

Want Better Shopper Experiences and Supply Chain Cost Reductions?

Let's Orchestrate CPG Network Flows with Data and Shared Goals

Executive Summary

Our supply chain ways-of-working and logistics configuration in the U.S. Consumer Product Group (CPG) supply chain must change. The transformation mandate has been accelerated by three forces: new consumer behaviors, the pandemic and powerful emerging technologies applied to supply chain management. The pressure is on all of us, members of the CPG ecosystem, to meet new expectations of service, and to deliver cost and efficiency improvements, as shoppers push the boundaries of personalization, omni-channel shopping, affordability and meaningful shopping experiences.

CPG manufacturers, in fact, share with our retail customers a common vision and objectives: drive consumer value with better shopper experiences and product availability; act as partners sharing the information needed to better operate our supply chains; and continuously strive for new ways of operating the business to drive sustainable, profitable growth.

This paper explores current CPG supply chain opportunities in the context of the 2020-21 operational disruption, and proposes different ideas, mechanisms and joint projects to help address short-term disruptions, build long-term supply chain resilience and deliver differentiated value to our common shoppers and consumers.

Context: The 2020 CPG Supply Chain Disruption.

It's tempting to blame all the dysfunctions of our current CPG supply chains on the pandemic, with all the demand, supply and product disruptions it created globally. However, in fact, fundamental underlying structural flaws in supply chain configurations came into stark focus, and the industry struggled to quickly rebalance operations, keep shelves stocked and contain costs. Demand disruptions have mostly been driven by the growth of eCommerce, shifting buying patterns of omnichannel shoppers and service expectations shaped by the ubiquitous "direct-to-consumer" model that subsidizes shoppers' cost-to-serve and pushes fulfillment costs to suppliers. Erratic demand patterns during the pandemic have also played a role.

These demand disruptions were accompanied by major supply disruptions. The top 10 CPG categories accounted for nearly \$3 billion in lost sales due to out-of-stocks from May 2020 to February 2021, as reported by market researcher NieslenIQ.^[1] Sourcing, production and inventory plans were destroyed by massive consumer behavioral shifts and more importantly by the industry's inability to staff manufacturing plants, distribution centers and fulfillment operations as the country went into lock-down. Daily COVID-19 worker callouts and new safety procedures affected overall productivity—adding to the overall supply chain disruption. The Consumer Brands Association members survey shared earlier this year showed in the second half of 2020, over 15% of CPG's manufacturing and distribution workforce were absent due to the pandemic.

Transportation disruptions were also protagonists of the 2020-21 supply chain disruption. Already tight freight capacity became tighter in 2020 across all transportation modes. Spot pricing spiked in ocean cargo rates with Asia's constrained capacity, which in turn affected sourcing and inbound logistics for consumer goods manufacturers in the U.S. Air cargo capacity also had declined by 17% in February 2021, according to Seabury Consulting, Accenture's transportation advisory practice, with only a modest 5% recovery by May 2021.^[2]

In the over-the-road (OTR) mode, the North America trucking industry operated in 2020 with the worst mismatch between available transportation assets and available drivers in the last 20 years. Due to COVID-19 related causes, there were 80,000 fewer available drivers on the road compared to 2019.^[3] CPG manufacturers reported an increase of 40% in the number of 'loads available' per driver, from 5 to 8+ in the case of beverages. Additionally, the industry lost another 45,475 drivers for repeated failed drug tests.^[4]

Coping with long-term demand disruptions will need more than pushing for more stringent service level agreements (SLAs) and translating underperformance into financial penalties. As these service pressures are being pushed upstream, from shoppers to retailers, and then from retailers to CPG manufacturers, improving performance requires more than "demanding" more from partners. Instead, the future of shared value creation lies in new models of collaboration, integration of shared data streams and increased visibility into partners' supply chains to cope with demand disruptions.

Supply chain and operational disruptions have created an incredible opportunity for the CPG ecosystem to lead a profound transformation of how we serve our shoppers and consumers, and create value for retailers, manufacturers, carriers and suppliers that make essential products

available to and affordable for society. We can get started by measuring the performance metrics that really matter.

Evolving the metrics that matter.

Measuring On Time In Full (OTIF). We all love 100% performance. As a supply chain practitioner, you know that “perfect service” is aspirational as leaders, managers and planners handle the operational uncertainties of an interdependent and connected network of parties. Considering that many retailers have recently raised their expectations on manufacturers’ OTIFs, it is important to share our position on this critical service key performance indicator.

OTIF as a metric, calculates the probability to deliver an order “in-full” and “on-time: at the agreed location and within a pre-define service lead-time. Setting a 98% target for OTIF assumes that all suppliers have a probability to deliver 99% of all orders (irrespective to the number of lines in an order) in full, and 99% of all orders on-time, irrespective of the agreed upon service lead-times. A 99% first-time, full-order fill rate, across all SKUs and locations has inventory carrying costs implications that have not been measured or discussed strategically with retailers to drive a total lowest cost and best availability for shoppers at the shelf.

On the other hand, measuring item-level on-shelf availability (OSA) as service metric, drives the industry’s common focus toward improving shopper experience and integrating supplier’s performance with retailers’ logistics and store operations. Item-level metrics drive more effective actions than grouping them at the order level and at a delivery center (DC) location.

We also need a CPG conversation on setting manufacturer’s fill rate targets. Optimal fill rates are not 100% fill rates. Optimal fill rates achieve the right balance between the cost of “not-having” and the costs of “having” inventory available. Mature retailers and CPG manufacturers have the data that measures lost sales costs due to out-of-stocks and inventory carrying costs by store, by SKU and by demand season. Optimal fill rates require data-driven product segmentation and store prioritization based on different planning parameters.

Data can build a better CPG supply chain.

Yes, data is nirvana. Better data makes for better performing partners, suppliers and customers. CPG manufacturers today can use better data on demand patterns, product substitutes, retailers’ forecasts, pricing strategies, and any available data that helps CPG companies understand the causal factors that explain demand variability for their brands and products at all retailing locations. Did we mention that data on store segmentation and demand profiles by outlet are also very useful? Five years ago, manufacturers generally could not handle large volumes of transactional datasets from retailers, in addition to the enriched metadata for those datasets. Today it is a different game. CPG leaders have invested in enhancing their data and analytics capabilities, and new cloud architectures and more powerful computing can yield better decision-making from real-time data processing.

From our perspective, gone are the days of retailers protecting, selling, and monetizing data from their suppliers. The future is to make data available with the proper security and privacy

provisions because unless CPG manufacturers have better access to real-time demand signals, the industry will not likely improve. CPG manufacturers need less latency in the data exchange and more transversal views of the performance of their portfolios within the network of retail customers.

A great opportunity to drive new data-sharing ways of working is in digital commerce transactions. The CPG industry could take advantage of the physical lead time lag between order placement and fulfillment. This lag exists as the consumer has options as when to receive the order, giving the industry better time to respond if it has visibility to it. Online order data is also a great proxy to what happens at the physical shelf. So as eCommerce continues to expand, retailers can make online commerce data available to the supply network in real time. This would be a game changer for the industry and the overall shopper experience.

Of digital twins and digital threads for CPG.

Supply network modeling tools have evolved to accommodate uncertainty in the variables and different probable outcomes of the models. With greater data quality and powerful computational power, we are finding better and more accurate representations of what is happening in the CPG supply network. Digital twins and threads enhance reliability of the CPG supply chain and must be developed, shared and enhanced collectively by suppliers, manufacturers and retailers. Real-time, transactional data powers these digital twins and digital threads of the CPG's flow of goods and information, and those models bring greater clarity of bottlenecks and points of pressure in the network.

With the incredible advances in cloud, big data and technology platforms and the availability of sensors and signals in the network, we should be building true digital twins of our physical supply chain processes for the consumer goods and retail industries, and use these models to simulate a myriad of "what-if" scenarios that can inform service requests from retailers to manufacturers and suppliers. Modeling is the beginning of real-time visibility. Without accurate models, demand signals and capacity monitoring become disjointed data sources without the context of the underlying network model that connects shoppers with their product supply. Digital twins can be built by product category or by region of the country, and should include the product, information and financial flows among all members of that particular supply network.

Control towers: From modeling to real-time visibility and orchestration.

As the data and modeling evolution unfolds and individual companies leverage internal supply chain data, artificial intelligence for planning, and other emerging technologies, we should envision the transformation of CPG supply networks with enhanced visibility to everything and everyone within orbit. This vision underpins the rise of supply chain control towers. Control towers enable joint visibility and orchestration of supply chain flows and decisions supported by

the promise of big data and predictive analytics. Day-by-day we chip away at the protectionist barriers of traditional CPG and retail supply chains as companies see the benefit of adopting a “network of networks” mindset in their daily operations.

Conceptually, control towers ingest near real-time transactional data from any supply chain transaction and can connect that data regardless of its location in ERP system modules, independent systems, or specific functional applications. Control towers eliminate information integration lead times that can last weeks the further you go upstream in the chain. Members of a supply network control tower get visibility to real-time data, are alerted when specific issues arise, and receive information on expected performance of a variable and a recommended optimal response.

The promise of control towers begins with visibility but really ends with enabling better actions and decision-making. In the journey to building a control tower capability (see Figure 1), CPG manufacturers and retailers can start with visibility and performance monitoring but should quickly evolve into alert management from predictive analytics, intelligent rapid responses and end-to-end orchestration of optimal decisions.

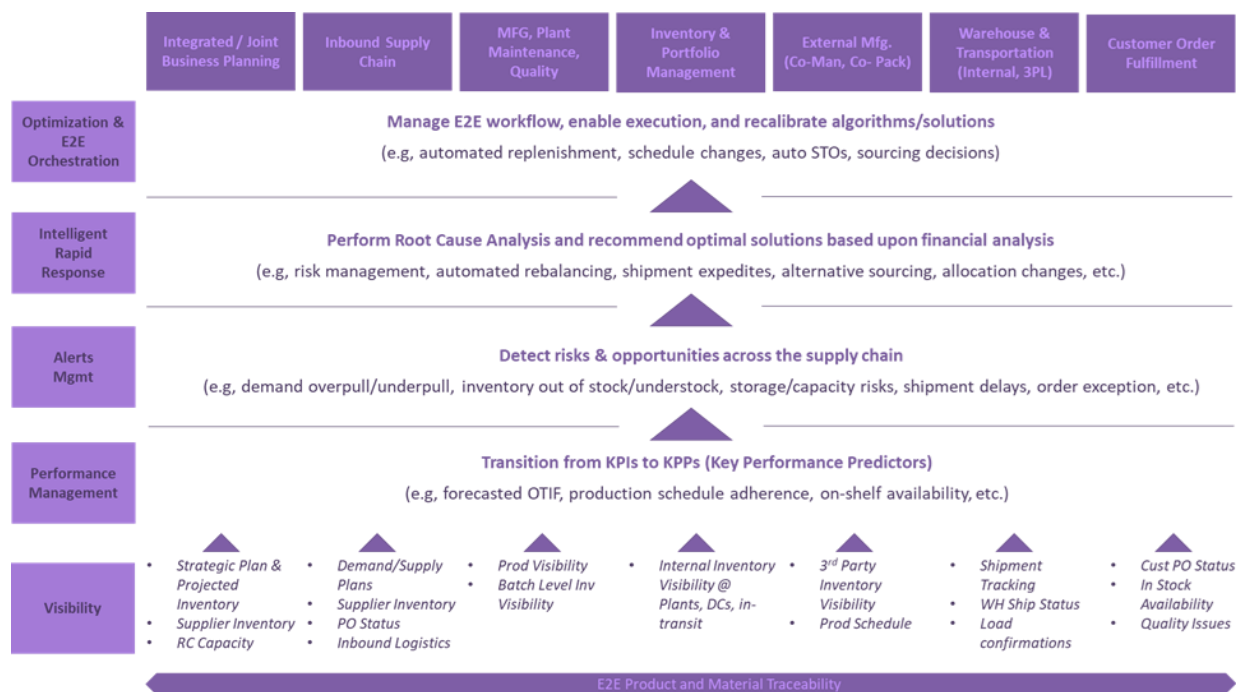


Figure 1: Control Tower Demand Driven Supply Network framework, *Source:* Accenture, 2021

Control tower applications integrate the entire value chain rather than enhancing the efficacy of individual functional areas or individual entities. Establishing a cross-functional control tower supply network of networks between retailers and consumer goods companies would significantly improve OSA and supply chain performance that goes beyond measuring traditional KPIs by complementing them with Key Performance Predictors (KPPs) that anticipate the service and cost exceptions throughout the planning and execution cycle.^[5]

Dynamic pricing as an alternative to fees and fines.

Across a variety of industries, customers and suppliers are successfully achieving their goals and unlocking trapped value by collaborating with greater transparency using performance-based pricing frameworks with different levels of service for different levels of cost. For years, the delivery package industry has used a pricing and marketing mix policy for the packages that vary on distance of transportation, time of delivery, dimension of the product, weight of the product and value of the product.^[6] From warehouse bracket pricing to less-than-truckload, there are several analytical pricing models with service level tradeoffs that have been used. And then there is Uber's surge pricing engine using artificial intelligence where in cases of very high demand rides the Uber app lets the riders know prices may increase, and the riders can wait or pay more.^[7]

Retailers and manufacturers should be able to understand which products and channels can create enough value to pay the estimated costs associated with higher OSA fill rates. The use of bracket pricing is not new to the food industry, but now with the power of advanced analytics we can crunch massive amounts of data to model the financial/service model tradeoffs. Let's remember the main supply chain objective is to manage the inventory flows of goods so they are either in-transit or on the shelf rather than sitting in warehouses.

Consumer goods companies and retailers can now analyze and understand the relationship between the cost to serve and bracket pricing looking at all variables surrounding transportation, inventory, pricing, and orders throughout each stage of the order to deliver lifecycle. Machine learning (ML) and artificial intelligence (AI) can analyze thousands of orders, customers' "ship to" points, and SKU's to create a performance-based bracket pricing model.^[8] While understanding that customers have different responsiveness and efficiency needs, multiple supply chain segmentation and digital transformation strategies are required, with a performance-based pricing trade-off framework supporting it.

CPG needs a network configuration that drives volume into the system in a steady state flow. As we bring volume flows, then speed and accuracy improve and we reduce waiting time in warehouses for carriers, and the endless hand-offs of information and transactions. In this model, CPG companies could aggregate volumes of similar categories in the network and share transport and warehousing resources with their shipments to customers driving greater economies of scale. This would be transformative in terms of cost and service while increasing asset utilization.

A bias for shared value and delivering better shopper experiences.

Solving the CPG supply chain performance challenge is critical to improve the availability, affordability, and shopping experiences that consumers demand in North America. Left unsolved, consumers will likely pay the price at the cash register, and we all can be exposed to disruption from innovators in CPG. We have invested for decades in new product portfolios, better shopping experiences, increased service models, and yet, consumers want more. They want

more personalization in their products, customized services, and unique brand and shopping experiences across channels. And it is not just because of COVID-19. Yet the pandemic created the perfect storm, driving volatile product demand and accelerating the pivot to eCommerce.

For decades the CPG industry and retailers have found common ground in their objective to better serve shoppers, through collaborative supply chain programs to reduce inventory levels, improve response times and availability of products on the shelf. Initiatives such as VMI, CPFR, ECR, blind receiving and other collaborative efforts have evolved the industry and the experience for shoppers. Today, we must resume the “collaboration” conversation again.

The battleground to attract shoppers and consumers to their favorite brands and shopping experiences has moved from the physical-only to the digital marketplace. Shoppers are “omni-channel”, and they will seek digitally enabled and consistent experiences as they shop for their favorite brands in their favorite outlets. We are convinced that better visibility, better orchestration, better performance metrics and better supply network models can bring resilience and adaptability of our CPG supply chains to deliver on our common goal.

It’s time for change. Where do we start?

The time has come for CPG companies and retailers to create a plan for how to work better together to unlock trapped value and enhance shopper experiences in physical and digital stores. We need to adopt the new ways-of-working that lead to more efficient trading partnerships and improved on-shelf availability for consumers. Improving OTIF supply chain performance will require CPGs and retailers to share data and get closer to the consumer, adopting a “network of networks” mindset while establishing new levels of trust and transparency. Successful trading partnerships can recognize the value in growing together and creating a free-flow of information that enables manufacturers to see shifting demand patterns and retailers to increase on-shelf availability and to run optimized, highly efficient, omni-channel supply chains.

As a set of next steps, it's time for all parties to roll up their sleeves and start to design, test, and learn about control tower demand driven supply networks. The table below suggests where to start.

10 Actions to Adapt and Advance the CPG Supply Chain in North America

Action	From	To
1	EDI order batching based on daily POS data	Real-time control tower track & trace capability for order management
2	Pre-defined ideal fill-rates and OTIF targets	Optimal OSA targets by SKU and by store segments
3	Demand forecasting based on time series models of historical retail orders	Demand forecasting based on causal models of shopper demand
4	Replenishment processes based on sequential, linear hand-offs between suppliers and retailers	Multi-enterprise process orchestration to ensure product flow in the network with minimum batching and daily adjustments in volume
5	Focus on targets for perfect orders	Focus on targets for sustainable and profitable demand response using cost/service financial trade-off analyses
6	Supply chain status reporting based on KPIs	Modeling and simulating operations in a true digital twin of the flow of goods and information in the CPG network
7	Internal ERP systems with disconnected planning modules and applications	Cloud-first supply chain architecture that enables multi-party inventory planning and real-time S&OE routines
8	Static network designs based on deterministic parameters and models	Digital twins and digital thread models of supply networks that account for variability (stochastic and probabilistic) in the model as a more accurate representation of reality
9	Limited visibility of real-time events and actions in the supply network	Real-time visibility, event management, and predictive analytics based on supply chain control towers.
10	Focus on cost reduction inside individual companies while pushing costs upstream or downstream	Focus on taking costs out for the whole ecosystem, unlocking trapped value and value sharing for CPG and shoppers.

Contact Us

Maria Rey-Marston, PhD

Accenture, Managing Director, Supply Chain & Operations
maria.rey-marston@accenture.com

Christopher McDivitt

Accenture, Managing Director, Supply Chain & Operations
christopher.mcdivitt@accenture.com

Tom Madrecki

Consumer Brands Association, Vice President, Supply Chain and Logistics
tmadrecki@consumerbrandsassociation.org

Keith Olscamp

Consumer Brands Association, Director, Industry Affairs
KOlscamp@consumerbrandsassociation.org

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