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 **SUPPLYCHAIN**  
MANAGEMENT REVIEW

# How advanced technologies are affecting supplychain software

From AI to ML to IoT, the new crop of supply chain technologies support a world where companies can use the past to predict the future.

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With no end in sight to the proliferation of advanced technologies, the supply chain software space is replete with acronyms that range from IoT to AI to ML to RPA, not to mention Big Data, blockchain and myriad other innovations. Concepts that were emerging only five years ago have since become commonplace in a corner of the business world that's centered around visibility, connectivity and efficiency.

This doesn't surprise Kaushal Dave, global head of digital supply chain products at Aera Technology, who says supply chain software developers have spent decades getting customers to put aside their manual ways and use technology to work smarter, better and faster. "It's always been about replacing Excel spreadsheets," says Dave, "and introducing collaborative technology that brings all different types of data together under a single umbrella."

The process that propels that mindset shift has changed over the last few years, according to Dave, who sees scenario management, robotic process automation (RPA) and cognitive automation (i.e., decision-making) as a few of the key game changers. The latter, for example, is completely transforming the way supply chain software has historically been built and sold.

"We're now telling companies that they no longer need to manually collect and enter data, put it on PowerPoint slides and use it to consider different scenarios and make decisions," says Dave. "Cognitive automation does that." For instance, the supply chain manager who has to manually run five different scenarios to determine which of them provides the best return ROI due to lower costs, largest margins and highest profitability, can use automation to handle that time-consuming task.

"You can still evaluate whether that decision

from the system is correct or not, but we're definitely moving toward a day when cognitive automation and decision-making take place within the software itself," Dave explains. "This reduces the amount of time and energy spent manually doing things in the software, versus the software doing it for you and giving you the magic wand to say 'yes' or 'no.'"

### Tackling supply chain complexity

As software vendors fold more artificial intelligence (AI), machine learning (ML) and RPA into their solutions, many outside factors are also driving the charge. Salim Shaikh, senior director of global industry strategy for JDA Software, says the fact that supply chains are becoming increasingly complex is driving up demand for more advanced features and capabilities.

"When you're buying from suppliers around the globe, working with contract manufacturers and collaborating with distributors, the need for visibility increases exponentially," says Shaikh. Concurrently, customer service level expectations are growing, and pushing the ongoing need for faster delivery speeds and better responsiveness. Exacerbated by the "Amazon effect," these demands directly affect the supply chain for both B2C and B2B companies.

Global fuel shortages, driver shortages,



tariffs and supplier compliance aren't making the situation any easier for supply chain organizations. "Walmart and other large companies are imposing 30% penalties on suppliers that don't deliver their orders on time and in full," says Shaikh. "In the past, organizations have been able to survive by keeping excess inventory and/or throwing additional resources at the problem. That's just not sustainable in an environment where margins are shrinking, labor is scarce and competition for capital is increasing."

Combined, these challenges are prompting more companies to leverage technology that goes beyond the basics and that incorporates AI, ML, Big Data and other advanced capabilities. With these tools in hand, organizations can effectively analyze vast amounts of data, make better decisions, spot trends and even predict events before they actually happen. The company that uses software to incorporate social data and news events into its global supply chain planning, for example, is working with a more complete picture of both the opportunities and challenges that it faces.

"Companies want to be able to make better and faster decisions using better visibility, speed and automation," says Shaikh, "while at the same time addressing increasing supply chain complexity and staying profitable."

### **The innovation stage in the rearview mirror**

Ask Zia Zahiri, CTO at JAGGAER, what he thinks about AI's proliferation in the supply chain software space, and he'll tell you that it's already past the innovation stage and pretty much just has to be implemented. A force in the e-procurement space, JAGGAER is putting more

effort into intelligent or "adaptive" procurement right now. It's also integrating augmented reality (AR), natural language processing (NLP) and IoT-based sensor technology into the mix, all with the goal of helping customers make better, data-based decisions.

"If you have good data, you can make good decisions," says Zahiri. Add ML to the equation and the user can begin detecting and leveraging patterns and pattern recognitions. "With ML, you can really look inside the data and get the valuable information that you traditionally wouldn't even know how to detect or perceive," says Zahiri. Layer in some IoT sensors and things start to become more programmable and automated, enabling the construction of both rules and logic around key functions within the supply chain.

These technologies ultimately work together to help streamline supply chain operations, enable good decision-making and even reduce risk. "Companies have always had to deal with data, but not the way they're being forced to manage it in today's supply chain," says Zahiri, who expects both innovation (on the vendor side) and adoption (on the user side) to continue growing over the next year or so. "It improves decision-making, reduces the time it takes to make those decisions and provides valuable data that companies are coming to trust and execute upon."

### **Using the past to predict the future**

Forced to manage avalanches of data, more supply chain organizations are looking to their software vendors for help. Christopher Orban, VP of data science for Trimble, Inc., says the large majority are still focused on figuring out what's costing them the most money and using



technology to help whittle down those numbers. This really just scratches the surface with data analytics, says Orban, who refers to this approach as “straight-line analytics.”

“We’re still kind of stuck in the past and reporting on it,” says Orban. “It’s not true machine learning, where you can actually use the past to predict the future.” To get there, he says software providers will have to build algorithms that reside within a company’s internal system (and, learn how that company operates).

For example, a transportation manager may want to know why a less-than-truckload (LTL) carrier is different than an over-the-road (OTR) hauler, or why a fuel delivery company is different than a flatbed transport option. “Supply chain software makers may already understand the need for this type of data,” says Orban, “but they don’t necessarily have the solutions inside of their systems to be able to say: ‘You need to do these three things differently because that’s primarily a flatbed company,’ or ‘you should do these four things because you’re working with a regional auto hauler.’”

To supply chain managers that are implementing new or upgrading existing software right now, Orban says it’s best to focus on how it will enable faster decision-making. “Don’t necessarily buy into the hype that a certain solution will cut your order management staff by 50% or that claims to be able to increase order throughput in the double digits,” Orban cautions. “Companies are making those claims, but they can’t always substantiate them.”

Also, understand that no supply chain software platform is a magic bullet for all companies. “You can’t just install any supply chain management solution and magically be done,” says Orban. “There are always going

to be customizations and configurations needed, plus an understanding of how your business is just slightly different than someone else’s. This is where those ML algorithms will come in, learning from your operation over time and pushing that needle farther and farther to the right.”

### No longer a luxury

The days when AI, ML and IoT were considered experimental “extras” are long gone in the supply chain software space, where for some companies it’s a question of survival, says Shaikh. “For many companies, it’s a strategic mandate at this point. Either they look at business use cases and leverage these technologies or they get disrupted.”

Just look at how companies like Netflix are making movie recommendations, e-tailers like Amazon are making product recommendations and apps like Google Maps are figuring out the fastest routes between points A and B. Using AI, ML, Big Data and even facial recognition, these companies are positioning themselves as the frontrunners in their respective industries.

Supply chain isn’t any different. A place where social sentiment, weather, tariffs and data generated by physical assets (sensors, smart phones, etc.), can all affect the planning process, supply chain is ripe for even more advanced technology in the coming years. “It’s about making better, faster decisions to drive against previous customer experiences and commutative advantages,” says Shaikh. “Whether a truck is delayed in traffic or a shipment is delayed due to poor planning, the sooner companies can sense disruption before it happens, the more options they have for solving it and lowering the associated costs.” ☞☞