



Getting a head start with generative AI in industrial manufacturing

Industrial manufacturers are ready to apply the new technology broadly to help speed the transition from traditional to “smart” industrials



Introduction

Generative artificial intelligence (AI) has enormous potential in manufacturing—to transform many routine tasks, such as production scheduling—and to speed the transition to “smart industrial” enterprises. These smart industrials are traditional manufacturing companies that not only use data and intelligent machinery on the factory floor, but also have developed smart products, built new business models (such as as-a-service) that rely on digital platforms, and are using technology to connect with customers, suppliers, and employees in new ways.

Our new research into how executives across industries expect to use generative AI is based on findings from an exclusive KPMG survey conducted in March 2023 of 300 global executives across a wide range of industries. (Where relevant, we compare the results with findings from our follow-up survey of 200 US executives three months later.) This research shows that leaders in industrial manufacturing lag their peers in intention to adopt the new technology. In this paper, we go deep into executive expectations, the barriers to adoption, and ways industrial manufacturers can get a quick start in generative AI and gain first-mover advantage.



Industrial manufacturers are laying a new foundation with generative AI

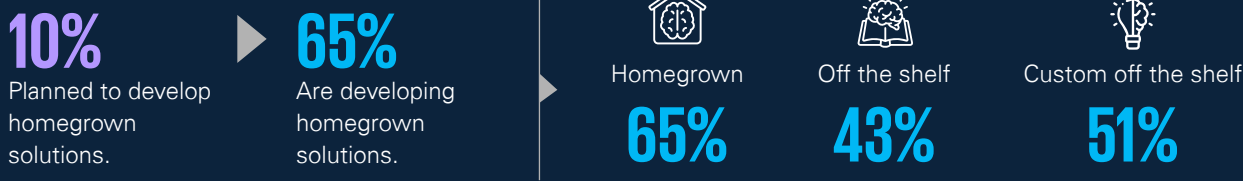
Industrial manufacturing executives are embracing homegrown solutions...

Respondents see generative AI as a game-changer:

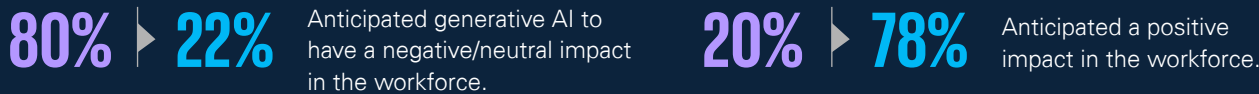
In June, **78%** of IM executives selected generative AI as the top emerging technology (compared to **67%** in March).



IM executives are rapidly developing homegrown solutions:

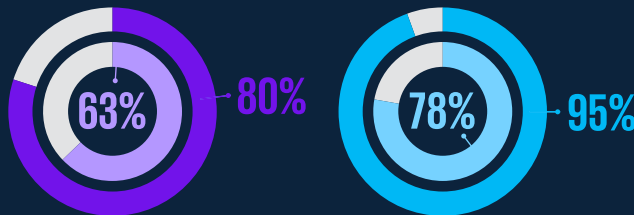


IM executives see generative AI as a workforce positive:



Executives believe generative AI will boost productivity and creativity:

In March, industrial manufacturing leaders identified increasing productivity (80 percent) and changing the way people work (63 percent) as positive impacts of generative AI.

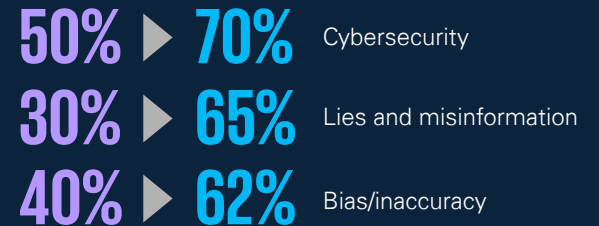


In June, 95 percent agreed that generative AI will enhance employees' creativity and thoughtfulness, and 78 percent believe that the technology will reduce burnout and improve productivity.

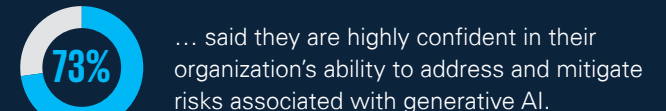
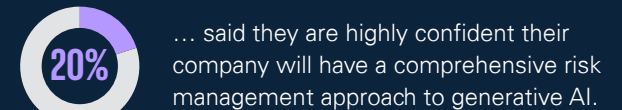
Note: Findings are based on KPMG surveys on generative AI from March and June 2023; the comparative March survey data points are based on 225 US respondents.

... and believe they can handle generative AI risks.

Top three risk management concerns among IM professionals:



IM executives are becoming more confident they can mitigate risks:



IM executives are diligently implementing responsible generative AI governance programs:



What industrial manufacturing executives expect from generative AI

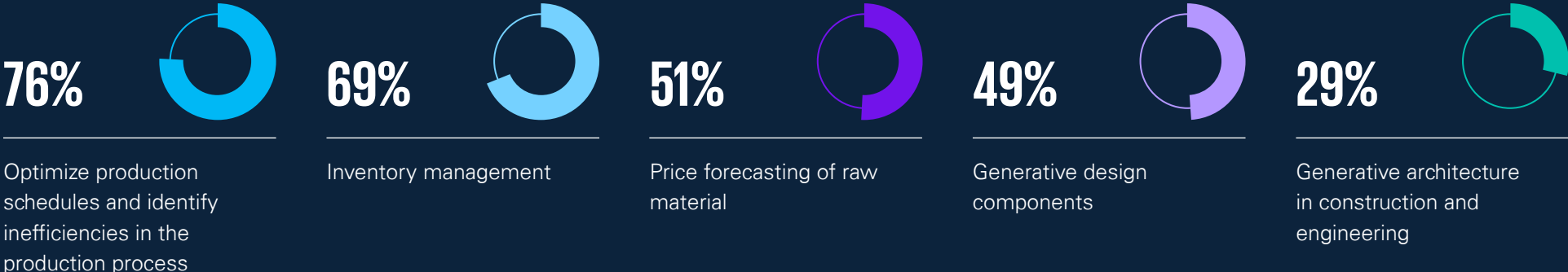
Here’s a paradox: even more than other executives, industrial manufacturing leaders (87 percent versus 76 percent for all respondents in our March 2023 survey) identify generative AI as the technology that will have the biggest impact on broader society over the next three to five years. But industrial manufacturing leaders were least likely to say that researching generative AI applications will be a high priority for their organization over the next three to six months (21.7 percent vs. 11 percent). Asked what actions they are most likely to take in the next six to 12 months to enable generative AI implementation, 76 percent say they will simply try to define objectives for the technology. Only 44 percent say they are ready to allocate budget to the job (versus 50 percent of all executives), and only 22 percent say they are ready to establish clear policies and procedures for use of the technology (versus 41 percent of all executives surveyed). However in our June survey, 43 percent of industrial manufacturing leaders said they have a mature responsible AI governance program in place, and 43 percent were in the process/partially have

implemented a responsible AI governance program. Eighty-one percent in June said they anticipated their company’s overall investment in generative AI to change over the next 6 months to 1 year to rise 50 percent to more than 100 percent.

Industrial manufacturing leaders have some definite ideas about how generative AI can be used. The most common applications will likely center around operations Exhibit 1). More than three quarters of our respondents expect to use generative AI in tasks such as optimizing production schedules and identifying inefficiencies in the production process. Generative AI gives these manufacturers the ability to plan based on user prompts—to enter a query like, “Provide three alternate 2024 sourcing plan scenarios that consider supplier performance and risk while meeting service level, inventory, and operating cost objectives,” and receive instant answers. Other top applications include inventory management, materials price forecasting, and component design.

Exhibit 1: Industrial manufacturers see generative AI driving improvements in operations

Which of the following areas of generative AI have the likelihood of being applied within your company?



Use generative AI to improve productivity, sales, and service

There are opportunities to deploy generative AI across a broad swath of industrial manufacturing operations, from product development to supply chain to after-sales support—a growing source of revenue for manufacturers.

In supply chain, generative AI can be used to help optimize distribution and logistics by making it easier to build and use models.

In sales, generative AI can help manage and conduct sales operations, supporting key activities including: creating sales content such as RFP responses or proposals or tailored sales messaging; customer contract lifecycle management; and training sales professionals.

Generative AI can help industrial manufacturers provide better service by cataloging service knowledge, enabling conversational AI and prompted searches for customer service representatives to quickly resolve customer problems.

Consider, for example, how generative AI can streamline a configure-to-order business, such as creating customized solutions for B2B customers. This work is engineering intensive and time sensitive, with outcomes highly dependent on the experience of the engineering or sales lead. Manufacturers may be able to develop better solutions, more quickly, by training generative AI with the full dataset of all the solutions their engineers have developed in the past and then using that knowledge to quickly configure the solutions customers want.

Hurdles to implementing generative AI in industrial manufacturing

Among the biggest concerns that executives across industries have about adopting generative AI is whether they have the proper technology platforms and access to data. In our March survey, manufacturing executives said they would be much more likely to cite inadequate technology infrastructure (54 percent vs. 36 percent) as a barrier to using company data to build large language models for generative AI. In our June survey, the most significant barrier to implementing generative AI was regulatory uncertainty, while most leaders noted lack of skilled talent to develop and implement as the second biggest barrier. Indeed, we see that many manufacturing organizations have grown through a series of mergers and acquisitions, which has left them managing an array of legacy systems and siloed data. Manufacturers also lack access to the customer data that could help them build generative AI applications (in after-sale service, for example).

We believe that generative AI can help manufacturers overcome these technology obstacles. First, generative AI could be used to extract, classify, and label third-party data from customers, channel partners, and suppliers across a company's value chain. Where data is not available directly, generative AI could be used to generate synthetic data from which manufacturers

could then extract the insights they need to improve their products and their service capabilities. Generative AI could also help manufacturing companies ensure that a prospective acquisition is a good fit—including its systems and data. Generative AI can help manufacturing companies reduce the risk of acquisitions and maximize synergies. In the future, generative AI applied to M&A transactions will become table stakes by automatically interpreting large amounts of unstructured data and surfacing insights into supplier relationships and overlaps, innovation, existing technology and its compatibility, and more. All of this will create a faster turnaround and a higher level of transparency.

Another potential challenge for generative AI adoption is cultural resistance. Ten percent of manufacturing executives in this sector identify this as a big issue. While that's not a high percentage on an absolute basis, it is the highest among all sectors, where the average is 6 percent. And we know from transformation work that organizational change in manufacturing often takes strong, thoughtful, and consistent leadership. So while cultural resistance is low, organizations should keep in mind how big the lift can be to prepare for this, especially around issues of data readiness and data quality.

What to do next

We have identified five key actions industrial manufacturers can begin taking right now to jumpstart their generative AI agendas.

1 Address data availability, quality, and integration.

Start by assessing and addressing shortcomings in data availability, data quality, and data integration. To take full advantage of generative AI, industrial manufacturers will need a reliable data infrastructure that is customized for the business and can be trusted by all stakeholders.

2 Identify and pursue early use cases.

We believe that industrial manufacturers who are first movers in generative AI adoption can build significant advantages. So, even as efforts to create a sound data foundation get underway, we encourage manufacturers to begin identifying discrete use cases for generative AI and then experimenting with the technology. The goal should be tangible quick wins that will naturally build momentum. A good way to target the highest-value use cases will be to look for those that will have a direct impact on revenue, costs, risk, or other important outcomes, and that are reliant on high volumes of data, insight, and reasoning.

3 Prepare the workforce.

In tandem with efforts to assure data quality and identify use cases, industrial manufacturers will need to pay attention to the impact generative AI will have on their workforce, making sure to focus on upskilling workers and forming a data culture. Industrial manufacturing executives are more inclined than most to believe that generative AI will boost productivity and enhance collaboration, with a positive impact on IT and creative jobs. That message needs to be delivered to workers. But executives in this sector also foresee negative impacts for employees in customer service, administrative, and legal jobs. Accordingly, manufacturers need to think about how they can prepare those workers to thrive amid the changes ahead. It is also important to

understand that persona-based education and training, in partnership with HR, is a pathway to retention, and that productivity gains should be reinvested into the workforce.

4 Address talent gaps.

More than 60 percent of industrial manufacturing executives say they will probably need to hire or train people for generative AI, versus 50 percent of all executives. To build generative AI capabilities, companies are already looking for outside help. Thirty-three percent of industrial manufacturing leaders say their company expect to collaborate with external partners on generative AI in the next six to 12 months, versus 26 percent of all executives surveyed. Executives in this sector are more likely than others to be looking for outside help with algorithm development and optimization (67 percent versus 59 percent of all executives) and with data acquisition and preprocessing (61 percent versus 51 percent). And while new talent can and should be brought in, it should be done in a way that is in union with maximizing the existing workforce as well.

5 Develop a broad generative AI strategy.

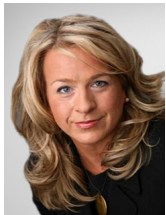
We recommend that industrial manufacturers create a broad generative AI strategy that weighs costs against revenue opportunities and risks, and creates a framework for responsible use, including a generative AI working group that leads to executive level buy-in. Most companies will want to designate a single person to coordinate generative AI activities across the enterprise. In industrial manufacturing, it will be especially important to also develop generative AI literacy across the workforce to successfully embed generative AI in a range of operations.

How KPMG can help

An early and enthusiastic advocate for the power of AI, KPMG is well positioned to help your organization leverage generative AI. With our technical experience in AI and our deep industry knowledge and experience, we can help guide your organization through strategy, use case development, vendor selection, and pilot implementations, and then provide ongoing support to help you scale and optimize your investment. We understand both the promise of generative AI and the process and cultural changes that will be required to realize its full potential.

KPMG also recognizes that users of generative AI have a responsibility to learn about the technology's risks and how to control those risks to prevent harm to customers, businesses and society. Those risks will grow and evolve as AI technology advances and becomes more pervasive, and as public pressure from regulators increases. The KPMG responsible AI offering features frameworks, controls, processes and tools that can help ensure AI systems are designed and deployed in a trustworthy and ethical manner, which in turn can help manufacturers accelerate time to value when using those systems.

Contact us



Claudia Saran

Partner, National Sector Leader,
Industrial Manufacturing
KPMG in the U.S.

csaran@kpmg.com



Todd Lohr

Principal, Advisory
Lighthouse
KPMG in the U.S.

tlohr@kpmg.com



Martin Kaestner

Principal, Advisory
Lighthouse
KPMG in the U.S.

mkaestner@kpmg.com



Michael Pricer

Principal, Advisory
KPMG in the U.S.

mpricer@kpmg.com



Danielle Beringer

Managing Director, Advisory
Lighthouse
KPMG in the U.S.

dberinger@kpmg.com

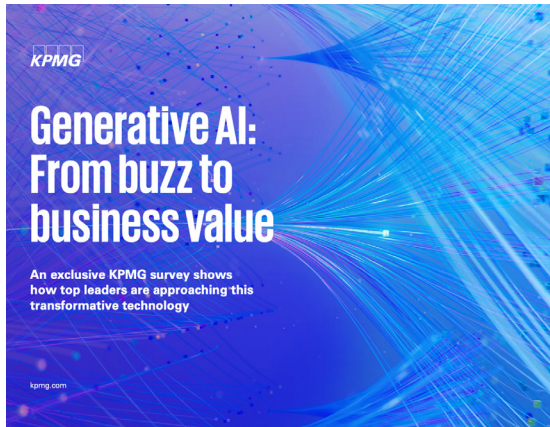


Len Prokopets

Managing Director, Corporate
Services
KPMG in the U.S.

lprokopets@kpmg.com

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Learn how KPMG can help make your [generative AI implementation](#) successful, and explore how we can help you [adopt AI](#) in a safe, trustworthy, and ethical manner.

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