From Management to Orchestration

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Supply chain managers currently face a myriad of challenges: The flow of real-time supply chain data from multiple sources is increasing, while planning horizons and expected execution time are shrinking. With new technology, a transformation in design and execution is on the horizon.

Former California Governor Jerry Brown once commented about his sprawling, complex state, with its countless competing needs and interests, that he really didn't govern it as much as preside over it. Supply chain managers know the feeling.

Supply chains are fast approaching an inflection point in their complexity as their reach extends across borders, and hundreds or thousands of n-tier suppliers and vendors — all while facing an explosion in distribution points and customized delivery options.

The COVID-19 pandemic, severe climate events and infrastructure failures of 2020-21 only amplified a broader set of challenges from the rise in omnichannel, direct-to-consumer fulfillment.

"When we think about supply chain management, we think about it in terms of all the activities that have to happen to get the goods to where they need to be," explains Alexa Cheater, director of product marketing with supply chain management software provider Kinaxis. "How can we make people happy, give them what they want, when and where they want it, in the right configuration and color, at the right cost, doing the least harm to the planet. Those are the complex factors companies have to balance."

Supply chain planning and execution remain highly fragmented today. Critical information is compartmentalized in data silos, whether internally across functions or among internal and external partners — each with distinct processes, performance and success metrics, and a separate technology stack defined and developed over time by function. The result is often information gaps and operational inefficiencies that impact performance, resilience and customer satisfaction, not to mention return on investment and working capital.

A holistic, well-orchestrated supply chain, by contrast, can unlock hidden efficiencies through optimization and automation of processes, and continuous monitoring, measurement and fine-tuning of network performance. While supply chain orchestration galvanizes the connection between supply chain planning and execution, it needs the right technique and supporting technology to be successful. A holistic approach run on manual processes and legacy software with top-down, internally dictated execution will fail to produce results that are any better than the siloed techniques that have dominated the industry for the past 30 years. There are simply too many end-to-end data variables and tradeoff decisions involved, especially as more and more of the required data comes from unaffiliated, external sources.

Embracing Transformation

Supply chain orchestration entails a higher level of digital maturity and connectivity to standardize and integrate internal, partner and third-party contextual data — traffic conditions, weather, market trends, demand indicators, shipment sensor data, and so on — in a real-time, continuous flow. Analytics, typically driven by artificial intelligence (AI) and machine learning (ML), is increasingly a 'must-have,' as technology advances and becomes accessible and affordable, to interpret large data volumes quickly for enhanced visibility and faster, more precise decision-making.

The ultimate goal: end-to-end control tower visibility, and partner transparency and collaboration. COVID disruption highlighted the need to anticipate, sense and respond in real time to sudden supply constraints, demand shifts and shipment exceptions. It isn't easy. The tech learning curve, internal change management required and time to ROI are hurdles companies often cite in their hesitation to modernize.

A key starting point is integrating and connecting critical elements of the supply chain to begin to unlock end-to-end internal data trapped in divisional and functional silos across the organization.

On the planning side, that means standardizing companywide supply, demand, inventory, sales and operations, integrated business

planning and other planning data in a database format and making it shareable through control tower visualization. On the execution side, it means fully integrating order, inventory and transportation management data, including returns and circularity. Finally, there is continuous-flow, control tower 'oversight' data generated for shipment track-and-trace, measuring network performance, and assessing supply risk and demand shifts.
"We're seeing the market moving in that direction," Cheater says, "toward a single platform for planning and execution with a single user experience and a unified control tower approach."

Digital Change Drives Organizational Change
Technology is a key enabler of orchestration, but the real change driver is a new organizational chart as data silos are dismantled.

A continuous information flow from a single trusted source, customizable through user-friendly dashboards, interpreted through AI/ML analytics, shareable in near-real time among partners from supplier's supplier to customer's customer, reveals insights and invites collaboration. "Supply chain is becoming a team sport," Cheater says. "Everyone plays their role, knows what others are doing and the impacts of their actions, and are working toward the same objectives. That's a stark contrast to how many manage their supply chains today — functional groups focusing on their own functional objectives, unaware or uninterested in what other portions of the supply chain are doing."

And, she adds, "It's not just about horizontal integration and connectivity across functions. "It's not enough for the supply chain to be working together. It needs to be connected to finance, sales and marketing and the other core functions within the business so that everyone is aligned strategically."

"The key to seeing value from supply chain orchestration, even if some partners in the network are less mature than others, is a willingness to stay connected and sharing access to the same data sets."

All of this suggests a level of process maturity and connectivity many larger businesses — and most small or mid-sized companies — don't yet have. At the same time, suppliers and vendors will increasingly need to provide information about their digital maturity and integration capabilities as part of the bid process.

"Partners don't all have to be at the same level of maturity, and in most cases won't be," Cheater insists. "The key to seeing value from supply chain orchestration, even if some partners in the network are less mature than others, is a willingness to stay connected and sharing access to the same data sets. Integration can boost the capabilities of less mature partners simply by connecting."

Speed to Detect = Speed to Correct
AI and ML are not new technologies, but affordable, off-the-shelf solutions were not widely available until recently. When it comes to supply chain planning, the first value came from the ability to crunch massive data volumes and, via analytics, tease out operational and performance insights and test 'what-if' future scenarios.

Extending their reach from planning into execution, AI and ML mine current and historic internal and external supply and channel data to speed exception response. "That ability to respond in real time to any kind of disruption, any kind of risk, any kind of opportunity, is critical," Cheater says. "You need to be able to connect your plan to what's actually happening and if the two don't match up — you need to quickly understand that and get a new plan back out into the execution layer quickly, in hours or less."

Predictive analytics driven by AI and ML doesn't promise 100% forecasting accuracy, but instead utilizes the capability to assess relative probability of thousands of scenarios in minutes for a much more detailed calculation leading to a much more educated prediction.

A continuous data flow of contextual weather data might, for example, detect a hurricane coming, assess its likely severity, and recommend alternative routing for freight, or reallocation of resources in the affected area to ensure business continuity. As the system "learns" from managing real-world situations over time, it is able to distinguish apparent, relevant signals from noise. Responses can be automated to shorten reaction time while allowing for human intervention.

At that point predictive analytics can also become prescriptive, deploying a detailed understanding of current and historic assets and capabilities to recommend and execute alternative strategies. "The beauty of prescriptive analytics," Cheater says, "is recommendations for possible solutions are based on business KPIs, which are then tied back to business strategy as distinct choices, to examine the possible implications for service levels, margins and so on, because there are tradeoffs to every decision."

Efficiency and Cost Reduction. And Sustainability. And Compliance. And…

The operations and process benefits that flow from real-time, shared supply chain visibility and collaboration are well known – to track shipments and inventory; optimize routes, loading and warehouse travel time; select and manage suppliers and vendors; manage exceptions, and more.

But now supply chain managers are bracing themselves for a new set of concerns that are outside the traditional commercial realm but no less real or urgent.

Climate change and sustainability goals are top of mind for new-generation consumers and for government regulators, as climate events worsen and require concrete action to reach carbon neutrality at 1.5° C above pre-industrial temperatures. Circularity initiatives to extend existing product lifecycles and create after-sale channels for reuse and re-purposing of clothing, electronics and other products are also a priority, to minimize waste. Finally, provenance concerns over forced labor, factory conditions, use of conflict minerals or sanctions violations will add to supply chain complexity.

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All of these objectives will likely, over time, require reporting and certification, in the case of emissions down to so-called "Scope 3" end-to-end emissions reporting from supplier's supplier to customer's customer. Failure to comply could mean fines and penalties, as well as potential lost sales.

Acceptance has been slow, but pending regulation in the EU, Japan, Australia, North America and elsewhere is focusing minds. "It's about to become much more challenging for companies because they'll have to start reporting effective 2025 using 2024 numbers, so they'll need a good sense of what kinds of decisions and impact they're having on the planet across their supply chain and even what their suppliers are doing, or risk heavy financial penalties."

The good news is that 1) companies able to demonstrate reductions in fuel consumption and emissions, circularity in their products and inputs, and fair treatment of workers and surrounding communities, stand to be rewarded with customer and workforce loyalty; and 2) a smaller carbon footprint and elimination of wasted effort and materials can, over time, deliver meaningful efficiencies and cost savings to accelerate ROI, free up working capital and improve balance sheets.

A real-time, actionable, 'everything, everywhere, all-at once' control tower view of the end-to-end supply chain, supported by AI/ML-enabled analytics — Cheater and Kinaxis refer to this as 'concurrency' — is of tremendous potential value in the post-COVID environment. Realizing the full benefits, however, will take a new level of transparency and active collaboration, across internal functions and among partners, and a new way of looking at the supply chain management — not dictated top-down, but orchestrated via a single trusted source of information and a shared vision.

Resource Link:
www.kinaxis.com/en/solutions/supply-chain-orchestration