MANUFACTURING TRENDS 2026

Building Agile, Intelligent and Future-Ready Operations

NATIONAL ASSOCIATION OF Manufacturers

Manufacturers are entering 2026 with a clear goal: to build stronger, savvier operations to help them learn, adapt and compete in a market shaped by rapid technological change and unpredictable global pressures. The data shows strong momentum. Companies are expanding digital tools, investing in workforce capability and rethinking supply networks to stay resilient and profitable.

The insights in this report come from a mix of industry surveys, expert interviews, feedback from members of the National Association of Manufacturers, research from the Manufacturing Leadership Council (the NAM's digital transformation division) and operational data gathered throughout the past year. Input from the Manufacturing Institute (the workforce development and education affiliate of the NAM), the Innovation Research Interchange (the NAM's innovation division) and NAM Operational Solutions programs also informed the analysis. Together, these perspectives offer a grounded view of the forces shaping modern manufacturing.

This e-book covers eight trends that matter most for today's leaders. These trends represent the areas where action will create a measurable competitive advantage. They highlight how companies are gaining speed, where challenges remain and what investment is producing the strongest results.

Propelling Autonomous and Adaptive Smart Operations

THE TREND:

Manufacturers are shifting decisively toward operations that can sense, respond and optimize with minimal human intervention. The push toward autonomy is no longer experimental. Plants are now deploying machine-learning models to control production schedules, adjust equipment settings, detect anomalies and optimize energy use in real time.

The core change is the move from reactive to predictive and from predictive to adaptive. Systems that once provided alerts now make recommendations. Systems that once made recommendations now adjust equipment automatically. With production environments becoming more connected, plants are forming networks of sensors, analytics engines and automated controls that work as a single ecosystem.

These capabilities are improving uptime by identifying failure risks earlier, reducing scrap through tighter process controls and shortening throughput times by adjusting workflows based on demand and material availability. Manufacturers report that the greatest gains come from linking autonomous functions across multiple plants, enabling shared learning and coordinated optimization.

This shift also reshapes the workforce. Operators now focus more on managing exceptions and validating system decisions rather than performing manual interventions. Engineering teams spend more time refining algorithms, aligning workflows and validating data quality. Companies that invest early in workforce readiness are seeing the fastest returns on autonomy.

Impacts to Manufacturers:

- Manufacturers must explore self-managing and self-learning facilities powered by AI and machine learning to stay relevant and keep up with what the majority of manufacturers believe will play a key role in the future.
- Factories should embed AI to grow or maintain business in the next five years.
- Manufacturers increasingly seek insights, case studies, and peer connections to accelerate adoption of AI-enabled, autonomous systems and integrate them into existing R&D and operations frameworks.
- Opportunities for manufacturers to collaborate have expanded; autonomy blurs boundaries between IT, operations, and innovation, and convening diverse experts to share best practices, develop new metrics, and address organizational and cultural challenges is pivotal.

Resources

- Read the Manufacturing Leadership Council's Shaping the AI-Powered Factory of the Future report
  LEARN MORE
- Keep up with the latest developments and the progress of your peers with Operational Insights. This twice-monthly newsletter focuses specifically on overall operations, such as environmental, health and safety regulations; energy efficiency and sustainability; workforce and labor management; cybersecurity tactics; risk compliance; supply chain management; product development and more. Find articles on best practices and emerging trends as well as downloadable checklists and assets.
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Expert Insight

The Next Leap in Manufacturing Intelligence

Authors: Dan O'Neill, Principal, US Industrial Products Sector Leader, PwC and Ryan Hawk, Principal, Energy and Industrials Industry Leader, PwC

Manufacturers are fast-tracking toward a future where factories think, learn, and act on their own. With AI, IoT, and digital twins working in sync, operations are shifting from automated to adaptive. They're becoming capable of anticipating demand, reconfiguring in real time, and fixing problems before they happen.

According to PwC's Future of Industrials Survey of 500+ industrials and energy C-suite leaders, nearly half (49%) expect their operations to be fully modular by 2030, up from just 6% today. This is not incremental progress but a reinvention of manufacturing playing out in real time.

Modularity goes mainstream

Forget rigid assembly lines. Modular systems built on plug-and-play architectures are redefining industrial manufacturing. According to our survey, executives are investing in reconfigurable production lines (52%) and standardized, interchangeable modules (46%) to boost agility and responsiveness.

These designs allow manufacturers to shift to new products or supply conditions with minimal disruption. They're also creating self-healing factories that diagnose and correct disruptions automatically through predictive maintenance, adaptive scheduling, and digital twin simulations.

About a third of executives surveyed expect most their supply chains to be modular or self-healing by 2030. The challenge is scaling these systems efficiently, whether through greenfield builds that showcase the full potential of modularity or brownfield retrofits that upgrade legacy operations. Both approaches require collaboration with financial and energy sectors and will shape how adaptive manufacturing takes hold across the sector.

AI takes the wheel

AI is moving from pilot to production. Eighty-one percent of executives surveyed tell us they plan to increase AI investment in the next three years, and 93% say America's industrial advantage will rely on intelligent systems. High-growth manufacturers are leading the way. They're investing up to 17 percentage points more than peers in cloud analytics, predictive maintenance, and supply chain visibility. For these companies, AI is not an experiment but the foundation of industrial competitiveness.

Still, only 44% of executives expect to convert more than 60% of their operations to intelligent systems by 2030. Another 26% believe technology will outpace their infrastructure. The modernization of the technology infrastructure is the key for innovation across the industrials base. Bridging this gap requires stronger data foundations, better system integration, a focus on value streams rather than isolated AI use cases, and a workforce confident in using intelligent tools to boost productivity at today's employment levels.

The goal is not to automate everything. It's to build trust in systems that are transparent, secure, and explainable, enabling people and machines to create value together.

The next era of adaptive operations

The shift toward autonomous and adaptive manufacturing will define the next decade of industrial leadership. Companies that connect modular design, predictive systems, and Responsible AI will gain a lasting performance edge. But they can't afford to wait and risk irrelevance. In fact, 73% of executives surveyed agree that companies that don't embrace industrial realignment will become irrelevant within a decade. The window to lead is open now for those ready to define the next era of manufacturing leadership.

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Embedding Sustainability into Business Strategy

THE TREND:

Sustainability is becoming part of the core financial model for manufacturers. Instead of treating environmental goals as parallel initiatives, companies are now integrating emissions tracking, waste reduction and circular design into their operating strategies.

Three pressures are driving this shift: regulatory complexity, customer expectations and long-term cost advantages. Regulators are requiring clearer emissions reporting and more accurate tracking of material flows. Customers want proof—real data, not general claims—that suppliers are improving environmental performance. Internally, manufacturers are recognizing that sustainability-driven improvements often reduce material use, energy consumption and operational risk.

Companies are embedding sustainability earlier in the product lifecycle. Teams now consider material impact, energy intensity and end-of-life pathways during product development rather than after production begins. Digital tools such as lifecycle analytics and AI-driven forecasting help quantify the financial and environmental implications of design decisions.

Sustainability is also influencing capital planning. Many companies are prioritizing upgrades that reduce energy use, improve resource efficiency and support clean-power integration. Organizations that treat sustainability as a strategic investment—rather than a compliance requirement—are achieving stronger profitability, improved brand perception and better alignment with customer expectations.

Impacts to Manufacturers:

- Sustainability is becoming a competitive advantage. By embedding environmental goals into core business and innovation strategies, manufacturers can reduce risk, attract customers and investors, and develop new market opportunities.
- Using AI and analytics to track emissions, waste, and resource use enables manufacturers to assess impact, demonstrate compliance, and tie sustainability efforts to profit and brand recognition.

Resources

- Read this IRI report on the advancing sustainability model
  READ NOW
- Listen to this podcast with IRI and the global tech leader from DuPont to understand how her company defines and manages substances of concern.
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Reinforcing Cyber Resilience, Connectivity

THE TREND:

Digital systems now run the core of manufacturing operations. As companies connect shop-floor equipment, enterprise systems and cloud platforms, the need for strong cybersecurity has escalated sharply. Cyber incidents continue to rise, and human error remains the leading cause of unintentional breaches.

Manufacturers are modernizing infrastructure and adopting zero-trust models to reduce attack surfaces. Cloud-based operational platforms are becoming standard as companies consolidate data, deploy advanced analytics and enable remote management. This movement to the cloud also creates new risks, requiring integrated security across both OT and IT environments.

AI-driven security tools are gaining traction, offering real-time threat detection and the ability to identify unusual behaviors before they escalate. However, technology cannot replace the need for continuous workforce awareness. Many incidents still stem from phishing, misconfigurations or weak passwords. Companies are shifting toward ongoing micro-training and frequent scenario testing to build cyber awareness into daily routines.

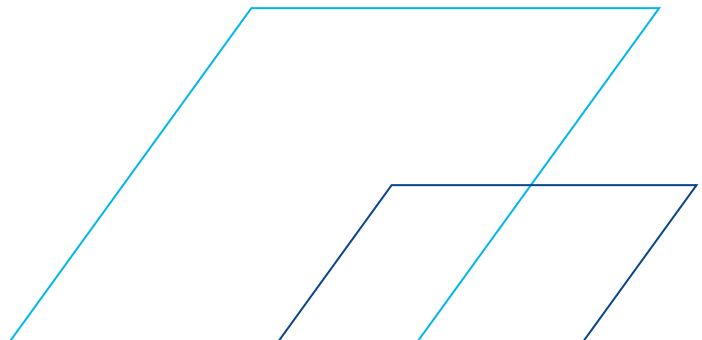
Supply-chain cybersecurity is becoming a strategic priority. Manufacturers are requiring clearer security documentation from vendors, placing heavier expectations on suppliers and building more rigorous third-party controls. As operations become more connected, manufacturers must view cybersecurity as an operational discipline—not a technical add-on.

Impacts to Manufacturers:

- Manufacturers can adopt cloud-based and zero-trust architectures and subsequently better protect intellectual property, ensure business continuity, and safeguard connected assets across global operations, resulting in strengthened operational resilience.
- As digital integration expands, manufacturers must balance innovation with risk management, and pair advanced cybersecurity tools with continuous workforce training and awareness to reduce vulnerabilities.

Resources

- Download MLC's 2025 Smart Factories and Digital Production survey
  DOWNLOAD
- Ensure your manufacturing smart operations, business and reputation are protected with NAM Cyber Cover, risk mitigation, automated alerts of vulnerabilities, and cyber insurance specifically for manufacturers, with policies that cover ICS, SCADA, bodily harm and pollution liabilities.
  LEARN MORE



Building Resilient and Transparent Supply Networks

THE TREND:

Supply chains are undergoing structural transformation. After years of global disruption, manufacturers are shifting from reactive recovery to proactive resilience. This means building networks that use real-time data, predictive modeling and improved transparency to anticipate issues before they affect production.

Companies are regionalizing parts of their supply chains to reduce exposure to geopolitical risk and transportation volatility. They are also expanding multi-sourcing strategies and strengthening relationships with suppliers through clearer expectations, shared insights and collaborative planning.

Digital traceability tools are becoming essential. Manufacturers are using them to track materials, verify compliance, improve recall readiness and support sustainability reporting. These tools help companies understand not only what is happening but why, and they create a foundation for continuous improvement.

A growing number of manufacturers are using forecasting models that incorporate market data, logistics indicators, weather patterns and historical disruption trends. These analytics help determine inventory buffers, production routing and supplier risk scores.

The most resilient organizations treat suppliers as partners rather than transactional vendors. By improving transparency, sharing more data and co-planning for continuity, companies are strengthening their entire ecosystem—not just one tier of it.

Impacts to Manufacturers:

- Many companies are redesigning the supply chain process as more digital technologies are adopted.
- Real-time visibility and AI-driven forecasting allow manufacturers to anticipate disruptions, decrease time to response, adjust sourcing strategies, and maintain continuity even amid market volatility.
- Greater transparency and traceability strengthen supplier relationships, ensure compliance with sustainability standards, and unlock new efficiencies across the supply network.

Resources

- Review MLC's Resilient Manufacturing 4.0 Supply Chains Survey
  LEARN MORE
- Ensure you have enough variation in your suppliers to withstand disruption with Connex Marketplace, a manufacturing buyer-seller connection platform. Users can search based on certifications, location, materials and other key details to obtain a clear view of supply chain strengths and potential vulnerabilities.
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Accelerating Innovation Through Human–AI Collaboration

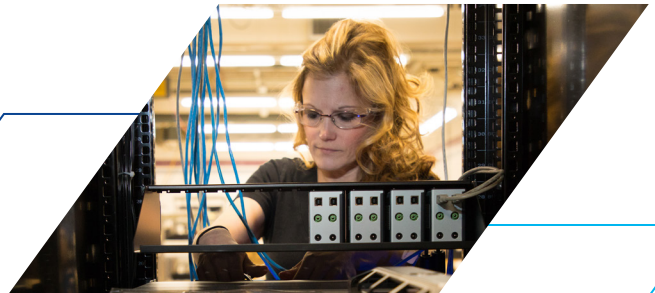
THE TREND:

The pace of innovation is defined increasingly by how well teams use AI and advanced digital tools. Manufacturers are accelerating product development cycles, improving decision quality and identifying new opportunities by pairing human creativity with machine intelligence.

AI supports engineers with generative design tools that propose options based on performance goals, material constraints and manufacturability. Simulation modeling allows teams to test ideas quickly without physical prototypes. Robotics and automation systems augment human labor, improving safety and repeatability while freeing people for higher-value work.

The shift is cultural as much as technological. When teams understand how to use AI—not just what it does—they gain confidence to experiment and adapt. Human oversight remains central. AI expands the range of possibilities, but people still make the final decisions and validate outcomes.

Organizations that embed AI into daily workflows, rather than limiting it to isolated projects, see faster learning cycles and greater operational benefits. Innovation becomes continuous, distributed across teams and reinforced by shared data and consistent feedback.



Impacts to Manufacturers:

- Teams can focus on imagination, experimentation, and strategic problem-solving while AI conducts analysis and optimization.
- Innovation can become a continuous, organization-wide capability, leading to competitive advantage.

Resources

- Listen to this IRI podcast around the topic of AI and machine learning accelerating the pace of product development, and impacts on different manufacturing sectors.
  LISTEN NOW
- Stay on top of policy and business developments that could serve as catalysts for innovation. The NAM's morning newsletter delivers exclusive insights from across the industry. Learn more about Input.
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- Get an inside look at how other manufacturers have reshaped processes to advance their businesses with the Manufacturing Leadership Council's plant tours. Join an in-person plant tour or peruse summaries of past tours.
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Positioning Data as Industrial Capital

THE TREND:

Data is now treated as an operational asset—something to be governed, protected and used strategically across the enterprise. Manufacturers are building unified data architectures that connect plant systems, supply networks and customer insights into consistent models.

The biggest shift is the move away from fragmented, plant-specific data toward interoperable platforms. These platforms ensure that operational data has consistent definitions, accurate lineage and the context needed to support high-quality analysis and demonstrate value of the data itself, not just the end result.

More manufacturers are forming data stewardship teams to oversee quality and ensure that analytics projects use traceable, validated inputs. As data flows improve, companies are using predictive insights to enhance maintenance, manage inventory, adjust pricing and optimize energy spend.

Well-governed data systems also accelerate digital transformation. When plants use the same models and standards, AI deployments scale more quickly. Decisions become more evidence-based. Leaders gain a clearer picture of performance across multiple sites, and teams collaborate more effectively.

Manufacturers that treat data as capital tend to move faster, react more accurately to disruptions and make more profitable operational decisions.

Impacts to Manufacturers:

- Manufacturers need to continue to improve the organization's ability to collect AI-ready data, versus traditional operational data.
- By treating data with the same rigor as physical capital, manufacturers can unlock value and predictive insights that drive efficiency, quality, and innovation across every function.
- Unified data systems and strong governance ensure reliable, real-time information flows—empowering leaders to optimize operations, improve collaboration, and create new value across the ecosystem.

Resources

- Review the results from MLC's Data Governance, Mastery and Analytics
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- Discover what your peers are doing and gain new ideas from NAM SmartBrief. This quick daily summary of relevant articles around new technologies, data, sustainability, supply chain, workforce and morej explores how the industry is pivoting the perception of data.
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Prioritizing Energy Procurement, Transformation

THE TREND:

Energy strategy has become a financial and operational priority. Manufacturers are experiencing higher digital energy demands, rising volatility in energy pricing and increasing pressure to meet carbon targets. As a result, facilities teams no longer solely handle energy procurement—it now involves finance, operations and sustainability leaders working together.

Companies are blending long-term procurement contracts with flexible pricing mechanisms to balance risk and cost. Many are integrating renewables, exploring microgrids and evaluating onsite generation to gain greater control over energy supply.

Analytics play a growing role in energy management. Load forecasting tools help predict future consumption and optimize usage around peak periods. Advanced monitoring provides greater clarity on energy waste and equipment inefficiencies, enabling targeted investment.

Grid instability is prompting companies to think more strategically about resilience. Manufacturers are modeling future grid constraints and exploring technologies that support localized backup power or storage. These efforts reduce downtime risk and support long-term sustainability goals.

Energy strategy is shifting from a cost-management function to a driver of resilience and growth. Organizations that adopt a financial lens—balancing price, risk and carbon—are gaining greater control over their long-term operational stability.

Impacts to Manufacturers:

- Leading manufacturers are making energy a strategic advantage by integrating renewables, microgrids, and advanced analytics, manufacturers can stabilize energy costs, ensure supply reliability, and meet carbon reduction goals.
- Manufacturers can balance profitability, resilience, and environmental responsibility in a volatile energy landscape by linking sustainability with financial performance.

Resources

- Download this quick guide for tips on ensuring any capital investments and upgrades benefit from state and local credits, rebates and incentives.
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- Read this Strategic Guide to Energy Procurement
  READ NOW
- Watch this presentation on Energy Procurement
  WATCH NOW

Rethinking the Organizational Structure for a Digital Future

THE TREND:

Digital transformation is reshaping workforce needs, leadership expectations and organizational design. Automation and AI are creating new types of work, shifting job roles and requiring new skills across all company levels.

Manufacturers are reorganizing teams around digital workflows rather than traditional department boundaries. Cross-functional groups with engineering, operations, IT and data roles are becoming standard for technology projects and ongoing optimization efforts.

Skill needs continue to shift toward digital literacy, data interpretation and system management. Companies are expanding upskilling programs, offering microlearning paths and creating internal talent pipelines focused on automation, analytics and digital operations. As new technologies take hold, demand is rising for technicians, integrators and hybrid roles that blend mechanical, digital and analytical skills.

Leadership models are also changing. Managers need to support continuous learning, adapt quickly to new technologies and guide teams through ambiguity. The most successful organizations are fostering cultures that encourage experimentation, transparent communication and problem-solving at every level.

Attracting and retaining talent remains a challenge. Companies that provide growth opportunities, meaningful development pathways and modernized work environments are seeing stronger engagement and lower turnover.

Impacts to Manufacturers:

- Manufacturers must prioritize digital fluency, data literacy, and adaptive leadership to keep pace with evolving operational demands as automation and AI transform roles.
- Upskilling programs and human–machine partnerships will become central to attracting, retaining, and empowering a future-ready workforce that thrives in an increasingly digital environment.
- Manufacturers that can fail fast, scale what works and adapt without stalling will have a significant advantage in the future.

Resources

- Read the synopsis of MLC's Leadership, Culture, Organization and People survey results
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- Explore how R&D leaders should adapt and prepare for the culture change happening with the use of AI tools in this IRI podcast
  LEARN MORE
- Ensure that you offer the benefits desired by employees to attract and retain the workforce needed to succeed with Manufacturers Retirement 401(k) and Savings Plan. This high-quality multiple-employer plan helps employees feel secure while reducing the amount of time, personnel and money spent managing a retirement plan.
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Expert Insight

Beyond Hierarchies: How to Reshape Your Organization in the Age of AI

Author: Emily Richi, Partner, Citrin Cooperman

The manufacturing workforce is undergoing a significant transformation as automation and artificial intelligence (AI) rapidly reshape the industry. Manufacturers face an urgent need for employees with advanced digital skills, data literacy, and adaptive leadership capabilities. This shift is not simply about plugging technology into existing processes — it requires companies to reimagine both the types of jobs and the nature of work to keep pace with technological progress.

Data Literacy and Digital Management: The New Essentials

As automation and AI become commonplace in manufacturing, the demand for workers who can interpret, manage, and leverage data continues to surge. Whether it's operating smart machinery, analyzing production trends, or optimizing workflows, manufacturing employees are increasingly expected to navigate digital platforms and extract actionable insights. Data literacy is now essential across roles ranging from line operators to plant managers.

Companies at the forefront of this trend are investing in robust digital training programs to ensure their workforce remains competitive. These initiatives target not only technical proficiency in operating automated systems, but also broader competencies in data analysis and digital communication. Employees with digital management expertise can supervise integrated operations, troubleshoot algorithmic errors, and harness predictive analytics to drive efficiency.

Leading with Agility in a Rapidly Changing Landscape

Gone are the days when management focused solely on output and logistics; today's leaders must embrace new technologies, continuously adjust strategies, and effectively steer teams through periods of rapid transformation.

High-performing companies are rolling out leadership development programs with a strong emphasis on digital fluency and change management. These programs aim to empower teams to solve novel problems, cultivate a culture of learning, and facilitate human-machine collaboration. Forward-thinking organizations recognize that retention hinges not just on providing job security, but also opportunities for professional growth in an evolving digital landscape.

Collaborative Intelligence: Creating Balance in the Human-Machine Dynamic

As AI tools and autonomous systems take on repetitive tasks, the focus in manufacturing is shifting toward higher-value work that leverages uniquely human capabilities. This trend is redefining talent acquisition: manufacturers seek candidates who bring innovative thinking, cross-disciplinary skills, and the ability to work alongside intelligent machines.

Businesses are challenged to adopt new models for workforce development, including apprenticeships in digital manufacturing and cross-training between human and machine roles. These models not only broaden the talent pipeline, but also foster an environment where people and technology synergistically advance production goals.

With strategic planning, the right digital tools, and skilled talent, AI can significantly enhance service capabilities. Advanced technologies can process extensive customer data to identify patterns and trends that drive proactive service approaches. This foresight enables manufacturers to predict demand shifts, customize offerings, and resolve potential issues before they arise. By adopting intelligent automation and digital platforms, manufacturers build a dynamic, data-driven service ecosystem that not only fulfills present customer needs but also pioneers personalized solutions for sustained future growth.

Embracing this digital shift means preparing for new kinds of workers and new kinds of work — a strategy that will define industry leaders in the years ahead.


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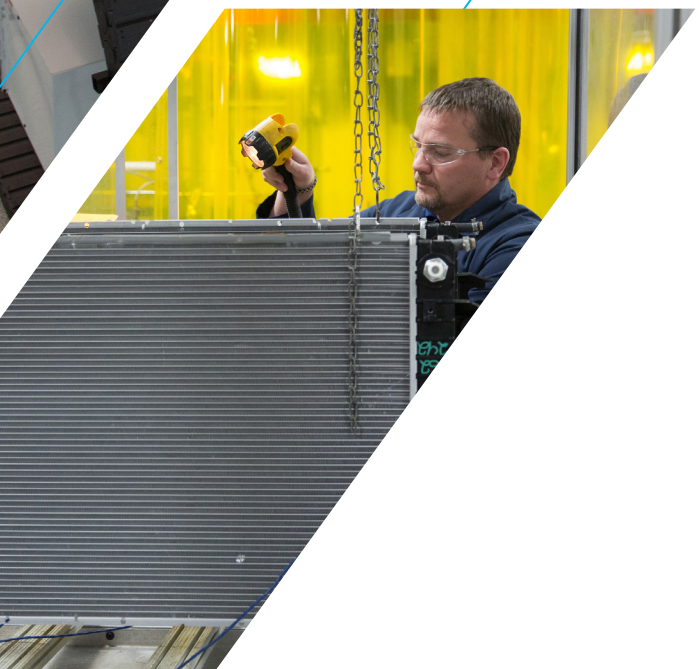
CONCLUSION:

Manufacturers that act on these eight trends will be better prepared for the demands of 2026 and beyond. The companies leading the way are building adaptable operations, using data strategically, strengthening their workforce and making decisions rooted in long-term resilience.

These trends highlight the opportunities ahead: smarter production, stronger supply networks, better use of energy, more secure digital systems and an empowered workforce ready to use advanced tools. With the right strategies and partnerships, manufacturers can turn these trends into real competitive advantage.



Other Resources

1. NAM Legal Referral Service Powered by Meritas

NAM members can access world-class attorneys from full-service law firms to help answer questions from contracts to labor and employment, environmental compliance, product safety, trade and intellectual property. Get a personal introduction to a qualified law firm and a 30-minute courtesy advice call.

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2. The Manufacturing Institute

This 501(C)3 nonprofit workforce development and education partner of the NAM builds, diversifies and strengthens the modern manufacturing workforce. Tap into the MI to access resources as well as a talent pool of highly skilled women, military veterans and students.

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3. NAM Shipping & Logistics

Don’t be caught unprepared if your organization experiences a delay in shipments and funds are not received when expected. UPS Capital, offered through the NAM Shipping program, provides peace of mind that your cash flow will not be negatively impacted by things out of your control.

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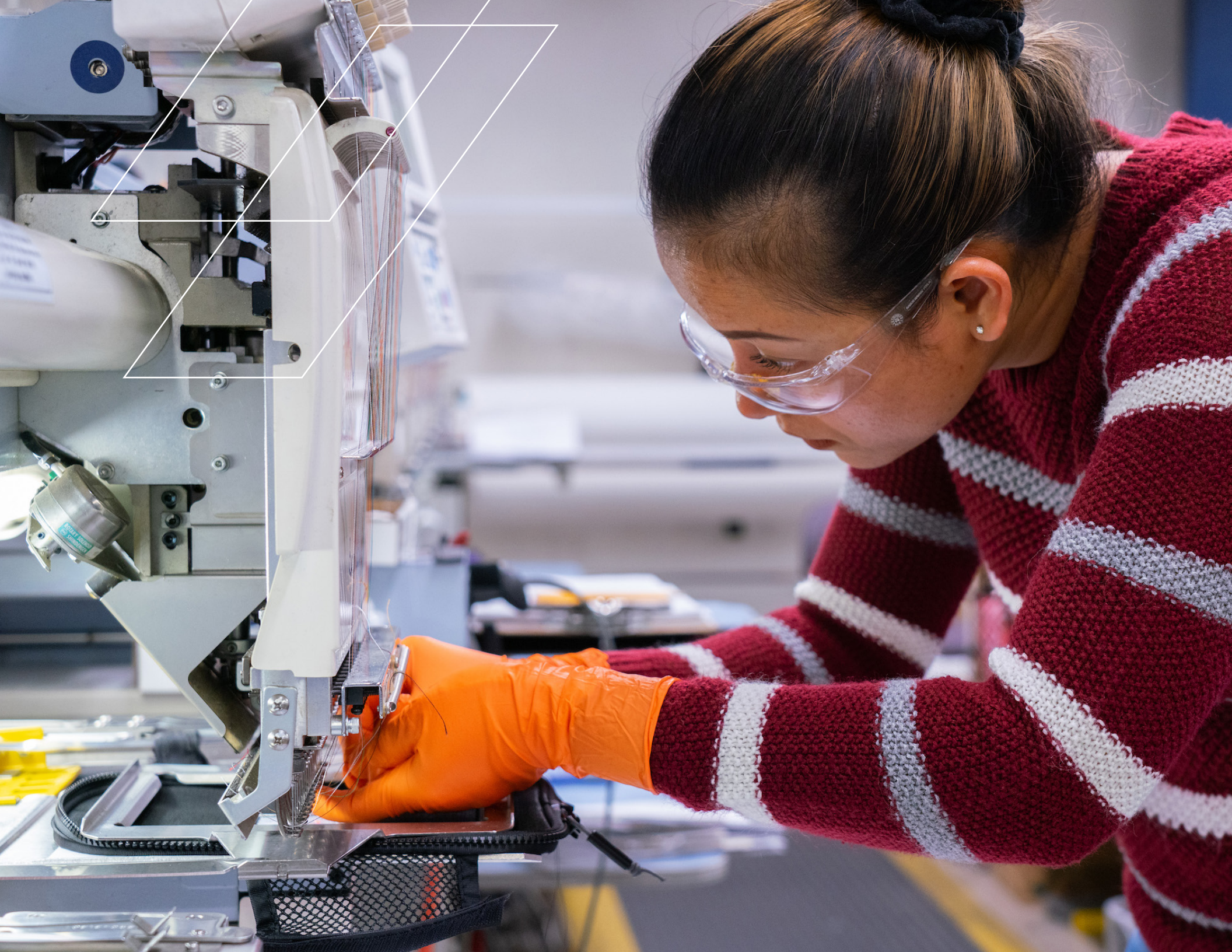

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Input
The NAM's morning newsletter delivers exclusive insights while keeping manufacturers informed on policy and business developments as well as the NAM's activities.

Power of Small
The NAM's exclusive resource network for small and medium-sized manufacturers provides access to trusted advisers and delivers intel and analysis on advocacy, workforce development, legal action, operational excellence and news focused on supporting manufacturers' long-term success.

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