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IndustryWeek

# The State of Production Health 2024

Data shows investing in advanced technologies is working. What does it mean for manufacturers' Industry 4.0 strategies?

# The State of Production Health 2024

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# INTRODUCTION

With workforce upskilling initiatives returning value, manufacturers are shifting their spend toward supply chain and capacity concerns.

The manufacturing industry, and production processes in particular, face wide-ranging challenges and competing demands that impact performance, efficiency, and resilience. By tracking and trending these shifts, The State of Production Health will help you measure and understand your organization's status among peers and potential opportunities for improvement.

This year's report, which builds on the 2023 inaugural baseline study, reveals the hurdles, progress, and promise of strategies reported by more than 700 manufacturing leaders working at companies with an annual revenue of at least $100M. For example, addressing common concerns with advanced technologies such as artificial intelligence (AI) and the Internet of Things (IoT) is proving to be an effective, scalable strategy with operational and economic advantages. Additional prominent findings include:

## Artificial Intelligence Proves Its Worth

Investments in AI continue to rise as manufacturers realize its benefits and begin quantifying its value. As confidence in AI grows and the ability to scale programs improves, they can address other challenges and reallocate their workforce to new priorities.

## Supply Chain and Capacity Opportunities Gain Focus

Manufacturers have begun shifting spend to address supply chain and capacity concerns. Interestingly, although manufacturers rank the supply chain as the top production obstacle (25%), a top area where AI is used (43%), and the top area where AI's impact is quantifiable (41%), it is surprisingly their lowest ranked objective for leveraging AI. This may be because manufacturers believe their existing investment in the supply chain is working and/or manufacturers have not yet realized the impact of the technology on their supply chain. Regardless, increasing capacity is now the number one objective for leveraging AI, at 44%.

## Workforce Concerns Persist but See Some Improvement

For manufacturers struggling with an aging workforce and skilled-talent gap, the advent of technologies such as AI provided welcome relief — so much so that in 2023, the top objective for leveraging AI was to upskill the workforce (25%). Today, one year later, the ranking of workforce constraints and upskilling as a concern has shifted, and the emphasis on investment in this area is decreasing. With near-unanimous agreement (97% strongly agree, agree, or somewhat agree) that AI and advanced technologies will help create new jobs in the manufacturing industry, shifting money to areas like capacity may further mitigate resource issues by enabling AI-driven automation and workflow improvements.

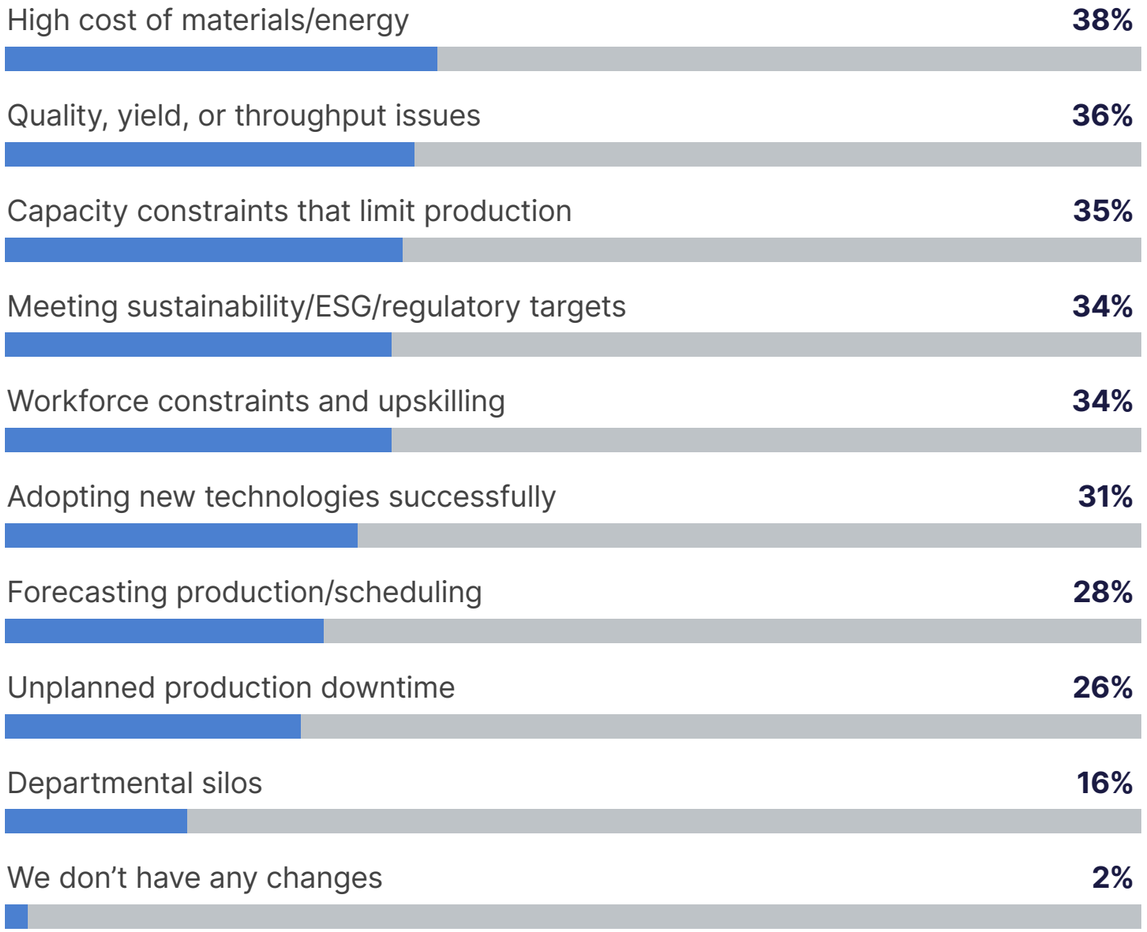
This report summarizes these and other 2024 research findings and highlights key comparisons to 2023 results, helping manufacturers benchmark their capabilities and objectives and develop future-focused strategies aligned to optimize production health.

## PART ONE

# Manufacturing and Production Challenges

The foremost manufacturing challenges identified by respondents in 2024 are remarkably similar to 2023. The high cost of materials/energy (38%); quality, yield, or throughput issues (36%); and capacity constraints that limit production (35%) are all still in the top three, and the workforce constraints and upskilling category remains solidly at the midpoint. Having departmental silos remains the least concerning, and it is down 4% from last year to 16% now.

**Figure 1:** What are your organization's biggest manufacturing challenges?




The top three manufacturing challenges identified by respondents were the high cost of materials/energy (38%), quality, yield or throughput issues (36%) and capacity constraints that limit production (35%). Departmental silos was the least selected challenge with 16% identifying it as a top problem.

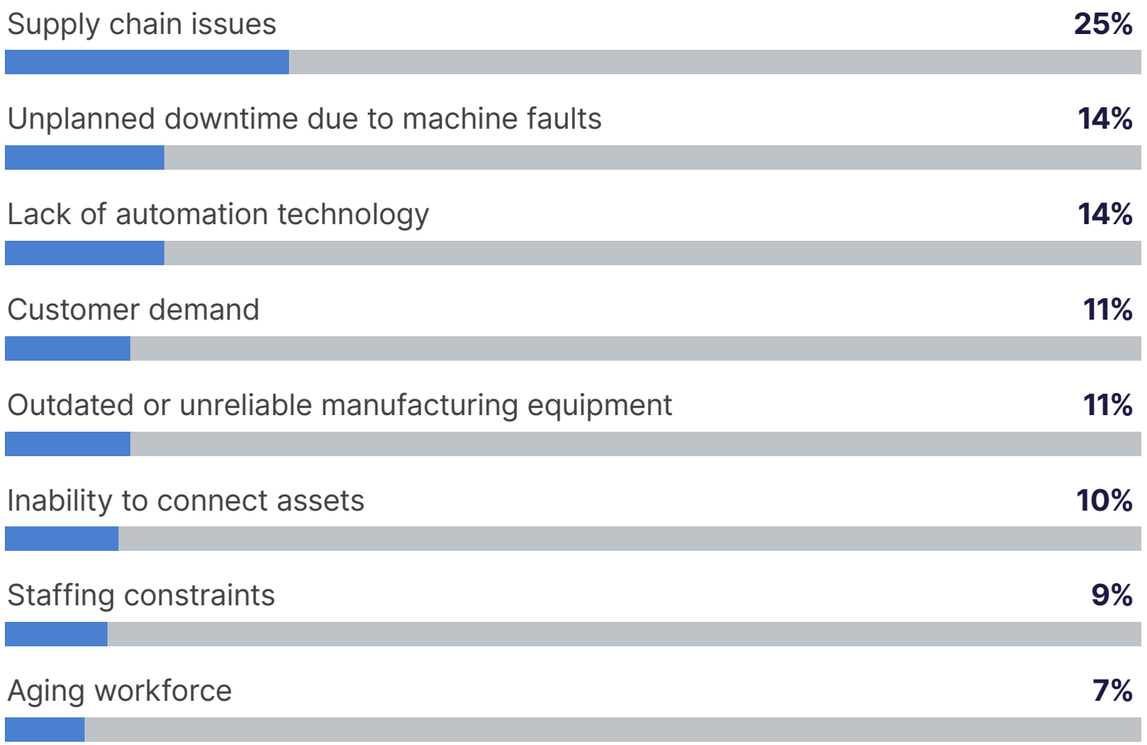
Base: All respondents (n=705). Up to 3 answers allowed.

By comparison, there are significant deviations in the production obstacles reported from 2023 to 2024. For instance, supply chain issues rose to the top in 2024, up 11% from a fourth-place ranking last year, while staffing constraints sank from the second-greatest obstacle in 2023 (18%) to seventh in 2024 (9%).

Specific industries played a leading role in driving these trends. Respondents who work in building materials and oil and gas were especially instrumental in supply chain rising to the top of production obstacles this year. Conversely, the chemical and pharmaceutical sectors were influential in the lowered ranking of staffing constraints as a production obstacle.

**Respondents who work in building materials and oil and gas were especially instrumental in supply chain rising to the top of production obstacles this year.**

**Figure 2:** What is the primary factor that could limit your ability to meet production targets/business objectives over the next 18 months?



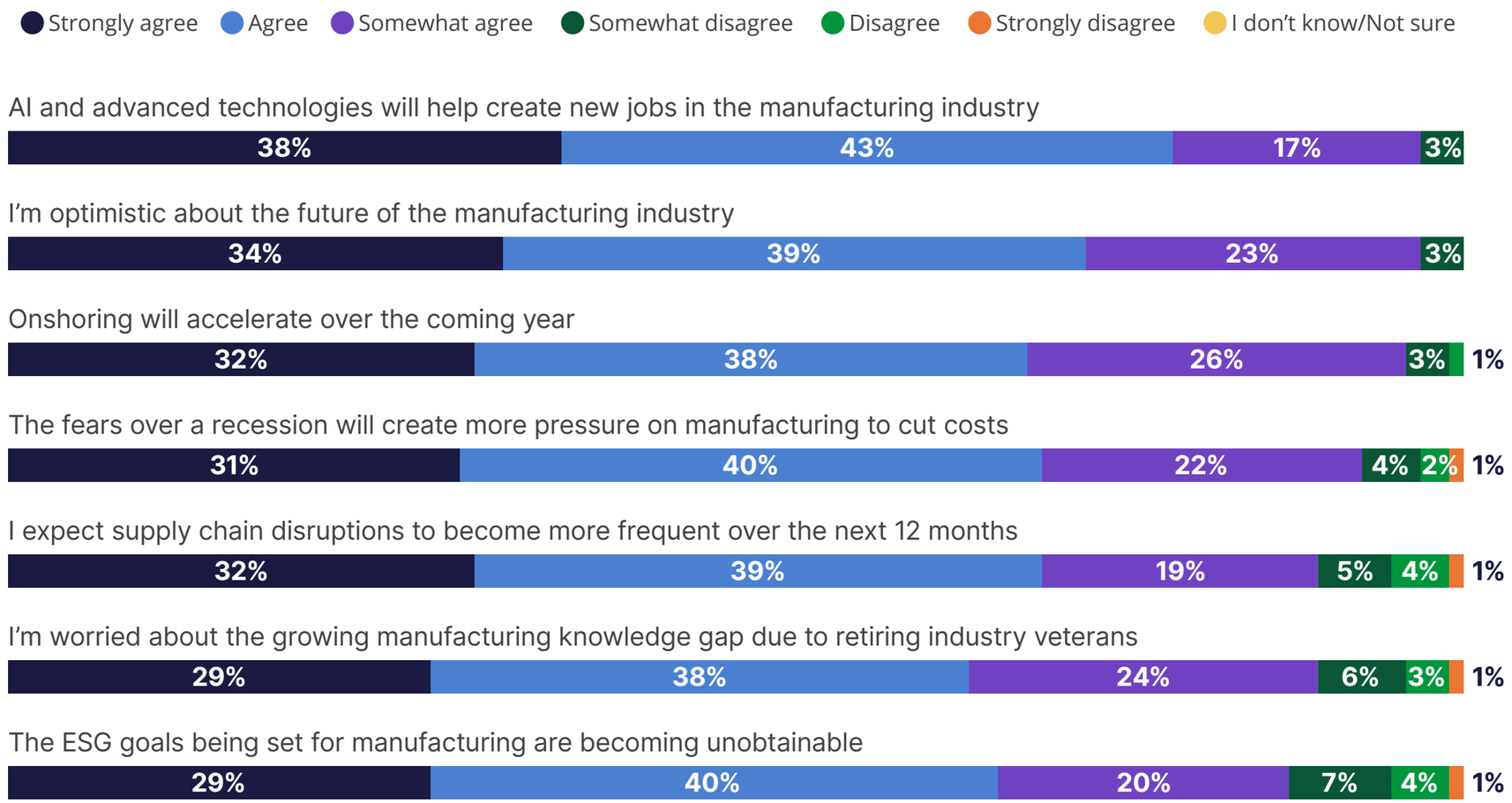

A quarter of respondents (25%) said that supply chain issues was the primary reason that they might not meet production targets or business objectives over the next 18 months. The next two top factors were unplanned downtime (14%) and lack of automation technology (14%).

Base: All respondents (n=705).

Despite acknowledging the industry's manifold challenges and obstacles to production, optimism for the future is evident. Nearly all the respondents either strongly agree, agree, or somewhat agree that AI and advanced technologies will help create new jobs in the manufacturing industry (97%), and they are personally optimistic about the future of the manufacturing industry (96%).

That said, they are also realistic about what is to come, including 90% agreeing to some extent that supply chain disruptions are expected to become more frequent over the next 12 months.

**Figure 3:** To what extent do you agree or disagree with the following statements?



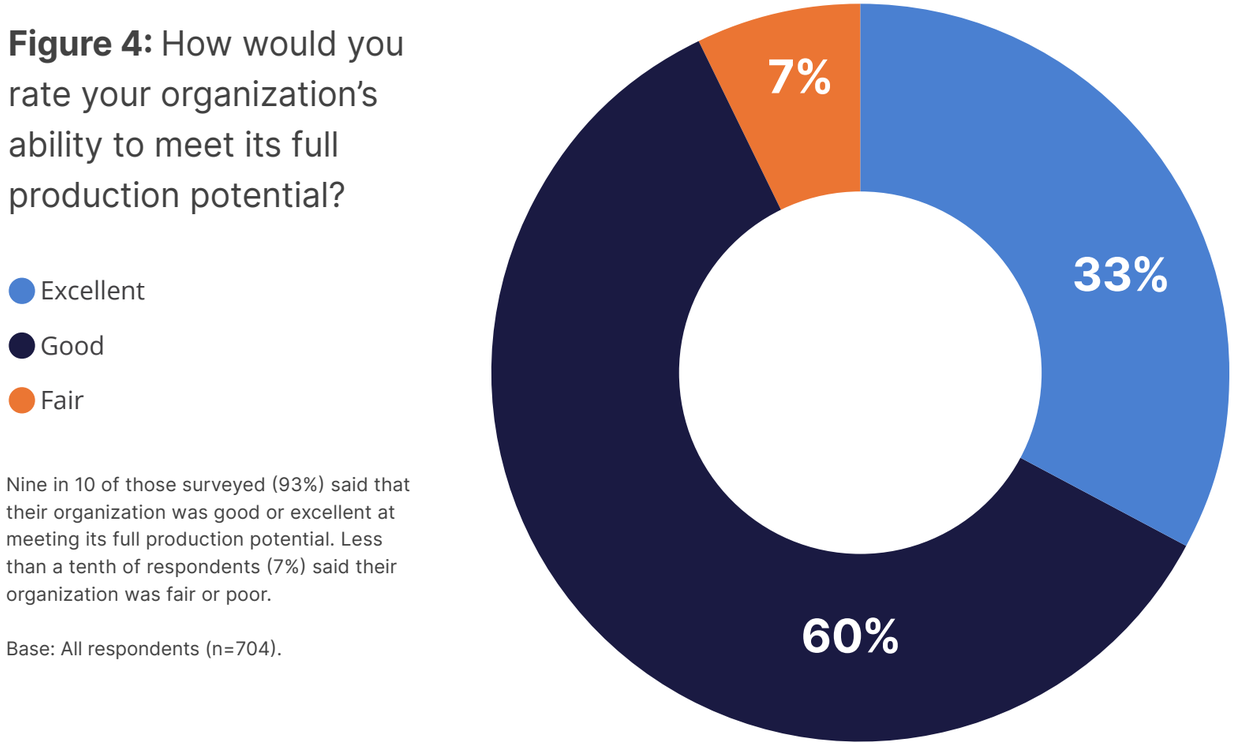

Nearly all respondents (97%) agreed (Strongly agree + Agree + Somewhat agree) that AI and advanced technologies will help create new jobs in the manufacturing industry and that they're optimistic about the future of the manufacturing industry.

Base: All respondents (n=699 - 705).

Surprisingly, as was also the case last year, the respondents seem rather generous in how they rate their own organization's ability to meet its full production potential. Nine in 10 of those surveyed (93%) said that their organization was good or excellent at meeting its full production potential, while less than a tenth of respondents (7%) said their organization was fair or poor. In 2023, the divergence was less acute, with 70% rating their organization as good or excellent, 28% fair, and 2% poor.

For both years, the results appear top-heavy given that manufacturing productivity numbers are not improving — and, in fact, are getting worse. This also runs contrary to Figure 2, where 25% of respondents consider machine faults and outdated or unreliable equipment to be an obstacle to meeting production targets. The ratings may reflect confidence in the production potential going forward as opposed to what the organization is currently achieving. Conversely, manufacturers may be accepting production obstacles as a cost of doing business, unaware that vast improvements in machine performance and processes are possible.

**Figure 4:** How would you rate your organization's ability to meet its full production potential?




Nine in 10 of those surveyed (93%) said that their organization was good or excellent at meeting its full production potential. Less than a tenth of respondents (7%) said their organization was fair or poor.

Base: All respondents (n=704).

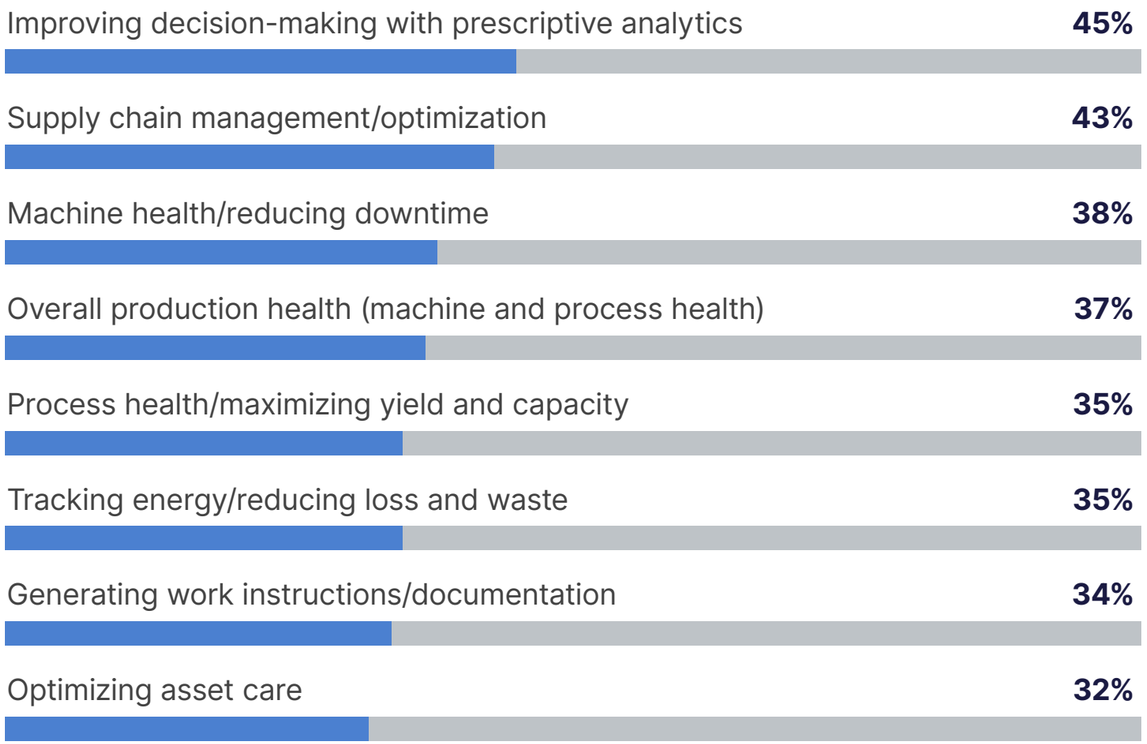
**Nine in 10 of those surveyed (93%) said that their organization was good or excellent at meeting its full production potential, while less than a tenth of respondents (7%) said their organization was fair or poor.**

## PART TWO
# AI in Production

With the increasing prevalence and maturity of AI applications in manufacturing, three new options were added to the AI usage question this year. One of them, improving decision-making with prescriptive analytics, already ranks first at 45%, likely reflecting users transitioning from learning about data to learning what actions are recommended based on the data. Ultimately, prescriptive analytics improves upon the value derived by AI in areas such as supply chain management/optimization, overall production health, and tracking energy consumption — the three top responses in 2023 — as well as improving machine health/reducing downtime, which ranks third this year.

Drilling down on this year's prescriptive analytics results reveals that plant leadership (nearly 78%) and digital transformation (57%) are the departments most often reporting the use of prescriptive analytics to improve decision-making.

**Figure 5:** For which of the following areas does your company leverage artificial intelligence (AI)?




More than two in five respondents said that their company was leveraging AI to improve decision-making with prescriptive analytics (45%) and to manage/optimize the supply chain (43%).

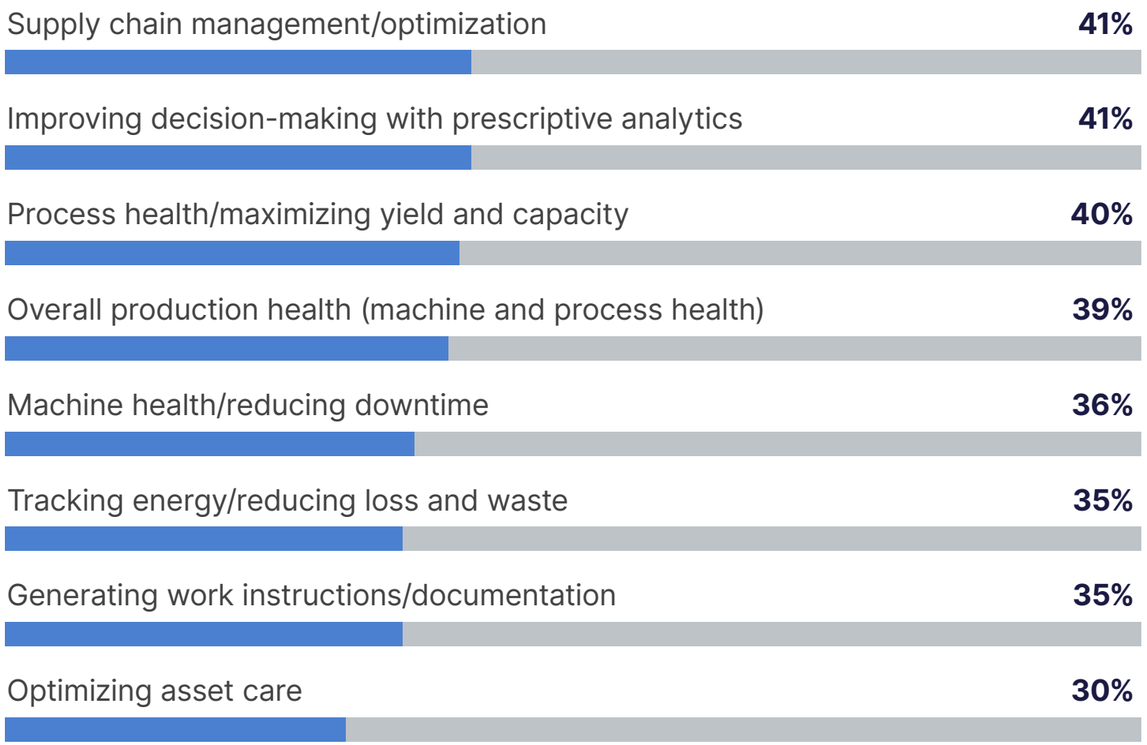
Base: All respondents (n=705). Multiple answers allowed.

There was positive movement between 2023 and 2024 in the ability to quantify the impact of AI in meeting business objectives. Last year, optimizing supply chain management received the most responses at 25%. This year, it received 41% and is virtually tied with the second-place capability, improving decision-making with prescriptive analytics. Indeed, none of the named capabilities received less than 30% in 2024.

The significant growth in respondents reporting the ability to quantify value from AI investments in various areas indicates that manufacturers are getting better at using AI, and thus increasingly realizing a return on investment.

**This year, optimizing supply chain management is virtually tied with improving decision-making with prescriptive analytics.**

**Figure 6:** For which of the following areas are you able to quantify the impact of AI in meeting business objectives?



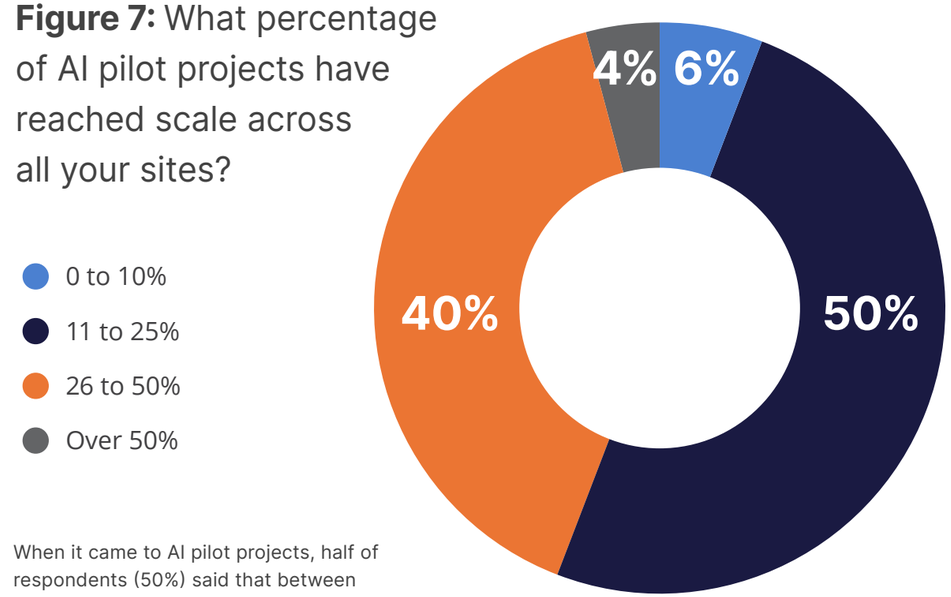

When it comes to quantifying the impact of AI on business objectives, the top areas respondents identified were supply chain management/optimization (41%), improving decision-making with prescriptive analytics (41%) and process health/maximizing yield and capacity (40%).

Base: All respondents (n=704). Multiple answers allowed.

The perception of AI pilot success, meaning a pilot has reached scale, was wholly unanticipated. Half of respondents (50%) said that between 11% to 25% of AI projects reached scale at their sites, and four in 10 (40%) said between 26% to 50% of AI projects reached scale. This is remarkable, given how industry and market analysts generally agree that such programs are more likely to fail. For instance, according to the World Economic Forum, more than 70% of companies investing in Industry 4.0 technologies fail to move beyond the pilot phase of development, landing them in IoT pilot purgatory. Could it be that program success is not being communicated well enough?

Comparing responses by department, more than 50% of user respondents (reliability and maintenance, manufacturing/operations, supply chain, and plant leaders) report that 26% to 50% of their pilot projects reached scale, while other respondents, notably IT, are lower. This means that despite industry perceptions, many people believe they are making progress with their pilots. But this also points out a perception gulf, which could have a negative impact on machine health initiatives and reveals a need for better communication between hands-on plant workers and other teams.

**Figure 7:** What percentage of AI pilot projects have reached scale across all your sites?




When it came to AI pilot projects, half of respondents (50%) said that between 11% to 25% had reached scale at their sites. Four in 10 (40%) said between 26% to 50% had reached scale.

Base: All respondents (n=703).

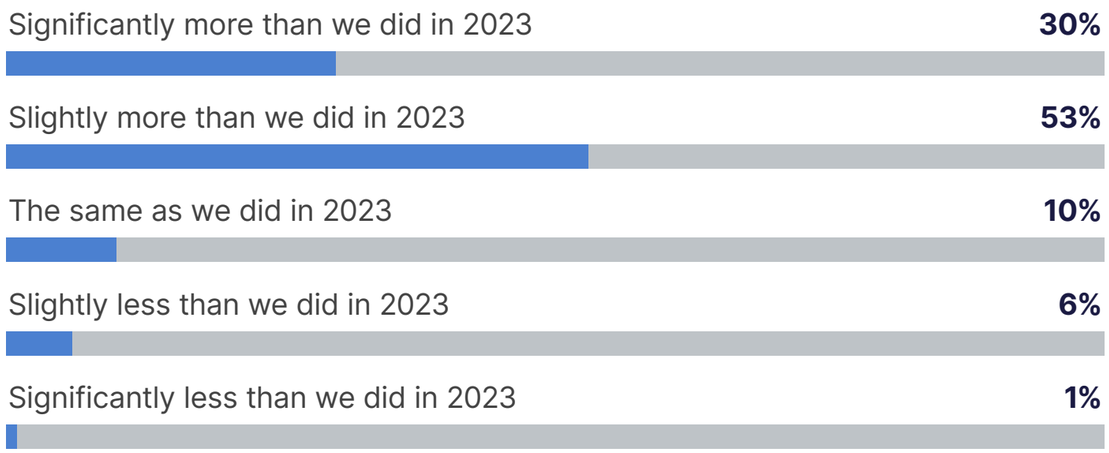
The study's findings surrounding the use of AI validate the strong growth in AI investment. Four in five respondents (83%) said that their company was investing more in AI in 2024. Of those respondents, almost half (49%) were investing 26-50% more in AI than in 2023. Strikingly, respondents reporting plans to invest significantly more than the prior year on AI rose from 7% in 2023's study to 30% in 2024.

Growing confidence in AI technology and increasingly innovative applications will drive consequential improvements in machine and production health and foster significant returns on investment.

**Four in five respondents (83%) said that their company was investing more in AI in 2024.**

**Figure 8**

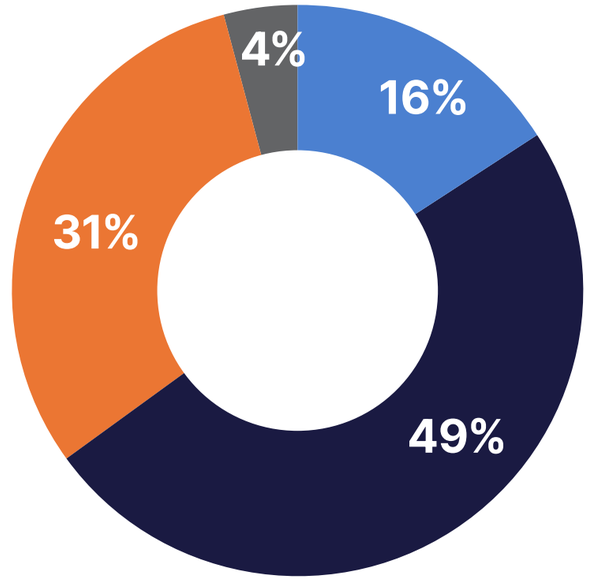
For 2024, which of the following best describes your company's plans for investing in AI?




Base: All respondents (n=705).

How much more do you plan on investing in AI in 2024 compared to 2023?


Base: Respondents who are investing more in 2024 (n=538).




Four in five respondents (83%) said that their company was investing more in AI in 2024. Of those respondents, almost half (49%) were investing 26-50% more in AI than in 2023.

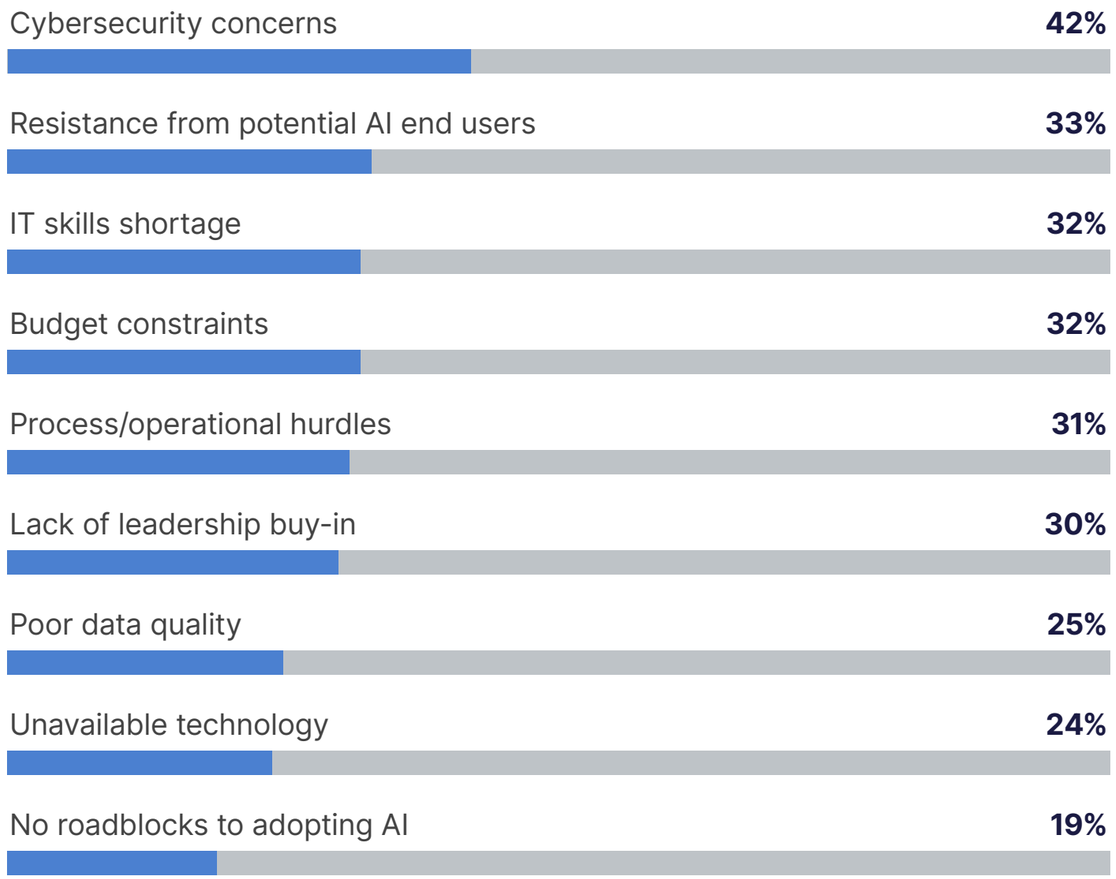
## PART THREE

# Overcoming Roadblocks and Meeting Goals

The most significant finding in the reported roadblocks to adopting AI tools in order to solve production challenges is a 300% increase in respondents citing an *absence* of roadblocks since last year. Six percent of 2023 respondents said there were no roadblocks to AI adoption, whereas in 2024, that figure grew to 19%. Considering the AI pilot success rates noted in Figure 7, some reduction in roadblocks to adoption is to be expected. It may be confidence in testing new AI tools that contributed to manufacturers seeing fewer adoption hurdles in front of them.

Another interesting result is how cybersecurity concerns remain the dominant roadblock to AI tool adoption year over year, though its share fell by 5% to 42% in 2024. The majority of respondents reporting this concern work in IT departments, which is unsurprising as they are more acutely aware of the risks.

**Figure 9:** What are the primary roadblocks to adopting AI tools in order to solve production challenges?




Two in five respondents (42%) identified cybersecurity concerns as a primary roadblock to adopting AI tools to solve production challenges. A third (33%) said resistance from potential AI end users was a challenge.

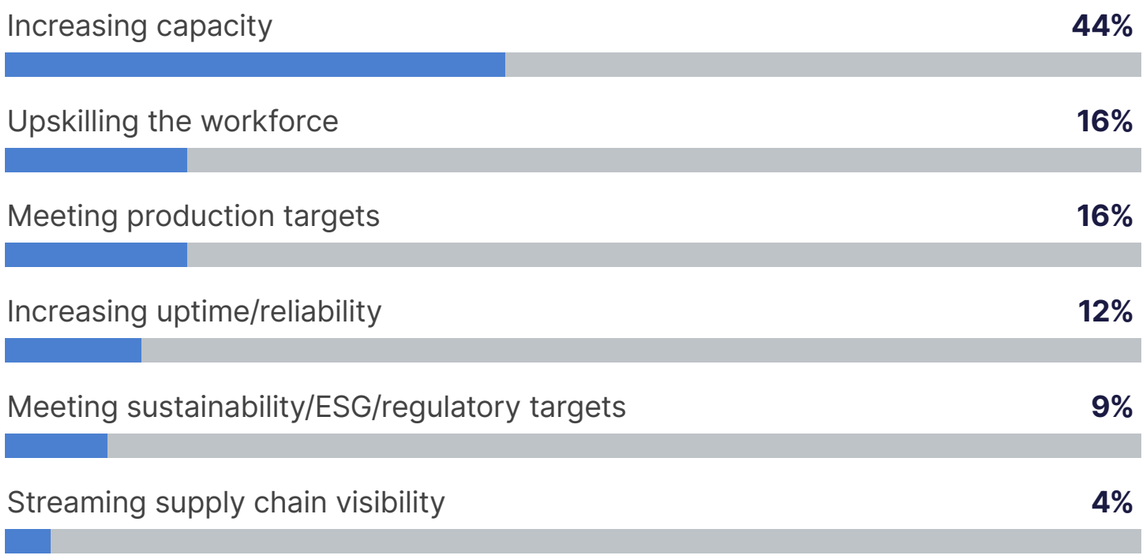
Base: All respondents (n=705). Multiple answers allowed.

The respondents citing increasing capacity as their top objective for leveraging AI more than doubled from 21% in 2023 to 44% in 2024. The number citing streamlining supply chain visibility plunged from 19% in 2023 to 4% in 2024, surprisingly becoming the least identified objective. Meanwhile, upskilling the workforce declined from 25% to 16% year over year, though it is still a major industry concern. The reason for the paradox may be that previous workforce investments are working, so companies are shifting to managing better, or they do not believe supply chain issues can be solved by AI because aspects such as third-party suppliers and transportation providers are out of their direct control.

Most who rated increasing capacity as their top objective in 2024 are from IT (27%), and most who selected supply chain visibility in 2024 work in operations (33%).

**Respondents citing increasing capacity as their top objective for leveraging AI more than doubled from 21% in 2023 to 44% in 2024.**

**Figure 10:** Select your top objective for leveraging AI in 2024.




Nearly half of respondents (44%) said that their top objective for leveraging AI was increasing capacity. Streamlining supply chain visibility (4%) was the least identified objective.

Base: All respondents (n=705).

Upskilling the workforce has now fallen to last place (21%) in the production goals that respondents most want AI to help achieve. This is in line with upskilling's decline in Figure 9's objectives for leveraging AI. Improving capacity rose from 22% in 2023 to 28% in 2024, in line with Figure 9's increase. But streamlining supply chain visibility rose to the second highest production goal in 2024 at 28%, which is contrary to the supply chain plunge in Figure 9's objectives for AI. There is no easy rationale for this deviation other than possibly that manufacturers have made progress on internal processes and are now working on improving what lies outside their own walls.

**Figure 11:** Which production goals would you most want AI to help achieve?


The top three production goals that respondents wanted AI to help achieve was improving quality, yield and throughput (33%), streamlining supply chain visibility (28%) and improving capacity (28%).

Base: All respondents (n=705). Multiple answers allowed.

# CONCLUSION

This year's report reflects how AI's impact on the workforce and user buy-in is improving, enabling manufacturers to look to larger, persistent opportunities such as supply chain issues and capacity. The shifts in the rankings of concerns, use, and obstacles track not only the biggest issues in manufacturing today, but the progress that has been made — and there is more to do.

Crucially, optimism in the value of AI is a key uptick and very promising for the future state of manufacturing and Industry 4.0. For the first time, manufacturers can quantify the value of AI projects, which is driving investment and, by extension, the rising confidence. And it's not a "blind" optimism, but optimism based on new capabilities and the ability to measure the impact. This confidence will only increase as AI continues to create a more empowered workforce, unlock efficiencies, create new collaboration methods, and change how manufacturers plan for and measure success across the organization — including machines, processes, upskilling, waste reduction, operations, and more.

As manufacturers look toward the future — and specifically toward improving production health — those who have yet to embrace IoT connectivity and AI solutions need to do so immediately. Those who have already found success should expand those investments to better visualize and act on the data that connects machines, processes, and operations. This is foundational to the ability to meet production objectives while overcoming what they say are today's key challenges, such as capacity constraints, supply chain issues, workforce concerns, and equipment reliability and efficiency.

## ABOUT AUGURY

Our mission is to provide manufacturers and other industrial sectors with insights into the health of machines, processes, and operations to transform how people work and what they can create. Together with our customers, we are building a world where the combined work of people and machines makes life better in every way. A pioneer in Machine Health and Process Health solutions, we use purpose-built AI, trained by industry experts and the world's largest data library, to help customers eliminate production downtime, improve process efficiency, maximize yield, and reduce waste and emissions. Augury's global customers achieve 3-10x ROI, often in a matter of months.

## ABOUT THE SURVEY

On March 11, 2024, Augury's research partner, Endeavor Business Intelligence, emailed invitations to participate in an online survey to members of the *IndustryWeek* database. By March 27, 2024, Endeavor received 705 qualified responses to the survey. The respondents were screened to include full-time employees with Director, VP/Head, or C-suite seniority from the U.S. and Europe, working in industries including building materials, cement, chemicals, consumer packaged goods, food and beverage, pharmaceuticals, metals and mining, oil and gas, paper and packaging, and wood products. All the companies have an annual revenue of $100M+, including 40% with revenues above $500M. All the respondents report that their company has at least five manufacturing sites.

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