AI & ADVANCED TECHNOLOGIES IN MANUFACTURING

How AI Powers Smart Supply Chains and Smarter Decisions

LMA Consulting Group®

SECTIONS & TITLES

FOREWORD | Lisa Anderson, President, LMA Consulting Group

Each year, I invite a cross-section of leaders—operators, technologists, financiers, risk experts and commercial strategists—to share what they're seeing on the front lines of manufacturing and distribution. We asked for two short paragraphs. What came back were pages of sharp, field-tested insight. Rather than compressing real substance into a "special report," we elevated it into this eBook.

A few threads run through every contribution.

First, *results come from integrated use cases, not lab demos. Demand forecasting, inventory optimization, advanced planning, MES (manufacturing execution systems) and associated IoT devices, digital twins and agentic AI create value when integrated into your operating backbone (ERP/CRM, MRP, planning, order fulfillment, quality and service), not on the sidelines.*

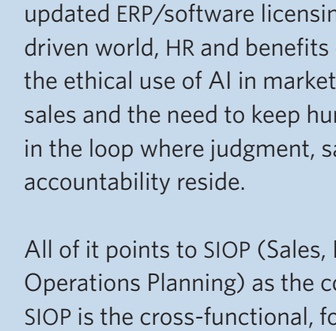
Second, *data has become both a constraint and an unlock for strategic value. What once required a billion-dollar scale is now within reach of mid-market firms: connecting a handful of systems with predictive processes and important insights emerge.*

Third, *adoption is uneven. Early movers who pilot focused use cases and scale what works are separating from the pack; those waiting for a "perfect strategy" are losing ground.*

Talent, execution and responsibility matter just as much as speed. Themes you'll see include the critical importance of talent, optimizing your use of ERP and related technologies, secure-by-design IT/OT, updated ERP/software licensing in an AI-driven world, HR and benefits compliance, the ethical use of AI in marketing and sales and the need to keep humans firmly in the loop where judgment, safety and accountability reside.

All of it points to SIOP (Sales, Inventory & Operations Planning) as the control tower. SIOP is the cross-functional, forward-looking cadence that aligns demand, supply and executive decisions, turning signals from AI and advanced technologies into predictable, tangible results in revenue growth, service, margins and cash. It's how you move from reactive to proactive, and ultimately, to predictive and transformative.

Thank you to the leaders who contributed their hard-won lessons. I hope that you'll use this eBook the way the best manufacturers use AI—practically, cross-functionally and with urgency.



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About Lisa Anderson

Lisa Anderson is the founder and president of LMA Consulting Group. Known for creating bold customer promises—and the operations to deliver them—she partners with closely held, private-equity–backed and large, complex organizations across aerospace and defense, building and industrial products, food and beverage, healthcare and medical devices. Her expertise spans the end-to-end supply chain, with a specialty in SIOP (Sales, Inventory & Operations Planning). Taking a holistic view of people, processes, systems, technology and finance, Lisa identifies the few priorities that create outsized impact—accelerating growth, margin and cash performance.

What's inside—and why it matters

- Strategy. From pilots to core operations: contributors demonstrate how predictive maintenance, vision systems, digital twins, advanced planning systems and agentic AI drive measurable gains when embedded in day-to-day processes, rather than layered on as experiments. The winning approach: pick a few high-impact use cases, learn fast and scale.

- Data & SIOP Enablement. Mid-market manufacturers can now integrate ERP/CRM/APS (and more) at a fraction of the historical cost and time. Once key data sources are connected, insight quality rises exponentially, fueling monthly SIOP decisions on demand, capacity, sourcing and inventory.

- Supply Chain & Networks. Adoption is fast but uneven. Decision-intelligence agents, GPS/geofencing and robotics are raising baselines while widening the gap between early adopters and laggards. Order status and supply chain visibility are integral to success. Logistics real estate strategy is shifting toward power, fiber, clear heights and automation-readiness, delivering double-digit improvements in cost and cycle time.

- Technology & ROI. The leaders aren't "adding AI" to old processes; they're rebuilding around operational intelligence, reporting step-change improvements in revenue growth, customer value, operational costs, service and inventory levels and faster throughput.

- IT/OT & Cybersecurity. As ERP/MES converges with IoT, attackers are also weaponizing AI. Security must be designed in: segmented networks, least-privilege access, disciplined patching, tested backups, model governance and incident playbooks that include safe shutdowns and manual overrides.

- ERP & Software Risk. AI is becoming the "new conductor" of ERP, making recommendations and automating actions while legacy contracts lag. Modernize licensing terms, controls and audit rights to match the new risk profile.

- Finance & Labor. Next-generation multi-axis "smart" machines enable one operator to perform the work of two or three, improving repeatability. Back-office automation is shifting finance teams toward analysis, forecasting and cash management, while investment cases remain grounded in staged pilots, operational milestones and clear payback.

- Talent & HR. Recruiting for automation roles blends AI-enabled sourcing with hands-on skill validation. HR's AI adoption must pair speed with fairness, transparency and human judgment as new rules take effect. Benefits platforms are moving beyond enrollment to year-round guidance; integration and PHI protection are non-negotiable.

- Commercial Excellence. AI-driven insights in CRM sharpen targeting, pricing, retention and pipeline quality. Automation frees sellers to spend more time with customers, while marketing utilizes AI responsibly—for ideation, personalization and analytics without compromising originality, privacy or trust. AI also powers sales forecasting and SIOP (Sales Inventory & Operations Planning) processes to drive revenue growth and customer value.

- International & Risk. Geopolitics and chronic chokepoints demand proactive monitoring, contingency planning and contractual readiness. Business continuity remains human-led: AI accelerates scenario modeling and signal detection, but culture, leadership and change management drive execution.

What ties it together

AI raises the tempo; the SIOP process keeps the orchestra in time. The combination drives predictive insights, resilient and forward-looking options to address changing conditions while minimizing risk and cost, and transformative upgrades to the end-to-end supply chain. A robust SIOP cadence links commercial plans to capacity and materials, converts insights into trade-offs before performance erodes and connects monthly executive choices to weekly/daily execution. As providers embed AI deeper into transactional and strategic workflows, SIOP becomes the governance rail for data, scenarios and scaling what works.

What to do next

- Perform a rapid assessment and select 2–3 cross-functional use cases tied to real bottlenecks/opportunities; measure forecast accuracy, quote to order conversion rates, promise date accuracy, production output, OEE, first-pass yield, schedule adherence, lead-time, OTIF, margin and inventory levels, not "AI usage."

- Upgrade the process and build the data foundation: simultaneously take the top-down and the bottom-up viewpoint to gain traction while upgrading processes and optimizing ERP and advanced technologies. Start with what's meaningful and where the signals are dense, such as demand or MES, focus on what's essential, such as critical customer and/or product groupings and connect with ERP and appropriate data sources to power SIOP.

- Select a pilot milestone to gain a quick win, incorporate insights and ideas, engage the team and determine the design and critical path to deliver a powerful ROI through a series of progressive steps forward.

- Execute and govern for speed and safety: clarify ownership, model oversight, security and change control; keep humans in decision-making and judgment.

- Invest in people: engage in AI and advanced technologies, teach prompt discipline, problem-solving and domain logic; validate skills with real work, not just polished resumes.

Use this eBook as a field manual. Start where value is obvious, scale what works and establish an operation rhythm that turns AI from experiments into enterprise results.

Arthur S. Beeman & Joel T. Muchmore

Founding Partners, Beeman & Muchmore, LLP

"ERP software licensing agreements negotiated before the advent of AI have become anachronistic almost overnight. Good business and legal decisions today acknowledge that the promise of AI is inseparable from its risks."

AI AS ERP'S NEW CONDUCTOR

The great orchestras of the world captivate us with their performances, not because a particular instrumentalist or section in the orchestra stands out. In fact, what puts us in the seats to listen to orchestral concerts is the magic of different instruments – violins, trumpets, clarinets, French horns and others – playing in harmony, creating a unified and beautiful piece of music.

What can be said about orchestras also applies to Enterprise Resource Planning ("ERP") systems, which are integrated software solutions that manage a company's core business processes. When functioning as intended, ERP systems act like an orchestra, with different departments (e.g., human resources, finance, supply chain) performing as different instruments. The beautiful music is created when the ERP software connects the various departments, providing a unified view of business activities and a single source for reliable and credible data.

Procuring ERP systems is a "big ticket item" for virtually every business. According to recent industry data, companies spend between 1% and 3% of their annual revenue on ERP implementations. On average, a small to mid-sized business can expect to spend between $20,000 and $250,000 on a basic ERP installation. At the same time, larger enterprises may invest many millions of dollars, depending on the scope, customization and number of users.

Until very recent times, the ERP orchestra was conducted by human beings, who inputted the data, analyzed the results and made critical business decisions. But now there's a new maestro in town and the ERP conductor's baton is being handed off to Artificial Intelligence ("AI"), which promises to redefine the music of ERP, making systems more intuitive, predictive and autonomous.

AI-conducted ERP systems are increasingly functioning as intelligent platforms that can predict future discordances before they arise. For example, AI-powered anomaly detection can identify inefficiencies in supply chains, predict equipment failures and recommend corrective actions. The AI conductor continuously learns from data patterns, adapting to new market conditions and operational demands. Foreseeing and responding to business needs in real time is the promise of AI.

The acceleration of AI into ERP systems is measured by days and weeks rather than months and years. In August, for example, Oracle Corporation, a global behemoth in ERP technologies and Google Cloud announced that they have expanded their partnership to offer ERP customers access to Google's most advanced AI models. With the new arrangement in place, Oracle's customers will soon be able to build AI agents for a wide range of tasks, including advanced coding and software development tasks, productivity and workflow automation, and research and knowledge retrieval.

"Oracle's AI-driven technologies will reshape how businesses go about performing day-to-day tasks like maintenance, customer engagement, data security and more," commented Dean Bolton, Chief Architect and Co-Founder of LicenseFortress, a software asset management firm that counsels its clients on software licensing and audit matters.

"But the real challenges still lie ahead," Bolton said. "It remains to be seen whether the transition to AI in the ERP world will be seamless or laden with speed bumps."

Indeed, the rapid advancement of AI in ERP systems has stirred serious concerns about data security, corporate espionage and competitive risks. With cloud-based ERP solutions, there is the risk that Generative AI, which learns from existing data to generate new content, could share or expose sensitive comparative data, jeopardizing customers' competitive advantages. Moreover, the risk of Generative AI extracting, modifying, and integrating code without authorization could lead to significant breaches in intellectual property protection.

How the risks created by AI are managed and allocated will be largely determined by the lawyers beating the drums of software licensing terms in the percussion section of the ERP orchestra. The fusion of AI and ERP is not just a technological upgrade – it represents a fundamental transformation in how businesses will operate in the future.

ERP software licensing agreements negotiated before the advent of AI have become anachronistic almost overnight. Good business and legal decisions today acknowledge that the promise of AI is inseparable from its risks. What tomorrow's software licensing terms in an AI-driven ERP world may look like and who bears the attendant risks of Generative AI remains to be seen and heard.

David Ogilvie

Founder, Ogilvie

"ROI isn't coming from broad GenAI rollouts—it's coming from targeted robotics and narrow AI on specific, repetitive tasks. When AI is engineered into integrated processes, the gains are real and sustainable."

ENGINEER AI INTO THE PROCESS, NOT THE HYPE

AI and Advanced Technologies in Manufacturing are commanding attention as organisations invest heavily in generative AI—yet the results are falling far short of expectations. A recent MIT report, titled "GenAI Divide," found that 95% of organisations reported no measurable return.

A recent example from Australia's largest bank, the Commonwealth Bank, illustrates this point. The bank announced 45 redundancies following an AI pilot in their call centre, which was projected to deliver productivity gains. However, it later reinstituted those roles and invited the staff back when it became clear that the technology could not replace the value of human labour. This episode starkly illustrates the wider finding: most corporate AI deployments are stuck in experimentation, with elusive gains and a persistent gap between headline promises and operational reality.

For manufacturing, the path forward is clearer but no less challenging. ROI is being realised not from broad AI implementation but through targeted investments in robotics and automation, where returns are real and measurable. Even as energy costs continue to climb, success comes from focusing on "small wins," deploying narrow AI or automation solutions for highly specific, repetitive tasks that cut costs and boost efficiency. However, both industry-wide analysis and the experience of the Commonwealth Bank caution against assuming that optimising in silos or substituting people for unproven AI tools will yield transformative results—integration bottlenecks and unmet expectations are recurring barriers.

For those seeking a lasting advantage, the lesson is that AI must be integrated into business processes, not simply layered on as standalone solutions. Effective manufacturing leaders tie AI to real operational bottlenecks, embrace disciplined integration plans and resist the lure of hype-driven spending. The Commonwealth Bank's reversal serves as a cautionary tale: genuine transformation demands tools that adapt, learn and evolve—while process reengineering and system-level thinking are vital for delivering sustainable benefit from both AI and advanced manufacturing technologies.

Keith Cerwinski

Regional Executive Vice President, American Business Bank

"Next-generation multi-axis equipment now allows a single individual to oversee processes that once required two or three operators—smart machines that measure and calculate automatically."

NEXT-GEN MACHINES, LEANER TEAMS, CAUTIOUS AI

As production costs continue to rise—driven by materials, energy and labor—many of my manufacturing clients are turning to automation as a disciplined hedge against these rising costs. Where two or three operators once managed a single machine, today's multi-axis systems enable one individual to oversee the same process. These next-generation assets perform in-line measurements and calculations automatically, tightening tolerances and reducing rework. The net effect is higher repeatability and steadier throughput, with scarce skilled labor redeployed to programming, setup and continuous improvement.

Looking ahead, clients are preparing for potential labor shortfalls over the next 12 to 18 months, a concern tied in part to restrictive immigration policies and, in some sectors, an aging workforce. Automation is being positioned less as a blanket replacement and more as a way to cushion variability—right-sizing crews, stabilizing schedules and protecting customer commitments when absenteeism spikes or hiring stalls. Alongside equipment upgrades, we're seeing renewed emphasis on cross-training and upskilling to keep people advancing with the technology.

AI adoption among small and mid-sized businesses remains measured. Many owners are still determining where AI generates tangible returns and how to govern it responsibly. By contrast, national and publicly traded companies are actively evaluating and investing, often starting with targeted use cases—such as predictive maintenance, production scheduling and quality checks—where the payback is more apparent and the operational risk is lower. For middle-market leaders, a pragmatic path is proving out: small pilots with defined metrics, followed by staged rollouts once value is verified.

The administrative side is also poised for meaningful gains. Automation is streamlining billing, collections, accounts payable, bank reconciliations and financial close activities through exception-based workflows. These advances won't make controllers or CFOs obsolete; instead, they shift the center of gravity toward analysis, forecasting and cash management. Teams may become leaner, but they'll also be more data-driven—providing the insight and oversight needed to guide ongoing investments in smart machines and AI.

Marco Arcadia

Senior Vice President, Group Director, Sunflower Bank

In the middle market, more manufacturers and distributors are weaving AI and advanced automation into their long-term strategy. What began as selective deployments—small robots to handle repetitive tasks—has broadened to plant-wide investments in machine vision, predictive maintenance and autonomous material handling.

The goals are familiar: reduce manual labor costs, improve quality and throughput and remain competitive as customer expectations continue to rise. But a second objective is now front and center: resilience.

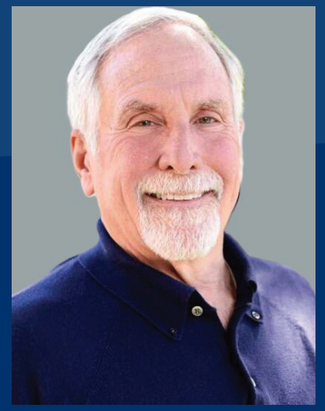
Recent disruptions made the case tangible. During the COVID-19 pandemic, some clients shut down for days due to outbreaks, new safety protocols or labor shortages—costly interruptions that exposed single points of failure in labor-intensive processes. At the time, low borrowing costs and clear paybacks (often inside three years) helped green-light projects. Today, even with financing costs higher than they were, many investments still pencil out when you model avoided overtime, lower scrap, fewer safety incidents and higher uptime.

Workforce volatility is another catalyst. Immigration-related disruptions have become a board-level risk in certain regions. One client experienced over 100 of its 275 employees absent in a single day following immigration raids in their city, prompting leadership to accelerate automation specifically to protect service levels and delivery commitments. Unlike human labor, automation doesn't call out sick, generate workers' comp claims or face compliance exposure; paired with AI, it scales consistently and predictably.

From a financing perspective, the winning patterns are pragmatic: stage projects to early wins; tie funding tranches to operational milestones; and measure payback in operations terms (OEE lift, first-pass yield, schedule adherence, lead-time reduction), not just a generic ROI line item. Many mid-market teams combine equipment financing with software subscriptions and services to align cash flow with value realization, while incorporating covenant headroom to accommodate a volatile demand environment.

Bottom line: in the middle market, AI and automation are no longer "nice to have." They are strategic investments in both competitiveness and continuity—tools to run leaner when demand softens and to scale without disruption when it surges.

"In the middle market, more manufacturers are embracing AI and automation—not just for efficiency, but to harden operations against labor volatility and future shocks."



Jay Prag

Professor, Claremont Graduate University

"AI will be to the service sector what automation and robotics were to manufacturing. Outsourced service jobs will be reshored—not to people, but to AI-powered programs."

From hand calculators to home computers to smartphones, from assembly lines to automation and robotics, innovations have enabled people to accomplish tasks more quickly and efficiently. Workers in every field are more productive than ever; workers who still have a job. By their nature, innovations replace what came before, including many jobs. Fearing or denying the inevitability of these changes is pointless. If the new approach is faster and more efficient, it will also be more cost-effective, and that means it will be widely adopted. So now we have AI.

Computer programs can mimic some of the activities of the human brain and learn to make decisions that we consider well-informed. Currently, AI-powered machines can drive a car, create legal documents, and write a high school term paper on Machiavelli. AI-powered autopilots can fly a jumbo jet carrying hundreds of passengers, no human pilot needed. The list goes on.

The questions then become:

- *Will the customer be okay with that?*
- *Will passengers pay for a ticket on a plane if they know there's no human pilot?*
- *When does a person want or need another person as part of a transaction?*

The father of modern management, Peter Drucker, was famous for asking, "What about the people?" The innovations being envisioned by AI developers create a new application of Drucker's mantra.

AI doctors can certainly diagnose disease given the symptoms, but will people be okay hearing that they have inoperable cancer from Dr. AI?

Everything that a teacher like me knows (well, almost everything) can be learned by Professor AI and then taught by an AI version of me. But is it going to be as simple as having a computer understand the skill set that a professor knows?

Consider this:

- *Would you pay for an AI-powered robot to teach your five-year-old how to swim?*
- *When AI is everywhere, where will human jobs still be in demand?*
- *Will the human job be nothing more than the messenger or, in the case of the airline pilot, the human who oversees the decisions of a computer?*

Ominous as this perspective sounds, it does help us understand short-term trends in the labor market and the economy as AI-based applications pick off the low-hanging fruit.

Outsourcing in the service sector has been a long-standing practice for many years. Coding, accounting, basic legal services and even customer services were offshored to countries with lower labor costs. Every user of these outsourced services faces a constant tradeoff between cost and quality. But AI can do most of those services.

The way it's often described, AI can perform any service, in this case, where the skills or processes are rote, formulaic and repetitive. Given that, AI will be to the service sector what automation and robotics were to the manufacturing sector.

So, the trend that is underway and likely to continue apace is that outsourced, offshore service sector jobs will be re-shored but not to people, to AI-powered computer programs. The end user of these services will trade the frustration of dealing with a far-away, outsourced labor force for the frustration of dealing with a computer program that still has things to learn.

Kathleen McEntee

President, Kathleen McEntee & Associates, Ltd.

"Use AI to support and amplify—not replace—human judgment and creativity. Be transparent about data and AI-generated content so you can accelerate growth and still earn trust."

HUMAN-LED, AI-ENABLED MARKETING & SALES

AI is changing the dynamics of marketing and sales—fast. Beyond drafting copy for marketing, it's about improving the way we analyze prospects and customers, segment audiences, score and route leads, optimize email timing and content, listen on social media, generate creative variants, personalize web experiences, forecast the pipeline and spot churn risk.

On the sales side, AI helps refine ICP/TAM (Ideal Customer Profile and Total Addressable Market), prioritize accounts, tailor messaging and timing, analyze win/loss and surface enablement content that actually advances the deal. It's also fueling a wave of new tools that make small teams extraordinarily efficient and feel bigger—if we use them thoughtfully.

That's the point: thoughtful use. We have an ethical responsibility to deploy AI in ways that support and enhance people, not cavalierly replace them. AI should inform decisions, not make them. Be explicit about how you use data and AI internally and (when relevant) with clients. Respect privacy and the law. If content, voice, video, images or audio were AI-assisted, be honest. And absolutely do not plagiarize—copying text, images or logos because "no one will notice" is still theft. I'm frustrated when I see people take AI-generated work and claim full authorship. I wince when someone says, "We'll just have ChatGPT whip up an article." AI can brainstorm and outline; however, a human must own the point of view (POV).

From practice and from a local working group in the Coachella Valley (CA) that shaped my perspective, here's a pragmatic approach:

- Human-in-the-loop. Use AI as a force multiplier, but a person makes the call and owns it.
- Transparency & consent. Disclose meaningful AI use, obtain proper permissions and protect PII.
- Originality. Treat AI as a catalyst for creativity, not a shortcut. Cite sources, license assets, etc.
- Data stewardship. Govern what data you ingest or share (customer, prospect, employee).
- Treat prompt design as a core competency. Teach, collaborate and share the skills.
- Sustainability. Recognize AI's energy footprint. Opt for efficient models, select eco-friendly options.

Right now, it does feel a bit like the Wild West because we're learning in real time. The opportunity is enormous, and so is our responsibility.

Leverage AI to improve, not replace, people. Be transparent, protect privacy, credit the work and keep the human voice at the center. That's how marketing and sales get smarter, faster—and more trustworthy—together.

Colleen Francis

Owner, Engage Selling Solutions

AI and advanced technologies are transforming the way manufacturers and distributors structure and lead their sales teams by streamlining operations and sharpening competitiveness, leading directly to a boost in sales results.

Specifically, predictive analytics and AI-driven insights within a CRM system enable teams to anticipate customer demand, optimize pricing and prioritize the most effective opportunities, thereby reducing wasted effort and enhancing pipeline quality. At the same time, AI-powered "early warning systems" predict customer defections, allowing sellers to take action to preserve retention rates and margins.

Automation tools—from CRM integrations to digital quoting and ordering platforms—eliminate manual processes, freeing salespeople to spend more time with customers and less time on administration, while reducing the need for sales support positions. Our clients are experiencing increased sales with higher profit margins as a result.

Key to sales messaging and marketing, advanced customer intelligence enables reps to tailor their messaging and value propositions to specific buyer needs, thereby creating stronger differentiation in competitive markets.

Examples

For manufacturers: AI-enabled production and sales forecasting can align factory output with sales opportunities. A manufacturer using predictive analytics to anticipate which products will see increased demand in a specific region can ramp up production early, allowing their sales team to approach distributors with guaranteed availability—securing preferred supplier status and preventing lost sales.

For distributors: AI-driven inventory and customer analysis ensure that sales reps focus on the highest-value accounts. A distributor using machine learning to identify which customers are most likely to switch suppliers can proactively offer tailored promotions and bundled deals, protecting key accounts while expanding wallet share.

Together, these innovations are accelerating sales velocity, improving margins and equipping teams with the agility to respond more quickly to changing conditions, ultimately driving more consistent and profitable growth.

"Predictive analytics and AI-driven CRM insights let teams anticipate demand, optimize pricing and prioritize the right opportunities—reducing wasted effort while lifting pipeline quality, retention and margin."

David Gering

Principal, Business Resilience Solutions LLC

"When crisis hits, you need someone who can think on their feet, not just follow pre-programmed responses."

AI and Business Continuity Management – What It Can and Can't Do
While AI is making waves across every industry, business continuity management isn't just another process that can be automated away. Sure, AI can crunch numbers and spot patterns, but when your operations are on the line, you need more than algorithms—you need human expertise.

AI Can't Replace Human Judgment When It Matters Most
When crisis hits, you need someone who can think on their feet, not just follow pre-programmed responses. AI lacks the nuanced judgment and real-world experience that seasoned professionals bring to the table, especially when facing unprecedented situations. There are tough ethical choices and value-based trade-offs, decisions that require accountability to real people.

Your Company Culture Isn't in Any Dataset
Every organization has its own DNA—unspoken norms, internal politics and cultural quirks that shape how things actually get done during a crisis. Organizational context is crucial when designing response protocols that people will actually follow when things go sideways.

AI Struggles with the Unprecedented (And Crises Are Often Unprecedented)
Most AI systems learn from historical data, but what happens when you face something completely new? When your business faces its own "black swan" event, you need human creativity and adaptability, not just pattern recognition.

Security and Privacy Need Human Oversight
While AI can enhance your security monitoring, it's not foolproof. AI systems can introduce their own vulnerabilities, from biased algorithms to exploitable weaknesses that bad actors might use to target data security and privacy.

Change Management Is a Human Game
Even the best business continuity plan is worthless if your team won't follow it. Successful BCM implementation requires change management, training and stakeholder buy-in—all fundamentally human activities. You can't automate trust-building or cultural change.

The Bottom Line
AI absolutely has a role in modern business continuity management. But thinking it can replace human expertise is like believing GPS eliminates the need for good drivers—helpful tool, but you still need someone behind the wheel.

The most resilient organizations will be those that thoughtfully combine AI capabilities with human judgment, leadership and cultural understanding.

Peggy Hosking

Shareholder, Buchalter

"While AI technology brings efficiency and competitive advantage, it also introduces new legal responsibilities and compliance challenges."

AI'S LEGAL REALITIES IN MANUFACTURING & DISTRIBUTION

AI is revolutionizing industrial operations by streamlining production, enhancing quality control and enabling predictive maintenance that reduces costly downtime.

In manufacturing, AI-powered robotics and analytics allow for greater automation and adaptability, leading to faster innovation cycles and efficiency gains.

In distribution, AI-driven tools optimize supply chains by forecasting demand, improving inventory management and increasing delivery accuracy through intelligent routing.

The integration of warehouse automation and autonomous logistics systems enables companies to respond quickly to market shifts and customer needs, thereby making their operations more resilient and competitive.

The adoption of AI introduces complex legal challenges across both manufacturing and distribution. Liability remains a central issue, as responsibility for accidents, defective products or algorithmic decisions may involve multiple parties ranging from software developers to equipment operators.

Regulatory compliance is also critical: AI-enabled machines must meet workplace safety standards, and AI-driven logistics systems must navigate rules governing autonomous vehicles or drones. Data protection laws such as the GDPR (General Data Protection Regulation) in Europe and the CCPA (California Consumer Privacy Act) impose strict requirements for handling consumer and supplier information processed by AI models.

Additionally, intellectual property concerns arise when AI systems contribute to product designs or supply chain optimizations, raising debates about authorship and ownership rights.

To address these risks, companies should implement governance frameworks that combine technical safeguards with robust legal oversight. This includes clarifying contractual terms in supply agreements to allocate liability fairly, conducting compliance audits for workplace and data privacy laws and ensuring transparency in AI decision-making to limit disputes over algorithmic accountability.

Strong cybersecurity protections are needed to secure sensitive operational and customer data from breaches. Additionally, proactive engagement with regulators can help businesses anticipate and shape emerging AI-focused policies.

By integrating legal due diligence with operational planning, organizations can harness AI's competitive benefits while minimizing legal exposure and maintaining stakeholder trust.

Candice Tal

Founder & CEO, Infortal Worldwide

"Whenever searches are initiated and not reviewed by a skilled human to critique the information and sources presented, the results and assumptions made can cause serious and unnecessary risk exposures across a multitude of scenarios."

AI IN COMPLIANCE - TRUST BUT VERIFY

Great strides are being made in the application of AI to corporate compliance and security for international businesses. Evaluating massive volumes of data and identifying new business opportunities can be accomplished by AI tools in seconds, compared to the time required for human analysis. AI tools are clearly reducing costs and speeding up information retrieval of known data. However, it is not all a bed of roses; there are many limitations, and caution is needed.

One issue of concern to distributors, manufacturers, and indeed any business, is that AI often hallucinates information and is literally known to make things up instead of presenting facts. The first clue is the online disclaimer: "AI responses may include mistakes".

How many users, even in the early adoption of AI tools, pay attention to this important disclaimer?

What are the risks to businesses from unidentified risks based on these unidentified mistakes?

Whenever searches are initiated and not reviewed by a skilled human to critique the information and sources presented, the results and assumptions made can cause serious and unnecessary risk exposures across a multitude of scenarios. Even worse are situations where AI generates false information to conceal its own biases.

While critical assessment of AI results may one day lead to increased operational efficiencies and improve competitive position or even corporate strategy, it arguably does not yet replace human assessment of data, at least in critical or high-risk business considerations.

AI is not yet effective in all areas for manufacturers and distributors, particularly in high-stakes areas such as compliance with AML/KYC regulations and global sanctions lists. This information may not exist in current datasets or from large data aggregators. The lack of available data may lead to misinterpretation of whether a new supply chain vendor, distributor or agent is operating illegally or involved in money laundering, or other forms of fraud and corruption, leaving important risk blind spots. Using incorrect information may cause a manufacturer to initiate business dealings with a partner who is corrupt or legally compromised, thereby exposing their business model to unnecessary risk. This could, in turn, lead to legal liability, regulatory sanctions, and significant reputational harm.

Another serious issue for executives to consider is that AI does not foresee potential risks around corners. AI recreates/recompiles known information and places it into context depending on the questions and/or prompts requested of it; its ability to create distinct analyses is limited by its inputs.

Additionally, AI cannot replace human intuition, "gut feel" or "hunches" when evaluating information and determining if anything is missing that should be present. AI may guess at, but be wrong about information that cannot readily be found or is not contextually available. AI computes results using linear, logic-driven parameters; however, out-of-the-box thinking and concerns about why information does not look right can be missed by AI. When it cannot determine an appropriate response, AI may move into the realm of dreaming or hallucinating information or erroneously presenting fiction as fact.

The best way to leverage AI tools is to consider them as a highly knowledgeable assistant whose job is to augment the skills and capabilities of trained employees. Staff training, review of findings and critical thinking are still essential to reduce exposure to erroneous AI findings.

However, it is also important that processing vast amounts of information and identifying complex patterns of risk that are not readily apparent to human beings are extremely important in improving competitiveness, supporting key decisions and perhaps even shaping business strategy.

CHOKEPOINTS & PROACTIVE SUPPLY CHAIN RISK

John Tulac

International Business Attorney

"War is God's way of teaching Americans geography." (attributed alternatively to Ambrose Bierce and Mark Twain). I'm sure you are well aware of the Ukraine/Russia war, the Israel/Gaza war and the recent strikes on Iran. However, there are 25 other active violent conflicts in the world, most of which are internal to the affected countries. Can you name them all? You can track these conflicts by using Conflict Tracker, an online tool from the Council on Foreign Relations (https://www.cfr.org/global-conflict-tracker).

War, civil war and civil strife can directly or indirectly interrupt or slow your supply chain or the delivery of your goods to your intended markets.

Can you name the seven chronic choke points in the global supply chain? They include the South China Sea, internal logistics and ports in China, the Strait of Malacca, the Suez Canal/Red Sea, the Arabian Sea/Persian Gulf, the Dardanelles and Black Sea and the Panama Canal. If your goods (whether as imports or exports) transit through any of these choke points, they are routinely at risk, and the probability of risk changes with global, regional and local events. Chances are high that if you have a force majeure clause in your global contracts, it is a standard (boilerplate) clause and is inadequate to invoke against known, foreseeable risks.

You are thinking, "I know this," at least generally. The problem is that if you wait to react to an incident, you are already too late. Geo-political risk analysis requires constant updates and predictive methods to ensure robustness and resiliency by having contingency plans to keep your goods in transit or soon to be in transit out of harm's way.

Software and advisory services can be (and are) expensive, but not nearly as costly as lost, damaged, destroyed or excessively delayed goods.

Fortunately, you can now train ChatGPT (the paid version) as a way of getting daily updates on conflict hotspots, choke points, specific markets/countries and other significant world news (such as energy markets). You can also utilize AI to track policies and proposed policies, including economic and foreign policies (both our own and those of others), as well as their effectiveness, and provide input on proposed legislation or regulations. It takes time to turn AI from a dumb tool into a smart tool - but it is a worthwhile effort, even though it is no substitute for having your own information resources and global network to draw upon.

"If you wait to react to an incident, you're already too late. Geopolitical risk analysis requires constant updates and predictive methods, with contingency plans to keep goods in transit out of harm's way."

Tom Hanson

International Trade Advisor,
Channel Architect

RETOOLING AT SPEED, AI-DRIVEN RESILIENCE

Since the Great COVID-19 Pivot of 2020, all manufacturers have demonstrated resilience, but it's the advanced ones—those utilizing AI, automation and cutting-edge tools—that have led the way.

We've seen clients rise to the challenge, setting new standards for agility and innovation. When demand for critical supplies surged, automotive and aerospace advanced manufacturers quickly retooled to produce ventilators and protective gear. Textile producers switched to making masks and gowns. And food and beverage processors shifted their focus to support hospitals and emergency distribution.

These pivots weren't just quick fixes—smart systems, such as AI-enabled tooling, interactive engineering, decentralized operations, transportation and warehousing, training and certification and tiered technical support, powered them. And newer generations of those battle-tested systems turn the wheels at advanced manufacturers every day.

AI is leveling the playing field, strengthening a company's operations, competitiveness and strategic plans.

Advanced manufacturers now thrive in every industry and region. This broad reach gives clients and supply chain partners unprecedented choice, opening doors to new and geographically diverse suppliers that were previously out of reach.

The lesson we take to our advisory work is clear: advanced, AI-driven manufacturing isn't just about making products—it's about rethinking how industries respond, adapt and lead. The pivots of 2020 were just the start; the next decade belongs to manufacturers who can innovate at scale.

"The pivots of 2020 were just the start; the next decade belongs to manufacturers who can innovate at scale."

Tim Harris

Founder & CEO, TQStarling

"Manufacturing is undergoing a fundamental shift as AI moves from experimental pilots to core operational infrastructure—predictive maintenance alone can cut unplanned downtime by 30–50% by reading sensor data and acting before failures cascade."

Operational Excellence Through Intelligent Automation
Manufacturing is experiencing a fundamental shift as AI moves from experimental pilot programs to core operational infrastructure. Predictive maintenance powered by machine learning is delivering measurable ROI by analyzing equipment sensor data to predict failures weeks in advance, reducing unplanned downtime by 30-50% in many facilities.

Similarly, AI-driven quality control systems utilizing computer vision can detect defects at a microscopic level and at speeds impossible for human inspectors, catching issues before they cascade through production lines. Digital twin technologies are perhaps most transformative, allowing manufacturers to simulate entire production processes, test optimization scenarios and predict outcomes before implementing changes on actual equipment.

Supply Chain Intelligence and Back-Office Transformation
The real competitive advantage emerges when manufacturers extend AI beyond the factory floor. Platforms like Palantir are revolutionizing supply chain visibility by integrating disparate data sources—such as supplier performance, logistics networks, demand signals and geopolitical factors—into unified intelligence systems that can predict disruptions and automatically suggest mitigation strategies. This level of supply chain orchestration is becoming essential as global networks grow more complex and volatile.

Equally significant is the automation of back-office functions that historically consumed substantial resources. ServiceNow and Moveworks are streamlining IT service management through intelligent ticket routing and automated problem resolution. Salesforce's AI capabilities are transforming customer service by predicting customer needs and automating routine interactions. In finance and HR, Microsoft's suite of AI tools is automating everything from invoice processing to employee onboarding workflows.

For manufacturers, this back-office efficiency isn't just cost reduction; it's strategic enablement. When administrative functions run autonomously, organizations can redirect their human capital toward innovation, customer relationships and strategic decision-making that drive competitive differentiation in an increasingly AI-augmented marketplace.

Julie Dorr

Lead Growth Strategist, Madison Logic

"Those who view AI not as automation, but as a strategic operating partner, will set the next standard of competitiveness."

Agentic AI is transforming the way manufacturers sell, market and serve their customers. Unlike rule-bound automation, agentic systems learn and make decisions in real-time—managing adaptive workflows across prospecting, nurturing and offer design — to shorten sales cycles and anticipate customer needs.

On the service side, AI-powered assistants and knowledge engines resolve routine inquiries instantly while routing complex issues to people. This blend of automation and intelligence strengthens supplier and customer relationships while freeing teams to focus on higher-value interactions.

Within the enterprise, cross-functional teams are integrating AI into ERP systems to enhance operations. Automation has long handled repeatable tasks; now, AI enables predictive forecasting, real-time insights and scenario planning across procurement, logistics and production—the move from executing known steps to anticipating what comes next.

Winning with AI requires new tools, metrics and mindsets. Traditional KPIs (such as impressions and basic response times) often overlook the value of adaptability and the depth of relationships. Manufacturers and distributors should measure responsiveness, learning velocity and customer lifetime value uplift—treating AI as a strategic operating partner, not just another automation layer.

Whether building in-house or buying off-the-shelf, the leaders will be those who align agentic AI to revenue goals and customer experience, with governance that keeps humans focused on strategy and judgment.

Jaime Portocarrero

Sr. Business Systems Consultant

"Modern MES platforms, paired with AI, turn real-time production data into faster time-to-market, sustained quality, shorter cycle times and higher OEE."

AI FOR SMB MANUFACTURERS - MINDSET, MES, MOMENTUM

Working with small and mid-sized high-tech manufacturers (typically with revenues under $100M), I'm seeing a decisive mindset shift. Owners and managers who once treated AI as "an IT project" now feel a real urgency—partly because their larger, tech-savvy customers are pushing for digital integration to reduce friction, lead time and costs. Rank-and-file employees are already utilizing LLM tools (such as ChatGPT and Copilot) daily; the pressure is mounting for leadership to establish a clear vision and implement automation.

Yet, most SMBs struggle to move from awareness to execution. Limited resources, scarce in-house expertise and uneven support from mid-tier ERP vendors make it difficult to form a credible roadmap. The result is experimentation without impact.

The most immediate and high-leverage opportunity lies at the Manufacturing Execution System (MES) layer. Modern MES captures rich, real-time line data. With AI integrated, that data becomes actionable, accelerating time-to-market for new products, sustaining quality by preventing out-of-tolerance conditions, shortening cycle times and improving OEE by minimizing downtime. Beyond the line, AI-enabled MES helps right-size inventory, streamline work-order flow and automate replenishment. Compared with legacy capacity planning in many ERP/CRP modules, today's MES-plus-AI approach maximizes throughput with far less complexity.

This isn't theoretical, it's operational. SMBs are using AI to:

- Detect anomalies early and schedule maintenance before a breakdown
- Translate machine/quality signals into automated containment and root-cause prompts
- Anticipate material needs and trigger supplier actions
- Surface bottlenecks by product mix and shift, then rebalance schedules accordingly

Strategically, this changes competitiveness. Faster learning cycles become a differentiator: each run produces data, AI turns that data into prescriptions and teams implement fixes in days, not quarters. For distributors and make-to-order shops, tighter digital handshakes with customers (including specs, forecasts and quality feedback) reduce rework and shorten the quote-to-cash loop.

What should SMB leaders do now?

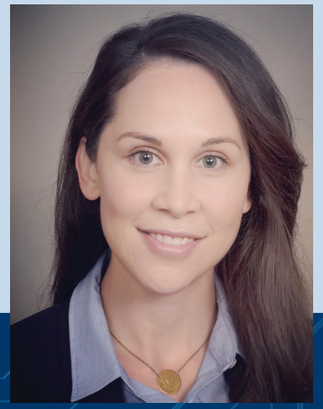
- Own the mindset.
- Start where the data is rich—MES.
- Tighten the ERP/MES loop.
- Build practical AI fluency.
- Treat "prompt engineering" as a frontline skill. T
- Govern for speed and safety.
- Measure what matters.

Bottom line: SMB manufacturers don't need massive budgets to win with AI. Start at the MES layer, close the loop with ERP, build team fluency in asking better questions and iterate.

The companies that do this will turn uncertainty into performance and make AI a durable operating advantage rather than a side project.

Diane Garcia

Senior Associate, LMA Consulting Group



FROM TACTICAL WINS TO SMART SUPPLY CHAINS

AI and Advanced Tech in the Supply Chain: A Practical Shift is Underway.

I'm seeing a significant shift in how manufacturers and distributors are approaching AI and advanced technologies. More and more clients are not just open to these tools; they're actively requesting recommendations that will enhance decision-making and deliver real, measurable improvements across their operations.

It's clear that AI is maturing rapidly, and while it hasn't yet overhauled enterprise-wide processes, it is making a growing impact at the tactical level. We're seeing it used in practical ways, such as transcribing meetings, producing standard work, streamlining reporting, supporting analytics and aiding the planning process. These small efficiencies are starting to stack up — and the organizations embracing these tools will ultimately differentiate themselves.

We're standing at the edge of a new scale. I expect that as ERP providers continue to embed AI capabilities deeper into both transactional and strategic functions, the transformation of how data is managed and decisions are made will accelerate rapidly.

The best part? We are the generation laying the tracks for what will become high-speed automation tomorrow. Each time we work to fine-tune and train AI agents, i.e., interpret data or interact with ERP systems, it gets us closer to a future where AI doesn't just assist — it accelerates business.

Ultimately, AI is enabling what I'd call "smart supply chains" — more responsive, data-driven and capable of adapting in real-time. The companies that lean into this shift early and thoughtfully will outpace the competition in speed, service and resilience.

"Ultimately, AI is enabling what I'd call 'smart supply chains'—more responsive, data-driven and capable of adapting in real time."

Patrick Daly

Managing Director, Alba Consulting

"AI itself may not take your job, but a colleague—or a competitor—who wields AI more effectively than you - will."

AI'S FAST, UNEVEN RACE IN SUPPLY CHAINS

From a macro perspective, the adoption of AI and advanced technologies in manufacturing and distribution is happening at a rapid pace, but it is anything but uniform.

On my Interlinks podcast, Fred Laluyaux, CEO of Aera Technology, described how large organizations are now deploying decision intelligence agents to automate thousands of small operational decisions that were previously left unattended, preventing what we could call the "entropy" of business systems. This means that what was once the slow decay of information quality due to outdated data can now be reversed through continuous automated updating. Yet the impact is not distributed evenly.

At a multinational life sciences client I work with, some employees are racing ahead—building their own custom agents and mastering prompt engineering—while others are still struggling to produce basic outputs, such as a simple presentation. The result is an accelerating divergence: early adopters are becoming increasingly capable, creative and productive, while those who are slower to adapt risk being left behind. As I often tell leaders, AI itself may not take your job, but a colleague—or a competitor—who wields AI more effectively than you - will.

At the micro level, this uneven adoption underscores why strategy must keep pace with action. As Hamish Mackenzie of NewSpace AI told me on Interlinks, companies should resist drafting all-encompassing AI strategies that will be obsolete before the ink is dry. Instead, they should identify and execute a small number of high-impact use cases, learning by doing and scaling what works.

I also see growing experimentation among distributors with warehouse robotics, where AI enhances picking, binning and scheduling to boost productivity. The macro shift is clear: advanced technologies are no longer theoretical—they are redefining operational baselines in real time. The micro imperative is equally clear: leaders must act pragmatically and with urgency, embedding AI where it delivers immediate, tangible value.

The race is already underway and it will quickly sort the field into winners and laggards.

Cory Whitman

Vice Chair, Colliers

"Site selection strategies aren't just about access to transportation hubs or labor anymore—they're about power infrastructure, data infrastructure, automation-readiness and future-proofing operations."

AUTOMATION-READY LOGISTICS REAL ESTATE STRATEGY

The theme is a timely one—AI and automation are already reshaping how manufacturers and distributors plan for real estate.

In the Inland Empire (So. California), we're seeing a fundamental shift, especially for highly capitalized companies: site selection strategies are no longer just about access to transportation hubs or labor—they're about power infrastructure, data infrastructure, automation readiness and future-proofing operations.

Robotics and AI-driven WMS/TMS platforms are driving demand for buildings with high clear heights, redundant power and fiber connectivity. Clients are asking us to evaluate properties not just on cost per square foot, but also on their adaptability to support automated systems and advanced fulfillment technologies.

Recently, we collaborated with a major national distributor that eliminated two regional warehouses in favor of a single, optimized facility equipped for automation. That one decision will reduce their real estate operating cost by 23% over the next five years while improving order cycle times by 18%, driven by AI-backed data modeling we helped support on the front end. We're on the second leg of this project now, analyzing their entire West Coast supply chain footprint and are likely to consolidate approximately 2 million square feet over the next 3-4 years in favor of a highly specialized, fully automated warehouse facility.

We're not just in a new economic cycle—we're in a new technological one. And it's changing the definition of a "strategic location."

Christopher Gopal

Faculty, UC San Diego; Strategic Board Advisor, Equitar Technologies, Inc.

"AI and accelerated edge technology are now poised to enable the necessary and radical transformation of global supply chain resiliency."

EDGE AI AND THE RESILIENCY FLYWHEEL

In an era of unprecedented globalization and risk, the imperative for resiliency in the distributed global supply chain has never been more urgent. The traditional methods of addressing this have typically included single-point and structural actions – diversification, x-shoring and increasing supply control through various forms of vertical integration.

As globalization has gone exponential and far more complex, resiliency has not kept up. This is because solving for exponential resiliency has been impossible, as it demands fast decision-making at the edges and scaling a linear sequence of centralized processes, commands and human stakeholder interventions—without a system of integration, complex problem-solving and continuous learning.

Fortunately, today's AI and accelerated edge technology are now poised to enable the necessary and radical transformation of global supply chain resiliency.

Today, the fundamental challenges of exponential resiliency can be addressed with mature and proven technologies that, when interoperating continuously, can start what the author has named The Resiliency Flywheel™.

With accelerated, massively parallel AI chips running at the edge in a multi-device environment, supply chain state data can now be observed and available for model training with near-zero latency.

With continuous AI learning models, complex supply chain risk analysis can now be performed in real-time, leveraging inference based on continuous learning models for accurate prediction.

With optionality generation, forecast models and optimization recommenders, AI-assist can properly inform human-approved responses, thereby solving for exponential resiliency at scale in terms of supply, material design, inventory, manufacturing, demand-supply matching and geopolitical and tariff changes.

In other words, intelligent decision-making at the edges.

In the future, 6G communication systems will deliver terabit-scale data planes, further enabling unprecedented distributed learning and computing. By 2030, it is expected that over 70% of supply chain data processing will occur at these intelligent edges, turning global supply chain networks into a mesh of intelligent, semi-autonomous and connected nodes.

Indeed, the supply chain of tomorrow will be driven by AI technology and parallel computing architectures, resembling a dynamic, intelligent network—with a decentralized, federated, continuously learning structure on a common data platform and an exponentially resilient flywheel.

Lisa Anderson

President, LMA Consulting Group

"SIOP is the governance that converts quotes, orders and forecasts into one cross-functional plan; AI accelerates the predictive analytics and alignment across ERP, CRM, CPQ, PLM, MES and APS."

Manufacturers don't miss targets due to a lack of effort; they miss them because functions optimize locally. Sales promises dates. Operations jumps through hoops to meet changing customer needs. Finance sees cash tied up in the wrong stock. And costs rise with suboptimal visibility, expedites and changing conditions. The problem compounds in high-volume businesses as demand and supply get out of sync quickly, and in custom and engineer-to-order businesses, where each quote can change routings, materials and lead times. Raw materials, components, inventory carrying costs and expedite costs (overtime, freight, labor, etc.) add up quickly as demand and supply run off-track. The gap is alignment.

SIOP (Sales, Inventory & Operations Planning) replaces parallel plans with a single one. At the monthly executive level, SIOP reconciles demand by product family and key attributes (planning families) with capacity, materials and cash, allowing for trade-offs to be made early and scenarios to be evaluated to maximize revenue and profitability. Weekly S&OE (Sales & Operations Execution) keeps execution tethered as reality shifts. Teams are seeing fewer last-minute changes and steadier schedules when decisions move upstream so that operational performance can be optimized with superior service levels.

AI doesn't replace SIOP—it makes it faster and more transformative. It unifies demand signals from CRM/CPQ/ERP, cleans and maps data across PLM/ERP/MES/APS/WMS and speeds credible ATP/CTP simulations before dates are promised. It also compresses scenario work (e.g., demand shifts, supplier slips, shift changes) so leaders see service, cost and cash impacts in time to act. In essence, SIOP provides key insights for executive decision-making and end-to-end supply chain optimization. Clients report revenue predictability, greater ability to scale rapidly, superior service, shorter planning cycles and measurable reductions in costs and inventory.

For configure- or engineer-to-order (CTO/ETO), attribute-based SIOP links quotes and option mixes to materials and routings, rolls up long-lead components and runs ATP/CTP simulations. AI speeds up finite-capacity rough cuts and constraint checks, ensuring promised dates and mix align with what can be built. Manufacturers report higher OTIF and fewer expedites as dates become more realistic upfront.

Leaders don't need hindsight; they need "what-ifs" with customer, operational and financial impact—a regional demand step-up, a supplier lead-time slip, a facility shift change, a transportation lane disruption, a tariff move. AI builds these scenarios quickly, quantifies the effects and recommends plan changes, allowing the executive team to make deliberate choices. Executives tell us that trade-off discussions are clearer and consensus comes faster.

Models are monitored for drift and bias to mitigate risks and increase accuracy; data ownership and stewardship are explicit; sensitive information is protected. Role-based views keep Sales, Operations, Supply Chain and Finance on the same page. AI accelerates analysis and predictive forecasts; humans retain judgment.

When AI-fueled SIOP is running, the pattern is consistent: growth goals are achieved through scalable operations, service improves (OTIF/lead time) because dates are accurate; margin improves as operational performance is optimized across the network and the mix is protected; cash improves as incorrect stock is replaced with the correct stock and inventory turns increase.

The result isn't "more dashboards"—it's one plan, one language and predictable performance across many systems. AI raises the tempo of signals; SIOP turns those signals into a single strategy that the enterprise can execute.

Alan Dunn

President, GDI Consulting & Training Company.

"These tools are powerful—and fast to damage in unqualified hands. Invest in logic and problem-solving, not just tools."

AI POWER DEMANDS HUMAN LOGIC

Since early 2024, I have been a bit obsessed with understanding how large language models (LLMs), artificial intelligence (AI) and machine learning (ML) can be constructively used to improve global supply chain design, planning, execution, economic performance, problem solving, catastrophe avoidance and enterprise resiliency. I have exercised no less than 30 AI-based supply chain management tools (apps) plus more than a dozen AI-based performance disaggregation and aggregation reporting tools. Though I still don't think I have learned all that is necessary to predict where this technology is going, here is what I can tell you for sure:

Powerful tools, thin proficiency.
Few professionals in the supply chain world are capable of effectively using these enormously powerful tools. It's not because the tools are complex—in fact, the brightest feature is the man–machine interface. They are simple to operate… and fast to damage in the hands of an unqualified operator. They are the proverbial Ferrari F40 in the hands of a 16-year-old predisposed to risk-ignorant decisions.

Speed without logic is dangerous.
Like many biological, mechanical, electrical and chemical systems, LLM/AI/ML tools move faster and dig deeper than humans. These new tools often outstrip people's skills. Why? Because many young professionals have been educated more in how to do things rather than how to solve problems. Some lack the logic base required to use these tools effectively. Many don't understand that it's essential to know how the tools work and how their domain works in order to trust the outputs. Most don't truly understand how their ERP systems work in a logical context.

Quality assurance collapses without domain understanding.
AI in the hands of people who lack underlying logical knowledge relinquishes the ability to perform basic quality assurance on tool output. This is very dangerous. Think about Boeing 737 MAX software engineers who failed to fully comprehend firmware-based algorithmic impacts on flight dynamics. Now multiply that by every company in the world and you don't have a single Ferrari steered by a single maniacal juvenile—you have an entire expressway of them. Disaster isn't a possibility; it is a probability, and a high one at that.

AI can amplify old ERP failures.
Enterprise resource planning systems have experienced dismal success rates for decades for similar reasons. Now we can put ERP on steroids with the certainty that unqualified people will make much bigger mistakes faster than ever. That isn't progress.

What worries me—and what wins.
I'm less worried about the advancements these technologies bring than I am about the extreme capabilities they place in unqualified hands, which can cause more than remedial mistakes. Catastrophic consequences come from decisions made without regard for possible outcomes. Yet companies that develop their people at the same pace they develop these technologies will see the opposite. Their trajectories—and those of their people—will lead to market domination and unbridled success.

Never have I seen a new technology that requires more investment in logical and problem-solving mental model training than AI, LLM and ML.

LaJoi McClendon

COO, StoneTapert Insurance Services

"AI is no longer just about efficiency—it's giving small and mid-sized businesses enterprise-level power to compete for talent and deliver a people-focused benefits experience."

Artificial intelligence and advanced technologies are reshaping employee benefits and transforming HR administration. Platforms such as HealthJoy, ALEX by Jellyvision and Nayya personalize plan recommendations and simplify the enrollment process. Meanwhile, tools like Flimp's AI Benefits Agent and Leena AI provide 24/7 guidance, deflecting routine tickets, speeding up answers and improving the employee experience.

For small and mid-sized businesses, systems like Ease have long streamlined onboarding and open enrollment. However, the move toward Employee Navigator illustrates how rapidly the market is evolving. Backed by major investment, this platform expands beyond enrollment to provide a comprehensive HR backbone for SMBs, with an AI Support Assistant (in beta) designed to deliver real-time answers for both HR teams and employees. This mirrors a broader HRIS trend: vendors are expanding beyond point solutions through partnerships and acquisitions (e.g., Employee Navigator's purchase of Ease), bundling enrollment, core HR and AI support under one roof.

The next edge comes from integration and governance. Connecting benefits platforms to payroll/HRIS and carriers via EDI/APIs reduces eligibility errors, automates life event changes and supports ACA reporting and COBRA administration. At the same time, guardrails matter: protect PHI, require clear audit trails, and route sensitive issues (such as claims appeals, leave and accommodations) to human experts. Used this way, AI doesn't replace HR—it amplifies it, helping employers communicate in plain language, nudge smarter choices (such as HSA funding, in-network care and cost-aware Rx alternatives) and monitor utilization to refine plan design.

Bottom line: AI-enabled benefits are moving beyond enrollment to year-round support. SMBs that pair smart tools with sound compliance and a human touch will reduce HR friction, elevate employee experience and compete more effectively for talent.

Eileen Angulo

Chief Solutions Officer, HR Solutions & Services LLC

"AI can turbocharge resume screening, scheduling, and matching—but with California's ADS rules taking effect on October 1, 2025, HR must pair speed with fairness, transparency, and human oversight. Use the tech, but use it responsibly."

RESPONSIBLE AI IN HR - SPEED, FAIRNESS & HUMAN JUDGMENT

AI is transforming talent acquisition by automating resume screening, interview scheduling, sourcing and candidate matching, thereby boosting efficiency and shortening the time to hire. After 25+ years in HR, I view AI as an augment, not a substitute: it can structure outreach, standardize assessments and surface overlooked candidates, but culture, judgment and accountability remain human.

With new regulations, such as California's Automated Decision-Making Systems (ADS) rule, taking effect on October 1, 2025, HR leaders must pair innovation with effective governance. The amended FEHA regulations make it clear: employers cannot use ADS in ways that discriminate against protected groups. Practical steps include inventorying all AI-enabled tools in your hiring stack, disclosing AI use to candidates, documenting criteria and data sources, conducting regular adverse-impact testing and ensuring that a qualified human makes the final hiring decision. Tight vendor agreements (including data use, retention and model updates), clear audit trails and accommodations for candidate accessibility are essential.

In practice, I advise clients to keep humans in the loop at every high-stakes moment: structured interviews anchored to job-relevant competencies, work-sample or job-trial assessments and reference checks that validate hands-on capability and team fit. Train recruiters and hiring managers on prompt discipline and bias awareness; measure what matters—time-to-qualify, first-90-day success and one-year retention—so AI can speed up the process without compromising equity or trust.

Used this way, AI helps smaller employers compete for top talent while preserving fairness, transparency and the human judgment great hiring requires.

Joe Van Tassel

Managing Principal, Integress

AUTHENTICITY WINS IN AI-ERA RECRUITING

Cutting Through the Noise in Recruiting
Isn't it the noisiest it's ever been? Between texts, emails and notifications, it feels like something new is constantly competing for our attention. The recruiting world is facing the same challenge, with AI-generated outreach flooding candidates' inboxes.

The result? Many candidates are left wondering whether a message is a real opportunity or just another bot-driven blast. For companies seeking to attract top talent, authenticity makes all the difference.

A tailored message that speaks directly to a candidate's background stands out in the noise. On the other hand, a broad, generic pitch is far more likely to be ignored. In recruiting, just as in any meaningful interaction, quality matters more than ever.

Reshoring, Skills Gaps and the Role of Automation
While recruiting wrestles with noise, manufacturing is grappling with its own transformation. Reshoring efforts are bringing production back to the U.S., but a significant challenge remains: the skills gap.

Over the past decades, as many jobs moved overseas, training and education for skilled trades slowed here at home. Today, that's left us with a shortage of workers ready to fill critical roles. Bridging that gap will take time, investment and a renewed focus on workforce development.

In the meantime, automation is stepping in. Robots, conveyors and vision systems are helping companies boost efficiency and predictability on the production floor. Moreover, the cost of automation has decreased significantly, making these solutions accessible to small and mid-sized businesses—not just the largest companies.

This trend isn't slowing down. In the years ahead, expect to see continued adoption of automation as companies balance reshoring with rebuilding a skilled workforce.

"A tailored message that speaks directly to a candidate's background stands out in the noise—quality matters more than ever."

David Bailey

President, BaileyWick Enterprises

“AI can screen at scale and sharpen the signal—but culture, safety and shop-floor judgment still demand a human in the loop.”

AI is rapidly changing how manufacturers find and evaluate talent. We’re already seeing virtual assistants handle first-pass screening—confirming shift availability, travel, pay ranges, certifications and baseline skills—so recruiters can engage more candidates per opening. Candidates are also using AI to tailor their resumes to job descriptions, which raises match rates but can obscure their true capabilities. That’s why AI should augment—not replace—human judgment, especially for culture, safety and collaboration.

In technical and automation roles (controls engineers, PLC programmers, robotics technicians, maintenance techs, vision/quality specialists), AI is most useful in three places:

Sourcing & Screening: Parsing profiles for specific positions/skills; generating targeted outreach; and running structured knockout questions to reduce cycle time without losing viable candidates.

Assessment: AI can pre-score work samples and simulations, but humans must review the output. A short, practical exercise: “walk me through how you’d …” beats a polished, AI-written resume every time.

Coordination & Experience: Automation for interview scheduling and status updates enhances the candidate experience and reduces drop-off, while freeing recruiters to focus on building relationships.

Controls matter. Left unchecked, AI can over-filter, amplify bias or misread context. Manufacturers should document use, test for adverse impact, protect candidate data and keep humans making final decisions. Just as important: guard against resume inflation by validating skills with practical tasks, references and trial projects when feasible.

For culture and safety, rely on structured behavioral interviews anchored in real scenarios, such as shift handoffs, lockout/tagout discipline and cross-functional problem-solving. Aim for “culture add,” not just “culture fit”—people who raise the bar on curiosity, teamwork and continuous improvement.

Measure what matters: first 90-day success, ramp to independent work, quality escapes tied to skill gaps and 12-month retention. The goal isn’t to replace people; it’s to hire better, faster and best qualified—using AI to widen the funnel while experts make the final call on capability and fit.

Kathy Dawson

CEO & President, Dawson & Dawson

"The companies that will win are the ones who can pair cutting-edge technology with the right talent strategy—investing in both recruitment and reskilling to stay competitive."

As a leader in search and staffing, we are witnessing the rapid transformation of manufacturing through the use of AI and advanced technologies. These innovations are reshaping not only operations and competitiveness but the very fabric of workforce strategy. For HR leaders, that means new challenges across recruiting, retaining and reskilling talent.

Workforce needs are shifting. Traditional line roles are declining while demand is rising for robotics technicians, engineers and data analysts. What works: build talent pipelines through trade schools and technical programs; cross-train current employees into tech-driven roles; and apprenticeship and mentorship programs to bridge skills gaps.

Recruiting is more competitive than ever, especially for hybrid-skilled talent that combines operational expertise with digital fluency. Manufacturers can strengthen their employer branding around innovation and growth, offering competitive packages that extend beyond salary (such as flexibility, purpose, and learning opportunities). They can also utilize specialized recruiters and AI tools to identify and attract passive candidates.

Reskilling and upskilling are essential. Many employees lack digital/AI skills, and training can feel expensive or disruptive. Modular microlearning that fits into daily workflows is helpful. Partnerships with workforce development organizations can help share costs. Most importantly, create clear career pathways that are directly tied to reskilling initiatives.

AI's strategic impact is real—predictive maintenance, smarter supply chains, better quality control—but HR is too often left out of adoption plans. Involve HR early in the technology strategy, utilize workforce analytics to predict skill gaps and hiring needs and develop flexible hiring models (such as contract-to-hire or project-based) to stay adaptable.

Finally, modernize employer branding. Manufacturing can still be perceived as "old school," limiting appeal to younger generations. Share innovation stories (AI, robotics, sustainability), spotlight employee success and growth and emphasize culture—purpose, trust, impact—in recruiting communications.

At Dawson & Dawson, we're seeing firsthand how AI and advanced technologies are changing the face of manufacturing. It's not just about automation, it's about people. The companies that win will pair cutting-edge technology with the right talent strategy, investing in both recruitment and reskilling to stay competitive.

Bruce Hoffman

Founder & CEO, Optimizepros

"Stop asking 'Where can we use AI?'—start asking 'What would we build if we had perfect operational intelligence?'"

BEYOND PILOTS, OPERATIONAL INTELLIGENCE AT SCALE

Manufacturing's AI Reality Check: Beyond the Pilot Program Purgatory
What I'm witnessing across manufacturing operations in 2025 isn't just AI adoption; it's a fundamental shift in operational paradigm that's creating a measurable competitive advantage.

The research confirms what I observe on factory floors: while 78% of manufacturers have transitioned beyond pilot programs into serious AI integration, only 5% are achieving rapid revenue growth. The difference isn't about having better technology demos. It's about manufacturers who completely rebuilt their operational frameworks around intelligent systems rather than retrofitting AI onto existing dysfunction.

The manufacturers I'm working with have implemented predictive maintenance systems that reduce unplanned downtime by 50% and utilize demand forecasting engines to cut inventory costs by 30%. These systems integrate with ERP systems that have been enhanced by machine learning, which optimizes operations based on real-time operational patterns and trends.

AI-driven label inspection ensures real-time quality control, reduces human error in repetitive tasks and can yield immediate ROI with short implementation cycles. Manufacturers can also slash inspection time with AI vision systems and utilize AI assistants to accelerate knowledge management systems to address gaps left by the departure of long-term employees. Additionally, automated order processing can improve customer relationships and enable growth without additional staff.

Companies implementing these integrated approaches are reporting 3.7x ROI on AI investments, with predictive maintenance alone delivering 25-30% maintenance cost reductions and 70-75% downtime reduction.

The difference between success and expensive failure? They stopped asking "Where can we use AI?" and started asking "What would we build if we had perfect operational intelligence?"

Mark Cioni

President, MV Cioni Associates, Inc.

"High-tech with high touch must manifest for employees, customers, partners and others across the holistic supply chain."

DIGITAL TWINS TO AGENTIC AUTOMATION

AI has made a significant impact within manufacturing and distribution, while also highlighting associated concerns. AI engagement spans straightforward use cases, such as research, vibe design and workflow automation, to more complex scenarios like multimodal (vision, sound) prototyping with digital twins and extensively autonomous process automation using agentic frameworks & intelligent instrumentation response.

Concurrently, AI usage should incorporate appropriate guardrails, including cybersecurity, quality control and performance management, among others.

AI also requires vigilance in areas such as model training and refinement, bias detection and ensuring responsible usage aligned with enterprise values, mission and objectives.

High-tech with high touch must be evident for employees, customers, partners and others throughout the holistic supply chain.

Obviously, enterprises will seek to derive foundational benefits, including reducing cycle times for production, rapid customization and new feature iteration, among others.

At the same time, enterprises should maintain visibility into opportunities to diversify their supply chains, mitigate the impact of tariffs and other constraints and prevent significant disruptions to supply chains, manufacturing operations and distribution channels.

Henry Park

CEO, Pandoblox

"AI now allows $50M firms to achieve billion-dollar insights by starting with just three data sources."

AI DATA ADVANTAGE FOR MID-MARKET MANUFACTURERS

Historically, advanced data integration was accessible only to the largest manufacturers. Integrating three data sources (i.e., ERP, CRM, WMS) for predictive analytics typically required the manufacturer to have $200–$500 million in annual revenue to justify the necessary investment in infrastructure, systems and specialized teams. Expanding to ten sources often demanded revenues in excess of $1 billion annually. As a result, mid-market companies were left with fragmented data, limited visibility and slower decision-making cycles.

Artificial intelligence has fundamentally altered this equation. Today, companies with $20–50 million in revenue can integrate three data sources at scale, while those with $100–200 million in revenue can manage ten or more. AI-enabled platforms now normalize, analyze and present KPIs at a fraction of the historical cost, delivering outcomes 10–20 times faster and at up to 90% lower cost than legacy data warehouse initiatives.

Critically, the value is not merely in efficiency, but in compounding insight: once three or more sources are integrated, organizations unlock an exponential "10x" increase in the quality and depth of insights. This integration reveals patterns, correlations and predictive capabilities that are otherwise invisible when systems remain siloed.

For manufacturers, this represents a strategic turning point. Firms that once lacked the scale to compete analytically with industry leaders can now achieve comparable capabilities far earlier in their growth trajectory.

Executives will need to adapt by managing their operations through integrated KPIs and real-time performance data, a skill set that has historically been confined to billion-dollar enterprises.

At the same time, this creates significant opportunities for consultants and service providers to guide organizations through the transition, helping them leverage data-driven insights to accelerate growth, improve efficiency and enhance competitiveness.

Shantae Hansen

Senior Account Executive, VC3

"Attackers are using generative AI to weaponize phishing and probe connected devices—manufacturers that treat cybersecurity as part of innovation, not a checkbox, are the ones pulling ahead."

SECURE-BY-DESIGN AI FOR SMART MANUFACTURING

AI is changing the game for manufacturers — not just in how they operate, but in how they compete. We're seeing companies use AI to optimize production schedules, predict equipment failures before they happen and even personalize customer experiences at scale. These aren't just efficiency plays; they're strategic moves that help manufacturers respond more quickly, deliver better results and differentiate themselves in crowded markets.

From our vantage point in IT and cybersecurity, one of the most significant shifts in manufacturing is how AI is being embedded in core systems—MES/ERP, IIoT devices and plant networks—as OT (operational technology) and IT (information technology) converge. Smart manufacturing is becoming the norm, and with that comes a new set of risks. Adversaries are using generative AI to craft convincing phishing lures, automate reconnaissance and exploit vulnerabilities in connected devices and networks. The leaders we work with treat security as part of their innovation strategy – not just a compliance box to check. They segment OT from IT, enforce least-privilege access and MFA on admin consoles, patch on a disciplined cadence and maintain offline, tested backups so they can recover from disruptions quickly.

AI can also help on defense. Behavior analytics and anomaly detection flag drift in user activity and machine signals, while automated response playbooks contain incidents before they spread. Governance matters: define data ownership and lineage, monitor models for drift and bias and require security attestations from integrators and cloud vendors. Build and test incident-response runbooks with managers, including safe shutdown procedures and manual overrides, and conduct tabletop exercises to ensure teams know exactly what to do.

The real competitive advantage is knowing how to use AI responsibly and securely. Manufacturers that integrate AI into their operations with a clear strategy, strong governance and a security-first mindset are better positioned to scale, adapt and lead.

Douglas Squirrel

Director, Squirrel Squared Limited

"Tools like ChatGPT, Claude and DeepSeek are actually best employed as eager, very junior research assistants—with the superpower to read and synthesize data at lightning speeds, producing summaries and useful search results from shelves full of documentation in minutes."

KEEP AI BACKSTAGE - ASSISTANTS, NOT STRATEGISTS

"Chatbots" aren't for chatting. Tools like ChatGPT, Claude and DeepSeek are actually best employed as eager, very junior research assistants with the superpower to read and synthesize data at lightning speeds, producing summaries and valuable search results from shelves full of documentation in minutes.

Of course, that isn't what you'll read in the tech and business press, where breathless technophiles are constantly promoting AIs as writers, managers and even company strategists. But I work on the bleeding edge of tech every day, and I assure you that today's and tomorrow's "large language models" are nowhere near ready for the boardroom or the foreman's desk. In fact, they can barely keep to a coherent narrative once you ask them to write more than a few pages on policy or strategy, and you can forget asking them to drive machinery or manage production schedules without a lot of human supervision. (For a good laugh at robot expense, check out the World Robot Games just held in Beijing; these stumbling boxers and footballers sure aren't ready for your assembly line.)

Instead, my best clients in manufacturing are keeping these "large language models" offstage, putting them to work behind the scenes to process mounds of information and produce innovative, highly profitable tools and services.

For example, one firm I work with utilizes its bots to efficiently process thousands of machine manuals, constructing "decision trees" that enable rapid diagnosis and problem resolution on the factory floor. And another has frozen hiring of software engineers, instead training LLMs to produce complex supply-chain management software under the watchful eye of senior programmers.

There's no question that AI will upend parts of your business in the next year or two, but it will be in the back office, not the front line. Keep the bots in the basement and you'll reap the rewards.

LMA Consulting specializes in manufacturing strategy and end-to-end supply chain transformation that maximizes the customer experience and enables profitable, scalable, dramatic business growth.

For more insights and information on supply chain transformation, please refer to the following ebook from LMA Consulting: SIOP Creating Predictable Revenue and EBITDA Growth

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