



Expert Insights

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# Smarter supply chains for an unpredictable world

Continuous  
intelligent planning

IBM Institute for  
Business Value



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Working at the intersection of people, process, and emerging technology, Jessica Scott helps enterprises transform their ways of working by reimagining their supply chain into intelligent workflows. Her experience as a management consultant supporting large retail/CPG corporations positions her as trusted support to organizations worldwide as she collaboratively helps them design solutions to adapt to changing environments.

Even a small disruption in the intertwined, multifaceted modern supply chain can have dramatic effects.

## Key takeaways

### Supply chain chaos

In the wake of COVID-19, 93 percent of organizations have faced challenges associated with demand volatility.<sup>1</sup> With organizations forced into reactive mode, supply chain leaders have had limited time and attention to focus on higher-value strategic initiatives.

### Time for change

Future disruptions in global supply chains are inevitable. Modern supply chains must be equipped to quickly and efficiently adjust operations in response to rapidly changing buying patterns.

### Seizing control

Augmenting existing planning methods with exponential technologies like artificial intelligence (AI) and immediate data insights enables organizations to transform from perpetual reactive mode to a proactive approach: continuous intelligent planning (CIP).

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## Introduction

Supply chains have become increasingly important to the health and wealth of our communities, serving as a backbone for the global economy. They have also grown increasingly complex, evolving into networks with hundreds of suppliers, service providers, and production and distribution centers spread across the globe. The COVID-19 pandemic has exposed supply chain vulnerabilities that exist in virtually every sector and industry. And even a small disruption in the intertwined, multifaceted modern supply chain can have dramatic effects.

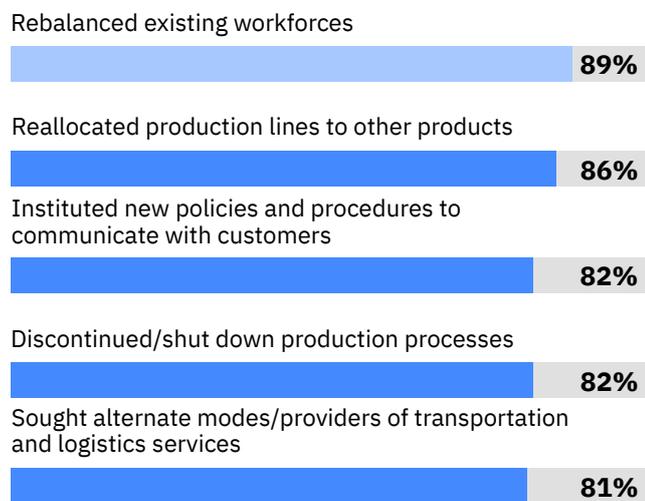
The pandemic created supply, demand, and logistics challenges that required immediate action, forcing supply chain executives to re-chart their courses. According to our recent supply chain study, which included inquiries specific to the pandemic, some of the more effective short-term tactics include reallocating production lines to other products, rebalancing existing workforces, shutting down production, and finding alternate logistics modes and providers (see Figure 1).<sup>2</sup>

As they implement such short-term tactics, however, supply chain leaders are also thinking ahead, grappling with how to maintain supply chain continuity in the face of future disruptions: How can they keep inventory at a level that reduces future shortages of high-demand commodities? How can they make sure they have the right inventory in the right locations to support continued production, manufacturing, and assembly? How can they successfully analyze and quickly react to conditions at hundreds—or even thousands—of locations?

Supply chains are under extreme pressure—from demand volatility and inventory fluctuations to logistics constraints and shifting supply networks.

**Figure 1**

Short-term strategies in response to COVID-19 disruptions



Source: IBM Institute for Business Value Smarter Supply Chain Study, 2020. Q: To what extent do you feel that your supply chain organization's strategies and tactics in response to the COVID-19 pandemic have been effective? (Percentages represent respondents who selected 3, 4, or 5 on a 5-point scale.)

To better anticipate and navigate disruption and volatility, organizations need smarter, more agile supply chains. The first step toward achieving this goal is through continuous intelligent planning (CIP), an approach that enhances integrated business planning with continuous and collaborative planning using AI-augmented capabilities. These capabilities enable “always-on” capabilities at the enterprise level, providing continuity in dynamic markets and the ability to shift from reactive to more flexible “sense and respond” operations.

## Today's supply chain challenges

Supply chains are under extreme pressure—from demand volatility and inventory fluctuations to logistics constraints and shifting supply networks. Many of these challenges stem from issues with supply chain visibility, demand management/forecasting, operational workflow efficiency, and inefficient cross-domain collaboration—all of which impact cost and revenue.

*Limited visibility across the supply chain:* For many organizations, difficulty accessing data makes supply chain visibility next to impossible. Other organizations utilize limited data sets, leaving potential insights on the table. The complexities of multi-tiered supply and manufacturing further add to the visibility challenge. Obscured vision prohibits an organization from proactively addressing potential risks.

*Volatile demand, new digital channels, and low predictability:* Predicting the future through time series models that rely on historical sales and operational data, cobbled with some current data, can lead to inaccurate demand and supply planning and execution. Poor forecasting translates into inventory surpluses, missing sales due to depleted inventory, and incoming supplies that don't align with actual demand.

*Insufficient, outdated workflows:* Inefficient processes (like manual aggregation) and unexpected expenses (such as last-minute expedited shipping) can drive higher operating, carrying, and inventory costs—and lower profitability.

*Slow organizational responsiveness:* In addition to improved efficiency and reduced costs, supply chain collaboration can drive improvements in speed, service levels, and customer satisfaction. But increasingly complex processes with inconsistent objectives can stifle agile and collaborative decision making.

Supply chain executives know these challenges—and often the outcomes—all too well. What steps can organizations take now to recover, rebalance, and re-invigorate their supply chains? How can they dampen the impacts of future unanticipated events?

### **Planning for the future**

Intelligent workflows, increased agility, and integrated continuous demand management are crucial elements of the modern supply chain. CIP can guide organizations in the proactive preparation and ongoing collaboration necessary to create a dynamic, responsive, insight-driven supply chain.

The pandemic has driven this point home: When asked how the COVID-19 experience will impact their long-term strategies, a majority of supply chain executives say they will develop agile and resilient workflows; improve end-to-end visibility across the organization; and integrate technologies to automate and optimize processes. In addition, close to half plan to use AI and machine learning to leverage unstructured real-time data. And 70 percent say they will use intelligent automation or AI to support demand management and forecasting in the next three years.<sup>3</sup>

## **Insight: What is continuous intelligent planning?**

Building the modern supply chain requires innovative planning. The continuous intelligent planning approach is designed to help improve visibility and forecast accuracy, reduce costs, and increase collaboration. CIP allows an organization to complement existing integrated business planning with AI-augmented supply chain planning capabilities that enable continuous collaborative planning and help boost supply chain agility and performance. CIP employs unique change management techniques designed to relentlessly drive better outcomes, opening the door to sustainable change.

# Continuous intelligent planning provides a path to both efficiency and proactive preparation for future global trade complexities and disruptions.

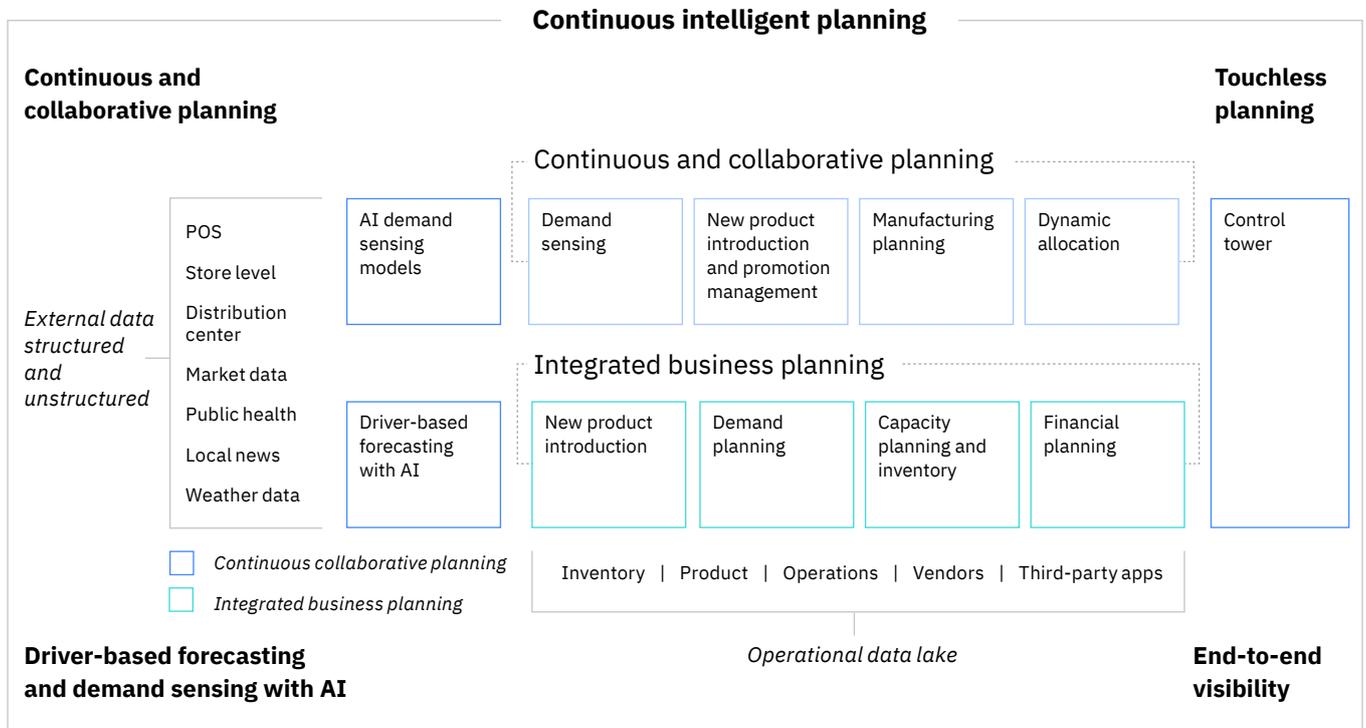
## Modernizing supply chain planning

Seventy-one percent of supply chain executives recently surveyed say efficiency is one of the most important elements of their operating model.<sup>4</sup> Efficiently moving a product to its destination necessitates end-to-end supply chain visibility. It also requires intelligent automation for optimized order processing, receiving, scheduling, and logistics. Equally important is the ability to sense and rapidly respond to changes—be they small hiccups or larger, more catastrophic events—that impact today’s complex, often interwoven, supply chains.

CIP offers a path to both efficiency and proactive preparation for future global trade complexities and unexpected physical and security disruptions. CIP includes AI-augmented supply chain planning capabilities that complement other enterprise solutions and can sense and respond to market changes affecting the supply chain. Through modern, intelligent demand planning featuring integrated platforms, innovative AI models, and integrated intelligent workflows, CIP can help address challenges in visibility, forecasting, workflows, and collaboration (see Figure 2).

**Figure 2**

The CIP architecture



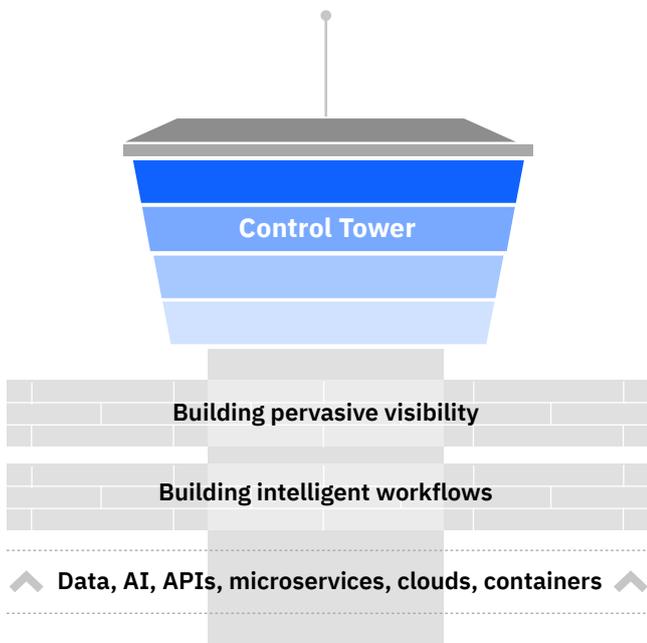
Source: IBM Institute for Business Value

## End-to-end visibility

A supply chain control tower—a connected, personalized dashboard of data, key business metrics, and events across the supply chain—enables an organization to more fully understand, prioritize, and resolve critical issues (see Figure 3). Combining the power of control towers with connected and integrated enterprise, partner, external, and device data enables organizations to see where their products are—in real time and in full view—across the world. AI capabilities can turn unstructured real-time data into insights that help predict disruptions. And the control tower’s end-to-end view can both uncover short-term vulnerabilities and help gauge up and downstream impacts for long-term decisions.

**Figure 3**

Control tower connected layers



Source: IBM Institute for Business Value

For example, a global leader in computer hardware sales was experiencing operational challenges tied to supply chain disruptions. The company sought improvements related to mitigating surprise events, accessing data for daily operations, and driving workload efficiencies. As a solution, the company is implementing an AI-powered control tower to achieve end-to-end visibility, predict disruptions, and act based on newly received data-driven insights.

## Predictive forecasting with demand sensing

According to a study of 600 households, retailers lose close to USD 1 trillion due to out-of-stock situations.<sup>5</sup> Yet, the most common analytical tool used by supply chain planners is still a spreadsheet program.<sup>6</sup> CIP, however, leverages AI capabilities powered by both traditional data and new, nontraditional data sets, such as information related to unemployment, consumer mobility, demographics, and consumer sentiment, for proactive and preemptive forecasting. Using analytics, AI, and visualization tools, executives can model and then build flexibility and optionality into their supply chains.

Replacing cobbled data with dynamic real-time data further improves planning accuracy and responsiveness. Demand sensing models can capture fresh information to create an accurate forecast of demand and enable rapid fulfillment and reduction of inventory. Machine learning algorithms leverage real-time data to generate refreshed near-term forecasts and their associated operational plans—as well as continuously learn and improve based on outcomes and user actions.

In the wake of the COVID-19 outbreak, one of the world’s largest snack companies needed a new way to evaluate demand. The company implemented COVID-19-specific demand forecasting capabilities, including a dashboard that tracks virus outbreaks, economic stress, and government regulations in addition to traditional supply chain transactional data. The solution integrates the latest relevant external and internal data to produce product, region, and channels reports; product shipment forecasts; and recommendations on production and packaging schedules.

CIP enables continuous collaboration through shared platforms and collaboration rooms, allowing ecosystem partners to rapidly join forces.

### **Automated workflows with touchless planning**

Despite the importance supply chain executives place on efficiency, many organizations employ inefficient planning processes that involve a high degree of human effort and communication. Replacing manual analysis with automation can save time and free resources that can be allocated elsewhere for higher-value work, as well as help drive both cost and operational improvements. AI capabilities can automate routine tasks and decisions across forecasting and demand sensing. For example, automated bidirectional data exchanges can result in alerts that dynamically allocate inventory, manage trade promotions, and adjust deliveries, accordingly.

A leading energy company sought a major change in operational performance. It first established a control tower to accelerate operations visibility. Next, the company implemented an AI-powered solution to help recognize inefficiencies and streamline complex operational analysis. As a key element of the company's intelligent production management workflow, the solution can generate production plans—which previously took hours—within minutes.

### **Constant collaboration**

Linear steps and handoffs between functions can limit collaboration and make timely decisions difficult, if not impossible. However, CIP enables continuous collaboration through shared platforms and collaboration rooms. This allows supply chain leaders to rapidly join forces with ecosystem partners—forming an agile digital team—to understand impacts across their joint supply chains. Together, they can determine how to rapidly respond to and resolve issues—sometimes before they occur.

A global beverage company digitally transformed its integrated planning platform to automate and optimize its planning processes and workflows across business units. Supply chain collaboration and automation included sales and operations planning, demand planning, inventory optimization, supply planning, response planning, production planning, and detail scheduling and advanced available-to-promise—all orchestrated by a cohesive control tower. What-if analysis allowed the company to achieve the right balance between inventory investment and service levels. Collaboration among the various functions led to immediate response to demand and supply fluctuations, reducing cost and improving the customer experience.

## Action guide

### *Smarter supply chains for an unpredictable world*

In our recent research, we asked organizations to compare their innovation capabilities with those of their competitors. The organizations that rated themselves as significantly more innovative also had higher percentages of intelligent automation implementation. We discovered they are infusing intelligent automation and AI into their demand management/forecasting and inventory management workflows. They also expect major operating cost reductions and significant annual revenue growth in the next three years.<sup>7</sup>

Innovators understand the importance of intelligent automation. And they realize that continuous intelligent planning is not merely a strategic play; rather, it is an essential element in building the modern supply chain. Just imagine an integrated capability that enables end-to-end planning and visibility—one that is not based on the passage of information and time-consuming consensus discussions, but on real-time data that supports collaborative and automated decision making.

By enhancing integrated business planning with continuous collaborative planning and AI-augmented capabilities, your organization can make the leap from continuously reacting to supply chain challenges to proactively planning for the future. We offer the following recommendations as first steps to implementing continuous intelligent planning.

#### **1. Transform your planning experience**

Integrate business planning synced with real-time continuous planning processes. Re-purpose the time saved on automation to focus on collaboration and fine-tuning planning models for your industry and organization. Institute shared key performance metrics and incentives between sales, operations, and planning functions with executive oversight.

#### **2. Establish a center of excellence**

Establish a framework and governance structure to support evolution of process, people, and tools to propel innovation. For each of the five key steps of the planning cycle—product review, demand planning, supply planning, executive sales and operations planning, and continuous collaborative planning—identify objectives, owners across business units, core and extended teams, key performance metrics, and key decision criteria. Assemble the right teams, dynamically, to collaborate and manage exceptions and resolve disruptions quickly.

#### **3. Leverage a visibility control tower**

Consume organizational supply chain and enterprise data, external data (for example, weather, news, social), and partner data to proactively monitor and manage transactions. Establish real-time alerts for potential disruptions related to transaction processing, approvals, the movement of goods, and volatile changes in demand and supply patterns. As each event and resolution is captured, leverage AI capabilities to develop digital playbooks that curate organization knowledge to optimize responses to future events.

#### **4. Engage a modern planning architecture**

The heart of your planning is the underlying architecture on which effective execution is built. Modern architectures support AI-enabled demand sensing models with externally influenced (or driver-based) forecasting. Integrated business planning includes new product introduction, demand, supply, capacity, inventory, and financial planning. Today's architectures have the added layers of real-time demand sensing, production planning, and dynamic allocation—all in a shared collaborative platform. Evolve your organization's infrastructure based on these intentions.

## Notes and sources

- 1 IBM Institute for Business Value Smarter Supply Chain Study. 2020.
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- 3 Ibid.
- 4 Ibid.
- 5 Howland, Daphne. "Out-of-stocks could be costing retailers \$1T." Retail Dive. June 22, 2108. <https://www.retaildive.com/news/out-of-stocks-could-be-costing-retailers-1t/526327/>
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- 7 IBM Institute for Business Value Smarter Supply Chain Study. 2020.

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