



Expert Insights

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The next evolution for consumer supply chains

Future-proof your operations
with exponential technology

IBM Institute for
Business Value



Experts on this topic



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The impact of COVID-19 exposed supply chain vulnerabilities in two primary areas: inventory and agility.

Key takeaways

In the next normal facing the consumer industry, we see inventory, agility, and cost as the priority. These can be optimized through four key actions.

Realign and optimize costs by sensing and shaping variability.

Improve cash flow by using machine learning to bolster cost efficiency and rebalance inventory.

Drive flexibility and responsiveness with the rise of agile execution.

Address unanticipated volatility by building algorithm-enabled agility into manufacturing and logistics execution.

Enhance awareness and insights with a renewed focus on supply synchronization.

Synchronize supply with demand through a shared ecosystem.

Play offense by reshaping the end-to-end journey.

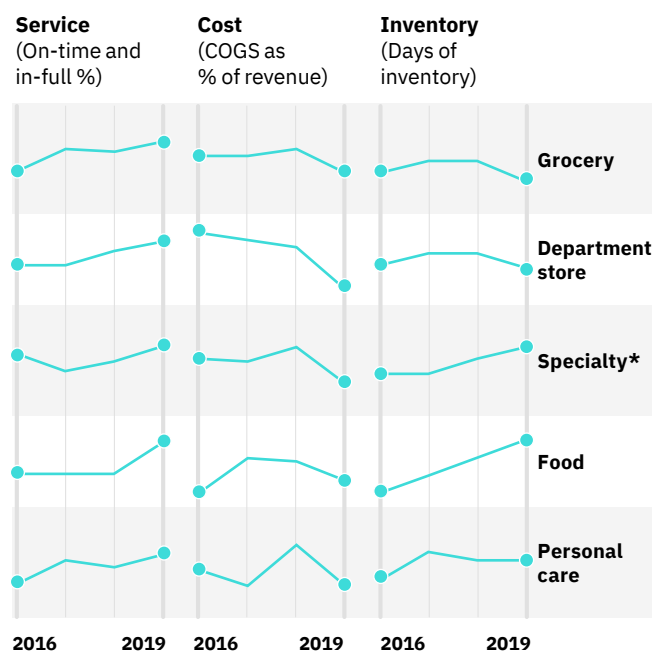
Reshape the operating model and accelerate omnichannel initiatives to adapt to market shifts.

Prior to the pandemic of 2020, the consumer industry as a whole had been on a journey to build customer centricity throughout all parts of the enterprise. For supply chain operations, this often manifested itself into demand-driven strategies, where service level was “king,” while cost and inventory were tightly managed to help ensure operational viability (see Figure 1).

Across segments of the consumer industry, retailers went to great lengths to help ensure product was “in stock” while consumer goods manufacturers promised goods that were “on-time and in full.”¹ And while most found ways to drive down cost of goods sold, a relentless focus on fulfilling consumer demand placed tremendous pressure on working capital. In the end, retailers remained challenged to drive substantial improvement to inventory, while manufacturers suffered greater impact to days of supply to serve their retail customers.

Figure 1

Supply chain operations from 2016–2019



Source: American Productivity & Quality Center (APQC) and Thomson Reuters.

*Includes apparel, home furnishing, home improvement, electronics, and sporting goods segments







Fast forward several months and the supply chain has been upended. Market volatility shot through the roof, impacting consumer industry segments in different ways. But as a whole, the impact of COVID-19 exposed vulnerabilities in two primary areas: inventory and agility (see Figure 2).

In the case of inventory, fifty-four percent of consumer industry executives indicated the need to reallocate stock in response to the crisis.² Food and grocery segments continue to experience shortages of essential goods³—

products that are “in extremely high demand, creating a bullwhip effect on the supply chain and pressuring suppliers to keep production lines flowing.”⁴ Whereas the apparel segment suffers from the direct opposite with a glut of non-essential inventory trapped in stores due to pandemic-driven lockdowns. So much so, that cash flow deficiency has driven businesses like J.Crew and Brooks Brothers to bankruptcy.

Figure 2

Impact of COVID-19 on inventory and agility

	Managing inventory shortage and excess	Increasing agility with speed and flexibility
Consumer goods	 <p>Ensuring production at plants with thermal screenings, social distancing, and acceleration of robotic automation^I (Kraft Heinz, Tyson Foods)</p>	 <p>Repurposing production lines and ingredients to produce non-core SKUs like hand sanitizer^{IV} (Estée Lauder, L’Oréal)</p>
Grocery and hypermarket	 <p>Identifying new suppliers and diverting goods from supplier’s food service channel to grocery^{II} (Costco, Kroger)</p>	 <p>Expanding warehouse labor capacity and increasing worker pay to meet demand^V (Albertsons, Walmart)</p>
Specialty retail	 <p>Halting seasonal product orders, unlocking store inventory for online, and pushing liquidation^{III} (H&M, Gap)</p>	 <p>Accelerating storefront and curbside pickup fulfillment for online channel demand^{VI} (Best Buy, Coach)</p>

Source: (I) <https://www.smartbrief.com/original/2020/08/grocers-cpg-producers-take-new-era-safety-concerns>; (II) <https://www.perishablenews.com/meatpoultry/kroger-ceo-customers-will-have-meat-during-the-coronavirus-pandemic-so-long-as-they-are-flexible>; (III) <https://www.businessinsider.com/gap-beginning-mall-brand-struggles-experts-2020-4>; (IV) <https://www.barrons.com/articles/how-beauty-brands-large-and-small-are-combating-covid-19-01585236291>; (V) <https://www.reviewjournal.com/business/albertsons-walmart-amazon-increase-pay-amid-coronavirus-impact-1989153>; (VI) <https://fortune.com/2020/06/05/shopping-by-appointment-retail-industry-trends>

Planning decisions must become increasingly AI-driven to effectively rebalance cost and inventory.

In terms of agility, defined as the ability for a supply chain to adapt and respond to market volatility,⁵ beauty and grocery segments are demonstrating flexible production and logistics capacity to support unexpected surges in demand. While in specialty retail, new fulfillment options like curbside pickup are being accelerated. This acceleration even gained traction with consumer brands like Frito Lay and Kraft Heinz who recently deployed direct-to-consumer (DTC) fulfillment channels.

Based on these implications and the ongoing impact that the pandemic continues to have on the consumer industry, supply chain priorities for manufacturers and retailers continue to shift more toward inventory, agility, and cost. To that end, four key imperatives can help organizations thrive in the next normal.⁶

- Realign and optimize costs by *sensing and shaping variability*
- Drive flexibility and responsiveness with *the rise of agile execution*
- Enhance awareness and insights with *a renewed focus on supply synchronization*
- Play offense by *reshaping the end-to-end journey*.

Sensing and shaping variability

Today, planning decisions are often made by using forecasts and plans generated by IT systems which are then refined through multiple layers of human assumption and tribal knowledge. While assumption can help compensate for system limitation, it can also perpetuate human bias and even devolve into speculation during heightened periods of market volatility. To expedite recovery from the pandemic fallout, these decisions must become increasingly AI-driven to effectively rebalance cost and inventory.

For years, a global consumer goods company had been using its enterprise planning system to generate a four-week baseline forecast. Planners would then extract the baseline from the system only to manually apply adjustments based on input from various external partners. These amendments provided downstream insights but were also subject to heuristics, which was problematic given the current climate of pandemic-induced buying behavior and retail closures.

To improve reliability, the planning division employed machine learning to predict the variability, using external drivers like weather and events to sense it and internal levers like pricing and promotion to shape it. In the end, they were able to improve inventory productivity by increasing forecast accuracy by 11 percent.⁷

Supply chain organizations must double down in the area of AI, not as an investment in exponential technology, but out of necessity to recover and optimize benefits. Moreover, the ability to deploy machine learning has greatly matured, enabling incremental cost savings and working capital efficiency to be realized in weeks, not months.

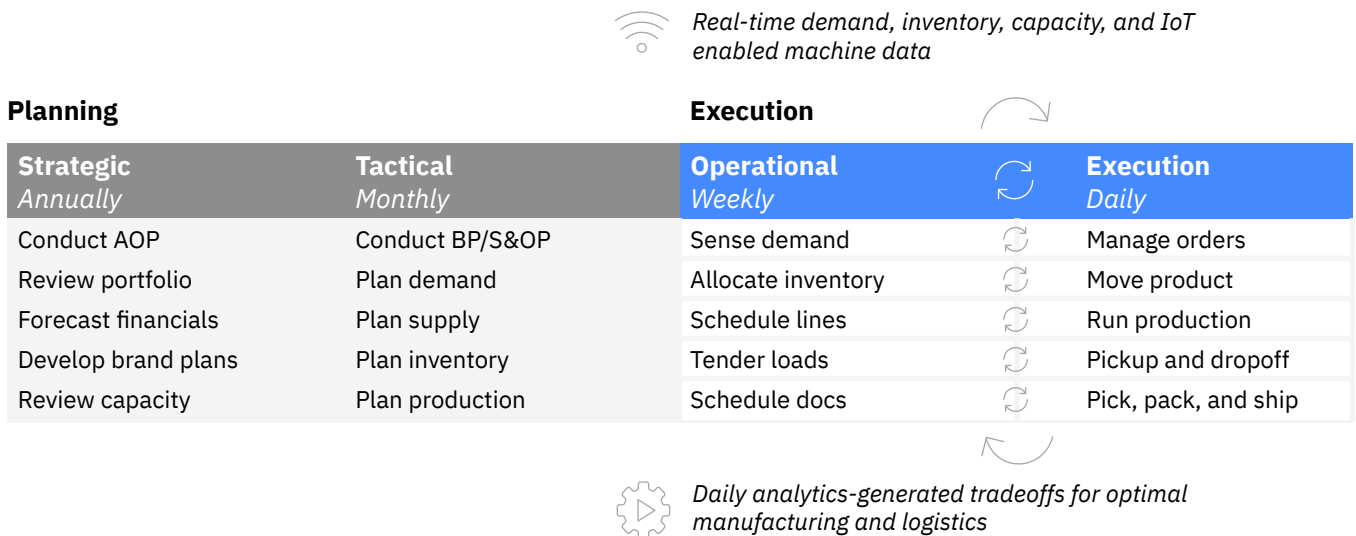
The rise of agile execution

Operations has always relied on a push model where forecasted demand drives scheduled production and distribution. But given the recent volatility experienced by manufacturers and retailers alike, many are realizing the challenge in producing viable mid- to long-range plans. Consumer behavior continues to shift demand, absenteeism is impacting plant throughput, and workloads are squeezing logistics capacity.⁸ Moving forward in such an uncertain market requires more emphasis to be placed on the pull, where actual demand is met by flexible and responsive execution (see Figure 3).

A leading food and beverage manufacturer experienced low production attainment and high labor cost at one of their manufacturing facilities. Much of which was due to unexpected demand during the plant's frozen period, forcing an excessive number of production line changeovers. To address the volatility, the plant adapted their detailed schedules by running constraint-based algorithms on a shift-by-shift basis. Real-time connectivity to equipment sensor data, raw material properties, and SKU-specific run rules, provided the agility to respond to changes in demand. The ability to optimize execution for every work shift enabled manufacturing to increase attainment by 13 percent and reduce overtime by 75 percent.⁹

Figure 3

Agile supply chain execution



Source: IBM Institute for Business Value.

Flexibility and responsiveness in manufacturing and logistics execution have never been more critical.

Flexibility and responsiveness in manufacturing and logistics execution have never been more critical. Forty-nine percent of consumer industry executives indicated they will develop agile and intelligent workflow as a long-term supply chain strategy.¹⁰ Companies must build agility to rapidly respond to the unanticipated shifts in SKU demand and channel. This not only optimizes inventory in the near-term, but it also charts a path towards higher asset efficiency at the lowest cost by optimizing utilization across plants, trucks, distribution centers (DCs), and stores.

A renewed focus on supply synchronization

Supply visibility is not a new problem, but past solves that have been put in place like Collaborative Planning and Forecast Replenishment (CPFR) and Vendor Managed Inventory (VMI) have not been enough to align the supply network. Forty-eight percent of consumer industry executives indicated they intend to improve end-to-end visibility across the organization in response to the crisis.¹¹

Visibility remains a manual and asynchronous process, producing inventory and capacity discrepancy between parties. And in the current climate, companies can no longer afford the error. As shocks to the supply chain continue to unexpectedly surface, connected ecosystems can help synchronize supply with the heightened demand for essential goods.

A leading home improvement retailer experienced sizable supply discrepancy between what was ordered, shipped, and received. The lack of visibility between vendor DCs, cross-docks, retail DCs, and retail stores drove inventory overage and shortage disputes. Many of which would require up to 90 days to resolve due to a complex reconciliation of POs, ASNs, goods receipts, and invoices.

To synchronize the network, each party was onboarded to a secure Blockchain platform along with the relevant data. In the end, lead time to mitigate supply risk was reduced by over 90 percent. And while the retailer began with a single vendor, it has already onboarded five additional suppliers with the goal of having 30 by end of year.¹²

In short, synchronization improves responsiveness to unanticipated surges in demand and reduces risk with alternative sources of supply. More importantly, this can help level-load throughput across the entire network and ultimately minimize the conventional bullwhip experienced at every echelon from retailer to supplier.¹³

Reshaping the end-to-end journey

Over recent years, digital supply chain transformation graduated from being a driver of operations improvement to an enabler of enterprise strategy. Consumer and retail brands formulated strategic multi-year plans, defining end-to-end initiatives like integrated planning or connected manufacturing (see Figure 4 on page 6). While intended to envision the future state, they may not sufficiently address the more recently surfaced vulnerabilities. To effectively compete in the next normal, organizations must accelerate or reshape these strategies to strengthen dimensions of agility and resilience.

A leading sporting goods retailer undertook an end-to-end transformation for its fulfillment operations. Given the rising expectations around omnichannel, the supply chain integrated orders and inventory across its DCs and hundreds of stores, enabling new fulfillment options that included Ship From Store (SFS) and Buy Online, Pickup In Store (BOPIS).

Given the ongoing implications of the pandemic, prior strategies must be reviewed with a new lens.

While catering to the consumer was key, they soon realized that logistics would require the ability to adapt to changes in demand while balancing margin, logistics expense, and network capacity.

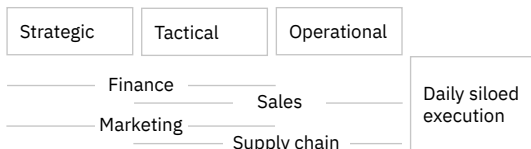
Hence they added a new agility requirement to their journey, delivering the ability to scenario plan and optimize how orders were sourced across the network. In the end, they exceeded consumer expectations while reducing operating costs by 7 percent.¹⁴

Given the ongoing implications of the pandemic, prior strategies must be reviewed with a new lens. Planning strategies will require closer ties with execution to optimize cost and working capital. Manufacturing initiatives should expand automation scope with equipment like multi-axis machines or Autonomous Mobile Robots (AMRs) to boost production efficiency and resilience. And fulfillment strategies need to consider accelerating omnichannel logistics implementation to sustain competitiveness and growth in ecommerce.

Figure 4

Strategic multi-year, integrated plan

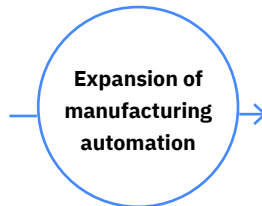
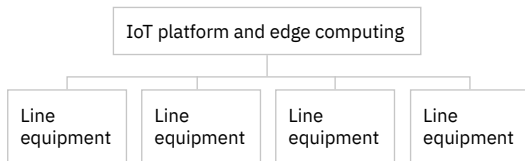
E2E planning across horizon and function



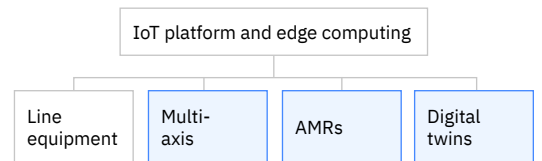
Execution feedback to address volatility



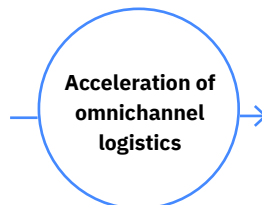
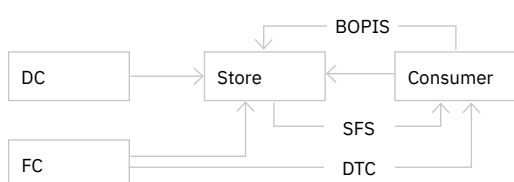
Connected manufacturing for higher line efficiency



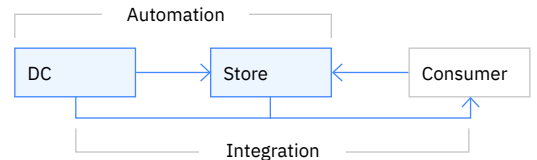
Production efficiency and automation



Siloed logistics for multiple channels



Unified logistics for omnichannel



Source: IBM Institute for Business Value.

Action guide

Future-proof your business with exponential technologies

Consumer goods companies and retailers are no strangers to market variability, but this year has been quite the exception. Supply chains have been impacted in unanticipated and nuanced ways across every segment, be it apparel, beauty, department store, food and beverage, or personal care. And while some implications of the pandemic may be fleeting, many will have much more lasting impact on inventory, agility, and cost.

To that end, four tactical considerations can help steer supply chain organizations in the right direction.

1. Realign and optimize costs by sensing and shaping variability

- Prioritize biased data-driven decisions that remain high-touch due to qualitative judgement and computational complexity, like scenario planning
- Apply deep learning where accuracy outweighs explainability while using conventional machine learning to adjust drivers like asset condition or promotions
- Incubate an operations-centric garage capability to rapidly prototype and operationalize.

2. Drive flexibility and responsiveness with the rise of agile execution

- Exploit areas with fixed policies that are adjusted by exception or on an infrequent basis such as line changeovers or inventory policy
- Transition from one-time analyses to perpetual models like moving from what-if analyses to scenario analytics or SKU rationalization to segmentation simulation
- Leverage highly tuned optimization algorithms for weekly and daily execution to unlock additional capacity for lines, loads, space and labor.

3. Enhance awareness and insights with a renewed focus on supply synchronization

- Prioritize inventory and capacity discrepancy scenarios that persist among parties despite use of partner exchanges like EDI, VANs and supplier portals
- Build the “network business case” for each party involved to justify the initiative, with benefits that are either financial or reputational
- Ground the solution in open source and interoperability standards like Hyperledger Fabric for blockchain to “future-proof” network and prevent tech lock-in.

4. Play offense by reshaping the end-to-end journey

- Reinforce integrated planning with integrated execution to enable plans to sense fluctuating market behavior and receive feedback on frontline constraints
- Rebalance overall equipment effectiveness and efficiency with advanced automation and digital twinning initiatives to build “resilient productivity”
- Recalibrate omnichannel fulfillment model to accommodate new labor and space capacity constraints for SFS, BOPIS, and curbside pickup.

Notes and sources

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