SUPPLY CHAIN connect™

August 2026

Setting the Stage for

AI USAGE FOR DEFENSE SUPPLY CHAINS

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By AVERY LARKIN

Setting the Stage for AI Usage for Defense Supply Chains

A new executive order puts AI to work identifying and addressing weak links across defense supply chains.

Artificial intelligence has worked its way into nearly every corner of the business world, where organizations use it to answer customer questions, write software, analyze data, forecast demand, make faster decisions and handle myriad other tasks. Adoption is high right now, with Stanford University reporting that 88% of organizations use AI in at least one business function, up from 78% a year earlier.

Still, AI is in its infancy, at least from the broad-use perspective, even though the technology has been around for decades. The field traces its roots to a 1956 workshop at Dartmouth College, where researchers coined the term "artificial intelligence." Fast-forward to 2026 and many AI users are still testing tools, setting internal rules and weighing faster decisions against the risks of bad data, weak oversight and answers that sound convincing but may be inaccurate.

Uncle Sam is no different, it seems. In a new *Securing America's Defense Supply Chains and Ensuring Domestic Acquisition of Critical Materials* executive order, the federal government laid out new requirements focused on getting a better view of the materials, components and suppliers behind military equipment. A new set of instructions for using AI across defense supply chains was tucked into those requirements.

Using AI to Map the Supply Chain

Specific to AI, this new executive order gives the technology a specific goal: helping the Department of War identify national security vulnerabilities across critical supply chains. Using acquisition information supplied by contractors, for example, the department says it wants to map the "vulnerabilities, bottlenecks and single points of failure" connected to key raw materials and other links in the chain. This process (aka "supply chain mapping") involves tracing where every material, part and supplier comes from, all the way back through the chain.

The order says the department has to consider any and all supply chain risks before granting future exceptions to domestic and allied sourcing rules. These AI-related efforts are part of a broader push to trace defense supply chains from raw materials through the final product.

Some of the new rules include:

- Contractors have to submit a complete, indentured bill of materials that traces components, parts, equipment, software and materials back to their raw material origins.
- They also have to establish written procedures for vetting suppliers and subcontractors for financial risk, foreign ownership or control and manufacturing or supply concerns.
- Contractors must keep covered materials from unreliable foreign suppliers out of critical supply chains, subject to specific exceptions.
- They have to take steps to reduce identified risks and track those actions through completion.
- And they must notify the department of significant risks within 15 days of completing the supplier review.

"Per the new guidance, military contractors will have to submit a complete indentured bill of materials that traces all components, parts, equipment and software back to the origin of raw materials in their supply chains," *DefenseScoop* reports. "They'll also need to implement procedures for conducting risk assessments and 'proactively' vetting suppliers and subcontractors, among other requirements."

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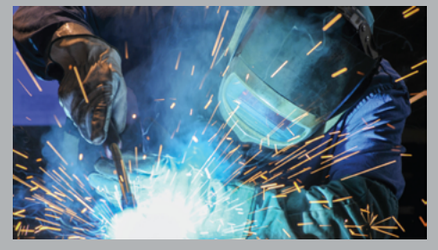
U.S. Manufacturing Continues its Expansion Streak

The Manufacturing PMI hits its highest point in more than 50 months in July, indicating continued positive growth for the domestic manufacturing sector.



Amid the ongoing business uncertainty, geopolitical events and economic concerns, the U.S. manufacturing sector continues to post month-over-month gains, according to the latest ISM *Manufacturing PMI Report*. This is positive news for a vital economic engine that's experienced its share of ups and downs over the last few years, and the growth doesn't appear to be letting up.

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By AVERY LARKIN

Small Components With Outsized Supply Chain Risks

As electronic components get more connected, inverters have become a target for bad actors in the supply chain.

Electronic devices that convert direct current (DC) into alternating current (AC), inverters play an important role in industrial electronics manufacturing because they make electricity usable by the equipment that runs factories, warehouses and other industrial facilities.

Even as industrial technology becomes more automated, connected and sophisticated, manufacturers need inverters that control motors, manage power from renewable sources and keep production equipment operating at the right speed and output.

The inverter's staying power comes down to a basic electrical mismatch: solar panels and batteries generate or store electricity as direct current, while most industrial equipment and the electrical grid run on alternating current. Inverters bridge that gap. In motor control applications, they also adjust the frequency and voltage supplied to a motor, allowing operators to change its speed rather than running it at full output all the time.

In industrial operations, inverters handle functions like these:

- On a conveyor line, an inverter controls speed and torque so products travel at the rate required by the operation.
- In pumping and ventilation systems, it adjusts motor output as demand changes, reducing electricity use and wear on the equipment.
- Solar arrays and battery storage installations use inverters to convert stored or generated DC electricity into AC power that a plant or the grid can use.

The devices are also built into compressors, mixers, mills and extruders, which means a shortage or sourcing restriction can reach far beyond the clean-power sector and into everyday industrial production.

Small, Mighty and Vulnerable

Inverters are used at a critical control point in industrial power systems, which makes them an attractive target for bad actors. Many modern units can also be monitored, updated and controlled remotely. That connectivity gives cyberattackers a possible route into the equipment and systems connected to them.

As the control points or "brains" in a solar PV, wind or battery energy storage system (BESS) installation, inverters optimize power flow, monitor performance, ensure grid safety and coordinate with the batteries and loads that are connected to them, like electric car chargers, air conditioners and heat pumps.

According to the International Energy Agency (IEA), modern inverters are usually connected to the internet and other networks, making them controllable remotely and therefore potentially vulnerable to cyberattacks.

"If a cyberattacker gains access, they can potentially control and alter the operation of the equipment the inverter is connected to," a team of senior IEA technology and supply chain experts writes in *Inverter supply chains and cybersecurity*. "Cyberattacks can either target an asset directly by exploiting weak points in its online connection, password protection or remote-control system; or they can arise from threats in the supply chain if 'back doors' (unauthorized access channels built into devices) are established during the manufacturing process."

Software updates can create another vulnerability area. For example, the IEA says malicious software can be included in an update supplied by the manufacturer, giving an attacker access after the inverter is already installed. Depending on the equipment affected and the scale of the attack, the consequences could range from a localized disruption to a lengthy blackout.

Pushing Inverter Security into the Spotlight

The IEA isn't the only organization raising concerns about inverter cybersecurity. On July 28, the Federal Communications Commission (FCC) announced an immediate ban on approvals for new foreign-made inverter products, citing "unacceptable risks" to national security. The ban applies to all countries, making it a broad restriction on foreign-made products.

ING Research says the decision could further disrupt solar and battery supply chains, with ripple effects for the fast-growing data center industry. Already-approved inverter models are exempt, so developers can continue importing products that have an FCC ID. That should limit immediate disruptions. Over time, however, the restrictions could complicate sourcing.

"Concerns around inverters are increasingly focused on cybersecurity," ING explains. "Many modern inverters have remote monitoring and control capabilities, creating potential vulnerabilities. If compromised, they could be manipulated or shut down remotely, disrupting power assets and, in extreme cases, affecting grid stability."

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Tariff Refunds Are Adding Up Quickly

Companies have received about $100 billion in IEEPA tariff refunds so far.

After spending much of last year navigating a complex and ever-changing global tariff environment, organizations are starting to see relief in the form of refunds. The reverse flow was triggered by the U.S. Supreme Court's ruling that the International Emergency Economic Powers Act (IEEPA) didn't authorize the administration to impose tariffs.

READ MORE

By AVERY LARKIN

Europe Raises the ESG Compliance Bar for Electronics

Europe's ESG rules are changing what electronics manufacturers have to track, document and report across their supply chains.

As U.S. sustainability reporting requirements remain in flux, Europe is pressing ahead with new environmental, social and governance (ESG) regulations. Some of the newer requirements apply directly to electronics companies and their supply chains.

Last month, the Global Electronics Association introduced IPC-1401B, ESG Management System Standard. The updated industry standard gives manufacturers a scalable way to demonstrate ESG performance to customers, investors and regulators.

According to the Association, the standard lays out a consistent way to document ESG performance while incorporating those requirements into existing operations and supply chain processes. It also reflects a broader push for more sustainability data as global customers ask suppliers for more information about environmental practices, governance and responsible sourcing.

"Manufacturers are under growing pressure to demonstrate credible, measurable ESG performance across their operations and supply chains," said Peter Zhou, one of the organization's lead sustainability experts. "IPC-1401B gives manufacturers a practical, scalable framework to integrate ESG into the way they do business every day, strengthening governance, managing risk, and meeting evolving market expectations that are reshaping procurement and investment decisions."

Built to Work With Existing Systems

Developed over the last 10 years, IPC-1401B was built on input from more than 400 committee members representing over 300 companies and 20+ industry associations. Some of those members include Foxconn, Huawei, Fujifilm and ZTE. The Global Electronics Association says all of these companies have adopted and deployed IPC-1401, which helps manufacturers:

- Embed ESG into every business function, from marketing and procurement to R&D, logistics and after-sales services.
- Manage supply chain risk by integrating ESG guidance across the value chain.
- Strengthen accountability by aligning compliance, governance, and investor-grade transparency.
- Meet customer and investor requirements with a framework built to their needs.
- Support responsible products, services and business conduct.

According to the Association, IPC-1401B works with existing management systems and is compatible with ISO 14001, ISO 45001, ISO 37301, RBA, IFRS S1 and GRI. As ESG expectations continue to expand, this compatibility makes it easier for manufacturers to build the new requirements into their existing systems.

"As ESG requirements increasingly shape green products, green production, responsible procurement and sustainable investment," Zhou says, "IPC-1401B offers manufacturers a timely tool to strengthen resilience, improve transparency, and support long-term competitiveness."

Why Electronics Needs a Common Standard

Electronics manufacturers and distributors have supply chains that stretch across several countries and include layers of suppliers that are difficult to see beyond the first tier. The OECD says that limited visibility can make it harder to track environmental, labor and sourcing risks across the full supply chain. This makes electronics a strong candidate for a common ESG standard.

The electronics sector also plays a central role in technologies like artificial intelligence (AI), clean energy, healthcare, digital infrastructure and electric mobility. For this and other reasons, ESG management has a wider impact that extends beyond a company's own manufacturing or distribution facilities.

"While some industries have slowed their ESG efforts, electronics manufacturers are facing growing pressure to integrate ESG into the way they source materials, manage suppliers, design products, and oversee operations," *KnowESG* points out. "The change is being driven by stricter regulations, investor expectations, and customers demanding greater transparency across the value chain."

Regulatory developments are accelerating this transition. Along with IPC-1401B, the European Union's Corporate Sustainability Reporting Directive (CSRD) and Corporate Sustainability Due Diligence Directive (CSDDD) both require companies to provide more reliable sustainability disclosures and strengthen due diligence across their value chains.

"As global sustainability expectations continue to evolve, the electronics industry is moving toward a model where ESG is no longer measured solely through reports," *KnowESG* concludes. "Instead, success will depend on how effectively companies embed responsible business practices throughout their operations and supply chains."

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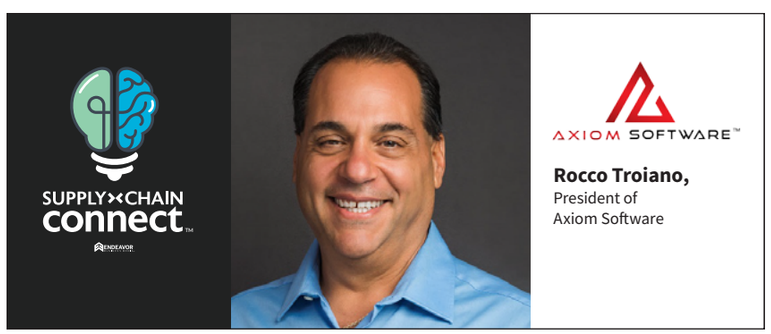
The Podcast Channel for Supply Chain Professionals

Supply Chain Connect provides supply chain and purchasing professionals with essential news, information and analysis about the technology and business trends that impact the global supply chain industry.



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From EDI to AI: The Next Wave in Electronics Distribution

Axiom Software President Rocco Troiano explores how AI, automation, APIs and clean data are reshaping electronic component distribution and helping distributors overcome manual processes, market volatility and legacy system roadblocks.

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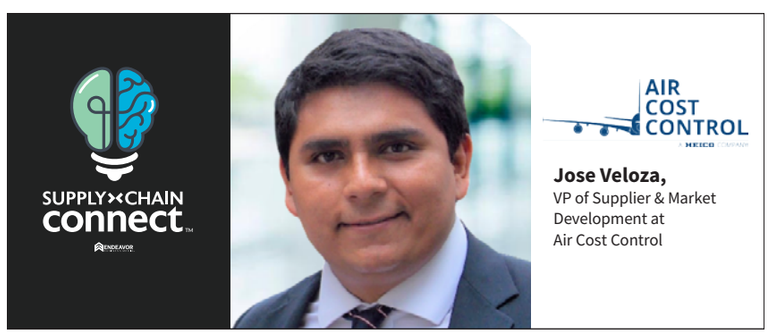
Weidmuller USA's President and CEO Randy Sadler shares how the industry is navigating AI driven demand, data center growth and decentralized manufacturing in a rapidly shifting electronic component market.



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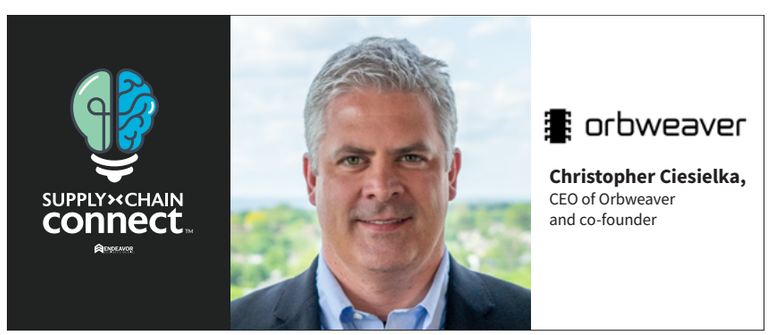
The Trends of Today's Aerospace Electronics Market

Jose Veloza, VP of Supplier & Market Development at Air Cost Control, details how the market is navigating post-COVID recovery, AI-driven demand forecasting and geopolitical volatility while keeping aerospace electronics flowing on time.



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Navigating the Web of Distribution, Data and Digital Transformation

Orbweaver CEO and co-founder Christopher Ciesielka shares what it takes for electronic component distributors to modernize: clean part data, smart automation, APIs that perform and a realistic approach to AI.

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By DAVE ANTOSH

Why Poor API Performance Has Become a Revenue Problem in Electronics Distribution

Application Programming Interface performance is no longer just a technical detail; it is a direct driver of revenue, customer experience and competitive advantage.

For years, Application Programming Interfaces (APIs) were treated as back-end infrastructure, owned by development teams and largely invisible to the business. That framing no longer applies. In today's electronics distribution landscape, APIs have become a primary interface for customer engagement, powering everything from product discovery and pricing validation to quoting and order execution.

This shift has elevated APIs from technical assets to revenue-critical channels. Engineers, procurement teams, contract manufacturers and digital marketplaces increasingly rely on APIs as their preferred method of interaction. In many cases, APIs are not just supporting the customer experience, they are the customer experience.

Organizations working closely with distributors on digital connectivity, including Orbweaver, are seeing this shift play out in real time. As API usage scales, performance is emerging not just as a technical concern, but as a measurable driver of revenue outcomes.

APIs Are a Front-End Experience

While not visible in the traditional sense, APIs have become the primary point of interaction. Customers who integrate directly with distributor APIs rarely visit a website or interact with a sales representative. Instead, their experience is defined entirely by how quickly and reliably those APIs respond.

When an engineer queries availability or pricing through an API, latency becomes the equivalent of page load time. When a procurement system validates a bill of materials, consistency and uptime replace traditional notions of usability. In this context, API performance is not abstract, it is immediately felt by the customer.

Forward-looking distributors are beginning to measure API performance the same way they measure digital storefront performance, tracking response times, success rates and abandonment patterns as indicators of customer experience quality.

Latency Directly Impacts Conversion

In high-velocity sourcing environments, time is a competitive differentiator. Automated purchasing systems and digital procurement workflows often evaluate multiple suppliers simultaneously. If one distributor's API responds faster or more consistently, it can influence sourcing decisions in real time.

Even small delays compound at scale. A few seconds of latency during product lookup, pricing confirmation or order submission can introduce friction that pushes buyers toward alternative suppliers. In automated environments, a slight latency for a single line item could escalate drastically when millions of line items are being actioned. To drive the point home, even a ten-millisecond reduction for a single transaction equates to more than two and a half hours cumulatively over one million transactions. These are not numbers simply picked to prove a point, as multimillion part catalogs are common.

Based on observed integration patterns across the industry, even modest improvements in response time can translate into meaningful gains in API utilization and transaction volume. Performance, in this sense, becomes a lever for growth.

AI and Automation Are Amplifying Demand

The rise of AI-driven sourcing and automated procurement is accelerating API traffic well beyond historical levels. Applications are no longer making occasional requests; they are continuously querying for availability changes, price fluctuations and supply chain disruptions. While AI has semantic and reasoning capabilities that did not exist previously, it often won't take the most efficient path to perform its tasks.

This creates a structural challenge for many distributors. Legacy ERP and transactional systems were not designed to handle this volume of external, real-time demand. As API calls increase, systems become strained, leading to throttling, degraded performance or restricted access.

Organizations supporting large-scale API ecosystems are increasingly seeing that what once worked for incremental digital adoption begins to break under exponential demand.
Throttling Is a Hidden Customer Experience Risk

To manage system load, many organizations implement rate limits or throttling mechanisms. While seemingly necessary from an operational perspective, these controls can unintentionally degrade customer experience.

From the customer's point of view, throttling manifests as failed requests, delayed responses or inconsistent data retrieval. In automated environments, these issues can disrupt workflows or trigger fallback behaviors that redirect business elsewhere.

Because these interactions often occur machine-to-machine, the impact is not always immediately visible. However, over time, unreliable API performance can reduce trust and discourage deeper integration, particularly among high-value customers building their own digital procurement capabilities.

Throttling is often a go-to for systems with an inability to scale. When traffic comes in bursts, fast scaling is paramount and often removes the need to throttle.

Legacy Infrastructure Was Not Built for This Moment

At the core of the issue is a mismatch between modern digital demand and legacy system design. Many ERP platforms were built for internal transaction processing, not for serving as high-volume, externally accessible data services.

Exposing these systems directly to API traffic introduces both performance and risk challenges. Increased load can impact internal operations, while security and stability concerns limit how broadly APIs can be exposed.

Replacing core systems is rarely practical in the short term. As a result, many distributors are looking for ways to extend the life and capabilities of existing infrastructure while meeting modern expectations for speed and scalability.

Digital Acceleration Layers Are Gaining Traction

A growing number of distributors are addressing this challenge by introducing a digital acceleration layer between customers and core systems. This approach decouples external API consumption from internal transaction processing, enabling greater scalability and control.

These layers typically incorporate capabilities such as edge caching to reduce repetitive queries, robust data indexing, normalized APIs to simplify integration across disparate systems, asynchronous processes to decouple long running tasks from time-sensitive requests, redundant, fail-fast workloads, and centralized monitoring to provide visibility into performance.

Orbweaver and others operating in this space have helped bring this architectural model into focus within electronics distribution. The broader takeaway is not about any single platform, but about the emerging consensus: API performance must be engineered intentionally, rather than inherited from legacy environments.

Performance Optimization Creates Dual Value

Investing in API performance is not solely about improving customer experience. It also delivers measurable operational benefits.

Reducing direct load on ERP systems lowers infrastructure strain, minimizes the risk of outages and can decrease operational costs associated with scaling legacy environments. At the same time, improved API responsiveness enhances

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By BRIDGET MCCREA

Americans Say "NIMBY" to the AI-Driven Data Center Construction Boom

As AI usage increases, communities nationwide are pushing back against the data centers needed to power it.

Love it or hate it, artificial intelligence (AI) has become part of everyday life for most Americans. According to a recent YouGov survey, 81% of U.S. adults have used some form of AI, including chatbots, recommendation systems, voice assistants and AI agents. And nearly half (48%) are using AI at least once a week.

YouGov also found that 18% of Americans use AI every day, including 25% of millennials. A different YouGov survey revealed that 11% of Americans use AI tools multiple times a day, 10% use them daily and another 21% use them at least once a week.

As more Americans use AI for a wide range of tasks, many of them don't understand the raw computing power required to train and run large language models (LLMs) like ChatGPT, Claude and Gemini.

These and other systems rely on massive networks of servers housed in data centers that are springing up all over the country. By 2030, JLL expects global data center capacity to nearly double to 200 gigawatts, up from about 103 gigawatts last year. It credits demand for AI and hyperscale cloud (i.e., those cloud-computing operations run by companies like Amazon, Microsoft and Google) with driving much of that growth.

70% Oppose the Plans

Americans may have embraced chatbots and other AI-driven tools, but the last thing most of them want is a new data center in their backyard. That opposition has turned into a modern-day version of the "not in my backyard" (NIMBY) mindset that took hold in the 1970s and 1980s, when communities acknowledged the need for power plants, waste facilities and other major infrastructure but fought to keep them away from their own homes.

The U.S. currently has more than 3,000 operational data centers. That number is expected to grow substantially in the years ahead, with more than 1,500 new data centers currently in various stages of development, according to Pew Research Center. Of these facilities,

- 67% of planned data centers are in rural areas.
- 87% of existing data centers are in urban ones.
- 39% of planned data centers are in counties that currently don't have any.

Pew says most of the planned construction of U.S. data centers will take place in the South and Midwest. Three-quarters of all planned data centers will be built in these two regions, with the South alone accounting for nearly half of them (48%).

According to a recent Gallup survey focused specifically on AI-based data centers, 70% of people oppose constructing such data centers in their local area. And nearly half (48%) are "strongly opposed" to these projects. It's the first time Gallup has polled Americans about data center construction, a topic that local residents in many parts of the country have been speaking up about.

"These data centers house computing equipment that helps power AI technology used by businesses, universities and other institutions," Gallup reports. "The centers cover large areas of land, require extensive amounts of electricity to operate and need substantial water to cool the equipment, raising concerns about their impact on the environment and local electric bills."

Why Communities Are Pushing Back

Gallup's survey also included some open-ended questions meant to dig deeper into the issue. It says about half of the detractors mention data centers' excessive use of resources, with 18% each citing water and energy use as the biggest issue. Sixteen percent cited related pollution concerns, including noise, air and water pollution.

About one in five opponents is worried about the impact on local quality of life, including increased population, increased traffic and preferring that the land be used for other purposes. "A similar share mentions potentially negative economic consequences," Gallup says, "including higher utility bills, cost-of-living increases, and the cost of building the data centers (which could involve the use of taxpayer funds)." ■

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Why Poor API Performance Has Become a Revenue Problem in Electronics Distribution *(Continued from page 13)*

customer satisfaction and increases the likelihood of repeat business and deeper integration.

The dual value of external experience and internal efficiency is why API performance should be discussed in executive conversations, not just within engineering teams. Even a small optimization will both improve the quality of the data, due to it being more recent, and get an external system out of a long data load, making it more responsive.

API Strategy Is Becoming a Competitive Differentiator

As digital channels continue to expand, API capabilities are influencing how distributors are evaluated and selected. Performance, reliability and ease of integration are becoming key criteria alongside traditional factors such as pricing and inventory availability.

Organizations that treat APIs as strategic products, complete with performance benchmarks, usage analytics and continuous optimization, are better positioned to capture digital demand. Those that view APIs as secondary infrastructure risk falling behind as customer expectations evolve.

A new component of API strategy to consider is Model Context Protocol (MCP). With MCP, tools become like endpoints for an AI model to communicate with. This allows a very natural use of a platform. In this environment, the ability to deliver fast, consistent and scalable API experiences is becoming a defining characteristic of digital maturity.

The Path Forward

The role of APIs in electronics distribution has fundamentally changed. What was once a technical interface is now a primary driver of customer engagement and revenue generation. Distributors that recognize this shift are beginning to rethink how their digital ecosystems are structured, introducing new layers, new metrics and new ownership models that align API performance with business outcomes.

As AI-driven sourcing and autonomous procurement continue to evolve, the importance of this foundation will only increase. API performance is no longer just an engineering concern. It is a strategic business priority, one that will shape how distributors compete, scale and serve customers in an increasingly digital supply chain. ■

By AVERY LARKIN

Less Than Half of Global Firms Are Prepared for Supply Chain Disruption

New research from ISM and Amazon Business reveals that 65% of global firms are using manual reporting and just 45% feel prepared to manage supply chain disruptions.

When it comes to handling unpredictable demand spikes, geopolitical conflicts, shipping interruptions and catastrophic events, less than half of the world's organizations feel prepared. U.S. firms rate themselves slightly less prepared, while those in Asia rate themselves somewhat better. Organizations with larger supply chain groups report the highest preparedness, according to new research from the Institute for Supply Management (ISM) and Amazon Business.

"Supply chains have undergone a fundamental shift as a result, with a relentless pursuit of lowest unit price evolving into a more complex mandate [of] balancing cost and risk," the companies note in "Balancing Cost and Risk: An Operating Model for Supply Chains." "That balance has become a board-level priority, framed in terms executives understand: revenue protection, margin stability, and continuity of operations."

Balancing Cost and Risk is the Default

Across all regions and organization sizes, respondents say balancing cost and risk is becoming the "default operating posture." In the report, David C. Dowty of Amazon Web Services says COVID-related supply chain shocks have merged with geopolitical challenges to create new financial stressors on raw material sourcing. "That has created an environment where everybody is reevaluating everything we thought we knew about industrial supply chain management," he adds.

Meanwhile, ISM's data finds that even as disruptions accelerate, many teams still rely on manual reporting and a narrower set of risk signals. Among the other key findings in the report:

- **Manual reporting is still widespread.** Two-thirds (65%) of respondents use manual reporting to gather data; larger departments rely less on manual methods and more on automation.
- **Most organizations report balancing cost and risk.** 71% said balancing cost and risk is a primary goal, with respondents in Asia reporting greater emphasis on risk mitigation and larger firms placing emphasis on cost savings.
- **Risk evaluation still skews to traditional measures.** Financial health assessments and quality management systems remain the primary supplier risk evaluation tools for organizations. "U.S. respondents report higher use of cybersecurity measures; larger organizations report more use of geographic concentration analysis and environmental compliance checks," the companies note.
- **Tools are common, but sophistication varies.** Respondents noted that their organizations largely rely on e-procurement solutions (58%) and supplier portals (51%). "Larger organizations more frequently use contract management systems, risk monitoring and predictive analytics," they add, "while Asian firms report lower usage of supplier portals and risk-monitoring tools."

4 Ways to Build Supply Chain Resilience

As organizations weigh cost against risk, ISM and Amazon identify four common practices that companies can use to build supply chain resilience in this uncertain environment:

1. **Diversify supply and fulfillment.** Companies increasingly see single-supplier strategies, once prized for efficiency, as vulnerabilities. "You don't need five suppliers for everything," say ISM and Amazon, "but you do need options where it matters."
2. **Improve visibility deeper into the supply chain.** New data and analytics tools help organizations monitor price, availability and supplier events in near real time. Multi-tier mapping tools reveal dependencies that companies couldn't see before: "When you can see six or eight levels down, it changes the conversation. It makes risk real."
3. **Shorten decision cycles.** Traditional procurement processes like lengthy RFP cycles no longer cut it in our fast-moving world. "The market can be fundamentally different six months after an RFP, making decisions obsolete by the time contracts are implemented," the organizations caution.
4. **Use scenario planning to manage risk.** Simulate potential disruptions, from geopolitical events and natural disasters to supplier failures and cyberattacks, and map out responses in advance. "It's hard, it takes time, and it's not always comfortable, but when something happens, you're ready."

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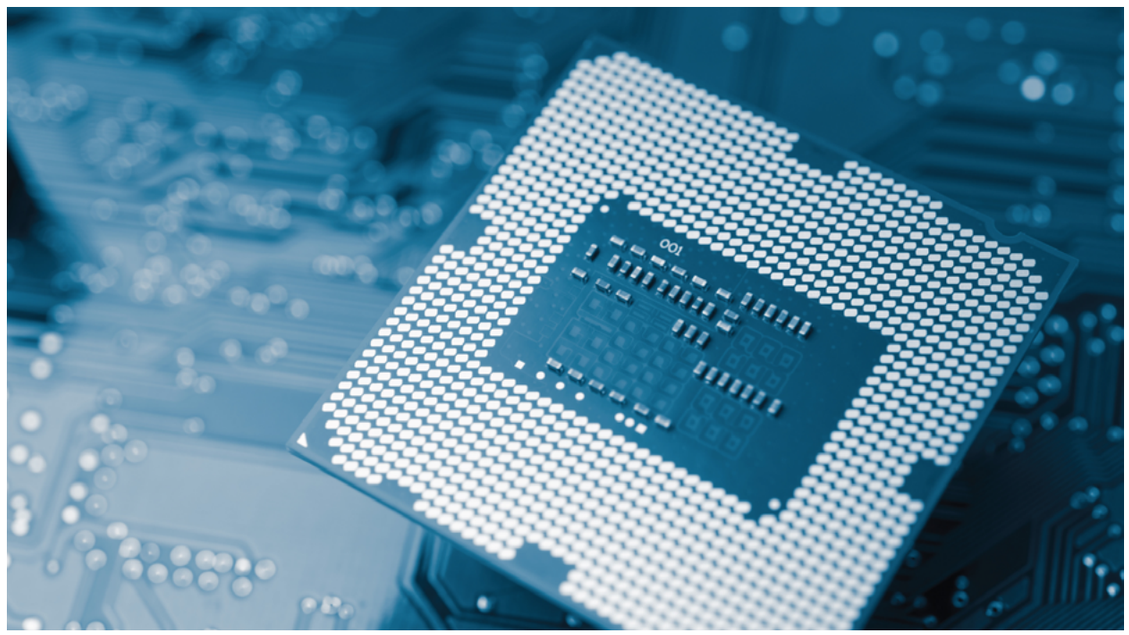
By AVERY LARKIN



Supply Chain News: Shortages, Tariffs and Capacity Bets

New tariffs, tight chip supplies and shipping disruptions kept procurement and supply chain teams busy last month.

Deep into the dog days of summer, supply chains dealt with stronger demand, tighter conditions and another round of trade and geopolitical uncertainty last month. Longer supplier delivery times, inventory building and rising costs kept procurement teams on their toes, while new U.S. tariffs and uncertainty in the Strait of Hormuz forced chief supply chain officers to revisit costs, forecasts and contingency plans.

On a positive note, LG Electronics added production capacity in Vietnam, while Samsung Electronics expanded its semiconductor relationship with Broadcom. Together, the developments summed up July: stronger activity, ongoing supply concerns, higher trade costs and continued investment in capacity.

The Chip Shortage Persists

New data centers and hyperscalers continue to eat up chip capacity, effectively leaving everyone else to battle over a smaller pool of available supply. According to Technology.org, major electronics manufacturers are voicing their concerns about the shortage. For example, Samsung Electronics says the problem could worsen and last until at least 2028.

Dynamic random-access memory (DRAM) is in particularly short supply right now. Used in PCs, laptops, AI systems, servers, cars and other electronic devices, this short-term memory includes high-bandwidth memory (HBM), a specialized form of DRAM used in AI chips and other high-performance systems.

"The shortage is now old enough to have changed the shape of the industry rather than just its prices," the publication adds. It says Samsung, SK Hynix and Micron together control more than 95% of DRAM output, and each has been shifting wafers toward HBM, which eats more silicon per usable bit than commodity memory.

"Analysts have described AI memory as effectively sold out," it continues, "and new fabs cost $15 billion to $20 billion and take years to build, so supply cannot respond quickly even when the money is available."

New Tariffs Were Introduced

Supply chains were hit by another trade development in July when the U.S. Trade Representative (USTR) imposed new Section 301 tariffs on imports from 60 economies, citing their failure to prohibit or enforce bans on goods made with forced labor. The decision followed two rounds of hearings, more than 2,100 public comments and talks with over 45 governments.

Rates vary by country and product. Imports from 18 economies, including Canada, India, Mexico and the United Kingdom, face a 10% duty. Certain products from the European Union, Taiwan, Japan, South Korea and Switzerland face duties of 10% or 12.5%, minus the existing most-favored-nation rate. Most other covered economies face a 12.5% duty.

USTR exempted some raw materials and other products that could be difficult or costly to source elsewhere. Other exemptions apply to countries that have made commitments on forced-labor import bans. U.S. Trade Representative Jamieson Greer said the tariffs address both human rights abuses and trade practices that burden U.S. commerce.

Things Remained Tense in the Strait of Hormuz

Shipping through the Strait of Hormuz remained severely constrained in July, with traffic running at a fraction of normal levels, according to IndustryWeek. Hopes for a ceasefire also faded as U.S. and Iranian strikes continued and both sides hardened their positions over the waterway.

IndustryWeek reported that U.S. Central Command's July 21 strikes targeted Iranian maritime capabilities, military operations centers, aircraft hangars and drone storage facilities. The goal, according to the command, was to weaken Iran's ability to threaten commercial shipping through the strait.

U.S. petroleum reserves also continued to fall. The Strategic Petroleum Reserve held 311.4 million barrels for the week ending July 17, down from 316.5 million barrels one week earlier, according to the U.S. Energy Information Administration.

Two Electronics Giants Add Capacity

The month wasn't all shortages, tariffs and shipping disruptions. LG Electronics expanded its advanced materials operation with a new glass powder production line in Haiphong, Vietnam. The 3,200-square-meter line adds 2,000 tons of annual capacity and gives LG a second production base for materials used in appliances, building products, food packaging and medical equipment. About 80% of the process is automated.

Also in July, Samsung Electronics expanded its semiconductor relationship with Broadcom through a five-year agreement expected to exceed $200 billion through 2030. According to CNBC, the companies will collaborate on memory chips, contract chip manufacturing, advanced packaging and next-generation high-bandwidth memory products. Broadcom's next-generation communications chips will also be produced using Samsung's sub-2-nanometer process technology.

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By EMILY NEWTON

The Pre-Peak Season Audit: 7 Signs Your End-of-Line Automation Has a Hidden Gap

Peak season doesn't expose weaknesses. It amplifies them.

By the time Q4 order volumes arrive, most manufacturers and distribution centers have already optimized demand forecasting, warehouse management, automated picking and transportation planning. Yet many operations still experience unexpected throughput losses during their busiest weeks because the final stretch of the production line wasn't audited with the same rigor. Case sealing, stretch wrapping, palletizing and load transfer often become constraints that determine whether products leave on schedule or require manual intervention.

Recent industry coverage has highlighted how supply chains are becoming increasingly connected and AI-driven, but smarter upstream operations also place greater pressure on downstream packaging systems. As throughput increases, any hidden inefficiency at the end of the line quickly cascades into missed shipping windows, labor overtime and dock congestion.

Conducting a pre-peak audit of end-of-line automation can reveal vulnerabilities before they become expensive disruptions. The following seven indicators can help organizations identify hidden gaps in their end-of-line automation.

1. Upstream Automation Frequently Waits for Packaging

The easiest way to identify an end-of-line bottleneck is to examine where products spend their time instead of where machines spend theirs. Many facilities have invested heavily in warehouse automation, robotics and AI-assisted production scheduling. As those systems accelerate, downstream packaging must absorb increasingly variable product flow. If conveyors back up because palletizers or wrappers can't maintain line speed, upstream investments deliver diminishing returns.

The importance of maintaining product flow extends beyond a single packaging line. A National Institute of Standards and Technology (NIST) analysis found that if work-in-process flow time had remained at 2005 levels, U.S. manufacturing productivity would have grown by 1.7% to 3.4% instead of declining 2.2%, underscoring how delays moving products through production can suppress overall performance.

The same principle applies at the end of the line, where packaging often becomes the limiting factor for throughput rather than production capacity. A pre-peak audit should measure conveyor accumulation, equipment idle time caused by downstream congestion and recovery time following brief stoppages.

2. Optimizing Throughput with Automated Stretch Wrapping

As throughput increases, fully automated stretch wrapping systems become a critical asset for maintaining end-of-line resilience. These solutions secure and wrap loads autonomously, allowing the line to function at peak efficiency without the variability of manual processes. Implementing these advanced systems creates a stable, high-capacity foundation that supports demanding schedules and ensures consistent output during your busiest weeks.

During peak season, high-volume operations thrive on the continuous flow end-of-line automation provides. Fully automatic stretch wrappers achieve this by integrating directly into the line, taking over completely after an operator places a pallet on an infeed conveyor. Advanced models use photo-eye sensors to automatically assess a pallet's size, select the optimal wrapping program and then secure and cut the film without human involvement.

By eliminating manual touchpoints, this hands-free capability is the key to resilience. If operators are still a limiting factor, the issue is equipment capability, not labor. A pre-peak audit should focus on any manual touchpoints left in the wrapping cycle. Equipment that seems adequate today can become a critical vulnerability when peak volumes demand continuous, intelligent automation.

3. Changeovers Take Longer Than Production Runs

Product variety continues to expand across nearly every industry. New packaging configurations, retailer requirements, promotional bundles and e-commerce formats all increase SKU complexity. While flexible manufacturing receives significant attention, packaging systems often remain configured for longer production runs.

When operators spend excessive time adjusting pallet patterns, case dimensions or wrapping parameters, automation loses much of its intended value. Industry observers note that increasing SKU proliferation is forcing manufacturers to prioritize flexibility alongside throughput, particularly within end-of-line packaging, where format changes occur most frequently. Audit metrics should include:

- Average changeover duration
- Number of manual adjustments required
- Operator intervention per SKU
- Restart time following setup validation

4. Operators Regularly Override Automated Decisions

Automation should reduce decision-making, not create additional exceptions. If employees routinely bypass sensors, manually adjust conveyor timing or reset equipment multiple times each shift, the system may no longer reflect current operating conditions.

These workarounds often point to equipment limitations rather than operator error. When staff must frequently intervene to compensate for inconsistent performance or sensor errors, it suggests that the existing automation lacks the sensing or control capabilities needed to support high-throughput operations.

The manual adjustments rarely appear in official documentation because experienced operators naturally develop methods to keep production moving. However, during peak season, increased staffing, temporary employees and higher throughput expose those undocumented processes. Tracking the frequency and cause of manual overrides during a pre-peak audit can help determine whether operational issues stem from process inconsistencies or from automation that has outgrown its intended capabilities.

5. Packaging Data Lives Separately from Operational Data

Many organizations have excellent visibility into production metrics but limited insight into packaging performance. Warehouse management systems, manufacturing execution systems and transportation software frequently generate detailed analytics, while packaging equipment operates with minimal performance reporting.

Without integrated data, operations leaders struggle to identify recurring micro stoppages, film consumption trends, pallet stability issues or recurring downtime patterns. Performance data is also essential for validating whether automation investments are delivering measurable operational gains.

For example, after automating part transfers on its F-35 production line, Lockheed Martin reduced labor hours per unit by 26%, cut required part movements from 18 to two and shortened forward fuselage manufacturing time by 75%. Those improvements were possible because performance metrics were tracked before and after implementation, making it easier to identify where automation created the greatest value.

End-of-line packaging should be evaluated with the same discipline. Monitoring metrics such as cycle time, micro stoppages, film consumption, pallet throughput and equipment utilization can help operations teams distinguish isolated issues from systemic bottlenecks before peak demand arrives. Packaging should generate the same level of operational intelligence as upstream automation, allowing teams to identify hidden constraints and address them before they affect customer shipments.

6. Pallet Movement Creates More Downtime Than Packaging

Completing a pallet isn't the same as shipping it. Once wrapped, finished loads must move efficiently toward staging areas and loading docks. Poor conveyor integration, limited buffer capacity or inconsistent pallet transfer can create congestion even when packaging equipment operates correctly.

Instead of evaluating machines individually, audits should assess the complete end-of-line flow from case packing through pallet transport. The industry's broader shift toward connected supply chains reinforces this systems-level perspective, emphasizing integrated operations rather than isolated equipment optimization. Questions worth asking include:

- Are wrapped pallets waiting for transportation?
- Does downstream congestion force upstream slowdowns?
- Can pallet movement keep pace during sustained production?

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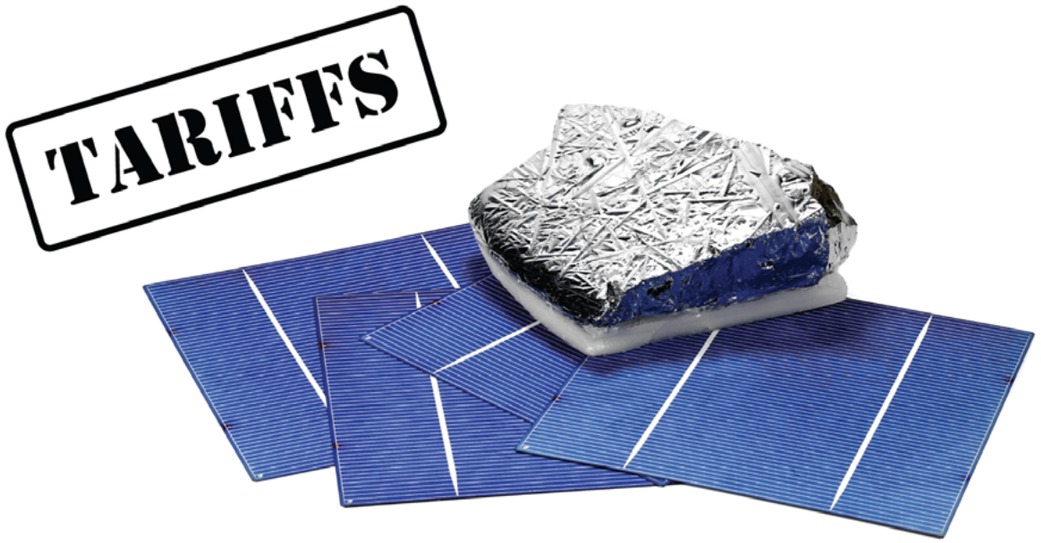
By AVERY LARKIN



New Tariffs Take Aim at U.S. Polysilicon Imports

The new trade measures set minimum import prices, add tariffs and push for more domestic semiconductor and solar manufacturing.

Last week, the White House took new measures to curb the imports of polysilicon and its derivatives into the U.S. Announced via an official proclamation, the move impacts both the semiconductor and solar power supply chains. The document highlights the essential nature of polysilicon to the "national security and economy of the United States," and how this base material for semiconductors is produced mostly offshore.

The document also says semiconductors are "critical inputs for United States defense systems, such as radar and communication systems, electronic warfare and cybersecurity systems, and guidance and control systems for missiles and drones." Polysilicon is also essential to solar product manufacturing, it adds, as both solar-grade polysilicon and derivative solar products support various national defense programs and artificial intelligence (AI) innovations.

"For decades, foreign governments — recognizing the strategic importance of polysilicon and polysilicon derivatives — designed policies to increase the production of these products in their countries, which have come at the expense of the United States industry," the White House explains. "These policies contributed to global oversupply in polysilicon and polysilicon derivative sectors."

Laying Out the New Rules

The proclamation places minimum prices on polysilicon and several products made from it starting Dec. 4, 2026. It also adds tariffs, new documentation requirements for importers and incentives for companies that invest in U.S. production.

The main changes include:

- **Minimum import prices**. $21 per kilogram for polysilicon, $100 per kilogram for ingots and wafers, $0.22 per watt for solar cells and $0.38 per watt for solar modules.
- **A new 15% tariff.** Polysilicon ingots and other covered derivatives will face an additional 15% duty. The proclamation sets different terms for imports from some U.S. trading partners.
- **New paperwork for importers.** Companies will have to document that covered imports meet the minimum price or qualify under a contract signed before the proclamation. Goods priced below the minimum may face an additional tariff covering the difference.
- T**ougher enforcement policies.** U.S. Customs and Border Protection will check those filings, and importers that submit "materially inaccurate" documentation can be permanently barred from bringing covered products into the U.S.

With the goal of bringing more of the polysilicon supply chain into the U.S., the proclamation also authorizes incentives for companies that build, expand or refurbish domestic plants producing polysilicon, ingots, wafers and cells. Also, companies with approved onshoring plans may qualify for relief from some of these Section 232 duties while they build or expand U.S. facilities.

"The plan of action in this proclamation will, among other things, help ensure the commercial viability of United States production of polysilicon and its derivatives that is necessary to meet United States economic and national security requirements," the White House says.

Industry Response

Response to this latest round of tariffs has been mostly positive. According to *Reuters*, American solar factories have been accusing their Chinese rivals of dumping solar panels in the market for a decade. "U.S. solar manufacturing has expanded since Congress created tax incentives in 2022," the news service says. "Much of that growth, however, has been concentrated in panel assembly, leaving manufacturers dependent on imported wafers and cells, which require longer investment timelines."

The new development comes as domestic manufacturers have spent years pushing for tougher trade protections welcomed the new measures, saying they could help domestic producers compete against lower-priced imports and invest in more U.S. production. "This is a decisive win for advanced American manufacturing and investment in domestic energy supply chains," said T1 Enegy CEO Dan Barcelo in a statement, according to *Reuters*. ■

The Pre-Peak Season Audit: 7 Signs Your End-of-Line Automation Has a Hidden Gap *(Continued from page 21)*

7. Maintenance Is Scheduled Instead of Condition-Based

Traditional preventive maintenance reduces failures, but it doesn't always prevent peak-season interruptions. Critical end-of-line equipment experiences different stress levels depending on production mix, shift patterns and seasonal demand. Components may deteriorate faster than maintenance schedules anticipate, leaving facilities vulnerable when throughput is at its highest.

Evidence from the NIST highlights the value of a more data-driven approach. Manufacturers that relied more heavily on predictive maintenance than preventive maintenance experienced 15% less downtime, an 87% lower defect rate and 66% fewer inventory increases associated with maintenance issues. These findings suggest that monitoring equipment condition in real time can significantly improve operational resilience during periods of sustained production.

Modern packaging automation and robotics increasingly incorporate sensors that monitor vibration, motor performance and cycle counts, enabling maintenance teams to identify wear before it causes an unexpected stoppage. As part of a pre-peak audit, operations leaders should evaluate whether maintenance schedules reflect actual equipment condition or simply follow fixed calendar intervals. A condition-based strategy can help prevent minor mechanical issues from becoming production bottlenecks when every hour of uptime matters.

Build Resilience Before Peak Season Arrives

Peak season is one of the few times when every part of the supply chain is tested simultaneously. While upstream automation often receives the greatest attention, end-of-line packaging ultimately determines whether finished products move efficiently from the production floor to the loading dock.

Conducting a comprehensive audit before a volume surge allows organizations to identify constraints that might otherwise remain hidden during normal operations. Assessing packaging capacity, equipment integration, operational data, pallet movement and maintenance readiness helps ensure end-of-line automation can keep pace with the rest of the facility. When those systems are aligned, peak season becomes an opportunity to demonstrate operational resilience rather than expose overlooked bottlenecks. ■

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