Supply Chain Management

How Global Companies Use AI to Prevent Supply Chain Disruptions

by Remko Van Hoek and Mary Lacity

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Summary. As they strive to make their supply chains more resilient, global companies are grappling with two challenges: the difficulty in discerning potential sources and the extended time required to find, vet, and onboard new suppliers. Companies such as Walmart,... **more**

Ever since the disruptions caused by the Covid-19 pandemic, boards of directors and CEOs have been pressuring corporate procurement leaders to de-risk supply chains. Our recent research at Walmart, Tyson Foods, Koch Industries, Maersk, Siemens, and Unilever revealed how these global companies are using advanced AI technologies to plan for and adapt to supply-chain disruptions.

These tools have a variety of applications. They can enhance large companies' visibility into what's happening in their supply chains, allow them to respond faster to disruptions, deepen their ties with current suppliers by expanding purchases to new items, enable them to discover and qualify new suppliers ahead of potential crises, and even automate negotiations.

Companies that move quickly to adopt these AI tools stand to gain an advantage. "When there is a supply-chain crisis, the key to being competitive is to be faster at finding alternative suppliers than everyone else because everyone's looking to do the same thing," Maggie Brommer, head of procurement for Unilever's Prestige Products, told us.

Here are details on how the global companies we studied are using AI in procurement.

Finding Alternative Suppliers

Unilever uses an AI application and service provided by German-based start-up Scoutbee to find alternative supply sources on short notice. The software generates a list of potential new suppliers by scraping websites for data on suppliers' finances, customer ratings, sustainability scorecards, diversity scores, intellectual property information such as patents and design awards, customs documents from U.S. Customs to validate international trading experiences, and real-time alerts from social media and news feeds that can be set by the user to include for example financial reports and major hires or terminations. After the software generates a list of potential suppliers, the process

becomes manual. Corporate buyers then instruct Scoutbee's staff to request more information from specific buyers on the list.

Unilever, which has promised to purchase €2 billion annually from diverse businesses worldwide by 2025, also uses the technology to find such suppliers in the United States. Lullit Jezequel, Unilever's procurement manager for sustainability and partnerships, says many of the diverse suppliers identified by the AI tool are small or medium-sized businesses (SMEs). "Sometimes what we're searching for isn't definable by a keyword," she told us. "This tool does a deep search to find pitch decks and the types of clients they service to better understand their capabilities. Improving supplier diversity supports supply-base diversification and introduces suppliers that can fill holes and step up during disruptions."

Siemens also uses Scoutbee to quickly find alternative supply sources — like when it faced a shortage of Surlyn, a highly specialized ionomer resin created by DuPont used in the packaging of medical diagnostic products. Because Surlyn is a patented product, there were no alternative manufacturing suppliers. Scoutbee searched import and shipping documents and within days generated a list of 150 Surlyn distributors. Siemens corporate buyers quickly pruned the choices, and Scoutbee's staff then found several distributors on the shortlist with inventory available for Siemens to purchase.

"Technology doesn't give you visibility to reliably prevent supply disruptions before they happen, but it can give you information that can help you respond to supply-chain disruptions much faster than human buyers can," Michael Klinger, Siemens's senior director of supply chain excellence, told us.

Discovering What Else Existing Suppliers Can Do

Onboarding of new suppliers can be time-consuming in specialized operations and manufacturing. Rolls-Royce can take a year or longer to qualify, test, certify, and onboard a new supplier. An alternative approach is to use AI to assess whether existing suppliers can provide additional materials.

Subsidiaries of Koch Industries, one of America's largest privately-held conglomerates are leveraging an AI tool designed by Arkestro to optimize its supplier base. Unlike traditional procurement methods that rely on managing suppliers based on high-level purchasing categories and aggregate spend, this AI tool delves into granular data, right down to the stock-keeping unit (SKU). It generates supply options, often among existing suppliers, thereby reducing the need for drawn-out requests for quotes.

The tool achieves this level of detail by ingesting comprehensive data sets, including existing supplier information, purchase orders, invoices, and even unsuccessful quotes from previous procurement cycles. This offers a nuanced view of qualified suppliers, allowing companies to identify backup suppliers across various categories.

The AI algorithm uses this historical data to automatically populate new requests for quotes (RFQs) with essential parameters like lead times, geographic locations, quantities, service-level agreements, and material costs. It then emails the RFQ to the respective supplier for review. A one-click submission is all it takes if the supplier agrees with the AI-generated quote. Should the supplier choose to modify the quote, the algorithm learns from these changes, continually refining its predictive capabilities. This mutually beneficial approach saves suppliers between 60% and 90% of the time typically spent on completing an RFQ.

For Koch, the primary aim of the AI tool is to identify additional sourcing options within its existing supplier network. However, the technology also benefits suppliers by generating new opportunities to expand their business with Koch.

Automating Negotiations

Both Maersk and Walmart employ a software product called Pactum AI to automate negotiations. Maersk uses its chatbot to more quickly search for transportation rates within existing agreements or have the bot automatically secure a quote if none is available. Walmart, which has more than 100,000 suppliers, uses it to negotiate with people at "tail-end" suppliers — those that account for the 20% or so of Walmart's expenditures on low-value items. Michael DeWitt, vice president strategic sourcing Walmart International shared with us: "The technology enables us to reach suppliers that without AI we simply would not have bandwidth for."

Deciding How to Proceed

In deciding whether or where to adopt AI, you would be wise to follow these guidelines:

Test the technologies.

While solutions from Pactum, Scoutbee and Arkestro have delivered on their promises to the customers that we studied, numerous other AI-based tools have fallen short. The lesson: Companies should use pilot programs to vet technologies.

Tyson Foods encountered a significant hiccup while testing one AI application: The software mistakenly labeled one of Tyson's most reliable suppliers, a publicly-traded cloud-services provider, as "high risk" solely based on its involvement in cybersecurity. Russ Stewart, senior vice president of procurement at Tyson told

us, “Many AI tools excel in assessing the financial risks associated with publicly traded companies, but they often struggle when it comes to evaluating the financial stability of private companies or identifying geopolitical risks. There are a lot of technology companies that are pitching emerging technologies, trying to fill the void.”

Koch Industries, Maersk, Siemens, Tyson Food, Unilever, and Walmart use production pilots on a few purchasing categories before rolling them out more globally. These pilot programs not only rigorously evaluate the technology; when successful, they also garner support from key stakeholders. Maersk conducted a successful pilot of its AI tool in North America, and its success paved the way for the tool’s implementation in 66 additional countries.

Know when not to use AI.

“You don’t need AI everywhere,” Mike Novello, vice president of global supply chain for Koch subsidiary, John Zink Hamworthy Combustion told us. Indeed, AI tools are not a solution to all problems. The value of AI diminishes in stable supplier markets where alternative suppliers are already well known and where buyers face minimal uncertainty. Moreover, AI tools offer limited added benefits for robust relationships with partners who already share in-depth information.

Build a portfolio of AI tools.

Given the current state of AI tools, companies will need to adopt several AI tools to build their supply-chain capabilities. Procurement teams in our study use several AI and automation tools, matching the tools to the tasks and risk levels.

For identifying potential alternative suppliers, tools like Arkestro and Scoutbee offer insights into the most probable suppliers and their likely pricing structures, generating multiple options for buyers to consider; there's little risk if the tool generates false positives. For the negotiation of rates and contracts, buyers preapprove all possible outputs from an AI tool like Pactum due to the legally binding nature of the agreements, thus ensuring a negotiation process that results in full legal compliance. One AI tool to cover all supply chain needs seems unlikely — at least in the near future.

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