



Expert Insights

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COVID-19 and shattered supply chains

Reducing vulnerabilities
through smarter supply chains

IBM Institute for
Business Value



Experts on this topic



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The COVID-19 pandemic has revealed vulnerabilities in global supply chains across most, if not all, sectors and industries.

Talking points

Unanticipated chaos

Companies typically create supply chains with the expectation that materials will be easily accessible. However, as COVID-19 has shown, unexpected events can shatter this basic premise, disrupting supply chain performance.

The need for resilience

COVID-19 has driven home the need to strengthen global supply chain networks. Supply chains should be dynamic, responsive, and interconnected to an organization's ecosystem and processes. This requires end-to-end visibility, real-time insights, and decisive actions—particularly in escalating situations.

Building smarter supply chains

Systems based on exponential technologies can help organizations build smarter supply chains and reduce vulnerabilities in global pandemics—or other unforeseen circumstances. Smarter supply chains that leverage the power of AI and other emerging technologies can help companies maintain business continuity amid disruption and uncertainty.

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The reality of a global pandemic

As the world works to manage the current COVID-19 outbreak, the focus is rightly on communities treating those infected, companies protecting employees worldwide, and collectively containing the virus to limit global health impact. Our thoughts are with all those individuals affected by this outbreak.

As the situation continues to develop, it's clear that economic and societal costs will be huge. The pandemic has revealed the vulnerabilities and fragilities in global supply chains across most, if not all, sectors and industries. Today, organizations are in reaction mode, focused strictly on maintaining supply and meeting customer needs, often through hands-on rigor and hard work. However, at some point, leaders must analyze the current pain points to better prepare for tomorrow. To avoid perpetual reaction to future "black swan" situations, leaders need to evaluate how they can proactively get ready for future unpredictable, yet inevitable, disruptions.

While no one can foresee what's in store for tomorrow, we can work today on building a smarter global supply chain. Organizations can leverage artificial intelligence (AI) and other technologies—such as automation, blockchain, IoT, 5G, and edge computing—to help turn the unanticipated into the envisioned.

The supply chain challenge

Current market volatility has highlighted the significant role supply chains play in the overall success and valuation of global corporations. Today's supply chains are incredibly complex, with myriad partners spread across multiple geographies as part of an unprecedented, intertwined global trade ecosystem. Consider the severe acute respiratory syndrome (SARS) epidemic, for example: in 2003 during the SARS outbreak, China accounted for just 2 percent of global GDP.¹ Now consider the COVID-19 pandemic: today, China's share of global GDP has increased to almost 20 percent.² As recent history has demonstrated, the potential global repercussions of a slowdown in China's economy have increased exponentially.

Intelligent workflows challenge siloed processes, uncovering efficiencies across a network of processes and partners.

Understanding supply chain risks requires gaining visibility into tier 2 and tier 3 suppliers that, despite their relatively small size, can quickly and significantly disrupt production. The knock-on impacts of China's shutdowns early in 2020 sparked strong interest in geographical diversification of supply chains. Recent reports show that over 90 percent of the Fortune 1000 companies have tier 2 suppliers in the regions of China most affected in the initial phase of the global COVID-19 pandemic.³ Any impediment to interaction and engagement with these suppliers makes risks hard to manage.

At the same time, there's been a heightened premium on accelerating or driving greater agility into supply chains to better manage rapidly evolving situations. Some European firms are moving from ocean freight to more expensive but faster rail transport from China.⁴ Perhaps the most resilient course of all may be teaming up with supply chain partners to establish a coordinated crisis-support system. In such situations, partners will likely rise or fall together, and sharing information, ideas, and response strategies in that climate becomes highly valuable.

Tenacious supply chain professionals are and will continue working through immediate challenges. But, moving forward, how can organizations better manage, foresee, and limit the severity of disruptions? The answer involves building the capabilities necessary to respond to future events with both pace and certainty.

Reimagining your supply chain

Traditionally, global companies have based their supply chain design on the assumption that materials flow freely globally, enabling them to source, produce, and distribute products at the lowest-cost locations around the world. However, as the COVID-19 pandemic has demonstrated, unforeseen events can trigger major disruption to entire supply chain networks.

Greater agility and the ability to rapidly recalculate strategy can help dampen the impacts of unanticipated events—from disease and foodborne illness to severe weather, geopolitical transformation, and international trade-policy changes. Transforming supply chain processes into intelligent workflows enables an enterprise to reach new levels of responsiveness. Intelligent workflows challenge siloed processes and ways of working, uncovering efficiencies across a network of processes and partners.

Augmented by AI and related technologies, new supply chain intelligent workflows—underpinned by business platforms—can deliver exceptional outcomes at scale. Opportunities for transformation exist across the value chain, from demand planning and manufacturing execution to order orchestration and fulfillment. Intelligent workflows reimagine the intersection of people, process, and technology which, in turn, helps supply chain professionals execute and deliver more effectively and efficiently, even as strategies and environments continually change.

Successfully navigating disruptions

Global supply chain disruptions present operational and service risks, limiting both continuity of operations and the ability to serve affected customers. Rapid assessments can help companies identify near-, mid- and long-term capabilities that can transform their supply chains to alleviate immediate pressures and proactively navigate global and local disruptions.

We propose organizations focus their supply chain resiliency efforts on three key areas.

1. Structural risk and flexibility

Smarter supply chain modeling and scenario analysis through digital twins can provide an immediate assessment, as well as continued evaluations of the fine balance between lean operations and risk mitigation. Analytics, AI, and visualization tools allow executives to model and then build flexibility and optionality into structural supply chains.

This includes assessing geopolitical risks, climate change risks, cyber security risks, and natural disasters. For materials and intermediate products, organizations can proactively identify alternate sources wherever possible, test and contract multiple logistics routes, and maintain the flexibility to reposition inventory across their supply chains.

2. Global visibility and insights

Using AI, organizations can turn unstructured real-time data into insights that help predict disruptions and vulnerabilities, providing near-term visibility. And global tools like integrated control towers can enable end-to-end visibility of supply chain flows for long-term solutions.

Combining the power of a control tower with connected IoT, AI, and blockchain capabilities enables organizations to see where their products are—in real time—across the world. This aids not only in predicting possible vulnerabilities and disruptions, but also understanding their up and downstream impacts, enabling more rapid response. Recent analysis highlights the importance of visibility into the full supplier network: While only 163 of Fortune 1000 companies have tier 1 suppliers in China, 938 have tier 2 suppliers in China, demonstrating a major impact to business.⁵

Lessons from the IBM Systems supply chain

Within our own IBM Systems supply chain, we have developed cognitive control tower capabilities to identify early warnings based on external data, such as social media or The Weather Company insights. As a result, our supply chain professionals have relevant and actionable information at their fingertips, allowing them to quickly respond to disruptions. And rather than chasing information and status reports, they can focus on higher-value activities like communicating with customers, suppliers, and other impacted stakeholders.

AI systems also help our professionals optimize orders based on criticality, including inventory reallocation and prioritization. This not only allows our teams to react quickly, it also shaves off hundreds of hours previously spent collecting data, again allowing more time to focus on that higher value work.

3. Rapid reaction and resolution

Collaboration rooms and data-sharing platforms help strategic partners rapidly join forces to understand the impact of disruptions across their joint supply chains. Together, they can determine how to rapidly respond to and resolve issues. In addition, AI-enabled systems that continuously analyze structured and unstructured data to form hypotheses and support rapid scenario planning can help supply chain professionals make more informed and timely decisions for their organizations.

Tomorrow's global supply network

Supply chains form the backbone of the global economy. This current crisis and its widespread effects on the global supply chain have exposed the dire need for proactive preparation. As organizations journey toward an intelligent, self-correcting, smart supply chain, the most adaptable companies will learn from their current challenges and implement intelligent workflow strategies to create smarter supply chains. Tomorrow's leading companies will be those that continue optimizing their increasingly global supply chain networks, while also positioning themselves to effectively respond to the next black swan disruption.

Action guide

COVID-19 and shattered supply chains

1. Re-evaluate your sourcing strategy and redesign the supplier network, weighing the level of risk the enterprise can tolerate against the amount of operational flexibility it wants to achieve. Use AI to leverage unstructured real-time data to provide alerts to help predict disruptions and vulnerabilities and to provide visibility and insights for recommended corrective actions.
2. Build smarter supply chain modeling and scenario analysis through digital twins to provide both the immediate assessment and longer-term ability to continually evaluate the fine balance between lean operations and risk mitigation. Using analytics, AI, and visualization tools, model and then build flexibility with optimal configurations into structural supply chains.
3. Set up data-sharing platforms so strategic partners can quickly collaborate and understand the impact of disruptions. Leverage AI to support rapid scenario planning and unlock hidden insights that augment the supply chain planner's abilities to quickly determine options and take action.

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Notes and sources

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