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Operations Practice

Finding the sweet spot in product-portfolio management

It's more urgent than ever to rebalance product portfolios so that complexity creates value rather than destroying it. Here's how.

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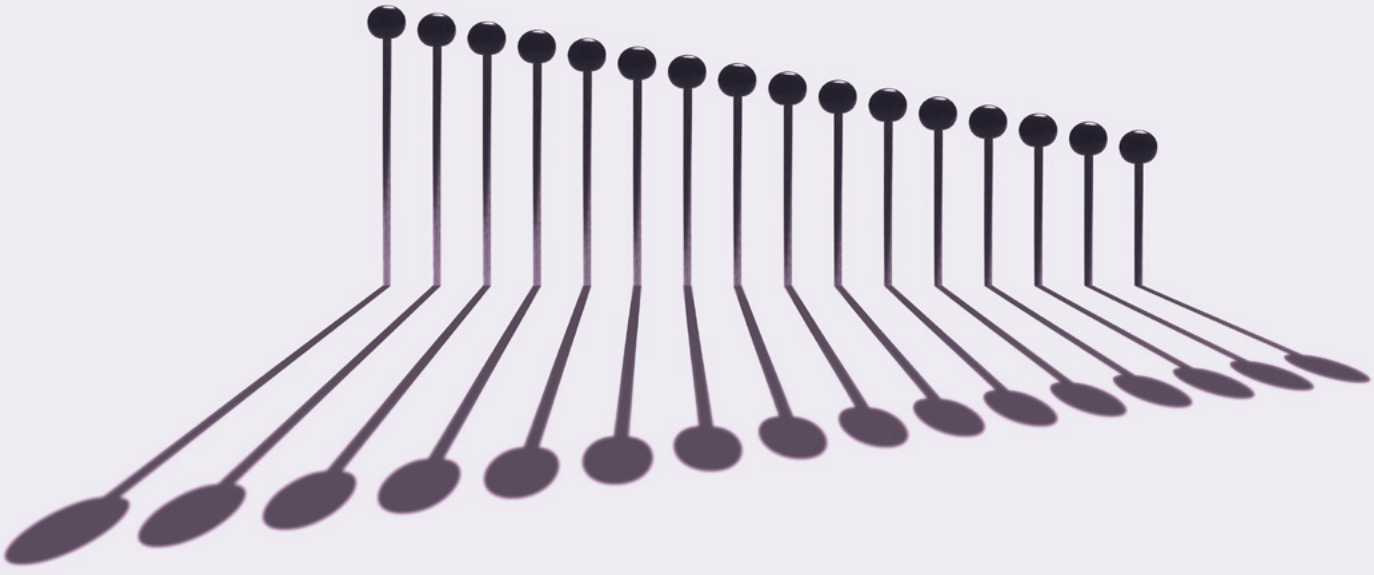

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Managing a product portfolio is a tricky business at the best of times. There's a constant tension between product development and its desire to create new things, operations and its focus on costs and complexities, and sales with its need to cater to customer needs in expanding the top line. Buoyed by the long economic expansion, many businesses have strongly grown their product portfolios. Increasing profits gave companies comfortable investment cushions, and ongoing digitization and automation fueled flexibility and economies of scale.

Some companies have felt the challenges associated with an expanding portfolio for a while; for others, the COVID 19 crisis has become a breaking point. When polled about their planned portfolio activities, about 40 percent of senior executives attending a virtual event on product development said they were already working to reduce their product portfolios, and 44 percent planned to reallocate their R&D budgets to new products (Exhibit 1).

The Volvo group offers a good example of the benefits of actively managing a portfolio. In 2011, the Scandinavia-based automotive player decided to phase out its five- and six-cylinder engines and replace them with four- and three-cylinder engines based on a unified, modular engine architecture. The intent was to become a leader in lowering carbon emissions, but the change also helped streamline production by replacing eight separate engine architectures on three platforms.

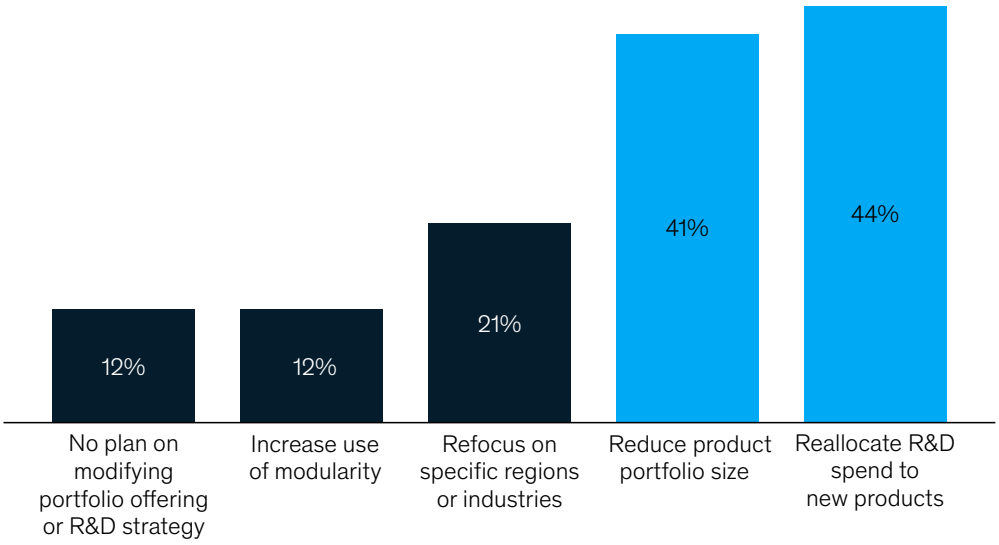
In another example, a machinery company went from actively selling about 800 product variants to selling about 25. By providing a better customer experience and shorter lead times, the vastly reduced portfolio increased sales by 5 percent while also achieving significant operational savings.

A third example comes from a consumer-product company, where focusing solely on increasing revenue came at the expense of profitability. Over a three-year period, the number of SKUs it offered increased by more than 50 percent, which

Exhibit 1

Executives report planning to reduce product portfolios and reallocate budgets.

Respondents identified certain portfolio actions as 'core' to their company's responses



Source: Webinar survey, "Leading your product development organization through the crisis"; n=35

reduced sales per SKU by more than 30 percent and margins by about 10 percent. A simplification program that comprised portfolio optimization, product design, and commercial-network alignment reduced the company's product portfolio by 25 percent while improving gross profit by 3 percent.

By leveraging the insights gained from the crisis and adding the right tools and processes, companies can actively shape a simpler, more effective product portfolio that can both reduce the burden of risk management now and better serve customers once the crisis eases.

Distinguishing good complexity from bad

The goal of portfolio management is not simply to reduce complexity as much as possible—that would be easy. It is rather about differentiating good complexity, which generates more customer value than it costs (because customers are actually willing to pay for the variance), from bad complexity, which adds complexity without contributing significant customer value (see sidebar, "The good and bad of complexity").

Some variance and complexity is important for every product portfolio. It helps distribute risks

The good and bad of complexity

Examples of good complexity:

A left-hand-drive configuration or additional type-approval for a vehicle that is otherwise identical **unlocks a new market**

A shorter strap for an otherwise identical watch **reaches a new target population**

A well-modularized paper machine that lets customers exchange printing modules while keeping all the paper-generating components identical **responds to customer request while reducing development cost and time-to-delivery**

A deodorant that won't mark black or white fabric **addresses a hitherto unserved customer need**

Examples of bad complexity:

Marketing four different types of air-conditioning systems for products sold mainly in cold regions **misaligns the portfolio to customers' purchase criteria**

Maintaining a large legacy portfolio to accommodate occasional sales to a single major customer **overestimates the relationship value of legacy products**

Continuing a range of single-speed motors when a new variable-speed motor design could replace the entire portfolio **undervalues innovation**

Allowing customers to combine individual product features when five predefined configurations would likely satisfy most customers **overindexes on choice versus simplicity**

and, when combined with a smart modularization effort, can increase scale effects on a large number of components while also providing customers with choice. However, too much variance and complexity can create their own risks while raising overall costs, such as by generating additional compliance requirements that absorb more management attention than anticipated—or spurring further R&D efforts to maintain the products over their lifecycle.

How portfolios grow…and grow…and grow

Organizations don't deliberately increase complexity. Instead, two different mechanisms automatically increase complexity and product variance in the pursuit of growth and additional customer value.

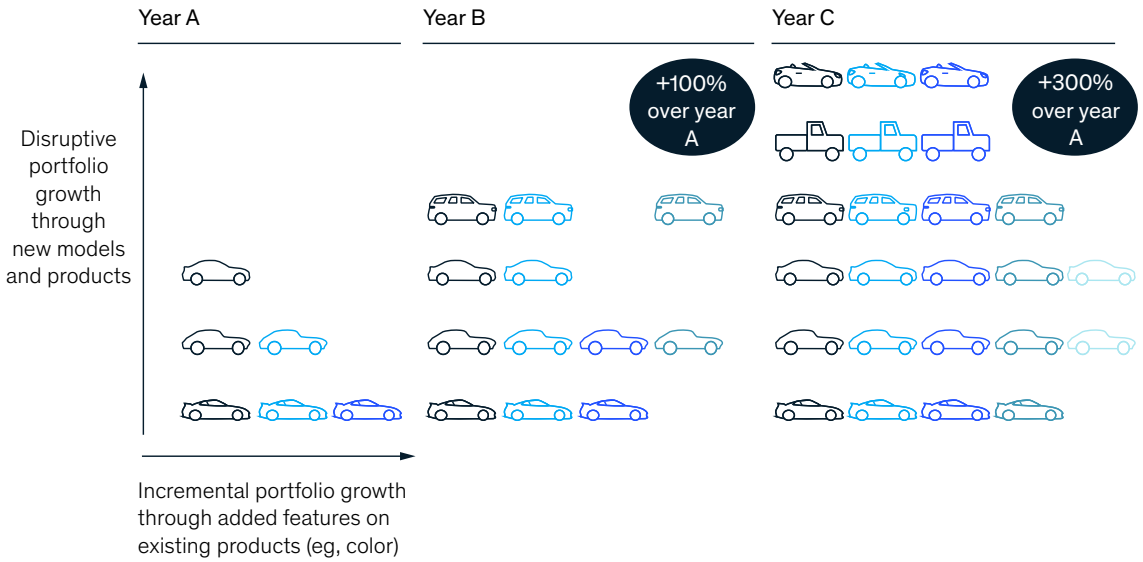
Incremental growth. The first kind of portfolio growth is incremental, taking place as companies develop and adjust existing product features. A company sees an opportunity to sell items or services that are fundamentally like what it's already selling, but with small variations: an additional size for a mobile phone, or a new-generation engine with lower fuel consumption. Managers might see an opening to capture small, additional markets that have specific requirements yet promise low incremental investment and cost, such as homeowners who lack the space for a conventional undercounter dishwasher but will buy a small countertop model. Underlying this growth is the common assumption that higher coverage of markets and consumer niches—and therefore additional revenue—will more than offset additional cost.

Disruptive growth. The second kind of portfolio growth, disruptive, happens when companies add entirely new technology to existing product lines, or set up completely new product lines. A company might replace internal combustion engines with electronic drivetrains, or meat in frozen meals with plant-based substitutes. For the past several years, one of the most frequent sources of disruptive portfolio growth has been the addition of software to traditional hardware products. Underlying this trend is the assumption that manufacturers can dramatically increase customer value by embedding software—together with competitive pressure as other players eye similar moves.

Both mechanisms have dramatically increased portfolio growth (Exhibit 2). A globally growing economy, burgeoning revenues and profits,

Exhibit 2

Portfolios grow because of incremental features and disruptive new product types.



and speedy consumer development in emerging countries have created explosive complexity and variance in multiple industries. For example, an automaker's recent analysis found that premium automotive OEMs' model offerings almost doubled between 2005 and 2020. An industrial-components company found that over the course of 15 years, the number of base models for a single product line grew 20-fold.

To counter spiraling complexity, companies can establish effective portfolio management—and with it, an ongoing practice of pruning their portfolios.

Under innovation pressure

Both traditional and breakout industries face rising pressure from shorter, more disruptive innovation cycles in the wake of technology advances. The resulting compression exacerbates the conflict between maintaining a current portfolio and delivering the innovative, high-margin products that are the lifeblood of any business. There are three main implications.

First, the tech industry increasingly sets consumer expectations, whether by annually upgraded mobile phones or social-media applications that are tweaked almost every week. Yet for companies offering physical products, rapid development limits the extent to which they can test new products and product features against their core customers' needs. With software accounting for a rising proportion of product value, the mismatch between physical-product updates and the digital world is causing research and development operations to rethink the ways they create.

That leads to the second major implication. Companies are taking a page from the tech sector by adapting agile software-development methodologies to product development. They are focusing on minimum-viable-product design practices and constant, iterative improvement, rather than spending years developing a perfect product that could be outdated before it can be launched.

Third, more and more products must integrate with other platforms and systems, in order to include features that both consumers and industry see as standard. In the automotive sector, for example, the major consumer-technology companies have been competing intensely to extend their ecosystems to the daily drive. But this level of integration requires the participation of more stakeholders in the product-development process, with major process and structural changes in R&D so that it can cope with approaching challenges around innovation. By understanding the current portfolio's costs and market coverage, companies are better able to create a structured approach to developing new offerings.

Electric-vehicle manufacturers are already successfully deploying software-based solutions to typical hardware issues. Traditionally, automakers that wanted to offer additional power for a higher price had little alternative but to change the drivetrain physically—by installing a turbocharger, for example, or offering a higher-capacity engine. Now it's possible to offer different power profiles—at different prices—for the same battery configuration, including under a pay-per-use model for range extension.

Finding the right complexity balance

There is no single, successful approach to product-portfolio management. But some companies are already coping with these challenges by applying advanced analytics, adapting processes and roles, debiasing decision-making, and putting the customer at the center of product-portfolio development.

Rationalizing portfolios through advanced analytics

The use of advanced analytics in a portfolio-management context is especially well-suited to quantify technological distinction within the product portfolio—in other words, how a given product's components compare to those in the rest of the portfolio. Two applications of this approach illustrate the potential benefits in overcoming limitations endemic to traditional product-portfolio rationalization.

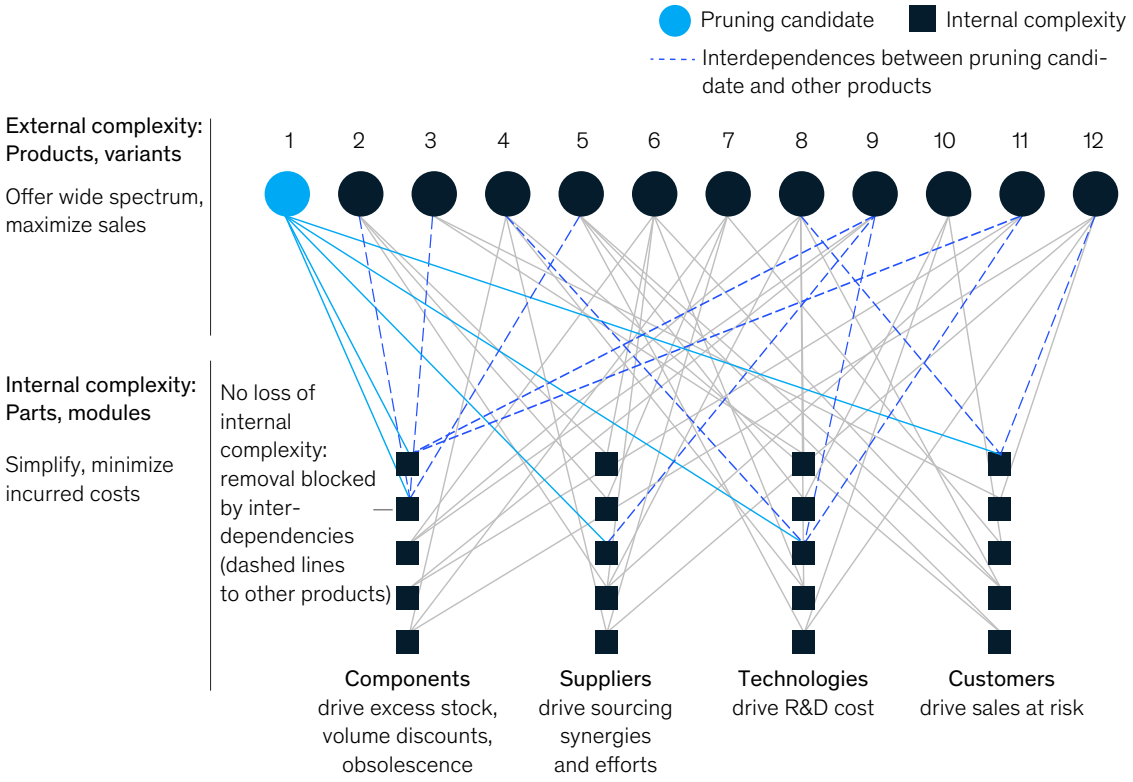
Focus on low performance, not necessarily low sales. The first scenario addresses the all-too-common disappointment that results from focusing only on culling the lowest-selling products—especially across many different product families. Despite the time and effort spent, internal complexity may barely budge. The underlying reason? What truly drives complexity isn't simply the number of product variants, but the number of components an organization must develop, source, assemble, and maintain to support those variants. If the pruned products have better-selling counterparts that use a majority of the same components, the complexity remains even as revenue disappears (Exhibit 3).

This is exactly the sort of problem modern network-optimization algorithms were designed for. These algorithms analyze component reuse across products, and identify the optimum combination

Exhibit 3

Step 1: The traditional pruning approach focuses only on low-selling products.

Step 2: Complexity remains because the same components are frequently used across products, including ones not culled.



of products to be pruned in order to release the most components while minimizing foregone sales (Exhibit 4). The result identifies and optimizes products with poor cost-performance ratios, rather than just products with low sales.

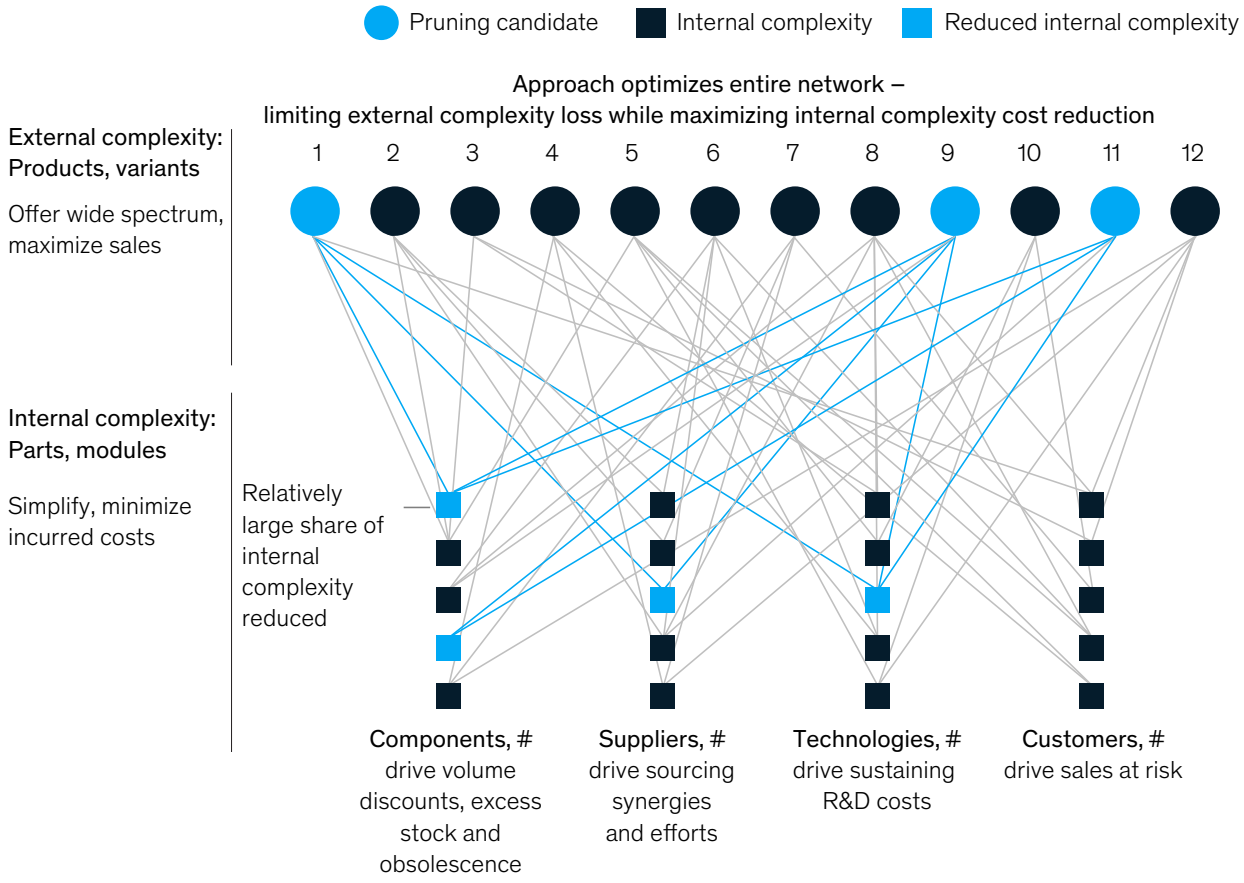
Companies can customize this exercise by allocating true complexity costs to sets of components, counting not just direct costs, such as inventory and related capital costs, but also harder-to-quantify expenses, such as associated R&D spend and production-line investments. This approach has helped a commercial-vehicle manufacturer reduce the number of components it deploys by 20 percent while affecting just 5 percent of sales—some of which were converted to other products. It also helped an engineered-products company realize that its base offerings could be bundled into just three key platform types, vastly simplifying the firm's internal complexity while preserving customer options.

Get granular at the component level. The second application optimizes at the individual-component level. The sheer number of components, together with the often-manual process of entering and classifying component data, creates significant challenges when an organization wants to identify components that are similar, but not identical.

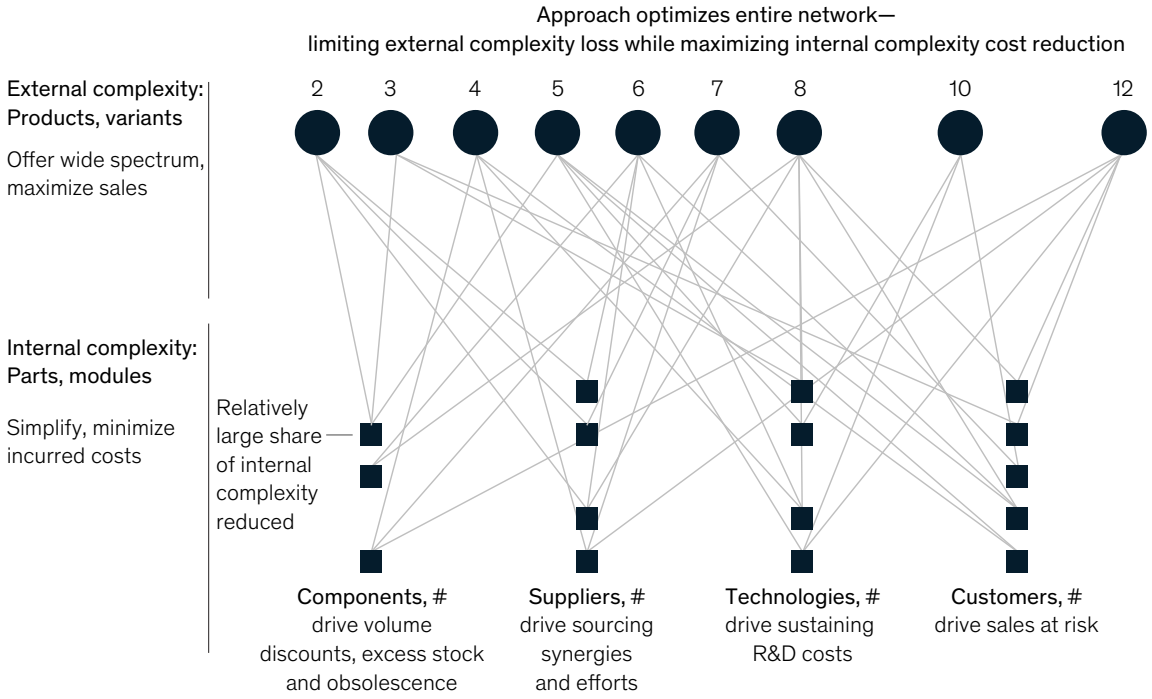
Machine-learning algorithms are ideally suited to this challenge, especially when trained over many months on comparable data. They are not only able to identify clusters of similar components, but can also use component similarity to highlight unexplained pricing discrepancies and point out more-competitive suppliers.

Exhibit 4

Step 1: Advanced analytics identifies optimal combinations of pruning candidates.



Step 2. Advanced analytics maximizes complexity reduction while minimizing sales impact.



One automotive supplier company, for example, created unified data pools by combining line-item spending with bill-of-material, material-master, supplier, and engineering data from different systems. Ultimately, the company uncovered clusters of similar parts with very dissimilar prices. In some cases, the most expensive were double the price of the least expensive. In other cases, the algorithms identified identical parts sourced from different suppliers for significantly different prices—which was not visible before because of classification differences.

Rethinking product-related decision-making

Even with the best advanced analytics, machine learning, and related technologies, portfolio choices still have a strong human factor. Human involvement means human biases are a major risk, of which many people are not even aware.

Stability bias values ventures that don't rock the boat or change direction. It happens when companies continue projects in which they've already heavily invested, rather than pursuing newer, riskier options that come with much greater potential advantages.

How to overcome it: Pooling riskier ventures in a separate unit is one way a firm can overcome stability bias.

Interest bias thrives in situations where different parts of a company argue for different projects. Perhaps engineers prefer technically advanced products (without considering customer demand), while sales pushes ideas that help them fill quotas (without keeping the cost of development in mind).

How to overcome it: Agreeing on decision-making criteria ahead of time can help combat interest bias.

Pattern-recognition bias lets past events drive current decisions. If a particular kind of product failed ten years ago, it's not worth trying now.

How to overcome it: Have a formalized process to evaluate previous experiences, including relevant context. What kind of product was it? Did an external shock drive failure?

Companies that excel usually facilitate the flow of information between functions and departments. They have dedicated product-portfolio managers who are closely connected with system architects and product owners. They use predefined criteria to guide their product portfolio development. That reduces the risk that biased, individual perceptions will drive decision-making.

Incorporate customer-centric insights

A good example of reviewing an old decision comes from a recreational-vehicle (RV) manufacturer, whose larger models had included the same basic components for many years. The company sensed that its customers' lifestyles were changing, but it was reluctant to make significant changes to its designs.

The crucial factor in overcoming this form of bias was to develop a single source of truth for customer and market research, through a mix of quantitative and qualitative research methods. Ethnographic research methods—interacting with consumers in their own environment—proved especially effective in light of limits on available market data. That research revealed that that the built-in kitchens traditional RVs provided were going unused. Instead, RV owners relied on outdoor grills. The company therefore developed a slide-out kitchen that was a hit with customers and increased RV sales.

Businesses can foster these sorts of insights in-house as well, by bringing engineers much closer to customer interactions or even establishing dedicated roles for this, as many agile teams do. Either method works to build a bridge between the products' creators and their ultimate users. Manufacturers have long been responsive to product reviews and testing organizations, but new technology's ability to provide instantaneous feedback means they can hear from the customers in real time. And, as software comprises more of a product's functionality, companies can respond much more rapidly as well, to improve products even after their sale.

Companies have more need than ever to rebalance their product portfolios so that complexity creates value rather than destroying it. They also have more tools at their disposal, with more power to create the right products that serve their customers' needs. Now is the time to get started.

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