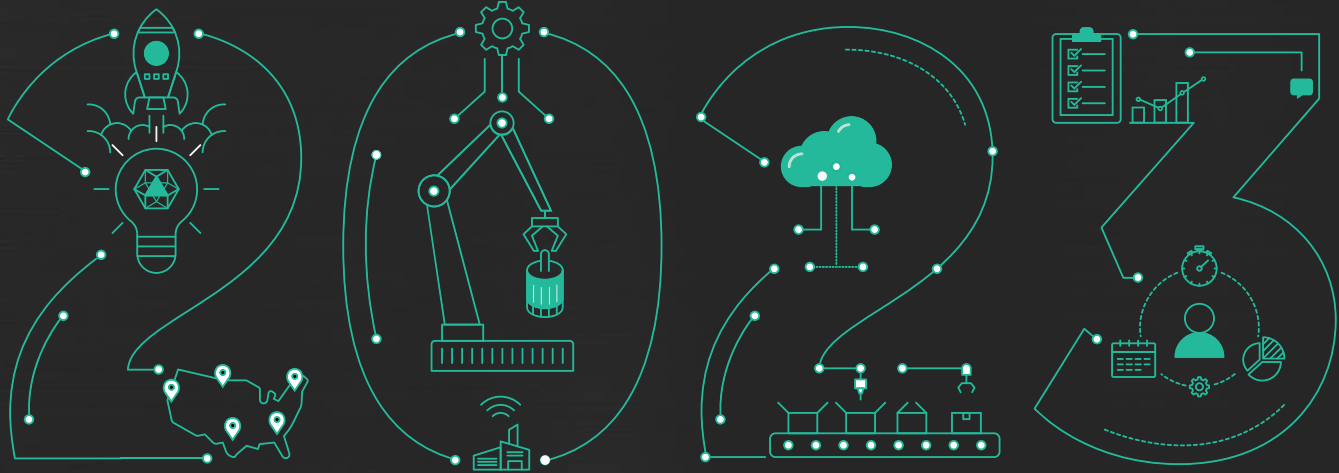


fictiv



8TH ANNUAL

STATE OF MANUFACTURING

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INTRODUCTION

The Challenges of Today Create the Opportunities of Tomorrow

Manufacturing organizations worldwide have faced and overcome incredible challenges in recent years. Yet the bullwhip effect of those issues remains in 2023. The present is marked by economic uncertainty and workforce challenges, but access to manufacturing technologies — especially those powered by artificial intelligence — is opening new pathways to success.

Responding to macroeconomic forces beyond their control, leaders are focused on stabilizing their supply chains, while their staffs seek greater operational efficiency to accelerate new product innovation, even as they adapt to these serious challenges.

How will companies achieve the increased stability and speed they seek? Leaders are increasingly sourcing parts closer to home and looking for suppliers with the expertise and capability to deliver quality parts at the pace the market demands. They're investing in upskilling their people and are betting big on digital tools powered by AI to enhance their teams' capabilities and increase productivity.

Now in its eighth year, Fictiv's State of Manufacturing Report seeks to spotlight these trends and provide insights to help companies of all sizes be successful — in 2023 and beyond.

EXECUTIVE SUMMARY

1 Technology, particularly artificial intelligence, is playing an increasingly important role in navigating a challenging economic environment

97% expect AI to impact product development and manufacturing

85% have plans to adopt or have already adopted AI technologies

2 Workforce productivity is a major concern given a tight labor market, especially for mechanical engineers, and upskilling is a big part of the solution

62% are training existing staff to enhance skills and productivity

97% are preparing for a shortage of mechanical engineering talent

3 Increasing the speed of new product innovation is more important than ever, even as companies face myriad barriers that are slowing them down

78% of companies are evaluating tech solutions for efficient product development

94% face barriers to new product innovation

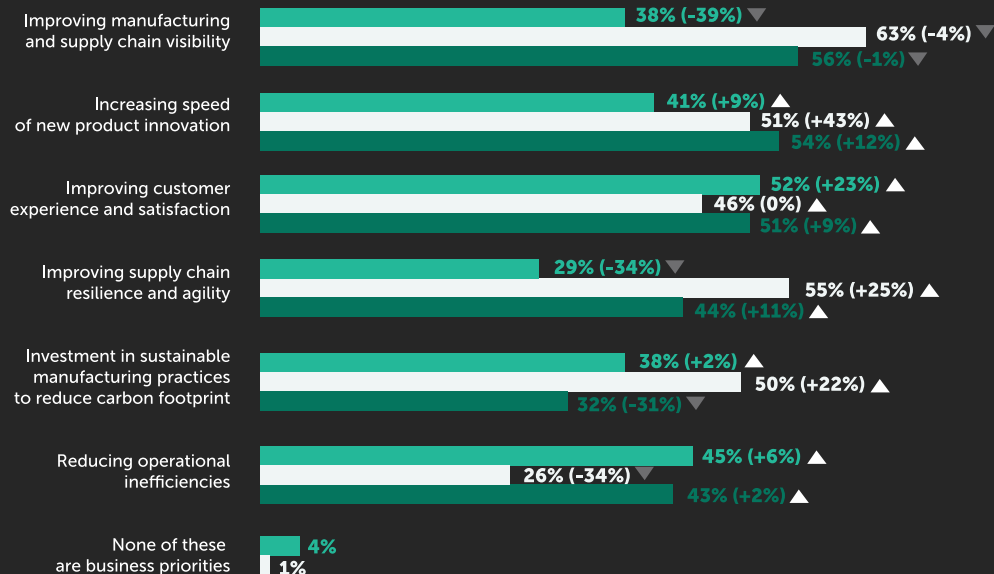


ACCELERATING INNOVATION AND STRENGTHENING SUPPLY CHAINS ARE TOP PRIORITIES

WHICH OF THESE ARE YOUR COMPANY'S MOST IMPORTANT BUSINESS PRIORITIES FOR 2023?

In 2023, one thing's clear: Across companies of all sizes, increasing the speed of new product innovation (49%, a jump of 11% YoY) has become much more important, especially for engineering leadership.

And that means companies need higher performing and more resilient supply chains to keep up with the pace of innovation.



Note: Throughout this report, we'll refer to company sizes as:

SMALL
< 2,500 employees

MEDIUM
2,500 - 5,000 employees

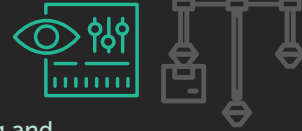
LARGE
> 5,000 employees

That's why, for a second straight year, "Improving manufacturing and supply chain visibility" (55%) is the top business priority for the majority of leaders overall, though that's no longer the case for smaller organizations.

Small companies are mostly focused on improving customer experience and satisfaction (52%) and reducing operational inefficiencies (45%).

Meanwhile, medium-sized companies have reshuffled their priorities and are more focused on improving supply chain resilience and agility than they were in 2022. As for the biggest companies, their top priorities haven't changed in the last 12 months.

55%



Improving manufacturing and supply chain visibility is the top business priority

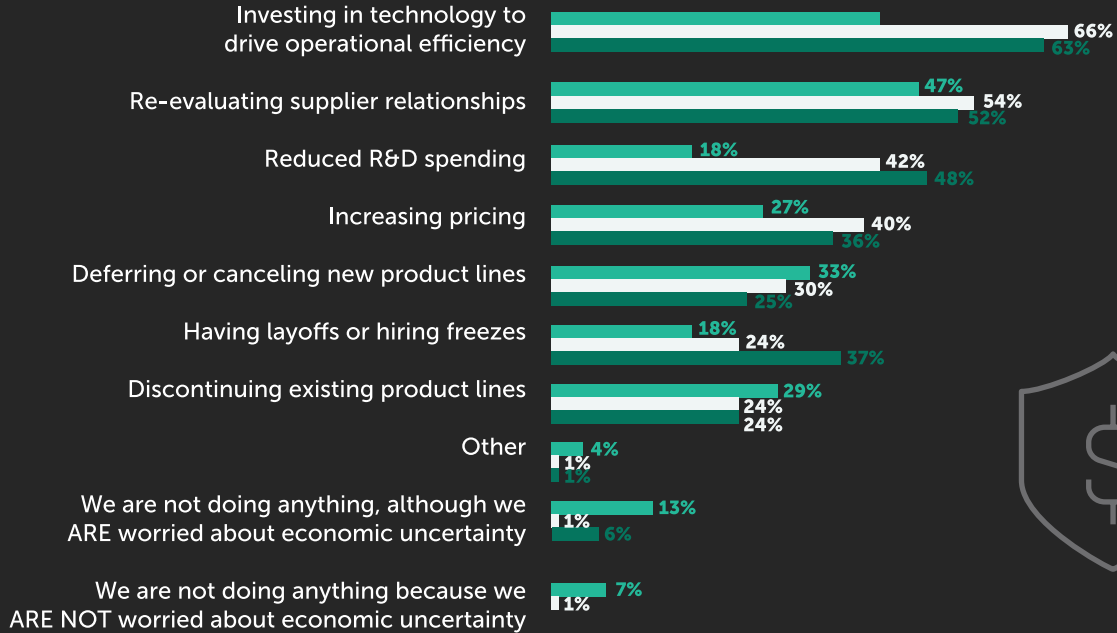


Navigating a Challenging Macroeconomic Environment

2023 has forced companies of all sizes to reassess their options. Economic uncertainty, inflation, and geopolitical instability are causing leaders to employ various tactics to mitigate the risks, depending on company size.

For the most part, leaders at medium-sized and larger companies are in lockstep — they're more than twice as likely to reduce research and development spending compared to smaller companies, and are far more likely to increase pricing and invest in technology to drive operational efficiency.

WHAT ACTIONS IS YOUR COMPANY TAKING TO PROTECT FROM ECONOMIC UNCERTAINTY IN 2023 (INFLATION, RISK OF RECESSION, ETC.)?



SMALL
< 2,500
employees



MEDIUM
2,500 - 5,000
employees



LARGE
> 5,000
employees

However, there's one point upon which they split. Large companies are, by far, the most likely to conduct layoffs or implement hiring freezes in 2023.

On the other hand, smaller companies are the least likely to reduce headcount or spending on R&D — it's possible there's little fat remaining for them to trim. Instead, they're deferring or canceling new and existing product lines to focus on their existing strengths.

Despite these differences, companies of every size are re-evaluating their supplier relationships and looking to technology to help drive innovation.



I think that this macro environment is really a forcing function, similar to what we saw with trade wars happening in 2018 and 2019, [and] a global pandemic happening in 2021-2022. It's really pushing technology forward and reinforcing the concept of 'Do more with less'.

Dave Evans

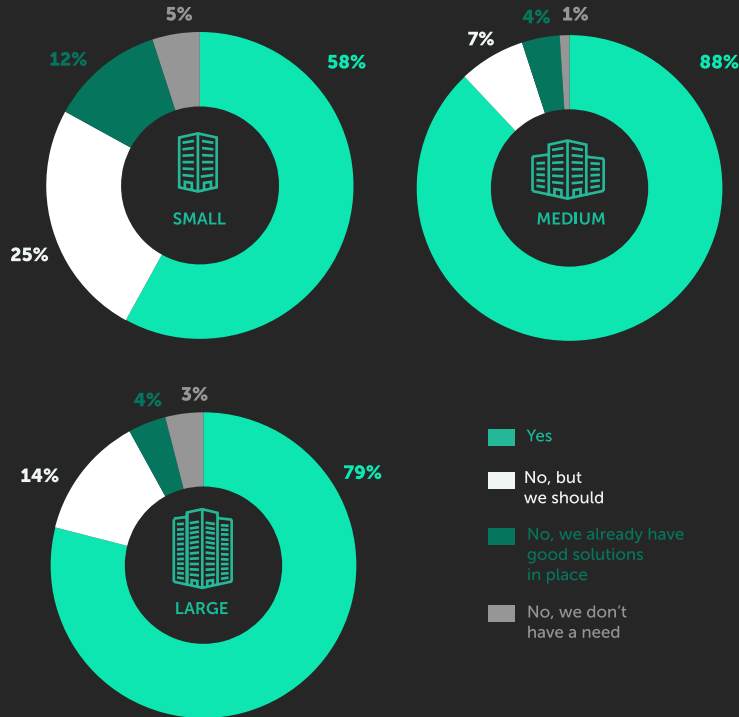
Co-founder and CEO, Fictiv

State of Manufacturing Roundtable, May 2023



SEEKING SOLUTIONS THROUGH TECHNOLOGY

IS YOUR COMPANY EVALUATING TECHNOLOGY SOLUTIONS TO INCREASE COMPANY-WIDE OPERATIONAL EFFICIENCY FOR NEW PRODUCT DEVELOPMENT?



Given the macroeconomic environment, most companies are seeking to increase company-wide operational efficiency for new product development, and more than three-quarters of leaders are counting on technology to help them get there.

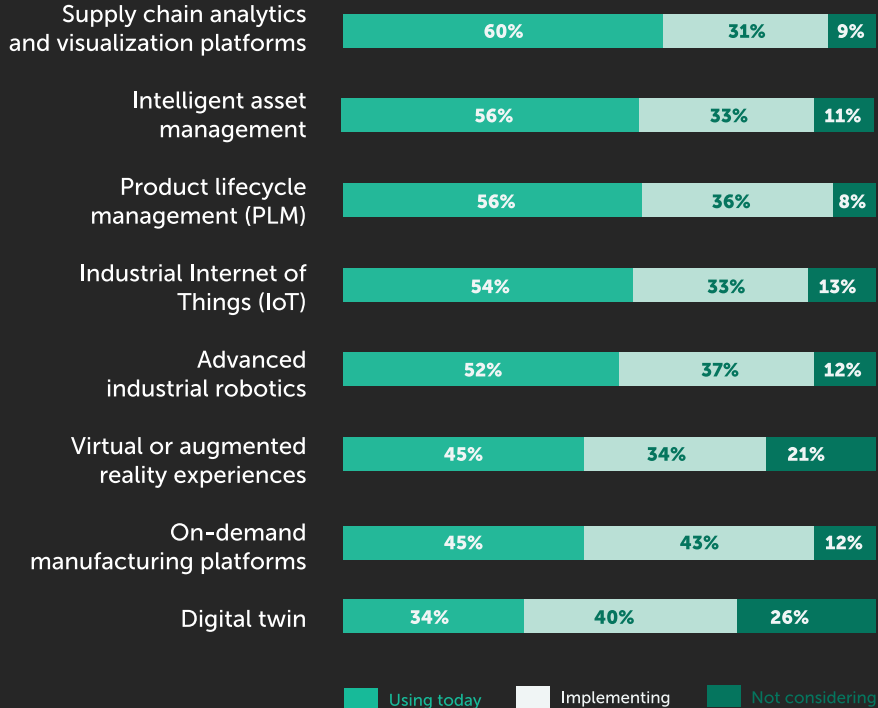
Medium-sized organizations are particularly keen on searching for new technologies that can help them succeed in 2023, and 8 out of 10 large organizations are exploring new tech solutions, too. Smaller organizations are increasingly sticking with what they've got – and 17% fewer saying they're evaluating new solutions compared to 2022 – with a quarter of those polled admitting that they *should* be evaluating new solutions, even though they aren't.

The Growing Importance of AI

These technological solutions come in a variety of forms. Over half of respondents already use supply chain analysis and visualization, intelligent asset management, and product lifecycle management technologies.

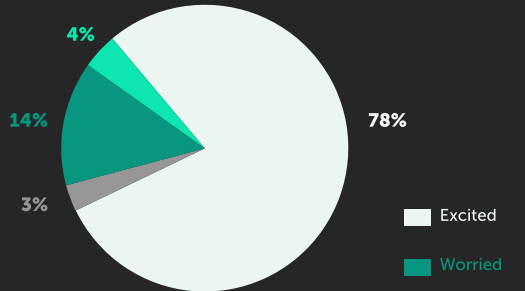
But artificial intelligence is really having a moment. The widespread accessibility of technologies like ChatGPT has made AI top of mind for almost every industry in 2023. Of course, manufacturing leaders have understood the promise of AI for years now — 97% expect AI to impact product development and manufacturing — although expectations for the technology vary by role and company size.

WHICH OF THE FOLLOWING DIGITAL MANUFACTURING TECHNOLOGIES HAS YOUR COMPANY ADOPTED?

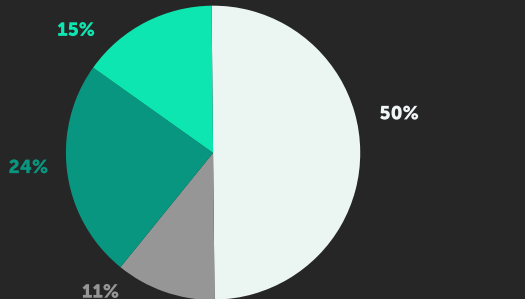


WHAT IS YOUR PERSONAL OPINION ABOUT THE LONG-TERM IMPACT OF AI IN YOUR FUNCTIONAL AREA OF THE BUSINESS?

C- OR VP-LEVEL



DIRECTOR



Overall, two-thirds of manufacturing industry leaders are excited about the long-term impact of AI in their functional areas of the business. But executive-level leaders have some work to do getting buy-in on the benefits AI can bring. They're far more excited and far less worried about AI's impact than their director-level reports, of which only half express excitement about AI while being almost 4 times as likely to be worried about it.

85% of companies have already adopted AI solutions, but they're not all going about it in the same way. A majority are working with existing suppliers to implement AI technology, but leaders are nearly as likely to source new suppliers that use AI, purchase commercial AI solutions, or build their own custom AI to suit their particular needs.

Regardless of how companies are getting it done, the industry-wide consensus is that AI has a big role to play in the future of manufacturing.

WHAT APPROACH IS YOUR COMPANY TAKING OR PLANNING TO TAKE TO ADOPT AI TECHNOLOGIES IN PRODUCT DEVELOPMENT AND MANUFACTURING?



We expect the current surge in AI software tools to continue accelerating, especially workflow efficiency tools, which is an area that's largely untapped right now.

We have a saying at Omni [...] that software for hardware teams is a decade behind software for software teams.

And [...] this is a big problem, but also a massive opportunity.

Simon Lancaster
 General Partner, Omni Venture Labs
 State of Manufacturing Roundtable, May 2023

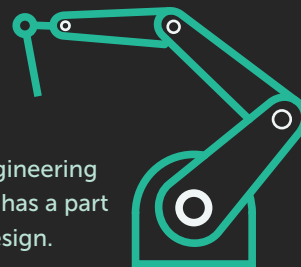
Engineering Leaders Differ On Expectations for AI

And while everyone agrees that AI will make significant contributions, opinions differ as to where it'll have the greatest impact. Engineering leaders are much more likely to believe AI will impact quality control and inspections, where the technology has seen widespread use for several years now.



51%

of people in non-engineering roles believe that AI has a part to play in product design.



But they're much less likely than non-engineering roles to believe that AI has a part to play in product design (36% vs. 51%), where its use remains a novel approach.

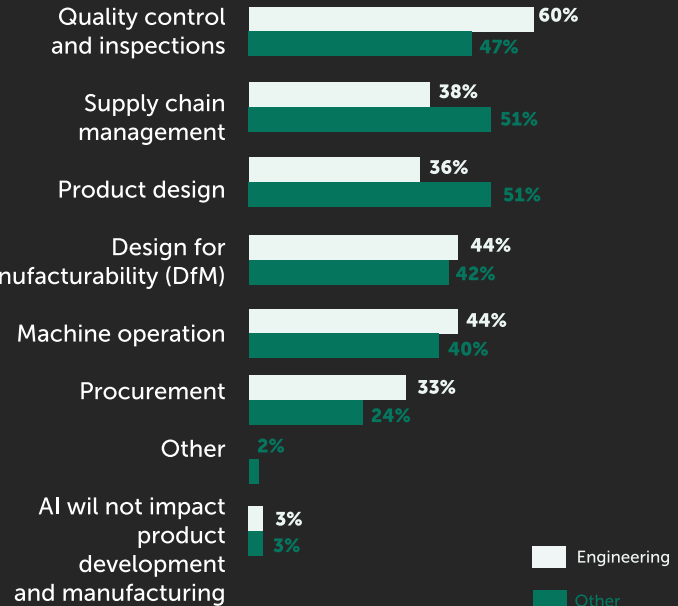
Given that engineers are increasingly spending more of their time on non-engineering procurement tasks (more on this in the next chapter), it makes sense that they're much more optimistic than others about AI's potential impact on sourcing.



It's interesting to see procurement rated the lowest out of this entire section — perhaps because it feels like an impossibility. It's clear that those activities are taking longer and longer compared to the rest of all the job functions, but with the rise of AI and large language models, sourcing is becoming a more streamlined process than it has been historically.

Sabrina Paseman
General Partner, Omni Venture Labs
State of Manufacturing Roundtable,
May 2023

WHICH OF THE FOLLOWING PRODUCT DEVELOPMENT AND MANUFACTURING FUNCTIONS WILL BE MOST IMPACTED BY ADVANCES IN AI?



A woman wearing safety glasses and a polka-dot shirt is working in a factory. She is looking down at a piece of machinery. The background is a blurred industrial setting. Overlaid on the image are several data visualization elements: a bar chart, a line graph, and a circular gauge. The text 'UNLEASHING WORKFORCE PRODUCTIVITY' is written in large, bold, green letters on the left side of the image.

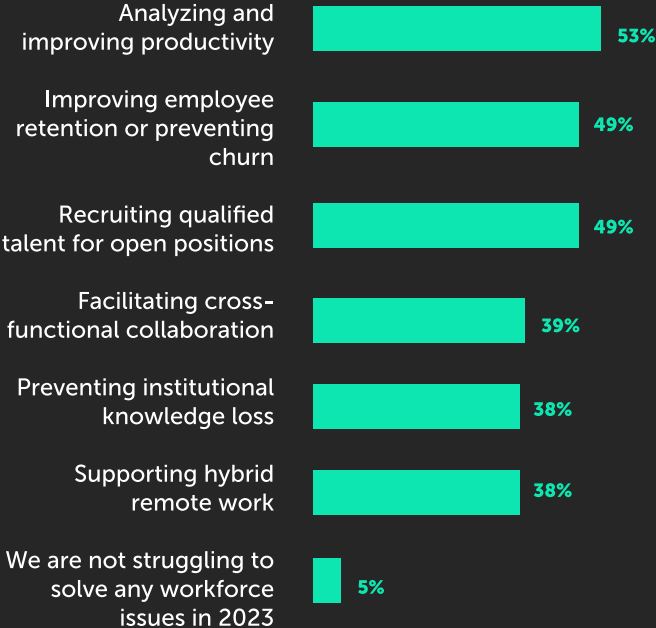
UNLEASHING WORKFORCE PRODUCTIVITY

WHAT TYPES OF WORKFORCE ISSUES IS YOUR COMPANY STRUGGLING TO SOLVE IN 2023?

However companies are using AI, its ability to catalyze workforce productivity is a highly sought benefit of the technology — in no small part because 95% of leaders are struggling to solve workforce issues in 2023, and they all have similar pain points.

A majority of those polled are finding it difficult to analyze and improve productivity. They're also struggling to retain employees and prevent churn and institutional knowledge loss. To top it off, nearly half can't find qualified talent for their open positions, and engineering leaders, in particular, report challenges with recruiting.

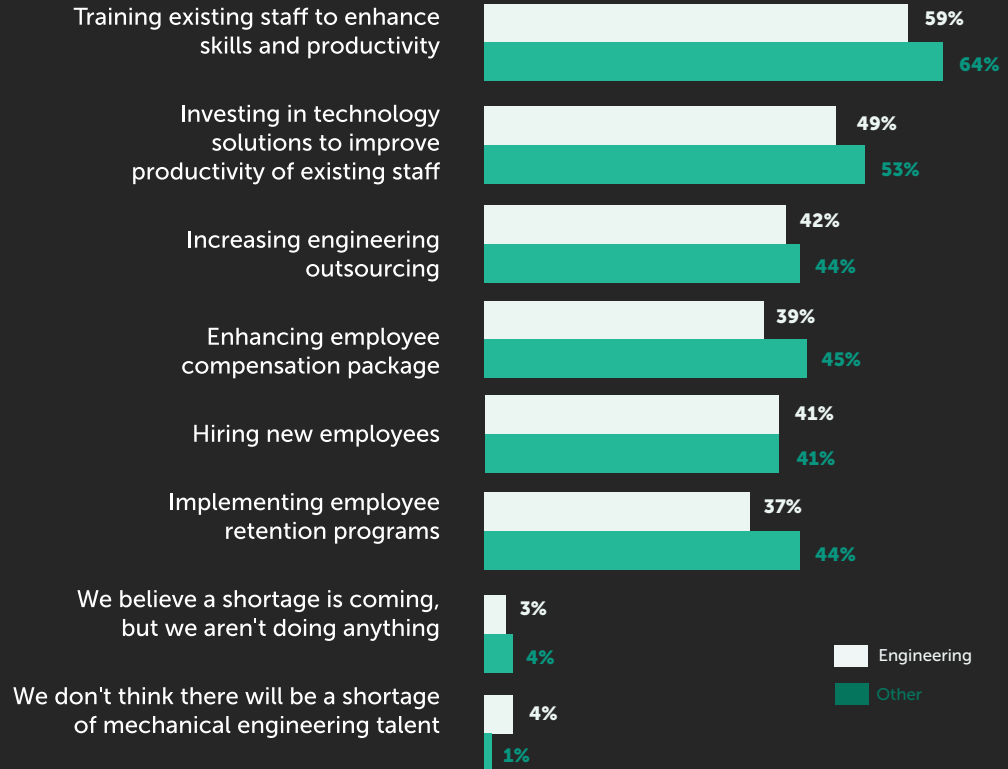
So, if you're having trouble finding new people, one way to tackle the problem is to get the best out of the people you have.



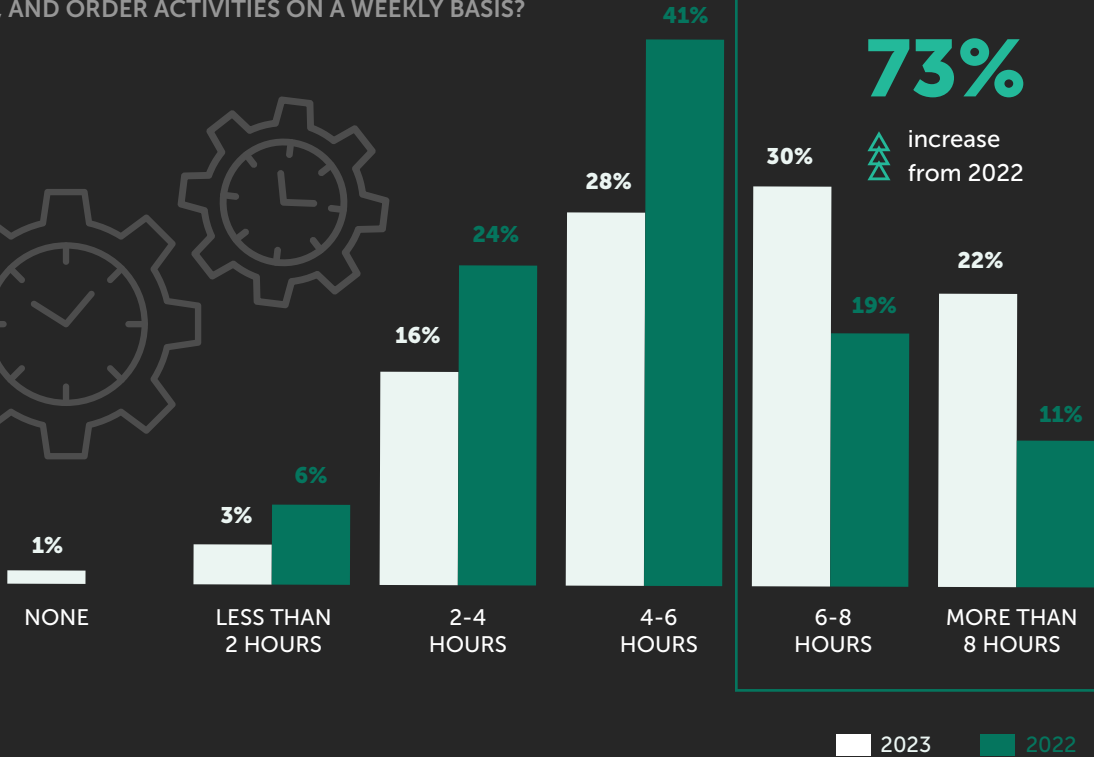
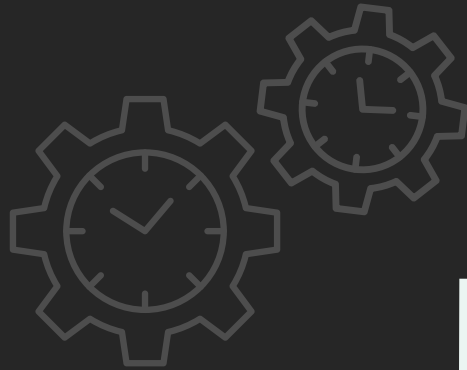
WHAT STEPS IS YOUR COMPANY TAKING TO ADDRESS THE SHORTAGE OF MECH ENGINEERING TALENT THAT IS BEING PREDICTED BY SOME EXPERTS?

Training and Technology to the Rescue

The majority of companies plan to manage the talent shortage by training staff to enhance their skills and productivity. 60% are also investing in technology to drive operational efficiency, and more than half are investing in tech to improve their existing staff's productivity.



HOW MUCH TIME WOULD YOU ESTIMATE A TYPICAL ENGINEER SPENDS ON VENDOR SOURCING, MANAGEMENT, QUOTE, AND ORDER ACTIVITIES ON A WEEKLY BASIS?



52%

of respondents estimate that engineers spend 6 hours or more per week on procurement activities



Engineering productivity is of particular importance given that companies are so focused on accelerating innovation in 2023. Yet 80% of leaders estimate that their engineers spend 4 or more hours each week on non-engineering tasks.

And these numbers are trending in the wrong direction — the number of engineers spending more than 6 hours per week has increased by 73% since 2022, and those spending more than 8 hours per week have doubled in the last year!



“As procurement gets more complex, and more parties are involved, it’s no longer just one engineer sourcing parts based on him[self]. He’s got to get other approvals because the technology is crossing specialties — and you have a team of engineers to account for as well.”

Scot Lindemann

CEO, Mission Design & Automation

State of Manufacturing Roundtable, May 2023

OVERCOMING BARRIERS TO INNOVATION

Increasing engineering productivity isn't the only issue when it comes to accelerating new product innovation. 94% of our respondents are facing a variety of structural barriers that are slowing them down.

The main reasons revolve around suppliers who aren't getting the job done, whether it's a lack of DFM expertise or slow feedback loops extending production timelines. Difficulty sourcing high-quality parts in low volumes continues to be a pain point, even as digital manufacturers offer a solution to the problem — now 56% of companies list it as their biggest innovation barrier, a 30% increase over the last two years.

78%

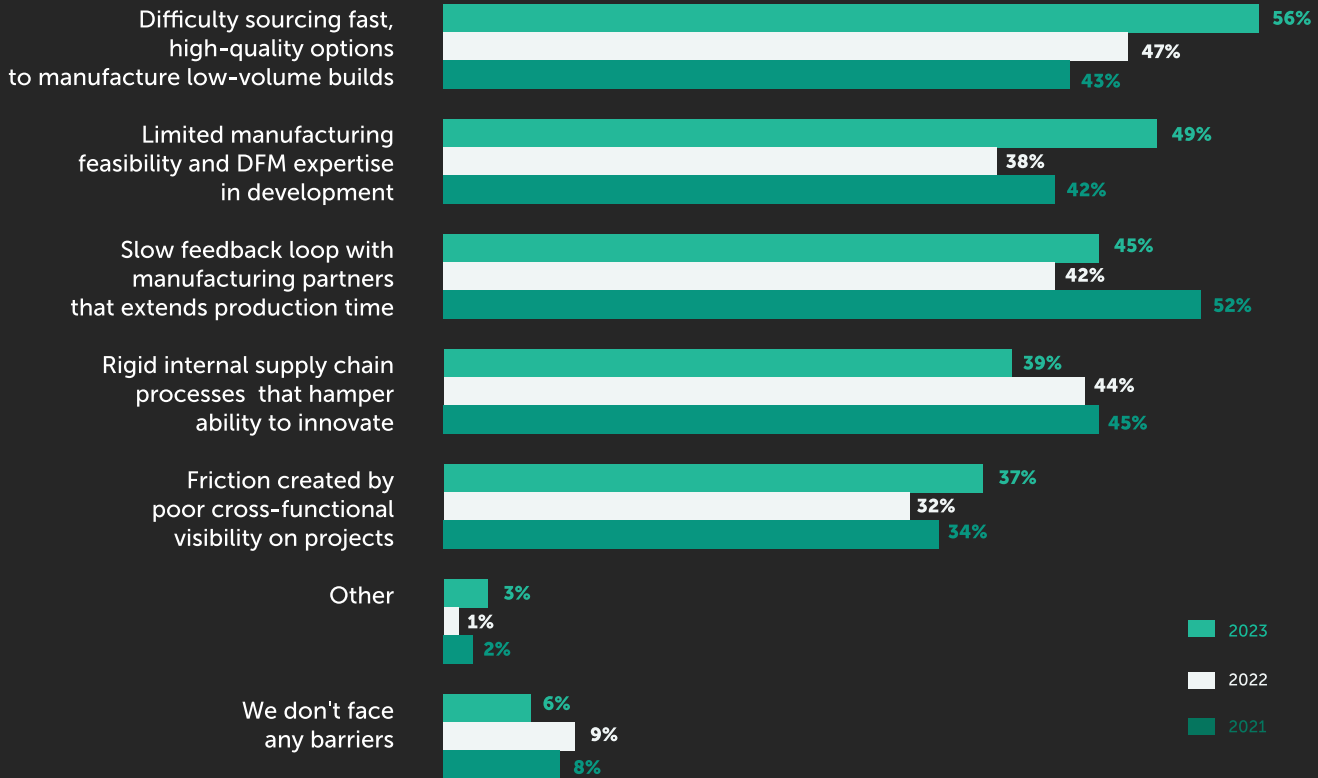


Evaluating tech solutions for efficient product development

To get what they need, companies are, once again, looking to technology for help — 78% of respondents are evaluating technology solutions to increase operational efficiency for new product development (see page 11), and more companies are evaluating on-demand manufacturing than ever before.

They're also looking for production options closer to home.

WHAT BARRIERS DOES YOUR ORGANIZATION FACE WITH NEW PRODUCT INNOVATION?

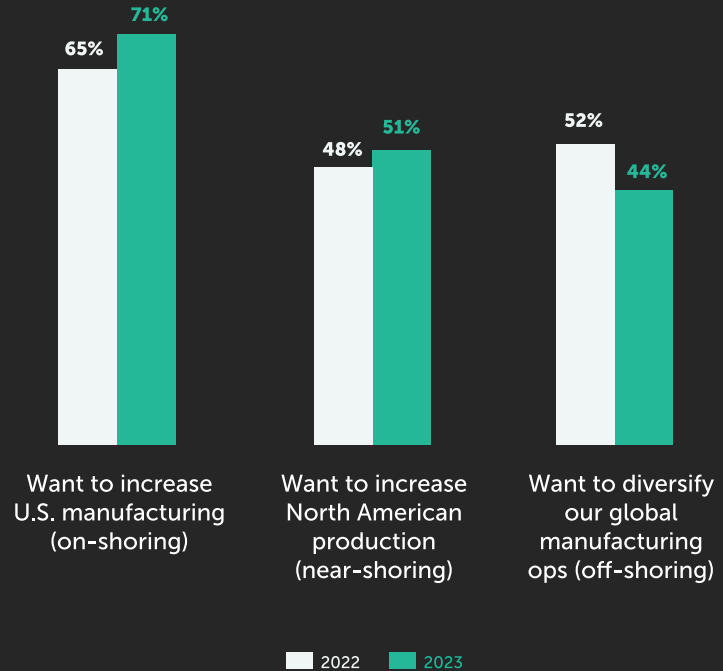


New Manufacturing Partners, New Possibilities

71% of companies want to increase their U.S.-based manufacturing, and over half want to increase their North American supplier base. But they aren't just looking for any vendor to accelerate new product development. To drive the innovation gains they seek, well over half of companies prioritize the quality of prototype components above all else when choosing a procurement partner.

And, in 2023 more, companies have recognized the benefits of digital manufacturing platforms than ever before. On-demand manufacturers can provide multiple production options in the U.S. while delivering quality parts quickly, which is why 88% of companies are either already working with an on-demand manufacturer, or are in the process of integrating them into their procurement strategy.

WHICH OF THE FOLLOWING STATEMENTS REPRESENTS YOUR COMPANY'S STRATEGY FOR 2022/2023?





Really, supply chain teams are looking for better choices — and that doesn't just mean making it in Michigan or in Erie, PA. You need to be able to say, "I can make it in Erie, I can make it in Guadalajara, and I can make it in Taipei."

Dave Evans

Co-founder and CEO, Fictiv
State of Manufacturing
Roundtable,
May 2023

KEY TAKEAWAY

Technology is the tailwind driving future success.

Challenges are merely the prelude to greatness. In an environment with continuing economic and workforce headwinds, there are opportunities, and the time to adapt and take advantage is now.

With a variety of tools at their disposal, companies are leveraging the power of digital manufacturing technologies to eliminate barriers to innovation, while leaning into the potential for AI to act as a force multiplier for their workforce. They're increasingly looking to vendors closer to home and on-demand manufacturers to build the higher performing supply chains they need.

Leaders that keep their minds open to these new possibilities will be the ones who win in 2023 and beyond.

ABOUT

Fictiv

Fictiv is the operating system for custom manufacturing that makes it faster, easier, and more efficient to source and supply mechanical parts. Its intelligent platform, supported by best-in-class operations talent, orchestrates a network of highly vetted and managed partners around the globe for fast, high-quality manufacturing, from quote to delivery. To date, Fictiv has manufactured more than 20 million parts for early-stage companies and large enterprises alike, helping them innovate with agility and get products to market faster. Learn how at fictiv.com.

Dimensional Research

Dimensional Research provides practical market research for technology and manufacturing companies. We partner with our clients to deliver actionable information that reduces risks, increases customer satisfaction, and grows the business. Our researchers are experts in the processes and technology used by modern businesses and their customers. For more information, visit dimensionalresearch.com.

SURVEY METHODOLOGY AND PARTICIPANT DEMOGRAPHICS

Individuals Represented

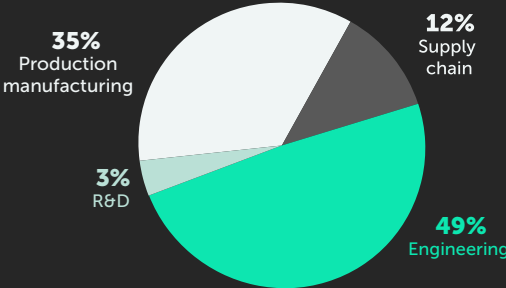
Independent sources of manufacturing professionals were invited to participate in an online survey where a variety of questions were asked on topics related to manufacturing industry trends. The survey was fielded between April 24 – May 8, 2023.

The report surveyed 241 senior decision makers in engineering, production manufacturing, supply chain, and research and development leadership roles at companies that produce consumer electronics, medical devices, automotive, industrial and robotics, aerospace, or energy.

JOB LEVEL



JOB FUNCTION



2023
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