

# How can AI unlock value for industrials?

Five ways for industrial companies to use AI to unlock real value, now and in the future.



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The EY logo, consisting of the letters 'EY' in a bold, white, sans-serif font. A yellow triangle is positioned above the 'Y'.

Building a better  
working world



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**1** Generative AI is spurring a manufacturing renaissance, enabling new capabilities and elevating previous uses of AI.

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**2**

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AI deployment has been hindered by a focus on point solutions and misalignment between expectations and incentives.

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**3**

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Five initiatives, which require immediate and longer-term actions, can help companies become AI ready and can build on successful pilots across the organization.

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Artificial intelligence (AI) is much more than a “buzz phrase” and is set to have a deep and wide impact across industrial sectors. While industrial companies already are using traditional AI approaches such as machine learning (ML) in operations technology (OT) point solutions, the rapid adoption of generative AI (GenAI) has raised awareness of AI’s capabilities and potential to transform and disrupt.

A few numbers indicate the progress and pace of change:

- ▶ Forty-nine percent of advanced manufacturing and mobility companies have fully integrated AI-driven product or service changes into their capital allocation process and are actively investing in AI-driven innovation.<sup>1</sup>
- ▶ In the next 12 months, 41% will follow, leaving only 10% that do not plan to do so.
- ▶ By 2030, 96% of companies are expected to increase manufacturing AI investment.<sup>2</sup>
- ▶ Beyond 2030, 59% of industrial leaders see AI as significant or game-changing for the future of manufacturing.

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1. EY Global Outlook on AI strategy, 24 October 2023.

2. Manufacturing in 2030 Project – The Manufacturing Leadership Council, 31 October 2022.

# AI deployment is hampered by a complex set of challenges

Despite the imperative to move fast, industrial leaders are often held back by uncertainty and constraints. In particular, industrial companies face challenges across four key dimensions: supply chain, strategy, people and information technology (IT).



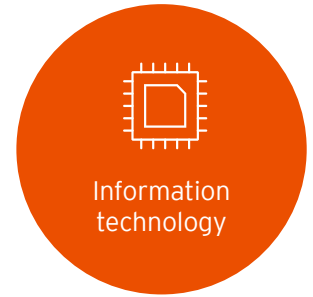
Supply chain and operations



Strategy, innovation and growth



People, organization and change



Information technology

AI needs data and cooperation channels

AI needs C-suite advocacy and accountability

AI needs people – the right people

AI needs infrastructure and enablement

- ▶ **Misalignment of supply chains** has led to complex and ineffective digital infrastructure and tools.
- ▶ Low coordination has caused in-existent or unstructured data to develop **AI compatible data aggregator platforms**.
- ▶ Lack of **real actionable data** to improve supply chain visibility, collaboration and resiliency.
- ▶ Complex supply chains are challenging to **map, monitor and manage**.
- ▶ Inaccurate **demand forecasting and inventory management systems** have prevented companies from being proactive rather than reactive.

- ▶ To compete in a technologically advanced environment, manufacturers need to **avoid stagnant business models and processes**.
- ▶ Rigid operations impact the critical changes necessary for **AI integration into business models**.
- ▶ Without strategic orchestration of AI initiatives, **point solutions may be disjointed and misaligned**.
- ▶ There is **uncertainty around the cost implications and ROI impact of AI**.
- ▶ Companies are missing the core **capabilities to innovate and grow in the AI space**.

- ▶ **Insufficient access to talent** due to high cross-sector demand and undefined career paths for technologists.
- ▶ Proprietary tools and on-site skills gained aligned to a specific industry have created a **specialization gap** vs. the current technology workforce.
- ▶ Mismatch between the **skills needed in the future** and the current industrial workforce.
- ▶ Ineffective knowledge management, upskilling and training programs in place that **align to strategic business initiatives**.
- ▶ Uncertainty around which **skills to target, timing and potential operational impacts**.

- ▶ **Insufficient resource allocation and commitment from the C-suite** can hinder AI investment and implementation.
- ▶ Operations focused legacy silos and incentive structures limit IT's ability to grow beyond its traditional role to **support new technology integration**.
- ▶ Budgets allocated to CAPEX projects with clear ROIs vs. IT investments with **less transparent costs and benefits**, such as AI and required infrastructure.
- ▶ **Operational KPIs are often prioritized** over foundational IT KPIs, which can impact the enablement of AI initiatives.
- ▶ IT departments in the sector often have **under resourced** small teams to deliver **against high expectations** or large teams with legacy skills.

Source: EY.ai AI Maturity Model.

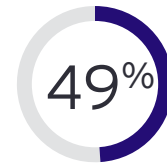
Twenty-nine percent of advanced manufacturing CEOs consider adapting supply chains for better resiliency as one of the most important strategic actions for their company in the next six months, according to the [EY CEO Outlook Survey 2023](#). However, 32% say they've delayed their supply chain plans amidst the changing geopolitical landscape. Almost half (49%) of industrial products CEOs are adjusting supply chains through supplier diversification, inventory build-up, technology investment, enhanced collaborations and relocating production closer to home.

Around 45% of advanced manufacturing CEOs surveyed believe AI is a force for good that can have a positive impact on business efficiency and innovation. Over 60% of manufacturing leaders are prioritizing enhancing technology capabilities, sustainability integration, and introducing new products and services in their capital allocation strategy. And 57% of manufacturing leaders are investing in organic growth initiatives and M&A to improve technology and expand their product and service offerings.

Industrial companies' AI ambitions risk being stalled by a lack of suitable technology talent. In response, 27% of advanced manufacturing CEOs say one of their top strategic priorities over the next six months is to [adopt new working models and talent strategies to attract and retain employees](#). For a quarter (26%) of manufacturing companies, scarcity and cost of talent with the right skill sets to accelerate growth, are the greatest risks to their business growth. This explains why 35% of advanced manufacturing companies plan to boost investment in talent including workforce wellbeing and skills development.

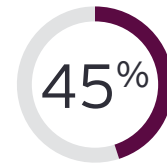
A separate survey by the Manufacturing Leadership Council found that 65% of manufacturing leaders see [data issues – notably access, format, integration, privacy and governance](#) – as the main challenge for AI adoption in their companies. Forty-six percent of advanced manufacturing CEOs believe tech and digital disruption, including cyber risk, poses the greatest risk to business performance over the next 12 months. To close this gap, 70% of advanced manufacturing CEOs intend to increase capital investment in data, technology and cybersecurity.

### Supply chain prioritization



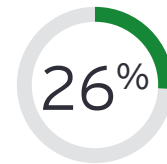
of leaders want to improve their supply chain via tech investment, supplier diversification and relocating production.

### AI as a force for good



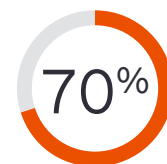
of manufacturing leaders see AI as a key driver for business efficiency and innovation.

### Talent's impact on growth



of companies consider scarcity and cost of talent with the right skill sets to accelerate growth as the greatest risk to the growth of their business.

### Capital expenditure



of manufacturing leaders are looking to increase their capital investment in data, technology and cybersecurity.

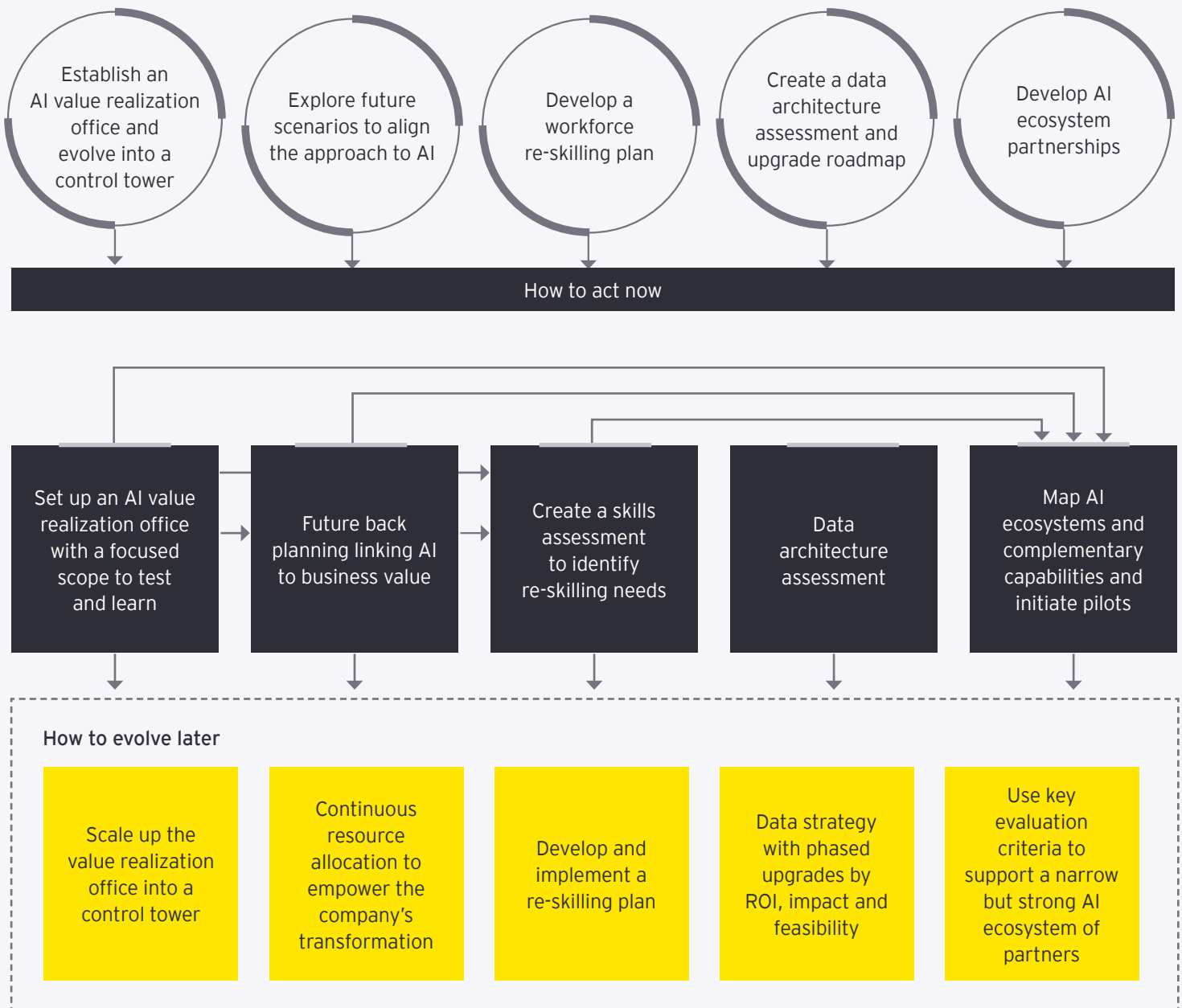


# Five initiatives industrial leaders can action to embed AI potential

Despite uncertainty, industrial leaders can take steps today to ensure their companies are AI-ready. We have identified **five cross-sector initiatives** that address the challenges to AI deployment and differentiate between how companies can “act now” versus “evolve later.”

The pace of technological development calls for a two-speed approach to these initiatives. The “act now” recommendations require minimal investment, cause minimal disruption, are modular, and should show tangible results in the short term. As the wins compound and achieve momentum, “act now” recommendations grow into “evolve later” suggestions. These forward-looking suggestions require top-down strategic orchestration and capital allocation to create a sustainable flywheel for AI initiatives to grow.

These five key initiatives will help guide AI deployment toward being strategically aligned, operationally purposeful and commercially viable:



# 01

## Establish an AI value realization office and evolve into a control tower

Industrial companies should form a unit that streamlines experimentation and resources around AI and ties it to business outcomes. The value realization office coordinates knowledge sharing and shapes governance, but its primary goal is to realize benefits, conduct project and risk management, and optimize resources.

The value realization office can start with a smaller scope, but to extract maximum value from AI initiatives across the enterprise, it must evolve into a **fully-fledged “control tower.”** The control tower is a C-suite business unit, tasked with AI strategy and steering cross-organizational initiatives. It has the authority to allocate capital and coordinate resources across different business functions.

### Act now: Set up an AI value realization office with a focused scope and C-suite accountability to test and learn

One way to experiment with AI is to create a value realization office via a simple project management office within a single business unit. This should involve stakeholders with different specializations, with C-suite support, focused on high priority or quick-win projects, and actively analyzing and adapting governance practices to new business requirements. Leveraging easier-to-use technologies like GenAI and low-code or no-code can lower technical barriers to experimentation, enabling nontechnical people to participate earlier. All of which increases buy-in, develops expertise, improves agility and enables activities that create value.

### Evolve later: Scale up the value realization office into a control tower

As the value realization office grows in credibility and scope, companies can increase its autonomy and responsibility to scale

up AI deployment with increasing C-suite oversight. It should evolve into a control tower, with formal positions, governance and resources to orchestrate projects companywide. The control tower would also orchestrate re-skilling needs, data infrastructure upgrades and ecosystem strategies.

### Case study: EY teams helped establish a new technology scale-up to support software development for an automotive company

EY teams helped a leading automotive organization establish a progressive and aggressive technology scale-up company in three months, while simultaneously and seamlessly integrating with an emerging joint venture (JV), with different cultural and governance backgrounds.

EY professionals coordinated multiple workstreams (IT, governance, legal, HR, sales and marketing, finance etc.), in the development of an operating model and business plan, provided operative support in the workstreams and took on interim roles in the senior management team such as CIO, CTO and CHRO. As a result, EY professionals helped create a software development function from the ground up with operating model, tools, frameworks and new ways of working.

The company now has a deep knowledge and network within the mobility sector, providing customized insights that guide strategic direction and master plans - including the project management office (PMO) engine.

# 02

## Explore future scenarios to align the approach to AI

There is no shortage of potential use cases for AI, but organizations often struggle to align these use cases with overall strategy and vision.

By identifying scenarios for potential AI impacts and benefits, industrial companies can more efficiently allocate resources and prioritize initiatives.

### Act now: Use future-back planning linking AI to business value

To develop focused initiatives aligned with an overall AI vision, industrial companies should begin with future-back planning, to identify the potential impact of AI on the business and the sector. Future scenarios should consider regulatory,

macroeconomic, supply chain and resource constraints, and link AI activities to business value.

### Evolve later: Allocate resources continuously to empower the company's transformation across dimensions

To transition the value realization office into a control tower, link the top-down scenario planning and capital allocation with bottom-up learnings and activities. Scenarios can also inform which skills are needed for re-skilling plans, data requirements for data architecture upgrades, and which competency white spaces exist for ecosystem strategies.

### Case study: How AI predicted market adoption of advanced driver assistance systems and connected vehicles

EY teams helped a US Department agency to develop a bottom-up quantitative model to predict market adoption of advanced driver assistance systems and connected vehicles. The model was based on qualitative assessment of technical, production, supply chain, maintenance and regulatory factors.

The complex market forecasting models can process granular inputs and apply ML techniques to forecast market penetration. With a powerful visualization tool, users can build and assess different technical, production, supply chain and regulatory scenarios, and derive insights to guide business planning.

# 03

## Develop a workforce re-skilling plan

AI is widely anticipated to have a sweeping impact on work and talent, as its rapidly advancing capabilities allow it to perform a wider variety of work with increasing ease and sophistication.

GenAI, in particular, can produce creative and analytical output like code, emails, images, slide decks – as well as taking over “blue collar” or “new collar” jobs in production. AI-enabled industrial robots are widening their roles by improving skills such as object recognition, learning and coordination, enabling them to play an increased role. GenAI could make factories more adaptive and efficient, by enhancing their ability to reduce unplanned downtime, enhancing forecasts.

The expanding role of AI will require workers to re-skill, both to gain proficiency with using it and to enhance competencies that will become more valuable in the era of GenAI, such as quality assurance, content integration or customer engagement.

### Act now: Create a skills assessment to identify re-skilling needs

Begin by assessing what tasks AI is likely to take on and what competencies are required for workers, especially for blue collar work, where the impact of GenAI has been less explored.

### Evolve later: Develop and implement a re-skilling plan

Organizations should strive to create a continuous learning culture to enable them to adapt to constantly changing skills needs. Incentives can play an important role, linking re-skilling to career advancement and financial compensation. And, by identifying and encouraging pockets of innovation, companies can keep talented employees engaged and attract new talent with in-demand skill sets.

### Case study: Mercedes-Benz invests in an AI re-skilling program to upskill its employees

As the automotive industry becomes increasingly digital and more reliant on AI, upgrading employees' digital skills is crucial. Mercedes-Benz plans to invest more than US\$2.2 billion by 2030 to train employees as data and AI specialists. Their “Turn2Lean” initiative's two pilot programs are training over 600 employees in production, production-related and administrative roles in digitalization and AI, with 'graduates' of the program awarded certificates.<sup>3</sup>

3. Mercedes-Benz invests over \$2.2B in AI re-skilling, *Automotive Dive*, 1 Aug 2023.



# 04

## Create a data architecture assessment and upgrade roadmap

Industrial companies have traditionally deployed OT focused point solutions without a cohesive data strategy but having the right data architecture is critical for the effective deployment of AI across an organization. The challenge is compounded by the different kinds of data used by traditional AI (structured data) and GenAI (which excels at working with unstructured data). To use GenAI across the workforce, large language models (LLMs) should be trained on operating procedures and best practices – building a “knowledge graph” for the organization. But much of this information often resides only in the minds of employees, and may not be formally codified, much less stored in digital form.

### Act now: Conduct a data architecture assessment

The data architecture should be evaluated to identify process design, dependencies, and data quality and security. Appropriate benchmarks can provide a performance baseline

and support future AI business cases. Map the potential system upgrade scenarios by pairing phased upgrades with the potential ROI of corresponding use cases. Governance should be reviewed and strengthened, to cover legacy risks (such as data privacy, bias and cybersecurity), as well as new risks created by new AI use cases.

### Evolve later: Execute a data strategy with phased upgrades by ROI, impact and feasibility

After the infrastructure is mapped, companies need a strategy to collect, store and manage the data needed for AI applications. The first step is to identify and implement processes for boosting data quality. Secondly, they can adopt an ROI-driven, phased approach to capture data and introduce new use cases. Explore opportunities for new data acquisition, including “synthetic” data as needed to compensate for the lack of historical data for AI model testing and deployment.

### Case study: EY teams helped deliver AI solutions for a large industrial products company

EY teams advised a large industrial products company on how to manage data science initiatives and build a technical team skilled in Azure Data Services, Python and Databricks programming, to help develop bespoke AI models. EY teams collaborated with the client’s subject experts, business analysts, data architects, data engineers and data scientists to design, model and help deliver AI solutions. A range of models were designed for demand forecasting, financial forecasting, customer health scoring and manufacturing risk to improve business efficiency and customer mapping.

# 05

## Develop AI ecosystem partnerships

Industrial companies are used to managing complex supply chain partner ecosystems. For both supply chain and AI partnerships, it's important to vet partners, set performance standards and manage partnership costs.

However, AI partnerships bring greater complexity and depth of integration because AI solutions need to connect to central systems, be adaptable and managed over time. Each partner adds to the integration and management costs, impacting on the orchestration of the technology stack. Underperforming AI partners can cause greater harm than traditional supply chain partners.

### Act now: Map AI ecosystems and complementary capabilities and initiate pilots





When choosing partners for AI projects, companies should compare their AI capabilities, maturity and ecosystems against emerging best practices. Partners and ecosystems with complementary capabilities and experience can augment gaps in skills, technology and implementation. However, new partner and ecosystem relationships also require new governance. By establishing early partnerships with multiple entities, and identifying small pilot project opportunities, companies can build experience ahead of larger AI projects.

### Evolve later: Use key evaluation criteria to support a narrow but strong AI ecosystem of partners

As the AI partner ecosystem evolves, it is essential to establish key criteria to evaluate the ecosystem relationships. This helps to select and develop relationships with priority partners and act decisively to remove unnecessary partners that fail to deliver value or adapt to future needs. As the ecosystem evolves, so should the function, governance, and best practices playbook.



## Impact of the five initiatives to address key challenges for industrial companies

Dimension	Challenge	AI value realization office	Future organizational scenarios	Workforce re-skilling plan	Data assessment and roadmap	AI ecosystem partnerships
 Supply chain	Misalignment of supply chains	✓	✓	✓	✓	✓
	Low coordination leads to poor data quality	✓	✓	✓	✓	✓
	Lack of real actionable data	✓	✓	✓	✓	✓
	Difficult to map, monitor, and manage	✓	✓	✓	✓	✓
	Inaccurate demand and inventory management	✓	✓	✓	✓	✓
 Strategy	Stagnant business models	✓	✓	✓	✓	✓
	Rigid operations	✓	✓	✓	✓	✓
	Lack of strategic orchestration	✓	✓	✓	✓	✓
	Opaque ROI vs impact	✓	✓	✓	✓	✓
	Lack of capabilities to innovate	✓	✓	✓	✓	✓
 People	Insufficient access to specialized talent	✓	✓	✓	✓	✓
	On-site skills vs. the current tech workforce skills	✓	✓	✓	✓	✓
	Mismatch in skills needed in industrial workforce	✓	✓	✓	✓	✓
	Ineffective knowledge management and upskilling	✓	✓	✓	✓	✓
	Uncertainty on which skills to target	✓	✓	✓	✓	✓
 IT	Insufficient commitment from the C-suite	✓	✓	✓	✓	✓
	Legacy silos and incentive structures	✓	✓	✓	✓	✓
	Lower capital availability for IT investments	✓	✓	✓	✓	✓
	Operational KPIs prioritized over IT KPIs	✓	✓	✓	✓	✓
	IT teams unable to deliver against high targets	✓	✓	✓	✓	✓

● Low impact    
 ● Medium impact    
 ● Transformative impact

Source: EY analysis, December 2023.

## Key considerations for industrial companies when deploying AI

Manufacturing companies have always been led by OT. AI won't reverse that trend but will support a deeper IT/OT convergence. Business-driven point solutions are likely to grow in number and require the standardization and interoperability of OT data. Industrial companies should then recognize the need for a mature data architecture, to justify IT investments, and ensure AI brings value sustainably and safely. AI is enabled by technology but should be led by business.

Many of the benefits AI can bring to industrial companies come from the foundational work that needs to happen inside companies pre deployment: It's not solely a technology upgrade, it's also an organizational and cultural upgrade.

The supply chain has existed for centuries and has always leveraged new technologies to adapt and improve. Today, supply chains that are more resilient, more cost-effective and more predictable are AI-enabled supply chains.

Some see AI as a buzz phrase, but it's worth remembering that AI isn't a switch, it's a journey.

## Summary

Industrial manufacturing companies are integrating AI into their operations to harness its transformative and disruptive potential. However, AI deployment also brings complex challenges, particularly regarding supply chain, strategy, people and IT.

These five initiatives can help guide companies toward more strategically aligned, operationally purposeful and commercially viable AI deployments. These initiatives include establishing a value realization office, aligning AI strategy with future scenarios, developing a workforce re-skilling plan, creating a roadmap to upgrade data architecture, and curating AI ecosystem partnerships.



## Key SMRs

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Urbanization, changing consumer expectations and emerging digital technologies are reshaping what's possible, from the production and distribution of goods to the transportation of people. To succeed in this new world of mobility and smart manufacturing, incumbents must transform themselves at unprecedented speed – to think like an innovative start-up, tap into new talent and engage the customer. With experience across the value chain and key technology alliances, our teams show clients how to create efficiencies now while adopting digitization and optionality for long term growth. Automotive, transportation, aerospace, defense, chemicals and industrial products companies can draw on the strength of our network of cross-industry players and put our diverse range of approaches to use today to equip their businesses for tomorrow.

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