

Operations as a competitive advantage in a disruptive environment





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Operation cleanup: How to thrive amid (more) consumer-industry turmoil

Mike Doheny, Shruti Lal, Daniel Rexhausen and Frank Sanger

Since 2013, when we published our previous collection of articles on consumer-packaged-goods (CPG) operations,¹ the pressures the CPG industry has faced have generally intensified. Despite some easing from earlier peaks, commodity and raw-materials prices remain highly unpredictable. Ubiquitous smartphones make pricing even more transparent. In many of the largest emerging markets, growth has stalled—or even fallen into reverse. And in mature economies, home to many of the industry’s largest players, a combination of slow growth and rising inequality are fueling widespread dissatisfaction and market volatility.

Nevertheless, for many in the industry, the past few years have seen a gradual recovery take hold as companies learned to adapt. The end of the commodities boom—measured especially by falling oil prices—contributed as well. Margins and revenues have started to grow again for more and more players. Costs are falling after almost a decade of increases. And underpinning these developments, a newfound focus on operational excellence has taken hold, particularly among the industry’s top performers. Indeed, reviewing data for large CPG companies from 2009 to 2013, we found that no company was able to increase its margins without also improving its cost performance, our proxy for strong operations capabilities.²

Time to breathe a little easier?

Probably not. Signs of new industry turmoil abound. Fewer and fewer CPG players remain independent: over the past five years, the number of M&A deals valued at \$2 billion or more has risen by 15 percent per year. About one-fifth of industry players show signs of financial distress, such as revenues falling by 10 percent in a year, a stock price falling by 20 percent, or a ratio of net debt to earnings before interest, taxes, depreciation, and amortization rising over 4.0. Not surprisingly, CEOs aren’t surviving very long, either. On average, their tenure has fallen by an estimated 40 percent since

2010, with some company head offices becoming virtual revolving doors. The industry as a whole has therefore become more vulnerable to the next shock, whether it comes from rising wages, trade interruptions, or a macroeconomic crisis.

Nevertheless, a few organizations are already responding successfully. A global foods player increased its manufacturing efficiency to achieve margin growth of more than 3 percent annually for five years—overcoming higher transportation and input costs along the way. And another fast-moving consumer-goods company achieved similar results with a company-wide continuous-improvement initiative that has eliminated billions in costs.

What organizations such as these share is a commitment to three strategic shifts that are becoming increasingly essential in order for organizations to survive—and thrive. Together they enable a company to make the most of unprecedented new technologies and rapidly changing consumer behavior.

1. Achieving next-generation functional excellence

Whereas economies of scale were once the way to meet customer needs efficiently, today's CPG manufacturers must become more nimble as they tailor their offerings more precisely while also preserving margins. Balancing the two imperatives will require deeper functional excellence across a wider range of capabilities than ever before.

Many of the most urgently needed skills concern what arguably is the industry's greatest underused asset: the vast quantity of data at its disposal, both from manufacturers' own systems and from supplier and retailer networks. With the right tools, together with careful testing of emerging technologies, CPG companies can generate powerful insights to inform everything from product development to demand forecasting. In the process, they can transform themselves into technology leaders.

Manufacturing remains at the core of CPG players' operations. The first article, "**CPG manufacturers need a comprehensive strategy for digitization**" (page 11), considers the impact of consumer-centered innovation and the successful adoption of digital technologies in the evolution of the CPG landscape through 2030. "**Playing catch-up in advanced analytics**" (page 21) then describes the opportunity for investing in industry-beating analytic capabilities, while "**Breakthrough technologies fundamentally change the game**" (page 27) examines how CPG manufacturers can identify the right combinations of new technologies (such as 3-D printing, machine-to-machine communications, and advanced robotics) to help them achieve breakout performance. "**Mastering the enablers of a sustained digital**

journey” (page 33) concludes the section by looking at the three enablers—people, governance, and partnerships—that are prerequisites for digital change to last.

The next focus is on supply chains. In **“Supply chain 4.0 in consumer goods”** (page 41), the authors detail how the Internet of Things, advanced robotics, advanced analytics, and big data are restructuring supply chains to significantly improve company performance and customer satisfaction. **“Digitization and advanced planning in CPG”** (page 53) looks at a new generation of digital tools that are helping consumer-goods supply chains run smoothly from end to end. The question posed in **“My supply chain is better than yours—or is it?”** (page 61) points to new, more-detailed benchmarks that can help CPG organizations uncover significant additional value throughout their supply-chain networks.

Technology advances are reshaping purchasing and supply management as well, as detailed in **“Driving superior value through digital procurement”** (page 71). And food players, facing especially heavy customer demands, now have a **“Recipe for success for sourcing in the food industry”** (page 81)—which finds new opportunities in how food companies specify, source, and manage their raw-materials supplies, helping them cut costs, meet changing consumer preferences, and manage risks.

The last major area for functional excellence brings everything together with a focus on quality. In **“The evolution of quality: Higher quality output—lower cost of quality”** (page 89), the authors explain that far from increasing costs, good quality often yields recall and warranty savings as a culture of quality takes hold.

2. Preparing for the new consumer

The shifts are even greater at the consumer level, where the industry must accommodate everything from aging populations, smaller households, and rapid urbanization to rising demand for customization and “wherever, whenever” shopping convenience. To cut through the noise and connect with customers, CPG players will need to thrive across many channels at once. And, amid intensifying competition for distinctive, value-creating features, what the industry is offering must quickly evolve as well.

At the same time, product proliferation threatens to reverse the hard-won gains CPG players earn from greater efficiency and new capabilities. Conventional efforts to “cut the long tail” too often backfire with unintended consequences, either raising costs or reducing sales. A middle ground allows for better, more strategic choices.

Building omnichannel excellence (page 101) notes that as consumers move more of their shopping online, service and efficiency challenges are rising for CPG players across all channels. A multifunctional response that brings to bear expertise in areas such as brick-and-mortar store operations, supply chains, marketing, customer service, strategic planning, and IT is a starting point to reimagined distribution networks. **“Design for value and growth in a new world”** (page 113) then expands the concept of design to value for an environment where customer choice has never been higher. Product design is thus critical for delivering outstanding products and services, and for building lasting customer relationships.

The section ends with **“Simpler is (sometimes) better: Managing complexity in consumer goods”** (page 123). Rather than try to fight complexity, consumer-goods companies should take a more nuanced approach, understanding that complexity can be bad or good depending on the circumstances. Developing an end-to-end perspective allows organizations to differ between the two, allowing manufacturers to master complexity—and even turn it to their advantage.

3. Strengthening enterprise resilience

An increasingly interconnected world means that local events are ever more likely to result in global fallout: flooding in Thailand idles automotive plants in Europe, and contaminated peanuts from a small US company leads to global recalls of packaged foods. That’s on top of increasing macroeconomic and political volatility in much of the world.

What organizations need is greater resilience, whether by increasing their financial breathing space based on sharper cost discipline, or by more effectively managing resource and reputational risks. Furthermore, given the time, attention, and resources these efforts require, companies need the changes to stick. The right transformation approach, organizational structure, and implementation support can turn a long shot into a much more sure bet.

The section opens with **“The truth about zero-based budgeting: ZBB for consumer-goods players”** (page 133). After decades lying dormant, ZBB’s recent successes stores have captured the CPG industry’s attention. But misconceptions abound. Ten myths and realities then illustrate ZBB’s power and practicalities. Next, **“Starting at the source: Sustainability in supply chains”** (page 141) explores how consumer industries can no longer take affordable, reliable supplies of energy and natural resources for granted. But by working closely with their suppliers, consumer companies can reduce not only their supply uncertainties but also their environmental and social impact.

“**The ‘how’ of transformation**” (page 153) reviews research confirming how often transformation programs fail. Creating a “performance infrastructure” can help ensure that yours won’t. And finally, the “**Secrets to implementation success**” (page 161) reveals what successful implementers do differently from other companies. According to a survey of more than 2,200 executives, the crucial factors are organization-wide ownership of and commitment to change, prioritization, and sufficient resources and capabilities.



Amid the extraordinary forces the consumer-packaged-goods industry now confronts, extraordinary opportunity awaits those companies that are willing to transform themselves with the capabilities that today’s world requires. Some leaders are already seeing the impact that comes from making a deep commitment to continuous improvement across their organizations. It’s a payoff that’s worth the investment it takes.

- 1 *Operations as a competitive advantage in consumer packaged goods*, McKinsey Consumer Packaged Goods Operations, 2013, available by request on McKinsey.com.
- 2 Mike Doheny, Jan Henrich, and Shruti Lal, “When subpar operations threaten margin growth,” *McKinsey Quarterly*, October 2015, McKinsey.com.

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1. Achieving next-generation functional excellence





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CPG manufacturers need a comprehensive strategy for digitization

Luis Benavides, Marnix Hollander, Frédéric Lefort and Julian Salguero

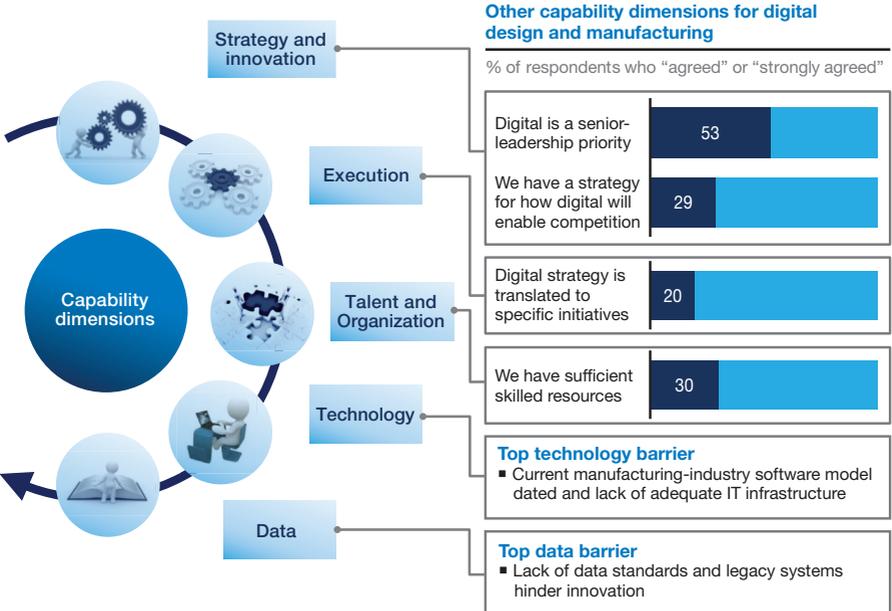
Increasingly competitive CPG markets are making consumer-centered innovation—and the successful adoption of digital technologies—essential as the CPG landscape evolves through 2030.

The relentless hype around digital in consumer-packaged-goods (CPG) manufacturing has left many leaders disoriented and paralyzed by the many buzzwords and the promised benefits of digital tools. At the same time, their efforts to gain traction with digital are hindered by legacy systems, processes, and capabilities. A recent McKinsey survey of senior CPG leaders found that most consider digital technologies to be a priority, but few have defined a clear strategic vision linked to actions. The major obstacles cited were a lack of skilled resources, out-of-date software models and an inadequate IT infrastructure, the absence of data standards, and obsolete data-management systems (Exhibit 1).

Several factors help to explain why manufacturers both need a digital strategy and have struggled to put one into action.

First, the manufacturing-excellence programs companies have employed in recent years are yielding diminishing returns. Companies believe they have already captured the full value from lean management and are struggling to find the next pipeline of initiatives that will deliver the typically expected 3 percent annual productivity improvement. Many companies have also already tapped the potential of zero-based budgeting or complexity reduction, and further cost reductions are not expected to be significant.

Exhibit 1 Senior leaders say digital is a priority, but few link a clear strategic vision to actions.



Source: McKinsey analysis

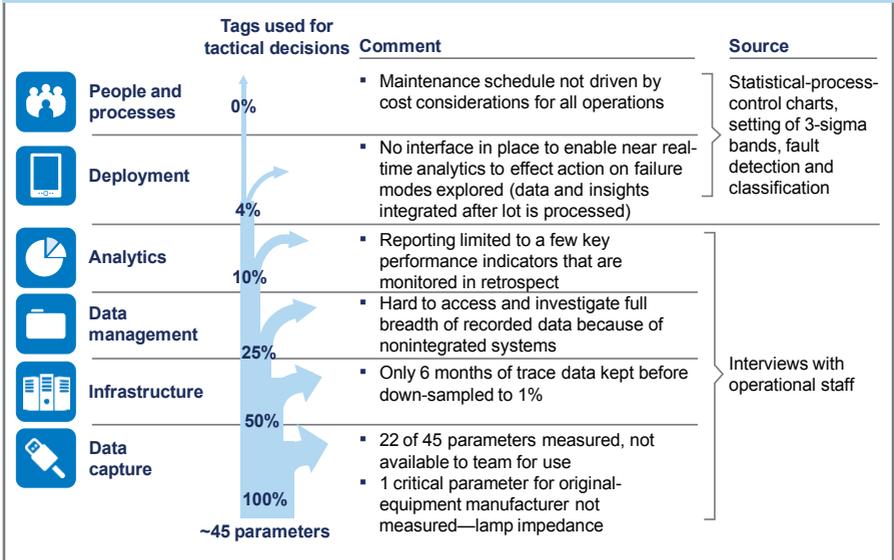
Second, companies' current practices and systems are not capable of drawing actionable insights from the vast amounts of data available. A recent, and representative, analysis found that a manufacturer failed to use up to 75 percent of the data it had captured. Data management was one major obstacle, as the lack of integration among systems made it hard to access and investigate the full breadth of the recorded data. What's more, the company did not perform real-time or forward-looking analyses, and it did not provide operators with an interface that would enable them to see the information and apply the insights to improve performance (Exhibit 2).

Finally, talent management has failed to keep pace with the needs of a digitally focused organization. Manufacturers must redesign their recruiting and people strategies in order to attract and retain employees, such as data scientists, with the specialized skills required for driving digital forward. At the same time, they must ensure they are educating and inspiring their current employees on the application

Exhibit 2

During the first phase, a lot of data is captured, but much of it—up to 75 percent—is not used.

From a base of 45 parameters, close to zero tags are used to inform operational decisions



Source: McKinsey analysis

and benefits of digital tools. When process experts and operators understand how digital technologies can help them, they can apply their knowledge to develop valuable insights and use cases.

To define and execute a strategy that supports their business goals, the leaders in adopting digital technology in CPG manufacturing have applied a four-part approach:

- using digital solutions to enhance performance and build capabilities
- applying advanced analytics to generate new insights
- implementing breakthrough technologies to fundamentally change the game
- mastering the right enablers throughout the organization to promote a sustained digital journey

Using digital solutions to enhance performance and build capabilities

Especially in the early to middle stages of the digital journey, companies should focus on targeted digital solutions instead of broad IT implementations. Examples of targeted digital solutions include real-time dashboards, digitized operating standards, and leader standard work. Benefits include higher overall equipment effectiveness (OEE), reduced levels of scrap, higher throughput, lower planned downtime, and faster changeovers. These solutions also promote higher levels of engagement throughout the organization.

Targeted digital solutions promote these improvements by addressing the typical pain points that prevent lean from being successfully implemented at scale. In trying to implement lean management and continuous improvement across manufacturing processes, companies typically face three major pain points:

- **Scalability:** Can ideas and practices implemented in pilot areas or sites successfully scale to the rest of the organization? Digital tools should actively promote and accelerate scale, instead of hinder it.
- **Consistency:** So that everyone from the frontline to the COO sees the same information, is there a single source of truth for all data and key performance indicators (KPIs)? Digital can rapidly aggregate and normalize data in a standard manner.
- **Visibility:** Can people across the organization quickly access the key information they need to make decisions? Digital can provide unprecedented levels of visibility to accelerate the decision-making process.

Well-designed, “lightweight,” digital tools — which do not require high levels of IT investment, integration, or training — can address these pain points rapidly and at a relatively low cost. These simple digital tools also serve as prototypes for more advanced tools and infrastructure and allow operators to gain experience with digital data, visualization, and basic analytics. Moreover, they help to identify which areas are good candidates for more robust digital tools, advanced analytics, and hardware and software investments, as well as indicating the data-driven returns on investment to pursue.

We have found that digital solutions can be considered in terms of four archetypes. These archetypes can be integrated to provide a full toolkit to frontline manufacturing leaders.

1) Setting performance targets

To set aspirational targets, companies need the right performance information and benchmarks. This requires having access to information about global operational performance through a simple platform, combined with internal and potentially external benchmarks presented cleanly with clear visuals to support insight generation. Companies can use the information to assess the gaps to full potential for every cost and operations performance element and the “size of the prize” from closing the gaps at different levels.

Example: A large food manufacturer wanted to maximize the returns from its next wave of continuous improvement programs. But, because it lacked visibility into performance throughout the organization, it was uncertain about which performance levers to pull across its network. Additionally, it was under pressure to deliver larger savings than the standard 2 to 5 percent achieved annually. To gain visibility, the manufacturer used a digital solution to serve as the single source of truth to track performance for all key metrics and provide internal and external benchmarks. This enabled leaders to understand the full potential value at stake. The manufacturer used the new digital solution to set performance targets that were consistent with the opportunities it identified. It also gave each plant access to the tool, so that managers could better understand the areas where their performance ranked higher or lower relative to other plants. As a result, managers now have clear performance targets and understand which areas should be the focus of improvement efforts. The potential opportunities identified totaled 10 to 15 percent of conversion costs and material waste. The increased visibility promoted by the solution has also sparked the sharing of best practices across plants. Moreover, because managers trust the accuracy of the performance data, they feel that they are being treated fairly and consistently.

2) Guiding daily performance and activities

Decision support tools (descriptive, predictive, and prescriptive analytics) and productivity boosters (digitization of paper or manual processes) help companies capture value from the application of lean principles. These solutions allow manufacturers to collect and track information on line performance (such as OEE), as well as execute and track standard work activities. The information serves as the input to action-oriented performance dialogues and promotes a faster continuous improvement cycle.

Example: One North American bakery was struggling to improve its performance as measured by productivity and OEE KPIs. Managers knew their OEE percentage, but

they neither understood the loss drivers nor possessed actionable data they could use for problem solving. Although supervisors and operators invested significant time-gathering data, the information was often incomplete and arrived too late and with insufficient detail to immediately identify corrective actions. To gain actionable insights for performance management, the site implemented a simple real-time OEE system that incorporated operators' insights and inputs from key workstations on the line. Because the new OEE system engaged operators to enter information, it increased trust in the data, ensured more actionable information, and promoted active engagement and problem solving on the line. By feeding this information into a well-coordinated performance dialogue structure that cascaded from the front line to the site manager, the site ensured accountability and action relating to the data.

As part of their efforts to apply digital solutions to strengthen daily practice, leaders also improved their use of leader standard work, which they had been using as a calendar tool rather than to develop employees' capabilities and thereby enhance performance. They rolled out a solution that allowed them to focus leader standard work on the most important development activities, such as one-on-one coaching, gemba walks, and root-cause analysis. By guiding performance and activities, leaders enabled their teams to increase OEE by 5 to 8 percent across their lines and motivate operators. Supervisors were also able to spend significantly more time on the line, instead of completing paperwork.

The system was targeted and simple enough to be deployed in days, without involving a major IT effort, while also being scalable to the rest of the bakery network. Furthermore, by leveraging a single cloud-based tool, OEE metrics could be measured consistently from site to site, enabling better benchmarking and visibility across regions. "I love the transparency the system provides," said a vice president. "I want it in all my plants."

3) Increasing operational maturity

When implementing or scaling initiatives, a common challenge is to ensure that processes and standards are consistent across regions and over time. Maturity assessments, with content ranging from management to maintenance, enable companies to measure operational process maturity against best practices and benchmarks. By asking tactical questions and calibrating answers, leaders can understand where gaps to best practice exist, and design plans to improve performance across multiple dimensions.

Scaling these assessments across a broad network and implementing best practices frequently prove difficult, given the challenges of data aggregation and assessment consistency. Companies can leverage digital solutions to scale and accelerate the assessment and the adoption of operational best practices. Digital solutions can use intelligent algorithms to automatically design transformation plans that achieve the desired results, connect best-in-class practitioners, and track operational performance against process maturity.

Example: A major European insurer wanted to rapidly scale a standardized operational maturity assessment across its organization, but its traditional paper-based assessments made it hard to do so in a sustainable and consistent way. Moreover, data was hard to gather, normalize, and benchmark, especially with many assessors scattered globally. To overcome these challenges to scaling, the maturity assessment was digitized to provide a single source of truth, facilitate continuous access, improve level-setting across assessors, and enable faster assessments. Data could easily be compared with internal and external benchmarks, generating new insights.

4) Accelerating capability building

As operational maturity grows across an organization, a failure to build the knowledge base and train employees on an ongoing basis can impede continuous improvement. In such cases, best practices are not easily shared across locations and traditional methods often require extensive overhead and travel. To build long-term capabilities, companies need the ability to easily codify, share, and improve upon their knowledge base. A digital system can accelerate knowledge sharing, enable more frequent interactions among practitioners, and ensure the availability of a well-curated knowledge base. Online trainings, augmented-reality simulations, and social sharing are key elements of a capability-building platform. For example, by maintaining an up-to-date library of standards, tools, templates, guidelines, and best practices, companies can give line leaders easy access to the knowledge they need as they advance in their lean journey. Rather than “reinvent the wheel” or use outdated approaches, leaders can readily learn about the organization’s best solution to a recurring problem.

Example: An industrial products company created a capability-building platform to facilitate a broad digital transformation. The company had many autonomous business units, with minimal collaboration within and between units and no common

standards within functional areas. To standardize processes within functional areas and across units, it developed a digitized production system that drew upon McKinsey's knowledge of trainings, best practices, and standards. A central web-based knowledge platform promotes collaboration within functions and across business units by enabling the sharing of global standards, fostering adherence to the standards, and improving communication. This enhanced level of collaboration facilitated the rollout of standardized core lean practices (including 5S principles, maintenance processes, and performance management) across more than seven sites. The effort aligned more than 2,000 employees in production and maintenance around the core lean processes.



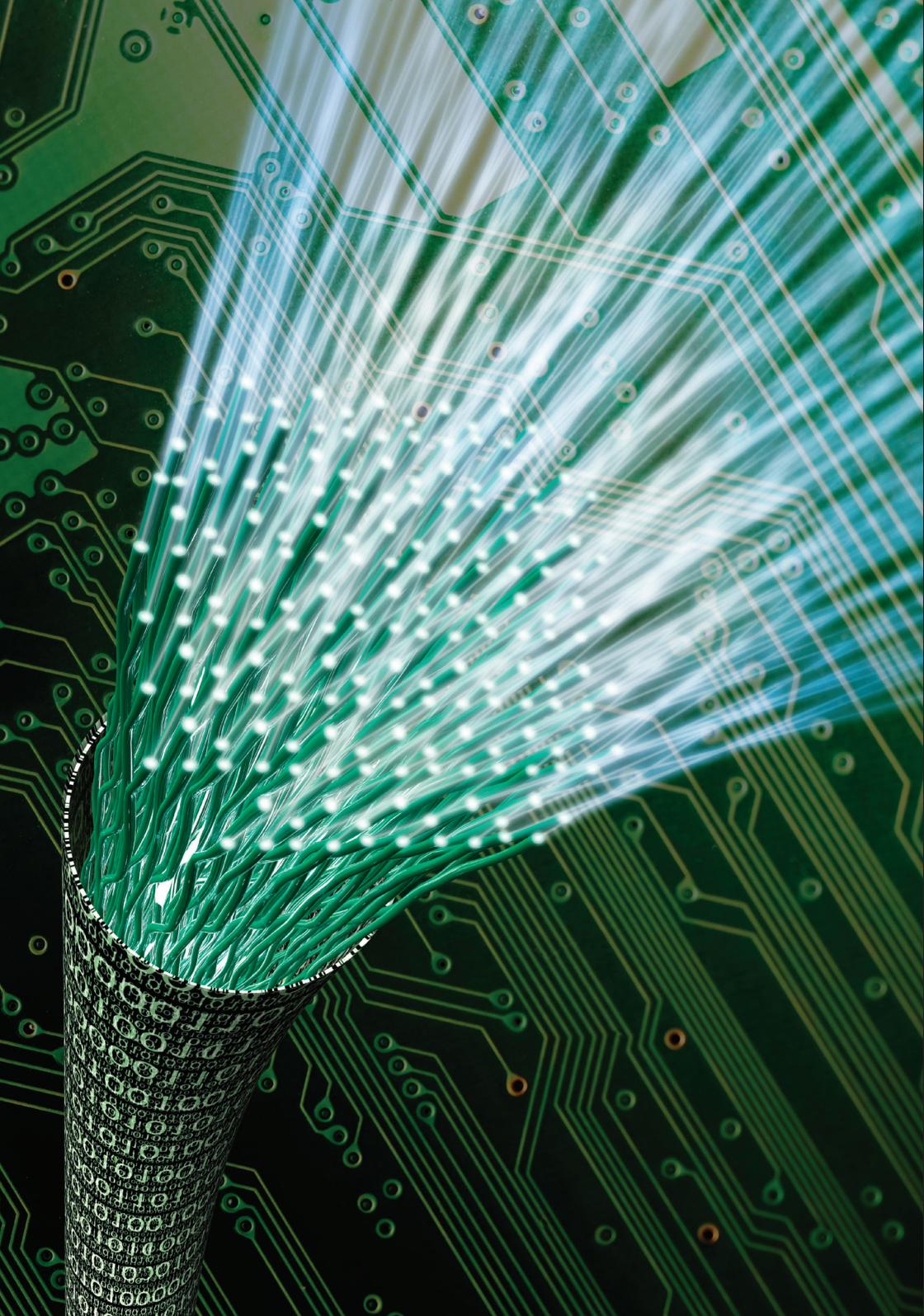
Even in an age when digital technologies are transforming operations, people remain essential to driving an organization's success. Companies should educate their people about how digital can help them solve their everyday business problems. Operational leaders can then apply this knowledge to develop use cases that generate value and ask for digital solutions to implement them. To make this happen, companies should empower individual operational leaders by giving them the freedom to explore options and take an entrepreneurial approach to implementing solutions. Early approaches should aim to "fail fast" and build momentum for a broader transformation. For a discussion of the requirements for long-term success, see the subsequent chapter, "Mastering the enablers of a sustained digital journey."

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Playing catch-up in advanced analytics

Luis Benavides, Rehana Khanam, Frédéric Lefort and Oscar Lovera-Perez

Among CPG companies' most underused assets are the vast quantities of data they generate. But there's still opportunity to invest in industry-beating analytic capabilities.

Consumer-packaged-goods (CPG) companies have increasingly gained access to unprecedented amounts of data, and we expect that this trend will intensify over time. However, most companies are generating very limited insight from these newly found sources, leaving a treasure chest of opportunities untapped. Companies that have already captured benefits from this trove of insight are reaching the next frontier of performance. For those companies that have yet to follow suit, it is imperative to take steps to catch up.

With all the attention given to advanced analytics, it may be tempting to assume that the benefits are overrated. But the value is real and significant. For example, by making a concerted effort to find correlations among more than 400 output and quality parameters, a paper company was able to reduce material cost by more than 10 percent and increase revenue per ton by more than 5 percent. To achieve its targets for quality at minimum cost, the company needed to optimize multiple consecutive process steps. Papermaking is a complex industrial process that combines interrelated chemical, thermal, and mechanical steps, but these interrelations and their impact on the product are often not well understood. The company had only a limited understanding of how control parameters influence product characteristics at each step of the value chain. Once the company understood the linkages among parameters, it used the latest machine learning and bespoke algorithms to optimize the paper mill for customer requirements. It also uses the model on a continuous basis to monitor and increase yield and improve performance.

Choose the right data and tools

Global companies should consider using both internal and external data, while addressing the challenge of accessing information in the most sensible way. Internal data sets must typically be cleaned and merged in order to glean insights. Depending on their source, data sets generated within a plant are often structured differently (for example, using different nomenclature or units of measure) and may contain statistical “noise” for a variety of reasons. External data can often provide CPG companies with much-needed insights related to consumers, customers, and competitors. However, the ability to use external data sources is highly dependent on the extent to which the provider has structured the data. Raw data may appear to be a random array of numbers and names. To make the data useful for analysis, the provider must, for example, clearly identify what is being measured and the units of measure. To generate insights from the data sources, companies must also understand the analytical tools and models available and select the right ones.

By choosing the right reliability-analytics approach, a heavy-equipment manufacturer reduced maintenance spending by about 5 percent, amounting to savings of tens of millions of dollars. The company applied a variety of advanced analytics to evaluate the performance of large motors used in production. These analytics included a Weibull analysis of component-failures data to determine the optimal maintenance strategy and logistic regression analysis to establish the relationship between alarms and failure events. Although these are not new analyses, the availability of real-time data, on-demand computing power, and machine-learning algorithms has enabled an entirely new level of proactive insight. The analyses revealed that high maintenance spending resulted from the need for a break-in period for new components. To prevent breakdowns, the manufacturer had been proactively replacing the components. In fact, the company’s overzealous approach to component replacement had actually been driving costs higher. By replacing the components less frequently, the company could improve their reliability and reduce maintenance costs.

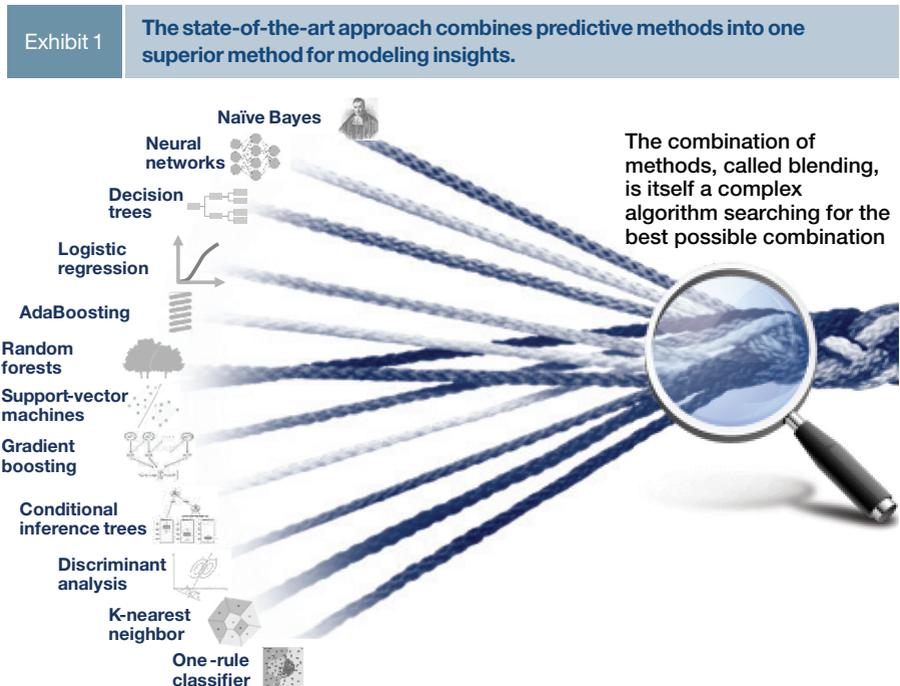
Take a comprehensive approach

Manufacturers must apply a robust advanced-analytics approach that includes statistical analysis, modeling, and optimization of processes and products, and then take action based on the insights:

- **Collect data** through sensors along the entire manufacturing process at critical points.
- **Record, archive, and analyze large volumes of big data** using statistical analyses.

- **Model, using logic and algorithms**, to calculate optimal settings or modes of operation. The state-of-the-art approach is to combine predictive methods into one superior method to model insights. The combination of methods, called blending, is itself a complex algorithm searching for the best possible solution (exhibit). The predictive methods blended in this approach are often not new. However, the availability of vast amounts of additional data and tremendous processing power has created new opportunities for companies to combine these analyses to predict performance and determine the optimum answers to business problems.
- **Act on the optimization and continually monitor** the impact to ensure decisions in plants are consistent with the design.
- **Set up and/or adjust the process or equipment** with continuous improvement.

Across CPG industries, companies are capturing significant value by deploying an analytics approach based on these steps. Two examples illustrate the potential:



Improving vaccine yield. A biopharma company increased its processing yield by 50 percent by building artificial neural networks to identify optimal machine parameters. Manufacturing was the bottleneck in the company's value stream. Yield was declining and highly variable, and regulatory bodies had raised concerns about process instability. The company's existing approach to improve yield was unstructured and showed limited success. The company adopted a new approach that began with thoroughly understanding its manufacturing process. It gathered all available historical process data sets and used advanced analytics to identify the most influential parameters. It applied the insights to identify linkages between critical parameters and operations, define the main levers for reaching the optimum process conditions, and develop an action plan for implementing the levers. Without the need for capital expenditures, the company succeeded in de-bottlenecking its production facility. The yield improvement helped to reduce costs by \$5 million to \$10 million and increase sales by \$20 million. The improvement also led to a resolution of the regulatory issues.

Accurately predicting spiciness. A food manufacturer was able to raise quality and reduce complaints by 90 percent by using infrared (IR) technology to continually monitor quality and optimize parameters to improve flavor characteristics. The perceived "hotness" of the company's products is a critical parameter, but could only be determined by human testers — a process that is both unreliable and expensive. The company sought to use the latest IR technology to capture data, and then use data analytics to develop a model to evaluate hotness. The company developed a fully automated model in a neural-network tool to correlate key IR measurements to hotness. It validated the model through production runs and a comparison with human flavor-tester results. Once data capturing and modeling was validated, key-input-controlling parameters were connected through a process loop, enabling the manufacturer to change inputs to meet hotness targets. The manufacturer now continuously monitors quality prior to packaging. Total testing costs have been reduced, while the sampling size has increased and variations in product characteristics have declined.

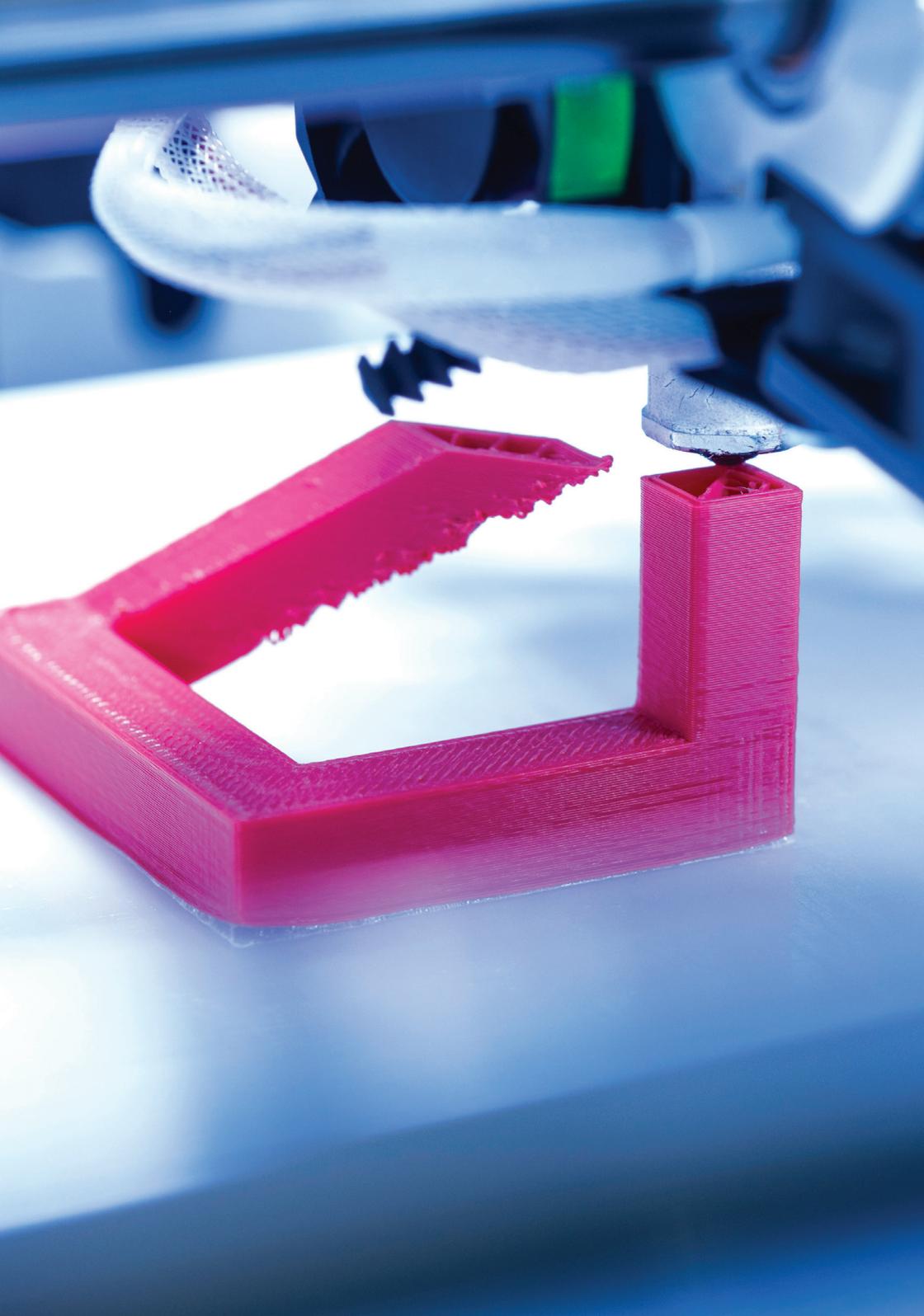


Efforts to adopt advanced analytics are typically initiated by teams in the industrial-engineering or continuous-improvement functions. While the value captured is often significant, these efforts are typically isolated and uncoordinated. Embedding such approaches more systematically requires coordination by the COO, working with other members of the C-suite to ensure that adequate energy, resources, and

attention are brought to bear. Most manufacturers will find that the data they need in order to derive valuable insights is already at their fingertips. Applying the right approach to advanced analytics is the crucial step to catching up to competitors that have already reached the next frontier of improvement.

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Breakthrough technologies fundamentally change the game

Luis Benavides, Frédéric Lefort, Rehana Khanam, and Oscar Lovera-Perez

The right combination of breakthrough technologies (such as 3-D printing, machine-to-machine communications, and advanced robotics) can help CPG companies achieve breakout performance.

Breakthrough technologies, collectively known as Industry 4.0, are changing the game in manufacturing in myriad ways. For example, skyrocketing levels of computational power and data availability allow for real-time production steering, while life-like simulations and unprecedented degrees of automation are revolutionizing work on the shop floor. Among the foundations is machine-to-machine (M2M) communication, which has seen notable advances in compatibility and speed. Many more innovations—including 3-D printing, human-machine interfaces, smart vision, and advanced robotics—are changing the manufacturing landscape. In aerospace, for instance, additive printing has opened new avenues for component production, and in automotive, collaborative automation is disrupting decades-old ways of working on the assembly line.

Although consumer-packaged-goods (CPG) manufacturers have been relatively slow to adopt breakthrough technologies, their factories will not escape the wave of change in the coming years (exhibit). Following the pattern seen in other industries, the early CPG adopters are gaining a competitive edge by capturing significant improvements in operational performance. For example, smart-vision technology has reduced quality losses by 10 to 20 percent, a blend of hardware and software that enables machines to detect their own performance and plan their maintenance has reduced downtime by 30 to 50 percent, and self-directed vehicles have reduced costs in warehouses and shop floors.

Exhibit

Disruptive technologies will soon arrive on the consumer-packaged-goods 'factory of the future' shop floor.

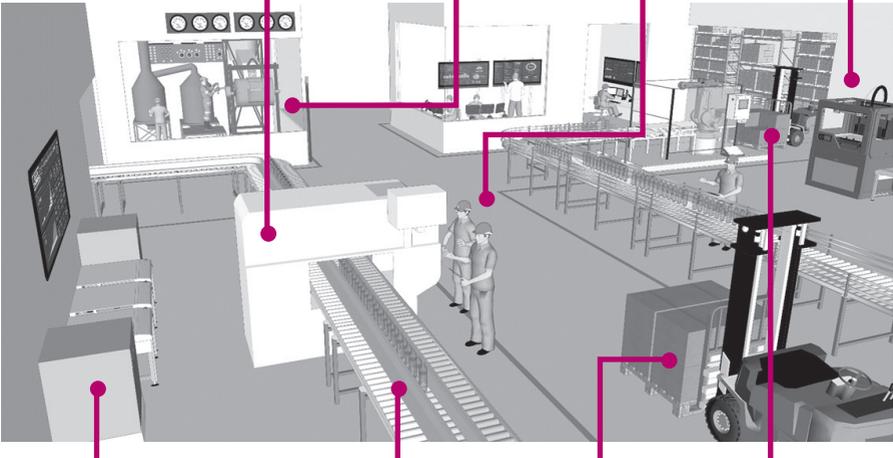
Incorporate flexible manufacturing technology where possible to improve ability to customize according to customer needs.

Sensors and high-resolution cameras continuously monitor quality parameters and adjust process based on operating windows. Potential failures and mechanisms to correct are identified early in process. **Cost of quality reduced 10–20%.**

Smart-energy monitoring allows for real-time parameter adjustments to improve yield and reduce energy consumption based on both internal and external factors (eg, pricing).

Smart glasses and augmented reality devices to support maintenance and complex problem solving.

3-D printing of components as required. Long lead time or expensive components to be printed as needed directly in facility to reduce inventory costs and downtime.



Machines plan own maintenance, plans are automatically generated based on performance and tracking of parameters. Maintenance orders raised automatically, replacements directly ordered from suppliers and potential root causes identified. **Potential 30–50% reduction of total machine downtime.**

Self-adjusting equipment maximizing its performance. Equipment settings are self-adjusted based on quality and raw-material parameters. Feedback provided directly to suppliers once outside operational range.

Self-directed vehicles in operating floor. Intrafactory transportation paths and priority optimization to move raw materials and finished products in facility.

Fully integrated and widely automated closed-loop demand and supply planning, breaking traditional boundaries between planning steps and producing on-demand plans for operations.

Source: McKinsey analysis

CPG companies must understand the new possibilities and find the right combination of technologies to address their business needs. Investing is typically triggered by a pilot case that demonstrates the potential—for example, a visionary plant that can test a specific solution and prove its value. Although these isolated areas of excellence provide confidence about the impact, the chief technology officer and COO will ultimately drive the adoption effort and determine which investments to prioritize to support business strategy.

To help CPG leaders understand how implementation of these disruptive technologies can address business demands, provide distinctive value, and shape the future of operations, we look at early examples of how companies are deploying them in the end-to-end flow of production

Develop and source: Shorten the time frame from concept to product

The speed at which CPG companies can test and launch a new product is typically restricted by the availability and flexibility of concepts and prototypes. The time required for the development process, from concept to product, ranges from months to, in some cases, years. In order to produce goods that can be tested and then introduced to the market, this process normally involves time-consuming and expensive adaptations of existing technology. In today's world of ever-changing market trends, this approach is no longer viable. Manufacturers must use breakthrough technologies to enable more flexible and faster processes for testing, pilots, and scale-up.

For example, 3-D printing and rapid prototyping now make it feasible for designers to print packaging or components, thereby shortening the time frame from concept to full-scale production. In footwear, designers and reviewers print design concepts as prototypes as part of their normal development process, slashing new-product development cycles from weeks to hours.

Make: Understand and optimize operations in real time

The depth and breadth of data available to CPG companies has reached unprecedented levels. To predict issues and challenges, factories have traditionally depended on the experience and know-how of operators. However, their capabilities are not always reliable and have limited scope. Most factory operations use programmable logic controllers for various systems. These controllers independently track the performance of individual assets but rarely connect to each other or provide a holistic picture. Typically, CPG companies end up in “firefighting” mode, reactively responding to issues, rather than using the insights at their fingertips to proactively optimize operations.

Breakthrough technologies are disrupting this traditional approach to identifying and addressing issues on the shop floor. The availability of reliable and economical sensors, combined with data clouds, compatible protocols that communicate with each other, and huge processing capabilities, has enabled companies to access big

data and shape it into insights much faster and more flexibly. The combination of new sensor hardware and potentially infinite computing power provides manufacturers with the tools to truly understand their operations in real time and gives them greater flexibility when optimizing processes.

In a variety of industries, companies are finding innovative ways to capture value from cost-effective smart sensors. A basic-materials company was able to reduce fuel usage while increasing throughput by about 156 percent by using real-time tracking of operational parameters to make decisions. An automotive company is leading the way in predictive maintenance by deploying condition-monitoring systems. The company gathers vibration data and other operating data (such as oil temperature and purity, currents, and pressure), compares the readings with the permissible range of values, and documents deviations. A traffic-light system visualizes the results for users.

Move: Use technology to cope with complexity

CPG companies need to transport products throughout their operations, sometimes at the rate of thousands of units each hour. The increasing complexity of operations has intensified companies' traditional challenges. Because human intervention is required to navigate spider webs of equipment, inefficiencies and errors are common. Fortunately, this old-age problem is being tackled through new installations and technical solutions that ease the burdens of accurately picking, moving, and placing products.

A global e-commerce company deployed autonomous robots to pick and place products, reducing warehousing costs by 30 to 40 percent. The robots lift racks with products up to operators based on the orders they need to process, bringing the work to them. Because the process is optimized for the operators, it promotes their productivity by reducing the waste generated in searching for products and improves the quality of their work.

Check: Detect, correct, and prevent quality issues

Quality is an imperative for all manufacturers. This is especially true in the consumer-goods industry—in the worst case, even a single error may severely damage a brand. Similarly, the imperative to be cost competitive has increased the pressure to get results from productivity measures, such as optimizing labor utilization. Many manufacturers may be caught in a dilemma as they try to strike the fine balance between attention and capacity.

Manufacturers can use technology to enable quality assurance and greater agility and responsiveness to quality issues that arise. Because operators are released from constantly manning and intervening with equipment, the opportunities are increased for automation and labor savings.

Wearable technologies, such as smart glasses, are already assisting quality inspectors in consumer-products manufacturing. The glasses gather information that a manufacturer can communicate in real time to production equipment in order to trigger adjustments. The technology not only helps to ensure that quality checks are more reliable and consistent but also enables the upstream process to adjust responsively, which minimizes the chance of issues recurring.



Breakthrough technologies are bringing tremendous changes throughout each leg of the product journey in CPG manufacturing. And it is still early days. However, manufacturers must appreciate that technology, by itself, is not a panacea. Businesses should recognize the real risks of chasing the “latest and brightest” innovations and regarding their adoption as the “holy grail.” It is common to hear senior executives talk about the adoption of Industry 4.0 as solving all of their operational, cost, or delivery problems. But, so far, their implementations have been disjointed efforts that typically fail.

The adoption of Industry 4.0 should be framed as enabling a well-defined vision and business strategy. As we discuss in the next chapter, companies should support the deployment of new technologies by building the right enablers, such as having capable talent, agile organizations, and meaningful partnerships. To operate in this new era, leaders should very carefully design their road map to the future and select the right solutions to support their strategies. Success requires a collaborative effort across functions, including HR, engineering, operations, and strategy.

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Mastering the enablers of a sustained digital journey

Luis Benavides, Frédéric Lefort, Rehana Khanam and Oscar Lovera-Perez

Three intertwined enablers — people, governance, and partnerships — are essential for lasting digital change.

The need to master new capabilities in finding digital talent, encouraging flexible and rapid decision making, and strengthening external sources of capabilities is urgent and intensifying. For example, talent with digital skills is scarce. Among executives interviewed by MIT, 75 percent cited skills gaps as an obstacle to implementing their digital transformation.¹

Companies in some industries, primarily in the services sector, have already succeeded in fully integrating digital enablers into their organizations. Among the most prominent cases are companies that successfully disrupted entire industries, whether Blockbuster in media decades ago or Google in advertising today. Their organizations not only started from a good business plan and technology platform but also acquired the best people available to help them realize their vision.

Like companies in other industries disrupted by digital, consumer-packaged-goods (CPG) companies focus on customers, operate at a fast pace, need to be agile and responsive to change, and must be deeply tuned into their proprietary insights about how technologies and markets are changing. However, CPG companies are still exploring how the adoption of digital technologies will impact the way they work and operate.

In supporting digital transformations in CPG and other industries, we have identified three imperatives for mastering the enablers of a sustained digital journey.

Build a workforce with digital capabilities

CPG manufacturers must build new sets of digital capabilities and talent in the organization. Before recruiting talent with new capabilities, companies should fully assess their internal capabilities. In some cases, current employees may possess valuable digital knowledge that could be deployed in new ways, and these opportunities should be explored. However, companies will need to source the lion's share of new capabilities externally.

Digital talent must be obtained to fill existing roles, such as quality professionals, operators, and process engineers, whose skill set is being changed by disruptive technologies. What's more, companies must obtain talent for an array of entirely new operational roles such as software designers, agile scrum masters and agility coaches, full-stack architects, and machine-learning engineers.

Companies in other sectors are exploring creative ways to both recruit and retain talent with digital skills (Exhibit 1).

Exhibit 1	To find needed skills, companies are getting creative.		
	Digital recruiting	Make full use of social media and digital recruitment tools	Global cosmetics maker
	Outside-industry perspective	Look for talent in other industries that are already further advanced	Automaker; fast-moving consumer goods player
	Acquiring	Buy small niche-technology players to capture tech talent	Online retailer, financial institution
	Locating near the talent	Carve out innovation labs in attractive, talent-rich locations (eg, engineering campuses) Establish technology centers in offshore locations near the expanding technical pools	Omnichannel retailer
	Partnering for talent	Deepen relationships with select partners for preferred access to specialized skill sets, eg, advanced analytics, data architecture, and cybersecurity	Fast-moving consumer-goods player; industrial-equipment maker

For example, Burberry defined a new recruiting strategy to obtain the talent required for an ambitious digital transformation. To create a world-class customer experience, the fashion company pursued a broad-scale transformation enabled by breakthrough technologies. Digital capabilities became the focus of recruiting efforts, leading to a workforce weighted heavily toward young people who grew up as digital natives.

Deciding to hire people with digital skills is just the starting point. In transitioning to a new people strategy, CPG manufacturers must recognize the need to change their value proposition for employees. Put simply, software developers are not looking for the same employment environment and culture as manufacturers' traditional factory workers and accountants. Manufacturers must adapt in order to attract digital experts.

In addition to hiring new staff, CPG manufacturers should undertake efforts to retrain current employees. When done right, such training efforts have proved effective. Nestlé regularly frees about a dozen marketing and sales leaders from their usual responsibilities within business units and places them together as a digital team in the corporate headquarters for eight months. They return to their jobs better equipped to lead a digital transformation of their business unit, run training sessions, and serve as strong role models. Employees at all levels of the organization are more likely to embrace a digital transformation that is led from within their ranks, rather than by facilitators from outside the organization.

Facilitate rapid decision making through flexible governance and fewer constraints

To pursue the pace of change required for a digital transformation, CPG manufacturers must adapt their approach to governance (Exhibit 2). Success requires giving teams more freedom to determine how to spend their budgets, enabling easier access to decision makers, and giving teams greater flexibility in deciding what to focus on. It is especially important to adopt a “fail to succeed” mentality, in which employees are encouraged to test ideas and proposals early on without expecting them to work the first time.

Spotify exemplifies how a more flexible approach to governance can produce benefits. The fledgling music service sought to disrupt a market dominated by giants, while bringing to bear limited scale and resources. It invested in extremely agile development units, initially working in multifunctional scrums of a few people. As

Exhibit 2	Governance must adapt to digital transformation's requirements.	
	Key principles	Examples
Clear mandate from leadership 	<ul style="list-style-type: none"> ■ Mandate to change the way we operate provided by CEO/COO made clear to all functions involved ■ Include reviews of progress at board level monthly 	<ul style="list-style-type: none"> ■ Ensure support functions provide necessary expertise (eg, IT, finance, supply chain, purchasing) to drive initiatives forward as a priority
Devolved financial authority 	<ul style="list-style-type: none"> ■ Teams to possess a greater degree of freedom on how to spend their budgets, allowing for greater autonomy, increased accountability, and fast turnaround of ideas 	<ul style="list-style-type: none"> ■ Allow local teams to spend their budgets based on local priority setting without having to go through the traditional approval process (within limits) ■ Relax some of the corporate commitments to obtain a number of quotes for all orders raised
Easy access to decision makers 	<ul style="list-style-type: none"> ■ Direct route to key decision makers without several layers of management 	<ul style="list-style-type: none"> ■ Weekly discussion with senior sponsor (COO) to discuss progress and support needed, daily access to senior local leadership to expedite local decision making where needed
Flexibility on what to focus on 	<ul style="list-style-type: none"> ■ Reconsider priorities inside the program when required without complicated administrative process 	<ul style="list-style-type: none"> ■ Empower local implementation and operational teams to set their priorities and allocate resources with limited central constraints
Encouragement of experimentation 	<ul style="list-style-type: none"> ■ Ideas for improvement should be compiled, piloted, and scaled up with reduced decision-making process 	<ul style="list-style-type: none"> ■ Internal, external, and partnership ideas to be prioritized, funded, and resourced locally all the way from feasibility to pilot stage
“Fail to succeed” mentality 	<ul style="list-style-type: none"> ■ Not all efforts will work first time; some of the initiatives might not result in the desired output at all; allow for early releases to test with users as part of the development process 	<ul style="list-style-type: none"> ■ Encourage teams to test ideas and proposals early on, without expecting them to work first time ■ Do not expect round after round of theoretical validation; allow users to test early, provide feedback, and modify as needed

the company's ambitions and challenges grew, it adapted to new ways of working. It created eight-person "squads" that work toward achieving unique short-term goals set by senior management. The squads are free to solve their problems in any way they choose, have control of their own budgets, and work together in a space designed to facilitate creative problem solving. This setup allows squads to be agile and try ideas without first requiring senior management's approval. It also increases a sense of ownership and accountability for their decisions.

New businesses such as Spotify have the benefit of setting their culture and way of working from the beginning using these principles, whereas established players need to redefine the way they operate. In 2014, ING launched its "Think Forward" strategy, focusing on people empowerment to stay ahead in the competitive financial-services industry. At the core of this change was transforming its IT function from an enabler to a driving force in its commercial strategy. To achieve this objective, the company established the expectation of continuous delivery, focused on engineering and technical talent, partnered with other players (rather than outsourced), and sought to be distinguished by its outstanding software. To match its new culture, ING is reorganizing its structure with scrum teams and tribes and flexible governance, with the goal of delivering new technology solutions to delight its customers.

Collaborate extensively with external partners

Effective partnerships and collaboration with small Industry 4.0 startups have proven essential in large companies' efforts to adopt digital technologies. For example, Amazon acquired Kiva Systems, whose expertise was instrumental in developing the cutting-edge robotic technology that is now widely used in the e-commerce giant's warehouses.

Large companies are also using M&A and joint ventures with other large players to open new opportunities. Cisco Systems has used acquisitions to close gaps in its technologies. These moves allowed it to assemble a broad line of networking products and to grow very quickly from a company with a single product line into the leading player in Internet equipment. From 1993 through 2001, Cisco acquired 71 companies, at an average price of approximately \$350 million. Cisco's sales increased from \$650 million in 1993 to \$22 billion in 2001, with more than 40% of its 2001 revenue coming directly from these acquisitions. By 2009, Cisco had more than \$36 billion in revenues and a market cap of approximately \$150 billion.

The joint venture between UPS and SAP is another case in point. Until recently, neither company was known for selling physical goods. In 2016, they joined forces to offer rapid 3D-printing services as part of SAP's distributed manufacturing initiative. The companies plan to open large 3D-printing facilities near distribution centers. Through the combination of SAP's network and UPS's logistics capabilities, the companies are aiming for next-day delivery in the US of orders placed before 6 pm. The use of 3D printing is evolving from prototypes and one-off novelty items to finished parts for assembly, creating an opportunity for the UPS-SAP venture to offer last-minute production support to many industries. Manufacturers can now focus on their high-volume standard products, while retaining the capability to provide custom or unusual variations without having to hold stock.

Partnership strategies are also a valuable way to acquire digital talent. Recent McKinsey research found that top online players acquire 56% of their digital talent through M&A or joint ventures. eBay, for example, has filled more than a dozen senior roles in its organization with founders of acquired businesses.



Business functions, such as human resources, strategic planning, and engineering, cannot design and implement these enablers independently. To make these new people, governance, and partnership strategies a reality, companies must rethink their traditional boundaries, roles, and responsibilities and require cross-functional efforts to ensure successful implementation.

1 Didier Bonnet, Andrew McAfee, and George Westerman, "The digital capabilities your company needs," *MIT Sloan Management Review*, October 2012, sloanreview.mit.edu.

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Supply Chain 4.0 in consumer goods

Knut Alicke, Daniel Rexhausen and Andreas Seyfert

In Supply Chain 4.0, supply-chain management applies Industry 4.0 innovations—the Internet of Things, advanced robotics, analytics, and big data—to jump-start performance, and customer satisfaction.

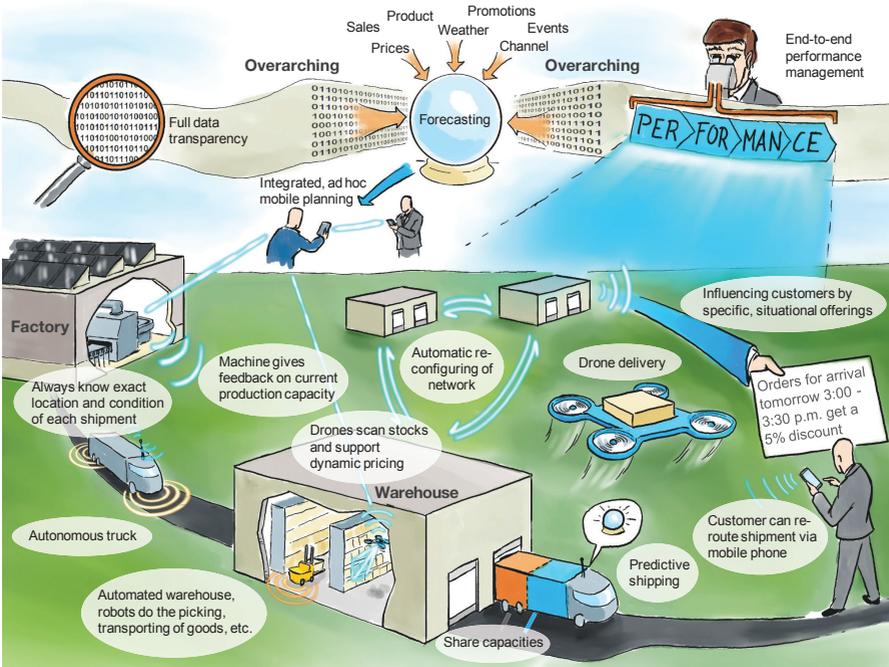
Over the last 30 years, supply chain has undergone a tremendous change. What was once a purely operational logistics function that reported to sales or manufacturing and focused on ensuring supply of production lines and delivery to customers has become an independent supply-chain management function that in some companies is already being led by a CSO—a chief supply-chain officer. The focus of the supply-chain management function has shifted to advanced planning processes, such as analytical demand planning or integrated sales and operations planning (S&OP), which have become established business processes in many companies, while operational logistics has often been outsourced to third-party logistics providers. The supply-chain function ensures that operations are well-integrated, from suppliers through to customers, with decisions on cost, inventory, and customer service made from an end-to-end perspective rather than by each function in isolation. .

Digitization creates a disruption and requires companies to rethink the way they design their supply chain. At the same time, customer expectations are growing: recent online trends have led to growing service expectations combined with much more detailed orders. Also, a definite trend toward further individualization and customization is driving strong growth of and constant changes in the SKU portfolio. The online-enabled transparency and easy access to a multitude of options regarding where to shop and what to buy drive the competition of supply chains.

To build on these trends, cope with changed requirements, and enable a wide range of new technologies, supply chains need to become much faster and much more precise (Exhibit 1).

Exhibit 1

Supply Chain 4.0 delivers innovation from factory to customer.



Source: McKinsey

Vision of the future state

The digitization of the supply chain enables companies to address the new requirements of customers, the challenges on the supply side, and the remaining expectations in efficiency improvement. Digitization leads to a Supply Chain 4.0, which becomes ...

- ... faster.** New approaches to product distribution can reduce the delivery time of fast runners to few hours. How? Advanced forecasting approaches, such as predictive analytics of internal data (e.g., demand) and external data (e.g., market trends, weather, school vacation, construction indices), when combined with machine-status data for spare-parts demand, provide a much more precise forecast of customer demand. What once were monthly forecasts instead become weekly—and, for the very fastest-moving products, daily. In the future, we will even

see “predictive shipping,” for which Amazon holds a patent: Products are shipped before the customer places an order. The customer order is later matched with a shipment that is already in the logistics network, and the shipment is rerouted to the exact customer destination.

- **... more flexible.** Supply Chain 4.0’s ad hoc, real-time planning allows companies to respond flexibly to changes in demand or supply, minimizing planning cycles and frozen periods. Planning becomes a continuous process that is able to react dynamically to changing requirements or constraints (e.g., real-time production-capacity feedback from machines). Even after products are sent, agile delivery processes let customers reroute shipments to the most convenient destination.

New business models increase the supply-chain organization’s flexibility. Rather than maintaining resources and capabilities in-house, companies can buy individual supply-chain functions as a service on a by-usage basis. Service providers’ greater specialization creates economies of scale and scope, increasing the potential for attractive outsourcing opportunities.

An “Uberization” of transport—crowdsourced, flexible transport capacity—will significantly increase agility in distribution networks as well. Manufacturers may therefore see new direct-to-consumer opportunities in what once was a playing field only for retailers.

- **... more granular.** With customers looking for more and more individualization in the products they buy, companies must manage demand at a much more granular level, through techniques such as microsegmentation, mass customization, and more-sophisticated scheduling practices. Innovative distribution concepts, including drone delivery, will allow companies to manage the last mile more efficiently for single-piece and high-value, dense packages—fulfilling customers’ customization needs while delivering their orders even faster than is possible today with mass-market, standard products.
- **... more accurate.** Next-generation performance management systems provide real-time, end-to-end transparency throughout the supply chain. The span of information reaches from synthesized top-level key performance indicators, such as overall service level, to very granular process data, such as the exact position of trucks in the network. The integration of that data from suppliers, service providers, and others in a “supply chain cloud” ensures that all stakeholders in the supply chain steer and decide based on the same facts.

In digital performance-management systems, clean-sheet models for warehousing, transport, or inventory set targets automatically. To keep performance-management aspirations in focus even if supply-chain disruptions occur, the systems will automatically adjust targets that can no longer be achieved to more realistic aspiration levels.

We will see performance-management systems that “learn” to automatically identify risks or exceptions, and that change supply-chain variables to mitigate harm. These capabilities enable the automatic performance-management control tower to handle a broad spectrum of exceptions without human involvement, engaging human planners only for disruptive, unplanned events. The resulting continuous-improvement cycle will push the supply chains closer to its efficient frontier.

- **... more efficient.** The automation of both physical tasks and planning boosts supply-chain efficiency. Robots handle the material (pallets or boxes as well as single pieces), completely automatically the warehouse process from receiving/unloading, to putting away, to picking, packing, and shipping. Autonomous trucks transport the products within the network.

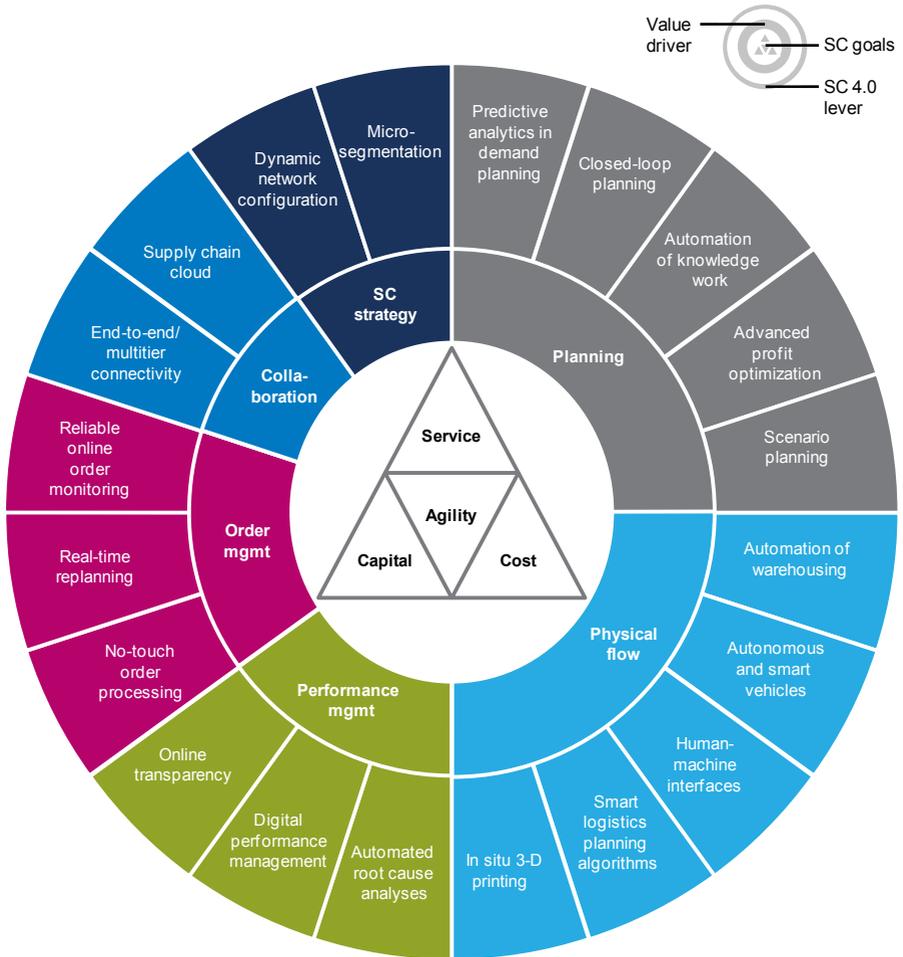
To optimize truck utilization and increase transport flexibility, companies share capacity through cross-company transport optimization. The network setup itself is continuously optimized to ensure an optimal fit to business requirements.

To create an ideal workload in the supply chain, the system leverages the high degree of transparency and dynamic planning approaches to drive advanced demand-shaping activities, such as special offers for delivery time slots with low truck utilization.

Increasing operational efficiency by leveraging Supply Chain 4.0

Supply Chain 4.0 will affect all areas of supply-chain management. This is evident in the way the main Supply Chain 4.0 improvement levers shown in the outer circle of Exhibit 2 map to six main value drivers (the inner circle). In the end, the improvements enable a step change in service, cost, capital, and agility.

Exhibit 2 Supply Chain 4.0's improvement levers map to six main value drivers.



Source: McKinsey

Planning

Supply-chain planning will benefit tremendously from big data and advanced analytics, as well as from the automation of knowledge work. A few major consumer-goods players are already using predictive analytics in demand planning to analyze hundreds to thousands of internal and external demand-influencing variables

(e.g., weather, trends from social networks, sensor data), using machine-learning approaches to model complex relationships and derive an accurate demand plan. Forecasting errors often fall by 30 to 50 percent.

Heavily automated, fully integrated demand and supply planning breaks traditional boundaries between the different planning steps and transforms planning into a flexible, continuous process. Instead of using fixed safety stocks, each replenishment-planning exercise reconsiders the expected demand probability distribution. Consequently, the implicit safety stocks are different with every single reorder. Prices can then be dynamically adapted to optimize profit and minimize inventories at the same time.

In the consumer-goods industry, several of the most prominent global conglomerates are leveraging advanced planning approaches, and a strong interest in broader application can be observed.

Physical flow

Logistics will take a huge step forward through better connectivity, advanced analytics, additive manufacturing, and advanced automation, upending traditional warehousing and inventory-management strategies. Easy-to-use interfaces such as wearables already enable location-based instructions to workers, guiding picking processes. Advanced robotics and exoskeletons could have equally dramatic effects on human productivity in warehouses.

Autonomous and smart vehicles will lead to significant operating-cost reduction in transportation and product handling, while at the same time reducing lead times and environmental costs. Linking warehouses to production loading points may even enable entire processes to be carried out with only minimal manual intervention. Finally, as production facilities start to rely more on 3-D printing, the role of the warehouse may change fundamentally.

Performance management

Performance management also is changing tremendously, with several major food companies taking a lead in making detailed, continually updated, easily customizable dashboards available throughout their organizations. Gone are the days when generating dashboards was a major task and performance indicators were available only at aggregated levels. Instead, performance management is becoming a truly operational process geared to real-time exception handling and continuous improvement, rather than a retrospective exercise on a monthly or quarterly basis.

Using data-mining and machine-learning techniques, this type of revamped performance-management system can identify an exception's root causes by comparing it with a predefined set of underlying indicators or by conducting big data analyses. The system can then automatically trigger countermeasures, such as by activating a replenishment order or changing safety-stock or other parameter settings in the planning systems.

Order management

Order management is improved through a pair of measures: no-touch order processing integrates the ordering system to the available-to-promise (ATP) process, and real-time replanning enables order-date confirmations through instantaneous, in-memory rebuilding of the production schedule and replenishment needs in consideration of all constraints. The net result is reduced costs (via increased automation), improved reliability (via granular feedback), and better customer experience (via immediate and reliable responses).

Collaboration

The supply-chain cloud forms the next level of collaboration in the supply chain. Supply-chain clouds are joint supply-chain platforms between customers, the company, and suppliers, providing a shared logistics infrastructure or even joint planning solutions. Especially in noncompetitive relationships, partners can decide to tackle supply-chain tasks together to save administrative costs and learn from each other.

One leading consumer conglomerate has already found that collaboration along the value chain allows for much lower inventories through an exchange of reliable planning data. It also slashes lead times, thanks to instantaneous information provision throughout the entire chain, while providing an early-warning system and the ability to react fast to disruptions anywhere.

Supply-chain strategy

Following the need for further individualization and customization of the supply chain, supply-chain setups adopt many more segments. To excel in this setting, supply chains need to master microsegmentation. A dynamic, big data approach allows for the mass customization of supply-chain offerings by separating the supply chain into hundreds of individual supply-chain segments, each based on customer requirements and the company's own capabilities. Tailored products provide optimal value for the customer and help minimize costs and inventory in the supply chain.

Impact of Supply Chain 4.0

Eliminating today's digital waste and adopting new technologies together form a major lever to increase the operational effectiveness of supply chains. The potential impact of Supply Chain 4.0 in the next two to three years is huge. Expectations include up to 30 percent lower operational costs, 75 percent fewer lost sales, and a decrease in inventories of up to 75 percent. At the same time, the agility of the supply chains should increase significantly.

How did we calculate these numbers? They are based on our experience with numerous studies and quantitative calculations. The three performance indicators are highly correlated; for example, an improved inventory profile will lead to improved service level and lower cost.

- **Supply-chain service/lost sales.** When customer service is poor, the driver is either a wrong promise to the customer (e.g., unrealistic lead times), a wrong inventory profile (ordered products are not available), and/or an unreliable delivery of parts. Lost sales in addition occur if the required products are not available on the shelf or in the system; customers will decide to switch to another brand. This is true for both B2C and B2B environments.

Service level will increase dramatically when the supply chain significantly improves interactions with the customer, leverages all available point-of-sale data and market intelligence, improves the forecast quality significantly (up to more than 90 percent in the relevant level, e.g., SKU), and applies methods of demand shaping in combination with demand sensing to account for systematic changes and trends. With the resulting service improvement, lost sales will decrease significantly.

- **Supply-chain costs.** Driven by transportation, warehouse, and the setup of the overall network, the costs can be reduced by up to 30 percent. Roughly 50 percent of this improvement can be reached by applying advanced methods to calculate the clean-sheet costs (bottom-up calculation of the "true" costs of the service) of transport and warehousing and by optimizing the network. The goal should always be to have minimal touch points and minimal kilometers driven while still meeting the required service level of the customer. In combination with smart automation and productivity improvement in warehousing, onboard units in transportation, etc., these efforts can achieve the savings potential.

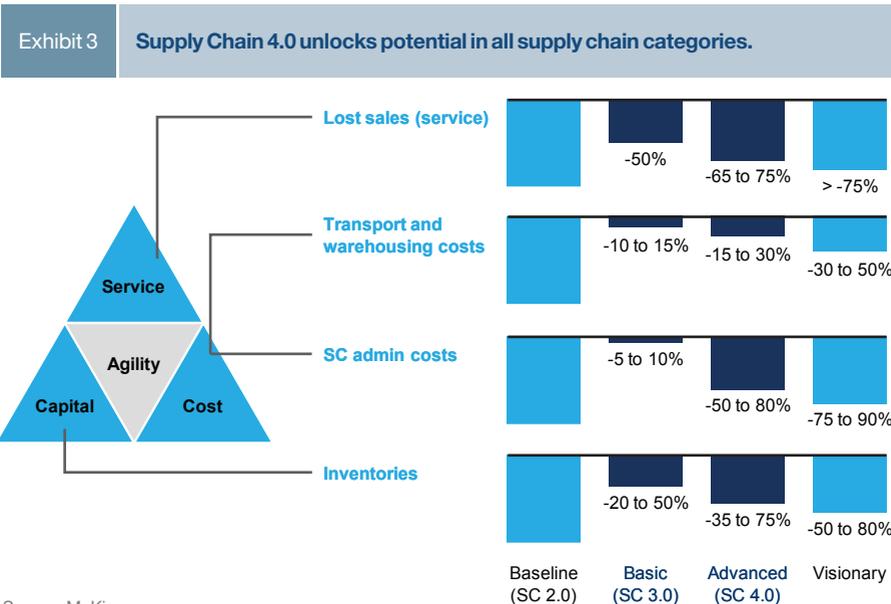
The remaining 15 percent cost reduction can be reached by leveraging approaches of dynamic routing, Uberization of transport, use of autonomous vehicles, and—where possible—3-D printing.

The McKinsey Digital walkthrough

Capturing the value is a journey that can be started right away. Where it starts depends on the digital maturity of the current supply chain. The McKinsey digital walkthrough helps companies understand the current digital maturity of the organization, create a sound understanding of the required levers to pull to reach the next performance level by leveraging Supply Chain 4.0 tools, shape the road map for digitization, and assess the potential impact.

The diagnostic tool assesses the supply chain systematically based on six value drivers and five assessment dimensions, such as data and analytics (Exhibit). It differentiates between three archetypes of maturity levels. Supply Chain 2.0 characterizes supply chains that are mainly paper based with a low level of digitization. Most processes are executed manually. The digital capabilities of the organization are very limited, and available data are not leveraged to improve business decisions. Supply Chain 3.0 describes supply chains with basic digital components in place. IT systems are implemented and leveraged, but digital capabilities still need to be developed. Only basic algorithms are used for planning/forecasting, and few data scientists are part of the organization to improve its digital maturity. Supply Chain 4.0 is the highest maturity level, leveraging all data available for improved, faster, and more granular support of decision making. Advanced algorithms are leveraged, and a broad team of data scientists works within the organization, following a clear development path toward digital mastery.

- Supply-chain planning.** The planning tasks such as demand planning, preparation of S&OP process, aggregated production planning, and supply planning are often time intensive and conducted mainly manually. With advanced system support, 80 to 90 percent of all planning tasks can be automated and still ensure better quality compared with tasks conducted manually. The S&OP process will move to a weekly rhythm, and the decision process will be built on scenarios that can be updated in real time. This combination of accuracy, granularity, and speed has implications for the other elements, such as service, supply-chain costs, and inventory. Systems will be able to detect the exception where a planner needs to jump in to decide.
- Inventory.** Inventory is used to decouple demand and supply, to buffer variability in demand and supply. Implementing new planning algorithms will significantly reduce the uncertainty (the standard deviation of the demand/supply or forecast error), making safety stock unnecessary. The other important variable to drive inventory is the replenishment lead time: with more production of lot size 1 and fast changeovers, the lead time will be reduced significantly. Also, long transport time — say, from Asia to the European Union or the United States — will be reduced, due to a significant increase in local-for-local production. In addition, 3-D printing will reduce the required inventory. We would expect an overall inventory reduction of 50 to 80 percent (Exhibit 3).



Source: McKinsey

Transformation into a digital supply chain

The transformation into a digital supply chain requires three key enablers: a clear definition, new capabilities, and a supportive environment. Defining the digital supply chain starts with an understanding of the current operation's digital waste. Capabilities regarding digitization then need to be built; typically they require targeted recruiting of specialist profiles. The final prerequisite is the implementation of a two-speed architecture/organization. This means that the establishment of the organization and IT landscape must be accompanied by creation of an innovation environment with a start-up culture.

This "incubator" needs to provide a high degree of organizational freedom and flexibility as well as state-of-the-art IT systems (two-speed architecture independent of existing legacy systems) to enable rapid cycles of development, testing, and implementation of solutions. Fast realization of pilots is essential to get immediate business feedback on suitability and impact of the solutions, to create excitement and trust in innovations (e.g., new planning algorithms), and to steer next development cycles. The incubator is the seed of Supply Chain 4.0 in the organization — fast, flexible, and efficient.

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Digitization and advanced planning in CPG

Alan Davies, Xin Huang, Shruti Lal, and Ildefonso Silva

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.

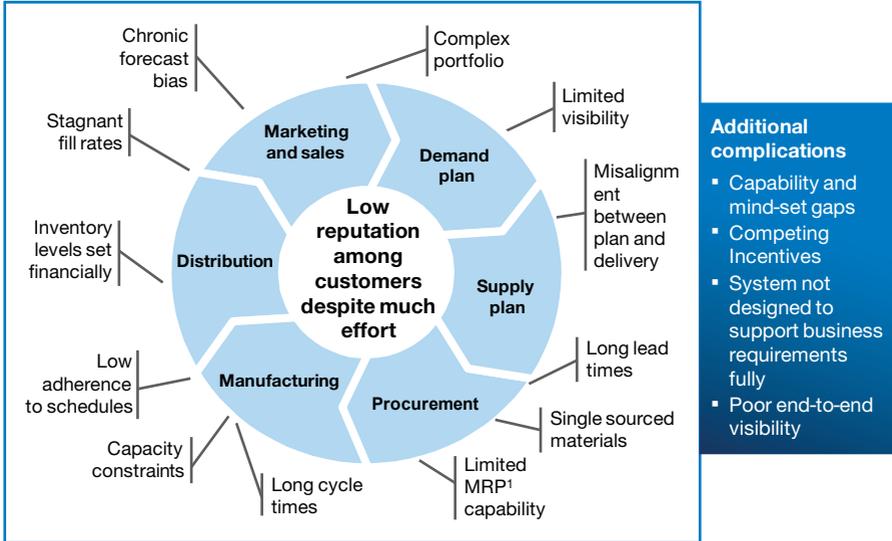
Managing supply chains is an inherently cross-functional activity, for they connect a company's major internal functions — sales, manufacturing, distribution — and encompass its key external partners, from raw-material suppliers to end-consumers. Consumer-packaged-goods (CPG) companies are acutely aware 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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My supply chain is better than yours—or is it?

Per-Magnus Karlsson, Shruti Lal, Daniel Rexhausen and Frank Säger

More-detailed benchmarks show that supply chains can still yield significant value—building on the investments so many CPG companies have already made.

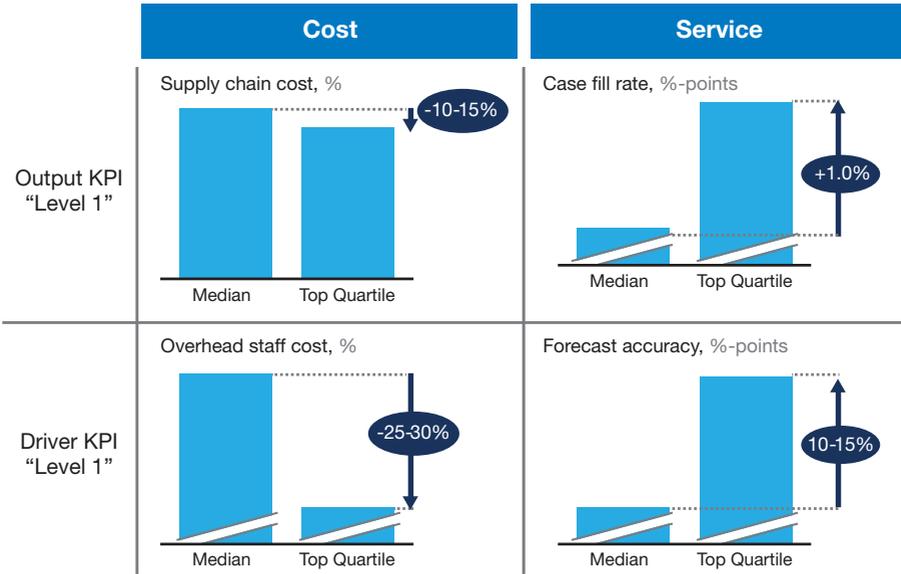
Supply-chain managers are in trouble. Customers want more—more variety, more convenience, more flexibility, and more service. But satisfying them adds still more cost and complexity at a time when across major economies consumer prices remain stubbornly low—and may fall under even more pressure.

The consumer-packaged-goods (CPG) industry's obvious response? Operations-excellence programs, which leading players have promised will yield multimillions to billions in savings while reducing resource costs and improving sustainability. With so many CPG players moving in the same direction, however, performance is naturally converging on many fronts at once. The result is that conventional metrics for finding new value, based on benchmarking high-level indicators such as total costs, inventory levels, and basic service-level metrics, uncover fewer and fewer opportunities for improvement. Furthermore, the remaining gaps between top and average performers, usually amounting to between 10 percent and 15 percent of total supply-chain costs, often appear to have an independent explanation: differences in product structure, for example, and demand volatility.

But appearances deceive. A careful analysis that filters out structural differences, examines specific supply-chain cost and efficiency drivers (including for labor or transportation per pallet), and quantifies the individual driver key performance indicators (KPIs) underlying the performance gaps can yield much greater optimization potential. Details such as these reveal improvement capacity of 25 percent or more on variables such as staff cost in some cases (Exhibit 1). The usual high-level excuses for those differences no longer hold, as we can really pinpoint the root causes.

Exhibit 1

Difference between high-level output KPIs and detailed-level driver KPIs



The right KPIs, comparability, and granularity make benchmarking smarter

But finding these opportunities requires more detail than traditional benchmarks usually allow — as shown in a review of several hundred supply-chain projects conducted with consumer-goods manufacturers across the globe. Indeed, analyzing this history revealed three fundamental challenges in current supply-chain performance benchmarking: an excessive focus on cost alone, poor comparability between peer companies, and insufficient granularity in analysis. Together these factors prevented companies from identifying the genuine improvement potential that is critical to performance breakthroughs.

A new methodology, however, reaches beyond traditional benchmarking practices, which too often just mean gathering reams of undifferentiated data. Instead, a more rigorous benchmarking initiative collects and analyzes only the right data, at the right level of detail, with the right methodology to achieve full comparability. These three principles provide a guide:

- **Look at costs as only one part of the big picture.** Companies should resist the temptation to focus their benchmarking efforts exclusively on costs. Service, productivity, quality, and flexibility are also critical metrics that supplement cost as part of a more nuanced, multidimensional analysis. A global food manufacturer applying the new benchmarking approach found that its higher supply-chain cost was a price it paid for achieving higher service levels. But the higher costs were not uniform across all of its markets: despite similar levels of service and flexibility, some markets paid substantially more than others did.
- **Make apples-to-apples comparisons.** Benchmarking a warehouse handling mixed-pallet deliveries in South America with a full-pallet warehouse in Europe isn't a useful exercise; although the warehouses might handle similar products, there may be important differences in their way of working or in the overall labor-intensiveness of each handled pallet. Details matter in making sure the comparisons are valid. The global food manufacturer initially thought that one specific warehouse suffered from both a lack of efficiency and a higher cost base than the rest—a belief borne out under a rigid euro-per-pallet view of the raw cost data. But once the company normalized the data to account for structural differences in picking mix, warehouse size, and operational complexity, the opposite turned out to be true: the “high-cost” site was actually more cost-efficient than other warehouses in the same market.
- **Examine each step in the supply chain and get all relevant parties involved.** Some companies gather data only on high-level indicators such as the number of personnel in each plant or warehouse, the total cost per product, or the amount of waste per batch. These metrics can be helpful and are typically uncontroversial, but they might also obscure deeper insights that would emerge if a company instead compared individual steps in the production process. More granularity may require more alignment, with top management, supply-chain leaders, and plant managers supplementing the controller's view of which variables matter and how best to measure them. But the results can be worth the effort.

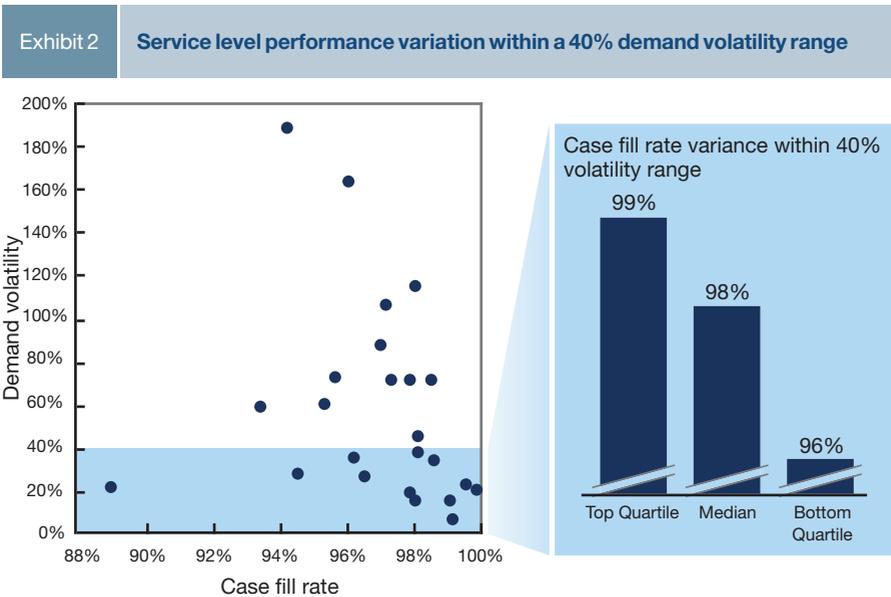
For example, a large dairy business appeared to have reasonable production costs. Only with a detailed examination of every step in the production process did the company realize that the picture was more complex. While the company's packaging process was highly efficient, any gains were offset by an outdated, energy-guzzling milk-drying machine. The obvious solution? Replace the milk dryer.

Smart benchmarking reveals great opportunities

A thorough analysis of this richer benchmarking data uncovered three critical lessons for the consumer industry’s supply-chain leaders.

Managing volatility is the key to better service

Many supply-chain managers think that fluctuations in demand make service worse. However, our analysis found that it doesn’t have to be that way. In fact, several companies manage volatility so well that they offer better service than their competitors, despite more pronounced fluctuations (Exhibit 2).



The best participants differentiate between volatility caused by the market and volatility they cause themselves.

Market-induced fluctuations in demand are always difficult to predict, yet incorrect forecasts can severely impact supply chain performance. That is why top-performing companies invest heavily in forecasting systems and capabilities (covering teams, processes, and systems) to achieve 10–15 percent greater forecast accuracy than their competitors. But the benchmarking analysis found that once forecast accuracy reaches about 75–80 percent, the marginal value of additional accuracy falls and

reactive capabilities become a better investment. One participant, for example, found that when its forecasting accuracy reached 80 percent, investments in flexibility—such as increases in production frequency for highly volatile SKUs—were more effective than additional forecasting accuracy was in raising service levels.

Self-induced demand fluctuations, due primarily to promotions, can have serious consequences unless they are managed carefully. But better estimates of promotions' impact can help turn demand volatility into a known quantity, creating a planning sweet spot that avoids both stock-outs and the hefty price of excessive safety stock. Consequently, manufacturers need to systematically identify and investigate internal volatility drivers and develop action plans accordingly. That makes closer cross-functional collaboration essential across sales, marketing, finance, manufacturing, and supply chain. Bringing all of this functional expertise together allows organizations to defeat the usual expectation that promotional intensity generally leads to loss in forecast accuracy. One company, for example, achieved more than 90 percent forecast accuracy on promotional products at both the SKU and store levels.

More warehouses means higher costs, but not always better service

The benchmarking data suggest that a higher number of warehouses increases total supply-chain costs by up to 8 percent for each additional warehouse. The reason is a lack of economies of scale in individual warehouses, which reduces productivity for the entire warehouse network. Companies in the average range would need to increase productivity in their warehouses by around 85 percent to reach the top quartile and another 70 percent to capture pole position.

Having more warehouses also raises capital costs: overall inventories of finished goods typically must be up to 30 percent higher to prevent local stock-outs. At the same time, the assumption that more warehouses would cut transportation distances—and therefore costs—has also not been confirmed. Several companies with multiple warehouses even reported substandard truck utilization and increased use of express logistics. And a higher number of warehouses does not seem to improve service levels; on the contrary, in some cases we observe more frequent local stock-outs, thus a reduction in service performance.

To avoid these outcomes, companies with many warehouses should fine-tune their planning, with clear reference to each individual warehouse. However, two out of three manufacturers still plan at aggregated network level instead. This could explain why companies with many warehouses often fail to deliver on their target service levels (see sidebar, “One company’s experience”).

Excellent service is possible even with relatively low inventories

Contrary to all assumptions, the best companies achieve very high service levels despite higher demand volatility. Furthermore, understanding the drivers of demand volatility typically reduces inventories of finished goods below competitors' levels. How do these success stories do it? Again we can turn to the differentiated benchmarking results, which point to three levers offering extremely high potential.

First, shorter “frozen periods” — periods when changes to the manufacturing schedule are not allowed — help the leading companies increase flexibility while simultaneously reducing their buffer of finished goods. However, only a few companies manage to adapt their supply-chain processes on a daily basis. Instead, average companies show frozen periods that are around 35 percent longer than the top quartile, which in turn are another 90 percent longer than the best in class.

Second, higher production frequency drastically reduces inventories of finished goods: companies that produce less naturally have less to store. But the higher a company's starting production frequency, the harder it seems to be to improve. Whereas average manufacturers would have to increase frequency by around 70 percent to reach the top quartile, companies that are already there would need to more than double their frequency to become one of the best.

Third, better schedule adherence reduces inventory levels. Here, however, the companies are already more similar than for the other two levers: the gap between average manufacturers and the top quartile is just 5–8 percent. The distance from there to the absolute peak is roughly the same.

Together with inventories of finished goods, we also analyzed other inventory types to identify optimization potential. In terms of stocks of unfinished goods (work in progress), the average companies are around 50 percent behind those in the top quartile, and from there another 60 percent behind the best competitors. For packaging materials, these figures are 25 and 40 percent, and for raw materials they are 35 and 55 percent. That said, manufacturers should be cautious about reducing stocks of raw and packaging materials, since too little inventory can limit flexibility. We therefore recommend examining inventories of finished goods, raw materials, and packaging materials all at the same time.

Smart benchmarking linked with cross-functional collaboration unlocks performance

The benchmarking results demonstrate in spectacular fashion how the best companies have improved transparency and performance management along the supply chain through more detailed and more comparable data, and have consistently

My supply chain is better than yours—or is it?

invested in processes, systems, and skills to reinforce understanding as well as responsiveness. In particular, the analyses show that cross-functional collaboration and real “insight mastery” are the key factors in using supply chains to successfully capture new areas of competitive advantage.

Accordingly, identifying and capturing improvement potential along supply chains will increasingly require new skills. While many might previously have considered supply chains to be the realm of specialists who may be more comfortable working with numbers than people, future success will depend largely on a combination of analytical and interpersonal skills. Now more than ever, supply-chain management is evolving into a cross-functional activity. Teams will have to interact more closely with other functional areas, such as sales and marketing, to identify the factors that influence self-induced volatility and agree on actions to manage it better. At these interfaces, people will need to be able to translate data and information into action, as well as communicate requirements to other units using language that is easy to understand.

One company's experience

A multinational consumer-packaged-goods manufacturer embarked on a three-month pilot benchmarking effort involving two of its most important European markets. The data showed that across the two markets, the company's total supply-chain costs ranked in the second quartile. As a result, the company showed a double-digit cost gap with an estimated value in the millions of euros.

The greatest individual potential proved to be in warehousing. A close review of specific warehousing cost gaps revealed significant performance differences across warehouses even within the same market. Among the root causes? High costs both for building and for direct and indirect salary expenses.

A joint analysis of inventories and service levels revealed further improvement potential. While inventory levels were best-in-class, service levels (particularly on-time, in-full fulfillment) were in the second quartile. Further examination found that a crucial contributing factor was an excessive focus on minimizing working capital levels. Allowing a focused increase in working capital thus led to improved service. Finally, the benchmarking enabled the development of new performance indicators, which led to upgrades in the company's online supply-chain portal.

Consumer Operations Benchmarking Initiative

- A benchmarking methodology and database developed especially for consumer goods manufacturers, allowing participants to compare their production and supply-chain processes both internally and externally against the competition, and to identify improvement levers.
- Four areas in supply-chain management: service, costs, capital, and capabilities. Five areas in production: costs, capital, productivity, quality, and flexibility. In both areas, the method analyzes over 100 KPIs.
- Drills down to production steps within plants and splits supply chains between different stages of transportation and warehousing, being truly end-to-end all the way from raw materials to customers.
- Compares apples with apples by mathematical normalization, reducing the analysis findings down to a common quantitative denominator, and allowing realistic comparisons of structurally different supply chains.
- Digital benchmarking tool and not a paper report, enabling any correlation analysis against the entire COBI database.
- So far comprises analysis from almost 300 manufacturing plants and more than 50 supply chains worldwide, in a range of food and nonfood product categories.
- Results summarized in a comprehensive, company-specific report that offers insights into performance and its underlying drivers — easy for anyone to understand.
- Quantified potential can be immediately translated into targets and actions and integrated seamlessly with a performance-management system for target setting as well as with external analytics-service providers. These service providers, such as McKinsey Advanced Analytics, analyze supply-chain performance on a monthly basis, identify performance gaps, and create concrete corrective actions to improve clients' supply-chain management.

My supply chain is better than yours—or is it?

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Driving superior value through digital procurement

Pierre de la Bouleye, Pieter Riedstra, and Peter Spiller

Emerging digital and advanced analytics tools promise new levels of procurement performance. To deliver that promise, CPOs must discover which of them are best suited to the needs of their company.

For businesses, big data¹ and advanced analytics will have profound implications: in raising data-driven decision making to a new level, helping companies to generate new insights, and enabling them to collaborate at scale. Imagine a procurement team so deeply connected to every tier of its supply base that it has access to all relevant data on cost structures, supply availability, lead times, financial and operational risks, and service and quality metrics. This procurement team would be well-positioned to negotiate the “right” prices, instantaneously adapt its own planning, or switch to alternative suppliers in the event of supply shortages. It could even proactively help suppliers improve deteriorating quality levels by spotting problems earlier and identifying their root causes more accurately. What category manager would not be excited to have a “tier-n supplier x-ray” like that?

Many CPOs who have already applied more well-established commercial and demand levers are convinced that big data and advanced analytics hold the key for future improvements in procurement performance. We asked a number of them around the world to quantify the likely near-term impact of their digital procurement programs. On average, their expectations included a 40 percent increase in annual savings, 30 to 50 percent less time spent on transactional sourcing, and a 50 percent reduction in value leakage.

But CPOs are also asking *which* of the new digital solutions will bring real value to their companies today. Which of the many “digital procurement” software vendors will live up to their promises? What should their company’s roadmap for digital procurement look like?

We expect Procurement to create value from many new applications in the future, considering the function's place at the crossroads of various data flows between the company and its partners. Category managers work with historic and future spending and usage data generated by the company's enterprise resource planning (ERP) and forecasting systems. They receive product specifications provided by their engineering counterparts; monitor contract adherence, invoicing behavior, and supplier performance; and generate supplier profiles and scorecards. Procurement also taps into various external data sources, like supply market-specific time-series data for commodities, currency and inflation rates, tax and tariff data, or supplier solvency data.

But how do companies create real value from this data? In a world of digital hype and with new solutions hitting the market every day, many CPOs are struggling to separate the wheat from the chaff. In this article, we attempt to bring structure to the discussion and provide a simple framework for CPOs to think about superior value creation through digital procurement and advanced analytics.

The digital applications that will make a real difference a company's procurement performance fall into two broad areas: tools that *identify and create value*, and tools that *prevent value leakage* (Exhibit 1).

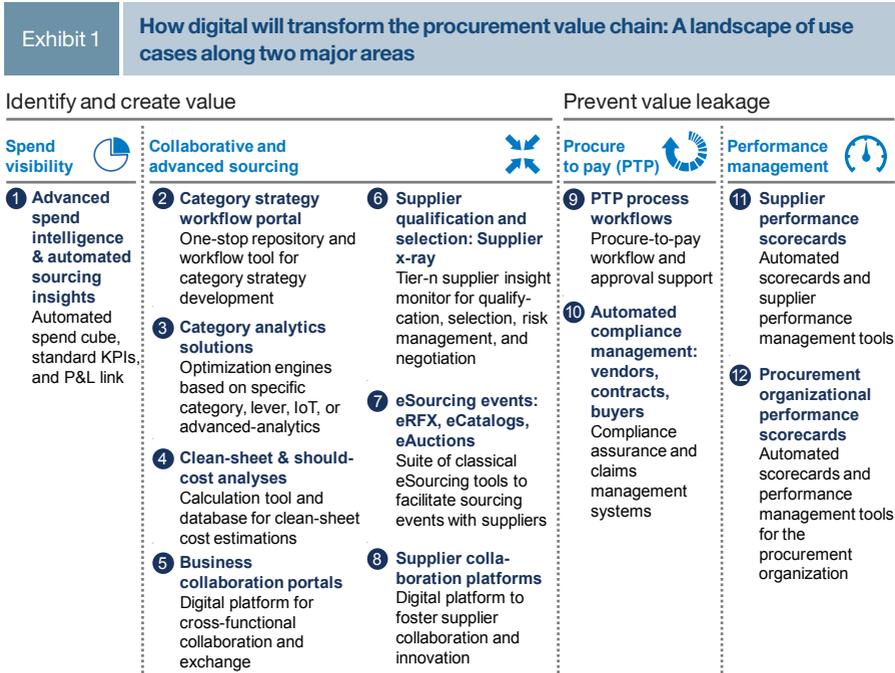
Tools that identify and create value

Simply speaking, tools to identify and create value support the strategic sourcing process. They can be further divided into those that create spend visibility, and those that support advanced collaborative sourcing.

Spend visibility

Advanced spend intelligence and automated sourcing insights. Spend visibility tools begin with solutions that pull historic purchase order (PO) and invoice data, and create a spend cube. The prevalence of fragmented ERP systems means many multi-national and multi-business companies still find it difficult to build even simple spend cubes. Some companies, however, are already automating data cleanup and classification with algorithms that make use of artificial intelligence and self-learning methods.

We expect that the solutions currently available in the market will be further enriched with additional data sources and the inclusion of basic, category-level key performance indicators (KPIs). For example, they will be able to generate automated price and specification benchmarks across entities, like price arbitrage analyses or facility management costs per square meter and per person. Prices will be correlated



Source: McKinsey Digital Procurement Service Line

to material cost indices, or to product specifications using linear performance pricing (LPP). Category managers will have automatically generated dashboards and heat-maps at their fingertips, helping them identify and capture sourcing opportunities. Finally, by linking the spend cube solution to company budgets and profit & loss (P&L) planning data in real time, next-generation systems will help reach that procurement “holy grail”: savings that can be tracked directly in budgets and in the P&L.

Collaborative and advanced sourcing

Category strategy workflow portal. While many systems support transactional procurement processes, very few workflow solutions currently support the generation of comprehensive category strategies and the systematic identification of savings levers. There are emerging solutions that are able to guide category managers through a configurable stage-gate process that includes every step in the creation of a category strategy: understanding demand, analyzing the market, generating savings and measuring the effectiveness of implementation. Relevant milestone

meetings with cross-functional partners will be triggered automatically, and all ideas will be stored and tracked up to the final implementation steps.

These workflow solutions will allow teams to collaborate via shared file spaces, forums, chats and video calls, and superiors will be able to track category manager activities and their impact in real-time. Also, as they serve as structured repositories for all the analyses conducted and insights generated during the strategy development process, these workflow systems also will make the assembly of category strategy documents and negotiation preparation packs almost automatic.

By applying the most advanced tools available today, we have seen companies shorten their category strategy development times by around 30 percent while significantly increasing the depth of insight and impact generated by category management teams. In one pilot program, teams exceeded their initial savings targets by an average of 20 percent.

Category analytics solutions. Many of today's more advanced category analytics are already very well standardized: for example, the LPP or Total Cost of Ownership (TCO) calculations for high volumes of similar parts, like fasteners or motors. These analyses will increasingly be coded into standard applications. Once defined, these category solutions will routinely create the defined analyses, and automatically flag potential improvements and specific levers needed to capture them.

In addition, we will see a number of category solutions for more complex, data-intensive categories like logistics, travel, telecoms, temporary labor, or freight. These will build on massive, relatively standardized data sets and again allow the execution of a set of standard analyses to identify levers and improvement potential. Freight optimization tools already work like this, for example. They take routing data and complete pricing schemes from multiple vendors to identify least-cost vendor combinations. They can also suggest demand changes, like not using express freight on a Friday when the goods will not be delivered until Monday. One large industrial company was able to reduce its total air freight costs by 25 percent using a commercially available multi-variable freight optimization solution.

Cleansheet and should-cost analyses. Knowing what a part or service "*should cost*" when produced at maximum efficiency and effectiveness is a key weapon for every buyer when negotiating with vendors. The cleansheet approach used to calculate such costs can also help to identify opportunities for savings from changes to a product's design or its value chain.

Cleansheet tools comprise a workflow application to build calculation sheets, several expert tools to estimate different cost areas like machining, logistics, or overhead cost, and a set of databases containing template libraries and factor costs (e.g., labor rates, raw material index prices, and currencies). It is not uncommon for these tools to reduce the cost of products or services by up to 40 percent, while also improving time-to-market for new product designs.

Business collaboration portals. Early involvement with internal customers and cross-functional cooperation to jointly challenge demand, specifications, and processes is critical for good sourcing. Digital platforms that foster exchange, transparency, and interaction can facilitate that collaboration. A number of large software vendors already provide generic collaborative spaces including file repositories, collaborative workspaces, audio- and video-conferences, and calendaring. We expect to see the emergence of solutions that are specifically geared towards the requirements of strategic sourcing. These include consolidating demand and specification data, and vendor insights, analyses, and strategies across diverse BUs and functions, allowing for timely and effective interactions to challenge what, where, and how to source.

Supplier x-ray. In the introduction to this article, we described a supplier “x-ray” solution that gathers procurement-relevant supplier data such as cost, lead times, capacities, inventories, and risks, along the whole value chain. Data sources for such a solution will include the proprietary systems of value chain partners, as well as structured third-party data and unstructured web feeds from many different sources, all combined into meaningful, real-time profiles of a company’s tier-n supply chains. Many of the elements of this approach already exist, including web-screening solutions designed to improve supplier risk management, and on-line supplier networks and communities. In the future, we expect to see a convergence of such solutions, ultimately delivering the kind of multi-tier supplier visibility that companies can only dream of today.

eSourcing events: eRFx, eCatalogs, eAuctions. Electronic sourcing tools have existed for more than a decade and have evolved significantly over time. Most vendors now offer suites that include several of these tools, along with spend analytics and other functionality. We expect the most significant future developments to come from automated analytics and user interface improvements, which is in our experience the single biggest factor to foster adoption. Future solutions will offer much more sophisticated analyses like bid-comparisons or best-of optimizations, fueled by comprehensive, category-specific bid sheets, templates, and analysis sets.

The increased power and ease-of-use of these solutions will significantly drive up the penetration of digitally managed and optimized sourcing events.

Supplier collaboration. Comparable to business collaboration tools, these applications will facilitate a better exchange and interaction between external partners, including suppliers (tier-1 to tier-n), research partners, and intellectual property providers. They will work like a social network for the company and its supply base, enabling better end-to-end cost optimization, faster interaction times, and broader access to external innovations.

Tools to prevent value leakage

Tools to prevent value leakage include ERP and transactional systems to manage the procure-to-pay (PTP) process, and performance management systems. Here, several new opportunities arise from the use of digitization and big data analytics.

Procure to pay

PTP process workflow. Procure-to-Pay solutions were among the first digital tools available to support operational and tactical procurement activities. Since their introduction in the early 2000s, they have evolved significantly in functionality, covering an increasing scope of the end-to-end process, from sourcing, to payment of the suppliers, and extending from requisition management to adjacent areas, like expense management.

The PTP tools of the future will use the vast amount of order and invoice transaction data available to enable value generation in core operational activities. They will create predictive order configurations for repeat buyers, reducing processing time and encouraging the use of standard order templates, for example. They will also automatically identify potential suppliers for categories not covered by contracts or catalogues, supporting operational buyers by creating more competition.

Systems will interconnect with those of suppliers to transmit digital POs and invoices, eliminating the need for invoice matching: The receipt of goods and services will be automatically tracked using radio-frequency identification (RFID), quick-response (QR) codes and other automated techniques. And all of this will increasingly happen in the Cloud, allowing ubiquitous connectivity and significantly reduced processing time and effort, while driving user adoption by Procurement and the wider business.

Automated compliance management: vendors, contracts, and buyers.

For many companies, especially those with global manufacturing and service footprints, value leakage is still one of the main untapped sources of procurement

impact. Advanced compliance management tools will act as an ever-vigilant watchdog, scanning every procurement transaction, both from structured, i.e., ERP systems, and unstructured sources, like invoices or expenses, to identify and quantify the leakages, and actively drive their resolution. Purchases performed through the wrong channels will be identified ex-ante (in the PTP tools) or ex-post (during invoice payment).

Advanced compliance management will be especially useful in the case of large, high-value outsourcing contracts, which are often governed by complex legal frameworks and dozens of individual service line agreements and KPIs. Future systems will automatically extract all these conditions from contracts through machine reading and match them against continuous streams of invoices, supplier activity, and performance data. Category managers, buyers, and business owners will then be alerted about compliance breaches and their business impact. The value at stake here is huge, considering the level of leakage of the life of a typical contract, and the high level of manual effort currently applied to contract governance.

Advanced analytics solutions will also be able to scan and identify noncompliance in transaction intensive purchases where manual analyses won't suffice—for example, in transportation, freight, parcel services; maintenance, repair and operations (MRO); taxi, or hotel spend. Today's existing point solutions in these areas will increasingly be consolidated into comprehensive application packages that address non-compliance by both vendor and buyer.

Performance management

Supplier performance scorecards. Supplier performance management systems will be integrated with the supplier x-ray capabilities described above. Such systems will deliver real-time insights on supplier performance, gaps, along with anticipated cost, quality, or delivery-time issues. Similarly, they will also link to automated scope and service level monitoring systems and offer integrated claims management functionality. The availability of this information will allow category managers to act more quickly and decisively when problems occur, and will give them the tools they need to encourage—or force—suppliers to improve.

Procurement performance scorecards. Measuring the performance of the procurement organization—as a whole and on an individual category level—is the last application where we see significant room for improvement using digital tools. Systems like the category strategy workflow portal described above will log all the activities of the strategic sourcing team, and savings ideas will be tracked in parallel. This information will allow the CPO to oversee and manage progress and results, even

down to a category manager's task level if required. Future workflow solutions will embed these performance management features to manage group, category, and individual performance on a real-time basis.

Finding the real value

To decide which of these solutions are right for them, companies need to understand the specific value drivers offered by each, and assess their potential impact on their own processes and teams. Those value drivers include higher efficiency per transaction, superior insights leading to better negotiation results, or lower risks through improved foresight. Many applications address several value drivers at the same time, although to a different extent (Exhibit 2). The ultimate impact of each driver will also be company specific, depending, for example, on transaction volumes, the categories sourced, and the sophistication of the company's people and other current processes.

In order to determine applications that have the highest value creation potential, these levers and associated applications need to be mapped to company specifics. For example, companies that have a large share of spend in the areas of logistics, freight, and MRO might benefit from sophisticated optimization models and tools for these specific categories. Companies that buy hundreds of thousands of SKUs and that struggle with price and contract term variability across the SKU spectrum should consider automated leakage management solutions.

We see three areas as a natural place to start the journey towards reaping the benefits of end-to-end digitization, advanced analytics, and automation. First, companies should conduct a thorough diagnostic of the current tool landscape for the sourcing company. Second, they should establish the need for action based on a clear set of KPIs. Finally, they must have a clear understanding of the opportunities at stake both from existing tools and solutions yet to be developed.



Will these new tools automate the category manager's or buyer's job in the future? We believe the opposite is the case. Many of the tools described in this article allow much more thorough analysis and deep investigation to create more impact. Such tools will only deliver their true value in the hands of capable talent. Companies should start building the required talent and exploring the promises of digital procurement solutions today. Many tools are still in their infancy. Ultimately, only by experimenting and building on their initial successes can CPOs determine which digital procurement solutions will help them create the next level of value for the company.

Exhibit 2 Sources of procurement impact based on use cases		Impact sources		
		Effectiveness	Efficiency	Sustainability
Spend visibility	1 Advanced spend intelligence & automated sourcing insights	✓		
	2 Category workflow portal	✓		✓
	3 Category analytics solutions	✓	✓	✓
	4 Clean-sheet & should-cost analyses	✓		✓
Collaborative and advanced sourcing	5 Business collaboration portals	✓	✓	✓
	6 Supplier qualification and selection: supplier x-ray			✓
	7 E-sourcing events: e-RFX, e-catalogs, e-auctions		✓	
	8 Supplier collaboration platforms	✓		✓
Procure to pay (PTP)	9 PTP process workflows		✓	
	10 Automated compliance management		✓	
Performance management	11 Supplier performance scorecards			✓
	12 Procurement organization performance scorecards			✓

Source: McKinsey Digital Procurement Service Line

1 Typically defined as data that is in high volume, changing with high velocity, and coming in a high variety of sources and formats

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Recipe for success for sourcing in the food industry

Mike Doheny, Agustin Gutierrez, Jan Henrich, Ludovic Meilhac and Roberto Uchoa de Paula

Transforming the way food companies specify, source, and manage the supply of raw materials can help them cut costs, meet changing consumer preferences, and manage risks.

Over the past decade, profits in the food industry have fallen in the face of significant headwinds. Increasing competition, especially from private-label players and discounters, as well as more value-conscious purchasing from consumers, are putting downward pressure on prices. And the race to keep up with new trends and changing dietary preferences is driving up demand volatility, portfolio complexity, and development costs. Raw-material prices, meanwhile, which account for 60 to 80 percent of direct material costs and 30 to 40 percent of total costs, have become 35 to 50 percent more volatile over the past decade. At the same time, currency fluctuations have compounded volatility among regions, affecting the global operations of major food companies.

In this challenging environment, food players are being forced to rethink the way they select, specify, source, and manage their ingredients. The best of them are doing this using a holistic approach that can reveal innovative ways to reduce total costs or unlock hidden value in the raw-material supply chain (exhibit). This approach has allowed food companies to save 2 to 6 percent on the cost of direct materials and 8 to 22 percent on the cost of conversion. That makes it one of the most effective levers that food companies have in their tool kit: for every 1 percent improvement in direct material cost, companies can improve their net margin by 200 to 300 basis points. Let's look at a few high-impact examples.

Exhibit 1 **Leading food companies are taking a holistic approach to the sourcing, specification and management of their ingredients.**

Questions

- How do I drive right mix of global and regional suppliers?
- How can I use clean sheets or “should cost” models to drive down margins?
- Are there any opportunities in contract terms— eg, freight, payment terms, delivery time, quality?
- Are there opportunities for price design?

Tools

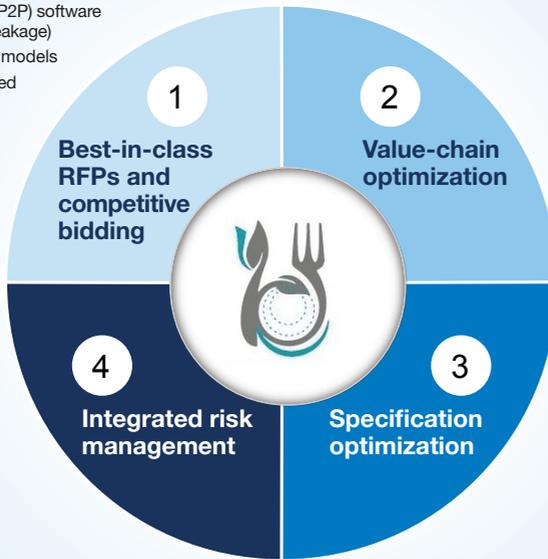
- Best-in-class requests for proposal (RFPs)
- Permanent RFPs
- Procure-to-pay (P2P) software (to avoid value leakage)
- Global sourcing models
- Clean-sheet-based negotiations

Questions

- What is value added at each step of physical supply chain?
- What are key factors influencing my decision to make or buy? When does vertical integration make sense?
- How should I structure relationship with other players (eg, co-investment, tolling)?

Tools

- Value-chain analysis
- Make vs buy analysis



Questions

- What buying strategy should company follow (eg, rules-based coverage, expertise-based coverage)?
- What is right level of risk exposure for these commodities?
- How can company manage and evaluate returns against nonmarket price risks such as credit, counterparty, quality, quantity?

Tools

- Value-at-risk (VAR) assessment and management
- Operations management for nonmarket risk

Questions

- How can I optimize specifications to reduce total cost of ownership or approach price/quality trade-off?
- How transparent will changes in specifications be to consumers?
- How switchable are my ingredients?
- How can I build flexible formulas, avoiding packaging changes?
- How do I engage food quality/safety and build right business case?

Tools

- Design to value
- Specification optimization

Developing the supply base

In the past two years, commodity prices have fallen steeply. To benefit from these drops in a timely fashion, however, companies need the mechanisms to identify and size savings opportunities, as well as a flexible procurement process to capture them quickly.

An increasing number of food-industry players are making use of clean-sheet cost-modeling techniques. Clean-sheet techniques allow a buyer to build up a comprehensive picture of the cost drivers of existing and potential suppliers. That insight helps them build efficient requests for quotation (RFQs) and to determine the most effective negotiation and go-to-market strategies, optimizing factors such as the award term and the degree to which prices will be indexed to underlying commodity costs. The approach can also suggest opportunities for the unbundling of certain components from a supplier's offering, if they can be delivered more efficiently elsewhere.

Companies also need a deep understanding of underlying commodity cost structures, including crop yields, farm production costs, and logistics costs. New analysis tools are helping here, allowing the evaluation of multiple potential sourcing scenarios—down to the level of individual farms—while enabling optimization on a global scale to drive efficient decision making.

One major multinational food company has implemented an inflation-tracking mechanism across all its major spend categories. This tool gives it direct feedback on how its sourcing efforts are performing against market movements and allows it to react faster to changes in underlying price trends.

Food players must also ensure that the short-term performance of their ingredient supply base isn't coming at the expense of its long-term health. Leading companies take action to ensure the sustainability of future supply. One major coffee buyer worked with growers in Kenya, for example, to develop an alternative source of long-term supply and to create competitive pressure in its supplier base. Another company partnered with rice growers two seasons before it made its purchases to ensure they planted rice paddy and not another crop such as corn.

Finding and securing these sources of value requires food companies to change the way they conduct their procurement activities. That in turn requires new skills, tools, and processes. The best companies are now taking a systematic approach to developing these capabilities. They may do this by taking on staff from industries,

such as automotive and high tech, that pioneered the use of advanced sourcing techniques, and by developing skills in house. By starting their advanced sourcing efforts in the categories where they spend the most, leading companies have secured rapid savings, while simultaneously refining the processes and skills they can go on to apply across their product portfolios. In our experience, the use of these techniques will deliver average cost savings of 8 to 10 percent. Moreover, they also improved availability and customer value perception—which together typically yield a 5 to 12 percent sales impact across multiple product categories.

Managing risk

Underlying much best-in-class materials supply management in the food industry is a smarter approach to risk. Price volatility in many major food commodities has been significant in the recent past. Volatility in wheat, rice, corn, and cocoa prices rose by between 50 and 80 percent from 2008 to 2014, for example. Leading companies protect themselves from the impact of these fluctuations in three ways. First, they improve their forecasting abilities, by analyzing the links between prices and external factors (such as weather, currencies, the wider economy, and demand elsewhere) and by monitoring key influences closely. Second, they use these forecasts to inform their use of financial tools to hedge against future price fluctuations. Finally, they make changes to their products and supply chains to reduce the impact of volatility. This might include the use of flexible specifications to manage short-term fluctuations, for example, or vertical integration through the purchase of farmland to secure longer-term supply. One company secured privileged access to quality products by entering into joint ventures with certain dairy producers, for example.

Optimizing specifications

Design-to-value techniques help companies to understand exactly which features of their products matter most to consumers. For food players, careful assessments of consumer tastes and preferences can often create opportunities for significant savings through changes to specifications or the substitution of lower-cost ingredients. They can also increase product value and sales through value-added processes and ingredients. One major food company was able to replace eggs with a mixture of vegetarian ingredients that replicated a similar taste and flavor, for example. The new formulation had no effect on the color, texture, or taste of its product, but it did reduce overall costs and had the added advantage of making the product kosher. Similarly, companies have successfully exploited growing consumer interest in the potential health benefits of certain food types (for instance, natural

products and those free of genetically modified organisms, antibiotics, hormones, and artificial ingredients) to develop successful new product lines that drive growth in mature categories.

A flexible approach can also help companies reduce their exposure to commodity-price volatility. One cheese maker, for example, developed a flexible formulation strategy to build alternative recipes for each product. Adapting its systems to allow switching between recipes was a crucial part of this strategy; doing so meant the company could change the recipe in accordance with the relative price and availability of ingredients or in response to the preferences of different consumer groups. Such flexibility has also allowed companies to minimize downside from currency volatility, letting them adapt their supply chains quickly and efficiently to source from the best-cost country at any time.

Understanding the value chain

Rather than just accepting what ingredients do cost, leading food players invest time and effort to find out what they *should* cost. They do this by looking beyond their direct suppliers and building up their understanding of the role of different players across the whole value chain from field to factory, the true costs of the services each provides, and the options available.

When one company analyzed the value chain for its processed-nuts product, it found that a key group of intermediaries had a disproportionate effect on both price and availability. Rather than just buying from downstream producers, as it had before, the company started negotiating separately with the intermediaries to achieve both better prices and improved supply security.

In another case, a major bakery analyzed the value chain for gluten and starch produced from different sources (wheat and corn) and different regions (Europe and North America). Since starch and gluten are products of the same process, understanding the value of the starch to producers helped the company pick the best source of gluten in each market.

Understanding their suppliers' underlying costs doesn't just help food companies to negotiate lower prices—such knowledge also helps them to find collaborative ways to deliver value, for example, by changing product specifications or delivery requirements to reduce the overall cost of supply.

As they evaluate the best course of action and define their strategies, food manufacturers should consider a few questions:

- Does your organization truly understand the structure of its supply chains from farm to factory, as well as the underlying cost drivers?
- Are you doing all you can to capitalize on the current low-price environment in commodities?
- Are you ready to respond to steep or prolonged changes in supply-market dynamics, such as future rises in energy or commodity prices?

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The McKinsey Food Institute aims to help food manufacturers optimize the total value of their raw-materials-specification and production processes using proven, proprietary databases and tools. To find out more about our approach, contact Agustin_Gutierrez@McKinsey.com or Ludovic_Meilhac@McKinsey.com.





The evolution of quality: Higher quality output, lower cost of quality

***Alvaro Carpintero, Evgeniya Makarova, Alessandro Faure Ragani
and Paul Rutten***

Good quality doesn't have to mean higher costs—in fact, it often means lower recall and warranty costs as a culture of quality takes hold.

Disaster has a way of concentrating the mind. Massive recalls and lawsuits—over beverages, dairy products, detergents, beauty products, and others—become almost totemic reminders of what a lapse in quality can mean. And for consumer companies everywhere, simultaneous increases in supply-chain complexity and media reach mean that the aftershock of a quality lapse is likely to be much larger than in the past.

But despite their impact, these events are only part of the story. Indeed, as important as it is to keep rare disasters from happening, focusing too closely on them can distort an organization's understanding of what quality really means. Fundamentally, quality is about meeting or exceeding customer expectations: every day, every shipment, in each product, year after year. That's where the true value is, measured not only in higher revenues from greater customer satisfaction but also in higher operational efficiency and effectiveness due to increases in productivity and innovation—and even employee engagement.

Yet organizations face constraints. Rising margin pressures, particularly in consumer-oriented industries such as fast-moving consumer goods, limit how much companies can spend on quality practices. Organizations therefore cannot just be good at quality—they need to be smart about it as well.

To achieve the right balance, organizations must learn to think about quality systematically. At the very earliest stage of quality awareness, organizations start to hear the voice of the customer more clearly while stabilizing their operating systems

and promoting greater transparency about quality problems (see sidebar, “More than compliance”). As these practices take hold, the next stage of maturity centers on strengthening cross-functional accountability and collaboration for quality—such as with new performance standards so that quality standards inform the design of products and the management of supply contracts.

At the third stage, quality informs much of the organization’s decision making, embedding itself so deeply that it becomes a part of the culture and essential to the company’s value proposition. Finally, among a small group of the very highest performers, quality becomes the basis for their reputation. These exceptional organizations expand their perspective on quality to address customer problems in ways that push their businesses into new areas, building on behavioral research and process analytics to develop deeper solutions and customer relationships.

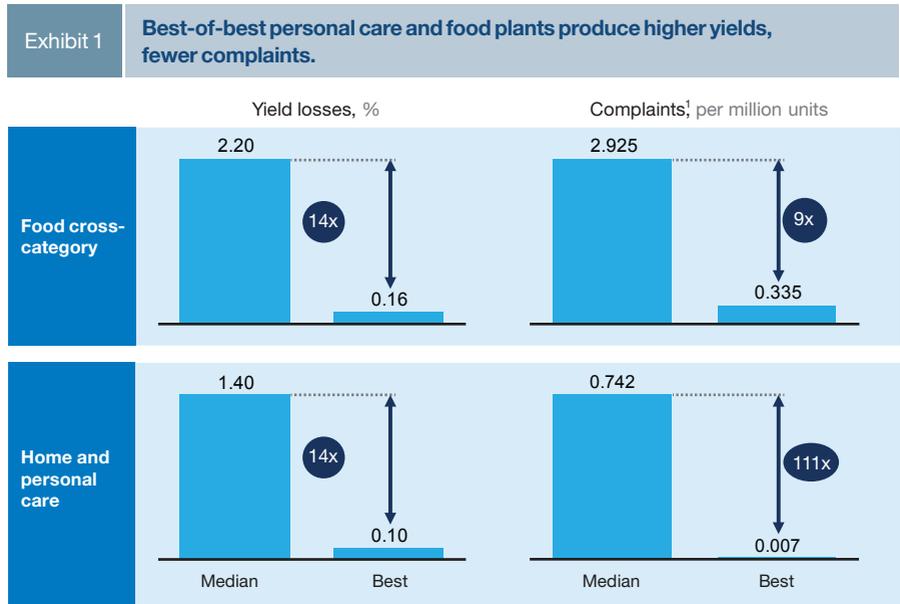
Achieving these outcomes requires investment. But the good news is that the organizations whose quality practices are the most sophisticated are not necessarily the ones that spend the most on quality. Instead, these leaders prioritize so that what they spend on quality is highly effective. At each stage of maturity, the advantages build: from essentially nonexistent to basic, from basic to average, from average to advanced, and from advanced to industry leading.

For example, a major dairy manufacturer at a basic stage reduced its “cost of nonquality”—such as for warranty claims, yield losses, and rework—by about 35 percent. A mid-level food producer’s facility reduced process deviations by more than 30 percent, while at the same time reducing the time to market by 30 percent. On average, the top personal-care and food plants produce dramatically better quality results on factors such as yield and consumer complaints, both of which have significant cost implications (Exhibit 1). At every stage, therefore, companies across industries are achieving higher quality at competitive cost, building capabilities that prepare them for further stages of quality evolution.

Four evolution stages of quality ‘maturity’

In assessing an organization’s quality practices, we focus on three foundational elements of quality.

The first is the operating system—the manufacturing processes for a dairy or the logistics operations for a distributor—gauging how well it can contribute to quality. Second is the quality system itself, including enterprise-level capabilities such as measuring quality output, or incorporating quality standards into the design of



1 Number of cases for food plants is limited. Number includes both complaints from end-consumer and retail customer.
 SOURCE: COBI

products and processes. The third element is the cultural dimension of quality—the way employees think about their contribution to product quality, and how they behave to ensure good quality.

How an organization performs in these three areas determines its stage of maturity (Exhibit 2). Although the boundaries between the different stages are not precise, each nevertheless correlates with a few important characteristics.

From the experiences of organizations that are investing in quality, a few broad lessons stand out. Most important, investments can pay off at every possible starting point, from stage zero, when a company has very few quality capabilities, to stage four, when it is among the standard-setting organizations that are redefining what quality can mean.

A further, related lesson is that the impact from investing in quality tends to increase with the organization's quality maturity. That's partly because of scale: as maturity increases, quality involves more and more of the organization. And it's also because quality increasingly informs strategy so that its effects are broader and longer lasting.

More than compliance

Especially in highly regulated industries such as packaged foods or pharmaceuticals, organizations often see quality mainly in compliance terms. There's good reason: as products become more complex, compliance and quality start to overlap, with some standards explicitly incorporating minimum quality targets.

Yet even the most intricate of standards may not incorporate all of the factors that customers include in deciding whether a product is fit for purpose. Instead, regulators have traditionally focused on the most critical variables, usually centering on safety—such as the presence of allergens and other potentially hazardous ingredients in foods.

And although at least some regulators are broadening their perspective on quality—for example, assessing new drugs based on holistic health or life-span effects rather than just control of symptoms—companies nevertheless have substantial room to expand their understanding of quality to encompass the standards that customers want met and improve on them. That's what organizations build as they move through the stages of quality maturity.

The final lesson, however, is that progress from stage to stage is neither smooth nor automatic—nor even necessary, depending on an organization's circumstances. Instead, progress comes from triggers that share certain features, even though the details are inevitably specific to the organization.

Building the basics of customer focus, transparency, and stability

The first trigger typically occurs when the organization recognizes that simply reacting to quality problems is no longer tenable. Often, a recall (or even just adverse news coverage) simply costs too much for a company to absorb—in administrative resources, warranty expenses, and lost reputation. And it's a lesson that applies equally to a start-up that has focused mainly on growth, a state-owned enterprise protected from market demands, and a company in a high-demand industry.

That was the case for a regional dairy player in a market where incumbent private labels started aggressive price reductions. The company's leadership team recognized that quality would be the competitive advantage that would help it

Exhibit 2		'Triggers' make companies advance to new stages of quality maturity.		
Maturity stage	Operating system	Quality system	Culture	
0. Starting	Inconsistent manufacturing performance	Reactive, minimal compliance	Limited attention to quality	
	Typical evolution trigger: opportunity to reduce quality costs (eg, financial, reputational), compliance requirements			
1. Basic	Progress toward repeatable, standardized manufacturing	Development of individual quality processes Establishing basic compliance standards Launch of separate quality function	Increased transparency about product quality Focus on improving compliance	
	Trigger: opportunity for quality to generate positive value and reduce quality risk exposures and failure costs			
2. Stronger	Robust manufacturing, some identification of improvement opportunities	Quality systems established in all functions Greater cross-functional accountability Active problem solving for quality	Quality as customer value Focus on reducing cost of quality	
	Trigger: opportunity for quality to rise from "table stakes" to substantial part of value proposition			
3. Embedded	Continuous improvement cycle for manufacturing	Quality and customer satisfaction drive product design and solutions, strategic decisions	Quality is the way the company works Focus on anticipating customer needs and continuous improvement	
	Trigger: opportunity to redefine what quality means			
4. Standard-setting	Adoption of advanced manufacturing and control technologies, and advanced analytics to inform new product and process design	Quality draws on unique capabilities and innovation, becomes a source of insight and an enabler of breakthrough products	Quality is one of the most valuable company attributes, focus is on developing solutions beyond the company's traditional boundaries	

navigate the industry’s downturn. But that meant changing peoples’ mind-sets to help them see that the poor results were a product of a weak quality culture.

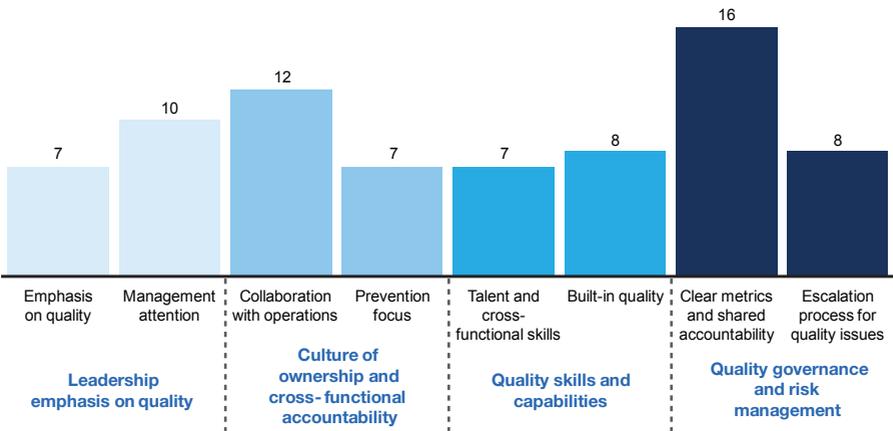
Today the company has built quality into its entire organization, starting with shop-floor huddle meetings that begin with a discussion of what the team did the day before to improve quality. In their regular cycle of in-person site reviews (or “gemba walks”), managers and leaders always mention quality, even when it is not the main focus of the day’s review. Together, changes such as these transformed the operation, increasing sales by 5 percent and earnings before interest, taxes, depreciation, and amortization by 2 percent.

Strengthening the culture for tighter collaboration

Once an organization’s quality becomes more transparent and stable, new opportunities often arise to increase quality’s value and decrease its cost. Our latest research confirms that higher-performing manufacturing sites score better on culture-related factors than their peers (Exhibit 3). Accordingly, at this stage, the goal becomes to enable greater collaboration across the entire organization so that quality becomes embedded in the culture. That collaboration extends outside the organization as well, to include stakeholders, such as partners and regulators.

Exhibit 3 High performers consistently score better on culture-related factors.

Percentage-point difference between bottom- and top-quartile sites



Source: McKinsey analysis

Two pharmaceutical manufacturers illustrate how this stage evolves. One, a generics maker, was facing compliance issues and needed to establish better quality operations on the factory shop floor. The other, one of the world's largest branded pharmaceuticals manufacturers, reexamined its already robust compliance practices for ways to improve its quality outcomes and risk profile even further — while reducing costs.

To reinforce the cross-functional nature of quality, both companies expanded their use of broad performance measures, such as error-free or right-the-first-time (RFT) production and on-time, in-full delivery. In team huddles throughout their production sites, the companies focused on daily tracking and discussion of the new indicators. In addition, tying these shared metrics to annual bonuses increased everyone's attention to quality — not just within their particular functional or operational units but also across organizational boundaries.

As these new practices took hold, productivity at the generic manufacturer's sites increased by more than 15 percent, while its end-to-end RFT percentage rose to more than 92 percent, from 83 percent. Individual sites started passing regulatory inspections more confidently and without any noted compliance issues or regulatory observations. For the branded pharma, the changes reduced both the number of quality incidents and its cost of poor quality, improving its risk profile with no added investment in IT, capital, or other resources.

Turning quality into the core value proposition

The third transition deepens the quality culture until it becomes the company's core value proposition. In effect, quality is no longer mainly a question of bottom-line savings but of top-line revenue generation. Tactically, this stage requires renewed investment in human and digital capabilities so that the company can consolidate all available customer data — from every internal touchpoint, and from external sources as well — to identify new openings.

A global logistics company's transformation of its quality approach illustrates the level of commitment required. Previously, the company's focus had been on fast delivery, a goal it had largely achieved. But customers increasingly looked to other factors, such as accuracy in predicted delivery times — speed was not necessarily helpful if a delivery arrived before the customer was ready to receive it. Moreover, the rise of a digital economy meant that deliveries were becoming far more complex: fewer large deliveries to warehouses and retail stores, and more very small deliveries to a vast number of residential addresses.

The new world demanded not just high quality but also quality leadership. The entire organization, from the executive suite to the uniformed drivers, immersed itself in capability-building sessions to understand the competitive reasons for higher quality and the implications for day-to-day work. Deeper problem-solving methodologies allowed people to identify new ways to serve customers. And new technologies crunched route data to enable wholesale restructuring of delivery practices that minimized the chance of error. The result was a major increase in customer satisfaction and renewed growth.

Setting a new standard with the latest analytics and technologies

The final stage applies the wider range of measurement and analytic technologies to develop solutions that push well beyond the organization's traditional business in predicting emergent customer needs — sometimes before the customers themselves are aware of them. One early example comes from sterile food filling, using techniques such as the ultrahigh-temperature pasteurization that has become familiar in shelf-stable dairy products. Historically, the sector's business model relied mainly on unit sales, but quality is an increasing focus as processors improve their remote monitoring of sterile machinery and use advance analytics to maximize output at the client's desired quality level.

At the level of individual manufacturing sites, advanced analytics are increasing output and yield: a dairy company has almost eradicated a chronic overfilling problem by refining the parameters that affect its filling process. Likewise, sophisticated modeling of energy inputs and demands can reduce energy usage by 5 percent or more. An appliance manufacturer used a cloud database to store several sources of information (for example, repair-technician notes, warranty-claims data, call-center records, product information, and manufacturing data), for which predictive analysis gave it early warnings of issues and allowed it to improve its design processes for both future and current products. And in less than two years, a biopharma site more than doubled its yield and RFT levels — with minimum additional process investments — by deploying advanced analytics to better understand important process variables and improve process specifications.



Not every organization needs to achieve the highest level of quality maturity — and certainly not all in one go. But all organizations should recognize that when a trigger looms, an investment in quality capabilities can often open major new opportunities for competitive advantage.

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2. Preparing for the new consumer



Building omnichannel excellence

Raj Kumar, Tim Lange, and Patrik Silen

As consumers move more of their shopping online, consumer-goods companies need to meet service and efficiency challenges across multiple channels. That calls for a new approach to the supply chain.

Competition in the consumer-goods sector has always been intense. Today, that competition is coming from a host of new directions. Retailers face competition from companies that used be their suppliers as consumer brands open dedicated retail chains and online direct-sales offerings. Consumer-packaged-goods (CPG) companies, in turn, face competition from retailers' growing private-label product offerings. And both retailers and CPG companies face competition from online superstores, such as US-based Amazon or Europe's Zalando, which offer vast ranges of products, inspiring customer experiences, personalization, ever faster delivery, quick returns, and more.

Fighting on so many fronts is taking its toll on the sector. Companies are creating new offerings in response to new threats and emerging opportunities. All too often, however, these piecemeal offerings cost a lot and produce little additional value, grinding profit margins down.

Most consumer companies recognize that the core of the problem—and of the solution—lies in the supply chain. That's why omnichannel has become such a potent buzzword in the industry. But while plenty of companies are striving to create an omnichannel supply capability, few have succeeded. When we asked a group of senior CPG executives in Europe about their organization's approach to omnichannel, 80 percent said they had efforts under way, but less than 25 percent believed they were on the right track. They also agreed that building the right supply-chain capabilities seems to be the most difficult part.

In our work with leading CPG players around the world, we've identified five distinguishing features that characterize successful omnichannel projects: they are intensely **cross-functional** efforts, they are the product of a clear and focused

omnichannel strategy based on key insights about customers, they require a custom-designed **supply-chain network**, they build—or acquire—**new supply-chain capabilities**, and they have a **transition plan** in place that encourages and allows the organization to test, learn, and adjust quickly.

Critically, the companies that are doing omnichannel well don't pick and choose from these characteristics—they have all five. The reason all five are critical starts with an understanding of how omnichannel became such an urgent priority for CPG companies.

Supply-chain requirements are rising fast

Last year, McKinsey asked 3,000 Americans about buying consumer packaged goods online. More than 40 percent of them had done so in the previous six months, and twice that number had gone online to do research, even if they had eventually bought their item from a store.

In the United States, online sales are growing 15 percent a year, against just 1.5 percent for overall retail sales. Last year, online sales accounted for 7.3 percent of total retail sales. The fastest growth of all is in omnichannel retailing—where retailers let customers buy something online and then pick it up in store, for example, or have it delivered from their local store. This sector is growing between 40 and 70 percent a year. Customers tend to order more when they buy online—up to four times as much as when they buy from a single-channel retailer. And when customers collect online orders in stores, they often make additional purchases while they are there.

This transformation in retailing is happening all the faster because new entrants are piling in and disrupting the market, dismaying incumbents and delighting customers. Amazon, the biggest disrupter of them all, became one of the top ten largest retailers in the United States in 2014, and it is already the number one retailer in many categories. Compared with conventional retailers, Amazon offers a much larger assortment, lower prices, more useful reviews, personalized recommendations, faster delivery, and better service—and as a result it gets better customer-satisfaction scores.

Keeping up is hard. Attempting to serve more channels in a seamless way puts a lot of pressure on the supply chain, especially when combined with rising customer expectations of speed, convenience, and service. Companies that have spent the past 20 years trimming their operations to become more efficient must now rethink their whole approach. And it's not just the physical setup that needs to change, but how an organization thinks about—and manages—its business. That calls for far-reaching changes to forecasting, inventory policies, and order-management processes.

This need for new approaches and solutions extends to CPG players, too. Many are already exploring new ways to reach their customers, such as P&G's online direct-to-consumer subscription business for its Tide PODS detergent product.¹ But CPG companies also need to support their retailer customers in new ways: their own success depends the ability of the retailers to grow and excel in today's competitive environment. And retailers will increasingly prefer to partner with the CPG companies that are the most willing to support them in their efforts.

1. Cross-functional collaboration

The omnichannel supply chain might be better termed the *omnifunctional* supply chain. To make business decisions that drive value for the whole company, and not just for individual pieces within the organization, a company needs to look at its business and operations from an integrated perspective. All the important stakeholders need to be part of this journey.

To do that, successful companies set up cross-functional teams right from the beginning of the omnichannel journey, and they keep them in place all the way from strategy definition to implementation. They give teams the resources and authority to make quick decisions and drive progress. The functions represented will typically include marketing, customer service, supply-chain finance, brick-and-mortar store operations, strategic planning, e-commerce, and IT.

If companies attempt to run their omnichannel efforts as a collection of independent offerings, they risk making decisions without understanding the implications for the supply chain and the impact on costs. Implementation will be hard, too, since there won't be one team that can speak with authority and credibility to the entire organization.

2. Omnichannel strategy

The second must-have is a go-to-market and service strategy that defines which channels the company will serve and which services it wants to offer consumers online, offer in its own brick-and-mortar stores, and offer to its wholesale and retail customers. This strategy must be clearly segmented, with definitions for each channel, customer group, product category, and location. The strategy must also define what the organization does not want to offer.

A strong strategy also requires a deep understanding of customer preferences, habits, and motivations. That takes real work. Especially for CPG companies, the term customer has two explicit meanings: the wholesaler or retailer that is usually their direct customer, and the end consumer. Companies need to gather detailed, holistic insights into their customers' behavior and the underlying drivers. To be

truly customer centric, CPG companies must understand how they can help their customers. In order to do that, they need to collect insights for each target customer segment (B2B and B2C) and category, at each stage of the purchasing funnel. And they need to understand that the things that encourage people to buy a product one time are not always the same things that drive customer loyalty.

Without the right strategy in place, companies risk jeopardizing their omnichannel efforts by making one or more of three common mistakes. First, they may offer things their customers don't really want, and forget about things they do want. For example, not every e-commerce customer wants same-day or next-day delivery. Many care more about convenience; others want the lowest shipping charges. Some retail chains will require high flexibility of supply, while others want the cheapest price and are willing to reduce their service requirements in order to obtain it. If an organization doesn't recognize these differences, it may end up spending a lot of money without making its customers any happier. Second, companies may not understand the benefits of improved services and how to provide a profitable value proposition. Unless companies understand how the costs and potential sales benefits of offerings in different segments compare, they have to make resource-allocation decisions based on gut feelings, and they may end up scattering resources that should have been targeted as part of a segmented strategy. Finally, they may not understand how things are moving. Where will the hot spots of the future be? Where are growth and new ideas coming from? Strategy has to be flexible and forward looking, not just fitted to the present.

3. Supply-chain network

The third must-have for omnichannel success is an optimized supply-chain network. Getting that right requires a company to decide where to position inventory and how products should flow from the factory to the customer. They also need to decide which parts of the supply chain they should own and run themselves, where it makes sense to partner with other organizations, and who those partners should be.

The supply-chain-network strategy needs to reflect the DNA of the company: it should be tailored for each individual segment of the go-to-market and service strategy. One size does not fit all for the supply chain in an omnichannel market. A poorly set up network will prevent a company from achieving the required service levels, push up distribution costs, and erode profits.

Why is this hard? Because companies can't apply the same thinking used in traditional network design to the omnichannel world. If an organization focuses too much on minimizing costs and boosting efficiency, it risks creating networks that can't meet customer-service expectations.

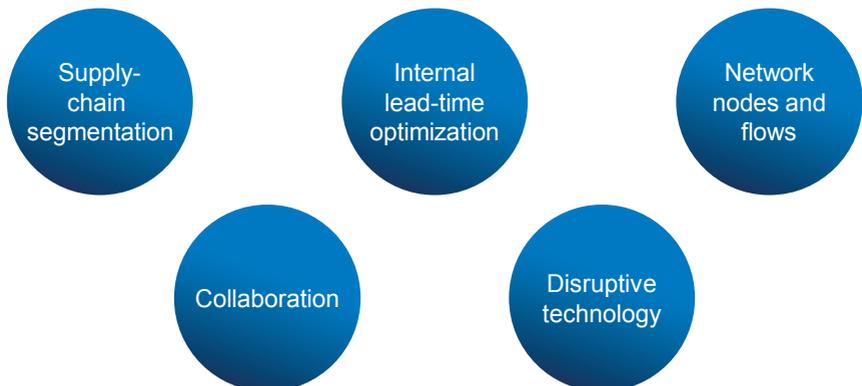
Similarly, companies used to running huge centralized distribution centers (DCs) designed to handle large orders with long lead times can overlook alternative concepts that allow them to position inventory closer to market or to offer new direct-to-consumer flows. Omnichannel networks often require new approaches, such as city service centers, dark stores, or collaboration with retail customers and third-party logistics providers.

Finally, companies may mistakenly believe that they can find and apply a standard best-in-class solution that suits every company in the marketplace. In practice, good omnichannel supply networks are always made to measure. A company cannot copy a successful solution from another player without recognizing the unique circumstances that shaped it. For example, many players started ship-from-store offerings, but many of them learned the hard way that this new service upset their walk-in customers and was more costly than other delivery concepts, especially when applied at scale.

To avoid these traps, companies need to take a broader perspective. Exhibit 1 shows the five elements that shape an effective network strategy.

Exhibit 1

Five steps lead to an effective network strategy.



Segmentation must lie at the core of any future supply-chain-network strategy. A segmented supply chain starts with the customer and with the related channel-, product-, and location-based service strategy, and combines it with product characteristics such as value and volatility. Once the segments are defined, all supply-chain elements—such as the network, flows, and capabilities—will be designed to

fulfill the requirements of each specific segment. Other sectors have made extensive use of supply-chain segmentation to deliver the right supply-chain performance at reasonable cost. In the electronics sector, for example, HP Inc. has segmented its supply chain into “no touch,” “low touch,” and “high value and solutions” segments, in order to meet every customer’s requirements, from cost effective to highly responsive.

Optimizing internal lead times might seem like an obvious way to reduce overall lead time, but only a few companies actually do it. Typical opportunities include faster order-to-release processes, shorter internal planning cycles, and eliminating buffers from physical processes. One company applied a range of simple changes to reduce its internal lead time by two-thirds. From the customer perspective, that ten-hour reduction meant products arrived a day faster than before.

Network structure is the heart of supply-chain strategy, as it defines the nodes and flows that connect the manufacturer with the customer. Nodes are worth particular attention right now, because many new models are appearing. That’s because above all, omnichannel networks have to be faster than ever in accommodating new demands, such as when delivering direct to consumers, or helping retailers fulfill same-day delivery promises without adding huge inventory. The traditional setup of regional or central distribution centers just can’t provide the speed the market demands. Few companies — with the exception of one or two e-commerce giants — have enough volume to extend their own DC network, so they need to find new ways to move faster. Faster transport, via air freight or point to point, is an alternative for next-day delivery, albeit an expensive one. The only way to achieve same-day delivery is by putting inventory closer to market — which makes next-day delivery cheaper as well. Several models have emerged for positioning inventory close to market (Exhibit 2).

None of these archetypes is the perfect solution for every company. They need to be carefully tailored to the individual omnichannel strategy, the existing DC and store network, and the organization’s capabilities.

Another opportunity to put inventory close to market is vertical or horizontal **collaboration**: drawing on inventory from suppliers, wholesale and retail customers, or other retailers. All market players need to shorten lead times, but it’s not feasible or efficient for them all to build their own infrastructure in every major city. That’s why successful companies have started to collaborate. Collaboration is an especially important opportunity for CPG companies within the omnichannel environment, even if they don’t operate their own direct-to-consumer business. By enabling retail customers to excel and grow with new services such as access to broader assortments, drop shipments, flexibility of promotion volumes, or high-speed

Exhibit 2		A number of models have emerged for positioning inventory close to market.		
	Associated flows	Assortment	Main purpose	
Central distribution center (DC)	<ul style="list-style-type: none"> E-commerce: ship to customer Replenishment to stores Replenishment to wholesale customers 	<ul style="list-style-type: none"> All SKUs 	<ul style="list-style-type: none"> Central stocking point Efficient processes Economies of scale 	
Regional or national DC	<ul style="list-style-type: none"> E-commerce: ship to customer Replenishment to stores Replenishment to wholesale customers 	<ul style="list-style-type: none"> Fast-moving SKUs Partially long-tail SKUs (different strategies possible) 	<ul style="list-style-type: none"> Balance between speed and scale for fast-moving SKUs 	
City service center or dark store ¹	<ul style="list-style-type: none"> E-commerce: ship to customer Out-of-stock delivery to hub or spoke stores Replenishment of stores (potentially) 	<ul style="list-style-type: none"> Maximum 8,000–10,000 SKUs Typically SKUs requiring higher service level (A items, promotions) 	<ul style="list-style-type: none"> Enables same-day and next-day delivery for key areas or cities Out-of-stock responsiveness Short replenishment lead time for key SKUs 	
Hub store	<ul style="list-style-type: none"> Walk-in customer E-commerce: ship from store Replenishment of spoke stores 	<ul style="list-style-type: none"> Displayed SKUs (typically more than in spoke stores) Key additional e-commerce SKUs 	<ul style="list-style-type: none"> Enables same-day and next-day delivery for key areas or cities Short replenishment lead time for key SKUs Serves traditional walk-in customers 	
Spoke store	<ul style="list-style-type: none"> Walk-in customer E-commerce: ship from store 	<ul style="list-style-type: none"> Displayed SKUs that are sold in store 	<ul style="list-style-type: none"> Enables same-day and next-day delivery for key areas or cities Serves traditional walk-in customers 	

¹ Includes extended backrooms of stores as long as they have some kind of warehouse-management process in place.

replenishment, they can participate in customers’ success and drive revenue and profit up. Examples include Amazon and P&G sharing facilities, and Zalando and Adidas Group sharing inventory. Retailer Nordstrom has connected some of its suppliers to its e-commerce website, allowing direct delivery of long-tail products from the supplier to the end consumer. With this collaboration, Nordstrom can offer a much wider range of products without stocking them, while the suppliers can access more customers and sell more products than before.

Collaboration leads perfectly into the next supply-chain question: should a given element in the supply chain be run **in-house or outsourced**? And how does a company find the right outsourcing partner? Leading companies are moving in both directions. Logistics-service providers have been taking on the management

of important parts of many supply chains for years, and their offerings continue to evolve. But some companies are also deciding to take back control of more supply-chain assets. Notable examples include Nike, which just opened its own distribution center of the future, and Amazon and Argos, which have started to build their own last-mile delivery fleets.

The next important element is **disruptive technology**. The Internet of Things, 3-D printing, big data, advanced robotics, and virtual or augmented reality will fundamentally change the way CPG companies think about production and external product supply. New technology will drastically change the economics of low-cost country sourcing, for example. Near-shoring and local production might become dominant again in many mature markets, drastically cutting reaction times and boosting flexibility. This trend is already under way. Adidas recently announced that it is opening a factory in Europe, and before long, 3-D printers will enable high-quality, cheap production in store or at home. Disruptive technologies will also help companies with operations in mature markets to increase efficiency, speed, and flexibility. As an example, reduced setup times will ease short-term changes in production volumes and more frequent changeovers, allowing companies to react faster to demand changes caused by promotions and similar events. A more detailed perspective on disruptive technology is described in the article “Breakthrough technologies fundamentally change the game (page 27).”

4. Supply-chain capabilities

The fourth must-have for omnichannel success is the next generation of the supply chain capabilities. The capabilities required to run a segmented omnichannel supply chain are significantly different from those that have served many companies well in the past. Some capabilities have evolved over time to reflect the new environment, but many—such as advanced analytics in planning or distributed order management—just did not exist under older models, and they have to be built from scratch. In our experience, many of the most vital capabilities, such as forecasting, supply and inventory planning, and multinodal order management, are the ones that are least developed. Worse, many players don’t know which capabilities they really need.

For example, many CPG companies have little experience in the use of insights from emerging data sources (for instance, e-commerce websites or social media) or consumer-flow analysis to gain insights into consumer preferences. And if they do gain such insights, they often struggle to translate them into improved supply-chain performance (for example, through dynamic pricing, demand shaping, or demand sensing).

Similarly, physical supply-chain processes such as warehousing and transportation are often not fast or flexible enough to cope with the large numbers of smaller orders that

omnichannel requires. Stores don't have the processes for in-store fulfillment and the underlying operating model is unclear. The result is high costs and unhappy customers.

Capabilities are more than just systems or software. Companies also need to transform processes and enable people to operate efficiently in the omnichannel world. McKinsey research and observations in the field show that successful companies have mastered six core capabilities to run their segmented omnichannel supply chains.

Analyzing consumer and product flows. This might seem a straightforward requirement, but few companies really create benefit from it. Some are struggling to ask the right questions, others are not using the data at all. Consumer and product-flow analytics includes basic elements, such as understanding cost-to-serve expenses for different service levels combined with an estimation of the benefits. It also includes demand shaping through dynamic pricing and a deep understanding of the underlying drivers of consumer behavior.

Real-time inventory visibility. In a decentralized network, a company needs to be able to see inventory across channels, and potentially across companies, so that it knows where products are available and how fast it can get them to customers. New software solutions aim to integrate the business processes, systems, and stock files across companies to eliminate inefficiencies and maximize sales. Combined with a strong distributed **order-management** system to determine the optimum node from which each order should be fulfilled, such systems make inventory more accessible. And that means better service, more sales, and lower costs.

In a decentralized network with many nodes, it is essential to put the right inventory in the right place at the right time. Without this ability, companies must choose between high inventory levels — and the associated high storage costs and high risk of obsolescence — or stock-outs and disappointed customers. Best-in-class **planning and inventory management** uses advanced analytics and machine learning to predict point-of-sale demand per SKU for specific stores, or specific zip codes, by day and sometimes even by hour. Combined with quick, smart replenishment processes for stores and DCs, this reduces the stock required for individual nodes by enabling a sort of just-in-time delivery.

Planning isn't just about software and systems. As important as having the right tools is having the right people, ones with a broad understanding of the integrated marketplace and supply chain. Systems can help get the best out a company's people — for example, by automating basic tasks and allowing people to concentrate on managing exceptions and optimizing the system as a whole.

Efficient and rapid node and store operations have become increasingly critical, but companies also have to make trade-offs among speed, cost, and flexibility. Warehouse automation using robotics and automatic guided vehicles can help, but the right level of automation and the complexity of flows will depend on parameters such as order size and number per carton. This can be easy to get wrong. One European retailer built a new automated e-commerce DC with highly complex systems and flows. As key parameters changed during the implementation, the DC struggled to achieve the foreseen volumes, which led to a steep sales decline in the most important season of the year.

Transport optimization is another increasingly important capability. Omnichannel supply chains will involve many more flows from manufacturer to the consumer, via multiple routes, in more decentralized networks, and with a large number of nodes. They may involve more partners and more services, too, such as drop shipments from suppliers to the end customer.

Industry leaders have also started to make use of additional sources of information to actively optimize routing of their vehicles. United Parcel Service, for example, uses traffic information to change delivery routes to optimize vehicle utilization and schedule compliance. Other companies run daily e-auctions to find the cheapest provider for certain delivery services.

The last, and often forgotten, capability is the right **operating model**. A company's operating model means more than the design of its organization. It also includes performance management, incentives, responsibilities, and decision rights. If these elements aren't aligned with the wider goals of the business, it will have a hard time moving in the right direction. At one major retailer, for example, responsibility for e-commerce order fulfillment from DCs and from stores was allocated to different departments with different incentives. As a result, the process and resource allocation for in-store fulfillment was so poor that every order fulfilled from the store cost substantially more, making the process extremely expensive and unattractive.

5. Transition plan

Last, companies need to get the transition right. In such a fast-changing environment, companies need to be quick and flexible during the implementation of the new segmented supply chains. They also need to change their approach and mind-set. Transition in the world of omnichannel requires an iterative approach, with frequent, rapid changes and adjustments. That requires all the traditional skills of project implementation and change management, with the addition of three key elements.

Implement smaller pieces. Large transformations, taking several years before new concepts can be implemented with a big bang, don't work in a fast-changing environment: their impact might come too late to deliver its promised benefits. That does not mean that companies should not have a bigger plan for the whole transformation; it means that they need to learn to implement smaller pieces quickly without waiting until everything is ready.

Test and learn. Companies should use pilots and experiments, to test and refine the strategy and concepts on a small scale before rolling them out across the entire organization. This includes new service offerings to the consumer as well as supply-chain capabilities and concepts. While testing in a small setting, companies learn quickly, learn how to operate the new capabilities, and learn if the new concepts really enable the aspired business value.

Change the mind-set of the organization. An agile, flexible, and fast-changing supply chain requires a new organizational mind-set. It will require big companies to think and act more like start-ups, which have new ideas; it will require companies to try new ideas in a small context, to see if they work. Companies must encourage people to try new things, allow for mistakes, and be prepared for some experiments and pilots to fail. There will always be trade-offs among speed, stability, and resources, but finding the right balance will have a huge impact on the success of companies in an omnichannel environment.



For consumer-goods companies, omnichannel isn't one thing, but many. The most successful examples today differ widely in their scope, design, and execution. What these companies share is a commitment and willingness to address each of the five key elements described in this article.

1 Procter & Gamble launches direct-to-consumer subscription business," Business Insider, July 26, 2016, businessinsider.com.

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Design for value and growth in a new world

Ankur Agrawal, Mark Dziersk, Dave Subburaj, and Kieran West

Customer choice has never been greater, so terrific design is essential for outstanding products and services—and to build lasting customer relationships.

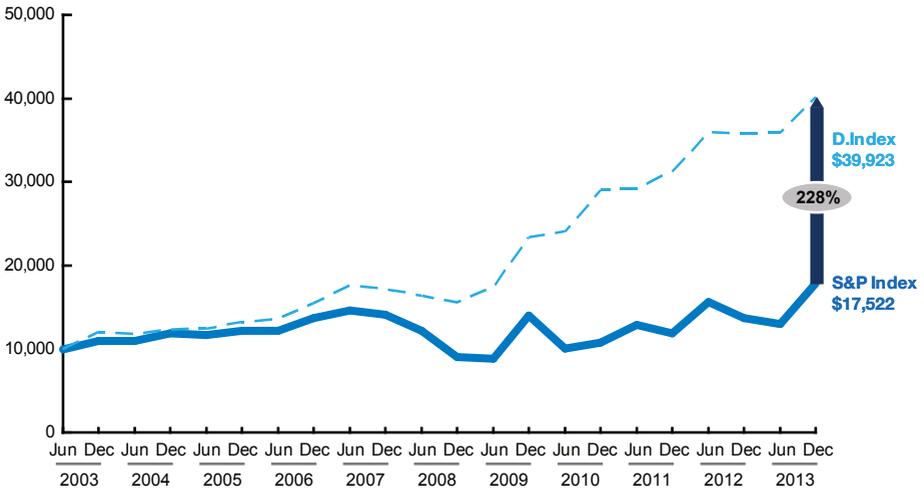
Because customers demand compelling experiences, successful companies create products with a “hook”—a certain look or unique features that meet customer desires and build brand loyalty. At a time when demand is restrained in many sectors and geographies, such products can be a source of differentiated growth. The most successful designs achieve this growth in a commercially viable way by juggling the trade-offs of maximizing customer value within constrained costs.

For many years, manufacturers have used the design-to-value (DTV) model to manufacture products at lower costs while retaining the features needed to compete. These principles have now evolved into design for value and growth (D4VG), a new way of creating products that provide exceptional customer experiences. Under D4VG, design not only creates value but also generates growth, through products with the features, form, and functionality that turn customers into loyal fans and leading to above-trend sales.

In addition to generating badly needed growth, well-designed products can also raise margins—even if, initially, D4VG products can cost more to build. That sounds counter-intuitive, but makes sense if considering how a design can evolve over time. The upfront investment in a design that includes extra features or more costly materials pays off if those design choices are based on a clear understanding a product’s core brand attributes, deep insights into consumer motivations, and innovative design thinking. These are the designs that hook customers. Once hooked, redesigns that focus on clever cost reduction lead to second- and third-generation products that are significantly more profitable. The impact of this approach is highlighted in research by the Design Management Institute. Over a 10-year period,

from 2003 to 2013, design-led firms delivered returns 228 percent above those of the Standard & Poor's 500 index (Exhibit 1). When we reviewed the institute's figures in May 2015, the outperformance was still at 219 percent.¹

Exhibit 1 Over a ten-year period, design-led firms outperformed the S&P by 228 percent.



Source: Design Management Institute; McKinsey analysis

Apple is the poster child for the D4VG-led approach. When the iPhone debuted in 2007, its sleek metal case, sharp screen resolution, and easy user interface set it apart from any other phone on the market and created a massive fan base. Since then, Apple has not only managed to increase customer value through each generation of iPhone, it has also steadily cut costs. The features of the iPhone 5, released in 2012, dramatically improved on those of the original 2007 model,² yet estimates suggest that bill-of-materials costs (including 26 percent lighter packaging with 41 percent less volume) were 8.6 percent lower (Exhibit 2). The iPhone 5 was followed by the iPhone 5S and 5C. The former, using a lower-cost polycarbonate casing instead of a metal one but offering similar functionality, was built to attract more cost-conscious customers.

Apple is not unique. Design-led value creation is being used across industries, including in CPG, by some of the largest global players. Still, most companies have not seized the D4VG opportunity. Despite the evolution of design-led product

Exhibit 2

Later iPhone models packed more features at lower cost to Apple.



Source: McKinsey teardown analysis, web literature searches, iSuppli, HIS news release 2013

development, many companies still see it as a cost-reduction approach, often as part of a procurement cost-saving drive. Or they tinker around the edges, making minor changes they perceive will do no harm to the integrity or appeal of the product, such as thinning package walls or reducing the number of color variants. But they aren't thinking about design that enhances the user experience and improves the desirability of a product, which would lead to higher sales and stronger customer loyalty.

Building capabilities for design-driven growth

The key to design-driven growth is blending traditional design-to-cost principles with consumer insights and specialized product-redesign expertise to create a winning combination of lower costs and more desirable products. This enhanced, reinvigorated approach requires an end-to-end perspective on D4VG:

- Knowledge of the competitive landscape to frame the product space
- Insights about competing products to understand potential alternative offerings and learn from companies facing similar design challenges

- Insights from customers to determine what makes them desire a product and what they are willing to pay for
- A complete understanding of a product's cost drivers and of production capabilities and constraints to ground discussions about feasibility and cost limits
- Design teams that bring together this knowledge in desirable product options

For the purposes of this article, we will focus on generating consumer insights and using design thinking. Other steps in the standard DTV process, such as competitive product teardowns, factory walkthroughs, and supplier workshops, are core parts of the D4VG diagnostic framework but much has been written on them previously.

A D4VG toolkit

Fundamentally, the customer must be at the heart of successful D4VG. The head of R&D at a major food producer notes that D4VG's importance lies in how it leads with an understanding of customer desires, which it combines with customer and competitive insights for product designs that deliver improved quality and customer experience at a lower cost. Furthermore, the alignment D4VG produces around customer needs helps resolve what the company should prioritize in new designs.

Critical to D4VG is a set of six next-generation customer-insight tools that avoid the unconscious bias inherent in classic interview or survey questions. They provide a more sophisticated way to look at customers' behavior and assess their reaction to different product features.

- **Use it or lose it** analysis systematically maps choices against consumer preferences to understand whether customers value specific features or attributes, which can be omitted if they do not make the cut.
- **Technical testing** uses competitive benchmarking to clarify the performance-versus-cost trade-offs of design choices.
- **Buzz analytics** researches customer opinions captured on websites and social media about product features and attributes, then maps the relative importance of each feature to the brand's overall performance.
- **Product testing** via mock shopping experiences determine if consumers notice premium attributes in blind testing.

- **MaxDiff surveys** help companies understand the relative importance of product features and attributes by asking participants to make trade-off choices.
- **Conjoint or other kinds of quantitative analysis** help identify which attributes are the most important to customers and how much value they attach to each attribute.

Organization for D4VG

To succeed at D4VG, however, companies need more than just new capabilities — they also need the organization and mind-set to use them fully. All too often, we see clients requiring help with problems that result from unresolved conflicts between different functions, such as marketing, R&D, and product design. Marketing wishes to please customers with a “gold standard” product at a competitive price, or want to avoid any impact on a successful brand; product design and R&D are under pressure to keep down costs. Despite the best intentions, these cross purposes can lead to a stalemate that delays new products. For example, at a leading fast-moving-consumer-goods company, the design team couldn’t make changes without explicit agreement from marketing, which meant that someone from senior management had to weigh in before design changes could be seriously considered.

D4VG counters these effects by relying on cross-functional teams that bring together the core stakeholders: purchasing, manufacturing, R&D, quality, marketing and sales, finance, and design. Team members hammer out their differences within the group, reaching alignment by focusing on the customer needs in question. For example, a European dairy producer set up an intensive, four- to five-month product category review process led by cross-functional working groups. Comprising about ten people, with expertise in product development, production, packaging, marketing, and distribution, the groups created a suite of product-redesign initiatives that were then validated and implemented, as appropriate, by the product-development team.

That approach needs strong leadership to bring together a diverse range of stakeholders. For example, when a global electronics manufacturer went through a two-year D4VG program to save more than \$1 billion while intensifying its products’ desirability, it set up a clear governance structure to oversee the work. A new global head of D4VG, reporting to the global chief procurement officer, led a team of D4VG project leaders who had a specific mandate to partner with stakeholders across the company’s markets and businesses to promote the development and implementation of ideas.

Many companies that wish to embed D4VG in their processes have invested in dedicated design organizations, which may be led by a chief design officer. In CPG, a North American food company sought to ensure sustained impact from its D4VG group by following three principles for organizational alignment:

- Define clear role boundaries between D4VG and R&D
- Have the D4VG organization report directly into a senior leader (initially the COO) to give it a seat at the table when decisions are made
- Help the design organization move beyond a design-to-cost mentality and find opportunities to add value

To this end, the company used D4VG to maximize margins and optimize prices, with a new focus on understanding customer desires, enhancing existing products, and developing new ones to meet unmet needs (such as through ingredient substitution). To keep the customer central to its design approach, it developed a new method for testing ideas jointly with retailers prior to product launches. These changes, together with a more traditional DtV approach to redesigning its current portfolio, enabled the company to review and tweak its product line— enhancing customer experience while eliminating costs. Now repositioned against its competition the company has generated significant margin benefits over a sustained four-year process.



We see a bright future for D4VG. With consumers increasingly influenced by design, we believe that design-driven companies will continue to outperform their peers in both sales and profit growth. DV4G is a critical tool for growth-oriented companies that want to exploit consumers' unmet needs by creating new features, appealing to their aesthetic sensibilities, and building strong customer loyalty to.

¹ Jeneanne Rae, *Good Design Drives Shareholder Value*, May 2015, dmi.org.

² For example, a better display, additional memory, lighter weight, voice control, and a digital assistant (Siri).

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D4VG case study: ecobee

Toronto-based ecobee helped create a new thermostat category by being first to market, in 2009, with a Wi-Fi-enabled smart product. But it was overtaken in 2012, after competitors launched a thermostat that attracted a broader base of consumers. A design company, engaged with a remit to help ecobee regain market share, designed a program of qualitative research conducted with professional installers and homeowners to understand the ecosystem of selection, purchase, installation, and use. Following a development plan that included generating insights, prototyping concepts with users, and engineering solutions to technical challenges, the design team identified ecobee's "ownable" differences and unearthed crucial expectations that would set the new offering apart from its chief alternatives.

This design work led to the development of a new-to-market feature—remote sensors that help the system know where you are in your house and the temperature there—that gave the user greater control over all the spaces in the home, not only in the thermostat's front-hall location. The new "squircle" shape is a recognizable icon (Exhibit 3). Moreover, the user experience and interface have been tailored for each context: wall, mobile, and PC.

The ecobee3 has been recognized in multiple design competitions: a Spark Award in 2014, the PC Magazine Editor's Choice Award in 2015, and an iF Product Design Award in 2016. This design, which enabled ecobee to launch directly in several additional retailers, has driven significant growth, and it is the highest-rated smart thermostat in leading retailers' online stores.

Exhibit 3

A thermostat illustrates better design.



McKinsey Design

McKinsey has a strong design-to-value (DTV) track record, with more than 100 global experts and consultants and a network of external experts. In the past four years, they have worked on 300-plus DTV engagements, about 25 percent of them in the consumer sector. We have nine product-teardown centers (in East Asia, Europe, India, and the United States), with a direct link to McKinsey's global sourcing expertise (such as our sourcing centers in Wroclaw and Shanghai). Our functional and industry practices allow us to leverage a broad understanding of all elements of the value chain: consumer, marketing, manufacturing, and supplier. For example, our global Consumer and Shopper Insights Practice has over 25 years of business-oriented perspectives on consumers and shoppers, as well as more than 120 experts and analysts in ten countries and 20 cities working on 500-plus client engagements annually.

To help our clients develop design-led approaches to growth, McKinsey has built significant next-generation design tools and created the six core customer-insight tools detailed in the article. Further, in 2015 we gained specific expertise in design-driven growth by acquiring LUNAR, a global design and engineering firm with over 30 years' experience delivering maximum impact for clients through beautiful, ingenious, and charismatic products and experiences. LUNAR, a leader in its field, has offices in Asia, Europe, and North America (enabling global coverage) and an international client list. Its work for its clients has received over 150 design awards.

The LUNAR team creates new products and services with a distinctive visual expression, useful and novel functions, and deep meaning for consumers. Together, these capabilities have created a core offering focused on three primary services:

- The targeted conceptual design and development of a product, service, or package for handoff to the supply chain, engineering, or developers
- Solutions created through the end-to-end design and development of branded products and packaging, including rapid insights and ideas about opportunities to differentiate brands, immersion with disruptive companies and experts on disruption, capability building, and (as required) coaching
- Product, brand, and design strategy, which helps organizations either to manage growth initiatives by identifying opportunities, their potential impact, and priority investments or by transforming (or, where needed, turning around) product portfolios

LUNAR's mantra is that superlative design links strategy to the real world and represents a powerful approach for transforming businesses into responsive, agile organizations in an increasingly turbulent business environment. The intersection of three factors engages consumers emotionally and gives them a better experience:

- Beauty — a powerful brand expression engendered by the aesthetics of products and born of a distinct and harmonious point of view
- Delight — satisfying unmet needs in surprising and fulfilling ways that bond users to a brand experience or service
- Ingenuity — the seemingly complex or impossible becomes pure elegance in the hands and minds of users

Through LUNAR, McKinsey brings clients a range of capabilities to improve design-led innovation for consumers and businesses. LUNAR combines comprehensive tools for generating insights with experienced business and design expertise to provide a holistic view of product and business strategies. Its world-class design and engineering services have become part of a proven innovation process refined across 350-plus engagements, including global prototyping and testing for actionable feedback, as well as building capabilities that get great products and services to market.



Simpler is (sometimes) better: Managing complexity in consumer goods

Christina Adams, Kari Alldredge, Curt Mueller and Justin Whitmore

Here's how consumer-goods manufacturers can master complexity — and even turn it to their advantage.

With consumers' product preferences diverging and retail formats proliferating, consumer-packaged-goods (CPG) companies have compelling reasons to constantly launch new SKUs. Fast-growing niche markets — such as health and wellness products, socially and environmentally responsible wares, and ethnic foods — represent enticing opportunities for CPG companies, as do new online and offline retail channels. Indeed, product innovation can help CPG companies win shelf space and capture growth, which is crucial at a time when many CPG categories are experiencing flat sales. But manufacturing more SKUs means having more complexity in the entire business system — and that's not a trivial matter to CPG companies already under pressure to cut costs and to become ever more efficient. We estimate that complexity among food-and-beverage manufacturers, for example, is costing them as much as \$50 billion in gross profit in the US market alone.

Many companies are painfully aware of the problem, and acknowledge the difficulty of keeping complexity under control. CPG executives from a range of companies — including Campbell Soup, Colgate-Palmolive, ConAgra Brands, Hershey, and P&G — have made public statements about their efforts to reduce complexity in their businesses. It's a tricky undertaking, precisely because some level of complexity is necessary and advantageous. Traditional approaches to simplification — such as “cutting the tail,” or discontinuing the lowest-volume SKUs — are suboptimal, both because they tend to address only one aspect of the business system (a cut-the-tail program is all about assortment) and because they can produce unintended

consequences. For example, by discontinuing a low-volume SKU, a manufacturer might inadvertently eliminate a product that plays a unique strategic role in the assortment. Or it might unknowingly drive up the per-unit cost of manufacturing other SKUs made on the same production line.

Companies should take a more nuanced approach to managing complexity. Specifically, they need an approach that takes into account both commercial and operational perspectives, uses big data and analytical insights, and sets aspirations and action plans that the entire organization can agree on. In our experience, such an approach can help a CPG manufacturer achieve significant impact: a net revenue increase of one to four percentage points, margin improvements of three to six percentage points, and asset-productivity gains of 10 to 25 percent — even as it trims its SKU count by 25 percent. To top it off, the company will also likely increase its speed to market, improve shelf availability, and boost customer satisfaction.

Two kinds of complexity

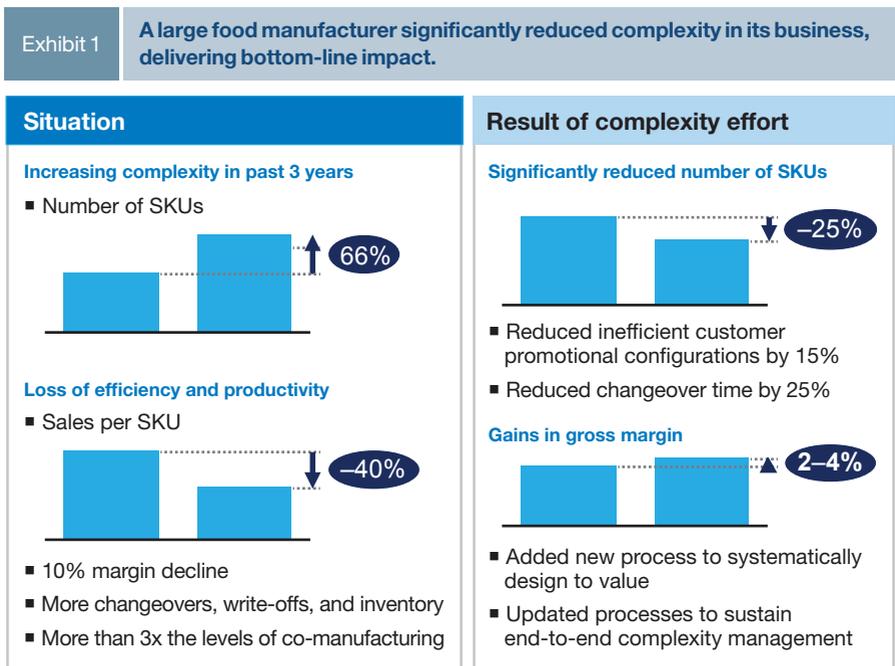
The key to mastering complexity is to recognize that there is both good and bad complexity, and then to systematically distinguish one kind from the other. Good complexity drives incremental sales and volume that exceed the incremental expenses incurred, or results in a favorable shift of the product mix. Good complexity can take the form of new SKUs that fill unmet consumer needs or that capture growth in emerging segments (such as gluten-free foods or organic products), new price tiers that allow for better margin management or that fulfill additional need states, or the addition of unique ingredients that influence consumers' purchasing decisions (such as Angus beef or antibiotic-free chicken). In other words, good complexity more than pays for itself. Bad complexity, on the other hand, erodes profit, increases inventory, and makes the supply chain less agile.

To ensure that it's adding only good complexity to its business, a company must become adept at figuring out what products and features consumers are willing to pay for. The company must then put in place the supply-chain systems and capabilities that will enable it to bring those products to market profitably.

Consider the case of a global food manufacturer. In one of its leading business units in North America, SKU count had risen by 66 percent in just three years, mainly because of three types of items: line extensions (such as low-calorie versions of existing products), new pack sizes, and products developed for specific retailers or channels (SKUs customized for the dollar-store channel, for instance). In response to retailer pressure and fierce competition, the company had added new items without

discontinuing any older ones. During the three-year period, sales per SKU dropped by 40 percent. Furthermore, some of the new SKUs contained allergens that required separate storage space and long changeover times; other new SKUs had packaging configurations that required co-manufacturing and new online capabilities. The company thus found its productivity and efficiency declining. Margins fell by as much as 10 percent in select categories.

Alarmed at the company's deteriorating performance, the top team launched an ambitious simplification program. Instead of resorting to a traditional cut-the-tail exercise, it used advanced analytics to understand sales by region and to assess the true incremental value and cost of each of its SKUs. It found that the new pack sizes drove incremental sales and could be manufactured less expensively; on the other hand, sales of the new SKUs containing the allergen, although stronger than expected, fell short of covering the additional costs of manufacturing them — so those SKUs were discontinued. The results of the program: SKU count dropped by 25 percent, changeovers became speedier, and gross margins improved by 2 to 4 percent (Exhibit 1). In short, the company dramatically reduced the bad complexity that had clogged up its supply chain.



Another company, a US-based packaged-food producer, didn't just get rid of bad complexity but also added a considerable amount of good complexity. For one of its main brands, the company eliminated ten low-volume SKUs but didn't reduce its SKU count. It instead replaced those SKUs with new items that filled identified gaps in its assortment—for example, it introduced more vegetarian items, which consumer research showed would attract new customers to the brand. It created a new price tier targeted at consumers looking for trade-up options. The company also reformulated certain low-margin SKUs and reduced the number of ingredient variants for selected categories. The expected impact of these and other program initiatives: more than \$50 million in run-rate gross margin across five brands.

An end-to-end view of complexity

Many CPG companies tackle complexity by undertaking either a SKU rationalization or a manufacturing optimization, usually led by the supply-chain side of the business. While such initiatives can certainly tame complexity, they are limited in scope and won't be nearly as effective as a multifunctional program.

We recommend that companies take a full-system view instead—that is, they should examine all the possible entry points for complexity using what we call “market back” and “supply forward” lenses (Exhibit 2). Market-back considerations have to do with what consumers and retailers care about—for example, assortment, pricing, and promotions. The supply-forward lens gets at how the company should manage operations, including its innovation pipeline, product-design processes and platforms, and supply-chain structure.

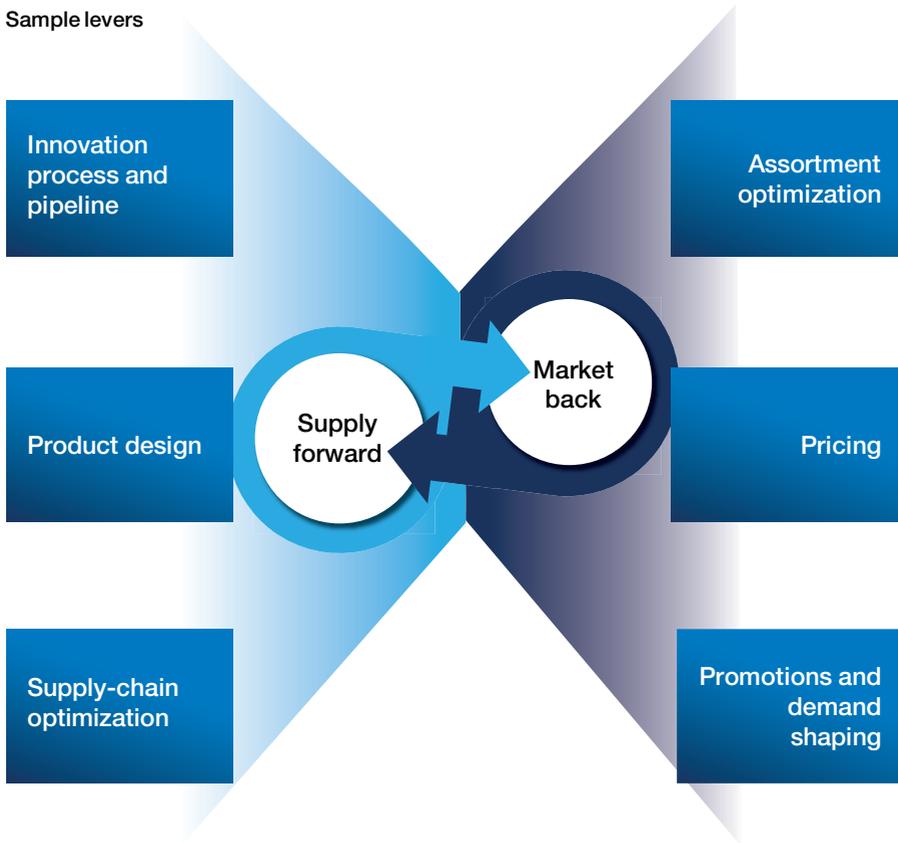
The most relevant market-back and supply-forward levers will differ for each company. A CPG manufacturer may find it useful to think about a series of questions from both a market-back and supply-forward perspective (Exhibit 3). Answering these questions can serve as a quick diagnostic to uncover the root causes of complexity, or the “complexity hot spots,” in a company's business.

For example, as shown on the exhibit, Company A—a manufacturer of both branded and private-label products—relies heavily on inorganic growth, frequently introduces new products, has an efficient but relatively inflexible manufacturing network (which makes launching each new product a rather expensive venture), and is highly exposed to commodity risk. Given these hot spots, assortment optimization would be an important lever for Company A. Less so for Company B, which isn't acquisitive and has a limited product portfolio that it sells through only a few channels. A complexity-management program at Company B should instead prioritize other levers, such as revamping the promotion architecture.

Exhibit 2

Complexity should be viewed through both 'market back' and 'supply forward' lenses.

Sample levers



Regardless of which specific market-back or supply-forward levers a company decides to focus on, it should seek to tap into the powerful insights that big data and advanced analytics can deliver. Take assortment as an example: successful assortment optimization relies in part on how well a company understands consumers' buying decisions—which product attributes matter most to them when buying a certain product, which products they consider interchangeable, and so on. Through big data analytics, CPG companies can now generate quantified and actionable insights into consumers' decision-making processes, thus helping them more precisely refine their assortments.

Exhibit 3

A series of questions can help companies identify their ‘complexity hot spots.’

Market back

How important is **M&A** to our growth strategy?

How rapidly have we increased our rate of **new-product introductions**?

How much do we **personalize or customize** our assortment based on channel and consumer trends?

How complex are our **promotional** tactics (eg, advanced analytics)?

How diverse is the set of **channels** that we serve?

Supply forward

How flexible is our **manufacturing technology** and footprint?

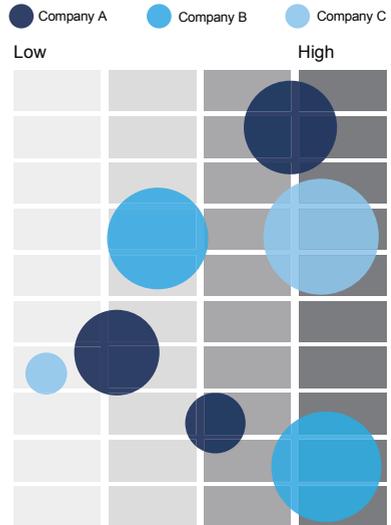
How well does our **distribution** capability enable channel growth (eg, last mile)?

How well do we adjust pricing and sourcing tactics to react to **commodity volatility**?

How well do our **partnerships** (eg, sourcing, co-manufacturing, joint ventures) enable network flexibility?

How strong are our **capacity and capability** in key categories?

Source: McKinsey analysis



Preventing ‘complexity creep’

To prevent bad complexity from creeping back in after a complexity-management effort, a company must redesign its business processes so that they systematically eliminate waste and inefficiency while also supporting good complexity. In particular, companies can take the following steps.

Establish a cross-functional governance structure. It’s easy for each function to revert to the habit of focusing exclusively on its own goals and coming up with siloed functional solutions, instead of taking an end-to-end view of complexity. To ensure that various functions continue to collaborate with each other, CPG companies would do well to create a cross-functional governance structure, with a defined cadence of meetings. For example, a leading food manufacturer established a recurring series of cross-functional working sessions involving brand teams, product-development teams, and line-level factory workers. During these sessions, participants discuss which SKUs and ingredients drive complexity, align on the biggest areas of opportunity, and develop potential solutions. When line workers observed that the penne in a pasta dish tended to bounce out of trays during the manufacturing process—requiring human intervention, slowing production time, and sometimes

resulting in food waste—the cross-functional team decided to replace the penne with a different pasta shape. Changes like these amounted to \$1 million in annual savings across three manufacturing plants.

Regularly pay attention to a range of metrics. When leaders become overly focused on only one or two financial measures—say, sales or gross margins—they ignore metrics that might be just as important, and often end up making suboptimal business decisions. The most successful companies consider metrics such as incrementality, velocity, and all-commodity volume distribution (a measure of a product’s availability at retail stores), giving them a fuller understanding of each SKU’s costs and contributions.

Change mind-sets. Complexity management shouldn’t be an episodic, ad hoc activity. Sustained improvement requires wholesale changes in mind-sets and behaviors. As part of broader efforts to embed a complexity-management mind-set into its business processes, a CPG company established a “one in, one out” rule for line extensions: each time it introduced a new SKU, an older SKU had to be discontinued. It created and maintained a “SKU watch list” that was on the agenda at every portfolio review and at annual planning meetings, and executives engaged in active SKU-discontinuation conversations throughout the year, both internally and with retailers.



Mastering complexity need not be a long and arduous undertaking. We’ve seen companies assess their situation, identify the most relevant complexity-management levers, prioritize and plan initiatives, implement those initiatives, and reap the benefits—all within a three- or four-month period. These companies then took steps to ensure they sustain the right level (and the right kind) of complexity in their supply chain. The results are anything but complicated: better financial performance, faster innovation, and greater customer satisfaction.

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The authors wish to thank Eric Wilson for his contributions to this article.



3. Strengthening enterprise resilience





The truth about zero-based budgeting: ZBB for consumer-goods players

Kyle Hawke, Matt Jochim, Carey Mignerey and Allison Watson

Ten myths and realities illustrate the power and practicalities of zero-based budgeting for the consumer-packaged-goods industry.

In industry after industry, zero-based budgeting (ZBB) is capturing the imagination of investors, analysts, boards of directors, and corporate executives as the methodology gains traction—and continues to deliver results. But nowhere has the interest been greater than in the consumer-goods sector, where industry leaders are delivering savings that would have seemed impossible a few years ago.

Skepticism remains. Some organizations' financial results have been much less impressive, expanding margins by little more than what traditional cost-cutting methods would achieve, even as executives proclaim they are "doing ZBB." In other cases, tales of draconian travel policies and underinvestment in growth have caused management teams to pause. As a result, many executives still wonder whether ZBB is an appropriate discipline for their organization—whether the results would justify the effort they envision.

The truth is that even now, several years after ZBB burst back onto the scene, many executives remain somewhat mystified by exactly how ZBB achieves and sustains its results. However, we continue to believe that this powerful methodology—formed upon simple tenets of visibility, accountability, challenge, and resource reallocation—has unprecedented potential to unlock tremendous shareholder value in the consumer-goods sector (and beyond).

By contrasting ten myths with the corresponding realities we have encountered in our discussions with a wide range of organizations, we aim to clarify what ZBB is really all about: what changes it requires, what actions are necessary for successful implementation, and how organizations can adapt ZBB to achieve desired results. All of this is rooted in a fundamental belief that, when applied properly, ZBB can achieve even the highest aspirations of companies' stakeholders.

Myth one: ZBB simply means 'building your budget from zero'

Reality: ZBB is a repeatable process to build a sustainable culture of cost management.

Zero-based budgeting is much more than building a budget from zero. The most effective ZBB efforts build a culture of cost and performance management throughout the organization by using a structured approach that includes process, systems, governance, and incentives. And all of these elements must be present. For example, it is quite common for budget owners to use bottom-up budgeting to create the organization they envision. But without systematic visibility, accountability to ambitious targets, and governance mechanisms to challenge budgets and reallocate resources, breakthrough results are difficult.

Myth two: There should be only one way to do ZBB

Reality: ZBB programs vary in both rigor and results.

ZBB's reputation is making this method more popular, but not every ZBB program is equally rigorous, measured in terms of the extent of its aspirations, the discipline of its approach, and ultimately, the impact realized. The greatest impact results when the aspirations are high and the approach is thorough, with sustained top-down leadership and bottom-up organizational commitment. Moreover, the approach—which depends on cultural change—is what matters for the long run and is often difficult to achieve. When organizations don't fully embrace ZBB as a mind-set, they risk having the program turn into just another cost-cutting project whose effects fade within a year or two.

Under the umbrella of ZBB methodology, there are range of choices an organization can validly make. Among them are the degree and pace of savings to be attained—targets that are best determined at the CEO level to fit the company's overall strategy and financial objectives. Additionally, companies must decide how to roll out and govern ZBB—for example, whether to address the entire company at once or to start with individual functions, businesses, or regions.

But some choices can undermine ZBB's effectiveness. A few organizations have tried to omit the granular, bottom-up budgeting and resource-reallocation decisions that ZBB calls for. While we recognize that some of ZBB's principles can apply to other contexts, changing these fundamental ZBB components results in a different kind of process, which might instead be called "zero-based cost management."

Myth three: ZBB is just a more aggressive version of the productivity initiatives we have always done.

Reality: ZBB is fundamentally different from typical cost-cutting because it switches the "burden of proof" for spending.

Standard cost-cutting programs typically start with a directive to reduce the previous year's spending levels. As a result, executives naturally focus on the largest expense categories—the tallest trees in the forest. ZBB instead asks everyone to rebuild their budgets from the bottom up, with no carryover from the preceding year. This process identifies many small pockets of waste that add up to big savings. It also yields a better fit with the business's priorities by tapping broader management understanding of choices and trade-offs.

Moreover, ZBB shifts the burden of proof from those tasked with driving cost reduction (such as a finance team or productivity program management office) to the business leaders and frontline organizations, which must contribute both to identifying unproductive costs and eliminating them in practice. Instead of debating targets until they disappear, ZBB shifts the organization's focus to asking, "What would it take to hit the target?"

Myth four: Implementing ZBB requires cutting 'to the bone'

Reality: The degree of cost reduction is based on the company's top-down target.

Headlines often associate ZBB with cutting costs to the bone, using any means necessary: sharing hotel rooms or centralizing trash bins, for instance. In some situations, measures such as these become part of the productivity culture, but they are by no means necessary for every company on a ZBB journey. The degree of cost management reflects the size of the specific organization's top-down savings aspiration, and efforts can be tailored to fit the business strategy and employee value proposition. We've seen year-one reduction targets range from an aggressive 30 percent down to a still-substantial 10 percent.

Myth five: ZBB will overwhelm your business and prevent it from doing anything else

Reality: Initial rollout of a new ZBB program can be facilitated by a central team and completed in four to eight months.

One executive told us, “I simply cannot afford to ask the entire company to stop what they’re doing for the year to implement ZBB.” But the idea that ZBB requires dedicated focus from every employee for a year or more is simply not true. While it takes time to embed a new cost-management culture into any organization, the requirements for setting up and rolling out the initial ZBB program are much more limited.

During the setup phase, a central coordination team develops deep visibility into costs and sets savings targets for the upcoming budgeting cycle. The team also ensures that the company’s systems and processes are in place for the detailed reporting, governance, and performance management needed for world-class ZBB. In our experience, this setup period could take anywhere from four to eight months and is primarily led by full-time support from finance and IT, with part-time involvement from P&L and cost-category owners across the company.

Organizations that are unsure about ZBB’s impact should test-drive the process. One company, for instance, started its ZBB rollout in its global finance function—the very team that would be charged with supporting ZBB across the rest of the business. This approach built team-member capabilities that were essential to drive the program more broadly, while also helping the team meet its existing budget targets.

Myth six: ZBB focuses only on SG&A

Reality: ZBB can be applied to any type of cost: sales, general, and administrative (SG&A) costs, marketing costs, variable distribution costs, and cost of goods sold.

The fundamental elements of a ZBB program—governance, accountability, visibility, aligned incentives, and a rigorous process—form a comprehensive cost-management tool kit. However, certain adjustments need to be made in particular areas. For example, when ZBB is applied to variable costs (such as cost of goods sold or distribution expenses), the budget needs to be volume adjusted in monthly performance reports.

In marketing, ZBB breaks down costs not only by type of expense but also by product or brand, clarifying the link between investment and return. Low-return investments are then rooted out and eliminated so the resources can be reused elsewhere.

Myth seven: ZBB is not designed for growth-oriented companies

Reality: Growing companies are successfully using ZBB to reallocate unproductive costs to more productive areas.

Whether an organization focuses on growth, profit, talent retention, or any number of other strategic factors, cost management remains crucial to its success—and ZBB can be a powerful tool. ZBB is not a slash-and-burn exercise that cuts costs without regard for consequences; in fact, it's the opposite. Eliminating unproductive costs allows those resources to be reallocated to whatever the company determines is more productive: back-office costs can be channeled to customer-facing activities, or real-estate expenses turned into digital investments. Every effective ZBB program we have seen has a rigorous annual process for resource reallocation. Deep visibility into costs thus enables surgical changes that cut the fat while building organizational muscle, and can even energize employees by helping drive growth and competitiveness.

Myth eight: ZBB is only about cost cutting

Reality: ZBB is just as much about performance management as it is about cost management.

Cost is the variable that managers have the most control over. Yet most CPG managers' incentives are largely based on sales and profit, with the assumption that cost, which lies in between, will take care of itself. For ZBB to be sustainable, performance standards for managers must include cost-based metrics. One CPG company, for example, supported its ZBB implementation by incorporating obsolescence costs into its innovation teams' performance scorecards. With that metric in place, managers not only would be credited for increased sales from new products, but also would be accountable for the downstream effects of poor product launches.

Accountability and performance management also come in the form of everyday operations and decision making. Think of how companies justify IT projects by estimating how the new technology will help particular businesses or functions. A

CPG company might implement a warehouse-management system with the intent of reducing distribution costs through improved productivity. But anticipated cost reductions are rarely translated into budgets; leaders typically just hope the financial benefits will come through. ZBB flips that process on its head: it embeds the target in the approved funding plan for the project, thus creating real accountability for managers to deliver expected results.

Myth nine: ZBB is a static methodology

Reality: The ZBB methodology has been evolving for half a century, and recent innovations are making it more sustainable—and easier to start.

New technologies are making ZBB less burdensome. In place of central teams coordinating thousands of spreadsheets, new digital solutions manage enormous quantities of data almost instantaneously. This not only reduces the need for cumbersome data-gathering exercises, but also enables organizations to bring ZBB to scale much faster. The level of detail is far greater as well, revealing that, say, an HR organization is doing 450 relocations per year at an average cost of €65,000 with a range of €10,000 to €300,000—a much more useful insight than a simple total indicating that relocations cost €20 million per year.

Myth ten: Reinvested savings won't be seen on the bottom line

Reality: Reinvestment is designed to drive growth—profitable growth.

If a company reinvests €1 million in an area of profitable growth, the CFO should see that show up as an EBITDA improvement of more than €1 million. Whether to drop savings to the bottom line or reinvest in growth should depend on the company's situation and is a broader strategic consideration. When the decision is to reinvest, ZBB's granular visibility and performance-management model guide reinvestment allocations across functions and business units to the most productive areas. Leaders throughout the organization can see the results—separately monitoring the “ins” of productivity savings and the “outs” of reinvestment. In this way, ZBB helps companies overcome the difficulty of managing aggregated inflows and outflows, and it increases the likelihood of profitable growth.



When done well, zero-based budgeting can drive significant, sustainable savings and is a machine for efficient resource reallocation. But getting it right requires leadership

stamina to see through initial resistance. World-class ZBB programs build a culture of cost management through unprecedented cost visibility, a unique governance model, accountability at all levels of the organization, aligned incentives, and a rigorous and routine process. When these elements are in place, ZBB lets organizations free up unproductive costs and redirect those resources toward profitable growth.

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Starting at the source: Sustainability in supply chains

Anne-Titia Bové and Steven Swartz

By working closely with their suppliers, consumer companies can lessen their environmental and social impact and position themselves for strong growth.

The next 10 to 15 years will present major opportunities for consumer companies. Some 1.8 billion people are expected to join the global consuming class by 2025, a 75 percent increase over 2010.¹ Consumer spending should rise even more than the number of consumers as household incomes swell and people use bigger shares of their budgets to buy consumer goods. China, for example, is on track to gain 100 million working-age consumers by 2030, and it is expected that their spending on personal products will be double the current rate.²

These trends contribute to a strong growth projection for the consumer sector: 5 percent per year for the next two decades. For investors, this level of expected growth should be good news. The worth of a company can be expressed as the sum of two values: the present value of the company's current cash flows extended into the future, and the present value of the expected growth in its cash flows. When we studied the enterprise value of the top 50 publicly traded consumer-packaged-goods (CPG) companies, we found that their expected cash-flow growth makes up roughly half of their current value. Because of this, factors that alter these companies' growth projections will also have a major effect on their total returns to shareholders (Exhibit 1).

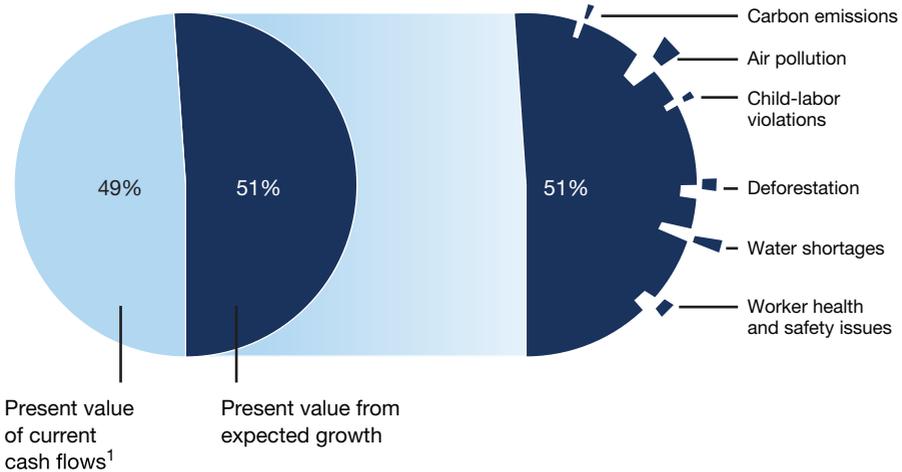
One condition that can slow a company's growth is poor sustainability performance, as measured in environmental and social impact. To make and sell goods, consumer businesses need affordable, reliable supplies of energy and natural resources, as well as permission from consumers, investors, and regulators to do business. But companies can no longer take those enabling factors for granted. Indeed, scientific consensus, along with pledges by governments and business leaders — including the leaders of some of the largest consumer companies — calls for dramatic improvements in sustainability performance.

Exhibit 1 Sustainability factors could alter the growth projections for consumer-packaged-goods companies, seriously affecting their total returns to shareholders.

Average for top 50 publicly traded consumer-packaged-goods (CPG) companies

Half of the enterprise value for top CPG companies depends on expected growth ...

... a growth which is vulnerable to being chipped away



¹ Current net operating profit less adjusted tax (NOPLAT) estimated for latest reported fiscal year held flat through perpetuity (NOPLAT divided by weighted average cost of capital). Value ranges from 18% to 88% across the 50 largest global CPG companies, whose combined market capitalization is \$2.68 trillion.

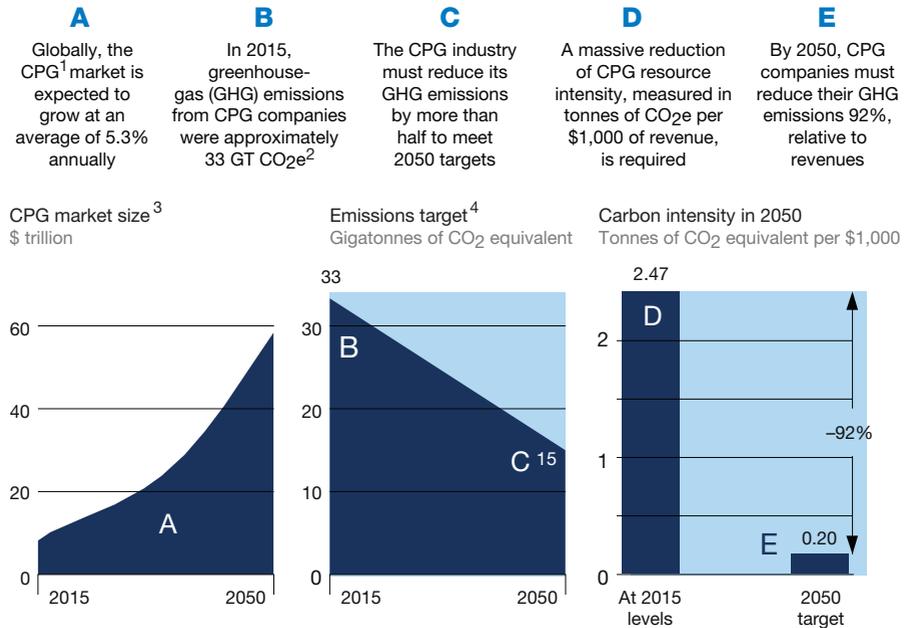
Source: Bloomberg; Capital IQ; McKinsey analysis

For example, the Paris Agreement, reached by 195 countries at the United Nations climate-change summit in December 2015, aims for reducing global greenhouse-gas emissions enough to prevent the planet from warming by more than two degrees Celsius. To cut their emissions in line with the Paris target while increasing sales at the projected rate of 5.3 percent per year, CPG companies would have to lower their carbon intensity—the amount of greenhouse gas emitted per unit of output—by more than 90 percent between 2015 and 2050 (Exhibit 2).

This figure suggests that consumer companies will have to greatly reduce the natural and social costs of their products and services in order to capitalize on rising demand

Exhibit 2

To achieve global climate goals while meeting growing demand, consumer-packaged-goods companies would have to significantly cut their greenhouse-gas emissions.



1 Consumer packaged goods.

2 Gigatonnes of CO₂ equivalent.

3 Based on estimated 5.3% annual growth of the global CPG market from 2013 to 2025 (\$7.5 trillion in 2013).

4 Based on 41% to 72% reduction in GHG emissions by 2050 required to maintain warming at below 2°C (2.1% annual reduction). Estimated consumer goods-related GHG emissions, from sourcing raw materials through disposal, were ~33 GT CO₂e in 2015.

Source: IPCC; McKinsey analysis

for them without taxing the environment or human welfare. To that end, some companies will benefit from innovations that allow products to be made using less energy and material and to be reused or recycled with ease (see “Toward a circular economy in food,” on page TK). As we explore in the rest of this article, consumer businesses are likely to find that their supply chains hold the biggest opportunities for breakthroughs in sustainability performance.

Supply chains: A missing link for sustainability

A high-functioning supply chain — the entire hierarchy of organizations, including energy providers, involved in making and distributing goods — can allow a consumer company to manage two types of sustainability-related risks. One type of risk has to do with the sustainability impact of providing goods and services to customers. The typical consumer company's supply chain creates far greater social and environmental costs than its own operations, accounting for more than 80 percent of greenhouse-gas emissions and more than 90 percent of the impact on air, land, water, biodiversity, and geological resources (Exhibit 3). Consumer companies can thus reduce those costs significantly by focusing on their supply chains.

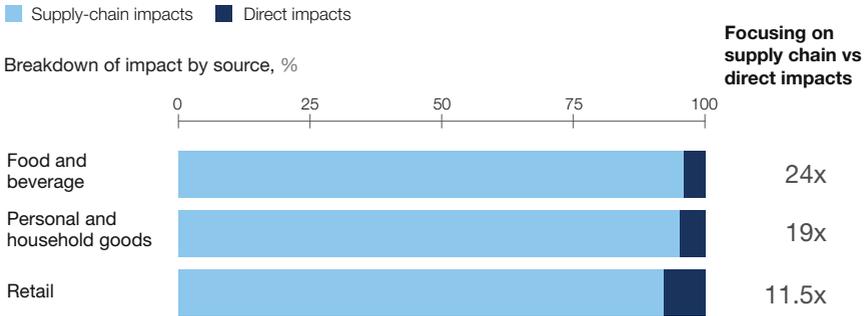
A second type of risk occurs because sustainability impact can interfere with consumer companies' supply chains. GrainCorp, a large Australian agriculture business, reported that a drought cut its grain deliveries by 23 percent, leading to a 64 percent drop in 2014 profits.³ Unilever estimates that it loses some €300 million per year as worsening water scarcity and declining agricultural productivity lead to higher food costs.⁴ In 2014, a ranking of the world's 100 most reputable companies included 8 apparel companies. Of those, 2 were dropped from the ranking in 2015, following the deadly collapse of the Rana Plaza factory in Bangladesh, which had been making goods for them, and they were left off the list in 2016.⁵

Notwithstanding the sustainability risks that lie in supply chains, relatively few companies are working with their suppliers to manage these risks. As an example, consider how businesses are addressing the climate impact of their supply chains. Of the companies that report their greenhouse-gas emissions to CDP, a nonprofit organization that promotes the disclosure of environmental impact data, only 25 percent say they engage their suppliers in efforts to reduce emissions.⁶

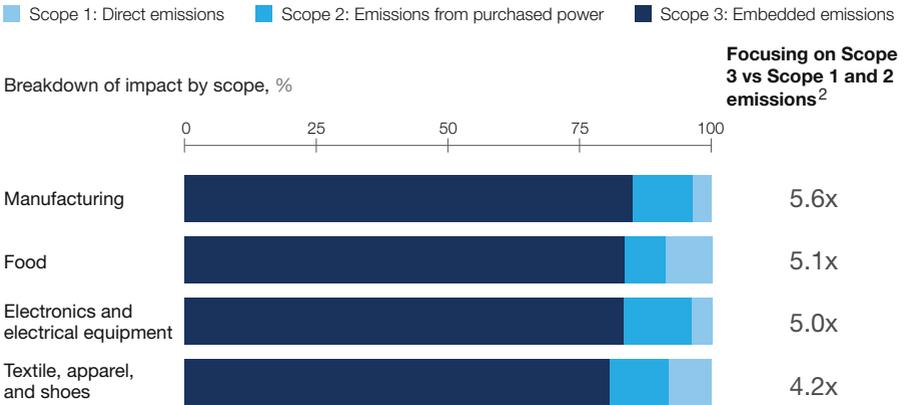
Even when companies attempt to influence their suppliers, they are likely to run into challenges. The biggest one may be that consumer companies do not deal directly with all the firms in their supply chains. Primary suppliers routinely subcontract portions of large orders to other firms, or they rely on purchasing agents to place orders with other firms. Subcontracting is especially common in the apparel industry; the fast-fashion business in particular requires large volumes of garments to be made in short time frames. Subcontractors can be managed loosely, with little oversight regarding workers' health and safety.

Exhibit 3 Most of the environmental impact associated with the consumer sector is embedded in supply chains.

>90% of natural capital impact (ie, affecting air, soil, land, etc.) of the consumer sector is in supply chains



>80% of greenhouse-gas (GHG) emissions in most consumer-goods categories are in supply chains¹



Only 25% of companies engage their suppliers to address Scope 3 emissions

Note: Supply chains are defined here as all the organizations, including energy providers, involved in producing and distributing consumer goods.

¹ Supply-chain impact multiples are lower for GHG emissions than for natural capital because GHG multiples consider Scope 1 and Scope 2 emissions jointly.

² Among companies that disclose to CDP.

Source: Carnegie Mellon University; CDP; GreenBiz; McKinsey analysis

Conditions such as these prevent consumer companies from knowing what sustainability impact occurs in segments of the supply chain where the impact is likely to be worst. In a recent survey by The Sustainability Consortium (TSC), a nonprofit organization dedicated to improving the sustainability of consumer products, less than one-fifth of the 1,700 respondents said they have a comprehensive view of their supply chains' sustainability performance. More than half reported being unable to determine sustainability issues in their supply chains.⁷ Until consumer companies identify the sustainability problems in their supply chains, they cannot begin to work with their suppliers on solving those problems.

Three approaches to improving sustainability in supply chains

In the eyes of shoppers and investors who are concerned about the sustainability of the goods they buy and the companies they own stakes in, consumer businesses are responsible for ensuring that their supply chains are managed well. These companies are also in a strong position to influence their suppliers. We believe three approaches can help consumer companies make their supply chains more sustainable. These include identifying critical issues across the whole supply chain, linking the company's supply-chain sustainability goals to the global sustainability agenda, and helping suppliers manage their impact.

Locate critical issues across the whole supply chain

To understand the impact of making consumer goods, companies must determine how natural and human resources are used at every step of the production process, whether in the supply chain or in direct operations. Companies must also consider a wide range of environmental, social, and economic issues. The tremendous variety of consumer products means that these issues can differ significantly from one product to another. For example, manufacturing LCDs causes the emission of fluorinated greenhouse gases, while coffee plantations are prone to hire underage workers to cultivate and harvest coffee beans.

Several organizations offer measurement frameworks and instruments that can help companies find the most critical sustainability issues in their supply chains.

- TSC has built a set of performance indicators and a reporting system that highlights sustainability hot spots for more than 110 consumer-product categories, covering 80 to 90 percent of the impact of consumer products.

TSC identified the hot spots and developed the performance indicators for them by reviewing scientific research and consulting with more than 100 stakeholder organizations.

- World Wildlife Fund (WWF) offers more than 50 performance indicators for measuring the supply-chain risks associated with the production of a range of commodities, as well as the probability and severity of those risks.
- The Sustainability Accounting Standards Board has developed standards that help public companies across ten sectors, including consumer goods, to give investors material information about corporate sustainability performance along the value chain.
- CDP and the Global Reporting Initiative have created standards and metrics for comparing different types of sustainability impact.

Link supply-chain sustainability goals to the global sustainability agenda

Once companies know where their supply-chain issues are, they can set goals for lessening the resulting impact. Ideally, they will base their goals on scientists' recommendations for bringing various types of sustainability impact under thresholds that will maintain or improve human well-being.

For example, the Intergovernmental Panel on Climate Change, a scientific body established by the United Nations, has defined global targets for reducing greenhouse-gas emissions. Based on these recommendations, CDP and WWF have calculated that the consumer-staple and consumer discretionary sectors in the United States should cut their greenhouse-gas emissions by 16 to 17 percent and 35 to 44 percent, respectively, to produce their fair share of global reductions between 2010 and 2020. Reaching those targets would also allow the consumer-staples sector to save \$15 billion and the consumer-discretionary sector to save \$38 billion in costs. The same report suggests that setting aggressive reduction targets makes it more likely that companies will achieve these goals and realize greater returns on their investments in reducing carbon emissions.⁸

General Mills used this approach to set an emissions-reduction goal for its entire value chain that corresponds to the internationally agreed upon target of lessening emissions by 41 to 72 percent, from 2010 levels, by 2050. With more than two-thirds

of its total greenhouse-gas emissions occurring in its supply chain, General Mills announced in late 2015 that it would endeavor to cut emissions “from farm to fork to landfill” by 28 percent within ten years. To reach these goals, the company is encouraging its agricultural suppliers to follow sustainable practices and has pledged to obtain 100 percent of ten priority ingredients from sustainable sources by no later than 2020.

Some suppliers have set sustainability targets of their own, ahead of receiving mandates from their customers. For example, Cargill has committed to creating a transparent, traceable, and sustainable palm-oil supply chain by 2020.

Assist suppliers with managing impact—and make sure they follow through

The purchasing power held by consumer companies and retailers gives them significant influence over their suppliers’ business practices. Relatively few companies in the consumer and other sectors use that influence to get their suppliers to reduce sustainability impact, though that is changing. Between 2010 and 2015, membership in CDP’s supply-chain program rose 30 percent but still stands at fewer than 100 companies, including 19 consumer companies. The number of suppliers reporting through the program increased fourfold, from 1,000 to more than 4,000. The supply chain collaboration has led to a reduction in carbon emissions of more than 3.5 million tons, with suppliers saving an average of \$1.3 million per emissions-reduction initiative.⁹

In recent years, consumer companies and others have adopted more sophisticated and effective methods for changing their suppliers’ practices. They have gone from disseminating codes of conduct, performing audits, and fielding questionnaires to helping suppliers design and implement sustainability programs that directly support the companies’ own goals. Campbell Soup Company, in collaboration with the Environmental Defense Fund, offers farmers technologies, guidelines, and products to help them optimize their fertilizer use and improve soil conservation.

Digital technology has also increased companies’ ability to assist large numbers of suppliers. In 2014, Walmart launched a program to help thousands of its Chinese suppliers make their factories more energy efficient through the use of an online tool. The program has enabled the average supplier to reduce its energy consumption by an average of 10 percent. Unilever uses a software tool, developed with the University

of Aberdeen, to collect data on whether farmers in its supply chain are using sustainable practices. Unilever offers them the tool for free, with the aim of procuring 100 percent of its agricultural content from sustainable sources by 2020.

To reinforce efforts like these, companies should monitor suppliers' sustainability performance and hold them accountable for it. Ultimately, consumer companies can only achieve ambitious sustainability goals if they set high standards for their suppliers' performance and stop doing business with suppliers that fall short — just as they do with other considerations, such as the cost and quality of goods and the timeliness of shipments.

Consumer companies can also offer their suppliers incentives for improving sustainability performance. Walmart has pledged that by the end of 2017, 70 percent of the goods it sells will come from suppliers that use the company's Sustainability Index, a supplier-sustainability scorecard that employs TSC's supply-chain performance indicators and reporting system. On Walmart's e-commerce site, companies with the highest Sustainability Index scores have their products tagged as "made by Sustainability Leaders," giving them an incentive to participate. Likewise, with the International Finance Corporation, Levi Strauss established its \$500 million Global Trade Supplier Finance program to provide low-interest short-term financing to suppliers that rate highly on Levi's own sustainability scorecard for suppliers.

Because supply chains overlap in many consumer sectors, companies have recognized the benefit of collective action and have begun working together to involve their supplier networks in sustainability efforts. For example, the Consumer Goods Forum (CGF), a global network of more than 400 retailers, manufacturers, and other companies, made a collective commitment in 2010 to achieve zero net 8 McKinsey on Sustainability & Resource Productivity Number 4, 2016 deforestation by 2020. CGF members are pursuing that goal through the responsible sourcing of four key commodities: beef, palm oil, pulp and paper, and soy.

Another example is the Accord on Fire and Building Safety in Bangladesh, which was set up after the collapse of the Rana Plaza factory. The accord aims to improve safety at factories by supporting independent inspections, remedial action, training, and disclosure of inspection reports. More than 200 apparel companies have pledged to inspect all of the 1,600 factories they work with. By December 2015, they had completed some 1,380 inspections.¹⁰



For years, most consumer companies paid relatively scant attention to whether their suppliers manage the social and environmental impact of their business activities. Now this is beginning to change, as consumer companies have come to appreciate the extent to which their supply chains contribute to global sustainability challenges, as well as the effects that poor sustainability management can have on their growth and profitability. A few leading consumer businesses, along with civil-society institutions, have created a widening array of practices and tools for working with their suppliers to lessen sustainability impact and have begun to realize the benefits of their efforts. Their experiences illustrate the possibilities for many more companies to initiate similar activities. Companies that manage their supply-chain impact may well be best positioned to gain from the boom in consumer spending that is expected to take place over the next decade and beyond.

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- 2 For more, see "Urban world: The global consumers to watch," McKinsey Global Institute, March 2016, on McKinsey.com.
- 3 Trevor Chappell, "Drought shrinks GrainCorp profit," Sydney Morning Herald, November 13, 2014, smh.com.au.
- 4 "Unilever CEO calls for decisive action to tackle climate change," Unilever, August 4, 2014, unilever.com.
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- 9 From agreement to action: Mobilizing suppliers toward a climate resilient world, CDP, 2016, cdp.net.
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The 'how' of transformation

Michael Bucy, Adrian Finlayson, Greg Kelly and Chris Moye

In the consumer sector and in many other industries, transformation programs often fail. Creating a 'performance infrastructure' can help ensure that yours won't.

Disruptive forces abound in today's business environment. Technological innovation, regulatory changes, pressure from activist investors, and new entrants are just some of the forces causing disruption, even in historically less volatile business sectors. It's therefore no surprise that many consumer-goods and retail companies are embarking on transformation efforts, sometimes in response to outside pressure and other times to get ahead of it. Regardless of why, these companies are introducing new ways of working to large numbers of employees, with the goal of producing a stepchange, sustainable boost in business results.

However, the painful reality is that most transformations fail. Research shows that 70 percent of complex, large-scale change programs don't reach their stated goals. Common pitfalls include a lack of employee engagement, inadequate management support, poor or nonexistent cross-functional collaboration, and a lack of accountability. Furthermore, sustaining a transformation's impact typically requires a major reset in mind-sets and behaviors — something that few leaders know how to achieve.

As practitioners in Recovery & Transformation Services (RTS), a McKinsey unit focused on supporting turnarounds and transformations across industries worldwide, we've observed that the most difficult part of transforming performance isn't determining what to do but rather how to do it. In this article, we discuss an often overlooked component of the "how" of transformation: the establishment of a performance infrastructure, made up of the people, processes, and tools that enable successful execution and sustainability of results.

A holistic approach to performance improvement

For companies in financial distress, transformations tend to focus on immediate and radical cost reduction. But many consumer-focused companies play in relatively healthy and stable product categories. For these organizations, transformation isn't a fight for survival. Instead, it tends to be about reaching the full potential of the business (going from good to great) or responding to an external challenge or opportunity, such as learning how to win in new channels or shifting away from an historical money-maker.

Our experience suggests that, regardless of the circumstances, real transformation happens only when a leadership team embraces the idea of holistic change in how the business operates — tackling all the factors that create value for an organization, including top line, bottom line, capital expenditures, and working capital. This is easier said than done. Ordinary approaches to transformation typically deliver ordinary (and often suboptimal) results.

To achieve extraordinary results, we believe a comprehensive, highly disciplined methodology — encompassing both the “what” and the “how” — is needed (exhibit). The “what” entails the smooth movement of the many specific transformation ideas and initiatives through three phases: from independent diligence to planning to implementation. These phases will sound familiar to the seasoned executive.

However, we find that executives tend to focus too much on individual initiatives rather than on how the business must change. Many leaders sense that this is an issue; they express concerns about execution risks and sustainability, knowing instinctively that the initiatives won't stick unless the business fundamentally changes how it operates. So how does an organization change the way it operates? We break the “how” into two parts: change management and performance infrastructure. Change management is a challenging concept for many organizations and one we will address in detail in a forthcoming article. Our focus in this article is the performance infrastructure, which helps create effective executive-level alignment, communication, and coordination during a transformation.

Exhibit 1		Our transformation approach encompasses both the 'what' and the 'how.'	
		Execution	
What to do	1 Independent diligence Establish the trajectory and full potential of the business using an investor-style due diligence	2 Bottom-up planning Develop a transformation plan (initiatives and financial projections) that is fully owned by the line leaders	3 Implementation Launch a full-scale effort to drive value to the bottom line
	Rapid execution of immediate opportunities		
How to do it	4 Change management Take tactical action to change the mind-sets and behaviors necessary to sustain the transformation		
	5 Performance infrastructure Put in place the people, process, and tools to ensure superior execution and value delivery to the bottom line		

Making change happen at speed

The performance infrastructure consists of the people, process, and tools that work in concert to ensure superior execution and value delivery. It serves as the central nervous system for a transformation effort and plays a vital role in the effort's success (see sidebar, "One company's transformation").

The people: A governance structure led by a chief transformation officer

To oversee the execution of each "workstream" (or area of activity), ensure decisions are made quickly, and keep the transformation on course, companies must create a governance structure—specifically, a transformation office (TO) comprising a few respected executives supported by analysts from the finance and HR functions. At the helm of the TO should be a chief transformation officer (CTO), who should also sit on the company's executive team. The TO should regularly report progress to the CEO, highlighting issues and decisions for resolution.

One might ask, is a CTO really necessary? Shouldn't the CEO lead the transformation? Our answer is unequivocal. The CEO should lead the company; an experienced, full-time CTO should lead the change.

The ideal CTO has extensive experience in orchestrating transformations and guiding companies through the process. The CTO should bring a perspective focused on what is possible, combining an objective view of best-in-class performance and the company's current capabilities with a realistic plan for spurring disparate groups to act in a coordinated manner.

It's a highly demanding role. From day one, the CTO must exude the confidence and gravitas that will keep the organization inspired and motivated, even when the going gets tough. He or she should not be a fist-pounding autocrat, but rather must possess keen judgment and instincts as to how — and how hard — to push people so that they reach their full potential. The CTO must also have the intellect to be able to lead deep dives into complex issues that matter to the company.

The CTO should be an extension of the CEO, with the mandate and authority to address all levers and to influence decisions about personnel, investments, and operations. The CTO can play an important role in “getting the right people on and off the bus,” weighing in on key decisions about the addition or dismissal of managers.

Many companies don't have a person with these qualifications who could readily step in to the role, much less maintain objectivity. The CTO, therefore, often comes from outside. Company leaders may have apprehensions about an outsider, but an outsider's ability to see the business with fresh eyes and to make decisions without being constrained by internal politics is among the most crucial success factors for a CTO.

The process: A relentless delivery cadence

A slow transformation process is an ineffective one. Thus, the cadence of weekly transformation meetings is an indispensable part of creating an effective performance infrastructure. Whereas most turnarounds are run by a projectmanagement office that meets for a couple of hours each week to discuss all workstreams (typically about a dozen in total), we recommend a cadence of 60- to 90-minute weekly meetings for each workstream, in addition to a 2-hour weekly TO meeting. This cadence is aggressive and relentless, and it works. It helps enforce “closed loop” accountability and accelerate implementation by preventing “pocket vetoes,” other delaying tactics, and slippage.

The meetings—in particular, the question-and-answer exchanges between the CTO and line leaders—are fundamental to holding people accountable. This discipline is not a comfortable, consensus-led approach; the CTO should be willing to be confrontational when managers don't meet their commitments. Meetings should be characterized by honesty and transparency, allowing the organization to diagnose its situation and align on not just the problems but also the solutions. The transparency is important to helping everyone understand the company's decision-making processes and priorities.

The weekly meetings are also a forum for surfacing and debating difficult trade-offs between cost reduction and revenue generation, and for refining the individual plans for each initiative as needed. Because it sees all the initiative plans in depth, the TO can help evaluate and manage competing priorities and call for speedy cross-functional decisions. In addition, the weekly meetings are an important mechanism for developing new talent and for identifying people who can best contribute to a certain initiative. For instance, when a consumer goods company decided to build a mobile app for customer acquisition, the TO used the weekly meetings to identify high-performing and motivated individuals who could help build and develop the app.

The weekly cadence is a critical building block for the transformation process, but it's not enough on its own. It should be supplemented by daily performance management to instill an execution-focused mentality into everyday decision making and operations, monthly value analysis to ensure and quantify bottom-line impact, and an annual "refresh" process that plugs into the budget cycle to reignite idea generation and foster continuous improvement.

The tools: Robust tracking and reporting systems

Making up a third component of the performance infrastructure are the tools and systems used to monitor performance. These might include organizational-health assessments, benchmarks, value-capture models, and visual management and planning aids. For instance, advanced initiative tracking tools that can be sorted by owner, department, delivery status, and other criteria allow users to understand, at a glance, the progress of all initiatives. The tools should make it easy to spot delays, observe trends, monitor impact, and create rich yet user-friendly reports. And these tools should be available to everyone involved in the transformation.

In our experience, the most successful transformations use an advanced tool that allows leaders to track the bottom-line impact of initiatives. Too often, executives launch initiatives, then simply hope and pray that the dollars will show up in the company's bank account. With sophisticated tracking tools, initiative owners can tie the impact of each initiative to a profit-and-loss line item. This level of detail enables executives to take appropriate actions to ensure that every initiative makes a quantifiable difference to business results. level of detail enables executives to take appropriate actions to ensure that every initiative makes a quantifiable difference to business results.

A transformation effort is not for the faint of heart. A company's leaders must be absolutely unified and committed before embarking on such a program. Once they do, they must pay close attention not only to the specific initiatives, but also to the changes they are making in how the business operates. Establishing a performance infrastructure is an essential ingredient of a successful transformation — one that yields rapid, dramatic, and sustainable business improvement.

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Recovery & Transformation Services is a unit of McKinsey focused on corporate turnarounds and transformations. We bring to bear our firm's industry and functional expertise, combined with specialists and practitioners with deep transformation experience. Our work ranges from acute crisis and liquidity management to large-scale transformations. Beyond recovery, we are committed to bringing our clients back to long-term health.





Secrets to implementation success

Frédéric Lefort, Dave McMurray, and Joseph Tesvic

What do successful implementers do differently from other companies? Our survey of more than 2,200 executives yields actionable answers.

Any executive who has led a major change program knows that even the most carefully planned programs can fail due to mediocre implementation. Turning plans into reality isn't easy, and certain companies just seem to be better at it than others. To learn how some of the world's leading companies ensure implementation excellence, we conducted a survey of more than 2,200 executives in 900 companies across industries.¹ We asked respondents to evaluate their company's implementation performance, capabilities, and practices.

Our survey revealed that “good implementers” — defined as companies whose respondents reported top-quartile scores for their implementation capabilities — also received higher scores on a range of financial-performance indexes relative to their competitors. Perhaps more important, good-implementer respondents say that two years after the change efforts ended, their companies sustained twice the financial benefits compared with change efforts at poor implementers. So what can consumer-packaged-goods (CPG) companies learn from successful implementers?

The factors that matter most

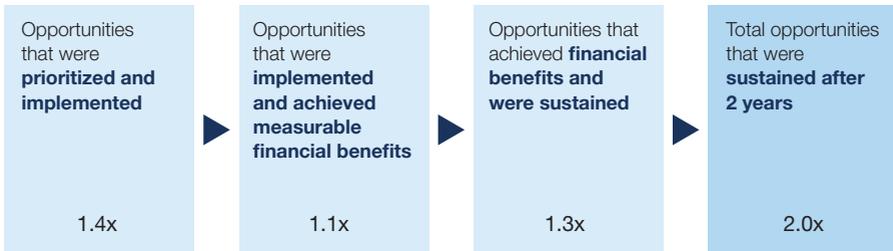
Every company “leaks” value at various stages of the implementation process: some of the prioritized initiatives don't get implemented, others are implemented but don't achieve bottom-line impact, still others may achieve bottom-line impact but that impact isn't sustained. Good implementers retain more value at every stage of the process than poor implementers do (Exhibit 1).

Clearly, implementation is hard to get right. Less than half of respondents say that most or all of their change efforts in the past five years met their initial goals and sustained results over time.

Exhibit 1

The ‘good implementers’ retain more value than their peers at every stage of implementation.

Proportion of opportunities that good-implementer companies retain at each stage of implementation, relative to bottom-quartile companies



The most crucial factors when it comes to implementation success or failure, according to survey respondents, are organization-wide ownership of and commitment to change, prioritization, and sufficient resources and capabilities (Exhibit 2).

These factors are the top three for many industries, including CPG. Below, we discuss each of these factors in greater detail, citing examples of best practices that we’ve identified in our work with CPG companies worldwide.

Ownership and commitment

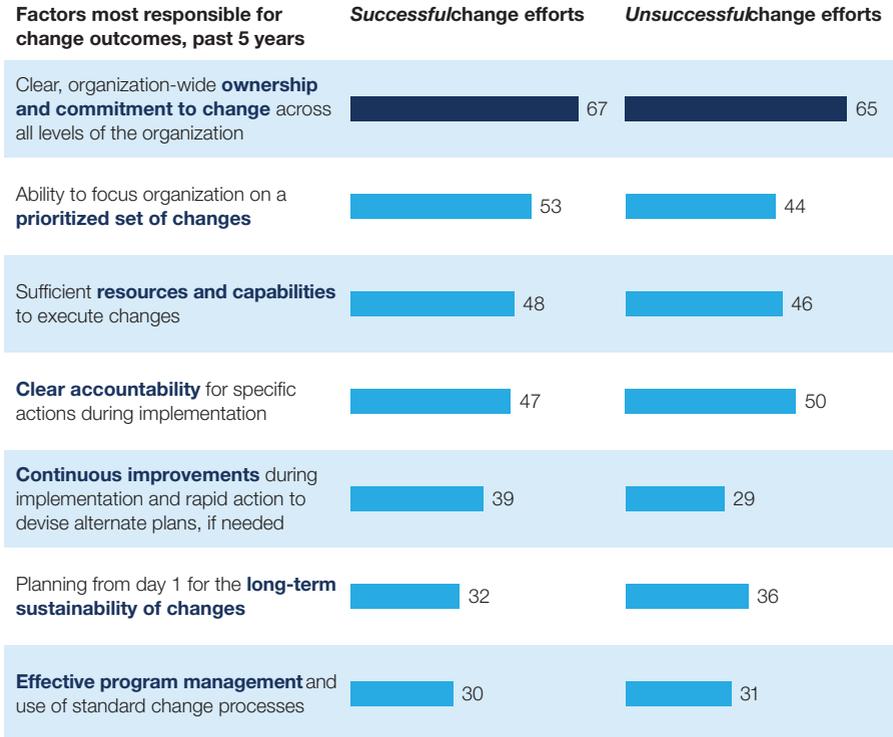
In our experience, one effective way to foster ownership and commitment is to create a project management office (PMO): a formal entity directly responsible for leading the change effort and monitoring its progress. The PMO should be led by a relatively senior person who reports to a C-level executive—otherwise he or she won’t be taken seriously. Top management must view the role of PMO leader as an important stepping stone for a high performer; in other words, the PMO leader should be someone who is seen as a future C-level executive. Although the ideal PMO leader will be chosen from within the company (so that he or she will have more credibility in the organization), we’ve found that it’s more effective to bring in a skilled leader from outside rather than appoint an insider who doesn’t have the leadership skills to rally the troops.

The “troops” will almost always include staff from different functions. For instance, a sales transformation will most likely involve not just salespeople but also employees in the marketing, finance, and product-development functions. At a large CPG

Exhibit 2

Ownership of and commitment to change have the greatest bearing on a major change effort's outcome.

% of respondents,¹ n = 2,230



¹ Respondents who answered "don't know" are not shown.

manufacturer, a hand-picked representative from every relevant function devoted 20 percent of his or her time to the PMO for 12 to 24 months and reported to the PMO leader as either a direct or dotted-line report. The entire team had joint goals related to the transformation, and these goals were linked to each team member's performance appraisals and compensation.

The PMO should consist primarily of high-performing individuals, but it should also include up-and-comers who would benefit from the training and increased responsibilities. In addition, some companies deliberately assign to the PMO a few

valued employees who are perceived as roadblocks— people who may initially be opposed to the transformation—to understand and address their concerns and eventually gain their support.

But ownership and commitment among the PMO staff won't be enough; the rest of the company has to get on board as well. To that end, leaders should ensure that several critical elements are in place early on, including top-team alignment on the transformation's "change story" and aspirations, specific targets for both performance and health across all the relevant business functions, and visible and committed leadership at all levels. Frequent and varied communication is essential.

When a leading breakfast-foods manufacturer embarked on a large-scale transformation, executives kept all stakeholders informed about its progress using a range of written communications— e-mail updates, a new internal newsletter, intranet stories, webinars during which employees could ask questions anonymously—as well as in-person forums such as town halls and department meetings. The CEO kicked off the change program and, every six months, sent out a company-wide letter celebrating its achievements. In each of the company's four geographic regions, the senior executive directly in charge of the transformation held a town hall and fielded questions from employees. The PMO leader hosted open forums regularly and gave monthly progress updates either in person or in writing.

Prioritization of initiatives

Some transformation efforts flounder because too many initiatives are going on at once, spreading the organization's resources too thin. To ensure that resources are efficiently and wisely allocated, leaders should assess each initiative's alignment with the organization's strategy and its potential impact, and prioritize accordingly.

A global food company took a phased approach to its procurement-transformation efforts, devoting the initial phase to a set of quick wins in order to build buy-in and momentum. For instance, for one of the company's key food ingredients, it had too many suppliers— eight, compared with three or four suppliers in other categories. Consolidation would increase the company's buying power and significantly lower its costs. Therefore, one of the early high-priority initiatives was to put all eight incumbent suppliers, along with a few new vendors, through a competitive bidding process. After three months, the company had four fewer suppliers, a more efficient supply base, and 10 percent cost savings in the category— demonstrating to the rest of the organization that the transformation effort was worthwhile, and spurring the procurement teams in charge of other categories to reevaluate their supply base as well.

One common mistake companies make is to assume that certain changes simply can't be made— that a suboptimal multiyear contract with a supplier, for example, would be impossible to amend. But, in our experience, very few things are set in stone: the terms of an agreement can be renegotiated, contracts can be modified, and project time lines can be accelerated or lengthened. It may just take more energy and creativity to get to a “win/win” scenario, and the head of the PMO may need to forcefully make a case for change.

Another common mistake is to simply continue whatever initiatives happen to already be under way, even if they won't make as much of an impact as other initiatives. Companies should instead build a solid fact base, agree on an estimate of the “size of the prize,” and focus on those initiatives that will yield the greatest payoff. If a company continues to commit resources to low-impact initiatives, the transformation effort will lose steam; resources will be squandered and opportunities lost.

Resources and capabilities

For consumer-facing companies, resources are a particularly important success factor: 43 percent of respondents from such companies, compared with 34 percent of their B2B peers, attribute the success of change efforts to sufficient resources and capabilities. For failed efforts, half of B2C respondents say insufficient resources were to blame; just 40 percent of B2B executives say the same.

At the best implementers, change programs are staffed with the required number of people who have the relevant skill sets. Each person's role is well defined, and expectations and responsibilities are aligned to the resources available; employees' duties lie solidly within their areas of specialty or are appropriate for their skill levels. All employees receive feedback and ongoing coaching.

Sometimes, there are enough people working on a change program— but they don't have the requisite capabilities. At good-implementer companies, a rigorous capability-building component is central to the program and typically involves the creation and use of a detailed skill matrix to highlight skill gaps and training needs, stringent evaluation processes, and clear professional-development and career paths.

The food company undertaking a procurement transformation had multiple purchasing centers around the world. The purchasing staff used whatever category-management practices, processes, and tools they wanted, and the lack of standardization often resulted in wide variability in performance. So, as part of the transformation, the chief procurement officer designated a lead buyer for every category. The lead buyer was tasked with overseeing and training the buyers for

that category in every region, ensuring that all the buyers across the company were using the same guidelines, tools, and metrics and aiming for the same targets. Even experienced buyers had to be retrained in some best-practice tools and techniques that they had either never learned to use or had stopped using in favor of easier but less robust methods. The capability-building component honed the skills of all the company's 80-plus procurement professionals.

With global category strategies in place and a central repository of best-in-class sourcing tools (such as supplier profiles, procurement playbooks, "clean sheets," and requests for proposals) accessible to all buyers, the procurement organization was able to capture synergies and efficiencies in its tactical activities — freeing up staff to focus on more strategic initiatives. The impact was a 54 percent decline in costs compared with the previous four years.

Implementation practices

As for specific implementation practices, executives said their companies do fairly well at developing standard operating procedures and assessing employees against their individual goals. But they say their companies falter when it comes to conducting effective meetings, having processes in place to identify problems, and giving employees effective feedback (Exhibit 3).

Often, it takes a radical decision to get to best practice. For example, a C-level officer at a large food distributor realized that the members of his buying staff were constantly in internal meetings and thus weren't spending enough time on their core responsibilities. He took the bold step of discontinuing all routine departmental meetings, thus freeing up several hours of the buyers' time each week. Instead, he required buyers to participate in detailed one-on-one sessions with him to discuss progress on specific initiatives. During these sessions, the executive gave each buyer direct and immediate feedback. Ultimately, the executive himself had many more weekly meetings than he previously had, but he — and the buying staff — agreed that these meetings were significantly more productive.

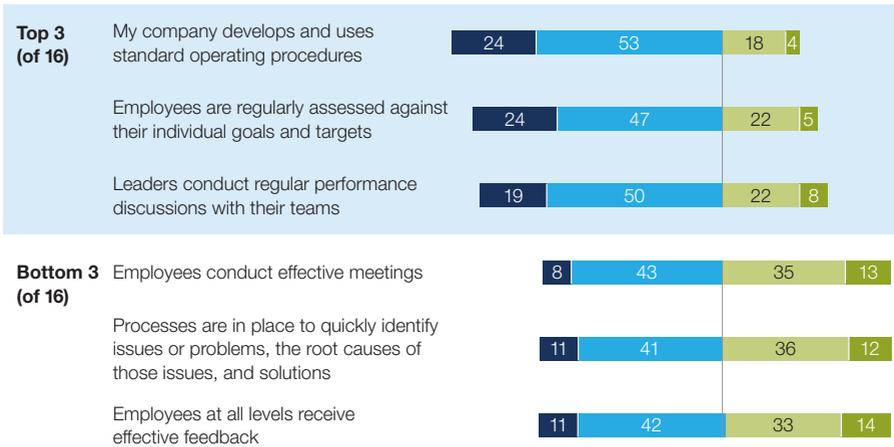
At top-quartile implementers, a higher proportion of experienced change leaders lead transformation programs relative to other companies. In fact, the survey respondents at good implementers were 1.4 times more likely than those at poor implementers to have personally led multiple change efforts. These findings are consistent with the belief, shared by the world's best implementers, that implementation is a discipline and that people can get better at it over time. Indeed, by learning from others' experiences and adopting their best practices, leaders at consumer-goods companies can better ensure implementation success.

Exhibit 3 Companies are best at using standardized procedures and assessing employees; many lack effective problem-solving processes.

% of respondents,¹ n = 2,230

Strongly agree
 Somewhat agree
 Somewhat disagree
 Strongly disagree

Extent to which respondents agree that practices describe their organizations



¹ Respondents who answered “don’t know/not applicable” are not shown, so figures may not sum to 100%.

1 The online survey was in the field from January 14 to January 24, 2014, and garnered responses from 2,230 executives representing the full range of regions, industries, company sizes, functional specialties, and tenures. The results reported in this article also include responses from an additional 151 global executives surveyed at an earlier date. To adjust for differences in response rates, the data are weighted by the contribution of each respondent’s nation to global GDP.

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