CEO & Co-Founder,
Synera



“Agentic AI is more than a productivity tool. While automotive engineering processes embody decades of expertise, the real opportunity is to rethink and reinvent them. By combining human judgment with autonomous capabilities, agentic engineering can create new ways of collaborating, making decisions, and executing work. Those that embrace this transformation will gain lasting advantages in performance, innovation, and competitiveness.”

Eric Dalla Vecchia

Vice President, Intelligent Industry Accelerator,
Capgemini

02

**Agentic product
development remains
an untapped growth
opportunity**

Competitive advantage is shifting to insight-to-action velocity

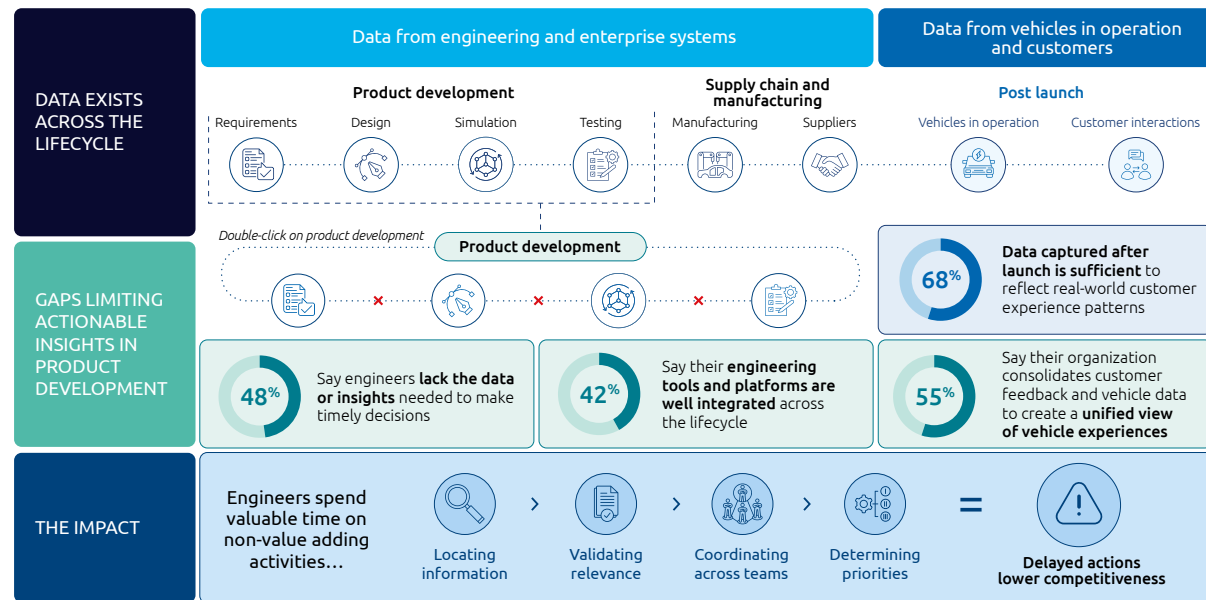
As engineers spend more time navigating processes, manual activities, and rework, the challenge becomes to accelerate the transformation of information into action. Nearly 7 in 10 respondents say that the data their organization captures after vehicle launch is sufficient to reflect real-world CX patterns. The challenge now is establishing **the capabilities needed to derive actionable value from it** (only 54% have done this).

Much of the challenge lies in connecting information across the engineering lifecycle. Without a **digital thread** linking requirements, design, simulation, testing, manufacturing, suppliers, and field performance, organizations struggle to provide engineers with the context needed to make timely decisions and drive better product outcomes.

Only 53% of executives (from OEMs and suppliers) say that their organization has clear decision processes for determining which experience insights require action, while 61% report there is a lack of clear prioritization of engineering activities across programs and teams.

Figure 9.

Collecting data isn't the problem – it's gleaning insights from it



Source: Capgemini Research Institute analysis.

The pattern is consistent with this. Among executives from OEM and supplier organizations who say that engineers lack the data or insights needed to make timely decisions, **67% report development-cycle overruns and 60% report slower innovation cycles.** Among the rest, the figures are 63% and 55%.

Organizations that can effectively connect and use engineering data across the lifecycle will be better positioned to accelerate development and improve engineering outcomes. As engineering organizations increasingly compete to convert information into action, such gains illustrate why insight-to-action velocity is becoming a critical source of competitive advantage.

Complexity and manual work eat up engineering capacity

Engineers must work across a growing web of disciplines, teams, suppliers, and technologies. While this complexity is driving innovation, **it demands great effort to coordinate work, manage information, maintain documentation, and align stakeholders.**

Jomon Kunnel, Director of AI Technology Engineering, EMEA, Oracle says: *"Engineering teams spend significant effort bringing together information from suppliers, test programs, dealer networks, and vehicle data before they can even begin making decisions. When parts data arrives in different formats and teams operate in silos, engineers spend time reconciling information, rather than improving products."*

61%

report there is a lack of clear prioritization of engineering activities across programs and teams





“The industry has learned to let AI do engineering work faster than it has learned to accept and deliver what that work produces. Speed is no longer the constraint. The constraint is evidence: whether an agent’s output can be traced, checked, and released into a vehicle on its own clock. The organizations that create lasting value will invest in that evidence chain, not in more agents.”

Heiko Huettel

Executive Vice President, Automotive Software
and Chief Technology & Innovation Officer (CTIO),
Capgemini



"Engineering teams spend significant effort bringing together information from suppliers, test programs, dealer networks, and vehicle data before they can even begin making decisions. When parts data arrives in different formats and teams operate in silos, engineers spend time reconciling information, rather than improving products."

Jomon Kunnel

Director of AI Technology Engineering, EMEA,
Oracle

Our survey findings (see Figure 10) suggest that this complexity is placing growing pressure on engineering capacity. Nearly three-quarters of executives from OEMs and supplier organizations (72%) report capacity constraints or workload imbalances within engineering teams. As engineers devote more effort to administrative and coordination activities, organizations increasingly experience duplication of effort and delays arising from misalignment across teams.

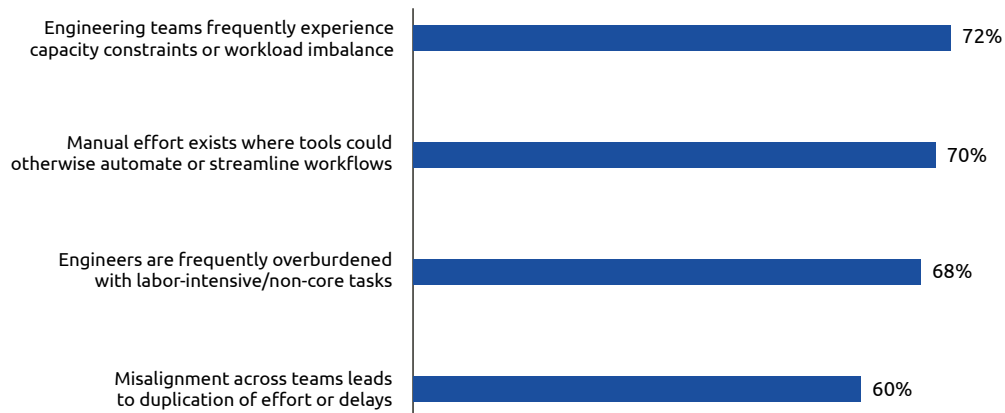
72%

report capacity constraints or workload
imbalances within engineering teams

Figure 10.

Engineering teams are bogged down with low-value/non-core tasks

Percentage of executives who agree with the following statements



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Among executives from OEM and supplier organizations that say that engineers are overburdened with non-core tasks, **68% report development-cycle overruns and 61% slower innovation cycles.**

Together, these challenges point to a common reality: a growing share of engineering capacity is consumed by the effort of managing complexity, leaving less time for the innovation, problem-solving, and product development activities that create value.

Agentic AI gains momentum in automotive product development

While the first wave of AI adoption focused on using Gen AI as a support capacity for engineers, organizations are increasingly looking toward autonomous execution. Attention is shifting to agentic AI, which can coordinate activities, orchestrate workflows across tools and functions, and act on behalf of engineers to advance work with minimal human intervention, more efficiently, and at greater scale.

Our research suggests that this transition is already underway. As Figure 11 shows, Gen AI has established a meaningful presence across engineering organizations: 65% of executives from OEMs and suppliers report its use in engineering processes and tasks, and 55% report its use in engineering tools and platforms. OEMs are somewhat further ahead on both measures (67% and 57%, against 61% and 49% among suppliers).

At the same time, agentic AI is emerging as the next phase of AI adoption in product development. While adoption remains at an earlier stage, 35% of executives from OEMs and suppliers say their organization is using (“using extensively” or “using to a limited extent”) agentic AI in engineering processes and tasks, and a further 33% are actively piloting it.

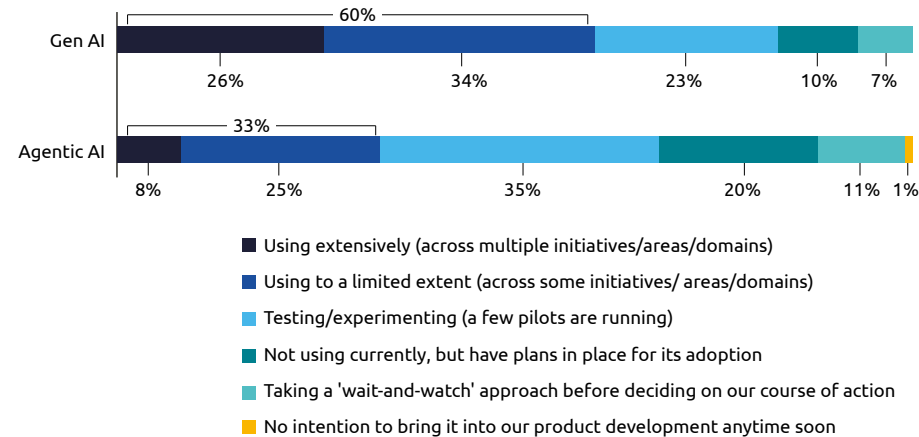
68%

have reached at least the pilot stage of agentic AI adoption

Figure 11.

More than one-third of executives are already scaling agentic AI in automotive product development

Which of the following statements best describes your organization's usage of Gen AI and agentic AI in your product development lifecycle?



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

To put this AI adoption level in context, among other industries, automotive organizations are further ahead than their aerospace and defense counterparts in moving AI from experimentation into use. Nearly 60% of automotive OEMs and suppliers use Gen AI to a limited or extensive extent, compared with 36% of aerospace and defense organizations reporting deployed use cases.⁹ For agentic AI, 33% of automotive organizations report current use and 68% have reached at least the pilot stage, compared with 24% and 48%, respectively, in aerospace and defense. Across regions, the survey data does not show any significant differences, except Europe being slightly ahead in the use of AI (limited and extensive use taken together), and the US being ahead of other regions in terms of experimenting with agentic AI.

Agentic AI connects engineering activities, insights and decisions

Increasingly, organizations envision agentic AI as a connective layer that can **coordinate activities and decision making across functions, integrate information from multiple systems, and support workflow across the product lifecycle.**

McLaren Automotive is deploying agentic AI as a unified engineering layer connecting the previously siloed workflows of design, systems engineering, and simulation. The platform enables engineers to evaluate thousands of cross-disciplinary design alternatives in hours while continuously learning from simulation outcomes. Agentic AI delivers value as a coordinating and orchestrating tool **to accelerate development at scale.**¹⁰

Three in five (60%) of all surveyed executives (N = 800) believe agentic AI can better manage coordination across functions such as systems, software, and hardware (mechanical and E/E engineering) during product development.

This can help create **continuity between requirements, design, software development, testing, compliance, manufacturing, supplier collaboration, and field performance**, reducing the effort required to coordinate work across increasingly complex development environments.

Historically, engineers are not only problem-solvers but also provide a wide range of support, from documenting decisions and tracking requirements to coordinating with stakeholders, managing workflows, and consolidating information from multiple sources. But agentic AI is assuming a growing share of these coordination and administrative responsibilities.

Consequently, engineers can focus on activities that drive innovation and product performance. Reflecting this potential, our survey findings show that:

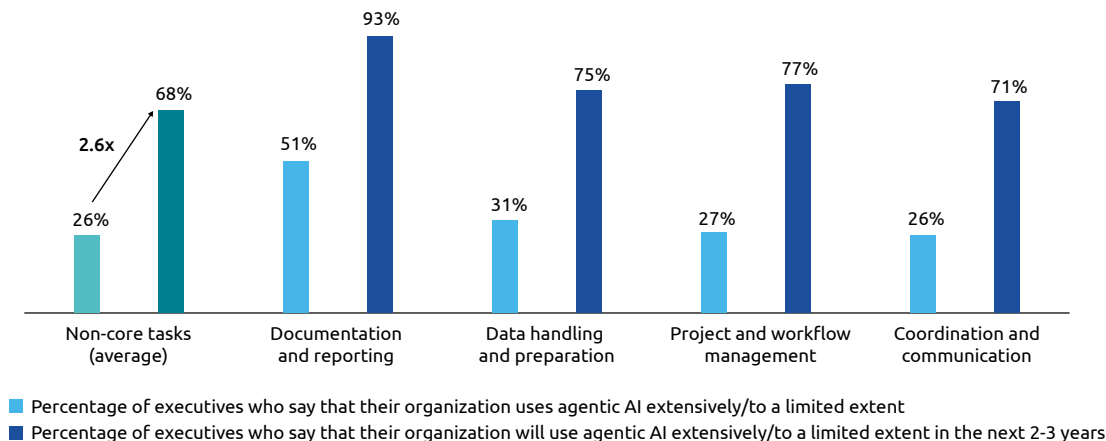
- 83% of all executives surveyed believe agentic AI can enable engineers to spend more time on core engineering tasks, rather than coordination and administrative work (Figure 13 shows how the time spent on non-core tasks will reduce in the future)
- 76% of them believe it can reduce manual effort across product development activities

Etienne Grass, Global Chief AI Officer at Capgemini, says: *"In automotive product development, I believe the greatest value of Agentic AI is its ability to strengthen engineering judgment and accelerate decision-making. By challenging assumptions, exposing blind spots, and enabling faster learning, autonomous agents can help engineers navigate complex design and development challenges more effectively. While AI enhances insight and efficiency, accountability, safety, and design integrity must remain firmly under human responsibility."*

Figure 12.

Organizations' use of agentic AI in non-core tasks will increase by 2.6 times in the next 2-3 years

Percentage of executives who say that their organization currently uses/will use agentic AI in engineering non-core tasks in the next 2-3 years



Source: Capgemini Research Institute, AI in automotive product development, July 2026, current use: N = 354 executives from automotive OEMs and 133 executives from tier-1 suppliers, expected use in the next 2-3 years- N = 396 executives from automotive OEMs and 155 executives from tier-1 suppliers

Our survey findings show that average adoption **across non-core* engineering use cases** is expected to increase **from 26% today to 68% within the next 2-3 years**.

* Non-core engineering tasks are supporting activities such as documentation, reporting, data preparation, information gathering, coordination, and workflow management that enable product development but do not directly create engineering outputs or product differentiation.

Core engineering tasks are activities that directly contribute to designing, developing, validating, and improving the vehicle, its systems, software, or components, and are central to product innovation, performance, safety, and quality.

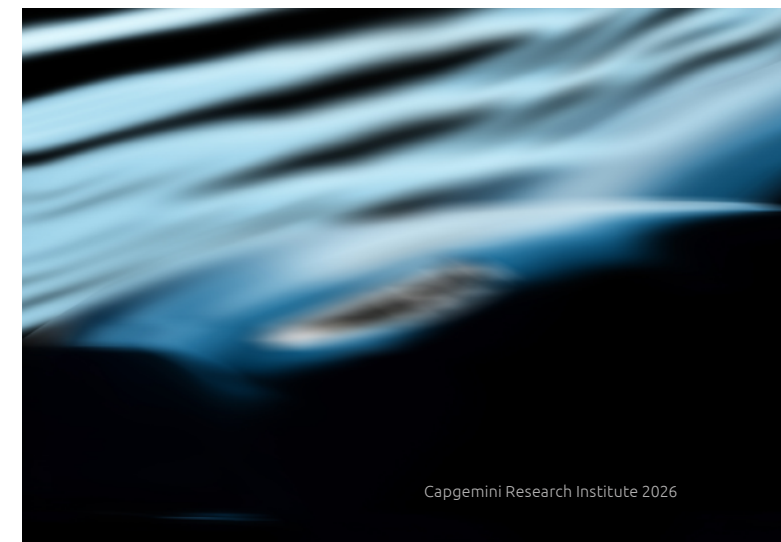


Figure 13.

Time spent on core vs. non-core activities



Source: Capgemini Research Institute analysis.

The thread running through these use cases is that they sit between, rather than within, engineering activities. **Their value lies in ensuring that information is captured, shared, tracked, and acted upon consistently across teams and lifecycle stages.**

Beyond workflow automation, by **synthesizing information from multiple sources, surfacing relevant context, identifying dependencies, and recommending actions**, agentic AI can help engineers evaluate options and make decisions with greater speed and confidence. More than seven in ten executives (71%) believe agentic AI can support faster and better decision-making. Additionally, 55% believe it can strengthen traceability across requirements, design, development, testing, and compliance evidence.

As agentic systems connect traditionally siloed functions, they can provide greater visibility into trade-offs, downstream impacts, and emerging risks.

A Global Director at a British luxury car manufacturer says:
“AI helped us move from local spreadsheets and project files to a much more data-driven way of working. We now have visible project data, dashboards, and evidence that create the foundation for automation and AI.”





"The challenge today is not a lack of technology or data. Automotive organizations already possess vast engineering data and digital tools. The real constraint is decision velocity, how quickly teams can access the right context, insights, and expertise at the moment decisions need to be made. Agentic processes in engineering have the potential to bridge that gap by connecting information across functions, contextualizing knowledge, and enabling faster, more informed engineering decisions."

Praveen Cherian

Executive Vice President, Group Automotive,
Capgemini

The feedback loop is not closed

Learning from vehicles in use

Product development no longer ends at launch. Rather, every vehicle in operation becomes a source of real-world intelligence in terms of vehicle performance, customer behavior, software usage, and operating conditions.

This shift creates the opportunity to move from a traditional release-based development model toward a continuous cycle of learning and improvement.



"Companies gain the most value from AI when they connect data insights directly to engineering decisions and product improvements. While many manufacturers still struggle with disconnected systems and manual processes, closing these feedback loops presents a major opportunity to drive efficiency, innovation, and business impact."

Ozgur Tohumcu

General Manager – Automotive and Manufacturing at AWS

Ozgur Tohumcu, General Manager – Automotive and Manufacturing at AWS, says: “Companies gain the most value from AI when they connect data insights directly to engineering decisions and product improvements. While many manufacturers still struggle with disconnected systems and manual processes, closing these feedback loops presents a major opportunity to drive efficiency, innovation, and business impact.”

Many organizations have already established the foundations of this capability:

- More than eight in ten (81%) collect data from connected vehicle telemetry
- 76% use dealer service network data and 72% capture insights from OTA interactions
- The over-the-air channel itself is broad, but what travels over it is still mostly content rather than behavior. 84% of OEM and supplier organizations currently deliver updates for vehicle-data security and 78% for navigation and traffic services; updates that change driving functions such as braking or suspension reach 36%, and updates for assisted or autonomous driving 30%.

The loop that could change how a vehicle behaves is the one that fewest organizations have closed.

Beyond these channels, every stage of the vehicle lifecycle generates vast quantities of data that engineers can analyze to improve future products and services.

Udo Lange, Global Head of Digital Engineering and R&D Transformation, Capgemini Invent, says: “I believe the industry is shifting from a ‘design, launch, and maintain’ mindset to continuous engineering. Connected products and OTA updates create a real-time feedback loop between engineering, product performance, and customer experience, enabling continuous learning and faster innovation. Agentic Engineering is perfectly suited to handle such incremental and iterative product development processes as they combine autonomy with agility and adaptivity. I am expecting that the introduction of multi-agent networks will fundamentally change how we are developing products – in terms of speed, cost and quality.”

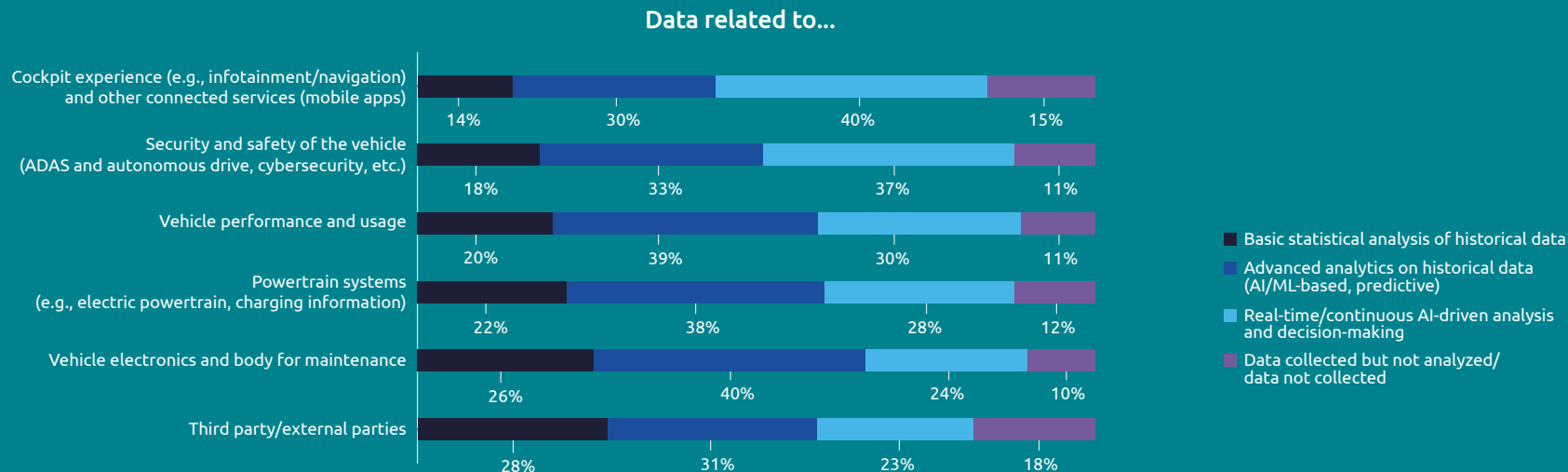
Turning data into insights

Organizations are becoming more sophisticated in how they analyze vehicle and customer data, but the predominant focus remains historical analysis, rather than real-time decision-making. As per our survey findings:

- Across all data categories, advanced AI/machine learning (ML)-based analysis of historical data is the most common approach, used by 30–40% of organizations
- Real-time or continuous AI-driven analysis remains less prevalent, with 23–40% of organizations using this, depending on data type
- Even in areas where adoption is highest, such as cockpit experience and connected services data (such as mobile apps) (40%) and vehicle safety and security data (37%), fewer than half of executives report that their organization uses real-time AI-driven analytics

Figure 14.

Organizations focus on historical data analysis

Percentage of executives reporting how their organization analyzes data

Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Turning insights into engineering action

While organizations have become increasingly effective at capturing data, many continue to labor with fragmented systems, disconnected tools, siloed information flows, prioritization challenges, and bottlenecks in translating insight into action. In many cases, the issue is not a lack of data, but that engineers, analysts, and business teams struggle to identify where it resides, access it efficiently, and interpret it within the appropriate engineering and business context. Multi-domain engineering compounds the problem, as optimization of individual domains such as software, electronics, or mechanical engineering is often more mature than overall vehicle performance.

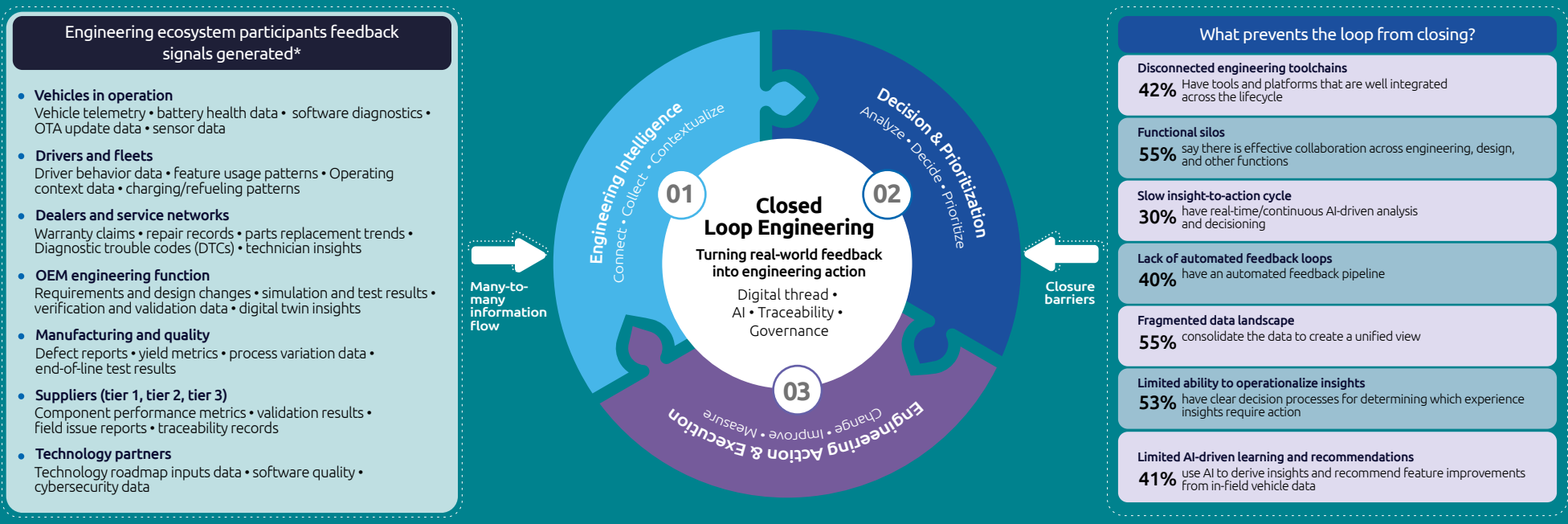
This is driving interest in making engineering data consistently interpretable across systems through shared, machine-checkable definitions of the data engineers and agents act on, validated exchange formats, and digital thread architectures that make enterprise knowledge more discoverable, contextualized, and usable by both humans and AI systems.

Our survey findings show that only 40% of executives from OEMs and suppliers report their organization having an automated feedback pipeline that connects data collection, insight generation, validation, and deployment. And just 41% use AI or Gen AI to generate and recommend actions based on in-field vehicle data. Furthermore, 64% say they primarily use insights from vehicles-in-use to inform decisions for future vehicle programs, rather than making short-term updates to the existing fleet. These data points suggest that, although organizations are generating greater visibility into real-world vehicle performance and CX, these insights are not always directly connected to downstream engineering and decision-making processes.

Established automotive manufacturers with decades of engineering expertise, operational knowledge, and historical vehicle data, much of which remains distributed across legacy systems and organizational silos, will find this particularly testing. Newer entrants, by contrast, operate with far less historical data but have built their organizations, processes, and technology environments around digital-first principles, supporting the ability to organize, contextualize, and operationalize data at scale.

Figure 15.

The feedback loop is partially closed



Source: Capgemini Research Institute analysis.



"I believe the industry is shifting from a 'design, launch, and maintain' mindset to continuous engineering. Connected products and OTA updates create a real-time feedback loop between engineering, product performance, and customer experience, enabling continuous learning and faster innovation. Agentic Engineering is perfectly suited to handle such incremental and iterative product development processes as they combine autonomy with agility and adaptivity. I am expecting that the introduction of multi-agent networks will fundamentally change how we are developing products – in terms of speed, cost and quality."

Udo Lange

Global Head of Digital Engineering and R&D Transformation,
Capgemini Invent

Agentic AI is reshaping the automotive product development lifecycle

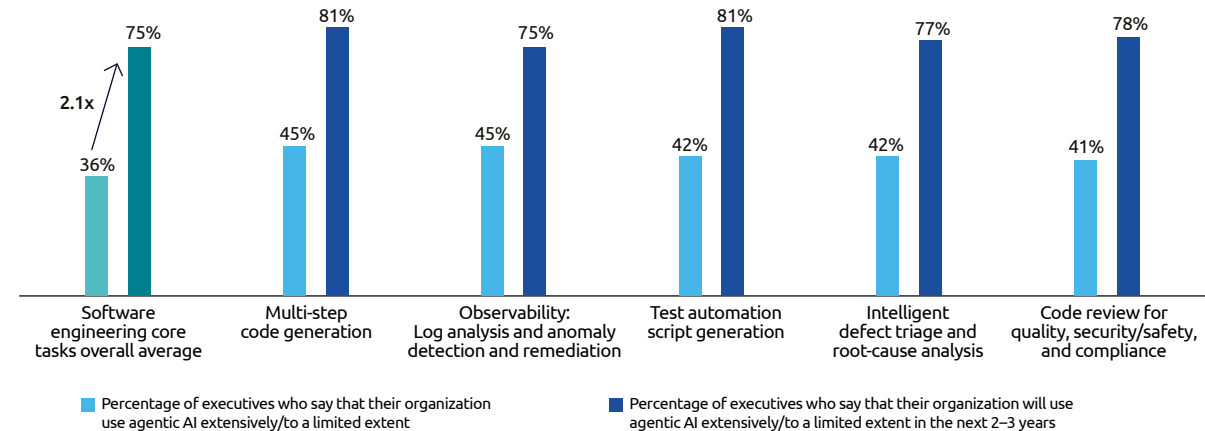
AI adoption is accelerating across the automotive product development lifecycle, transforming design, engineering, testing, and validation. As a result, usage of agentic AI across software engineering tasks by OEMs and suppliers is projected to increase from 36% today to 75% over the next 2–3 years.

NVIDIA's Norm Marks says: *"Software development has been one of the clearest success stories because the workflows are already structured and measurable. We have seen agents generate specifications, assist coding, automate testing, triage defects, and help us achieve roughly two-times faster execution across the V-model."*

Figure 16.

Agentic AI usage in software engineering tasks will more than double in the next 2–3 years

Percentage of executives who say their organization currently uses/will use agentic AI in software engineering core tasks in the next 2–3 years



Source: Capgemini Research Institute, AI in automotive product development, July 2026; current usage: N = 354 executives from automotive OEMs and 93 executives from tier-1 suppliers; expected usage in the next two to three years: N = 396 executives from automotive OEMs and 109 executives from tier-1 suppliers.



“Hardware development follows a different path because physical products must be validated in the real world.”

Antonio Lopez

Chief Product Strategist for full size SUV and pick ups for NISSAN and Infiniti (Global director)

However, mechanical and E/E engineering adoption dynamics work differently than software engineering, shaped by the need to integrate AI into environments where engineering outcomes must be validated against physical performance, safety, reliability, and regulatory requirements.¹¹

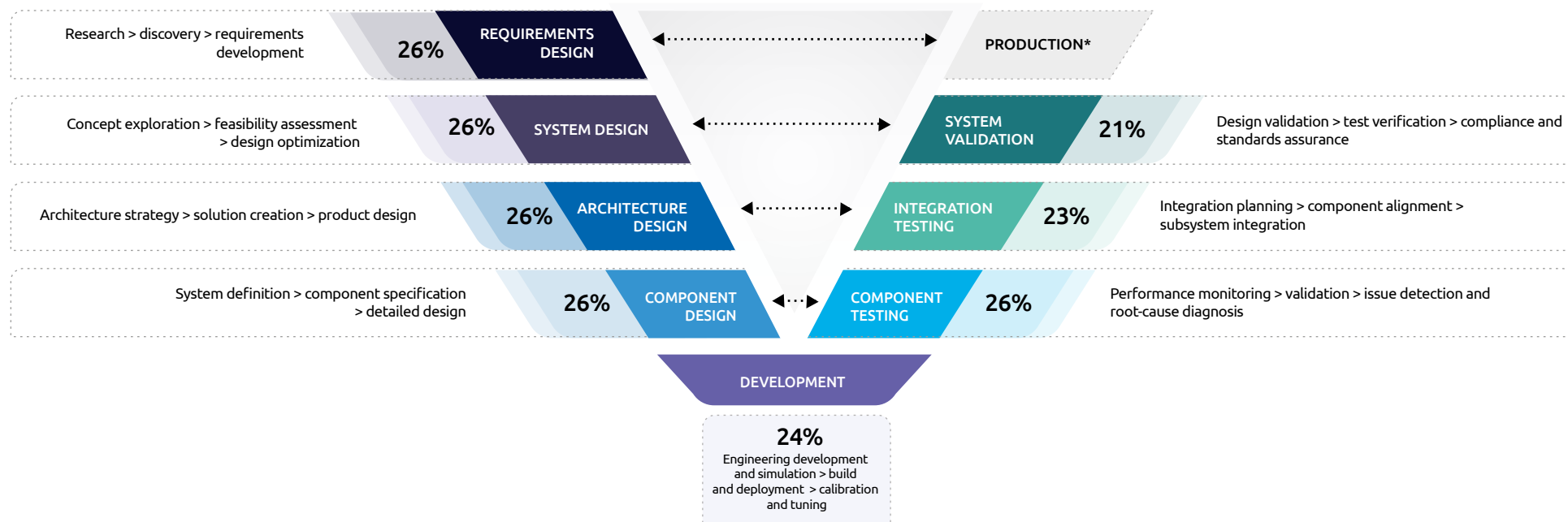
As a result, organizations are taking a cautious approach, with greater emphasis on **traceability, verification, and human oversight**. This is reflected in AI adoption across the engineering lifecycle with higher adoption in downstream activities (Figure 17) such as component testing (26%), development (24%), and integration testing (23%), where outcomes can be measured and validated against clear criteria. For instance, use cases (Figure 18) that rely heavily on machine-readable data and provide rapid feedback on engineering outcomes such as performance monitoring and test result analysis (27%), calibration and parameter tuning (26%), and simulation and analysis (26%) show higher usage.

Antonio Lopez, Chief Product Strategist for full size SUV and pick-ups at Nissan comments: *“Hardware development follows a different path because physical products must be validated in the real world.”*



Figure 17.

Agentic AI use-cases across mechanical and E/E engineering lifecycle



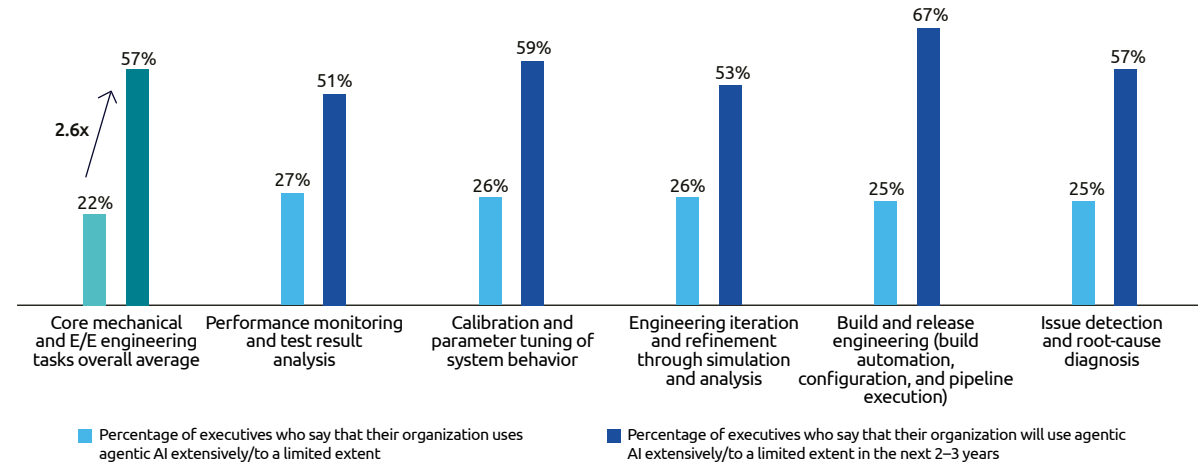
Source: Capgemini Research Institute, AI in automotive product development, July 2026; current usage: N = 229 to 307 executives depending on the stages of the product development lifecycle they oversee. Percentages indicate the extent of adoption of the top agentic AI use case for each lifecycle stage. *Production is out of scope for this research.

Despite this more cautious start, **mechanical and E/E engineering is forecast to grow by 2.6 times while software engineering is expected to increase its use of agentic AI by 2.1 times over the next 2–3 years.**¹² The use cases with the highest levels of agentic AI adoption have a common characteristic: they operate within highly digitalized engineering workflows. Performance monitoring, test result analysis, calibration, simulation-led refinement, and build-and-release processes all rely on machine-readable data and provide relatively rapid feedback on engineering outcomes. These conditions make it easier to evaluate, verify, and refine AI-generated outputs. By contrast, adoption tends to be lower in activities where outcomes remain more dependent on physical testing, real-world validation, or expert judgment.

Figure 18.

Agentic AI usage in mechanical and E/E engineering tasks will increase by 2.6 times in the next 2-3 years

Percentage of executives who say that their organization currently uses/will use agentic AI in core hardware engineering tasks in the next 2-3 years



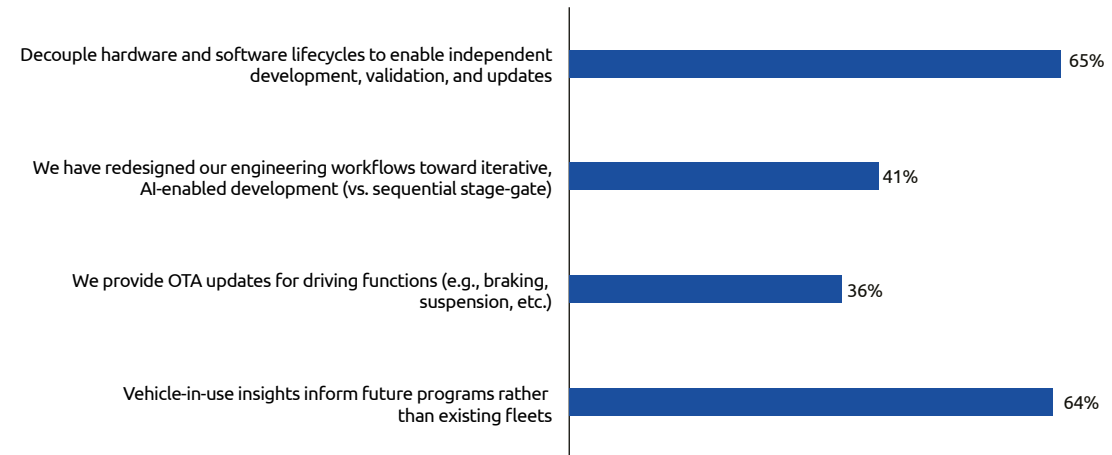
Source: Capgemini Research Institute, AI in automotive product development, July 2026; current usage: N = 171–255 executives from automotive OEMs and 52–81 executives from tier-1 suppliers; expected usage: N = 192–281 executives from automotive OEMs and 58–92 executives from tier-1 suppliers. Bases vary by task.

The two domains are also beginning to operate on different timelines. Nearly two-thirds of OEM and supplier executives (65%) say their organization aims to decouple hardware and software lifecycles to enable independent development, validation, and updates within the next 12-18 months, while 55% are designing architectures that support safe AI updates over the air after SOP. However, only 41% report having redesigned engineering workflows for iterative, AI-enabled development at scale, and 35% remain at pilot stage or have not started. Moreover, organizations that report iterative redesign are little more likely than the rest to deliver OTA driving-function updates (39% against 34%), maintain automated pipelines (41% against 40%), or feed learnings back into vehicles already on the road. This suggests that companies are still applying iterative development primarily within the vehicle development program rather than extending it into continuous improvement after deployment. In other words, the processes and delivery mechanisms needed to support a truly software-defined vehicle are still evolving.

Figure 19.

The decoupling gap - intent runs ahead of process, and process ahead of delivery

Percentage of executives who agree with the following statements



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

The criticality of the task also dictates the degree of autonomy of agentic AI. In non-safety-critical activities, AI can operate as an execution layer, autonomously carrying out multi-step workflows within defined guardrails. In safety-critical contexts, however, AI becomes a decision-support layer. Because outcomes can directly affect product performance, regulatory compliance, and customer safety, engineers must validate outputs and make final decisions. Human judgment, therefore, continues to serve as the primary control plane, with AI offering auxiliary support in engineering work.

Defining a robust human-led control plane will become critical to balancing autonomy with accountability. The governance, oversight, and operating model requirements for managing agentic AI across varying levels of risk and criticality are explored in greater detail in the next chapter.



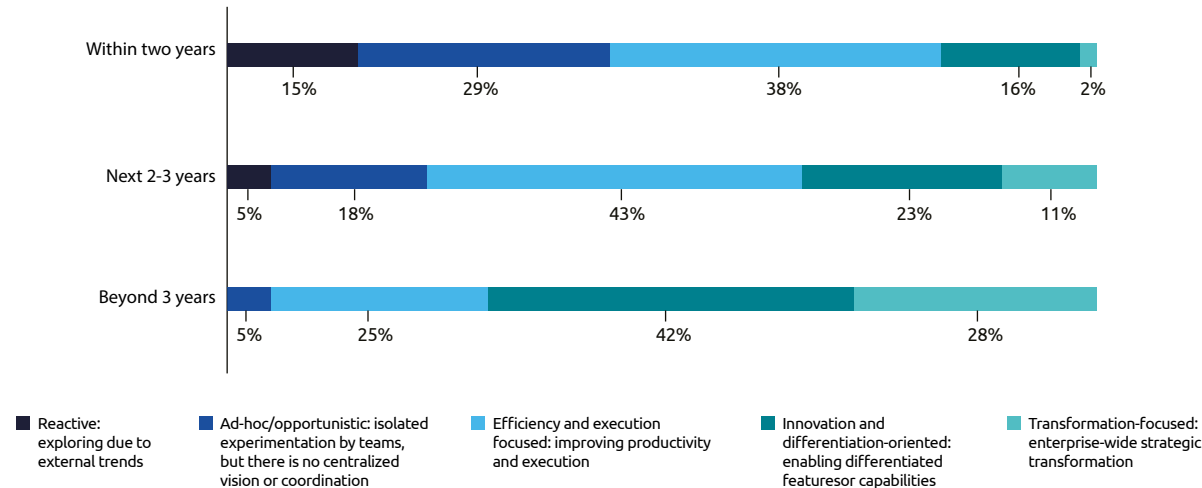
The next frontier of AI value lies in agentic products and services, not just AI-powered development

Organizations are beginning to perceive agentic AI as an influence not only on engineering execution but also embedded AI that changes physical vehicle behavior, conversational features, agents that coordinate multi-step action, and AI-enabled platforms that support services and ecosystems.

Rivian is deploying Rivian Assistant to compatible Gen 1 and Gen 2 vehicles. Built on Rivian's in-house agentic framework, the assistant can control vehicle systems and coordinate actions across navigation, messaging, and external services such as Google Calendar. This positions agentic AI as a customer-facing capability of the vehicle itself.¹³

Figure 20.

Organizations expect agentic AI to accelerate innovation

What will be the primary focus of agentic AI in your product development lifecycle?

Source: Capgemini Research Institute, AI in automotive product development, July 2026; expected usage: N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Increasingly, organizations expect agentic AI to bring innovation as well as productivity gains. The ability to rapidly develop, validate, and refine new capabilities is becoming a critical source of competitive advantage. For example, Mercedes-Benz's next-generation MB.OS combines conversational, behavioral, and agentic AI capabilities to create personalized in-vehicle CX that adapts to user preferences and refines responses based on previous interactions.¹⁴ Nearly 65% agree that agentic AI can accelerate product innovation. Beyond three years, 42% of respondents expect AI to focus on innovation and differentiation and another 28% expect it to drive enterprise-wide strategic transformation.

The head of advanced development at a global tier-1 automotive supplier comments: "AI is not only improving development processes but creating new product functions. TempAI¹⁵ is a great example of this, where AI becomes an integral part of the product itself, delivering enhanced performance, efficiency, and sustainability. It enables 15% more accurate temperature control while significantly reducing development time."



"In automotive product development, I believe the greatest value of Agentic AI is its ability to strengthen engineering judgment and accelerate decision-making. By challenging assumptions, exposing blind spots, and enabling faster learning, autonomous agents can help engineers navigate complex design and development challenges more effectively. While AI enhances insight and efficiency, accountability, safety, and design integrity must remain firmly under human responsibility."

Etienne Grass

Global Chief AI Officer,
Capgemini Invent

03

**Scaling agentic AI
requires a stronger
control plane**

Organizations are scaling AI faster than they are building the control plane

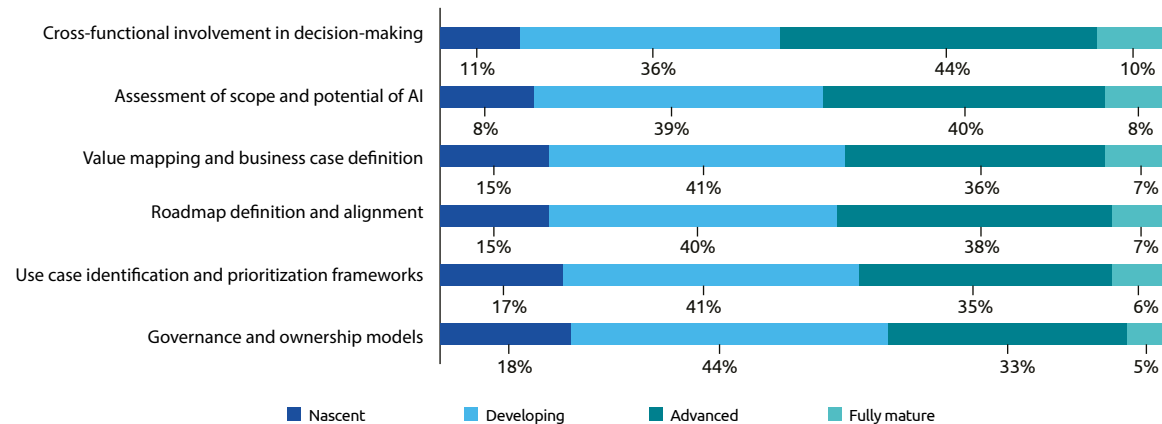
We evaluated the maturity of the key capabilities required to scale agentic AI initiatives across the automotive product development lifecycle. As Figure 21 shows, fully mature capabilities remain rare across every assessed dimension. For every one of the six capabilities assessed, fewer than one in ten executives rate their organization's practices as fully mature.

The largest readiness gaps are in AI governance and accountability, with just 5% of executives rating their governance and ownership models as fully mature and only 38% rating them as advanced or better. This is the lowest of the six capabilities assessed, suggesting that many are scaling AI adoption before fully developing the structures needed to manage it consistently.

Figure 21.

Decision-making, governance, and value realization frameworks remain underdeveloped

How mature are your organization's governance and decision-making practices?*



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

* **Fully mature** indicates that respondent has rated the practice 7; **Advanced** indicates that respondent has rated the practice 6 or 5; **Developing** indicates that respondent has rated the practice 4 or 3; **Nascent** indicates that respondent has rated the practice 2 or 1.



"AI governance is most effective when it is built into how engineering teams work. Clear guardrails, defined ownership, and strong data controls allow teams to innovate confidently without increasing risk."

Amol Pathak

Director- Projects and Vehicle Integration,
UD Trucks, Japan

Amol Pathak, Director- Projects and Vehicle Integration, UD Trucks, Japan says: *"AI governance is most effective when it is built into how engineering teams work. Clear guardrails, defined ownership, and strong data controls allow teams to innovate confidently without increasing risk."*

While most organizations recognize the importance of AI in product development, few have translated that ambition into a comprehensive enterprise-wide strategy.

Globally, 43% of automotive OEM executives report that their organization has defined an AI strategy and roadmap and has begun implementing AI across selected functions and programs, while another 45% indicate that their organizations are currently still defining or have not yet formulated a strategy, highlighting a substantial gap between ambition and operational deployment.

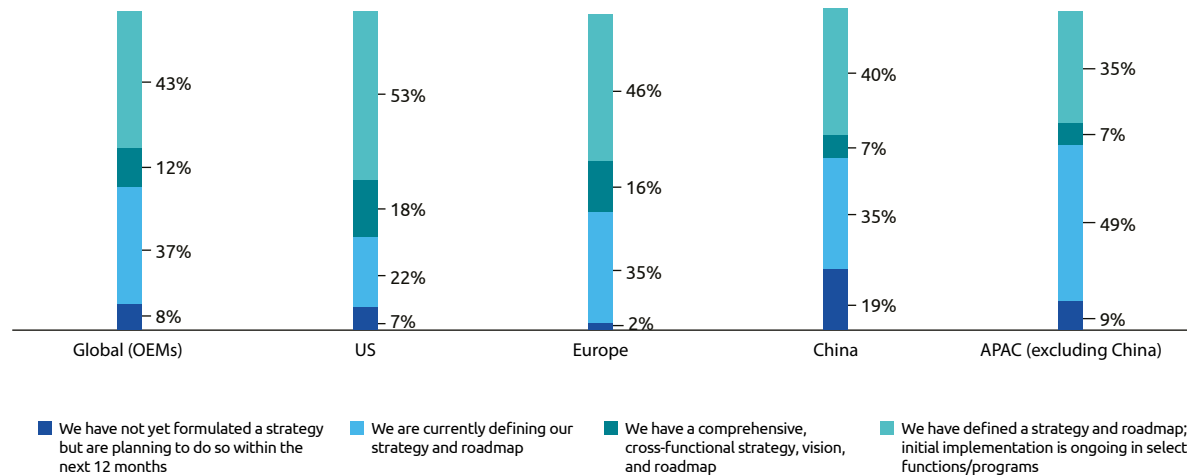
43%

of automotive OEM executives report that their organization has defined an AI strategy

Figure 22.

Organizations are still progressing from strategy to execution

Does your organization have a strategy and roadmap dedicated to the implementation of AI in the product development lifecycle?



Strategic maturity varies significantly across regions. US OEM executives (N = 55) are the most advanced, with a majority (53%) reporting that implementation is already underway in select functions and programs, alongside another 18% that have established a comprehensive cross-functional strategy and roadmap. European OEMs (N = 147) also demonstrate relatively strong readiness, with 46% reporting that their organization is at implementation stage and 16% reporting a comprehensive strategy.

Chinese OEMs are at an earlier stage than their EU and US peers, but ahead of the rest of APAC. While 40% of executives from Chinese OEMs (N = 86) say their organization has moved into implementation, only 7% report a comprehensive strategy, and nearly one-fifth (19%) plan to formulate a strategy within the next year. APAC OEMs excluding China (N = 112) show the lowest level of implementation maturity, with almost half (49%) of executives reporting that their organization is still defining its strategy and roadmap and only 35% having progressed to implementation.

Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs.



A Case Study

Hyundai Motor

Successful AI-at-Scale Strategy in Automotive Product Development¹⁶

Hyundai Motor Group has taken AI implementation beyond a technical initiative to the level of enterprise transformation. Its journey followed a clear progression:

Vision → Digital Transformation → Data Foundation → AI-enabled Engineering Platforms → Enterprise Adoption → Business Value → Physical AI

- **2018: Establishing vision**

AI transformation began with executive commitment. Executive Chair Euisun Chung set the long-term strategic direction for Hyundai to become “more IT-like than IT companies themselves.”

- **2019–21: Building digital foundations**

Hyundai launched its Digital Transformation (DX) program, modernizing processes, improving collaboration, and fostering a data-driven culture.

- **2022: Creating the data backbone**

The organization built a strong data and collaborative foundation through Microsoft 365, JIRA, Dooray, Confluence, and the Global One Data Pipeline, while strengthening software capabilities through 42dot.

- **2023–24: Advancing the SDV strategy**

Hyundai expanded into SDVs. Through 42dot’s partnership with Samsung, AI became increasingly embedded in connected and intelligent vehicles.

- **2025–26: Enterprise AI adoption, value realization, and AI-enabled products**

Hyundai expanded H Chat to give employees secure access to leading Gen AI tools. Adoption exceeded 30,000 active users (over 80% of employees). AI reduced crash-safety research time by 90%, manufacturing downtime by 86%, maintenance response time by 42%, and customer review processing time from 35 to 5 minutes.

At the same time, it began to move AI from processes into the vehicle itself. In 2026 Hyundai Motor Group unveiled Pleos Connect, its next-generation infotainment platform. At its core is Gleo AI, a large language model (LLM)-based in-vehicle AI agent that understands conversational and driving context, executes multiple commands, and integrates functions such as navigation, climate control, vehicle information, and web search. It also combines OTA updates with an open app ecosystem.¹⁷

- **Beyond 2026: The Physical AI Era**

Hyundai is now combining AI, SDVs, robotics, and smart manufacturing to build intelligent mobility ecosystems.

Trust, governance, and accountability define the limits of autonomy

Beyond readiness, a different question is confronting organizations: **how much responsibility can be entrusted to AI systems, and under which conditions?** Organizations place growing emphasis on transparency, oversight, and accountability. For automotive organizations, these elements are crucial. AI-generated decisions can ultimately influence vehicle safety, regulatory compliance, engineering sign-offs, and product performance.

As AI evolves into an agent capable of making recommendations, coordinating workflows, and executing complex tasks, organizations must determine where they can allow it to operate independently. The next phase of adoption will therefore depend not only on technological performance, but also on the **ability to establish trust in AI-driven actions and decisions**. AI systems must be relied upon to operate reliably, predictably, transparently, and within acceptable boundaries of risk. While respondents express broad confidence in AI's ability to improve productivity, coordination, and decision-making (as

discussed in Chapter 2), **only 41% believe they can ensure decision traceability (data, assumptions, rationale) for agent-influenced outcomes.**

But our findings suggest that trust is far from uniform across the product development lifecycle:

- Executives are most comfortable applying agentic AI in upstream activities (such as market research and concept exploration), where 59% trust AI to support decision making and execution.
- But confidence declines as AI moves closer to engineering and product-critical activities, falling to 49% in design, 44% in testing and validation, and 40% in development.

This reflects the sliding scale for the consequences of error as programs progress. While engineers can often review and correct AI-generated insights in market analysis or concept exploration with limited impact, mistakes in engineering design, software development, or validation can propagate across vehicle programs, affecting safety, quality, cost, and time-to-market. As a result, organizations appear more cautious where AI outputs must ultimately be verified and signed off as part of the engineering process.

41%

believe they can ensure decision traceability (data, assumptions, rationale) for agent-influenced outcomes

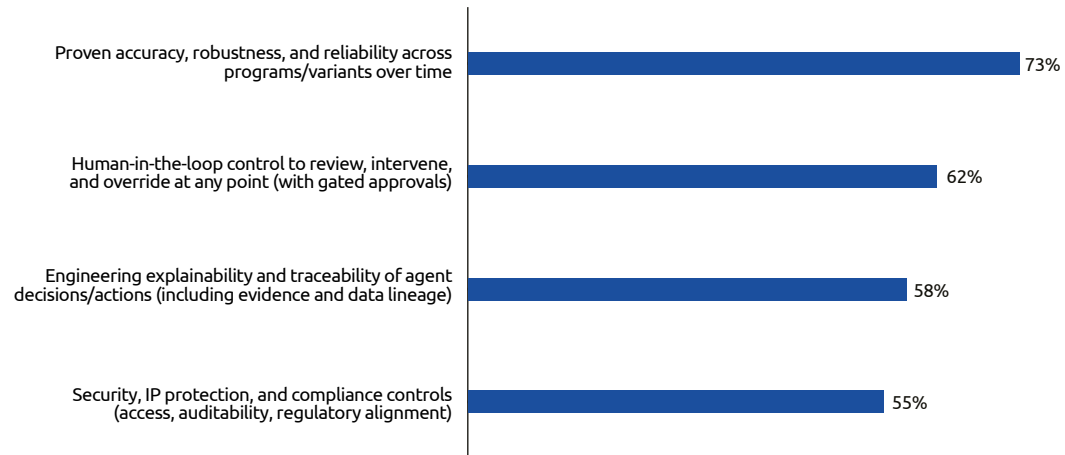
Automotive organizations have long used traditional AI/ML in areas where performance can be measured against defined engineering outcomes. They are also familiar with **deterministic** engineering automation, where outputs can be qualified through established processes. Gen and agentic AI are different: outputs are **probabilistic**, rather than deterministic, making it harder to validate, explain, and assure results with the same level of confidence.

As AI moves from supporting product development to influencing vehicle capabilities, the implications for automotive safety assurance become even more significant. To strengthen confidence in agentic AI, organizations are prioritizing mechanisms that improve the predictability, transparency, and controllability of AI systems.

Figure 23.

Trust in agentic AI is driven by reliability, control, and explainability

Which factors are most likely to increase your trust in agentic AI for the product development lifecycle?



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.



As agentic AI increases engineering throughput, the challenge shifts from generating work to validating, approving, and deploying the technology. Organizations may accelerate development activities, but AI-generated output risks accumulating faster than organizations can operationalize it. While organizations use AI to generate engineering artifacts such as requirements, code, documentation, and test cases, significantly fewer have established the traceability and evidence mechanisms needed to demonstrate how those outputs were created, validated, and approved.

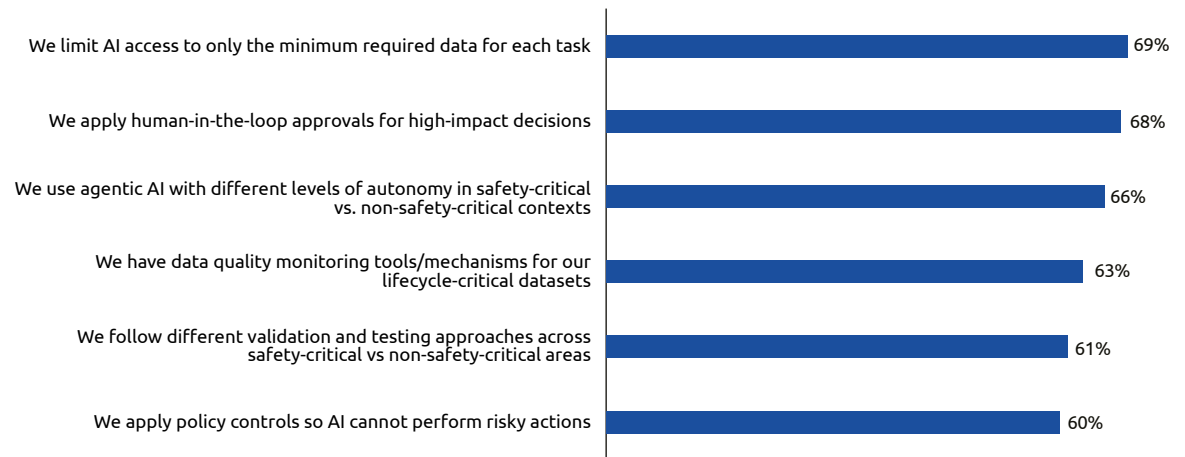
In parallel, automotive organizations are establishing controls to ensure AI-enabled development remains aligned with established engineering processes. As Figure 24 shows:

- Nearly seven in ten executives say that their organization restricts AI access to the minimum data required for a task (69%) and require human approval for high-impact decisions (68%).
- Similarly, 66% say their organization applies different levels of autonomy depending on whether a use case is safety-critical or non-safety-critical, while 63% have implemented data-quality monitoring for lifecycle-critical datasets and 61% apply distinct validation and testing approaches based on the criticality of the activity.

Figure 24.

Organizations are balancing autonomy with oversight

Percentage of executives who say their organization undertakes the following actions



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers

However, **many of these controls remain focused on restricting AI actions, rather than governing their performance across the full lifecycle in terms of evidence requirements, decision traceability, dual sign-off, and impact-based escalation.** This distinction is particularly important in automotive development, where organizations must maintain traceability across requirements, design, verification, validation, and release decisions. Restricting AI access or requiring approvals may reduce immediate risks, but long-term trust depends on demonstrating that AI-supported decisions can be consistently monitored, validated, and audited throughout the lifecycle.

As Figure 25 shows:

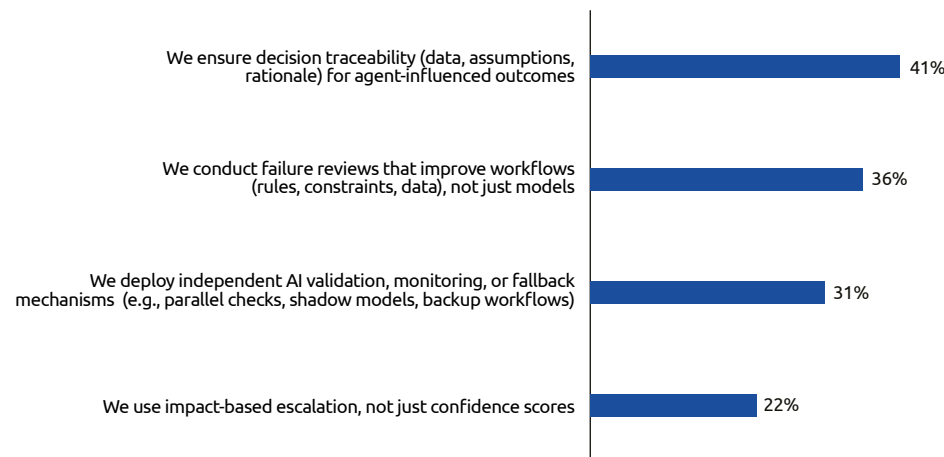
- Less than half of the executives surveyed say their organization ensures traceability of the data, assumptions, and rationale behind AI-influenced outcomes (41%).
- Yet only 31% have deployed independent validation, monitoring, or fallback mechanisms.

More advanced practices are even less common. Just 36% say their organization conducts failure reviews that improve the underlying workflows, rules, and data, and only 22% use impact-based escalation, rather than relying primarily on model confidence.

Figure 25.

Performance governance mechanisms are less common

Percentage of executives who agree with the below statements



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Royston Jones, Global Head of Automotive and Transportation, Siemens, comments: *"In automotive, AI has to earn trust through transparency. While engineers remain central to decision-making, increasingly physics-based AI will become an important tool by self-validating its accuracy and indicating when it is operating beyond its proven design space."*

Most organizations lack a connected engineering backbone, that underpins the agentic technology stack

Agentic AI cannot scale as a collection of standalone tools. Its value comes in providing orchestrated end-to-end decision-making support across the product development lifecycle. This requires a connected engineering backbone that links engineering data, lifecycle platforms, and workflows, giving agents the context and traceability to act across functions.



"In automotive, AI has to earn trust through transparency. While engineers remain central to decision-making, increasingly physics-based AI will become an important tool by self-validating its accuracy and indicating when it is operating beyond its proven design space."

Royston Jones

Global Head of Automotive and Transportation,
Siemens



“Scaling AI starts with bringing fragmented information together. In automotive, critical data sits across engineering systems, ERP platforms, supplier portals, and different teams. The real opportunity comes when these sources are connected with the help of autonomous AI agents that orchestrate across these different areas, creating a consistent digital thread that supports end-to-end decision-making.”

Nadine Kanja

Global Head, Industry Business
Unit Automotive at SAP



“Without connected requirements, specifications, architecture, testing, and traceability data, organizations spend more effort retrieving and reconciling information than generating value. The result is higher cost, slower scaling, and AI that remains confined to isolated use cases, rather than enabling end-to-end engineering decisions.”

Craig Turner

Vice-President and Managing Director,
Digital Cockpit and Middleware at Aptiv

Nadine Kanja, Global Head Industry Business Unit Automotive at SAP says *“Scaling AI starts with bringing fragmented information together. In automotive, critical data sits across engineering systems, ERP platforms, supplier portals, and different teams. The real opportunity comes when these sources are connected with the help of autonomous AI agents that orchestrate across these different areas, creating a consistent digital thread that supports end-to-end decision-making.”*

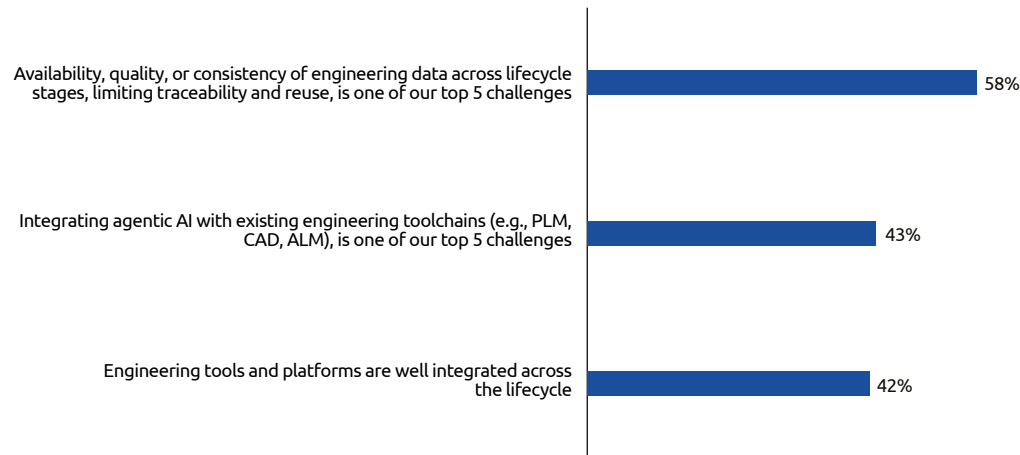
Many automotive organizations still lack this foundation:

- Nearly six in ten (58%) executives cite gaps in the availability, quality, or consistency of engineering data across lifecycle stages
- 43% say their organization faces challenges integrating agentic AI with existing engineering toolchains
- Only 42% say that engineering tools and platforms are well integrated across the lifecycle
- Only about half of executives agree that their organization has effective integration of tools, AI platforms, and data systems across lifecycle stages

Figure 26.

Organizations lack a connected engineering backbone

Percentage of executives who agree with the below statements



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Connecting previously siloed engineering knowledge enables agents to assess **trade-offs, dependencies, and downstream consequences of engineering decisions**. Honda, for example, is exploring a multi-agent AI approach that combines expertise from domains such as engines, chassis, and noise and vibration engineering to address the issue of disparate Gen AI initiatives that are dispersed across different engineering functions.¹⁸

Further, without linking engineering data to its requirements, dependencies, history, and intended use, agents lack the **engineering context to reason accurately across lifecycle stages**. Additionally, weak data structures can significantly **increase the cost of deploying and operating agentic AI**. Agents often need to retrieve, reconcile, and process larger volumes of fragmented or inconsistent information, driving higher token consumption and computational costs. This reduces efficiency and can undermine the business case for scaling agentic AI.

Craig Turner, Vice-President and Managing Director, Digital Cockpit and Middleware at Aptiv notes: *“Without connected requirements, specifications, architecture, testing, and traceability data, organizations spend more effort retrieving and reconciling information than generating value. The result is higher cost, slower scaling, and AI that remains confined to isolated use cases, rather than enabling end-to-end engineering decisions.”*

As many as **60% of organizations say delays are driven primarily by process inefficiencies, rather than technical challenges**. AI can accelerate individual activities, but its impact remains limited if workflows continue to rely on sequential stage-gates, manual handoffs, duplicated reviews, and disconnected approval processes.

While organizations are making progress in adopting AI-enabled capabilities, the broader transformation required to support agentic AI remains uneven. As Figure 27 shows:

- More than half of executives report significant or enterprise-wide changes in AI-driven engineering decision making (55%) and simulation-led development and virtual validation
- Nearly half have substantially automated engineering activities such as design generation, testing, and defect analysis (49%)

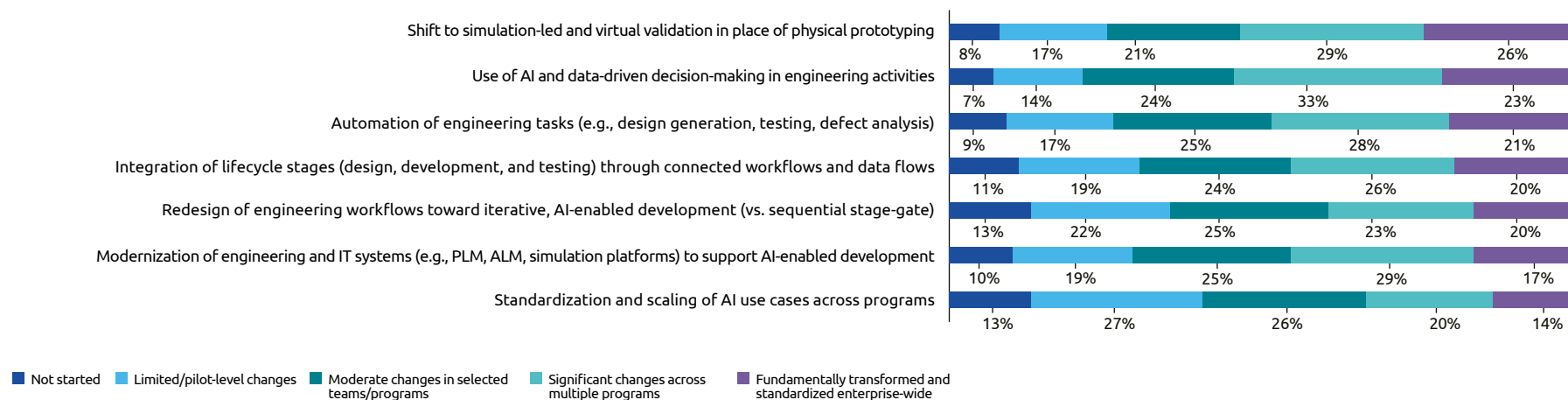
Less than half (46%) have substantially modernized engineering and IT systems to support AI-enabled development, and a similar proportion say their organization has made significant progress in integrating design, development, and testing through connected workflows and data flows. As a result, AI capabilities may deliver productivity gains within specific functions but struggle to scale across the product lifecycle – where agentic AI derives its greatest value.

The head of autonomous mobility at a German tier-1 automotive supplier elaborates: *“Our feedback loop works because new recordings flow into the cloud, models are re-evaluated, engineering teams address edge cases, and updates are pushed back to vehicles. Without that connected backbone, AI remains limited to isolated experiments.”*

Figure 27.

Organizations are early in the transforming processes to scale agentic AI

To what extent has your organization transformed its internal R&D/engineering processes to enable AI adoption in product development?



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.



"One of the biggest misconceptions about AI is that it reduces the need for human accountability. In reality, it elevates it. Engineers are spending less time on routine execution and more time validating outputs, orchestrating complex workflows, and governing autonomous systems to ensure trust, safety, and performance."

Oussama Ben Moussa

Automotive Global Industry Architect and Chief
Technology Officer for Autonomous Mobility,
Capgemini Engineering



Scaling autonomy entails new responsibilities

As AI systems take on portions of engineering workflows, human responsibility does not disappear, it shifts. Engineers increasingly become accountable for defining objectives, validating outcomes, managing exceptions, and ensuring that AI-driven decisions remain aligned with technical, safety, and business requirements.

The organizations that scale AI fastest will not be those with the most agents. They will be those with the clearest decision rights, cleanest data foundations, strongest validation evidence, reusable workflow patterns, and fastest governed path from insight to action.

This emphasis on validation and governance is also dictating the skills organizations require. As Laurence Montanari, VP Transportation and Mobility Industry at Dassault Systèmes, notes: *"As AI becomes part of everyday engineering work, the key skill will be using expert knowledge to check results and avoid errors or hallucinations."*



"As AI becomes part of everyday engineering work, the key skill will be using expert knowledge to check results and avoid errors or hallucinations."

Laurence Montanari

VP Transportation and Mobility Industry at
Dassault Systèmes

23%

of AI-generated test cases passed in the first iteration

Evidence from Volvo reinforces the need for rigorous human oversight as AI use expands. A 2025 university study applying Gen AI within Volvo's Hardware-in-the-Loop test-automation framework found that only 23% of AI-generated test cases passed in the first iteration, rising to 36% in the second iteration. Scaling autonomy creates new responsibilities for iterative testing, robustness assessment, framework integration, and engineering sign-off.¹⁹ The survey shows a similar gap: among organizations already using AI, requirement traceability — a core enabler of ISO 26262 safety compliance — sees only 11% agentic AI adoption today, against 51% for documentation and reporting.

Automotive organizations are building **strong top-down support for agentic AI**:

71%

of executives say that their organization encourages experimentation

66%

report leadership alignment on AI's role and priorities

64%

are investing in workforce capability building

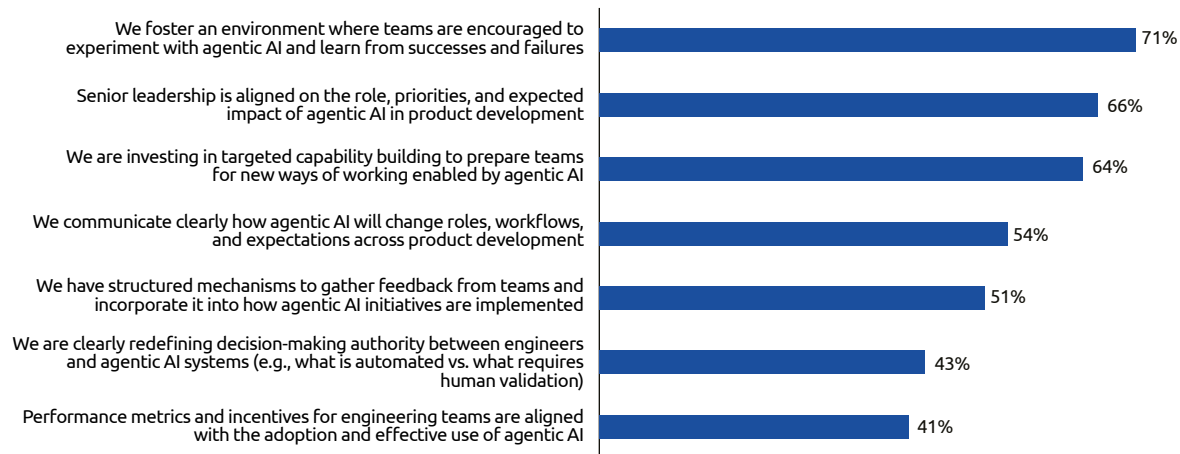
However, that momentum is not consistently translating into the operating model changes required for adoption at the engineering team or enterprise level.

The gaps are widest in the operating-model changes that agentic AI requires, and they do not close with adoption: agreement that decision-making authority is being redefined is 47% among extensive users of agentic AI, 43% among limited users, 44% among pilots, and 42% among non-users. Only 43% of executives say that their organization is clearly redefining decision-making authority between engineers and AI systems — and 43% say it is not, the only statement in the survey where the two sides are exactly level. Just 41% have aligned performance metrics and incentives with AI adoption, while 46% have not.

Figure 28.

Top-down support outpaces operating-model change

Percentage of executives who agree with the following statements



The challenge is not simply one of skills, but of change management. While 51% of executives report their organization upskilling employees to supervise agent workflows and validate outputs, fewer have established the governance mechanisms that make human oversight effective. Only 22% say their organization uses impact-based escalation, rather than just confidence scores, and just 27% provide reusable, approved workflow patterns that teams can adopt with confidence.

The head of UX at a US-based technology provider says: *"Organizations move fastest when leadership aligns around AI, employees embrace a workforce mindset of continuous learning, and change management supports adoption. Skills development, cross-functional collaboration, reusable design systems, and rigorous validation enable speed without compromising quality or trust."*

Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.



A discussion with **Ambica Rajagopal**

PhD, Group Chief Data and AI Officer at Michelin

How can AI accelerate automotive product development from design through manufacturing?

By connecting design, simulation, testing, validation, and manufacturing through predictive intelligence. Michelin uses AI models to predict tire performance from design specifications, enabling virtual testing and reducing reliance on physical test cycles. AI is also creating predictive feedback loops between design and manufacturing, helping engineers anticipate downstream production impacts earlier. These capabilities accelerate innovation, shorten time-to-market, improve sustainability, and enable engineering R&D teams to focus on higher-value design and innovation activities.

What three priorities should automotive organizations focus on to achieve enterprise-wide AI transformation?

First, provide broad access to AI tools, secure platforms, and learning communities, so employees can build confidence and capability. Second, invest in operational and strategic AI agents that transform engineering R&D, manufacturing, supply chain, and business processes. Third, establish strong data foundations because data quality, governance, and accessibility determine the success of enterprise AI initiatives.

How can automotive organizations build the employee trust needed to unlock AI value?

Building AI capabilities must go hand in hand with transforming how employees work, learn, and collaborate. Michelin provides employees with secure AI platforms, a Gen AI network, and communities of practice that encourage experimentation and learning. This approach helps employees gain hands-on AI experience, building the trust required to scale AI across engineering R&D, manufacturing, and business functions.

How can AI be integrated into engineering R&D and product development processes to accelerate enterprise-wide value creation?

AI applications in automotive organizations typically fall into three distinct categories: AI assistants for personal productivity; operational agents embedded directly into business processes; and strategic agents that support high-value activities such as forecasting and pricing. Enterprise-wide scaling is driven by combining domain-specific initiatives with cross-functional process governance, ensuring AI is integrated and scaled through both business domains and cross-functional process governance, rather than a series of isolated experiments.

Why are data quality, governance, and data architecture critical to scaling AI across automotive engineering R&D and product development processes?

Strong data foundations are indispensable to successful enterprise AI adoption. Michelin has invested heavily in data quality, governance, and a data mesh architecture to improve data availability and operational accessibility across the business. However, the most important transformation has been positioning data as a business-critical asset, fostering alignment of business and technology stakeholders to ensure data is operationally available precisely where and when it is needed.



04

Scaling agentic engineering requires a mature approach to AI ecosystem collaboration

Scaling AI in automotive product development will depend on an ecosystem of players collaborating in new ways that balance control, cybersecurity, compliance, and sovereignty.

The AI ecosystem encompasses the network of external technology partners that support the development, deployment, and scaling of AI across automotive product development. As AI capabilities become embedded in engineering processes, organizations rely on a diverse ecosystem of partners to operationalize AI at scale.

The ecosystem typically includes:

- **Cloud providers and hyperscalers** that provide computing infrastructure, data storage, AI platforms, and scalable training environments (e.g., Microsoft Azure, AWS, Google Cloud)
- **Data and analytics firms** that support data management, integration, and governance across engineering functions (e.g., Databricks, Snowflake)
- **AI model providers** that develop LLMs, multimodal models, and agentic AI capabilities (e.g., OpenAI, Anthropic, Google DeepMind/Gemini)
- **Engineering software and product development platforms** that embed AI into design, simulation, software development, testing, and systems engineering workflows (e.g., Siemens, Dassault Systèmes, PTC, Wind River, Aumovio, Aptiv)
- **Autonomous vehicle and AI stack providers** that deliver domain-specific AI capabilities for perception, simulation, validation, and autonomous driving systems (e.g., Mobileye, NVIDIA, Wayve, Applied Intuition)
- **Semiconductor and compute providers** that supply the specialized hardware required to train and run AI workloads (e.g., NVIDIA, Qualcomm, AMD)
- **Cybersecurity** providers that help protect AI models, data assets, connected vehicles, and SDV platforms (e.g., CrowdStrike, Palo Alto Networks)

AI ecosystem shows signs of low maturity

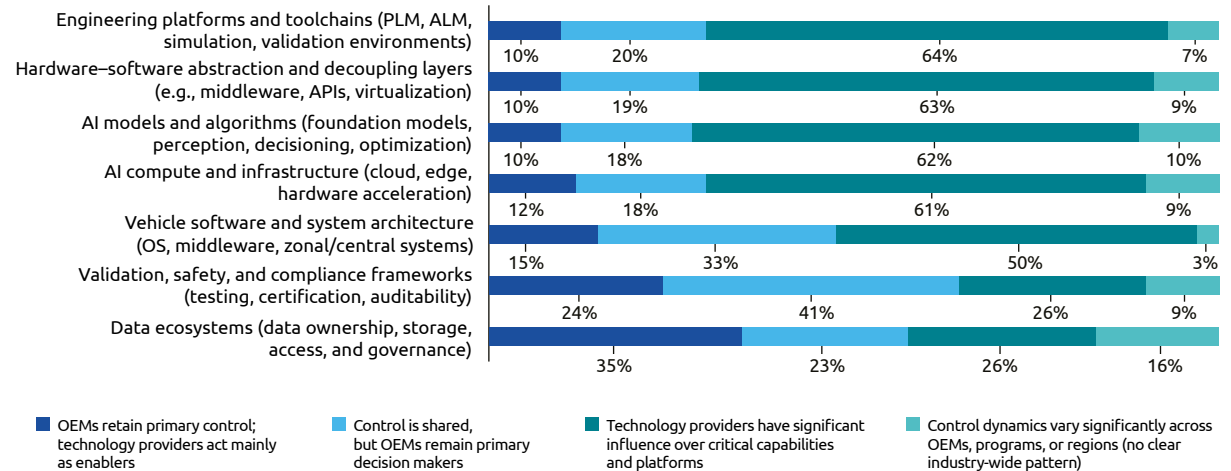
AI-enabled product development is increasingly interdependent, with influence and decision-making distributed across OEMs and ecosystem partners in areas ranging from engineering platforms and AI models to compute infrastructure and software architectures, as shown in Figure 29.

Ambica Rajagopal, Group Chief Data and AI Officer at Michelin adds: *“Our long-term technology partnerships are essential to unlocking AI value through shared roadmaps, innovation, and operational alignment.”*

Figure 29.

Technology providers see OEMs as heavily reliant on them

In the context of AI-enabled automotive product development, how is the balance of control and dependency between OEMs and technology providers evolving across the following capability areas?



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 240 executives from technology providers.



“Our long-term technology partnerships are essential to unlocking AI value through shared roadmaps, innovation, and operational alignment.”

Ambica Rajagopal

Group Chief Data and AI Officer at Michelin

However, growing ecosystem interdependence has not been complemented by equally mature collaboration models. Many organizations still operate through fragmented relationships with limited shared accountability. While 40% of all respondents – OEMs, suppliers, and technology providers alike (N = 800) – report active collaboration, these relationships are characterized by limited shared ownership:

- Only 30% have progressed to co-development models with shared KPIs and workflows
- Just 10% report an integrated ecosystem with shared development and lifecycle accountability (among OEM executives alone, 5%)

Even leading OEMs are still building the ecosystem capabilities to scale AI.²⁰

10%

Organizations who report an integrated ecosystem with shared development and lifecycle accountability

Growing dependencies give sovereignty greater significance

Deeper reliance on cloud infrastructure, high-performance compute, AI models, engineering platforms, and external technology partners means organizations are marking out areas in which they must retain control. These include sensitive data and models, where workloads run, limiting/eradicating downtime, and whether critical capabilities can continue if a technology provider becomes unavailable. Only 40% believe ecosystem partners accelerate engineering workflows without creating dependency risks.

This imperative is reinforced by a widening regulatory perimeter introducing requirements around AI governance, cybersecurity, operational resilience, and supply-chain risk. At the same time, emerging initiatives such as the EU's proposed Cloud and AI Development Act (CADA) reflect a broader policy push toward technological sovereignty. These requirements are pushing sovereignty from a technology-infrastructure decision into an engineering and business-continuity priority.

Our research reflects this broader interpretation:

- Seven in ten automotive organizations are strengthening sovereignty to **comply with regional AI and data regulations**
- Nearly two-thirds are seeking **greater internal control over data, models, or platforms**, while more than half prioritize the **ability to operate through geopolitical or supply-chain disruption**
- Organizations are also **reassessing structural dependencies**: 53% are reducing reliance on non-domestic or single-region providers, and 42% are investing in sovereign or on-premises AI infrastructure

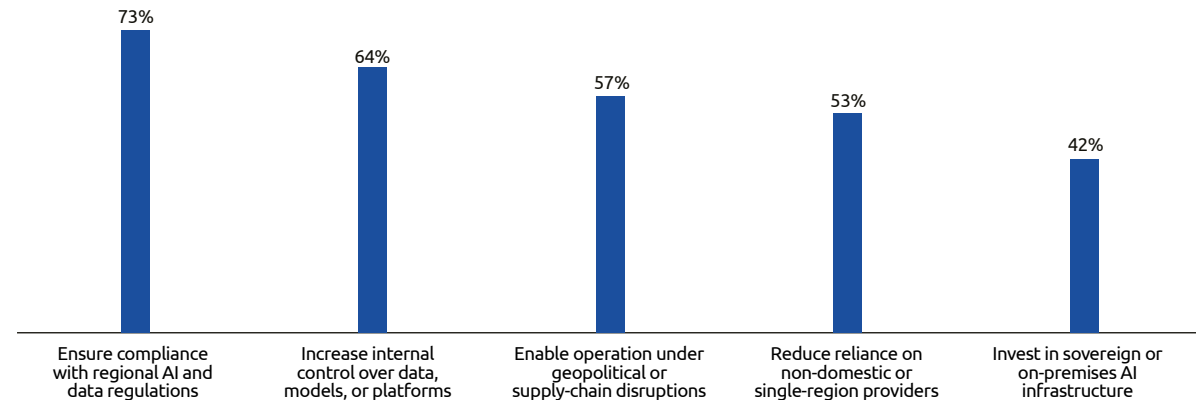
53%

Organizations are reducing reliance on non-domestic or single-region providers

Figure 30.

Sovereignty is being pursued for compliance, control, and continuity

Percentage of executives who say that their organizations intends to implement the following actions for digital sovereignty in the next 12–18 months



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Increasingly, organizations direct sovereignty investments toward the data, models, workloads, and engineering processes considered most important to business continuity and competitive advantage:

- About seven in ten (68%) executives say that their organization plans to **separate AI workloads by sensitivity** across public cloud, private cloud, and on-premises environments in the next 12–18 months
- More than half (53%) say their organization intends to **reduce dependence on a single hyperscaler** for AI-critical workloads, while half (50%) plan to move **selected workloads closer to the vehicle or the edge**

This reflects a pragmatic approach to sovereignty, balancing external innovation and scale with greater control over critical engineering assets and workflows. Rather than pursuing complete technological independence, **leading organizations view sovereignty as the capacity to choose and manage dependencies while retaining control over critical assets and decision rights.**

Capgemini Research Institute's global digital sovereignty research²¹ found that 69% of organizations define digital sovereignty as the ability to choose technological dependencies, while 67% view it as resilient interdependence, rather than isolation. The emphasis is moving toward ensuring portability, substitutability, and operational

continuity across critical platforms and providers, without becoming constrained by a single technology, cloud, AI, or supply-chain dependency.

Karine Brunet, Chief Operations and Delivery Officer at Capgemini, notes: *"For organizations, especially in Europe, the goal [of sovereignty] is not full autonomy, but a clear understanding of technological dependencies, so they can move from dependence to interdependence."*

Our separate digital-sovereignty research (April 2026, N = 130 automotive executives) indicates that digital sovereignty is becoming a strategic priority globally to achieve greater strategic control, flexibility, and resilience. In Europe **74% of organizations report pursuing digital sovereignty to enhance transparency, auditability, and accountability, while 87% of Chinese organizations identify AI sovereignty as a key priority.**

These priorities are reflected in evolving approaches to AI governance and regulation. In **Europe**, regulatory frameworks place strong emphasis on governance, accountability, data stewardship, and human oversight. Initiatives such as the **EU AI Act**²² and **UNECE vehicle regulations**²³ require robust safety validation, transparency, lifecycle monitoring, and explainability for high-risk AI systems and automated driving technologies.

In the **US**,²⁴ the regulatory landscape remains comparatively innovation-focused and sector-specific, while continuing to emphasize safety assurance, human accountability, and evidence-based validation.

China,²⁵ meanwhile, has adopted a more state-led approach that aligns the rapid advancement of intelligent and connected vehicle technologies with national priorities related to data security, algorithm governance, industrial competitiveness, and technological self-reliance.

Although these approaches differ, they pursue a common objective: ensuring that AI systems remain safe, accountable, resilient, and trustworthy, while reducing strategic dependence on external technologies and infrastructure.

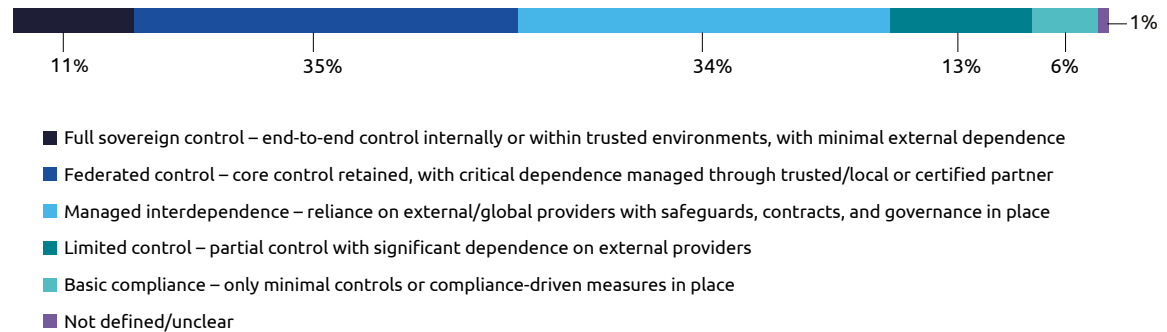
Automotive organizations are already overlaying these priorities onto infrastructure and operating-model decisions. For example, in 2026, Volkswagen Group selected T-Systems to build and operate its Group Private Cloud, with the aims of strengthening digital resilience, processing more data within its own controlled environment, and increasing independence while retaining access to advanced AI capabilities. The initiative highlights how OEMs are responding to growing dependencies by increasing control over critical data and technology infrastructure. This establishes sovereignty as a resilience and continuity strategy rather than solely a compliance requirement.²⁶

Despite progress on infrastructure, cloud, and AI governance, the strongest test of sovereign control lies at one of the most critical points in the value chain: OTA management and deployment to the customer. Only 11% of OEM and supplier executives say their organization holds end-to-end control of OTA management and deployment internally or within trusted environments, with minimal external dependence; 35% retain core control with critical dependencies managed through certified partners, and 34% rely on external providers with contractual safeguards. The survey asked for a self-assessment of control and dependence; it did not itemize the app-store, telecommunications, or data-residency dependencies behind that answer, which differ by market and are where the practical limits of sovereignty usually sit.

Figure 31.

Only 11% report full sovereign control over OTA management and deployment

To what extent does your organization maintain sovereignty in OTA management and deployment?



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

While organizations are strengthening control over infrastructure, data, and AI workloads, few have established comparable control over the deployment pathways that deliver software updates to vehicles. Control over update and lifecycle management of SDVs may prove just as important as control over the underlying data, models, and infrastructure.

The objective is not necessarily complete self-sufficiency. In our separate digital-sovereignty research, 63% of automotive organizations prioritize AI as part of their digital-sovereignty strategy, only 19% favor full sovereign control across the technology stack. Over half (55%) prefer federated control or managed interdependence. This makes it increasingly important to define where in the broader technology ecosystem control is non-negotiable.

Felix Schwabe, Head of Tech Unit Digital Platforms/User Experience at Audi, says: *"As software-defined vehicles and manufacturing ecosystems become increasingly complex, governance becomes a critical success factor. AI helps manage vast amounts of requirements, engineering data, and production knowledge, but true sovereignty depends on maintaining control over data, software quality, cybersecurity, and resilient operations across the entire value chain."*



"As software-defined vehicles and manufacturing ecosystems become increasingly complex, governance becomes a critical success factor. AI helps manage vast amounts of requirements, engineering data, and production knowledge, but true sovereignty depends on maintaining control over data, software quality, cybersecurity, and resilient operations across the entire value chain"

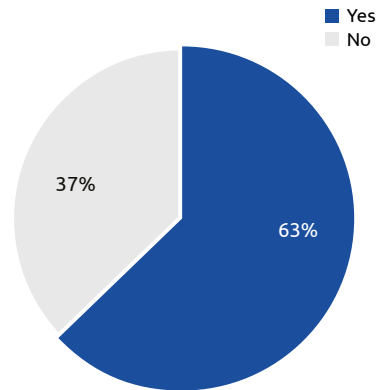
Felix Schwabe

Head of Tech Unit Digital Platforms/User Experience,
Audi

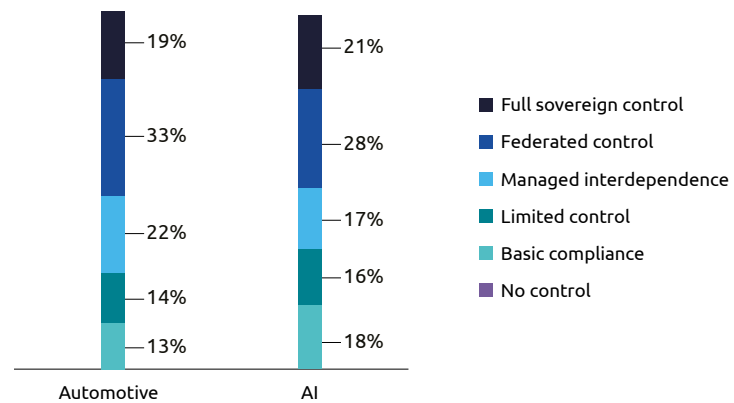
Figure 32.

Most organizations prefer federated control or managed interdependence to full sovereignty

Prioritized AI in the pursuit of digital sovereignty



Organizations' desired level of AI digital sovereignty



Sovereignty in automotive is less about owning every technology layer and more about strategic control over critical capabilities and operational continuity. As AI gains autonomy, this need for control becomes an imperative.



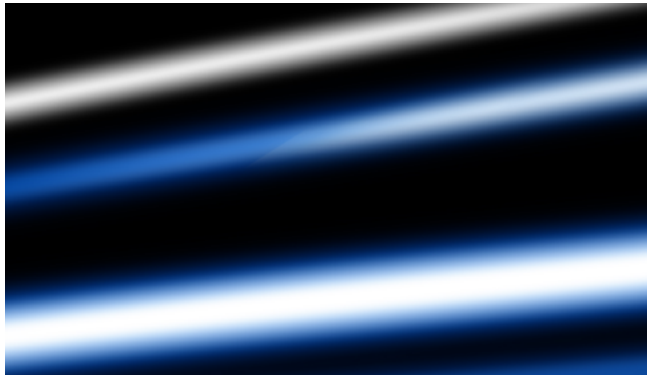
Source: Capgemini Research Institute, Digital sovereignty survey, April 2026, N = 130 automotive executives.

Managing ecosystem risk becomes a prerequisite for scale

Once agentic AI is given greater autonomy, organizational risk extends beyond its outputs to what it can access, change, or introduce into the engineering lifecycle. This is particularly the case if it is connected to multiple engineering systems. An error or compromise can propagate beyond the development environment and into the vehicle fleet.

The move toward AI-enabled engineering is also creating ecosystem-level risks. Agents may process data generated by interactions up or down the supply chain, creating exposure to new risks, ranging from cybersecurity vulnerabilities, compromised models and software, unreliable outputs, poor access controls and uncontrolled agent behavior.

However, 36% rate their practices for detecting and mitigating model manipulation and AI-driven cyber events below “defined and repeatable” on the survey’s scale, and 39% rate their practices for testing AI under adversarial conditions and edge cases as non-existent, while only 28% consider this capability somewhat to fully mature (Figure 33).



39%

Executives say that their organization has no formal practices for testing AI under adversarial conditions and edge cases

A 2025 Chalmers University study on automotive cybersecurity notes that increasing vehicle connectivity and software complexity are expanding the attack surface across the automotive ecosystem. Risk becomes mobile and a shared responsibility.²⁷

Dr. Jürgen Bohn, Senior Expert, Digital Solutions/ Regional Lead Digital Solutions Americas at Schaeffler says: *“I have learned that scaling AI in engineering is not something any company can do in isolation. We have built partnerships with technology providers, AI specialists, academic institutions, and engineering tool vendors because the challenge is too broad for a single organization. At the same time, every collaboration forces us to think carefully about governance, compliance, and how much control we retain over engineering data, models, and processes.”*

Additionally, regulatory fragmentation, compute shortages, and hyperscaler dependency can impact engineering lifecycle continuity. Our survey identified cybersecurity, AI model reliability and regulatory fragmentation as the top three ecosystem risks with 41%, 40%, 38% of respondents, respectively, citing them.



“I have learned that scaling AI in engineering is not something any company can do in isolation. We have built partnerships with technology providers, AI specialists, academic institutions, and engineering tool vendors because the challenge is too broad for a single organization. At the same time, every collaboration forces us to think carefully about governance, compliance, and how much control we retain over engineering data, models, and processes.”

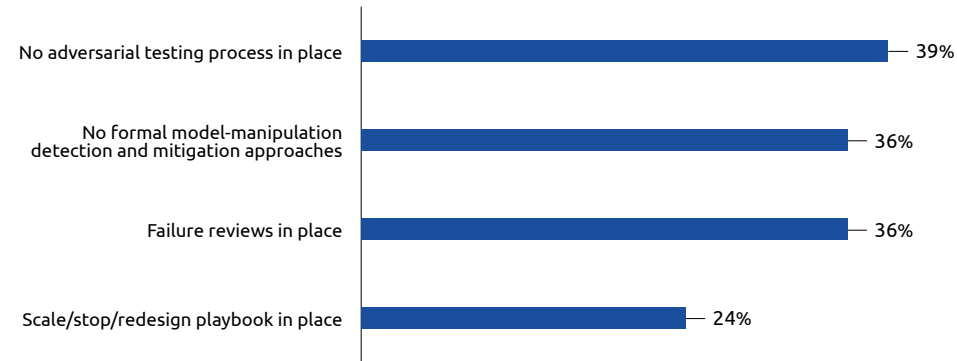
Dr. Jürgen Bohn

Senior Expert, Digital Solutions/ Regional Lead Digital Solutions Americas,
Schaeffler

Figure 33.

Formal response mechanisms to respond to ecosystem risks are inadequate

Percentage of executives who say their organization has...



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs and 160 executives from tier-1 suppliers.

Beyond human approval, there should be mechanisms to inspect, trace, validate and, where necessary, reverse AI-influenced outcomes. In practice, this means moving beyond simple controls on agentic action to the creation of traceable records of agentic activity to ensure regulatory and cybersecurity accountability across ecosystem partners.

Currently, **while 68% use human approvals and 56% restrict AI to approved sources, only 41% ensure traceability of agent-influenced decisions and 48% require supporting evidence for decisions**. Further, most organizations demonstrate limited preparedness for failure, with only 24% having a formal 'scale, stop or redesign' decision playbook, and only 36% conducting failure reviews.

Ecosystem participants must share responsibility for risk management and maintaining common standards across the engineering value chain. OEMs and their partners will need common expectations for model and software provenance, agent permissions, validation, monitoring, incident response, and traceability. But shared ecosystem assurance remains immature. **Only 10% of organizations describe their ecosystem as integrated, with shared development and lifecycle accountability**. Further, only 30% have clarified responsibilities and boundaries for AI-influenced deliverables where suppliers/partners are involved. Without these foundations in place, automotive organizations may succeed in piloting AI at workflow level but struggle to deploy it confidently at enterprise scale and in safety-critical vehicle programs.

Rewiring automotive product development – at AI speed

Our research points to three persistent barriers to scaling AI in automotive product development: trust, evidence, and decision rights. Organizations that address these challenges systematically are better positioned to translate AI adoption into engineering value. The following actions provide a practical framework for doing so. The survey gives a reading on each: only **5%** of organizations describe their AI governance as fully mature, and trust falls from **59%** to **40%** as agents move from strategy work to development; **69%** restrict what AI may access, but only **41%** can show what it did and why; and **43%** say their organization is clearly redefining who decides what between engineers and agents, while **43%** say it is not.



Scale AI across six interconnected dimensions – from the individual engineer to the ecosystem

Figure 34 sets out six dimensions on which AI changes product development, from the individual engineer to the ecosystem. The six are dimensions to work in parallel, each with an owner and a measure, not steps to climb in order. On each, the survey points to a specific action.

- Individual engineers.** Equip engineers with a curated set of approved AI agents and workflows focused on high-adoption use cases such as documentation, test generation, code review, and defect triage. Measure impact through time returned to core engineering activities. **Evidence:** **68%** of organizations report that engineers are overburdened with labor-intensive or non-core tasks.
- Engineering processes.** Embed AI into existing engineering gates, reviews, and release processes while strengthening traceability across requirements, design, software, testing, and field data. Prioritize the transition from sequential stage-gates to iterative development. **Evidence:** **60%** of organizations say delays are driven primarily by process inefficiencies rather than technology, while only **41%** have redesigned engineering workflows for iterative development at scale.
- Operating model.** Clarify decision rights between engineers and AI systems. Define accountability, align incentives, establish ownership structures, and provide reusable workflow patterns that teams can adopt consistently. **Evidence:** Only **43%** of executives say their organization is clearly redefining decision-making authority between engineers and agentic systems. Just **41%** have aligned incentives with AI adoption, while only **27%** provide approved, reusable workflow patterns.
- OEM–supplier relationship.** Standardize engineering deliverables in formats that can be consumed, validated, and acted upon by AI systems. Establish clear accountability for AI-influenced outputs across organizational boundaries. **Evidence:** Only **30%** of organizations have clearly defined responsibilities and boundaries for AI-influenced deliverables involving suppliers and partners.

- **Business model.** Treat validated agents, engineering data, and test assets as reusable strategic assets. Adapt business models to support continuous software delivery beyond vehicle launch. **Evidence:** 55% of organizations now design their architectures for updates after start of production, yet 64% say what they learn from vehicles in use informs the next program rather than the vehicles already on the road, and only 40% run an automated pipeline from vehicle data to deployment.
- **Ecosystem.** Participate in the development of standards governing AI-generated engineering artifacts, data exchange, validation, and verification. Ecosystem rules are being defined now and will shape future scalability. **Evidence:** Agents will increasingly operate across organizational boundaries, while only 10% of organizations (across all 800 executives surveyed; 5% among OEMs) describe their ecosystem as integrated, with shared development and lifecycle accountability.

Progress across these dimensions should be orchestrated through an enterprise transformation program, with executive sponsorship, cross-functional authority, named owners, and end-to-end measures of engineering value.

Figure 34.

Six dimensions on which AI changes automotive product development

1. Individual engineer efficiency Equip engineers with approved AI agents for high-value tasks, freeing up time for core engineering	2. Engineering processes (project and function) Redesign of development workflows, project milestones, and functional reviews	3. Operating model and organization Governance, team structure, division of responsibility between humans and agents
4. OEM – supplier relationship Contractual and technical risk-sharing, IP, co-development on shared platforms	5. Business model New services, data/IP monetization, shift from selling parts to selling platforms	6. Ecosystem structure Standards, regulation, and the redistribution of power across OEMs, Tier-1s, and silicon providers

Source: Capgemini Research Institute analysis.



Build an agentic control plane – put the controls on evidence, not only on access

By a control plane we mean the set of mechanisms that decide what an agent may do, record what it did, and verify what it produced. Trust determines how quickly engineers act on an agent's recommendations, and this is a key reason why clear governance mechanisms that enable trust act as a force multiplier on progress. Executives say that trust comes from proven accuracy and reliability across programs (**73%**), the ability to review and override agent decisions (**62%**), and ability to trace and explain how agents made decisions (**58%**).

The challenge is that most controls focus on restricting agents rather than proving their outputs can be trusted. While **69%** limit data access and **68%** require human approval for high-impact decisions, fewer provide evidence that decisions are sound. Only **41%** can trace the data, assumptions, and reasoning behind an outcome, **31%** use independent validation or fallback mechanisms, and just **22%** escalate issues based on impact.

Many organizations can constrain agent behavior, but far fewer can verify its results. Six mechanisms help bridge that gap.

73%

Executives say that trust in AI comes from proven accuracy and reliability

- **Classify tasks by criticality and set autonomy per class.** Safety- and homologation-relevant work gets decision support with named human sign-off; non-critical work can run within defined limits. **66%** already distinguish the two; the classification should be written down and enforced by the tooling, not left to individual teams.
- **Record provenance for every agent-influenced outcome:** the inputs, the model and its version, the instruction context, the assumptions made, and the person who accepted the result – captured automatically at the point of work, not reconstructed afterwards. This is the record that engineering review, safety cases and type approval will ask for, allowing those controls to become a routine part of delivery rather than a recurring source of uncertainty.
- **Separate authorship from verification.** The agent that produces an artifact never verifies it, verdicts come from qualified tools and tests, and a named engineer signs. ISO 26262 already requires this independence between those who build and those who confirm and it applies to agents as it applies to people.
- **Escalate on impact, not on model confidence.** Route a decision to people according to what it changes – a safety goal, a supplier contract, a release – rather than according to how sure the model reports itself to be. **22%** do this today.
- **Fix failures in the workflow, not in the post-mortem.** When an agent's output is wrong, change the workflow, the rules or the data that produced it (**36%** do), and keep a written rule for when an agentic workflow is scaled, stopped, or redesigned (**24%** have one).
- **Govern cost like any other engineering resource:** a model-usage and token budget per workflow, with the workflow owner accountable for it.

Together these mechanisms are what make autonomy auditable across vehicle program – the difference between agents that assist engineers and agents whose work can be accepted with confidence and adopted at scale. The control plane should be embedded within the broader transformation program, connecting governance with process redesign, change management, engineering architecture, validation, and value realization.



Make engineering data machine-interpretable, not just machine-readable

Engineering context is becoming a competitive asset. As AI agents take on more product development activities, from requirements analysis and software engineering to testing and validation, their usefulness depends on whether the data they read means the same thing in every system that holds it. The biggest barrier to deeper adoption is inconsistent data across lifecycle stages (**58%**), ranked ahead of toolchain integration (**43%**).

For example, when a safety engineer, battery engineer, and software team all refer to **"State of Charge"** or **"Available Torque,"** they should mean exactly the same thing across

every document, model, and tool. Otherwise, different teams may make design decisions based on different interpretations of the same term, leading to costly rework later in the program.

Organizations that consider their data **"ready"** encounter similar levels of value realization, agent adoption, and data-consistency challenges as those that do not. This is because traditional readiness assessments often do not determine whether the same engineering parameter, such as a torque limit, is defined and interpreted consistently across different tools. Without that consistency, agents spend more time searching, reconciling, and interpreting fragmented information, increasing cost while reducing accuracy and scalability.

Here are four practical steps, each with an existing standard or practice behind it:

Create a single definition of engineering quantities that cross tool boundaries. Inventory the engineering quantities that travel between requirements, simulation, test, and supplier tools, such as torque limits, state of charge, timing budgets, and safety levels, and fix the identifier, the unit and the definition of each in one place that every tool reads. A braking requirement such as "the vehicle must stop from

100 km/h within 38 meters" should be the same object, with the same unit, in the requirements tool, the simulation model, the test report, and the supplier specification.

- **Write requirements in a controlled form that can be checked as they are written.** This includes structured sentences, mandatory attributes, and acceptance criteria that a test can evaluate. Several OEMs already run such checks automatically and the practice is proven, while its coverage is not.
- **Validate data at every hand-over** with the exchange standards the industry already has and constraint rules on top of them, so that a file which parses correctly but contradicts its requirement is rejected before an agent reads it.

Make traceability mean consistency. A link between a requirement and a test is only useful if the two still agree. Check the links, not just their existence, and measure two things: the share of requirements with machine-checkable acceptance criteria, and the time engineers and agents spend reconciling information rather than using it.

Domain-specific models come after this work. Models grounded in an organization's own standards, methods, and validation records, and evaluated against engineering test sets before deployment, outperform generic models on automotive tasks; grounded in inconsistent data, they reproduce the inconsistency faster. The organizations that turn engineering knowledge into data an agent can act on without an engineer reconciling it first will out-scale those that keep generating output they cannot validate.



Manage the lifecycle on three KPIs

How fast an organization learns from its vehicles and acts on what it learns is now a competitive variable, and it can be measured. Three metrics capture it, and each should have an owner and a target.

The critical metrics are:

Feedback-to-decision time: The time taken to turn insights from testing, vehicle telemetry, customer feedback, or warranty data into an approved engineering decision

Decision-to-release time: The time taken to convert an approved engineering decision into a deployed software update, design change, or product release

Release-to-value time: The time taken for a released feature or improvement to deliver measurable business, customer, or operational benefits in the field

Baseline all three per program within a quarter, from data that already sits in issue-tracking, release, and telemetry systems, set targets per class of change, and connect requirements, test, and telemetry data so that the times are computed rather than estimated. Only **53%** have clear decision processes for which field insights require action – that is the first of the three to fix, because nothing downstream of an undecided insight can be fast.



Close the loop for vehicles in service, not only into the next program

Software-defined vehicles change the lifecycle from develop, launch, and replace to develop, deploy, learn, and improve – but only if what is learned reaches the vehicles on the road. In every other software industry a developer learns within days whether a change worked, because the change reaches the product. In automotive, that path exists at a few manufacturers.

Today it mostly does not. **64%** of OEM and supplier executives say insights from vehicles in use inform the next program rather than the existing fleet. Over-the-air updates for security (**84%**) and navigation (**78%**) are widespread, while updates that change driving functions reach **36%** of organizations and assisted or autonomous driving **30%**. Additionally, **65%** intend to decouple hardware and software lifecycles within 12–18 months, but only **41%** have rebuilt their engineering workflows at scale.

It's the process and delivery path where the real gap exists. Closing that gap requires five focused actions.

- **Decide which classes of change will be delivered over the air to vehicles in service, and by when** – content first, then performance and driving functions – and

design the validation and evidence chain each class needs before the first behavior-changing update ships.

- **Build the delivery path end-to-end.** One software mainline, staged rollout to a small cohort first, a rehearsed rollback, and a live record of which software sits behind each approval-relevant identifier, as UN R156 – the international regulation with legally binding framework for automakers to have a Software Update Management System – requires.
- **Automate the feedback pipeline** from vehicle data through insight and validation to deployment; **40%** have one today.
- **Give field learning a place in the current fleet's backlog**, with an owner and a cadence. Only **35%** have governed or fully embedded feedback capture, rather than only in the next program's requirements.
- **Decouple the two lifecycles at the interface.** Define the hardware–software interfaces, resource budgets, and safety assumptions as versioned contracts that both sides test against, so that hardware can change under the software, and software on top of the hardware, without re-opening the other.

The measure that matters is simple: the share of what is learned from vehicles in use that reaches vehicles in use.



Conclusion

AI is becoming a meaningful source of engineering advantage in automotive product development. What separates the leaders is rarely the AI itself. The real difference lies in the environment around it: strong engineering practices, reliable data, clear governance, and operating models that help teams apply AI consistently. When those foundations are in place, AI becomes far more effective and delivers measurable impact.

The industry's next challenge is scaling value. Many organizations have made progress with AI adoption, yet fewer have connected engineering data, decisions, and workflows in ways that allow AI to drive enterprise-wide impact. As vehicles become increasingly software-defined and engineering complexity continues to grow, competitive advantage will depend on how effectively organizations convert information into action and learning into continuous improvement.

For automotive leaders, the priority is to establish the foundations that support speed, trust, and adaptability at scale: connected engineering knowledge, modernized development processes, clear accountability, and closed-loop feedback mechanisms. Organizations that succeed will be better positioned to accelerate innovation, improve engineering effectiveness, respond faster to changing conditions, and continuously enhance products and capabilities throughout their lifecycle.

Research methodology

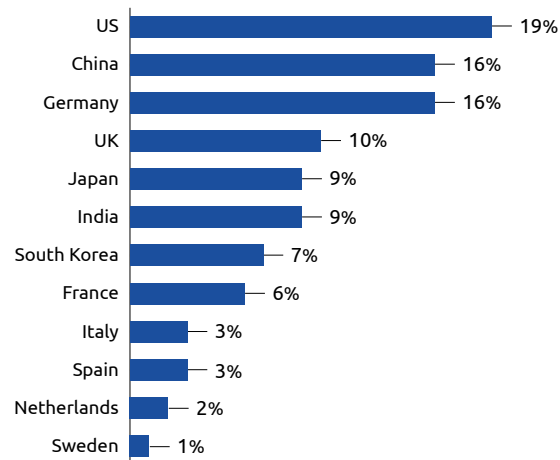
In July 2026, we conducted a global survey of 800 senior executives from the automotive industry, comprising 400 automotive OEMs, 160 tier-1 suppliers, and 240 technology providers. Respondents represented organizations across North America, Europe, and Asia-Pacific, and included leaders from product development, engineering, technology, data and AI strategy, and related functions. The research examined the adoption of AI, generative AI (Gen AI), and agentic AI across the automotive product-development lifecycle.

The survey findings were complemented by 24 in-depth interviews with automotive executives and industry experts to provide practical perspectives and contextualize the quantitative results. The distribution of survey respondents

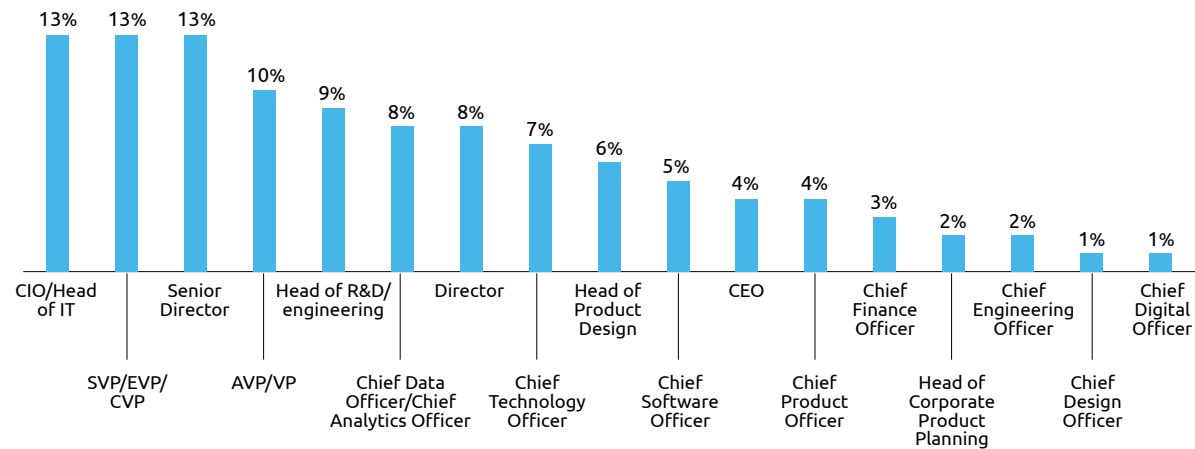
is presented in the following figures. Percentages are shares of the executives surveyed; where the text says “organizations”, it refers to the organizations those executives describe. Unless stated otherwise, engineering-practice questions are reported on the OEM and tier-1 supplier base (N = 560); ecosystem and sovereignty questions asked of all respondents are reported on N = 800.

The study findings reflect the views of the interviewees and survey respondents and is intended to provide high-level guidance. Please contact one of the Capgemini experts listed at the end of the report to discuss specific implications for your organization. This report contains AI-assisted content that has been reviewed, validated, and edited by human authors.

Executives by location

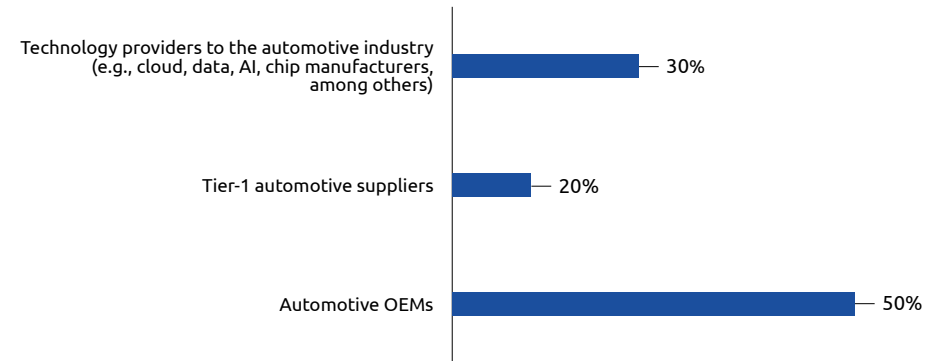


Executives by job title/role



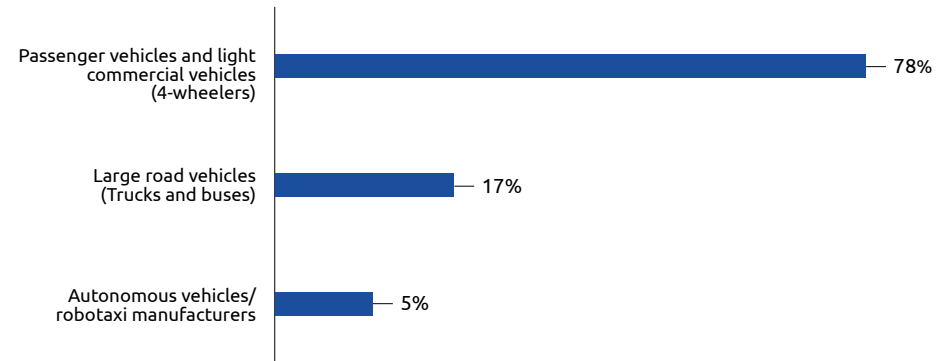
Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs, 160 executives from tier-1 suppliers and N = 240 executives from technology providers.

Organizations by type



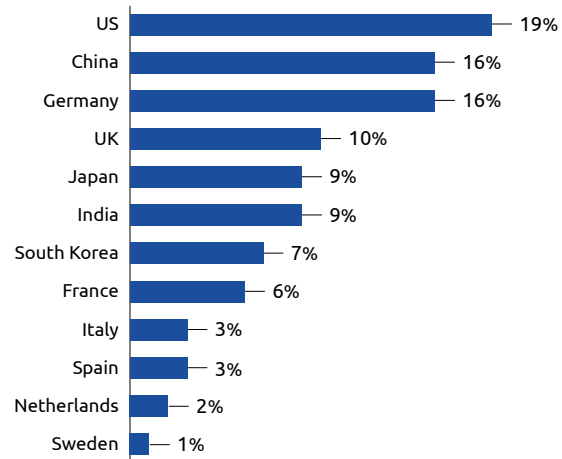
Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs, 160 executives from tier-1 suppliers and N = 240 executives from technology providers.

OEMs by type

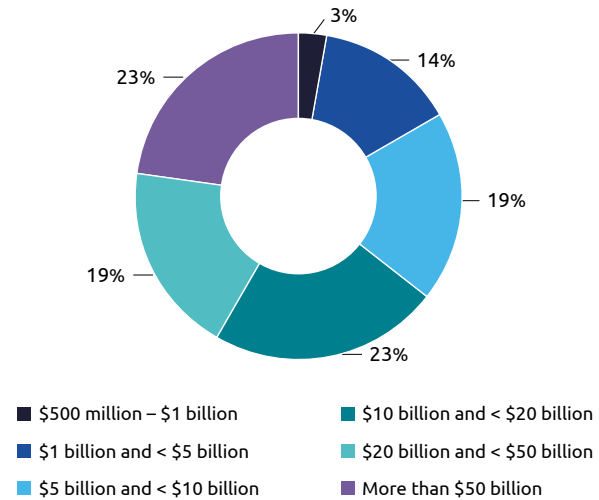


Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs.

Organizations by location of headquarters



Organizations by annual revenue



Source: Capgemini Research Institute, AI in automotive product development, July 2026, N = 400 executives from automotive OEMs, 160 executives from tier-1 suppliers and N = 240 executives from technology providers.

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With more than 25 years of experience in the automotive industry, Laurence Noël combines deep expertise in business, operations, strategy and engineering. A former senior executive at Stellantis and PSA, she has managed global businesses and operations, with deep knowledge of European and Asian automotive markets. Her focus today is on the major forces reshaping the industry, from AI and software-defined vehicles to engineering transformation and intelligent operations. She also holds board positions across the automotive, mobility and higher education ecosystems.



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The authors would like to thank the following for their contributions to the research: Claudia Hytrek, Mahtab Majd, Holger Cermann, Mikhail Bykov, Udo Lange, Oliver Straub, Michael Tenschert, Vlad Shymov, Andy Vickers, René Piper, Craig Suckling, Jean-Marie Lapeyre, Anuraag Bharadwaj, Baljeet Yadav, Christoph Bornschein, Daniela Rittmeier, Matthieu Lebas, Sergey Patsko, Mark Roberts, Laura Ferrer Montiel, Estelle Noel, Steffen Krause, Zenyk Matchyshyn, Michael Welsh, Bastian Renz, John Sparrefors, Mikhail Kazakov, Toni Sullivan, Julian Fowler, Virginie Toussaint, Asma Shaikh, Rémi Cassar, Markus Winkler, Wael Yahyaoui, Janet Smith, Laura Immonen Beatty, Elisabeth Gill, Florence Lievre, Saheli Chakraborty, Dominique Banon, Sonali Abhishek Malekar, Manish Saha, Aparajita Paul, Vibha Palekar, Amitabha Dutta, Suparna Banerjee, Subhadra Chakraborty, Madan Dhar and Punam Chavan.

The authors would also like to thank all the industry executives for their contributions to the research.

About the Capgemini Research Institute

The Capgemini Research Institute is Capgemini's in-house think tank on all things digital. The Institute publishes research on the impact of digital technologies on large traditional businesses. The team draws on the worldwide network of Capgemini experts and works closely with academic and technology partners. The Institute has dedicated research centers in India, Singapore, the United Kingdom, and the United States. The Institute was ranked #1 in the world for the quality of its research by independent analysts for six consecutive times - an industry first.

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Appendix

Our offerings: how Capgemini can help

The findings of this report point to one conclusion. The constraint in automotive product development is no longer producing engineering work; it is proving, accepting and delivering it. Agents can generate requirements, code, test cases and analyses faster than organizations can validate them, decide on them and ship them. The challenge is therefore not simply to increase engineering productivity, but to turn AI-generated work into trusted outcomes at scale. Capgemini's offerings for the automotive industry address this constraint by helping OEMs and suppliers establish the software foundation for continuous vehicle evolution, accelerate decision-making across the engineering lifecycle, and make AI-produced work admissible where safety, compliance and homologation demand evidence.

Software-driven mobility

As vehicles evolve from products largely finished at start of production into software platforms that continue to learn, automotive organizations need to develop, validate, deploy and operate software at scale. Our Software-Driven Mobility offering supports this shift through three moves, in the sequence in which clients tend to need them:

- **Enable - Developer experience. Modern, cloud-native SDV toolchains** provide the foundation for AI-agentic development within an open and sovereign ecosystem. Virtual targets and simulation-led validation, continuous integration and delivery from mainline to vehicle, and system integration across OEM, tier-1 and silicon partners help shorten development cycles and improve software quality. This is where the productivity gains described in Chapters 1 and 2 can be realized, and where agent adoption is already highest.
- **Scale - Software-defined vehicle. The software platform** extends across the vehicle, its services and its lifecycle after launch. Over-the-air delivery, fleet-state management and closed-loop feedback from vehicles in use enable vehicles to improve continuously and allow organizations to translate field insight into faster software validation and deployment. This helps close the gap between collecting field data (81%) and returning

it to vehicles on the road, rather than only to the next programme (64%).

- **Transform - Agentic AI and the ecosystem. The operating model** enables an automotive company to work at software speed and collaborate effectively across the ecosystem. It combines clear decision rights between engineers and agents, governance embedded as an engineering capability rather than treated only as a compliance function, reskilled roles, new business models, and ecosystem contracts that separate hardware and software deliverables. This is where the control-plane findings of Chapter 3 are addressed.

AI-augmented lifecycle engineering

Most clients do not lack systems; they lack decision acceleration. Engineering data sits in PLM, CAD, simulation, ALM, ERP and knowledge repositories that were bought and integrated over decades. Yet development time is often lost in the gap between data, insight, decision and execution. Our engineering transformation engagements therefore layer AI- and agent-enabled intelligence on top of clients' existing systems rather than replacing them. They connect lifecycle context, accelerate decisions and amplify engineering expertise through the same three moves as Software-Driven Mobility:

- **Enable - the decision layer over the digital thread. We diagnose where decision-making is slowest**, including engineering changes, validation, BOM readiness, supplier coordination and field-issue resolution. We map the data, systems and workflow bottlenecks beneath each and design a focused decision-support layer that organizes lifecycle context and gives engineers and agents the same view of it. Work starts with one or two high-value use cases and demonstrates impact on cycle time and engineering overhead before expanding further.
- **Scale - engineer amplification with agents. Targeted agents automate routine coordination, produce decision-ready insight and are embedded in live engineering workflows.** An AI mesh of cooperating agents supports insight and orchestration without creating hundreds of disconnected assistants. Reusable agents, approved workflow patterns and a shared engineering workspace provide the supporting foundation for initial use cases to develop into a capability that can scale across programmes.
- **Transform - lifecycle continuity and closed-loop learning. The broader operating model** raises throughput, strengthens cross-functional execution and frees engineers to focus on judgment, trade-offs and innovation. It combines a human interaction and decision layer, clear decision rights and escalation rules

between engineers and agents, and a feedback loop that carries learning from vehicles in use back into engineering decisions for the current fleet, not only the next programme.

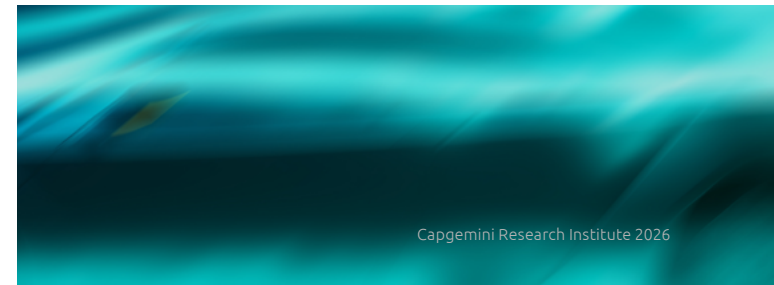
Underneath sit three structural layers: the client's existing domain systems, the AI mesh and the human decision layer. Together, they connect engineering context, agent-enabled insight and human judgment while reducing coordination overhead and enabling continuous learning. Progress is measured through the metrics proposed in this report: feedback-to-decision time, decision-to-release time and release-to-value time.

Making agent output admissible: the Automotive Agent Harness

Many organizations can generate outputs with AI. Far fewer can demonstrate how those outputs were created, validated and approved. Only 55% of executives believe AI can strengthen traceability across requirements, design, development, testing and compliance evidence, and only 41% ensure the data, assumptions and rationale behind agent-influenced outcomes can be traced. That is the gap between agentic productivity and agentic admissibility, and it is the one we are investing in. The Automotive Agent Harness establishes the governance, traceability and evidence

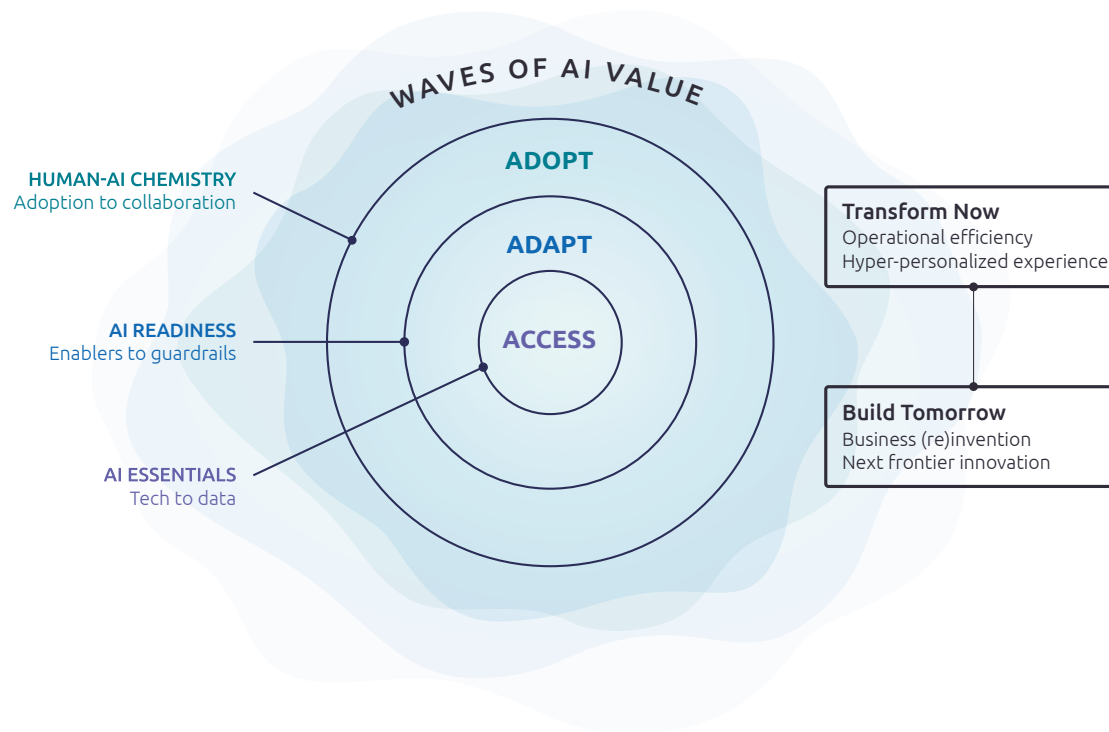
framework required to use AI in regulated engineering environments. It surrounds engineering agents with the specification they build against, held as typed, machine-checkable objects; independent, machine-issued verdicts on what they produce; and provenance showing which model and context were used and who accepted the outcome. Recorded as a build artefact rather than a form, this evidence can be read by an engineering review, a safety case or a type-approval authority, whether the work was done by an engineer, an agent or both.

Where to start. Most clients begin with a focused diagnostic: measure where decisions are slowest and where hardware and software still couple; assess whether the specification estate is machine-interpretable; and select one component or workflow where a governed agent can prove itself against a real acceptance path. This creates a pragmatic starting point that demonstrates measurable impact while building the foundations for scale. From there, the three offerings advance together - the software platform, the decision layer and the harness - because, as the survey shows, none of them scales alone.



Resonance AI Framework by Capgemini

The Resonance AI Framework by Capgemini provides a sequential approach to the successful conceptualization, structuring, and implementation of AI-driven transformation. It helps business leaders realize AI's potential and achieve market leadership, regardless of the industry. Anchored in transformation strategy, the framework helps integrate operations and culture while accelerating AI value creation – to both transform today and build for tomorrow.



AI essentials

To access the transformative power of AI, organizations must establish 'Intelligence-as-a-Service.' That includes scalable and robust enterprise data foundations combined with advanced language and vision models, and applications with built-in AI capabilities. These provide the foundation to build, operate, and scale AI with real, enterprise-specific impact.

AI-readiness

Adapting AI to organizational context requires the right enablers and guardrails to secure, govern, customize, and operationalize AI. Success hinges on the ability to empower an organization to scale AI while ensuring secure, ethical, and aligned organizational AI capabilities deployed on trusted data foundations and managed as business resources.

Human-AI chemistry

Organizations adopt hybrid forms of collaboration by designing the clear roles and intuitive interactions that enable seamless collaboration between humans and AI. This mutual reliability and collaboration defines 'human-AI chemistry' – the new alchemy of innovation and the defining success factor in your AI journey.

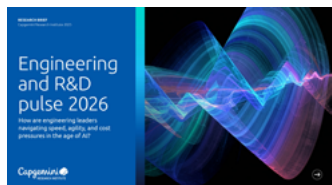
Waves of value

With the technological, governance, and collaborative foundations in place, AI value creation is poised for acceleration across an organization, ready to deliver the operational efficiency, personalized experiences, business reinvention, and next-frontier innovation that enable an organization to transform today and build for tomorrow.

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About Capgemini

Capgemini is the business transformation partner for enterprises in the age of AI. We help organizations imagine and build an intelligent, sustainable future, combining AI, technology and human ingenuity to transform how they operate, innovate and grow. With unique end-to-end capabilities spanning strategy, technology, engineering and intelligent operations, we bring together deep industry expertise and market-leading capabilities in AI, cloud and data to turn ambition into measurable business outcomes at scale. Supported by a robust ecosystem of partners and nearly 60 years of expertise, Capgemini is a responsible and diverse global organization of over 410,000 team members in more than 50 countries. The Group reported 2025 revenues of €22.5 billion.

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