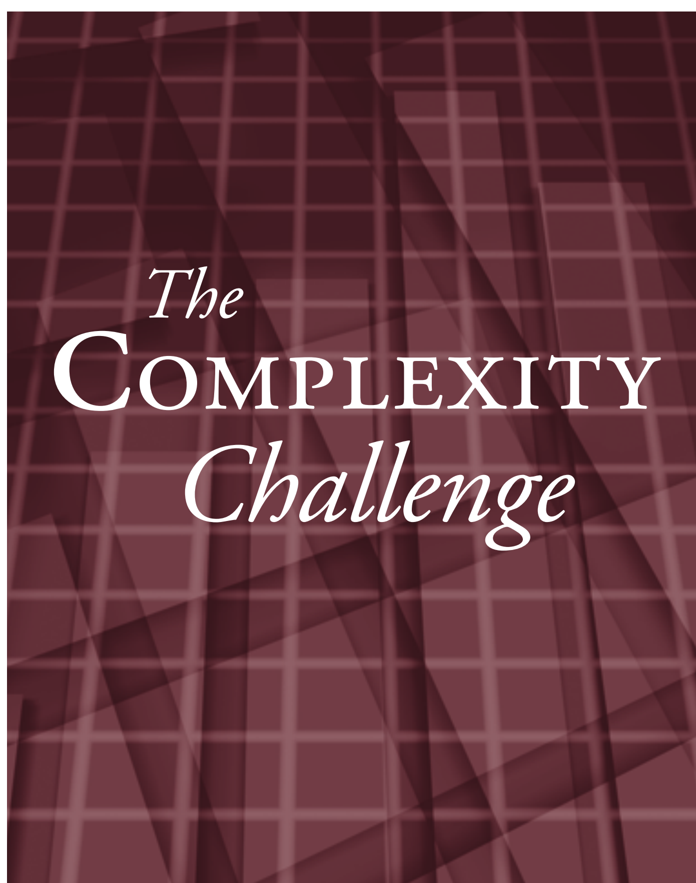
A Survey on Complexity Management Across the Supply Chain



A.T. KEARNEY

Introduction

Anyone who has visited a supermarket or mass merchandiser recently appreciates the explosion in the variety of products. Consumer product manufacturers have added brands, extended lines and altered pack sizes, shapes and colors to encourage more consumers to open their wallets. In 2003 alone, nearly 27,000 new food and household products were introduced, including 115 deodorants, 187 breakfast cereals and 303 women's fragrances.[1]

In introducing these new products—and variations on existing products—companies have made their businesses more complex. Designing, marketing, forecasting, pricing, producing and distributing a growing legion of unique SKUs (stock-keeping units) drives up costs, increases the risk of lost sales (due to out-of-stocks) and dilutes management attention. Add to this the uncertainties about why, when and how to add a new item or prune an existing product line, and the complexity challenge balloons further.

Given this increased level of complexity, A.T. Kearney undertook a study on complexity management, which captured the experiences of executives at more than 30 leading consumer products manufacturers in North and South America. The study components included a web-based survey, select follow-up interviews, and an executive roundtable in which participants discussed their experiences in complexity management.

This paper summarizes the findings from the research and the additional perspectives gained from the roundtable discussions.

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[1] *The Global New Products database compiled by Mintel International Group Ltd. Discussed in "The Vanishing Mass Market,"* BusinessWeek*, 12 July 2004.*

THE TRUTH ABOUT COMPLEXITY

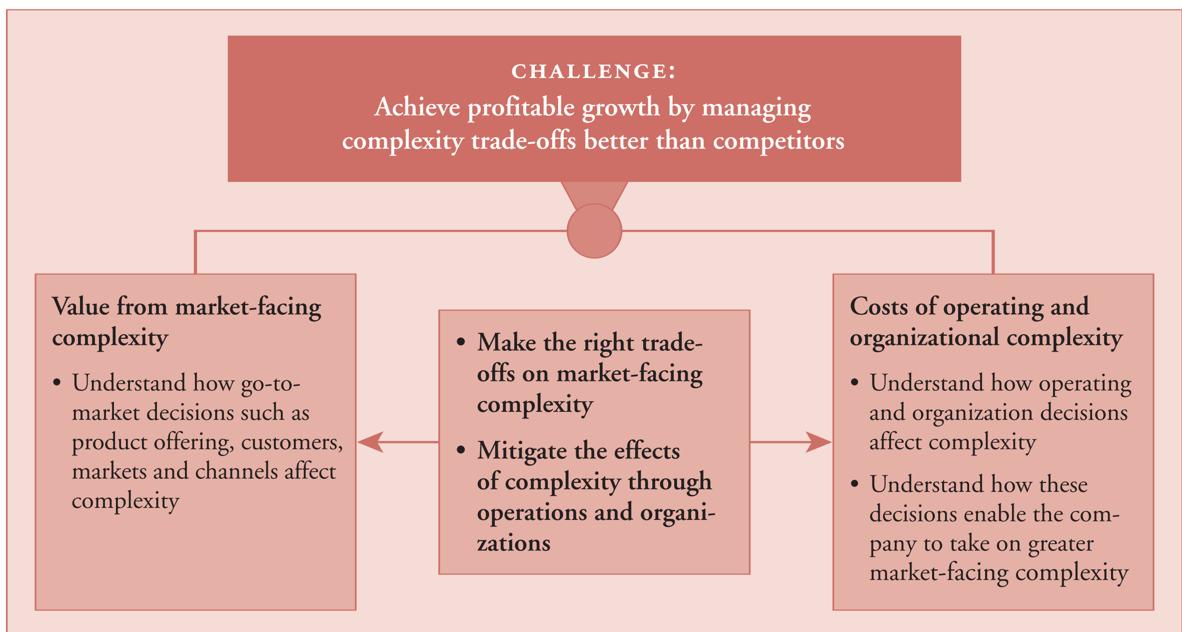
What should executives at consumer products manufacturers know about complexity and how should they prepare their companies to manage it better? Based on our recent research, A.T. Kearney offers the following three messages:

1. Increased complexity is almost inevitable as companies pursue business growth. Growth—the "holy grail" of business—means increased complexity for most companies. Organic growth usually means more products, markets and channels. Growth via mergers and acquisitions compounds complexity. Indeed, a robust 88 percent of survey participants note that their business has grown more complex over the past half decade, and 79 percent expect further increases in complexity over the next five years. Complexity is here to stay; companies must learn to address it.

2. Tomorrow's focus must be on complexity management, not simply complexity reduction. Most companies focus on tactical complexity reduction (for example, eliminating slow-moving SKUs). Few think about strategic complexity management: how to achieve and maintain profitable growth by only adding complexity where it counts (for example, providing consumers with the right product variety), while constantly driving unnecessary complexity out of the business.

3. There is a path toward effective complexity management. Although no single company in our research has completely "cracked the code" on complexity management, several report significant progress. The research distills their experiences and knowledge into six key practices for managing complexity effectively.

Figure 1: Balancing value and cost



Source: A.T. Kearney

GROWTH DRIVES COMPLEXITY

For companies intending to grow through new products and extended product lines, complexity will always creep in. Complexity is a natural by-product of adding categories, shortening product lifecycles, and accelerating product introductions. Similarly, growth via markets and channels brings with it such complicating factors as tailored service offerings, customer-mandated requirements and SKUs that are specific to individual markets and channels. In fact, the increasing competitiveness of the retail industry is challenging leading operators to differentiate their business from their peers, which often translates into greater complexity for the consumer products manufacturer. In addition, mergers and acquisitions boost complexity as the newly formed company works to rationalize assets and product lines, integrate systems and processes, and bring increased harmony to policies, cultures and behaviors.

Growth is not the only reason for increased complexity, however. Feisty new competitors, advances in technology, concerns over consumer health and safety, government requirements and restrictions (such as product labeling), risks that can disrupt a business (such as natural disasters, labor unrest and terrorism) and industry consolidation all add to complexity.

A company's approach to internal operations can help dampen complexity or exacerbate it. For example, companies that more readily absorb complexity are those with flexible production assets, common components and ingredients, and consistent operating processes across locations. Organizational structures and incentive and reward systems can encourage and enable cross-functional collaboration—but again, if improperly designed, can thwart it. In contrast, decisions to outsource can create new kinds of complexity as companies must manage new relationships and deal operationally across company boundaries.

MANAGING COMPLEXITY IS KEY

If complexity is here to stay, and a growing force, how should a company manage it? The first step is to understand that complexity is not necessarily a pejorative term. Simply focusing on reducing complexity is a mistake. There is such a thing as good complexity for consumer products companies—complexity that is necessary and value adding. And just like with good and bad cholesterol, companies need to treat good and bad complexity differently.

Sometimes complexity can help a company gain market share and boost the top line, as when consumer products companies employ promotional packaging and brand extensions or increase product assortments. But, as Barry Schwarz points out in his book, *Paradox of Choice*, too much variety can confuse and frustrate consumers.[2]

The burdens of complexity result from negative phenomena such as unchecked SKU proliferation, small batch runs and the loss of procurement leverage as purchase quantities dwindle. The challenge becomes one of balancing value and cost—that is, making the right complexity trade-offs to add good complexity in pursuit of growth, while mitigating the effects of bad complexity on operations and organizations. In other words, companies should aim to reduce the cost of good complexity and the level of bad complexity *(see figure 1)*.

Achieving the balance between value and cost is crucial. Nearly one-third of the consumer products manufacturers in our survey acknowledge

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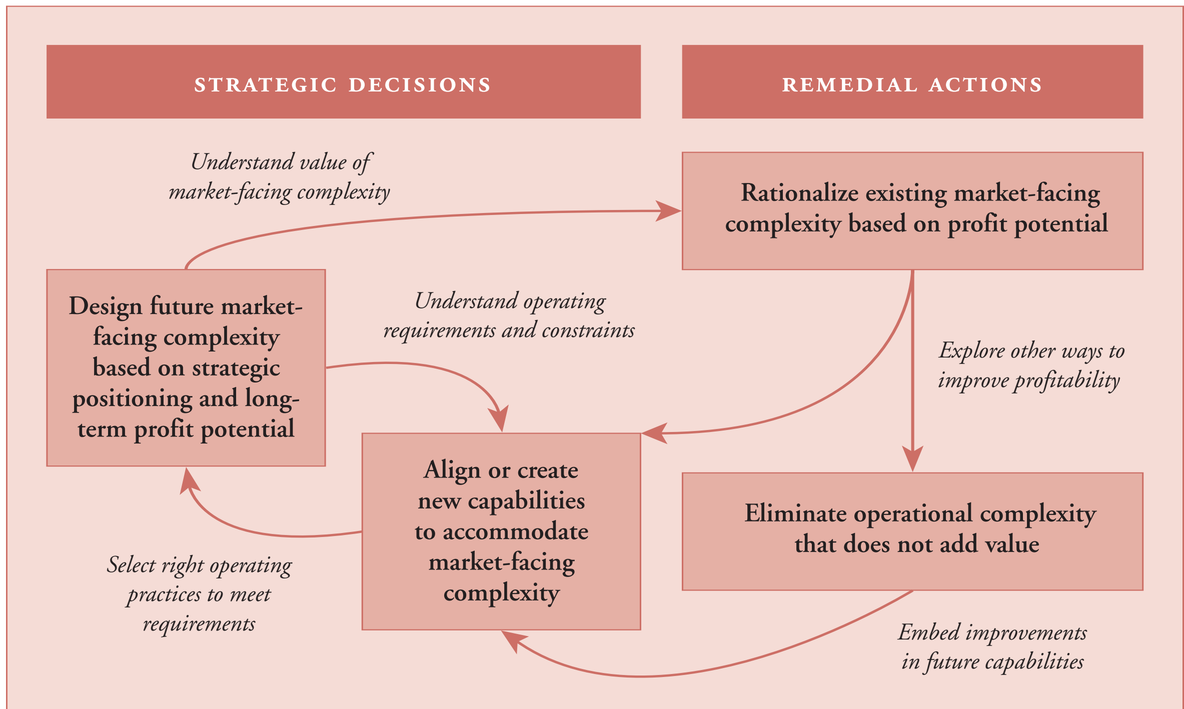
[2] *Barry Schwarz,* Paradox of Choice *(Ecco, 2004).*

Tomorrow's focus must be on complexity management, not simply complexity reduction.

that they chase revenue growth without adequate regard for long-term profitability. An all-too-common approach is to chase new business first, with the expectation that the business can be made profitable down the road.

Managing complexity requires both strategic decisions and remedial actions *(see figure 2)*. In the initial stages, a company may indeed look to reduce complexity by streamlining its current products and supply chains. But an active, ongoing strategic decision-making process is necessary to ensure that the pursuit of growth only adds necessary complexity. Otherwise the situation becomes, as one of our roundtable executives pointed out, "Like your basement or garage. Over time you accumulate 'stuff,' or complexity, and it is not until the basement is full of non-value-adding junk that you step back and decide you need to clean things up by having a yard sale." The challenge in business, of course, is to ensure that you never start accumulating unnecessary junk. Research by A.T. Kearney and others has found that there is a positive correlation between financial results and performance on key complexity management activities such as those listed in figure 3 on page 6. Yet, as the figure indicates, few of the executives in our research group rate their companies as more effective than their competitors in these areas. Most companies fall short in multiple areas; only 28 percent of participants rated their companies as ahead of the competition on six or more

Figure 2: Complexity management requires strategic decisions and remedial action



Source: A.T. Kearney

of these activities. It appears there is considerable room for improvement through more robust approaches to complexity management.

SIX KEYS TO SUCCESSFUL COMPLEXITY MANAGEMENT

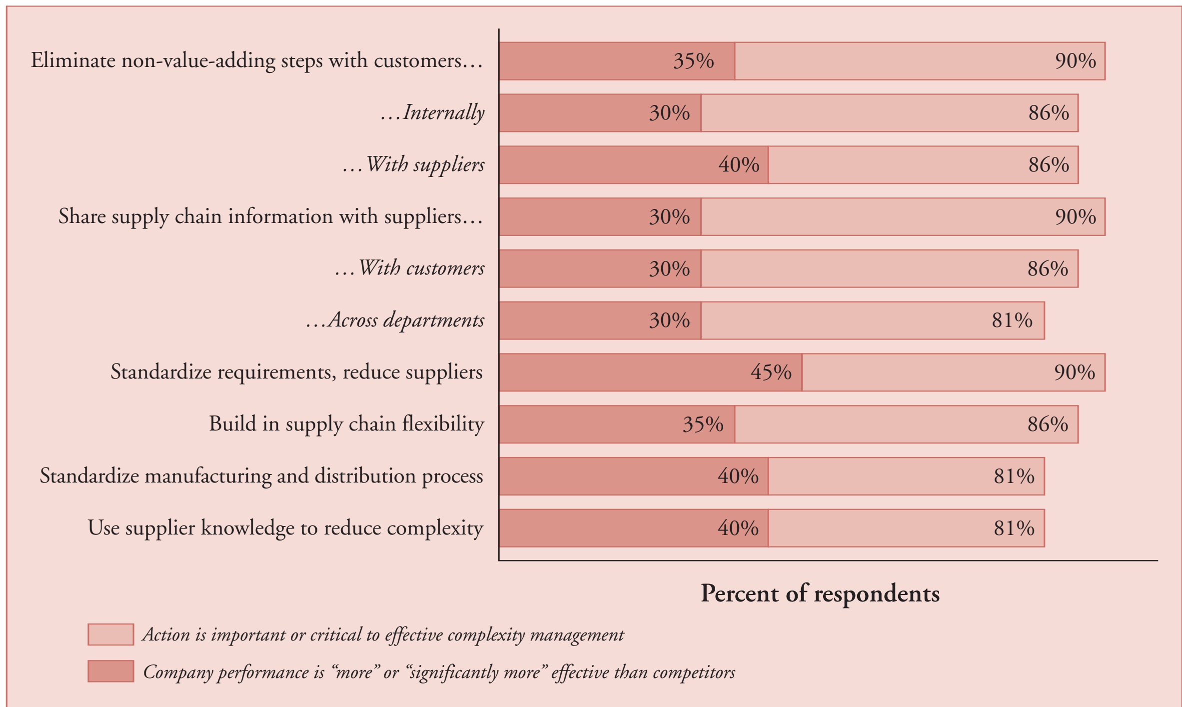
A.T. Kearney's current research focuses on learning how leaders successfully manage complexity. How do they determine the marketplace value of complexity? How do they manage the trade-offs of additional market-facing versus operational complexity? How do leaders decide where to start and where to focus?

Our findings indicate that success stems from strategic decision-making and improved capabilities. The former refers to the processes and information that leading companies have in place to make the right trade-offs and exploit capabilities quickly, while the latter refers to the ways in which leaders maintain a continuous focus on improving key operational capabilities to effectively manage complexity.

From our analysis, we have determined that six characteristics, common to all leaders, will help to effectively manage complexity:

- Understand the requirements of customers and consumers
- Make trade-offs based on an understanding of the cost effects of changes
- Eliminate over-specification and complexity creep in design and development
- Align goals and objectives at the executive level

Figure 3: Few manage operational complexity well enough to claim it is a competitive advantage



Source: A.T. Kearney 2004 Complexity Survey

- Provide visibility into complexity levels and required trade-offs
- Develop and leverage new capabilities on a continuous basis

Understand the requirements of customers and consumers

Our survey respondents agree that understanding the requirements and other factors that drive buying decisions of current and potential customers and consumers is important—often critical. The challenge lies in understanding value-added complexity. Value-added complexity is any product or service differentiator that the customer is willing to pay for. A customer in a large city may be willing to pay for standard food items in smaller quantities, such as a four-pack instead of a six-pack, for ease of carrying and storage. But a customer is less likely to pay more for different packaging that denotes a different flavor if that same information is already on the label. An example is peanut butter or soft drinks that have different cap colors denoting a different texture or flavor.

Similarly, the buying and switching behavior of both the consumer and the retailer is an important factor to consider. For example, if a new product is added to a line, does it produce real growth or merely cannibalize existing sales? If an item is discontinued, do sales shift to other products from the same brand or company or to competitors? By using techniques such as "design of experiments"—a systematic approach to examine the effects of numerous variables—in test markets, companies can model the effects of these decisions on a sample basis.

Also, a clear distinction needs to be made between complexity that is added to meet retailer requirements and added complexity that delivers value to the consumer. In a surprising number of cases it is actually the retailer that adds complexity. One roundtable participant recounted an example of some retailers deliberately requiring different packages for identical products, making it more difficult for consumers to comparison shop. Another roundtable participant sold products to a fast food franchise that dealt largely with perishable foods. This customer had a blanket requirement that goods must be received with 80 percent of their shelf life remaining. For perishables and fresh foods this was a sound policy, but for items with a three-year shelf life, this stipulation made no sense for either customer or supplier.

Make trade-offs based on an understanding of the cost effects of changes

When increasing or decreasing market-facing complexity, companies also need to consider how these changes will affect cost areas such as marketing, operations, SG&A (sales, general and administration) and other internal areas. Among the participants in our research, 82 percent said that estimating the cost effect on these areas was critical or important to effectively manage complexity. Yet only 33 percent believed they were more effective than competitors in doing so. In our experience, only a handful of companies know the key cost sensitivities involved as their product portfolio becomes more complex.

Understanding how costs behave provides the basis for estimating the impact of change. It is crucial to track and tie each cost to its source, whether the source is an individual customer, a broad customer segment, a certain product, a specific channel or some other factor. It is equally important to consider how changes fit with the business model and how they will

affect each internal area: Will the change help to gain or reduce manufacturing scale economies? Will it add or reduce risk? Will it require a change in investment levels? How will it affect predictability? A deep understanding of cost behavior—both for current costs and under potential scenarios—gives a platform from which to estimate the resulting effects on profitability levels. This requires both tools and thought that transcend traditional activity-based costing.

One roundtable participant explained how his company manages product additions by making marketing people accountable for product profitability. Much like justifying a capital investment, product managers prepare a 10-year financial plan, including a profit-and-loss statement and balance sheet. Included in the plan are budgeted marketing funds. Progress is tracked and additional marketing funds are made available for products that exceed profit goals. Products that don't perform well must deliver targeted profits—potentially by cutting out costs, including marketing funds—or be discontinued. In addition to driving financial performance, the company also uses the process to reveal and understand the root causes that drive performance higher or lower than the plan. Through these tight controls, the company's approach is both Darwinian ("to not keep funding the dogs," and instead feed successful products) and insightful (learning from past successes and failures to make better decisions next time).

Eliminate over-specification and complexity creep in design and development

More than two-thirds of our study participants consider it critical or important to design complexity out of their products by eliminating over-specification in design and by reusing designs and standardizing modules where possible. Yet only 20 percent of these companies believe they are better than competitors at these actions.

A useful way to think about product complexity is in terms of "at the skin" versus "below the skin" product simplification. "At the skin" product and packaging characteristics are those that are discernible to the customer, such as the basic look, feel or taste of the item, and the size, shape and color of its package. As these can affect buying decisions, a product's key differentiating attributes need to be identified and specified appropriately at the design phase, while other attributes should be standardized where possible.

On the other hand, "below the skin" complexity refers to raw material, component and packaging standardization that specifically targets efficiency improvement without introducing customer- or consumer-discernible changes. These considerations simplify the decision-making process around complexity, especially for those features that do not affect the consumer's buying decision.

A prime example of complexity creep was illustrated by one of the roundtable participants. As a manufacturer of various food products across multiple business units, the company did not previously monitor ingredients being specified for its products. As a result, 131 different specifications for onions—several onion varieties, each with form, shape and size differences—were used across the company. After an aggressive rationalization, the number of unique specifications was reduced to 21.

Align goals and objectives at the executive level

All executives in our study agree on the importance of aligning goals and objectives at the executive level to help the organization work

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together to manage complexity. And it is crucial to sustain the complexity management balance as the product portfolio evolves. Yet just 40 percent believe they have a competitive advantage in this area.

Goal alignment is relatively straightforward when an organization takes on a major corporate initiative. For example, one company established a separate project team aimed at four objectives: eliminating non-value-added complexity, harmonizing its portfolio, finding synergies across units on ingredients and packaging, and putting in place a self-sustaining process.

The size of the opportunity helped gain senior management buy-in and commitment. By crafting the steering committee structure and handpicking cross-functional team members, the company made considerable progress on the first three objectives. The challenge still facing this company—and the other roundtable participants—is how to establish an organizational structure and process that drives an ongoing program of complexity management. This requires a lasting form of goal alignment, one that does not dissolve when the program du jour ends.

Although no prescriptive answer emerged from the roundtable discussions, what may be needed is an integrated planning process for complexity similar to the one used for sales and operations planning by many companies. A recurring theme in the roundtable discussions was that complexity management is not a supply chain issue, nor a marketing, design or financial issue. It is a business issue. To manage complexity on an ongoing basis requires a common language for complexity, the opportunity and forum for cross-functional discussion and a business-led view of trade-offs and decisions.[3]

Provide visibility into complexity levels and required trade-offs

The survey reveals that most respondents do not have data readily at hand to manage complexity. For example, more than 40 percent lack easy access to information on the true number of SKUs in their product lines. Complications include both cumbersome data availability (such as multiple systems) and definitional issues (for example, different, non-substitutable promotional packs that carry the same SKU code).

Based on the roundtable discussions, most research participants believe improved analytical tools are needed to easily access and mine the data that is available. For example, they see the need for better tracking, reporting and analysis of the true sales effects of a product addition, deletion or packaging change. Faced with fact-starved decision-making, roundtable participants described a typical internal debate: "The new package was expected to boost sales by 6 percent. Sales only went up 4 percent. Was this a failure? But if we hadn't changed the packaging, would sales have dropped?"

Better data availability also includes improving product data management capabilities on the ingredient, formulation and packaging side. Roundtable participants explained how product researchers and designers add complexity by re-specifying particular ingredients because they do not have access to a catalog of previously specified items.

Develop and leverage new capabilities on a continuous basis

The final focus area is making sure the company has the capabilities to take on increasing levels of complexity at a reasonable cost, ensuring the

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[3] *See "Learning a New Complexity Language," A.T. Kearney* Executive Agenda*, First Quarter 2004.*

achievement and sustainability of profitable growth.

The first step is to exploit today's "sweet spot"—understanding current capabilities and leveraging them when adding complexity to the business. One high-volume manufacturer of consumer products has the capability to decouple its packaging operation from the production line, as opposed to its lower-volume competitors that package in-line. Although this process results in a higher unit cost, the increased flexibility allows the company to quickly seize market opportunities that require more packaging variety—both item count and pack appearance. By postponing final packaging and aligning it with actual demand, the manufacturer is able to offset the cost differential through greater customer responsiveness and lower inventory investment.

Companies also can improve their ability to take on complexity through the following actions:

- Standardizing material requirements and reducing the number of suppliers to help ensure consistency and quality of supply
- Standardizing manufacturing and distribution processes to allow products to be made and shipped from alternate locations
- Eliminating non-value-adding activities in supply chain processes with customers and suppliers
- Sharing information on usage, forecasts, capacity, inventory and shipments to customers across internal departments and with suppliers
- Developing supply chain strategies that build in flexibility and resiliency

But these are largely reactionary, incremental improvements. For some companies, increased complexity could sound the alarm to take bold, strategic action. A future of increasing complexity could trigger a program of fundamental business simplification. For example, rethinking brand profitability, product families and production technologies could eliminate the need for whole production lines or even whole plants, or enable shifts to manufacturing technologies with step-change cost advantages. This could yield a significant competitive advantage in total value chain cost.

Conclusion

In a global economy that offers a world of choices, business complexity will continue to increase despite efforts to hold back the tide. While this may seem like bad news, companies that can successfully manage complexity will enjoy a distinct competitive advantage in their markets.

Those looking to gain an edge will do so through:

- Superior intelligence and insight on customers and consumers
- Complete, accurate and efficient decision tools
- Relentless elimination of unnecessary complexity in products and processes
- Continuous enhancement of complexity management capabilities

The key to successfully managing complexity may well lie in reducing the cost of necessary complexity while simultaneously reducing the level of unnecessary complexity. Doing so requires not just a process, but also a conscious cultural change that embeds these principles within the organization.

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