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Walk into the In-N-Out Burger restaurant on Fisherman's Wharf in San Francisco, and one of the first things that may strike you is the number four. Four colors: red, white, yellow, and gray; four cash registers with four friendly faces behind them; and just four items on the menu. You can buy burgers, fries, shakes, and sodas. All the ingredients are delivered fresh to the store, where they're prepared in the open kitchen behind the cashiers. You'll see a few folks eating at the restaurant's tables or tucking into their food outdoors on patio benches, but most customers come in with a handful of cash—no credit or debit cards, thank you—and head back out with their meals.

Four is In-N-Out Burger's innovation fulcrum—the point at which the number of products strikes the right balance between customer satisfaction and operating complexity. Four means simple purchasing, simple production, and simple service. And, it turns out, in a world where fast-food restaurants are forever adding formats and menu items, simple means profitable growth. With its chain of about 200 restaurants throughout California, Arizona, and Nevada, the family-owned company expanded its sales by 9.2%, to $308 million, in 2003, a rate just about double the fast-food standard. Analysts estimate In-N-Out's margins at 20%, again supersized for the industry.

So where's your company's innovation fulcrum? What's the number of product or service offerings that would optimize both your revenues and your profits? If you're like most managers, you're probably scratching your head right now. You don't have a clear idea of where that point lies. All you know—or at least strongly suspect—is that it's considerably lower than where you are today.

The fact is, companies have strong incentives to be overly innovative in new-product development. Introducing distinctive offerings is often the easiest way to compete for shelf space, protect market share, or repel a rival's attack. Moreover, the press abounds with dramatic stories of bold innovators that revive brands or product categories. Those tales grab

managerial and investor attention, encouraging companies to focus even more insistently on product development. But the pursuit of innovation can be taken too far. As a company increases the pace of innovation, its profitability often begins to stagnate or even erode. The reason can be summed up in one word: complexity. The continual launch of new products and line extensions adds complexity throughout a company's operations, and, as the costs of managing that complexity multiply, margins shrink.

Managers aren't blind to the problem. Nearly 70% admit that excessive complexity is raising their costs and hindering their profit growth, according to a 2005 Bain survey of more than 900 global executives. What managers often miss is the true source of the problem—the way complexity begins in the product line and then spreads outward through every facet of a company's operations. As a result, the typical corporate response to complexity—launching a Six Sigma or other lean-operations program—often falls short. Such efforts may reduce complexity in one obvious area, but they don't address or root out complexity hidden elsewhere in the value chain. Profits continue to stagnate or fall.

In working with scores of companies since the 1980s, we've studied how complexity infects a company's entire value chain and identified the most common culprits for its spread: bad economic data, overoptimistic sales expectations, and entrenched managerial assumptions. Based on our research, we've developed a comprehensive approach to simplifying a business, centered on a company's innovation fulcrum. By finding the right balance between complexity and innovation—the way In-N-Out Burger has—companies can reduce costs by as much as 35% and lift revenues up to 40%. For many businesses, the innovation fulcrum becomes a turning point toward higher profits and greater sales.

Why Lean Is Not Enough

The usual antidotes to complexity miss their mark because they treat the problem on the factory floor rather than at the source: in the product line. Consider the case of a large, sophisticated high-tech manufacturer, long frustrated by its inability to reduce its inventory of parts and components. The company uses cutting-edge lean-manufacturing techniques to streamline production processes, and its labor force works at world-class productivity rates and routinely hits Six Sigma quality targets. But its inventory-turn rate, the number of times a year the company goes through its entire inventory, remains stuck at seven, a far cry from its goal of 12. Spurred by management's desire to fulfill customer needs and maximize sales, the company has steadily expanded its product line to the point that it now encompasses thousands of SKUs. To make all those products, the company must stock about 400,000 parts from hundreds of suppliers. Given the unpredictable variations in demand, particularly for less popular products, the manufacturer is forced to maintain extensive safety stocks in order to avoid having to shut down the plant while awaiting the delivery of a particular part. Because the product line's size drives inventory requirements, the turn rate lies beyond the reach of lean-manufacturing programs.

This company's problem is not unusual. It's natural for businesses to add products to keep customers happy. Smart marketers have no trouble justifying each addition as a means of adding or protecting revenues. But as more products are added, the costs of the resulting complexity begin to outweigh the revenues, and profits start falling. From that point on, every new offering—however attractive in isolation—just thins margins further. The more aggressively the company innovates in product development, the weaker its results become. (It's not just manufacturers that suffer from profit-eroding complexity. It affects service firms and knowledge companies as well. See the sidebar "The High Price of Service Complexity.")

What makes the problem particularly damaging is that it tends to be invisible to management. Look at what happened when one automaker started offering tinted windshields as an option. On the surface, the move looked like a clear winner. The company's marketers calculated that nearly 40% of customers would buy the option for $120, while the supplier would charge just $8 per unit. Moreover, installing tinted glass rather than clear glass seemed to add no labor costs on the assembly line. With new revenue far outstripping direct costs, adding the new option seemed to guarantee a quick profit boost.

But it didn't turn out that way. Offering

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tinted windshields, in combination with many other options, led to a whole range of higher costs that never showed up in the company's analysis. On the factory floor, the automaker had to adjust its work flows, add new quality-control tests, and even change the routes of its forklifts—all of which increased production costs. Purchasing and material-handling costs went up to accommodate the added part. Assembly-line errors crept up as proliferating options made workers' jobs less predictable. The tinted windshields added complexity to the company's operating and accounting software, which already produced millions of option codes to account for often-minor variations in assembly. Because the systems could no longer "control" for every option, orders now came to the factory floor in random patterns—for example, three cars in a row might require tinted windshields, followed by five that didn't. Workers' walk and reach time increased because they had to double-check order sheets to determine which windshield to install. The increased customization also caused unexpected peaks in demand, leading to dips in quality as workers rushed to finish tasks. Forecasting became more complex, resulting in cars with options packages no one wanted on dealers' hands. Perhaps most pernicious, when a dealer discounted a car to move it off the lot, the forecasting system would see that sale as true marketplace demand, triggering inaccurate forecasts of orders that were likely to come. All of this led to a ratcheting up of inventories to avoid possible stockouts. The "clear winner" ended up losing the company money, though management didn't make the connection at the time.

Traditional financial systems are simply unable to take into account the link between product proliferation and complexity costs because the costs end up embedded in the very way companies do business. Systems introduced to help manufacturing and other functions cope with the added complexity are usually categorized as fixed costs and thus don't show up on variable margin analyses. That's why so many companies try to solve what really are product problems by tweaking their operations—and end up baffled by the lack of results.

What Customers Want

To meet the complexity challenge, you have to begin at the source: with the way your company views customers and their needs. In most cases, managers overestimate the value buyers place on having many choices. Deeply entrenched in management thinking, that mistaken assumption sets the stage for product proliferation. But some companies have begun to challenge that belief. They have launched efforts to determine how much product or service choice customers really want and then gear their operations to efficiently provide that degree of complexity—and no more. These organizations are finding, in other words, their innovation fulcrums. (For an important caveat, see the sidebar "You Can Be Too Simple, Too.")

In 2003, the global food company H.J. Heinz decided to take on its complexity issues. The company launched a Remove the Clutter initiative aimed at "aggressively attacking complexity on many levels," as the company's annual report put it. The effort focused in particular on Heinz's product line, which, over the years, had ballooned to more than 30,000 SKUs as a result of mergers and acquisitions and a focus on creating local brands and products around the globe. As the company analyzed the portfolio, it discovered that many products actually had little appeal to customers. For example, of its three flavored ketchup variations—Hot & Spicy, Mesquite, and Zesty Garlic—only Hot & Spicy had attracted a loyal

The High Price of Service Complexity

The downsides of product complexity for manufacturers have been documented in many studies. But manufacturers don't suffer alone. In fact, in service and knowledge businesses, the continual introduction of new, information-rich offerings can have even more destructive consequences. It can leave virtually every employee struggling to make sense of a complex service portfolio, undermining both productivity and customer responsiveness.

One telecommunications company, for example, has used the power of information technology to slice and dice its service set into ever more finely differentiated options. The firm hoped it would boost revenues by more precisely fulfilling the needs of every imaginable buyer. But offering so many options has had the opposite effect. The company's customer-service reps are now forced to sort through more than a thousand promotion codes while they're talking to a potential customer. Most of the promotions offer distinct levels of discounts and product benefits. Making sense of them all is an overwhelming task. The result? Sales agents give slow and often inaccurate answers to inquiries—and customers grow frustrated and head toward a competitor.

clientele and was generating meaningful sales. By the end of 2004, Heinz had discontinued its least profitable SKUs, trimming the total to about 20,000. The cuts reduced manufacturing, packaging, raw materials, and procurement costs while unclogging store shelves to make room for its profitable products. The initiative helped add a full percentage point to the company's gross margin.

Similarly, Starbucks decided a few years ago to streamline its artisan approach to making drinks by automating and standardizing certain elements of the latte manufacturing process. Today, Starbucks still has a very complex product line on the surface—customers can customize their lattes by size, type of milk, temperature, and flavor additives—but all the variations are based on a standard platform. The process change made very little difference to customers: Their desire for a "custom" product continued to be satisfied even as Starbucks' speed of service increased significantly.

Navistar International, the industrial equipment manufacturer, has also found its innovation fulcrum. In the truck industry, manufacturers typically offer customers pages of options for customizing their vehicles, leading to innumerable build permutations and hidden complexity across the value chain. Navistar challenged the widely held assumption that consumers want a custom-built product, and, in the mid-1990s, introduced a companywide strategy to focus its assembly plants and streamline product lines.

A key piece of this strategy was Navistar's Diamond Spec program, which created a simpler and quicker ordering process for one class of truck while reducing manufacturing complexity. Customers now chose from 16 preengineered modules instead of thousands of individual components. Not long after its launch, Diamond Spec accounted for 80% of dealer orders for that class of truck. The shortened ordering process from days to hours and the guaranteed improvements in quality and performance resulted in consumers placing 120% more orders during the pilot than initially forecast.

Clearly, when organizations prune their offerings to better fit the needs of customers, they do more than cut costs; they often boost sales as well. In many cases, in fact, the revenue gains are even greater than the cost savings. Consider Chrysler's California Velocity Program, launched in the late 1980s. For certain car lines, the carmaker identified the 200 top-selling configurations out of an initial list of about 5,000. The company then used detailed market analysis to suggest to each dealer which four to six of those 200 configurations would be the hottest sellers in its local area. The dealers would then focus on stocking those particular configurations on their lots. This was critical because the months-long process of special ordering a car caused 92% of all customers to buy directly off the lot. If a configuration near what the customer wanted was not on the lot, the dealer was likely to lose the sale. Chrysler tested the initiative in California, using the rest of the United States as a control. After just a year, the automaker found that average dealer sales in California were 20% higher relative to the control dealerships, and the margins of the California dealers were significantly better as well. By more tightly tailoring their offerings to customer needs, dealers sold more cars more quickly, while avoiding the discounting traditionally required to move "turkeys" off the lot. Fewer choices meant happier customers and higher sales. Chrysler then rolled out the program nationally, and over the next four years the company increased overall revenues by 40%.

The Model T Analysis

How exactly can you find your own company's innovation fulcrum? We've distilled the experiences of successful companies into a two-step process that we call a Model T analysis.

You Can Be Too Simple, Too

Complexity is not always bad. In many cases, maintaining some degree of complexity is essential to effective operations and astute risk management. The high-tech hardware manufacturing sector, for example, suffers frequent supply disruptions for a number of reasons. These include cyclical capacity shortages (notorious in memory chips), technology schedule slippages (for new CPUs, for example), and regional crises affecting suppliers (such as earthquakes). If alternatives are not available, the financial implications can be devastating. Getting too simple in your inventory may prevent you from having enough $2 capacitors on hand, which stops production of a critical video card, which, in turn, holds up production of a high-end workstation. Supply disruptions have cost high-tech OEMs hundreds of millions of dollars in profits. In situations like these, it makes sense to maintain redundant supply sources—even though doing so adds considerable complexity to the supply chain.

First, you determine your zero-complexity baseline, the process cost of selling an absolute minimum number of standard products. What, in other words, would be your company's equivalent of Henry Ford's one-size-fits-all 1920s Model T? For Starbucks, the Model T might be a medium-size cup of brewed coffee. For a bank, it might be a basic checking account. Next, you add variety back into the business system, product by product, and carefully forecast the resulting impact on customer sales as well as the cost impact across the value chain. When the analysis shows the costs beginning to overwhelm the added revenues, you've found your innovation fulcrum. (For an overview of the process, see the exhibit "Finding Your Model T.")

Setting the Baseline. What would your company look like if it made and sold only a single product or service? Answering that question is important for two reasons. First, virtually every complexity reduction exercise we have seen that does not do this has failed to break through organizational resistance. Typically, marketing wants more product diversity, while operations wants less. Starting from a purely theoretical baseline allows long-opposed sides to suspend their defensiveness and "not invented here" mentality. Participants—especially senior executives from marketing and operations who will lead the initiative—can begin thinking about change without asking for commitments.

Second, a baseline changes the lens through which managers view the business. It enables them to see through a company's existing complexity—a difficult challenge given the way financial reports hide process costs. Only by stripping away all the products, options, and configurations do managers get a clear sense of the extent of the complexity and its costs. In working with one company, for example, we determined that its products could be configured in 10 billion different ways. A much more profitable competitor, in contrast, offered 3,000 possible permutations. Our client's managers were unable to comprehend the operational implications of going from 10 billion to 3,000 configurations. When we asked one of them what would change under such a scenario, he shook his head and replied, "We only build 1,000 units a day, so I can't think of anything that would change." But when we asked the managers to imagine producing just one standard product, their eyes lit up. They immediately realized how they'd be able to streamline processes, strip away entire IT systems, and simplify transaction processing. One manager was particularly struck by how making only one product would change the forecasting process for parts. Each night he took an inventory of all 46,000 parts in the plant to ensure he had what he needed to manufacture any of the 10 billion permutations that customers could, theoretically, request. "If we don't have enough in stock or arriving by truck in time to meet the next day's schedule, then we have parts flown in. On average, 15 planes a day fly in to the plant from our suppliers around the country." He then pointed out, "All those costs would disappear instantaneously."

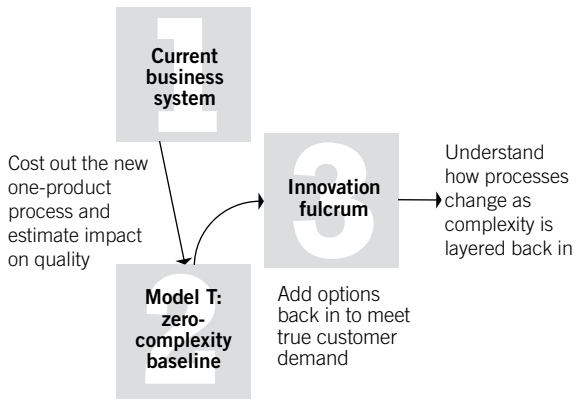
Choosing the right Model T can be tricky. Most companies should look for an average version of their basic offering, avoiding stripped-down versions on the one hand and elaborate models on the other. That way, variations in the cost of product features won't distort the analysis. Big companies operating in many markets may find it difficult to isolate a single "typical" offering. In such cases, manag-

Finding Your Model T

What would be your company's equivalent of Henry Ford's one-size-fits-all Model T? To figure that out, begin by considering one of your highest volume products or SKUs. This will usually give you the clearest snapshot of the overall business systems—from marketing and manufacturing operations to relationships with suppliers and retailers—that may need to change. Make sure to choose a configuration that is average in terms of content, cost, and cycle time through the system.

In some instances, a company may have more than one Model T. This is often the case when products:

- are targeted at entirely different customer segments;
- have separate manufacturing processes;
- rely on platforms that are so different that the supply chains cannot be compared.



ers should look for a proxy—a smaller competitor that's operating with a much more basic set of offerings. A national or international fast-food chain, for instance, might use In-N-Out-Burger as a proxy for its own baseline. By analyzing the smaller, simpler company's operations and financials, the larger enterprise could estimate what its own costs and revenues would be if it minimized its product set.

It's also sometimes possible to look outside your immediate industry to gain insight into your baseline. For example, the Royal Bank of Canada examined the operations and results of local Money Marts, simple check-cashing operations that were thriving in low-income urban neighborhoods, as a model for its baseline set of services.

Adding Variety. Having established the cost of producing a baseline offering, you now need to add back in the options that will be valued by customers. The simplest possible offering, after all, will rarely be the optimal offering. Henry Ford found that out when he continued to churn out basic Model Ts while Chevrolet was introducing new models. Ford soon saw his company's market share and profits erode. By expanding the product line, item by item, a company can forecast the costs

Gauging the Complexity of Your Business

The Roman poet Ovid surmised, "The cause is hidden; the effect is visible to all." Such is certainly the case with complexity today. It doesn't appear on balance sheets or on quarterly reports, but its impact can be conspicuous. We tend to see the most complexity in businesses that build products to stock, have a sophisticated supply chain or assembly environment, or sell products through retail stores. To determine the complexity of your business, begin by looking at your number of offerings, sales volume, modularity, and where complexity shows up in your value chain. Below, we offer a simple set of diagnostic questions for manufacturers, retailers, and service businesses. If you answer "yes" to any of these questions, your business is likely overly complex.

	Manufacturing	Retail	Services
Number of offerings	Is your total number of SKUs or possible product configurations greater than 1,000 or more than 50% greater than that of your lowest-complexity competitor?	Do your fastest-turning SKUs sell more than twice as frequently as your slowest? Are your inventory turns more than 10% slower than your lowest-complexity competitor?	Does your sales force have trouble understanding and communicating your most profitable offerings to core customers because of the complexity of the offerings?
Sales volume	Do less than 20% of SKUs, build combinations, or product configurations make up more than 80% of your sales volume?	Do less than 20% of SKUs, build combinations, or product configurations make up more than 80% of your sales volume?	Do less than 20% of SKUs, build combinations, or product configurations make up more than 80% of your sales volume?
Modularity	Have any of your competitors created modular or bundled products?	Is your approach to customer segmentation aimed at "offerings for many to attract the many" rather than "delighting the few to attract the many"?	Can you bundle offerings to meet specific segment needs?
Where complexity shows up	Does complexity show up early in the process, such as in engineering (creating change orders) or in assembly (creating unpredictability in the operation)?	Do you find that you frequently have to discount to sell slow-moving inventory?	Do you have excessive error rates, low close rates, or frequent customer abandonment due to customer confusion?

that greater complexity will add as well as the incremental revenues that will be gained. Using detailed market research and customer analysis, managers can determine, in concrete terms, the level of choice customers demand. The company adds complexity back in only when it knows that a segment of customers will want the additional SKUs and be willing to pay more than the full systems costs the added complexity entails. (See the exhibit "Adding Variety, Carefully.")

The secret to this second step is to take a painstakingly methodical approach, adding only a single element of complexity at a time and then tracing the effect through the value chain. To return to the fast-food business, consider how Burger King recently used a combination of five measures to identify how adding a product or ingredient, in this case a premium sandwich bun, could benefit its overall business. Using consumer, operational, supply chain, financial, and strategic criteria to evaluate its bread carriers and selection of buns, Burger King saw that several of its current products were relatively complex and costly to handle, requiring special manufacturing and distribution. For instance, sourdough breads and baguettes were baked, frozen, and then shipped, refrigerated, through distribution centers. But using the same evaluation criteria, Burger King identified one attractive new product, the 5-inch corn-dusted bun, which could go through Burger King's core hamburger-bun supply chain.

Burger King discovered that adding corn-dusted buns would benefit four critical stakeholders. First, consumers ranked the fresh-baked buns high on key dimensions of quality, including freshness, taste, and appearance. Second, the fresh-bread suppliers could deliver corn-dusted buns alongside standard buns on their current delivery routes. This would increase the drivers' average order and drop sizes, making each restaurant shipment more cost-effective. Third, corn-dusted buns would be simpler for restaurants, since suppliers would handle the inventory management, and the buns would not require costly frozen storage. Finally, the franchisees would benefit as the better products drove higher unit sales, and the simpler logistics resulted in lower unit costs. By analyzing the impact of the additional variety across all stakeholder groups, Burger King could see that the corn-dusted bun would be a winning addition.

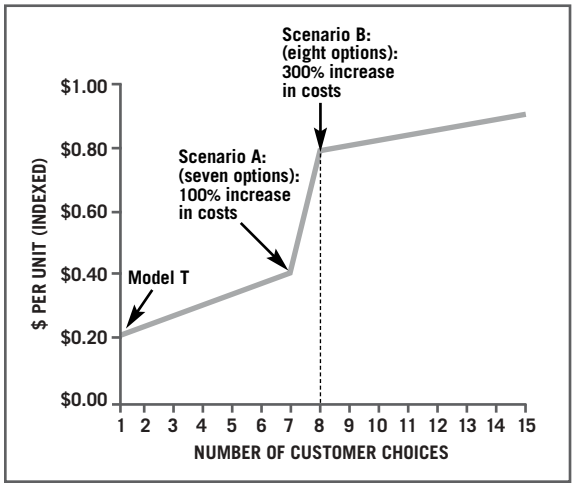
Keeping It Simple

As we've seen, complexity is insidious. Getting rid of it is only half the challenge. The other half is keeping it out. Once a company is balanced on its innovation fulcrum, it must be vigilant in preventing the proliferation of products and in reassessing its optimal fulcrum point as, for example, customer needs and production technologies evolve. Four practices can help stem complexity creep:

Raise the hurdle rate. Requiring a higher rate of return on new products not only makes it more difficult for marketers to arbitrarily add SKUs, it also increases discipline in the innovation process. Consider one consumer apparel company that markets a diverse portfolio of iconic, global brands as well as some other national brands. While new styles from the classic brands tended to remain attractive to customers for years on end, innovative styles from the lesser known brands had short shelf lives—and were becoming a drag on profits. To solve the problem, the company started by reducing complexity, dropping thousands of SKUs and million of dollars in unprofitable sales, thereby increasing gross margins. Then, to keep a lid on complexity, the apparel maker introduced significantly higher

Adding Variety, Carefully

When an industrial supplier saw that offering one additional option caused a huge leap in costs, it determined that its innovation fulcrum, the complexity level at which it would maximize both profits and revenues, rested at seven options.



Nearly 70% of managers admit that excessive complexity is raising their costs and hindering their profit growth.

hurdle rates for new-product introductions of its nonclassic styles, making it harder for the company to take on less profitable products. Instead of requiring a 15% return to introduce a new SKU, which had been the traditional standard, it upped the required return to 25%, a figure that more accurately reflected the added complexity costs. Finally, to ensure accountability in the innovation process, executives assigned a "product owner" to every new style. Employees in this role monitor new-product performance and quickly cull items before they become unprofitable.

Postpone complexity. The further down the value chain you introduce complexity, the less it costs you. The logic of postponement applies across a wide range of consumer durable and industrial goods sectors. Consider big-box retailing where consumers like product choices but don't want to wait for them and won't pay anything extra. Manufacturers accommodate this by designing products that are customized at the last step in the assembly or distribution process. Manufacturers can source materials and components from anywhere in the world, while assembling products just in time for customers close to the point of sale. In the kitchen department at Home Depot, for example, the retailer and manufacturers work together to provide a variety of customer options. MasterBrand Cabinets and Masco both provide entry-level cabinets that can be integrated with standard Wilsonart countertops. These manufacturers also provide higher-end custom products designed to be configured by in-store designers and then shipped directly to the job. (This approach addresses one of the biggest fears that Home Depot customers have—whether or not the company can actually deliver on its promise of an error-free custom design and installation.) In this way, Home Depot preserves economies of scale while giving customers the flexibility they want.

Institutionalize simplicity in decision making. The goal here is to manage complexity before it is hardwired into plants and costs. To do this, executives need to determine who has responsibility for making innovation decisions across the value chain. Take the example of one food company, where marketers had developed novel forms of packaging for a popular snack. From a marketing standpoint, the approach made sense. Consumer research had long supported the notion that grabbing attention in the store aisle was a prerequisite to growing sales in the impulse-driven snack market. Yet plant personnel knew that marketing's unchecked enthusiasm for innovative packaging was hurting efficiency across the supply chain.

To resolve the conflict, the company's executives entered the fray. First, they purged the excess complexity by consolidating products around a few standard kinds of packaging—an approach that reduced material costs and boosted the top line significantly. But the executives also developed a new decision-making process to ensure that complexity wouldn't sneak back in. They assigned formal roles in marketing and manufacturing that defined who would recommend, provide input, and approve new product and packaging concepts. Now brand managers no longer make decisions unilaterally but work through a series of checkpoints with manufacturing and sourcing managers.

Stay balanced. A company's innovation fulcrum can shift over time. As it becomes more experienced in production and distribution, for instance, a company can often drive down the costs of complexity, easing the penalty for adding a new product. Or, the needs of its customers may shift, either reducing or increasing the value they place on having more choices. A company needs to revisit its portfolio routinely to ensure it is optimizing profits. Here, the Japanese automakers provide an exemplary model. By the 1970s, the Big Three U.S. automakers had been competing for years on the breadth of the choices they offered consumers. The resulting complexity had driven up their costs, leaving them vulnerable to attack. Toyota and Honda made the most of this opening by striking the right balance between customer choice and operating complexity. Rather than offering customers millions of build combinations—as the U.S. automakers were doing—Honda, for instance, offered 32 build combinations with four colors.

The results were lower costs, higher-quality cars, and significant gains in market share. Even though the U.S. makers have followed their rivals' lead in becoming simpler—through reducing the number of basic platforms on which they build their various models—Toyota and Honda have been able to maintain their cost leadership by continually

Many companies try to solve product problems by tweaking their operations—and end up baffled by the lack of results.

resetting their fulcrums. Responding to the demands of customers, for example, Honda has redesigned its engines to reduce fuel consumption and emissions. At the same time, the company has also streamlined the manufacture of its engine family, making it possible for the first time to produce different engine models on the same production line.

What's the right balance? It's a question Henry Ford should have asked before he began to see his competitors' colorful vehicles everywhere. He did, eventually, introduce the Model A, replete with multiple hues and features that won back some customer loyalty. But the lesson remains: Companies that strike the proper balance between innovation and complexity create more efficient operations and more profitable relationships with customers. They also pave the way to a competitive advantage within their industry, often by forcing onto competitors the high costs associated with customization. The need for this equilibrium may not be as obvious as it was in Ford's day, but it's just as critical.

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