

# Digitization and advanced planning in CPG

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Consumer-goods companies want supply chains that run smoothly from end to end, but their efforts are often thwarted. A new generation of digital tools is helping to tackle the challenges.

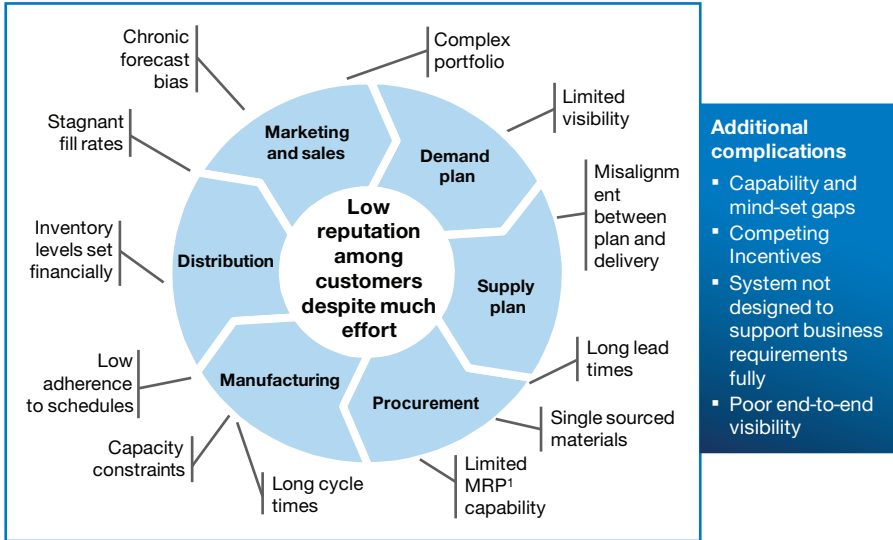
Managing supply chains is an inherently cross-functional activity, for they connect a company's major internal functions — sales, manufacturing, distribution — and encompass its key external partners, from raw-material suppliers to end-consumers. Consumer-packaged-goods (CPG) companies are acutely aware that organizational silos will prevent their supply chains from performing well; close alignment and coordination among all participants are necessary.

Yet even after many years of focusing on cross-functional transformations, many CPG companies struggle to bridge significant gaps in their supply chains. Distribution centers want to control inventory levels and handling costs. Sales-operation managers want to meet customer-service demands and minimize stockouts. But in this effort to maximize local performance, it's easy to make decisions that have a negative impact on other parts of a company and hard to manage the inevitable conflicts and trade-offs in an optimal way. Multiply those challenges across many business units and geographies, and the problem gets even tougher.

Other supply-chain issues are created within a company, but outside the function: differences in focus, incentives, and priorities among other parts of the organization all too often manifest themselves in poorer performance in the supply chain. Whether the problem is inaccurate forecasts by marketing and sales, long procurement lead times, or poor compliance with manufacturing schedules, the result is the same: costs rise, the health of the inventory suffers, and service levels fall (exhibit).

## Exhibit

Disconnects within and between functions can degrade the supply chain's performance.

**ILLUSTRATIVE**

1 Manufacturing resource planning

If supply chains are hard to run efficiently, the issue is compounded by wider industry trends—global networks, shorter product life cycles, channel and SKU proliferation, and rising service demands.

## Why is it hard to improve integrated supply chains?

Several challenges bedevil efforts to align players across the supply chain. Sometimes, for example, companies aim to foster cross-functional collaboration but have difficulty achieving it when they execute. Cross-functional meetings may struggle to make decisions and end up merely sharing information. Or companies may find it hard to make the numerous changes required to improve. The total margin-enhancement opportunity from closer collaboration between CPG companies and retailers may be approximately 2 percentage points. But capturing those gains requires a portfolio of actions—from better sharing of information to vendor-managed inventory approaches to close cooperation on sales and promotion strategies.

Many efforts to improve supply chains focus too narrowly. One CPG company gave the function aggressive top-down targets to reduce inventory, for example. To achieve them, it needed help from other parts of the organization, including more accurate forecasts and shorter manufacturing lead times. When that assistance wasn't forthcoming, the company had to adopt a different approach — reducing safety stocks in categories where it thought demand would be relatively stable. Not all of those bets paid off, and it started to experience service issues.

So CPG companies want to find data-driven solutions for the disconnects in their supply chains. One area of particular interest has been the use of point-of-sale data from retailers to build a more accurate picture of real-time customer demand. Yet many organizations struggle to turn that data into actionable insights. One global CPG company collected hundreds of gigabytes' worth from its customers' systems, for example, but couldn't mine that data. In fact, it hadn't identified the important decisions it had to make to improve its supply chain's performance, so it couldn't structure its data in a useful way or even ensure that it was collecting the right data from customers.

## Unleashing the power of digitization

Today, some CPG companies are finding new ways to address these challenges with the aid of digital technologies. Sometimes, as we'll see below, that involves the use of advanced analytical-optimization techniques. For many companies, however, the initial benefit of digitization is its ability to support current planning activities by speeding up and standardizing the problem-solving process.

How often have you seen individual planners working on their own analyses in an inconsistent and nonrepeatable way, working on relatively unimportant problems, or struggling to find the right answers with incomplete information? What's more, today's planners often solve similar problems again and again — for example, they may calculate the likely cannibalization effects on existing products whenever a new line is introduced. By identifying best-in-class approaches and sharing them across planning teams that use digital platforms, companies can create an efficient, sustainable process to deal with the problem. The more they gear these efforts to leading indicators (such as projections of stockouts or high inventory positions), the more planners can escape from firefighting activities. Better data-processing and visualization techniques help companies get the best out of their human planners by bringing together the right data and focusing on the right exceptions.

After a recent merger, for example, the newly combined company succeeded in consolidating the data from two completely different systems, with different planning approaches and different languages in a matter of weeks. It developed a series of dashboards to report its inventory performance (across multiple countries and segments) and to understand week-on-week changes in both targets and actual inventory. The dashboards also provided visibility into opportunities to balance inventory between the two legacy businesses and created a repeatable process to make the necessary adjustments. In addition, the final dashboards supplied more accurate forecasts for both components and finished products, and at a much more granular level, so the company could improve its performance across a high number of locations.

These initial steps don't just deliver quick wins. Digitizing and hardwiring the problem-solving process can create a platform for more advanced analytics: bringing critical data together in one place, providing the horsepower to process them, and creating the foundation for a more integrated supply chain. Building on that foundation, other emerging digital technologies—for integrated supply-chain management, predictive analytics, and optimized planning—could help companies fix the costly disconnects in their supply chains by breaking down stubborn silos and paving the way for truly integrated decision making.

### *Integrated supply-chain management*

The tools most CPG companies now use to manage their overall supply chains focus on rapidly generating performance reports based on information readily available from the wider supply-chain organization. These tools typically provide useful ways to filter and visualize that data but often lack effective mechanisms to validate them. Without consistent, good-quality information, supply-chain leaders can't have effective performance discussions with their staffs. Furthermore, these systems cannot manage multiple trade-offs, so it is hard, for example, to balance decisions about supply-chain footprints, inventory levels, and manufacturing strategy.

The newest generation of integrated supply-chain-management tools overcomes these limitations with improved data-collection and -validation features and the ability to optimize multiple interconnected dimensions simultaneously. One global CPG player, for instance, developed its own system to optimize a wide range of supply-chain dimensions, including footprints, transportation modes, routing, inventory, postponements, and production frequency. The algorithm reduced costs 10 percent more than the company's conventional individual-optimization approach had.

## *Predictive analytics*

Furthermore, risk-scanning systems can identify weaknesses and vulnerabilities in end-to-end supply chains, revealing the areas where problems will hurt performance most significantly. Companies are also developing algorithms to automate root-cause analysis (RCA) of service failure. They can avoid the finger-pointing that often accompanies today's manual efforts (and focus on process changes and improvements to prevent a reoccurrence of similar issues) by basing RCA on hard transactional data.

The use of advanced-analytics techniques isn't limited to the technical and process aspects of the supply chain: they are also being applied to critical human and organizational issues. Analytics techniques can identify the parts of the supply-chain function—and the links between specific individuals—that directly affect its performance. At one automotive company, applying these techniques to several years of data from dozens of different sources helped to reduce both time to market and costs by about 10 percent.

## *Optimized planning*

Established supply-chain planning systems are powerful—but often are slow, cumbersome, and inflexible. Once organizations have set up their planning models, they tend to stick with them because it's so difficult to customize them and test alternatives and improvements.

Next-generation planning tools will offer greatly improved flexibility, ease of use, and analytical power. They will also operate in—or close to—real time. That speed is particularly important in the context of today's complex CPG supply chains, with their multiple value-chain tiers.

Traditionally, planning solutions have effectively managed only a single tier of supply—finished-goods requirements to manufacturing, for example, or manufacturing requirements to suppliers. In this case, planning defines manufacturing requirements in one system, and then manufacturing runs its own planning systems, often independently, to define materials requirements from suppliers. Both systems can plan for economic batch sizes, constraints (given staffing, machine capacities, shutdowns, and so forth), and basic dual-sourcing splits. Finished-goods planners have added significant value by manually attempting to understand any constraints beyond manufacturing and incorporating them into the supply plan.

The more tiers in a supply chain has, the more acute this challenge becomes. We have seen the greatest progress when there are deep bills of materials or significant constraints in very low tiers. Those solutions usually take one of two forms. In the first, advanced algorithms augment legacy planning systems to solve for a handful of constrained raw materials. In the second, advanced planning systems embrace in-memory processing, which allows one system to solve across multiple tiers, with multiple constraints, in real time. This approach not only improves route planning but also allows planners to look at multiple scenarios quickly and efficiently.

In addition, advanced planning capabilities have become more accessible thanks to the development of cloud-based solutions, which help companies to experiment with new planning approaches, to adopt new solutions, and to scale them more quickly and successfully than they could with conventional enterprise IT infrastructure. The result can be a rapid, low-cost path to impact—provided that the internal IT function is able to provide the support that the supply-chain organization needs for implementation.

## The digital supply chain in practice

One company operating in a highly seasonal business used a range of advanced digital tools to address long-running disconnects among its retail, manufacturing, and supply divisions. Manufacturing had long based its campaigns on annual plans rather than responding to the changing needs of the retail division, and all three units' persistent failure to collaborate on forecasts or align incentives stranded large quantities of inventory in retail locations.

Since the company's existing supply-chain-management systems were old and poorly integrated, it used cloud-based technologies extensively to rapidly introduce a range of new tools and processes across its supply-chain activities. It established weekly demand forecasts for individual retail branches. Advanced demand analytics helped it both to define archetypes for different product types and to fit appropriate forecasting models to each archetype. And a new collaborative planning process now combines external market data with store-generated feedback to continually adjust the company's forecasts during peak seasons, allowing the supply-chain operation to make more-accurate replacement recommendations to retail outlets.

To evaluate the efficacy of the new collaborative processes, the company also established new key performance indicators (KPIs). For example, by measuring the compliance of retailers' orders with its replenishment recommendations, it could identify and investigate retail outlets that lacked confidence in the new forecasts and work with them to address those concerns.

The organization used an integrated planning approach to tackle the silos of supply and manufacturing. A thorough analysis of freight flows revealed that products moved from plants to retail locations in a fragmented and inconsistent way. Creating a new, end-to-end, lowest-delivered-cost model not only optimized logistics expenses but also created more regionalized and available inventory pools and improved service to retailers.

Finally, the company connected supply and manufacturing by aligning them around new incentives, together with an integrated planning process that acknowledged many constraints at plants. The new approach maintained the efficiency of plants while reducing manufacturing-driven supply shortages. Dynamic deployment algorithms and dynamic stocking targets greatly improved the health of the inventory throughout the network.

Together, the changes had a rapid and significant impact. In the first season of operation, the company reduced overall inventory by 15 percent and cut logistics costs by a fifth, while simultaneously improving service across its network.



Breaking the barriers between functions has never been easy, even though the value for supply-chain performance is clear. When thoughtfully implemented, digital tools now provide a crucial advantage at every stage from the company through to the customer.

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