

The Great Acceleration

Scaling AI from Tactical Pilots to Strategic Transformation

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You can find a variety of use cases and videos to complement this report.



About this Research

In early 2026, Manufacturers Alliance surveyed 100 leaders in manufacturing to better understand progress on AI implementation. Data was gathered from operations leaders across the manufacturing sector, targeting key functional areas including plant management, logistics, manufacturing operations, and supply chain. Additionally, we conducted almost 40 in-depth interviews with senior executives, manufacturing experts, and emerging technology specialists. This approach ensures the report reflects both the current state of enterprise-wide AI adoption and the nuanced human strategies required to navigate the manufacturing industry's ongoing talent and knowledge-transfer challenges.

Content for this article was analyzed with assistance from an AI tool and reviewed by the Manufacturers Alliance research team.

The manufacturing world has embarked on tens of thousands of new AI pilot programs over the past few years, and many companies are seeing rapid progress with significant gains. Analytical tasks that used to require weeks can be accomplished in minutes with AI, and many companies have seen their AI projects deliver impressive top- and bottom-line results ahead of schedule. The power of AI is accelerating the standardization and harmonization of data and processes that many in manufacturing admit are long overdue. At the vanguard of AI adoption are manufacturers engaged in reinventing themselves with an AI-first strategy aimed at treating AI as their core operating principle.

To gain a better understanding of where companies are advancing and how they are overcoming obstacles, Manufacturers Alliance interviewed nearly 40 manufacturing leaders and AI experts serving the industry. Additionally, this report draws on a survey of more than 100 mid-cap to large-cap manufacturing companies.

This research builds on our 2024 study, **“Manufacturing Intelligence – Exploring the Full Spectrum of AI Use Cases.”** Since the publication of that report, companies have shared mixed results on their progress. Achieving meaningful ROI, scaling up pilots, and putting poor data quality in the rear-view mirror remain elusive to some.

At the same time, some of the top concerns that emerged in our 2024 research have not materialized. Manufacturers are encountering less resistance to AI implementation than they expected, reflecting the gradual but steady increase in comfort using AI tools as well as improvements

in the tools themselves. Cost of implementation, which many (41%) expected to be a major obstacle in 2024, has receded as a concern in 2026 with 29% pointing to high operating costs as a barrier to AI adoption. While some projects require significant investment, many companies mentioned reaching goals with AI features built into existing platforms.

In both studies, the traits of leading companies are emerging. Having a strong data foundation distinguishes leaders as does their ability to galvanize employees around a clear vision of how AI advances business goals. Those at the vanguard know that AI requires an all-hands-on-deck approach. Leading companies view AI not as a cost-saving tool but rather as the key to enterprise transformation.

Regardless of where companies are on their AI journey, the speed of change makes most feel like they are falling behind. As one executive told us, “The technology’s changing so fast, we can build something really cool one week, and when we revisit it a week later, it’s already able to do more. The machine is sitting there learning and grinding in the background. It’s evolving faster than we can actually get our arms around.”

Manufacturers are encountering less resistance to AI implementation than they expected, reflecting the gradual but steady increase in comfort using AI tools as well as improvements in the tools themselves.



Key Findings

- » While some companies are still in the early stages of AI adoption, many have scaled successful pilot programs, and some more advanced companies are starting to orchestrate AI adoption across multiple business units and functions.
- » Making data AI-ready has been harder than expected. There will always be a need to process raw and inconsistent data. Many companies have found success addressing data integrity issues with AI tools.
- » Effective leadership requires communicating a clear vision of how AI adds value to the company while simultaneously conveying that human capital plays a vital role in that vision.
- » Most companies recognize that AI is an enabling technology and ROI can be unclear. They are willing to wait for payback and take unconventional approaches to calculating ROI.
- » While the use of agentic AI is limited in operations right now with only about 6% integrating AI into live production, nearly one-third (32%) are running active pilot projects and another 39% are working to identify potential workflows.
- » The pace of AI integration in manufacturing is determined less by technological limits and more by the readiness of people and organizations to trust and master it.

Roadmap: Designing Strategies for Transformation

Manufacturing has leveraged advanced analytics, machine learning, and computer vision for decades, but the next wave of AI adoption will require significantly longer “metabolization cycles” given the sector’s operational complexity and asset intensity. According to Gareth Hayes, Senior Partner at **Roland Berger**, manufacturers are currently splitting into three distinct strategic archetypes:

- » **“Wait-and-see” cohort:** Organizations constrained by uncertainty about the pace and direction of AI development. “Investment hesitation is driven less by skepticism and more by ambiguity—leaders are deferring large-scale bets until clearer value pools emerge.”
- » **AI vanguard:** Companies moving beyond functional use cases and actively redesigning operating models. These players are “re-architecting the enterprise around AI, not just applying AI within existing structures.”
- » **“Test-and-learn” segment:** Manufacturers pursuing a portfolio approach, running multiple pilots across functions, and selectively scaling use cases that demonstrate measurable gains in productivity, yield, and cost efficiency.

For most manufacturers, there is currently a reluctance to make capital investments in greenfield plants and major new projects because of ongoing uncertainty around tariffs and geopolitical instability. That’s why most manufacturers are trying to see what AI can do on legacy equipment at their existing facilities.

The near-term reality of AI in manufacturing remains largely evolutionary rather than transformational at scale. “If you take an OpEx lens, most

organizations are not yet designing fully AI-native factories,” Hayes said. “Instead, they are embedding AI incrementally, improving quality, reducing waste, and enhancing decision support, use case by use case. It’s an optimization journey, driven by improved data availability and iterative model tuning rather than a wholesale reinvention.” The OpEx view is more about cost efficiency whereas the CapEx view is about rethinking the entire business model.

For most of the manufacturers we interviewed, their AI journey started with building the foundation and defining a strategy. For **MSA Safety**, that included building a foundation of AI literacy. With that foundation in place, MSA Safety’s strategy emphasized value creation. “We focused on areas that could scale. We avoided one-offs,” Chief Information Officer Heiko Will explained. He described building an AI assistant and training it on the company’s product manuals for use by customer service and other functions requiring quick answers to product information. “That allowed us to take a more holistic view rather than looking at the ROI of an individual project.” One pilot served as the template for multiple additional projects requiring specialized knowledge, such as data sheets for engineering, since the proof of concept had already been established.

One pump equipment manufacturer’s AI strategy started with a foundation of responsible use and governance and focusing on three pillars.

- » The first pillar is creating an AI-enabled workforce by investing in individual-level skills as well as “looking ahead to what the functions and roles look like in the future in an

AI-enabled company,” a senior leader told us.

- » The second pillar is AI-enabled workflows, such as use cases where AI can play a transformational role in the company’s processes, such as production planning and optimization to address large spikes in orders.
- » The third pillar is about creating an AI platform and ecosystem of partners.

AI requires companies to take a hard look at their entire management system including rethinking the vertical structure altogether, **according to Sam Palmisano**, former CEO of **IBM**. “Many times, the management system is vertical with silos [for] finance, marketing, sales, development, manufacturing. Well, the models that use internal data to optimize your enterprise are horizontal. They go across functional areas,” Palmisano said. Breaking down silos and increasing collaboration across functions and business units becomes imperative.

This is precisely the logic behind creating a unified namespace – industrial software architecture that acts as a central hub for all real-time data, providing a single source of truth for an entire enterprise. We spoke with Clay Richard, Solutions Engineer at **Snowflake**, a data platform provider, about his work with manufacturers addressing this challenge as they deploy AI. “We talk about a unified namespace, which for manufacturing means addressing things like the gap between IT world and OT world. They speak different languages, but inherently, that data is related,” Richard said. “By connecting those pieces of data in the unified namespace, we’re able to break down those silos from your finance team to the shop floor, and even IoT devices into the single operational lens,” Richard said.

Southco’s Three-Tier Strategy

Southco Inc.’s AI strategy is divided into three levels. Aaron Walsh, Director of Global IT at Southco Inc., told us that the company positions its AI projects on a three-tier value curve.

Tier 1 – Efficiency: AI-assisted reporting, summarization. These projects are about working faster – doing the same things but at greater speed.

Tier 2 – Augmentation: AI-driven production planning, demand forecasting. This tier focuses on augmentation with humans and AI working together differently – performing different tasks that were not possible before AI.

Tier 3 – Transformation: Changes operating model. Tier three drives transformation. It eliminates steps and even entire processes while creating new capabilities. Ultimately, an entirely new operating model is created. This three-tier strategy represents a way to make progress at multiple speeds simultaneously.

Breaking down silos is a priority for **Southwire**. Its strategy has been to group AI projects around logistics, production, and business functions so that they “grow at the same pace and there is no digital bottleneck,” Zakaria Siddiqui, Director of Artificial Intelligence at Southwire, told us. “If AI simply told production to make more wire but logistics didn’t know about it, that would be a mess. We just want to make sure that we are not focusing only on one side of this entire puzzle,” Siddiqui said.

There are multiple valid approaches to launching AI initiatives. The key, as so many experts told us, is to start somewhere, such as a part of operations where data is available and of high quality. It is important to notch some early wins so that teams can start to figure out how AI works and develop the mindset of reimagining their business.

Foundation: Leveraging Data and Improving Data Quality

By far the largest roadblock to AI adoption remains poor data quality. In 2024, when we surveyed manufacturers, poor data quality ranked sixth on their list of major obstacles to AI deployment. Fast forward two years and manufacturers have discovered that data cleanup is more involved than they expected. Nearly two-thirds (63%) said their data required clean-up and mapping before starting AI pilots. More than 20% had data requiring major audits and correction. Only 3% said that no data cleanup was required.

The most common challenges related to data are the lack of centralization and the difficulty of retrieving it from legacy systems. Data that can be accessed is often of questionable quality and accuracy, something that 30% identified as their number one pain point. Inconsistent data formatting across plants is the biggest barrier to implementing AI, according to 21% of respondents.

MSA Safety explained that their data cleanup and consolidation work began

several years ago. “Now about 80% of our corporate data is centralized, so we felt we were pretty ready for AI. But we still found a lot of issues with data, such as conflicting data from our ERP and CRM systems or outdated information. Once you discover data quality issues, another rabbit hole opens up because you have to find out why the data was wrong and whether there is a process issue,” Heiko Will explained. “We underestimated the amount of work we need to do with our data. But it’s important to always remember: AI didn’t create these problems, it made them appear.”

It is not surprising that data integrity is a huge topic for manufacturing given the variety of data sets involved, the sheer quantity of data, and the disparate brands and generations of shopfloor equipment – especially at companies that have grown through acquisition. An AI pilot that works at one plant may not necessarily deliver the same result at the rest. As Logan Cooper, Senior Director of Digitalization at **Belden**, said, “We are developing an AI tool at our Richmond, Indiana plant to help us with a process

Top Data Pain Points

43%

Accessibility & Infrastructure

Data is trapped in legacy systems or lacks centralization

30%

Data Integrity

Issues with data quality, cleanliness, or accuracy

21%

Standardization

Inconsistent data formats across different plants or systems

6%

Other

Responses included IP protection, data security, and software adjustments

Source: Manufacturers Alliance Foundation, Feb. 2026

at this facility. As we look at deployment enterprise-wide after we complete our pilot, it is unclear what will happen at sites that don't have the same data, ERP system, processes for nonconformance or quality information. So while we can prove success here, it's not going to just be copy and paste across the organization."

Adding another wrinkle to the data mix is the explosion of raw data from edge devices as factories shift from cloud-first to edge-native strategies. Edge AI is able to reduce latency because it is run directly on local sensors or industrial PCs. "Having the capability to do edge computing off the data that is captured at the source is going to be a game changer," Nitin Murali, Vice President of Supply Chain Excellence at **GALLO**, told us. "That's why it's becoming more important to handle raw data before it is converted," he explained.

Data is never going to be perfect because there will be more acquisitions, investments in new equipment, and much more edge data. But AI itself can help improve the quality of data. AI-driven data quality solutions include things like automated data cleansing where AI agents remove inconsistencies, errors, and duplicates in massive data sets. For situations where there is uncertainty about the integrity of the data, AI can detect anomalies and gaps to determine if cleansing is necessary. One executive at an automotive components manufacturer expects AI to address most challenges: "AI is helping solve that. Even if it only gets you 90% there, you're farther along than if you hadn't started."

Several manufacturers stressed the importance of being selective about data needs. As Nitin Murali explained, "If you have a problem that you want AI to solve, you need to focus on the data

specifically connected to that problem. It can still be a challenge, but instead of dealing with 17 attributes, for example, you're dealing with four. Then it is only a matter of cleaning up the data for those four attributes. We are really focused on decomposition of a problem and looking at it in a modular way. Otherwise you end up boiling the ocean."

Another approach is to align AI projects around data availability. **Charter Manufacturing** is taking this approach by "attacking use cases that are approachable in our current data landscape. We did an assessment in 2025, and we're embarking on a large-scale data strategy and data transformation initiative this year to start getting all of our data more AI-ready," Jared Noble, Director of Digital Technology explained. "We have decided to put AI into pockets where the data is not ready but the project is low risk. Otherwise, we focus on areas where we're more confident in the data," Noble added.

We frequently heard in interviews that it is important to begin the AI journey even if large swaths of data are not perfect. Farooque Munshi, Americas Data and AI Leader for **EY**, emphasized the promise of a two-speed approach when it comes to addressing data and the larger AI vision: "You are building the data foundation, but you're also unlocking opportunities through investments in your AI and use cases. It's a balancing act." As Munshi points out, the key is to have processes in place to address data integrity. "Data is an area that's going to differentiate the leaders from the laggards. Companies that are really invested in data now will be able to see value from AI in the future."

"Your AI journey doesn't start at the moment you have massive data warehouses cleaned up. It's all about driving real impact, and this can happen with relatively small data sets."

— Phillip Leutiger, Roland Berger

Talent: Upskilling Talent for the Long Haul

The pace of AI integration in manufacturing is determined less by technological limits and more by the readiness of people and organizations to trust and master it. “When you’re looking at a successful AI project, it’s about 20% about the technology and 80% about the people. AI should not rest purely in the technology bucket,” Philipp Leutiger, Senior Partner at Roland Berger, said. This was a sentiment we heard in many of our interviews.

Gaining employee buy-in to use AI is proving less difficult than expected. In our 2024 research, 66% of companies cited “intrinsic resistance to AI taking over” for human workers as a major obstacle to deployment. In our 2026 research, only 10% of companies cited employee resistance as an obstacle.

Similarly, in our 2024 research, the top two impediments to AI adoption were

the AI learning curve and the need to retrain employees. Our 2026 interviews painted a picture of rapid progress in knowledge acquisition, sometimes seamlessly handled by AI tools themselves.

Upskilling to democratize AI

Most of the manufacturers interviewed stressed the desire to upskill their current workforce to use a variety of AI tools. Jared Noble at Charter Manufacturing says the company is seeking to “enhance the skill sets of existing staff because they have a deep knowledge of our business and our processes. We are looking for ways to upskill them to work in these new technologies.” Another manufacturer expressed similar sentiments: “We’re not laying people off. We’re moving our people into more value-add roles. They want to do a great job, and they want to add value.”

Tactics to Address AI’s Impact on the Workforce

78%

Upskilling & Training

Developing programs focused on AI tech and methodologies

47%

Peer Learning

Encouraging cross-functional knowledge-sharing for skills transfer

35%

Gap Analysis

Conducting regular assessments to identify emerging skills gaps

21%

Internal Mobility

Providing job rotation, redeployment, and support for displaced workers

7%

Mentorship

Offering coaching programs to help employees navigate career transitions

Source: Manufacturers Alliance Foundation, Feb. 2026

Toyota is setting a benchmark for AI democratization. Toyota partnered with Google Cloud to build a proprietary AI platform enabling all employees to use AI. The platform is fully deployed in all of Toyota's car and unit manufacturing factories, and allows employees to create models to inspect the application of adhesives or to detect abnormalities in injection molding machines, for example. Employee acceptance has been strong. As of 2024, factory employees had already **created more than 10,000 AI models**. In 2026, the company announced it is shifting its focus to agentic use cases, suggesting its democratization program has paid off.

According to Jason Ballard, Vice President of Digital Innovations at Toyota, "The differentiator isn't who has the best algorithm. It's who can embed AI into daily decisions without breaking trust." According to Ballard, "We're reimagining our entire operations," adding, "we've made that critical decision to just go ahead and invest in this area a bit further. We feel like that's where the differentiator is going to be going forward."

AI can be the source of empowerment to teams because it can turn gut-feelings from the shop floor into data-informed observations. Head of AI at **Foxtrot** Sam Batey shared: "I've seen some frustration from users whereby they know something on the shop floor that middle management or leadership just don't appreciate. And now, with AI, you're really empowering people on the shop floor to say, 'no, actually, the temperature needs to be a degree higher,' for example. They can prove that now with data in a way that they just couldn't do before."

Siemens' Sabrina Joos, Director of Program and Lifecycle Management for

New Systems, stressed the importance of including shop floor employees in use case development. "A lot of projects start from a data scientist perspective. Data analysts figure out all the patterns that they see in the data but forget to talk to actual users on the shop floor." Joos recommended working jointly from the beginning so that operations teams "can have a part in the creation and shape the solution as well as the workflow so that the AI solution fits their purposes." This approach results in a better use case and faster buy-in.

Another manufacturer's central AI team is focused on pushing AI out into the organization as much as possible. "We want to make sure my group doesn't become some corporate function handling all of the fun AI projects. We're shifting an eye towards building AI capabilities out into the various business segments to embed it into the organization," a senior executive told us. The company has also set up a cohort of AI navigators – individuals assigned to business units to answer questions about AI, steward use cases, and provide guidance about tools. To maintain the focus on business value, they set up an AI champions group made up of business unit and functional leaders. "They are essentially my board at the organization. They give me feedback and guidance to make sure that the AI team is focusing on projects providing the greatest value," the executive said.

Scott Bemis, Executive Vice President of Manufacturing at **LSB**, stressed that his

"We view AI as a turbocharger for the regular employee, and not necessarily a replacement for employees. It enables the business to scale with their current staff."

*— Pete Vigneux,
Portfolio Lead, Foxtrot*



vision for AI is “operator centric.” “Our board operators in the control rooms and our outside operators on the ground are the most important people to the organization. They’re the ones that are operating our plants for us 24/7. I really want to see decision-making driven as low in the organization as I can. Whenever we evaluate a use case, we ask how it enhances the ability of our operators to do their work.” For Bemis, it is therefore critical to “provide the right tools and information to those individuals in a way that is very easy for them to learn, and very simple for them to use.”

Gareth Hayes of Roland Berger stressed the importance of prioritizing upskilling. “On the shop floor, it’s going to be human in the loop for a very long time. So humans need to understand that loop. They need to know what’s behind that loop. They need to be trained to go beyond the large language models and simple chatbots. If the only exposure they have to AI is ChatGPT, they’re missing what AI can do.”

Leaders at manufacturing companies are exhorting teams to embrace upskilling. As one manufacturer told us, “Our top leaders are pushing AI. At a recent leadership meeting, we spent several hours focusing on AI and there was one clear takeaway: ‘We’re not going

to replace you with AI, but we will replace you if you don’t learn how to use AI.’”

At one manufacturing partner, AI training for employees is now mandatory. Jesus Gonzalez, Intangible Asset Leader at **Aon**, shared that “Aon management is clearly communicating the technology direction of the company and what types of investments are being made in AI. We are explaining to employees that they are needed on this journey because of their subject matter expertise.”

Training methods and change management

Manufacturers are pursuing a range of training methods to increase their AI literacy. Peer-to-peer programs are the most popular with manufacturers because they are decentralized and facilitate knowledge transfer between teams. For example, a team involved in a successful AI pilot program in one production area may be well-suited to train counterparts in a different production area. In contrast to top-down training approaches which can be slow to deploy and designed to appeal to as many users as possible, peer-to-peer programs can evolve rapidly and focus on the most relevant real-world challenges to a given function.



One-third (33%) of the manufacturers we surveyed train staff via simulations, sandboxes, or digital twins. These methods provide safe and realistic environments in which to run scenarios, experiment, and train AI models. By using these approaches, manufacturers can reduce errors, lower risk, gain speed, and confirm the value of their approach before scaling up in the real world.

Employees not only gain skills, but overall job satisfaction also rises. Doug Schrock, Managing Principal, Artificial Intelligence at **Crowe**, expands the ROI equation when speaking with clients. “We always drive for increased revenue and lowered cost as a foundation. But more broadly it’s important that AI creates a meaningful shift in Key Performance Indicators that matter. Employee satisfaction and retention is one of them. People know AI is important to their future, and they appreciate when you invest to teach them AI skills. Companies can be a destination employer where people know they will be reinventing themselves for the future of work.”

Acclimating employees to AI in the form of training and pilot programs helps build skills and trust in AI systems. At **Lincoln Electric**, Naïty Jacel, Vice President of Digital Supply Chain Strategy, shared “As the user is in the tool, there is a certain amount of suggestions and directions. They’re in the tool, and it is prompting and directing them. We’re able to apply training and change management, so there’s almost a process that feeds itself. The more people learn, the more they’re demanding of the platform, the more we iterate on its capabilities. It’s been transformational for us to be able to have both the training and the delivery of impact. I think we can’t underestimate that.”

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Leadership: Engaging at All Levels

Leadership attitudes toward AI can have a decisive impact on a company's speed of adoption and overall success. Natasha Porter, Chief Customer Officer & Co-Founder at **Benchmark Gensuite**, explained that executive sponsorship is critical because AI projects "often require some type of cross-functional collaboration across operations, safety, IT, and data teams. You really need to coordinate internally to make sure that the deployment of that solution is successful. When leadership actively champions that initiative, it really helps the organization move beyond just trying something out in pilot. They're really embedding AI into core operational decision-making."

A key to moving the entire organization forward is involving all layers of the organization. Athina Kanioura, **PepsiCo** Chief Strategy and Transformation Officer, stresses that a top-down approach is necessary but not sufficient. "A **big effort** that we have been undertaking in any major transformation including this one is having the leadership on board – one, two, three levels down. Not just the top, not just the bottom, but also the middle because they have to be the ambassadors of change."

When there is a leadership vacuum, progress comes to a halt. As one heavy equipment manufacturer told us: "Our business struggles because we're still under disparate systems, tools, and processes. We need alignment for the collective good of the company. But some units resist, arguing, 'Nobody at the top is telling me I have to do that, so I don't want to.' But we can't build the same solution 50 different ways because 50 different units want to do it slightly differently."

Lack of coordination is a recipe for failure. As one manufacturer told us: "There was a proliferation of projects chasing the same desired outcome and also a lack of coordination across business units to ensure that we solve the same problem only once." This is what a **recent report from Roland Berger** calls the "efficiency illusion" because "AI activity looks productive and dashboards show progress, but they confuse 'busyness' with business." Crowdsourcing AI ideas in the absence of an overall enterprise transformation strategy may contribute to this problem.

Leadership must make clear that the company's AI transformation is not just about the technology. AI will only be as successful as the people using it. One manufacturing executive said their leadership's current focus is on how employees are adopting and learning to use AI. "The leadership is really attuned to the workforce implications right now. They're looking at the system we're building and the use cases. They are willing to invest wherever it makes sense, but they want to make sure we have the workforce to actually receive those AI tools," she said.

Leadership Stance on AI

39%	Leadership proactively provides budget and resources needed to move fast
35%	Leadership supports AI, provided it doesn't interfere with daily production targets
23%	Leadership allows AI pilots but does not actively drive or fund them
3%	Leadership or company culture actively creates barriers that stall AI adoption

Source: Manufacturers Alliance Foundation, Feb. 2026

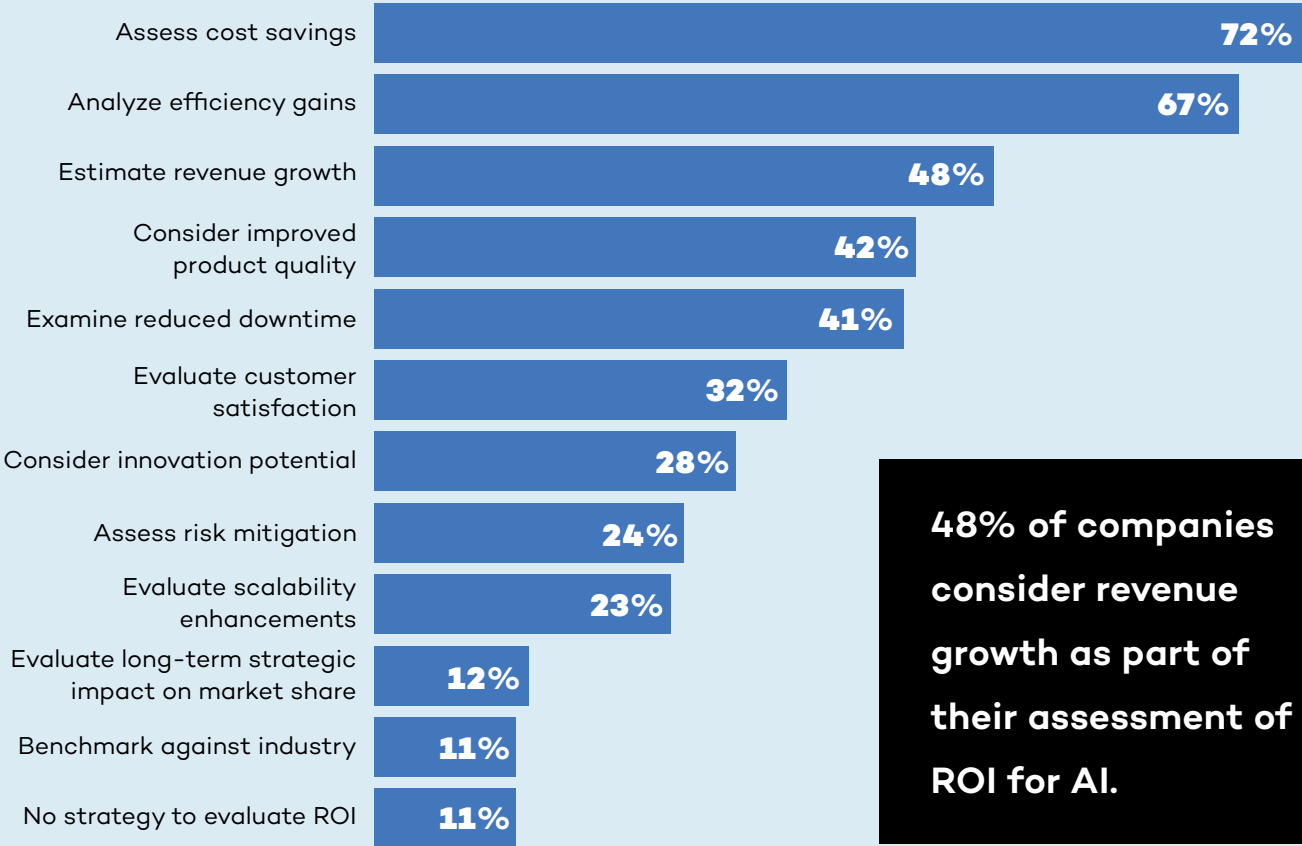
Investment: Calculating Real ROI in Untraditional Ways

Gaining buy-in from leadership often depends on the ability of the project to generate a meaningful return on investment. Where AI is concerned, the definition of meaningful ROI may vary. For many manufacturers we interviewed, the initial goal is simply growth with existing headcount. While most manufacturers measure cost savings and efficiency gains when it comes to the ROI of AI, 11% said they don't have a strategy to evaluate ROI. "It is clear that AI is often an enabling technology and so its ROI is

really unclear," one manufacturer told us. According to another manufacturer, "We know we have gained value, but it's not a hard number."

Doug Schrock at Crowe says the best AI solutions impact a variety of measurements: "If we're going to do a project, I need to see a material change on one or more KPIs that matter. We were able to help one of our clients shorten complex service resolution time from nine days to under three days. This

Methods of Assessing ROI of AI Implementation



Source: Manufacturers Alliance Foundation, Feb. 2026

client could respond faster, win more business, deliver a better customer experience, and ultimately increase revenue. If you choose your targets well and execute, it's hard not to have a good return on your AI investment."

Companies are aware of the hype around AI ROI and take a careful approach to calculating their return on AI investments. Zakaria Siddiqui at Southwire did not want to rush into AI initiatives based on speculation about ROI. "We don't select a use case unless it generates true financial value," Siddiqui said. "We had some projects we were very excited about, but then we realized they were not working. We had to be brave and pull the plug. Some were very hard decisions."

Several companies calculate ROI differently based on the type of project involved. When it comes to enterprise AI, Nitin Murali at GALLO told us, the process starts with the simple question: "Is there a problem that we want to solve, and is there an ROI to that problem?" For example, Murali pointed out the difference between a capital-intensive enterprise project and the use of vibe coding (plain speech coding that AI transforms into executable code). "If I can use vibe coding to create an app in a week, I'm still going to look at the problem first, but I may not need to go through this whole process of business case validation because I can potentially create a solution very, very quickly."

Sometimes, the ROI calculation takes a back seat to the urgent needs of a growing business. This is especially true if AI is outperforming expectations with very little investment. As one heavy industrial goods manufacturer told us, "We don't measure it because it doesn't cost much, and I can't hire fast enough to get the work done."

Traditional calculation models for ROI may need to be reworked to measure the impact of AI. According to Jared Noble at Charter Manufacturing, "AI can be expensive to build and expensive to run, so we wanted to understand the cost of the problem we're trying to address, the probability that AI could have an impact, and the magnitude of that impact. That's how we calculate our ROI on AI and other emerging technologies. We created a new framework that considers some other aspects that the traditional ROI model didn't include."

Unconventional approaches may include an entirely new type of budget line item. As Erich Kaepf, Chief Operations and Supply Chain Officer at GALLO, put it, "I recently approached our leadership team about carrying a new bucket of money which might be called 'AI bets.' We don't know whether or not there will be a return, but we're in an environment now where we need to actually take some bets. It's a different way of thinking, and we're going to see what happens."

Managing leadership expectations about the AI payoff is critical given the potentially slow ramp up of return, the number of unknowns, and the pace of technological change. Scott Bemis at LSB talked about laying out the return trajectory of AI implementations. "In the first year, you may not see a lot of change because you're just allowing the AI to model and learn the systems. But you have to be able to articulate for years two, three, four, and five the additional revenue that the application will generate. That's probably the hardest thing to do because it's going to take you into new territory. You may find new constraints, disappointing results, or higher costs than originally estimated," Bemis said.



Future: Fast Forward Manufacturing to the 2030s

What is the impact of AI on manufacturing over the next decade? We asked manufacturers to look five to 10 years into the future to predict what manufacturing will look like.

Several expect to see rapid advances in physical AI including exoskeletons and humanoid robots in operational roles. “The convergence of AI, vision systems, and humanoid robots may create an interesting opportunity to shift from human resources to robotic [physical resources] on the shop floor in the next five years,” Aaron Walsh of Southco, Inc. told us.

Many talked about the salutary effects of AI on manufacturing jobs. They focused on the ability of AI to make manufacturing jobs more interesting, better compensated, and safer. “Manufacturing will have more highly skilled people and more highly compensated people in the future,”

Scott Bemis of LSB said. Doug Schrock of Crowe echoed this sentiment, noting “We’re finding that the jobs aren’t becoming easier, they’re becoming harder because of the massive amounts of data and recommendations that are coming at you. Companies will need a higher caliber person to serve as a judgment worker to validate the outputs of an AI digital co-worker.”

Safety and quality will see major improvements, according to Anil Uzengi, CEO of **Stroma**, including “predictive ergonomics which warn of injury risks weeks before any symptoms appear.” In general, he foresees “much deeper integration of all systems including MES systems, safety systems, and all quality systems. Developing these integrations with AI agents is really straightforward right now. Five years ago, it was a headache, but right now, it’s practical and doable.”

Many expect to see the long-overdue modernization of manufacturing. One senior leader said, “I think ‘smartness’ is not going to be optional anymore. Either you’re smart, or you don’t exist anymore. It’s that simple. That means understanding what you’re building, how much you’re building, who you’re building it for, and knowing your consumer.”

That modernization includes better use of data. One senior distribution leader predicted AI will solve the “age-old problems of data and information. There’s going to be a little bit of a revolution in terms of the processes that data and information-heavy organizations have talked about for 10 years. There’s no excuse for bad data anymore.”

Sabrina Joos of Siemens told us, “I think AI will expand what manufacturing organizations can do, not just automate what they already do today. The strongest success stories that I see now are not cost-cutting narratives, but value creation stories. I’m talking about things like higher output, new service models, faster innovation cycles, and more resilient operations.” She commented on how quickly over the past two years customers have “moved beyond point solutions to more end-to-end integrated AI architectures where AI supports production, supply chain coordination, workforce enablement, and decision-making holistically. What is changing now is really the scale and the ambition.”

For others, it is efficiency on steroids. Clay Richard of Snowflake talked about AI’s ability to use data that exists today in entirely new ways. “Today you have a 30-year-old machine and a brand new 2026 machine on a shop floor, and they speak completely different languages. That becomes a giant rat’s nest. Traditionally we either couldn’t get information from it or didn’t want to

take the time to. In the future, AI will be able to take data from that rat’s nest to make decisions, get better products for cheaper, make more when we need more, or less when we need less. So for me, I think the future means much more efficiency,” Richard said.

Many spoke about the impact of AI on innovation. **Graco** is starting to review AI for product innovation by feeding customer feedback into product design. Data from technical service inquiries is run through an AI-based call summarization and sentiment analysis, which will be transferred back to R&D teams to ensure product managers and engineers can review data for product quality. This allows the teams to incorporate real-life user questions and difficulties into the new product design process. Jill Haubenschild, Vice President of Manufacturing Excellence at Graco, talked about better and faster innovation. “It’s going to help us make a more manufacturable part the first time versus the 15th time. It will reduce our iterations and make us better quicker,” Haubenschild said.

“I think we’re going to see a lot of innovation on adapting manufacturing to the requirements of the next step on the value chain,” Roland Berger’s Philipp Leutiger said. He also thinks AI will help manufacturing get “better at understanding customer demands and being able to match them by reusing and modularizing manufacturing.” AI “really put the onus on manufacturing to also be a little more customer-centric,” Leutiger said.

“[F]ewer than 200 humanoids are working in the world’s factories today, up to 5 million could be in place by 2040.”

— *The Wall Street Journal*,
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