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Streamlining Supply Chains

How advanced technologies can drive supply chain visibility and efficiency.

BY HANSOO KWON

THIS YEAR HAS HAD NO SHORTAGE OF EVENTS THAT UNDERscore the importance of supply chain visibility: shifting business impacts as COVID-19 case numbers have started to rise again, extreme weather events around the country and the world, and a return to a tight labor market. Manufacturing companies need to achieve situational awareness by gaining visibility and synchronization of their supply chains in order to navigate these fluctuations efficiently and with minimal disruption to customers.

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Harnessing the power of enabling technologies is one of the most effective ways to improve visibility and drive efficiencies across the supply chain. Manufacturers might consider using AI-driven simulation tools and digital twins to better anticipate supply chain disruptions and help them understand when to adjust their plans accordingly. Because interconnectivity will drive such efforts, businesses should also look for opportunities to further integrate smart device capabilities across their organization.

Just as important to the implementation of these AI-driven tools is a leadership team committed to supporting their integration throughout the business on a holistic level.

Transformative Tools

For manufacturers in the early stages of using advanced technologies to streamline visibility into their supply chains, achieving better situational awareness of these supply networks may seem daunting. At a basic level though, the effort boils down to three main components:

1. **The what** — What types of disruptions and events can your organization identify that will adversely affect your supply chain?
2. **The so what** — What would the impact of those disruptive events be?
3. **The now what** — What solutions can you implement to mitigate and/or resolve disruptions that do happen?

The skyrocketing cost of shipping that many companies have had to navigate this year is one example of the type of disruption that should compel manufacturers to prioritize improving their supply chain visibility. Several technologies can assist companies in achieving situational awareness of their supply chain. A complex event processing engine — a computing tool that leverages internal and external data streams with artificial intelligence — can help organizations understand how various geopolitical, climate and economic conditions affect operations around the world. Such processing engines can answer the first question by identifying events that have the potential to impact the supply chain.

If there is a hurricane churning in the Gulf of Mexico, for instance, an event processing engine can help a company that has manufacturing facilities in Alabama to be proactive about how the hurricane will eventually affect operations. Businesses can similarly use event processing engines to understand how surging COVID-19 cases in specific regions will affect operations in those locales.

While complex event processing engines can help identify events that may turn into disruptions, a discrete event simulation tool will allow teams to understand the impact of these disruptions when they occur. By answering the second question, companies will gain insights around which customer orders might be delayed, the various types of inventory shortages they might face, and which production lines may go down. Such insights allow for companies to be more proactive in heading off any supply chain issues, which leads to more consistency and better service for customers.

After an organization has identified disruptions and understands their impact, the next step would be to mitigate and/or resolve those disruptions and answer the third question. To that effect, a discrete event simulation tool along with a digital twin — a digital replication of a company's network on a computer or platform — can provide potential resolutions. The digital twin concept uses real-time updates and data integration to provide a holistic picture of the supply chain. In tandem with the simulation tool, this allows for timely analysis and scenario planning to understand how to mitigate disruptions and their downstream impacts.

These elements combined together provide the framework of an operational control tower, which uses real-time data to understand how current situations might affect the supply chain and how best to resolve those problems. All of this can dramatically improve a company's situational awareness.

Connectivity Is Key

These tools and technologies use information from a variety of data feeds and align that data with a company's supply chain network, including plants, suppliers, and warehouses. Because data is essential to these efforts, manufacturers need to have foundational information technology and operational systems and architecture in place to support the collection and analysis of huge amounts of data.

Many major-name manufacturers are investing heavily in these advanced supply chain technologies and even creating microservices around them. For midmarket and smaller companies, though, investment and adoption vary. Manufacturers should assess whether they have the right IT and OT systems in place to support such efforts.

Connectivity and communication across a manufacturer's supply chain are essential to any efforts around improving supply chain visibility. Such connectivity can come in the form of enterprise resource planning systems, the use of various Internet of Things-enabled devices, and making sure IT and OT systems are effectively integrated.

Beyond connecting systems to be able to use data harmoniously, manufacturers prioritize three key aspects of interconnectivity: the consumption of data, insight generation from that data, and making decisions empowered by that data. Those three elements are the backbone to any truly connected, integrated supply chain.

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Organizational Support

The level of holistic integration required to build a more nimble supply chain doesn't just apply to technological systems; it also extends to the people and teams that head up adoption efforts around advanced technologies.

Manufacturers need to have a center of excellence (COE) in place to support the adoption of artificial intelligence-driven technologies for supply chain transformations. Projects will likely fail if they are left in the hands of a couple of siloed leaders, but a company that stands up a COE comprised of subject matter experts across various functions will have a built-in support network to troubleshoot and navigate issues more effectively as they work on this integration.

Leadership teams should create a smart technologies framework that also helps to drive user adoption across the organization, including training employees and getting them comfortable with using these new systems. Automation and artificial intelligence will present opportunities to move workers away from repetitive tasks toward more critical problem-solving roles, and will allow companies to reimagine what other roles look like beyond the shop floor as well.

Best Practices

Especially for midmarket and smaller manufacturers, it may be overwhelming to determine where to start on the journey of improving supply chain visibility. Leadership teams should assess the company's current position and figure out where the biggest pain points are. This will help to prioritize areas of focus, from suppliers to shop floor operations to a range of other internal or external factors.

Here are some best practices that manufacturers should consider as they adopt advanced technologies to improve their supply chains:

- When implementing new technologies, start small to prove out the benefits before taking anything to scale.
- Identify the top supply chain challenges to help your team prioritize.
- Understand which technologies will fit your business — just because another company is implementing something doesn't mean it will benefit your company's manufacturing, supply chain or warehousing operations the same way.
- Assess how third parties can help you implement these technologies, how they can help with considerations around data integration and accelerate the time frame for adoption. This is especially important for companies that may not have robust IT departments in house.

Given the ever-evolving nature of artificial intelligence and related advanced technologies, manufacturers will need to regularly revisit and update their approaches to supply chain connectivity and visibility, but the areas outlined above are a foundational place to start. M

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