SUPPLY CHAIN connect™

THE TOP 50
Electronics Distributors

- Leveraging New Opportunities
- Inventory Management Tips
- Top 50 Lists

TOP DISTRIBUTORS 2024
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DigiKey Q&A

Tim Carroll, Global Head of Marketing and E-commerce, DigiKey

Bio: Tim Carroll is the global head of marketing and e-commerce at DigiKey, where he oversees all things digital, including marketing, e-commerce, pricing, asset management, accounting, Marketplace, application engineering and tech support. With Tim's leadership, DigiKey has launched the Marketplace initiative, enhanced website functionality such as new search functions and customer self-service portals, and increased the regionalization of global digital marketing strategies, all of which have contributed to DigiKey's massive growth and reputation as a trusted e-commerce distribution partner worldwide.

1. What new market trends are you seeing so far in 2024?

We expect to see signs of further design activity, with more new product introductions and projects coming to fruition toward the end of Q2. Hopefully, by the end of the year, we will see reasonably increased demand for electronic components as technology evolves.

Many key vertical markets are trending and will develop further this year, including renewable energy, electric vehicles, cellular networks, IOT and artificial intelligence (AI).

2. What new ESG (environmental, social, and governance) initiatives or plans have you put in place?

DigiKey understands that the business choices we make today directly impact our company's future success and viability, as well as our global community's future. We are committed to making a positive impact on the world by prioritizing innovation, quality and environmental stewardship. Through innovative practices, standardized certifications and collaborative partnerships, we are dedicated to minimizing our carbon footprint, conserving resources and enhancing the well-being of the communities we operate in. From our supply chain to our operations, sustainability is driving us to create a brighter future for many generations to come.

One way we demonstrate our commitment to protecting the environment and mitigating environmental impacts is through our ISO 14001 certification. DigiKey maintains compliance with various environmental requirements, including but not limited to air, soil and stormwater protection. Other sustainability initiatives include smart packaging, outbound shipping sustainability, EU to EU shipping, greenhouse gas inventory program, recycling and reuse programs, energy conservation and a variety of employee-led efforts.

3. Where do the opportunities lie right now and how is your company leveraging them?

We believe there is a huge amount of global opportunity ahead of us right now. DigiKey continues to invest in our infrastructure, systems and inventory to support all our global customers over the next few exciting years in our industry. Our purpose is to accelerate progress for engineers, designers and buyers while making interactions with DigiKey easy and efficient.

We also see how more customers continue to engage with us digitally, and we continue to make investments to meet our customers where they are. We continue to see a trend of customers wanting to place orders through digital means, and we have a team specialized in helping customers enable transactions through API, EDI and other digital channels, which will be a great opportunity this year and beyond.

Lastly, we have a great opportunity to show our industry what high service truly means and how that differentiates DigiKey from other distributors in the space. By building upon our foundation of high-performing teams, strong digital strategy and superior operational excellence, we'll continue to drive growth and capitalize on the market demand while exceeding our customers' expectations.

4. What do you see ahead for the rest for the year (any new trends, challenges, opportunities, etc.)?

We see wireless, IoT and sensors in virtually all end markets as the most promising and growing technologies this year and beyond. We're optimistic about the electronics community in all end markets in general and the wireless, IoT and sensor spaces across the whole business.

A lot more prototyping is happening using some technologies that people used to think of more as maker, but we're seeing a lot more of those tools being used up market as prototyping tools rather than just hobbyist tools. There are growth plans in place about taking these tools and using them as ready-made tools for accelerating the design cycle. The sophistication of these prototyping tools is improving and will be huge this year.

By SUPPLY CHAIN CONNECT EDITORIAL STAFF

Addressing Challenges and Leveraging New Opportunities

As technology continues to evolve, the Top 50 Electronics Distributors are leveraging new opportunities and tackling a mix of emerging and ongoing challenges in the global marketplace.

The world's top electronics distributors are managing a new set of challenges this year. They're also leveraging new opportunities that are emerging across various sectors. Data centers that support the artificial intelligence (AI) trend, for example, are coming out of the ground at a rapid pace. New "clean energy" facilities and electronic vehicle (EV) infrastructure are also being built to support the world's shift away from its reliance on fossil fuels. These are just some of the opportunity areas where distributors are lending their expertise, knowledge and experience to myriad different projects.

Distributors are also dealing with new roadblocks right now with the ship attacks in the Red Sea, ongoing geopolitical turmoil and new disruptions taking their toll on the world's supply chains. These VUCA (volatility, uncertainty, complexity and ambiguity) events are challenging distributors on several fronts, but the best of these companies appear to be faring well despite the roadblocks being placed in front of them.

The labor market continues to make it difficult to find and retain employees, managers and leaders, and this is a trend that no industry sector has been shielded from. And despite the staff cutbacks by technology firms and some other industry sectors in 2023, there's still a dearth of viable candidates compounded by strong job growth. In March 2024, for example, U.S. employers added 303,000 jobs. This represented the 39th straight month of growth and increased confidence among economists and investors that "robust hiring and rising wages can continue to coexist while inflation eases," the *New York Times* reports.

"The resilient data generally increased confidence among economists and market investors that the U.S. economy has reached a healthy equilibrium," it continues, "in which a steady roll of commercial activity, growing employment and rising wages can coexist, despite the high interest rate levels of the last two years."

The global economic outlook is also positive, according to McKinsey & Co., which points to political transitions and policy changes as two of the "pressing risks" that executives are concerned with. Citing its recent Global Survey, McKinsey says respondents share "much brighter assessments of the global economy and conditions in their countries than they did at the end of 2023. In fact, views of the global economy are the most positive they've been since March 2022.

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Addressing Challenges and Leveraging New Opportunities, (Continued from page 6)

"Looking ahead to the next six months, respondents are also more optimistic than they were last quarter," McKinsey & Co. reports. "Forty-six percent expect the global economy to improve—nearly double the share expecting worsening conditions—while 37% expected improvement in the previous survey."

Year-Over-Year Comparisons

Combined, the Top 5 distributors on this year's *Top 50 Electronics Distributors* list posted revenues of just over $90 billion in 2023, which was slightly lower than the top five's revenues the prior year. For the most part, distributor revenues were consistent with 2022, though some companies posted substantial increases last year. The top two distributors on the list—Arrow (#1) and AVNET (#2)—both posted gains for the overall year. WPG Americas (#3), DigiKey (#4) and Future Electronics (#5) found themselves in new ranking positions this year, though the top five consists of the same five companies as last year.

The total revenues for the next five entrants, rounding out the top 10, (TTI, Mouser, RS Group, Fusion Worldwide and NewPower Worldwide) reached $15.43 billion in 2023. Total sales for this year's *Top 50 Electronics Distributors* that reported their revenues to Supply Chain Connect reached $118.35 billion. This was a slight decrease in comparison to last year's total sales of $120 billion.

Stef Lukasik, marketing program manager at Flip Electronics (#38), says the proliferation of semiconductor components resulted in the widespread use of chips across various sectors. As more products integrate electronic components, companies increasingly rely on distributors to reach a wide range of customers.

"Additionally, authorized distributors are focusing on leveraging big data, analytics, and emerging technologies like artificial intelligence (AI) and machine learning to better understand market dynamics, analyze product demand and optimize pricing strategies," Lukasik says. "This technology-driven approach is seen as crucial for staying competitive and ensuring success in the evolving market landscape."

Opportunities abound in that market landscape, where Lukasik says Flip is "actively seizing the opportunities" by integrating AI applications into its supply chain processes. "Leveraging AI, encompassing machine learning, natural language processing and robotics, holds immense potential to revolutionize our operations, driving efficiency and cost reduction."

Manufacturing is Heading Toward Expansion

In its most recent *Report On Business Roundup*, the Institute for Supply Management (ISM) expressed confidence that U.S. factory activity could begin expanding this spring. The group's composite Purchasing Manager's Index (PMI) was 50.3% in March—the first real indication of expansion since September 2022.

This is yet another positive sign for global electronics distributors that support the manufacturing sector with a continuous supply of components, parts and services.

"This was no April Fool's Day joke," says Timothy R. Fiore, chairman of the ISM Manufacturing Business Survey Committee. "The numbers are real."

While commodities inflation remains a concern, the overall health of the manufacturing sector indicates "a growth cycle," Fiore adds. "And it starts with the fundamentals. Many of the industries performed well—not exceptionally well, but the biggest industries in particular gained performance compared to February. And activity levels were up (in the indexes) where they needed to be, with new orders and production expanding, a nice step up in inventory levels and employment reductions slowing."

The Production Index gave the PMI its biggest boost in March, up 6.2 percentage points to 54.6%. The group says that the index "showed resiliency" during the 16-month contraction period, staying higher than what might be expected thanks to the backlogs worked off due to coronavirus pandemic-inspired overordering. With backlogs contracting, production levels are more about business activity.

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FLIP® ELECTRONICS Making Obsolescence Obsolete Q&A

Bill Bradford
President

1. What new market trends are you seeing so far in 2024?

The proliferation of Semiconductor components resulting in the widespread use of chips across various sectors. As more products integrate electronic components, companies increasingly rely on distributors to reach a wide range of customers. Additionally, authorized distributors are focusing on leveraging big data, analytics, and emerging technologies like AI and machine learning to better understand market dynamics, analyze product demand, and optimize pricing strategies. This technology-driven approach is seen as crucial for staying competitive and ensuring success in the evolving market landscape.

2. Where do the opportunities lie right now and how is your company leveraging them?

In the current landscape of the electronics industry supply chain, opportunities are everywhere with the rapid advancements in emerging technologies, particularly artificial intelligence (AI). At Flip, we are actively seizing these opportunities by integrating AI applications into our supply chain processes. Leveraging AI, encompassing machine learning, natural language processing, and robotics, holds immense potential to revolutionize our operations, driving efficiency, and cost reduction. This summer we are working to enhance our AI capabilities, aiming to automate key business processes that have propelled Flip to this stage. This endeavor aligns with our goal of leveraging data more efficiently, allowing us to swiftly automate routine tasks and address inquiries that meet specific criteria. In turn, this optimizes resource allocation, freeing up human expertise to tackle more complex challenges and ultimately bolstering overall customer satisfaction.

3. What do you see ahead for the rest of the year?

As we look ahead for the remainder of the year, the electronics industry supply chain foresees ongoing progress in AI and other emerging technologies like machine learning and robotics. These advancements are poised to revolutionize our operations, driving efficiency gains and cost reductions throughout the supply chain. Simultaneously, the semiconductor market is primed for a strong recovery, fueled by innovations such as 5G and the Internet of Things (IOT). The escalating demand for semiconductor chips in automotive and industrial sectors, coupled with the resurgence in industrial demand, offers promising growth prospects. However, we anticipate challenges in optimizing product mix, navigating geopolitical shifts, and addressing supply chain concerns, necessitating adaptability and resilience from industry players. Despite these challenges, the coming months present ample opportunities for companies to capitalize on technological advancements and seize growth opportunities in the market.

Addressing Challenges and Leveraging New Opportunities, (Continued from page 8)

The Inventories Index (48.2%) also ticked up, with Fiore suggesting it's possible all five subindexes (new orders, production, employment, supplier deliveries and inventories) that directly factor into the PMI could be in expansion territory soon. The Federal Reserve's position on interest rate cuts could either support or curtail this expansion, and particularly since the most recent report point to a U.S. economy that's still in inflationary mode.

"The signs point to a decent expansion cycle," Fiore says, "not incredibly strong, but decent."

ESG is Top of Mind

Tim Carroll, global head of marketing and e-commerce at DigiKey (#4), expects to see signs of further design activity, with more new product introductions and projects coming to fruition toward the end of the second quarter. "Hopefully by the end of the year, we will see reasonably increased demand for electronic components as technology evolves," Carroll says. "Key vertical markets are trending and will develop further this year, including renewable energy, electric vehicles, cellular networks, AI and Internet of Things."

As the global environmental, social and governance (ESG) push continues, electronics distributors are doing their part to address environmental issues and preserve the planet for current and future generations. For example, Carroll says DigiKey understands that the business choices it makes today directly impact the company's future success and viability, as well as the global community's future.

DigiKey is ISO 14001-certified and maintains compliance with various environmental requirements, including air, soil and stormwater protection. Its other sustainability initiatives include smart packaging, outbound shipping sustainability, EU-to-EU shipping, greenhouse gas inventory programs, recycling and reuse programs, energy conservation and various employee-led efforts.

"We are committed to making a positive impact on the world by prioritizing innovation, quality and environmental stewardship," Carroll explains. "Through innovative practices, standardized certifications and collaborative partnerships, we are dedicated to minimizing our carbon footprint, conserving resources and enhancing the well-being of the communities we operate in."

Colin Strother, executive vice president of Rochester Electronics (RANKING#), says the company is committed to promoting gender parity and equality in engineering and employment. With the help of CircuitBread, the company focuses on educational initiatives to inspire the next generation of engineers. "Furthermore, we prioritize environmental and regulatory compliance," Strother says. "The company promotes green processes and maintains strong relationships with local communities."

Rochester also regularly reviews its manufacturing inputs and outputs to ensure compliance with the EPA and to preserve the environment. Waste reduction is a top priority, Strother adds, and the company has implemented recycling programs that capture and remove waste metals from waste streams for recycling.

"Intensive chemical analysis is performed within manufacturing programs wherever possible to optimize performance and reduce waste," Strother continues. "All hazardous waste created at Rochester Electronics is 100% designated 'Zero Waste to Landfill.' This waste is recycled, reclaimed or reused and never buried in a landfill as legacy waste."

Keeping an Eye on the Big Picture

In assessing the current global landscape, Strother says political and trade tensions have resulted in "large-scale restructuring of the semiconductor investment landscape, leaning in favor of North American and European production." Based on these trends, he advises electronics buyers to reassess purchasing practices and focus on "guaranteed supply" versus cost reductions.

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Q&A

Rochester Electronics®

Colin Strother, Rochester Electronics Executive Vice President

1. What new market trends are you seeing so far in 2024?

The semiconductor industry is cyclical, with an average peak-to-peak of shipped units of around 40 months. In 2023, the industry recovered from global shortages caused by the pandemic but is now experiencing oversupply.

It is expected that the first half of 2024 will follow the trends of 2023 with improvement anticipated in the latter half of the year. Both KPMG and the Global Semiconductor Alliance are optimistic about growth, and SEMI predicts a 6.4% global semiconductor capacity increase in 2024, which amounts to more than 30 million wafers per month. Other sources suggest a potential recovery of 9-12%. However, market conditions will likely remain challenging due to low global consumer confidence.

2. How are geopolitical events, the rising costs of business, and the labor shortage impacting your organization?

Political and trade tensions have resulted in large-scale restructuring of the semiconductor investment landscape, leaning in favor of North American and European production. Customers must reassess purchasing practices and focus on "guaranteed supply" instead of "minimizing costs."

To plan for future supply disruptions, customers should secure relationships with authorized partners, such as Rochester Electronics, who offer risk-free stock during shortages, provide extended product lifecycle solutions, and critical intelligence on market trends.

Additionally, Rochester's digital transformation strategy leverages technology to improve the customer experience with self-service options that resolve common questions.

3. What new ESG (environmental, social, and governance) initiatives or plans have you put in place?

Rochester Electronics is committed to promoting gender parity and equality in engineering and employment. With the help of CircuitBread, the company focuses on educational initiatives to inspire the next generation of engineers.

Furthermore, we prioritize environmental and regulatory compliance. The company promotes green processes and maintains strong relationships with local communities.

Rochester constantly reviews our manufacturing inputs and outputs to ensure compliance with the EPA and preserve the environment. Waste reduction is a top priority, and the company has implemented recycling programs that capture and remove waste metals from waste streams for recycling.

Intensive chemical analysis is performed within manufacturing programs wherever possible to optimize performance and reduce waste. All hazardous waste created at Rochester Electronics is 100% designated "Zero Waste to Landfill." This waste is recycled, reclaimed, or reused, and never buried in a landfill as legacy waste.

4. What other challenges are you working through, and how are you overcoming them?

Rochester Electronics provides top-quality products and services that meet customer expectations. Although the company is traditionally recognized for its End-of-Life (EOL) products and solutions, Rochester now offers around one-third of our 15 billion in-stock inventory as active products sourced directly from the Original Component Manufacturers. These products are 100% authorized and guaranteed.

We are focused on meeting customers' immediate needs by developing efficient supply chain solutions, and by expanding and supporting the world's largest portfolio of in-stock inventory for immediate dispatch.

5. Where do the opportunities lie right now, and how is your company leveraging them?

Rochester Electronics believes that digital transformation presents an enormous opportunity.
We offer a range of online and offline solutions and invest heavily in digital products, platforms, and services, including Trusted AI. All of this is to ensure the delivery of personalized service to customers in real-time and across global languages.

In January 2024, Rochester launched an enhanced online commerce portal that optimizes authorized component searches, streamlines purchasing, and simplifies order management. The portal is designed to realize customers' diverse needs, ensuring a seamlessly expedited purchasing process that minimizes order obstacles. We know that meeting customers' needs is of utmost importance, and we strive to always provide the best possible service.

We see significant market opportunities in the aerospace, defense, and industrial sectors. As a QML manufacturer certified by DLA Land and Maritime to MIL-PRF-38535, we offer Class Q and Class V microcircuits for military and aerospace applications.

Rochester has provided onshore licensed manufacturing since the mid-1990s to ensure secure IP and safeguard critical components.

Globalization has significantly shifted the industrial market, with regional standards evolving into international standards that support legacy and new equipment compatibilities. As a result, legacy equipment lifecycles are extended, and customers aim to optimize initial investments. Rochester aligns with that goal and provides an ongoing supply of EOL components.

6. What do you see ahead for the rest of the year (any new trends, challenges, opportunities, etc.)?

We expect the automotive sector to continue growing. As a result, many semiconductor suppliers are now adhering to higher standards, such as IATF-16949 for quality management systems, AEC-Q100 for qualification testing, and ISO-14001 for environmental management.

Crucially, ensuring product longevity is a requirement in the automotive industry. While car models may change yearly, the underlying components and assemblies can remain in use for many years. 10-year lifecycles, at a minimum, are often mandated. However, many vehicles have life expectancies beyond ten years, meaning product manufacturers must address lifecycles beyond the production, aftermarket, and repair requirements. Rochester Electronics provides a continuous semiconductor source that aligns with automotive manufacturers' long lifecycle and quality requirements.

In 2024, Rochester plans to expand its manufacturing services to continue to support diverse customer requirements. This expansion will cover wafer die processing, package assembly, testing, component lead finishing, reliability testing, and failure analysis.

Inventory levels are expected to normalize in 2024, and lead times will stabilize. Inflation will likely remain above government targets, but semiconductor manufacturers will continue monitoring capacity and rationalizing product lines.

7. How are recent Red Sea and Panama Canal events impacting your supply chain, and how are you working through these issues?

The Red Sea is not a necessary route for Rochester Electronics. As for the Panama Canal, we have experienced queue delays of up to 35 days. Consequently, in late 2023, we decided to avoid the canal and instead send freight to Los Angeles. From there, transport by rail is arranged to our centralized distribution facilities on the East Coast. Since most of Rochester's ocean shipments are full containers, the container remains closed throughout the journey, moving from vessel to rail to truck for final-mile delivery. This has made the swap a simple and clean process.

Routing through L.A. adds some days to transit time compared to the canal when it's working optimally. However, the L.A. route is more controllable and predictable. Rochester is currently monitoring the canal's performance and will revert to that freight route once queue delays are sustained for fewer days.

Addressing Challenges and Leveraging New Opportunities, (Continued from page 12)

Luke LeSaffre, chief revenue officer at Fusion Worldwide (#9) , says the "inventory digestion cycle" that started in 2023 continues to have a hangover effect for numerous industries. Some are seeing the scale balance, as certain manufacturers are increasing their wafer starts in anticipation of robust trends within enterprise data and CPU data center markets. However, he says there are signals that demand is softening within the industrial and automotive sectors, especially with electric vehicle growth slowing more than expected.

"Coming into 2024, we were moderately bullish and focused on widening our lens to keep our eye on the big picture," LeSaffre says. "That outlook has held steady as we have identified the best ways to support our customers with market intelligence and opportunities that enable them to move with the market."

Right now, manufacturers are signaling that the inventory digestion cycle will be resolved by the mid-point of the year—if not the tail end, according to LeSaffre. "While it remains to be seen if that is true, our unwavering commitment to supporting our customers remains unchanged," he adds. "We are especially focused on system-level commodity products, recognizing that GPUs and CPUs will play a pivotal role in facilitating the proliferation of AI."

What's the Outlook?

Looking ahead, Carroll sees substantial global opportunity, particularly within wireless, IoT and sensors. "We're optimistic about the electronics community in all end markets in general and the wireless, IoT and sensor spaces across the whole business," he explains.

Strother is bullish on the future of automotive sector growth. That expansion is pushing semiconductor suppliers to adopt and adhere to higher standards, such as IATF-16949 for quality management systems, AEC-Q100 for qualification testing and ISO-14001 for environmental management.

"Ensuring product longevity is a requirement in the automotive industry. While car models may change yearly, the underlying components and assemblies can remain in use for many years, with 10-year lifecycles, at a minimum, often being mandated," Strother says, who notes that many vehicles have life expectancies that extend beyond 10 years. That means product manufacturers must address lifecycles beyond the production, aftermarket and repair requirements. "[We] provide a continuous semiconductor source that aligns with automotive manufacturers' long lifecycle and quality requirements," he adds.

As he looks ahead for the remainder of the year, Lukasik expects ongoing progress in AI and other emerging technologies like machine learning and robotics in the electronics supply chain. "These advancements are poised to revolutionize our operations, driving efficiency gains and cost reductions throughout the supply chain," he says.

Simultaneously, Lukasik says the semiconductor market is primed for a strong recovery, fueled by innovations such as 5G and IoT. Growing demand for semiconductor chips in automotive and industrial sectors, coupled with the resurgence in industrial demand, both offer promising growth prospects.

"We do anticipate challenges in optimizing product mix, navigating geopolitical shifts, and addressing supply chain concerns, necessitating adaptability and resilience from industry players," Lukasik concludes. "Despite these challenges, the coming months present ample opportunities for companies to capitalize on technological advancements and seize growth opportunities in the market." ▪

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By SUPPLY CHAIN CONNECT EDITORIAL STAFF

Automation Supercharges Procurement & Supply Chains

Unveiling the power of automation in modern procurement and supply chain operations.

In today's rapidly-changing business environment, companies must continuously adapt to new challenges and opportunities or risk getting left behind the rest of the pack. In fact, we've reached a point where automating the supply chain is much more than just a technological imperative; it's also a crucial strategic choice for survival and development.

According to *Inbound Logistics*, many organizations are implementing or consiering investments in automation solutions to drive workforce productivity and agility.

"Automation is key to corporate initiatives to drive growth," the publication points out. "As more supply chains digitize, they can deliver a wealth of data. A lack of automation, however, can keep supply chain leaders from accessing real-time, enterprise-wide information that can help them identify operational inefficiencies." *(Continued on page 36)*

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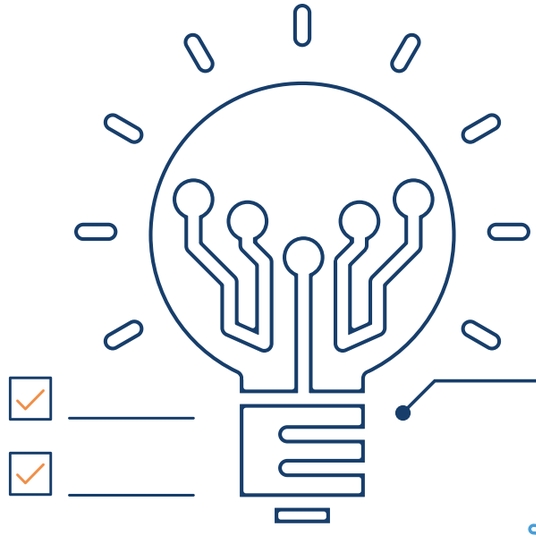
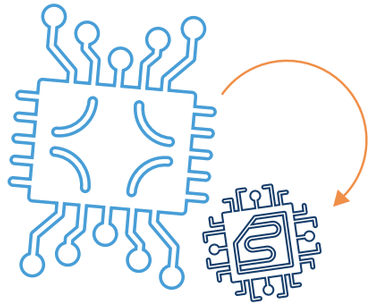


MARKET SEGMENTATION

COMPETITIVE LANDSCAPE



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ENDEAVOR BUSINESS INTELLIGENCE

By SUPPLY CHAIN CONNECT EDITORIAL STAFF

Supply Chain Trend Wrap-up

The collapse of Baltimore's Francis Scott Key Bridge and other events that impacted the world's supply chains in March.

March was an active month for the supply chain sector, with the collapse of Baltimore's Francis Scott Key Bridge clearly being one of the most newsworthy and tragic events to impact supply chains during that 30-day period. When the massive Dali cargo ship slammed into a piling on its way out of the Port of Baltimore, it took at least six lives and the elevated portion of the 1.6-mile span with it.

The recovery process and investigation were both still underway at press time, but experts have already weighed in on the potential impacts of the tragic event in terms of ocean-going freight, over-the-road trucking and the total financial impact of the collision. Within a few days it became clear that mechanical failure may have been to blame, and that the ship's pilot and crew took steps to try to avoid the collision and alert authorities about the problem.

The longer-term impacts of the bridge collapse on the world's supply chains remain to be seen, with *Bloomberg* pointing out that every day the Port of Baltimore is closed is "another $217 million that's not crossing its docks." The port managed about $80 billion in total bilateral trade in 2023.

First-Ever Global Supply Chain Forum Coming Soon

In March, UNCTAD announced the first-ever Global Supply Chain Forum, which it developed as a platform where leaders and experts can discuss the changing landscape of international trade and logistics. The forum will be an in-person, four-day event that takes place May 21-24, 2024 in Bridgetown, Barbados.

In recent years, global trade has faced significant disruptions, from the COVID-19 pandemic to climate change and geopolitical tensions. UNCTAD said these challenges have tested global supply chains and highlighted the urgent need for resilience and sustainability, particularly for developing countries.

Recognizing the disproportionate impact of supply chain disruptions on vulnerable economies far from the main lines of trade, especially small island developing states (SIDS) and landlocked developing countries (LLDCs)," UNCTAD said in a press release, "the forum will explore ways to strengthen resilience and sustainability in global supply chains, ranging from trade facilitation reforms to digital innovations."

Semiconductor Manufacturing Trends

In "Semiconductor Supply Chain: Political And Physical Challenges In 2024 And Beyond," Markit paints a picture of an industry sector that's posting double-digit growth this year. "Our forecast calls for industrial production of semiconductors to rise by 21% in the first quarter of 2024 due to a cyclical recovery, with the investment-driven growth only starting in 2026," the company says.

Strategic rivalry between the U.S. and EU on one side and mainland China on the other has distorted supply chains for nearly a decade and is likely to continue to do so, according to Markit, which expects private investment in industrial facilities to increase by 85% this year (compared to 2019).

"The chip industry sits at the nexus of national security and economic development policies," the company adds. "That has resulted in a race both in supporting national investments in the semiconductor sector as well as escalating restrictions against sharing technology.

It says that the US CHIPS and Science Act has attracted investment in six major U.S. semiconductor plants (or "fabs") so far, but adds that only a few funding awards have actually been made.

In fact, Markit says the act doesn't address three challenges that may hold back the development of the nation's supply chain ecosystem: vendor concentration; advanced packaging, testing and assembly; and cost increases. "The act also may be causing unintended consequences," it says, "including reactions from allies and from competitors."

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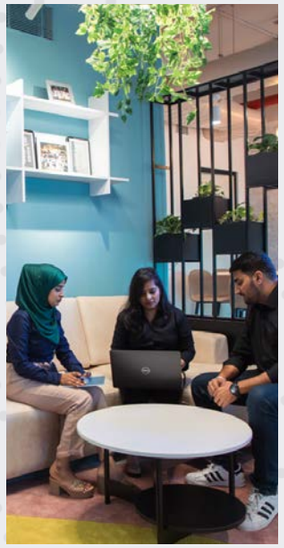

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By TYLER FUSSNER

5 Inventory Management Tips for Electronics Buyers

Tips for electronics buyers to successfully balance their inventory.

Managing inventory has always presented complex challenges for organizations. Unavoidable factors like changing customer behaviors, seasonal variances, long lead times, delays and budgetary constraints can all impact even the best-laid inventory management approaches.

Manual processes can also complicate the inventory management strategies, which can benefit greatly from technology aimed at streamlining the process.

TechTarget states that "Inventory management platforms can reduce inefficiencies and improve inventory handling, replenishment and fulfillment."

It says inaccurate data and analysis, delays in reordering, ineffective production planning, and inventory defects and waste can all contribute to a company's inventory management headaches.

The most effective inventory management strategies help procurement departments, supply chain professionals and other stakeholders streamline processes, operate more efficiently and drive down inventory carrying costs.

Here are five tactics you can start using today:

1. Adopt a good inventory management system

A sound inventory management system is the beating heart of any enterprise, offering real-time access to data that enables business leaders to forecast trends and shifts in buyer needs, as well as gain full transparency into demand and inventory levels.

Kristy Short writes in "8 tactics for inventory management," that "inventory management systems output powerful analytics and provide much-needed visibility into operations. For example, monitoring run rate to gain visibility into how much of an item you are selling at a given time helps accurately predict future demand."

2. Take control of your own inventory

Don't rely on suppliers and providers to accurately report on inventory levels. Take the lead role by regularly monitoring, auditing and managing inventory in your system to maintain an accurate picture of goods. Keep an eye on what's coming into your supply chain, regularly check the quality as well as the quantity you receive, and conduct inventory checks periodically throughout the month or quarter.

3. Leverage vendor-managed inventory strategies

In "The Importance of Inventory Management in Electronics Supply Chain," Ninaad Acharya describes how companies can use vendor-managed inventory – or VMI – to reduce stockouts, minimize excess inventory and reduce the burden on in-house inventory management. This inventory tactic can also help solidify supplier relationships which, in turn, may lead to better pricing and terms. For best results, businesses must work closely with their suppliers to establish clear guidelines and expectations for inventory levels and replenishment. Organizations should also use software tools to track inventory levels and usage, both of which can help anticipate future demand and support better decision-making.

4. Conduct an ABC analysis

This inventory management technique ranks inventory items based on their importance to a business. Evan Tarver writes in Forbes, that "this is most helpful when a business needs to prioritize which items to order and store, allowing for more oversight on certain inventory items."

When conducting an ABC analysis, he recommends dividing the inventory into three categories:

A Items: The most important items that account for 20% of the inventory items but up to 80% of the inventory value.

B Items: Items with medium importance to the business that account for 30% of the inventory items and roughly 15% of the inventory value.

C Items: The least important items that account for 50% of the inventory items but only around 5% of the inventory value.

5. Experiment with advanced technologies

The Internet of Things and smart warehousing technologies can help businesses optimize inventory management by providing real-time visibility into inventory levels, locations and movement. Acharya writes, that "with IoT sensors and smart tags, businesses can track inventory in real-time, streamline supply chain operations, and automate tasks such as inventory counting and tracking."

Use these five tips and you can successfully navigate the balancing act that is inventory management.

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TOP 50 GLOBAL
Electronics Distributors

SUPPLY CHAIN connect™

Company	Founded	Headquarters	Locations	Employees	2023 Global Revenue
1. Arrow Electronics, Inc.	1935	Centennial, CO	200+	22,100	$33,107,000,000
2. Avnet, Inc.	1921	Phoenix, AZ	250+	15,800	$26,500,000,000
3. WPG Americas	2005	San Jose, CA	100+	5,000+	$22,550,000,000
4. Digi-Key Corporation	1973	Thief River Falls, MN	10	5,000	$4,200,000,000
5. Future Electronics	1968	Quebec, Canada	170	5,100	$3,800,000,000*
6. TTI, Inc.	1971	Fort Worth, TX	136	4,015	$3,780,000,000
7. Mouser Electronics	1964	Mansfield, TX	28	4,018	$3,680,800,000
8. RS Group formerly Allied Electronics Automation	1928	Fort Worth, TX	40+	6,600+	$3,600,000,000
9. Fusion Worldwide	2001	Portsmouth, NH	22	520	$2,200,000,000
10. NewPower Worldwide	2014	Nashua, NH	14	152	$2,172,000,000
11. SMITH	1984	Houston, TX	20	900	$1,930,000,000
12. Newark Farnell	1934	United Kingdom	60	3,500	$1,730,000,000
13. DGT Technology (HK) Co., Ltd.	2012	China	2	50	$1,500,000,000
14. DAC/Heilind Electronics	1974	Wilmington, MX	74	2,200	$1,147,868,700
15. Master Electronics	1967	Phoenix, AZ	12	656	$572,000,000
16. Win Source Electronics	1999	China	9	260+	$527,000,000
17. Sager Electronics	1887	Middleborough, MA	10	420	$441,000,000
18. FDH Electronics	1970	Oklahoma City, OK	9	700	$394,000,000
Rochester Electronics	1981	Newburyport, MA	18	780	Privately Held*
19. Bisco Industries, Inc.	1973	Anaheim, CA	52	586	$332,000,000
20. Powell Electronics	1946	Swedesboro, NJ	12	262	$300,000,000
21. RFMW	2003	San Jose, CA	9	210	$290,000,000
22. A2 Global Electronics + Solutions	1978	St. Petersburg, FL	14	500+	$269,941,812
23. Richardson Electronics, Ltd.	1947	Lafox, IL	24	438	$263,000,000
Ample Solutions	2008	Singapore	8	500+	$260,000,000
24. PEI Genesis	1946	Philadelphia, PA	22	800+	$252,000,000
25. Chip 1 Exchange	2001	Arlington, TX	11	550	$240,000,000
26. Sigma Technology Group	2007	Hong Kong	7	120	$230,000,000
27. Shenzhen Shengyu Electronics Technology Limited	2016	China	4	56	$215,411,541
28. Taurus Group B.V.	2005	The Netherlands	6	160	$185,687,006
29. Galco Industrial Electronics	1975	Madison Heights, MI	3	218	$161,300,000
30. Hughes-Peters	1921	Dayton, OH	10	160	$121,000,000
31. Alantys Technology	2001	France	14	250	$121,000,000
32. Anglia Components, Plc.	1972	United Kingdom	2	150	$120,000,000
33. Cytech Systems Limited	2013	China	6	150+	$120,000,000
34. Ozdisan Elektronik A.S.	1980	Turkey	3	350	$110,000,000
35. Symmetry Electronics, Corp.	1998	El Segundo, CA	3	90	$106,000,000
36. Flame Enterprises	1969	Chatsworth, CA	2	62	$102,000,000
37. Steven Engineering	1975	So. San Franscisco, CA	3	120	$98,661,000
38. Flip Electronics	2015	Alpharetta, GA	1	92	$93,700,000
39. Classic Components, Corp.	1985	Torrance, CA	22	130	$92,000,000
40. Marsh Electronics, Inc.	1935	Milwaukee, WI	8	138	$85,062,209
41. THJ (HK) Technology Limited	2012	China	3	68	$82,500,000
42. All Tech Electronics, Inc.	1993	Hawthorne, NY	2	40	$74,000,000
43. Brevan Electronics	1983	Nashua, NH	2	63	$72,500,000
44. Briocean Technology Co., Ltd.	2019	China	3	200	$70,000,000
45. IBS Electronics	1980	Santa Ana, CA	8	120	$62,000,000
46. Area51 Electronics	1999	Irvine, CA	5	70	$60,571,460
47. Supreme Components International Pte.Ltd.	2001	Singapore	14	75	$56,000,000
48. Falcon Electronics	1994	Commack, NY	3	18	$47,380,000
49. Air Electro, Inc.	1952	Chatsworth, CY	1	75	$45,000,000
50. Direct Components, Inc.	1998	Tampa, FL	1	67	$42,321,369

* Publishers Estimate

Innovative Solutions Wanted

Right now, many companies are looking for innovative solutions to help ensure future business continuity. Procurement offices have traditionally relied on manual processes, spreadsheets and email chains, neglecting digital transformation. "Leading procurement teams are now turning to intuitive, cloud-based automated procurement solutions to help team members evolve from passive roles to strategic ones," says electronics component distributor WIN SOURCE.

"Buyers should also leverage this trend towards automation," it continues, "to gain a deeper understanding of the benefits of automated supply chain management, such as increased efficiency, cost reduction and higher customer satisfaction levels."

As with any major business initiative, achieving supply chain automation isn't easy—and it's a mission that can't be rushed. Companies need to invest a significant amount of capital, manpower and time in technology research and development, system upgrades and personnel training. They must also overcome challenges like rapid technological updates and data security risks.

4 Clear Reasons to Automate

Challenges aside, there are clear benefits to automating procurement departments and supply chain operations, including:

- **Enhanced operational efficiency.** By introducing automation equipment and technology, manual operations can be greatly reduced, the rate of human errors can be lowered and production speed can be increased. "At the same time, the automation system can monitor the supply chain status in real-time, optimize resource allocation, and reduce inventory backlogs and waste," WIN SOURCE says.
- **Lower costs.** Automation can reduce dependence on a large labor force, thereby lowering labor costs. Additionally, by optimizing inventory management and reducing transportation losses, companies can further reduce operating costs.
- **Improved service quality.** Supply chain automation can enable rapid responses to customer demands, increasing order processing speed and delivery accuracy. "This not only enhances customer satisfaction but also helps companies establish a good brand image," WIN SOURCE points out.
- **Better risk management.** Automated systems can collect and analyze data in real-time, helping companies predict and respond to potential market risks. They can also improve the transparency and traceability of the supply chain, and help companies respond promptly to emergencies.

Keeping Pace and Seizing Opportunities

Supply chain automation not only helps boost productivity; it's also an important step for businesses that want to keep pace and seize market opportunities. "Competitors have achieved precise control over production processes through automation, significantly improving product quality and production efficiency, thereby gaining a favorable position in the market," says WIN SOURCE.

Moreover, changes in the general environment also require companies to consider automation solutions. "Globally, shifts in population structures and consumer habits are driving the transformation of production methods," the company adds. "Rising labor costs and the growing demand for personalized products mean that traditional production models can no longer meet market needs."

Companies that don't actively embrace automation risk being eliminated by the market. Hence, considering automation solutions isn't just about enhancing a company's competitiveness—it should also be a key strategy for achieving sustained growth and long-term development. ▪

TOP 50 NORTH AMERICAN
Electronics Distributors

Company	Founded	Headquarters	Locations	Employees	2023 Global Revenue
1. Arrow Electronics, Inc.	1935	Centennial, CO	200+	22,100	$33,107,000,000
2. Avnet, Inc.	1921	Phoenix, AZ	250+	15,800	$26,500,000,000
3. WPG Americas	2005	San Jose, CA	100+	5,000+	$22,550,000,000
4. Wesco	1922	Pittsburgh, PA	770	20,000	$22,385,000,000*
5. Digi-Key Corporation	1973	Thief River Falls, MN	10	5,000	$4,200,000,000
6. Future Electronics	1968	Quebec, Canada	170	5,100	$3,800,000,000*
7. TTI, Inc.	1971	Fort Worth, TX	136	4,015	$3,780,000,000
8. Mouser Electronics	1964	Mansfield, TX	28	4,018	$3,680,800,000
9. RS Group formerly Allied Electronics Automation	1928	Fort Worth, TX	40+	6,600+	$3,600,000,000
10. Newark Farnell	1934	United Kingdom	60	3,500	$1,730,000,000
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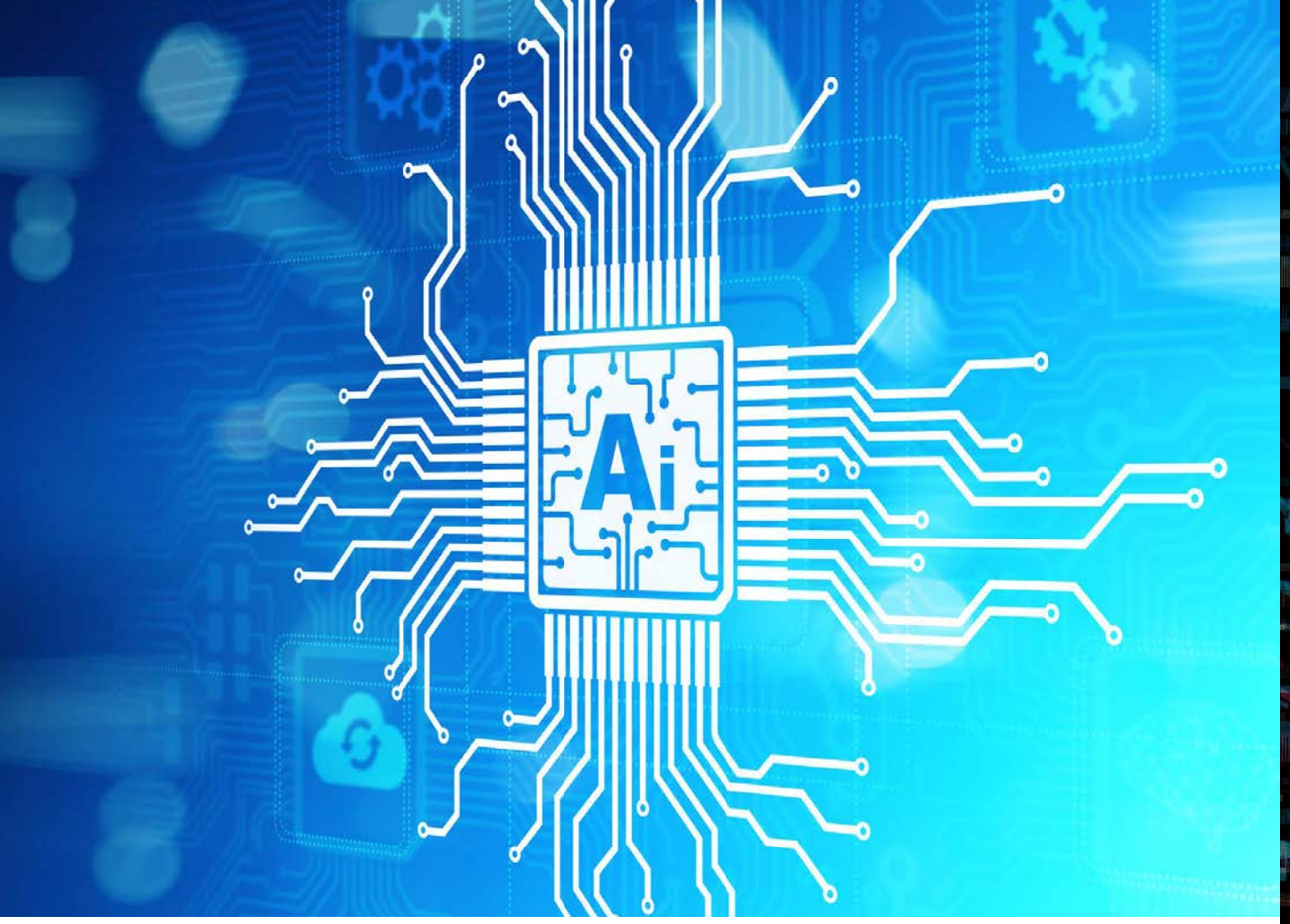
27. Marsh Electronics,Inc.	1935	Milwaukee, WI	8	138	$85,062,209
28. All Tech Electronics, Inc.	1993	Hawthorne, NY	2	40	$74,000,000
29. Brevan Electronics	1983	Nashua, NH	2	63	$72,500,000
30. IBS Electronics	1980	Santa Ana, CA	8	120	$62,000,000
31. Peerless Electronic, Inc.	1917	Bethpage, NY	1	100	$61,000,000*
32. Area51 Electronics	1999	Irvine, CA	5	70	$60,571,460
33. Falcon Electronics	1994	Commack, NY	3	18	$47,380,000
34. Air Electro, Inc.	1952	Chatsworth, CA	1	75	$45,000,000
35. Diverse Electronics	1993	Quebec, Canada	3	50	$37,500,000
36. NASCO Aerospace & Electronics	2001	St. Petersburg, FL	1	30	$37,417,145
37. March Electronics	1972	Bohemia, NY	2	40	$32,700,000*
38. NAC Semi	1994	St. Petersburg, FL	3	124	$30,000,000*
39. Marine Air Supply	1965	Frederick, MD	1	15	$25,200,000
40. Advantage Electric Supply	1993	Hayward, CA	1	15	$24,000,000
41. Jameco Electronics	1974	Belmont, CA	1	75	$24,000,000*
42. Kensington Electronics	1989	Austin, TX	1	26	$21,762,160
43. Projections Unlimited, Inc.	1980	Irvine, CA	2	34	$20,043,960
44. Benchmark Connector	1996	Sunrise, FL	1	50	$20,000,000
45. Suntsu Electronics	2002	Irvine, CA	1	32	$19,900,000
46. Beyond Components	1987	Westford, MA	17	84	$16,400,000*
47. VRG Components, Inc.	2014	Indian Trail, NC	1	18	$9,471,438
48. Microwave Components, Llc.	1980	Stuart, FL	15	34	$6,500,000*
48. Megastar Electroniques, Inc.	1989	Quebec, Canada	1	15	$6,000,000
50. Richardson RFPD	2010	Downers Grove, IL	30+	294	$3,100,000

* Publishers Estimate



By BRIDGET MCCREA

How AI is Shaping the Future of Semiconductors

Exploring the power of artificial intelligence in semiconductor manufacturing.

When global semiconductor manufacturer NVIDIA revealed in February that its year-over-year sales had increased by 265%, the industry sat up and listened. After experiencing some significant shortages and extended lead times during the pandemic, it looked like the semiconductor industry was not only "righting" itself—it was booming.

For fiscal 2024, NVIDIA's revenues increased by 126% to $60.9 billion. "Accelerated computing and generative AI have hit the tipping point," said Jensen Huang, the company's founder and CEO, in a press release. "Demand is surging worldwide across companies, industries and nations."

"Our data center platform is powered by increasingly diverse drivers—demand for data processing, training and inference from large cloud-service providers and GPU-specialized ones, as well as from enterprise software and consumer internet companies," Huang continued. "Vertical industries—led by auto, financial services and healthcare—are now at a multibillion-dollar level." *(Continued on page 44)*

TTI, Inc. - Electronic Component Specialists for Over 50 Years

TTI, Inc., a Berkshire Hathaway company, is the world-leading specialty distributor of electronic components. Paul Andrews, founder and the company's first CEO, started TTI at his kitchen table in 1971, and today it employs more than 8,000 people at more than 160 locations throughout North America, South America, Europe, Asia and Africa.

TTI's corporate journey began with the distribution of passive components such as resistors, capacitors and inductors. The company's success with these critical parts of electronic circuitry led to expansion into the interconnect business. Today, TTI is an industry leader in connector distribution providing certified military and aerospace connection systems for high-performance aircraft, from the phone charging connection in a jetliner's passenger armrest to on-board and off-board connectors for data, power, media and control.

Other components in TTI's specialized inventory include discrete semiconductors, potentiometers, trimmers, EMC and circuit protection components, wire and cable, wire management, identification products application tools, switches, sensors and electromechanical devices. These products are distributed from a specialized line of the industry's premier manufacturers the industry's premier manufacturers, including TE Connectivity, Vishay, Molex, Amphenol, YAGEO, KYOCERA AVX, Aptiv and TDK.

A key element of the many services and value-added offerings TTI provides is the company's supply chain management expertise. The company maintains more than 3.5 million square feet of warehouse space around the world housing over 850,000 component part numbers. TTI's combination of Specialists, proprietary Advanced Inventory Management (AIM) platform and the industry's deepest and broadest product inventory

ensure their customers get high-quality components, world-class service, lower costs, continuity of supply and peace of mind.

Pioneering one of the electronics industry's first Total Quality Management (TQM) programs, TTI Quality Improvement Teams monitor and continually improve the efficiency of an operation of an operation that ships more than 95 billion parts annually. TTI's proprietary Warehouse Control System (WCS) has been developed to seamlessly link the company's global network of warehouses through a single inventory management system. And TTI Application Programming Interfaces (API) allow distributor and customer machine-to-machine access to inventory, pricing and order placement in real time.

TTI also strives to be the industry's preferred information source by offering the latest IP&E technology and market information through online Markets and Technologies Resource Centers, and tti.com/MarketEYE, which includes articles by subject matter experts, technical seminars, RoHS, industry research reports and more.

For over half a century, TTI has been a preeminent player in the electronics industry. Its customers rely on proven expertise and ready-to-ship inventory from the premier names in electronic components. With recent warehouse expansion in North America, South America, Europe, Asia and Africa, TTI is well-positioned to serve the next generation of manufacturers creating electronic breakthroughs and the technologies they bring to the world.

TTI's goal is the same today as when it was envisioned over five decades ago: to be the most preferred electronic distributor of their customers and supplier partners, delivering the right parts exactly on time - to be the best, not the biggest.

How AI is Shaping the Future of Semiconductors, (Continued from page 40)

The Silicon Revolution 2.0

According to *CNBC*, NVIDIA has been the "primary beneficiary" of the recent technology industry obsession with large AI models, which are developed on the company's graphics processors for servers. NVIDIA's "Hopper" chips are in particularly high demand right now.

These H100 and GH200 chips are graphics processing units (GPUs) and accelerated computing processing units (ACUs) that are designed for datacenter use.

According to electronic component distributor WIN SOURCE, NVIDIA's year-over-year growth was a pleasantly surprising "report card" that dispelled market doubts. The uptick was largely driven by robust growth of AI models and OpenAI's Sora, the latter of which is an AI model that can create realistic scenes from text instructions.

"At the close of 2022, amid the emergence of ChatGPT, major players eagerly joined the AI model entrepreneurship wave—right down to small firm entrepreneurs—akin to a gold rush, with NVIDIA being the 'shovel seller,'" WIN SOURCE says. "NVIDIA's significant growth indeed stems from this wave of AI breakthroughs and demand, driving continued investment in infrastructure."

The distributor says electronics buyers should leverage NVIDIA's recent earnings report to "thoroughly grasp market trends," with a focus on how NVIDIA, Intel and Qualcomm use AI in semiconductor design and production to facilitate informed decision-making. "Buyers should also explore AI's potential applications across various industries, from healthcare to automotive, to gauge future equipment capabilities and functionalities," the company continues, "enabling advanced estimation of which components and devices to procure, thereby enhancing overall supply chain efficiency."

AI Takes Center Stage

NVIDIA's success mirrors the rapid expansion and widespread application of AI technology, and the growing demand for high-performance, efficient semiconductor products. Thanks to the ongoing convergence of AI and semiconductors, electronics buyers now have access to more advanced and diversified products. They're also realizing the benefits of higher production efficiency and lower costs due to the intelligent and automated application of new technologies in the production process, thus reducing production costs.

As a result of the current AI boom, the semiconductor industry is facing unprecedented opportunities and challenges. For best results, WIN SOURCE suggests buyers delve deeply into the application areas of AI technology, including AI chips, edge computing and the Internet of Things (IoT). This will help them grasp the industry's development direction.

Considering the widespread application of AI technology, buyers may also want to expand their product lines and increase procurement of semiconductor products related to AI to meet market demands and achieve business growth. "Buyers should also establish close cooperation with suppliers to guarantee timely access to high-quality, stable semiconductor products," WIN SOURCE adds. "With these recommendations and strategies, buyers will be able to capitalize on the opportunities presented by the AI boom and grow their businesses." ▪

By BRIDGET MCCREA

American Universities Cultivate the “Next Generation” of Tech Professionals

A roundup of some of the new initiatives that universities are introducing to help boost the nation’s technical workforce.

Technology is being woven into almost nearly every industry sector. From data analysis to automation, basic electronics knowledge has become a competitive advantage across various job markets. Even non-tech job functions often require expertise with digital tools, hardware and software.

The STEM sector (science, technology, engineering and math) is in particularly great need of recruits who are ready to start new careers in the field. Knowing this, a number of different American universities are rolling out new programs centered on training the “next generation” of tech-minded professionals.

In some cases, those programs involve strategic partnerships with organizations that are operating in the electronics sector. This month, for example, Utah State University announced a new partnership with Intermountain Electronics (IE). Together, they’ll provide paid internship opportunities for students interested in the electrical and welding fields. The internship program is for recent high school graduates and no prior experience is required to be eligible. The 90-day internship is designed for recent high school graduates, and the program is intended to attract applicants from the five counties surrounding the university. *(Continued on page 48)*

"This pre-apprenticeship program is different because we've built it with our students in mind," said Doug Miller, USU Eastern's chief campus administrator. "We have built it in partnership with the organization that it is going to serve. If you choose to pursue this opportunity, you get the full gamut of experience. You get a full campus experience, and you get a great job with one of the best employers that you can find within the state."

Getting them Ready

Binghamton University in New York is also doing its part to help students prepare for successful careers in the electronics industry. The university will soon receive a $1 million grant from the state to develop research and careers in the electronics industry.

The grant will allow the university to purchase additional packaging equipment for the Nanofabrication Laboratory (NLAB), a cleanroom facility for nano-scale research. The equipment will be used for research and to prepare undergraduate and graduate students for careers in the semiconductor packaging industry.

The grant was awarded as a part of the CHIPS and Science Act, a 2022 bipartisan bill spearheaded by Senator Chuck Schumer that allocated $280 billion for American industry—focusing particularly on semiconductor manufacturing. The grant will provide the NLAB with equipment to manufacture and test semiconductors, creating training opportunities for students.

About 100 people will receive job training from NLAB. Approximately 20 faculty and 60 graduate students will also benefit from the grant, as the additional equipment will assist with research projects supported by the facility.

Teamwork Makes the Dream Work

The University of Texas at Austin just announced a new partnership with Austin Community College District and Texas Institute for Electronics to create a new semiconductor training center. Under the partnership, UT, ACC and TIE will:

- Develop a joint Semiconductor Training Center (STC), allowing students at UT, ACC and across the nation to receive hands-on technical training combined with academic theory. It also will host programs designed to transition current workforce talent into the semiconductor industry and advance the careers of incumbent workers.
- Develop Semiconductor Curriculum & Credentialing. Leveraging faculty members from both institutions along with industry experts, this initiative will build stackable skill-based microcredentials and related education activities, with plans to develop K-12 partnerships.

"The joint initiative will help build the pipeline of skilled workers at all levels that are necessary to support an estimated 115,000 new semiconductor jobs expected to be added to the U.S. economy by 2030," UT Austin said in the press release.

The university also just introduced a new master's degree program that it says will "help fill the demand for semiconductor scientists and engineers and give students a chance to lead the next wave of innovation in the booming semiconductor industry." ■

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INSTANT COMMODITY PRICING
AFTERMARKET SERVICES
$325M CREDIT FACILITY
SURPLUS EXPERTISE
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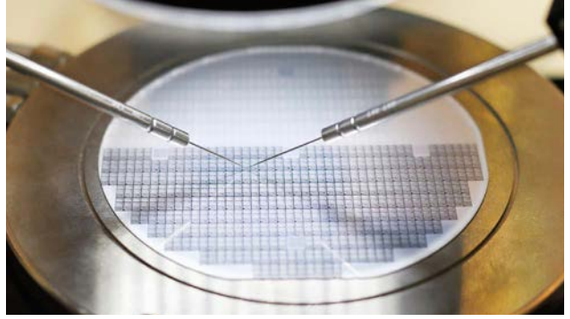
By SUPPLY CHAIN CONNECT STAFF

The U.S. is On Track to Triple its Semiconductor Manufacturing Capacity



A new report from the Semiconductor Industry Association says the U.S. will triple its domestic chip manufacturing over the next eight years.

Whether its lobbying in favor in the industry it represents, ensuring that public policies are promoting innovation or helping to unite all players in the space, the Semiconductor Industry Association (SIA) works tirelessly to support the U.S. semiconductor industry. The group also has its finger on the pulse of the domestic chip manufacturing sector, which it now says is on track to triple in size by 2032.

In their new *Emerging Resilience in the Semiconductor Supply Chain* report, SIA and Boston Consulting Group paint the picture of a sector that's shaken off the negative impacts of the global pandemic and great chip shortage, and that's well positioned to thrive and expand over the next eight years.

Government funding will play a key role in that expansion. The US CHIPS Act, signed into law in August 2022, committed $39 billion in grants and loans for semiconductor manufacturing. Likewise, the European Union unveiled the European CHIPS Act, Mainland China initiated the third vintage of its IC Industry Investment Fund, and various other incentive programs emerged across Asia and other regions.

"In parallel, over 100 new semiconductor manufacturing investments have been announced to meet increased market demand, dispersed worldwide across every major region," SIA points out in the report, which was last published in 2021. Since that time, global governments have made "substantial" efforts to increase their support for the semiconductor industry.

80 New Projects Underway

Between 2020 and year-end 2023, 80 new semiconductor manufacturing projects were announced across the U.S. alone. These facilities are expected to create 50,000 direct new jobs. "A portion of these investments is going to areas with a mature semiconductor footprint, such as Texas, Arizona, New York, and California," says SIA. "But there have also been substantial investments in Greenfields and capacity expansions in newer regions, such as New Albany, Ohio."

As technology continues to advance, semiconductors will play a critical role in the global economy in everything from everyday products to cutting-edge defense and AI products. For the semiconductor industry to thrive, SIA says these four things have to happen:

- **Foster talent at all levels, from cutting-edge research to technicians on the factory floor** and welders on construction sites, through effective partnering with educational institutions, workforce training and industry-tailored migration policies.
- **Provide sustained policy support to address remaining supply chain vulnerabilities,** anticipate the expiration of current incentive programs and "stay the course" through business cycles
- **Help new markets develop the right conditions to attract semiconductor investment,** including targeted and sustained use of incentives, workforce training, infrastructure buildout and improvements in the regulatory environment
- **Maintain open trade and diversify end markets** by enacting trade measures that are well-defined, consistently applied and aligned across likeminded partners, and negotiating effective trade agreements in the face of geopolitical uncertainty.

Expansion is in the Cards

With the U.S. expanding its capacity at the rate of 203%, the country is expected to grow capacity at a faster rate than other regions and much faster than in the preceding decade. In terms of thousands of wafer starts per month (300 mm equivalents), SIA says this represents an increase from 1,121 kwspm (thousands of wafer starts per month) in 2022 to 3,393 kwspm (203% increase) in 2032.

In order to maintain this momentum, SIA says U.S. policymakers must continue demonstrating a steadfast commitment to supply chain resilience. "In the United States, the government can accelerate implementation of existing CHIPS Act programs," it says. "It can also consider the need for future tax incentives; for example, if the current ITC were to be made permanent and broadened to cover semiconductor design, it would make future incentives more predictable, thus helping companies make better investment decisions."

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By BRIDGET MCCREA

Procurement Approaches Gen AI with a Skeptical Eye

As generative artificial intelligence becomes more prevalent in the business world, procurement teams are well positioned to harness its power.

Chief procurement officers (CPOs) are skeptical of artificial intelligence's power to change the way things have always been done in the procurement field, but that's not throttling growth in the AI procurement market. In fact, ELINT Market Research says the global AI "intelligence procurement" market surpassed $63.4 billion last year.

"The dominance of the AI market results from the growing adoption and integration of AI technologies across industries and market sectors worldwide, influencing business operations and overall strategic outlook," it says, noting that the proliferation of AI-driven solutions underscores a core strategic change in how businesses approach procurement and technology integration.

"As companies seek solutions to improve their efficiency, reduce the cost associated with various processes, and gain that competitive advantage," ELINT adds, "the importance of AI software has become apparent."

That may be so, but CPOs remain skeptical of AI's influence on and involvement in their corner of the corporate world. According to a new McKinsey & Co., study, these C-level executives are keeping a particularly close eye on generative AI, or those deep learning models that can generate high-quality text, images and other content based on the data they were trained on.

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Procurement Approaches Gen AI with a Skeptical Eye, (Continued from page 56)

Not Quite Sure

Right now, many CPOs are questioning the potential positive impacts of gen AI. The arguments range from overly niche functionality to concerns about the accuracy and security of using the large language models (LLMs) that underpin it. "More often, though, we hear skepticism about the start-up cost and initial duplication of existing work," McKinsey says.

In fact, 66% of CPOs surveyed in McKinsey's latest CPO 100 survey believe gen AI is still years from generating substantive business results. For example, a key procurement use case is automating document creation to reduce manual work. Yet many CPOs believe that this type of content generation is not yet mature.

"Gen AI is a great toy. It's good to play with, but our day-to-day work remains unchanged," a senior procurement executive of a Fortune 100 medtech company told McKinsey. Other companies are already leveraging gen AI's power in their procurement departments. For instance, the consultancy says one of its clients developed an RFP engine, leveraging sanitized templates and cost drivers from more than 10,000 RFPs and their responses.

"The technology replicated complex 'best of best' analyses in a fraction of the time," McKinsey explains. "It also learned what drove winning bids and redesigned future RFPs for optimal bid structure and cost granularity. Finally, it predicted, and prevented, omissions and mistakes in the bids."

To the untrained eye, gen AI applications in procurement may appear niche or gimmicky, McKinsey concludes. In reality, it says LLMs are trained across multiple knowledge domains, which allows them to handle broad, layered questions and draw implications that lead to good conclusions.

"It is one of the key capabilities that procurement organizations need to evolve and strengthen," the consultancy adds, "moving from a pure executing function to a strategic, business-leading function."

Putting Gen AI to Work in Procurement

In *How Generative AI will transform Sourcing and Procurement Operations*, Deloitte discusses the impact of gen AI on the sourcing and procurement landscape.

"Sourcing and procurement operations have historically been at the forefront of technological disruption. From leveraging advanced analytics for spend categorization to deploying conversational AI for guided buying, source-to-pay tools have continuously innovated to address process challenges," Deloitte says. "However, many sourcing and procurement functions continue to struggle to optimize efficiency, manage risk, and manage costs (inflationary pressures in recent times)."

According to Deloitte's 2023 Global Chief Procurement Officer survey, CPOs have continually invested in enhancing digital capabilities. Digital transformation remains the third priority over the next 12 months, it adds, with 80% of CPOs reporting it as their organization's top priority. In assessing the various types of technology that make up a procurement team's digital portfolio, Deloitte says gen AI can support teams on several different fronts.

For example, gen AI can be used in procurement compliance management to monitor procurement processes and identify potentially fraudulent activities or anomalies. It can also assist organizational governance by analyzing policy documents and reports and identifying areas of noncompliance to take corrective action. Finally, it can help buyers more efficiently identify, evaluate and select the most suitable suppliers based on the organization's needs. ▪

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