

AVNET®

SUPPLY CHAINS UNDER PRESSURE: WHAT THE BEST TEAMS DO DIFFERENTLY

A practical playbook for electronics supply chain resilience, visibility and component-level risk mitigation

TABLE OF CONTENTS

Executive summary 3

The new reality 4

AI-enabled visibility and predictive planning 5

Building sourcing optionality before disruption 6

BOM and component-level risk 7

Best-practice framework 9

Checklist: What the best teams do differently 10

Outlook: From reactive to predictive operations 11

Final thought 11

EXECUTIVE SUMMARY: FROM REACTION TO ORCHESTRATION

By Robert Cowan

Disruption is now part of everyday life for electronics supply chains. Still, the most successful electronics manufacturers can spot risk early, weigh options and move quickly.

When volatility hits, many companies buy more inventory, speed up orders or search for new sources. Those moves may relieve immediate pressure, but they often add cost, add to the bullwhip effect, and add complexity without fixing the underlying problem: supply chain risk. The strongest teams develop a culture of supply chain resilience by improving visibility, deepening supplier relationships, proactively expanding sourcing options and strengthening decision-making across the product lifecycle.

Getting there takes more than another dashboard or supplier quarterly business review. Leading teams look beyond direct suppliers, build truly independent supply options and address risk while products are still being designed. That matters because one shortage, lifecycle change or country-of-origin issue can disrupt production, customer commitments and revenue across regions. Resilience works best when engineering, procurement, manufacturing and supply chain teams own it together.

AI-powered planning, simulation and visibility tools can sharpen forecasts, test scenarios and speed decisions. But tools alone do not create resilience. Teams need clear workflows that turn insight into action and make continuous monitoring, sourcing options, BOM health and cross-functional governance part of daily operations.

This whitepaper offers a practical playbook for using AI, sourcing flexibility and component risk management to create more resilient and proactive supply chain operations.

TAKEAWAY

Research from Gartner, McKinsey, Deloitte and other industry analysts consistently identifies several characteristics of resilient supply chain organizations, including visibility beyond Tier 1 suppliers, sourcing flexibility, AI-enabled planning, proactive risk management and strong cross-functional collaboration.

WHAT LEADING SUPPLY CHAIN TEAMS DO DIFFERENTLY

- Use AI to improve forecasting and scenario planning.
- Monitor supply chain risk beyond Tier 1 suppliers.
- Build sourcing flexibility before disruption occurs.
- Manage component risk throughout the product lifecycle.
- Align engineering, procurement and supply chain teams around shared decisions.



Robert Cowan is Director of Supply Chain Solutions Development for Avnet Velocity® where he and a team of supply chain architects design end-to-end solutions for digital and physical supply networks for organizations throughout the global electronic component ecosystem. Robert has been with Avnet for 13 years. Prior to Avnet, he held positions as a supply chain consultant, project manager and supply chain manager. He has a master's degree in Logistics, Supply Chain and Project Management from SKEMA Business School in France, is a Project Management Professional (PMP) with the Project Management Institute, and a Member of the Chartered Institute of Logistics and Transport, UK.

THE NEW REALITY: PERMANENT VOLATILITY

Disruption is no longer the exception for electronics manufacturers. Ongoing geopolitical, supply, regulatory and logistics challenges create continuous risk across the supply chain. Volatility has become a permanent part of the operating environment.

Many organizations still rely on tactics built for a more predictable era: increasing inventory, accelerating purchases or finding alternatives after risk emerges. These measures may provide temporary relief but rarely correct structural weaknesses. Resilience instead comes from earlier visibility, meaningful sourcing options and flexibility designed into components and products before disruption occurs.

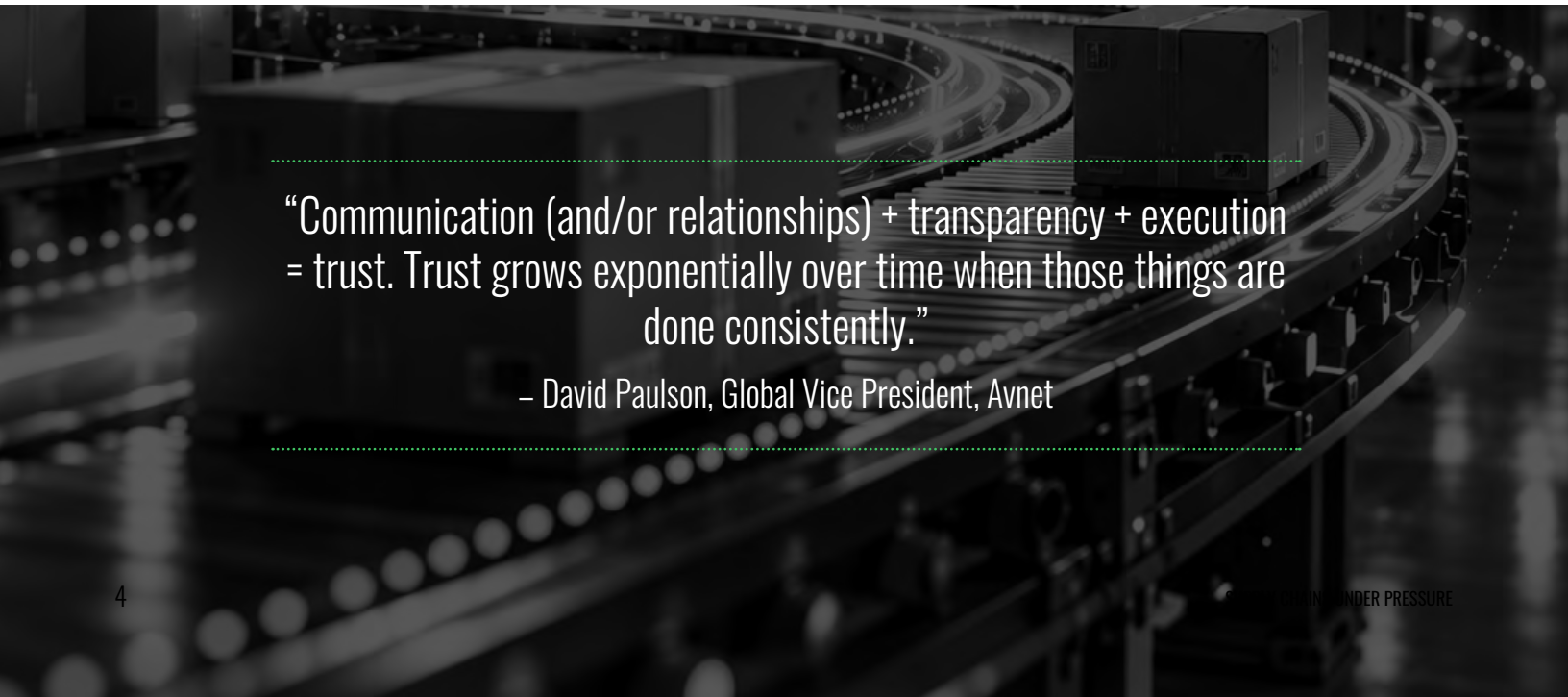
Supply chain excellence must now balance efficiency with resilience and adaptability. In electronics, this requires closer alignment among engineering, procurement and supply chain teams. Today, component selection, lifecycle planning and manufacturability determine future sourcing flexibility from the design stage onward.

AI-enabled visibility, predictive analytics and simulation can help teams identify risk sooner and test response scenarios. But technology creates value only when it is trusted, and when governance, workflows and cross-functional ownership turn insight into action. According to Gartner, resilient supply chain organizations are expanding visibility beyond Tier 1 suppliers and strengthening the capabilities needed to anticipate and manage disruption across increasingly complex supply networks. Leading organizations combine advanced visibility, predictive planning, sourcing flexibility and cross-functional decision-making to move beyond reactive firefighting and toward more adaptive, resilient operations

Underpinning resilient electronics supply chains is this foundational enabler: trust. When partners trust one another to share accurate information and act transparently, they can make better investments, sourcing and capacity decisions without the uncertainty created by inflated or duplicated demand signals.

WHAT THE BEST TEAMS UNDERSTAND

The best teams treat volatility as permanent and build the capabilities to operate confidently within it: deeper risk visibility, sourcing flexibility, component-level resilience and alignment across engineering, procurement, manufacturing and supply chain functions. These capabilities help organizations withstand disruption and turn uncertainty into a strategic advantage, a condition defined as **antifragility** by Gartner.



> "Communication (and/or relationships) + transparency + execution = trust. Trust grows exponentially over time when those things are done consistently."
>
> – David Paulson, Global Vice President, Avnet

AI-ENABLED VISIBILITY AND PREDICTIVE PLANNING

Supply chain visibility matters only when teams can turn signals into timely decisions. Leading companies combine data, analytics and AI-driven support to move quickly from insight to action.

AI can recognize patterns, test scenarios and improve forecasting, inventory planning, supplier risk analysis and logistics decisions—helping teams spot emerging risks earlier and focus expertise where it matters most.

In electronics, disruption often starts at the component level. Monitoring lead times, lifecycle status, supplier capacity, regulations and country of origin can reveal bill of materials (BOM) impacts before shortages or redesigns become critical.

Technology creates value only when clear priorities, ownership and escalation paths convert alerts into action.

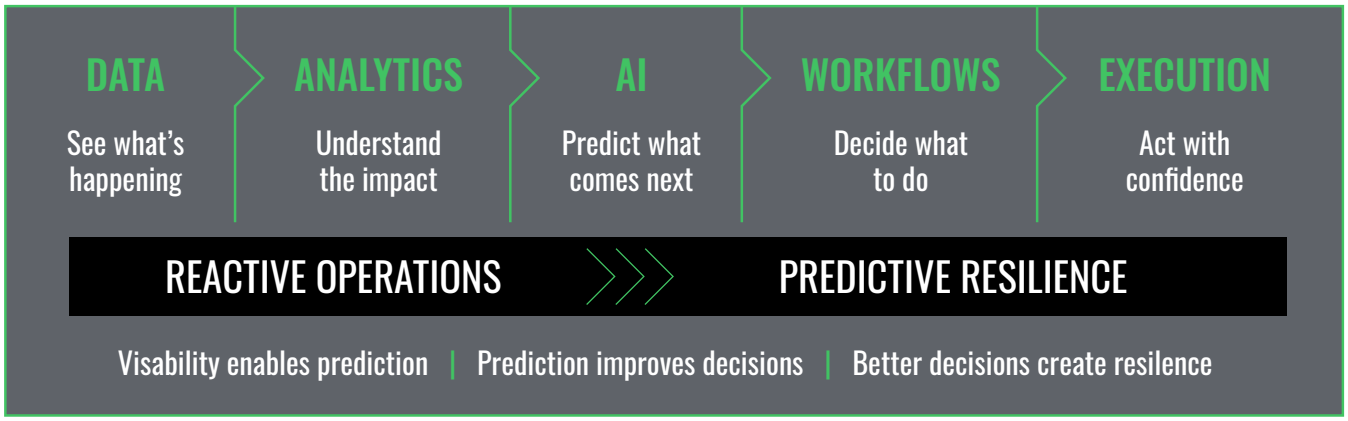
Effective playbooks assess risk to production, inventory, customer commitments and revenue, then trigger responses such as qualifying alternates, adjusting sourcing or updating forecasts.

Visibility must extend beyond direct suppliers. Mapping where critical components are made, how they move and which upstream dependencies create single points of failure helps teams act before risk cascades. AI-powered analytics can support continuous assessment of geopolitical events, lead-time shifts and lifecycle risks, provided the underlying data is clean and trustworthy.

The future of AI in the supply chain is autonomous transactions, which reinforces the need for clean, reliable data.

FROM DATA TO DECISIONS

Organizations that gain the greatest advantage from AI are not necessarily those deploying the most advanced technology. They are the ones that successfully connect five critical capabilities:



When these capabilities work together, organizations move beyond seeing disruption and begin actively shaping outcomes. In my opinion, that is the foundation of predictive planning and one of the defining characteristics of the best supply chain teams operating in today's volatile environment.

BUILDING SOURCING OPTIONALITY BEFORE DISRUPTION

Supply chains optimized solely for cost and efficiency often lack the flexibility to withstand disruption. As volatility becomes permanent, leading organizations are building optionality so they can adapt when markets, suppliers, logistics routes or regulations change. Regionalization and diversification reduce dependence on any single supplier, location or pathway without abandoning the benefits of global networks.

For electronics manufacturers, specialized suppliers are concentrated in a few regions, making it difficult to switch sources quickly. Building resilience means identifying risks early and balancing cost, availability, supplier diversity, capability and business continuity.

That's why visibility must extend beyond direct suppliers. Organizations need to know where critical components are manufactured, tested, stored and distributed. They need to know which upstream dependencies could become single points of failure.

We call this mindset ***strategic curiosity.***

Optionality depends on trust and information sharing. When organizations provide suppliers with useful demand signals, planning horizons and business context, partners can anticipate requirements and strengthen resilience across the ecosystem. The organizations best positioned to succeed are those that understand their networks deeply, maintain flexible sourcing options and build continuity into decisions before disruption occurs.

WHAT THE BEST TEAMS DO DIFFERENTLY

Leading supply chain organizations build sourcing optionality through a combination of visibility, collaboration and proactive planning:

- Map supplier ecosystems beyond Tier 1 relationships.
- Evaluate country-of-origin exposure and regional concentration risks.
- Identify and monitor potential single points of failure.
- Develop qualified alternate sourcing strategies where appropriate.
- Align strategic inventory, supplier agreements and demand planning around critical components.
- Share information and planning assumptions with key supply chain partners to improve ecosystem-wide resilience.

The result is a supply chain that is not only more resilient, but also more agile, informed and prepared to respond intelligently when market conditions change.



BOM AND COMPONENT-LEVEL RISK: RESILIENCE STARTS IN THE DESIGN PHASE

Resilient organizations address component risk before production begins. In electronics, the bill of materials (BOM) is not only an engineering document but also a supply chain risk-management asset. Component choices affect availability, lifecycle longevity, sourcing flexibility, manufacturability and continuity for years after launch.

> "Your resiliency strategy is only as strong as the BOM it is built upon. For example, when an end-of-life component slips into your prototype undetected, no amount of AI or planning will fix that."
>
> – David Paulson, Global Vice President, Avnet

That reality requires engineering, procurement and supply chain teams to evaluate technical performance, cost and supply risk together before BOM decisions are finalized. BOM health summarizes that risk by considering lifecycle status, supply availability, sourcing diversity, qualification options and geopolitical exposure. A specialized component may perform well but create vulnerability if it becomes constrained, obsolete or restricted. Designs with qualified alternatives can adapt faster and avoid major redesigns.

A practical component-risk review should assess:

- Supply availability and historical lead-time stability
- Product lifecycle status and end-of-life exposure
- Availability of form, fit and function alternatives
- Single-source versus multi-source dependency
- Manufacturing and qualification considerations
- Country-of-origin and geopolitical exposure

These criteria help teams detect risks that current-availability reviews miss. Qualifying alternate suppliers and form-fit-function options creates flexibility when demand, supplier performance or geopolitical conditions change. Continuous monitoring of product change notifications, end-of-life announcements and technology transitions also gives teams time to plan replacements, inventories and qualifications before continuity is threatened.

Digital BOM analysis tools can monitor lifecycle and supply conditions, identify alternates and assess large component portfolios continuously. Integrating this intelligence into product-development workflows turns BOM management from a one-time review into an ongoing resilience capability shared by engineering and procurement.

Designing resilience into the BOM

The strongest supply chains are designed, not repaired as you go. Treating BOM health as a strategic discipline by integrating engineering, procurement and supply chain expertise early reduces risk, expands sourcing flexibility and strengthens long-term continuity.

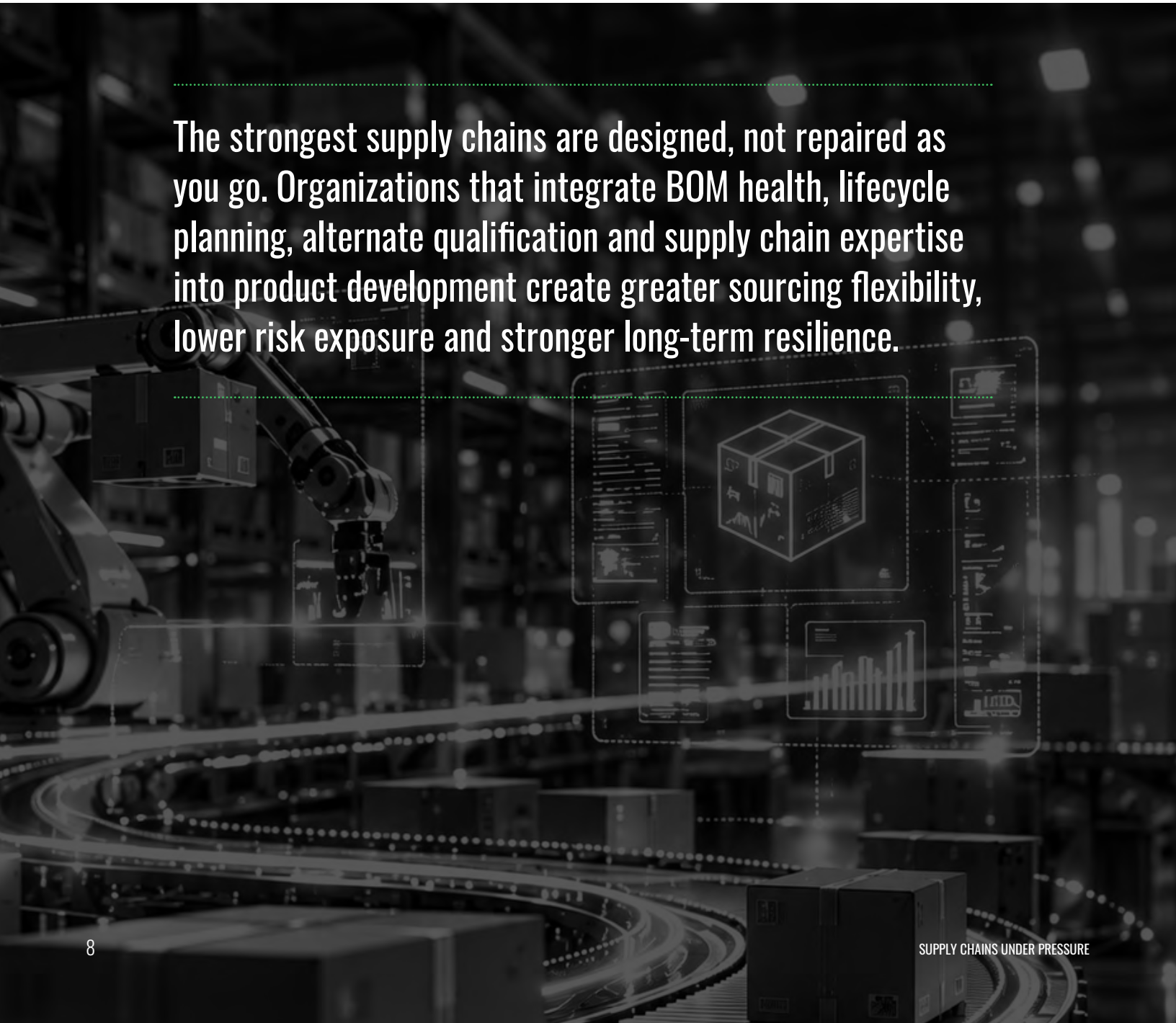
> "Strong supply chain organizations assess risk at a device level, then craft a supply chain resiliency equation around it. Example: If I have ASIC in my design, that supply chain strategy will look very different from that of a capacitor, where I have five sources and the lead times are short."
>
> – David Paulson, Global Vice President, Avnet

BOM HEALTH CHECKLIST

Before design moves toward production, leading organizations ask several critical questions:

- ☐ Are any critical components single-sourced?
- ☐ Have alternate components been identified and qualified where practical?
- ☐ Does the BOM include components with lifecycle or obsolescence concerns?
- ☐ Have country-of-origin and geopolitical risks been evaluated?
- ☐ Are procurement and engineering aligned on acceptable substitutions and sourcing alternatives?
- ☐ Has supply chain resilience been considered as part of the overall product design process?

Organizations that can confidently answer these questions are far more likely to withstand disruption.



The strongest supply chains are designed, not repaired as you go. Organizations that integrate BOM health, lifecycle planning, alternate qualification and supply chain expertise into product development create greater sourcing flexibility, lower risk exposure and stronger long-term resilience.

BEST-PRACTICE FRAMEWORK: THE RESILIENCE OPERATING SYSTEM

Resilient supply chains combine visibility, predictive insight, product and sourcing flexibility, cross-functional governance, continuous monitoring and improvement into one operating model. Rather than relying on isolated tools or tactics, high-performing organizations embed these capabilities into everyday decisions across the product lifecycle and supplier ecosystem.

1. SEE: Establish end-to-end visibility

Build visibility beyond internal operations and Tier 1 suppliers across supplier dependencies, component lifecycle, logistics and demand. The goal is an actionable understanding of vulnerabilities and business impact—not more data.

2. ANTICIPATE: Turn visibility into predictive insight

Use analytics, AI and scenario planning to convert visibility into forecasts, risk models and response options before disruption affects performance.

3. DESIGN: Build flexibility into products and supply chains

Address risk during product development through BOM health reviews, lifecycle planning, alternate qualification, dual sourcing and design-for-supply-chain practices. Flexibility created before design freeze provides options when shortages or supplier constraints emerge.

4. COLLABORATE: Break down functional silos

Align engineering, procurement, operations, manufacturing, logistics, compliance and finance around shared risk priorities, metrics, decision rights and escalation paths. Cross-functional governance prevents localized decisions from creating wider business consequences.

5. ADAPT: Maintain continuous monitoring and response

Continuously monitor component lifecycle, lead times, supplier performance, demand, geopolitical events and other continuity risks. Defined triggers and contingency plans allow teams to act before emerging issues become customer-facing problems.

6. IMPROVE: Create a cycle of continuous optimization

Track resilience KPIs, review supplier and business performance, audit risks and incorporate lessons learned into updated strategies and processes. Resilience improves through an ongoing cycle of measurement, learning and refinement.

FROM BEST PRACTICES TO COMPETITIVE ADVANTAGE

Competitive advantage comes from operating these six capabilities as one system. Organizations that continuously see, anticipate, design, collaborate, adapt and improve are better prepared to perform through uncertainty.



CHECKLIST: WHAT THE BEST TEAMS DO DIFFERENTLY

Use this checklist to assess whether your organization can identify risk early, maintain options and act decisively across five core capabilities.

VISIBILITY: Can you see risk before it becomes a problem?

- ☐ We map critical dependencies beyond Tier 1 suppliers and country-of-origin exposure.
- ☐ We monitor component availability, lifecycle status, lead times, product-change and end-of-life notices.
- ☐ Risk signals trigger defined response and escalation processes.

SOURCING: Have you built optionality into the supply chain?

- ☐ Critical components have qualified alternate sources where practical, and single points of failure are documented.
- ☐ Strategic inventory, supplier agreements and continuity plans address elevated risks.
- ☐ We evaluate geographic concentration and share demand assumptions with key suppliers.

PRODUCT DESIGN: Is resilience designed into the BOM?

- ☐ BOM health reviews occur before design freeze with engineering and procurement.
- ☐ Lifecycle, obsolescence and alternate-component risks are evaluated during development.
- ☐ Supply chain resilience is considered alongside performance, cost and manufacturability requirements.

GOVERNANCE: Can teams make decisions quickly and consistently?

- ☐ Cross-functional risk reviews occur regularly with clear ownership and escalation paths.
- ☐ Leaders review resilience priorities, decisions and metrics.
- ☐ A supply chain resilience culture is extended to your external partners.

TECHNOLOGY AND DECISION SUPPORT: Can you turn insight into action?

- ☐ Visibility tools support forecasting, scenario planning and actionable risk monitoring.
- ☐ AI and analytics are used to support forecasting, scenario planning and risk monitoring.
- ☐ Risk events trigger integrated workflows and response actions.

WHAT YOUR SCORE MEANS

Mostly "yes" answers indicate a shift beyond reactive management. Gaps identify priorities for strengthening visibility, sourcing flexibility, BOM health, governance or decision support.

TAKEAWAY: The best teams expose weaknesses before disruption, build flexibility into products and sourcing, align decision-makers and use technology to act faster. These capabilities separate organizations that react from those that consistently outperform.

OUTLOOK: FROM REACTIVE TO PREDICTIVE OPERATIONS

The future of supply chain management will be defined by how effectively organizations anticipate disruption.

As volatility becomes a constant, resilience must shift from a defensive response into a predictive operating model built on visibility, intelligence and flexibility.

AI, predictive analytics, intelligent simulation and digital ecosystems are enabling real-time monitoring, scenario planning and earlier action. Yet technology alone is insufficient. Predictive organizations pair data with clear risk ownership, defined workflows and collaboration across engineering, procurement, manufacturing, logistics and supply chain teams.

Electronics manufacturers also need to design resilience into products through BOM health reviews, alternate qualification, lifecycle planning and sourcing flexibility. Extending visibility beyond Tier 1 suppliers and understanding upstream dependencies creates options before disruption occurs.

Visibility enables prediction; prediction improves decisions; better decisions create resilience. Together, these capabilities help organizations adapt and compete through uncertainty.

FINAL THOUGHT

Supply chain disruption is an operating condition. The organizations pulling ahead are not simply reacting faster. They are using trusted AI-powered visibility, predictive analytics, sourcing flexibility and component risk management to anticipate risk and make better decisions, and have the relationships in place to execute them.

The future belongs to electronics manufacturers and partners that can see issues sooner, evaluate options faster and act with confidence. Those capabilities are turning supply chain performance into a competitive advantage.



ABOUT AVNET

As a leading global technology distributor and solutions provider, Avnet has served customers' evolving needs for more than a century. Through regional and specialized businesses around the world, we support customers and suppliers at every stage of the product lifecycle. We help companies adapt to change and accelerate the design and supply stages of product development. With a unique viewpoint from the center of the technology supply chain, Avnet is a trusted partner that solves complex design and supply chain issues so customers can realize revenue faster.

Learn more at www.avnet.com

Copyright © 2026 Avnet, Inc. AVNET and the AVNET logo are registered trademarks of Avnet, Inc.
All other brands are the property of their respective owners. FY27_1830_KL

Avnet
2150 E. Warner Rd.
Tempe, AZ 852841
800-332-8638
avnet.com