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The new enterprise DNA

How advanced analytics, technologies,
and design are redefining the capabilities
you need

McKinsey & Company

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McKinsey Quarterly

THIS QUARTER

If you are anything like me, you've probably settled into some well-grooved techniques for setting direction and solving business problems: We form hypotheses on the basis of frameworks and mental models that simplify the world; we test them through a combination of facts, analysis, pattern recognition, and experience; and then, informed by the results of those tests, we chart a course. There's a lot to be said for this approach, which has its roots in the scientific-inquiry method that helped create our modern world, and which isn't going away.

But it also isn't enough. Leaders today can let go of their hypotheses and let the data speak through the application of artificial intelligence and advanced analytics. They can pursue radical change through human-centered design techniques aimed at rising expectations and unmet needs. They can undertake rapid prototyping to test, learn, and pursue initiatives that once might have required months or years of study and planning. All of this requires fresh skills and mind-sets that many leaders lack.

The individual challenge is multiplied many times for the enterprise as a whole, and so is the prize: activating the organization to identify new business opportunities and to disrupt before being disrupted. This issue of the *Quarterly* lays out three critical priorities for seizing that prize. In "The cornerstones of large-scale technology transformation," my colleagues Michael Bender, Nicolaus Henke, and Eric Lamarre provide a road map for companies struggling to make the most of the advanced technologies and analytics at their disposal today. The challenges, they suggest, are less about technology per se than they are about integrating multiple technologies with one another and stretching the last mile to derive value from them, and from the data associated with them.

“The business value of design” also focuses on the importance of integration—of design and the user with a company’s business priorities, and of multiple perspectives, on cross-functional teams, pursuing iterative development processes. My coauthors and I describe how to stretch toward this ideal and show that reaching it isn’t just a nice-to-have these days; it’s a critical enabler of financial success in just about any physical, service, and digital setting.

Building the skills and organizational alignment needed to deliver on the promise of advanced analytics, technologies, and design is hard work and can be unnerving for people at all levels. In “Digital strategy: The four fights you have to win,” Tanguy Catlin, Laura LaBerge, and Shannon Varney explain how to fight the fear, ignorance, guesswork, and diffusion of effort that can be debilitating.

Together, these articles paint a picture of the changing corporate organism. Offering further food for thought are leaders at Koç Holding in Turkey, Ping An in China, the Rijksmuseum in Amsterdam, and SAP in Germany—all of whom are redefining their organizations and the skills they need. Their insights and experience underscore the degree to which a business isn’t just a system for delivering value; it’s a bundle of capabilities that must continuously evolve if the business is to thrive over the long haul. [Q](#)

A handwritten signature in black ink, appearing to read 'Hugo Sarrazin', with a long, sweeping horizontal line extending to the right.

Hugo Sarrazin
Senior partner,
Silicon Valley office
McKinsey & Company

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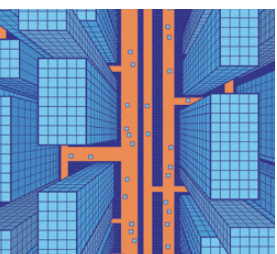
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CLOSING THE GENDER GAP: A MISSED OPPORTUNITY FOR NEW CEOS

Many new CEOs reshuffle their top teams, but surprisingly few make them more diverse. Can we do better?

by Michael Birshan, Carolyn Dewar, Thomas Meakin, and Kurt Strovink

Diversity matters in the workplace. It is an important social issue, and a performance imperative: more diverse top-management teams appear to benefit from a richer decision-making dialogue, which can contribute to better financial performance.¹

CEO transitions matter, too. Our research has shown that a CEO's likelihood of outperforming his or her peers depends heavily on the mix of strategic and organizational decisions made during the first two years on the job.² Management reshuffles—a critical piece of the performance puzzle for many new CEOs, according to our research—should create opportunities for new CEOs to boost gender diversity. Too few do so, however, suggesting that new CEOs, and the

boards that hire them, should be asking tougher questions about diversity and asking those questions sooner than they normally do.

A missed opportunity

At the beginning of their tenures, new CEOs typically change the makeup of their management teams. Our research shows that more than two-thirds of chief executives replace at least half of the members of their top teams within two years of taking office.³ They may do so to strengthen the capabilities of those teams, to embark on new strategic directions, or simply to replace former peers they had competed against for the top job, who may have different ideas about the way ahead. The management reshuffles

that happen during transitions hold the potential to serve as “unfreezing moments,” dramatically improving the representation of women at senior levels and sending a strong signal to the organization that this issue matters and that the CEO expects to increase gender diversity going forward.

Yet only a small number of new CEOs are taking advantage of the narrow window of opportunity a transition provides to boost the top team’s diversity (see sidebar, “About the research”). For example, we found that within three years, gender diversity in senior teams that new CEOs reshuffled increased by only two percentage points—raising the proportion of women in management to only 14 percent, from 12 percent. The picture of female representation didn’t improve when we expanded the time period to cover management reshuffles over the entirety of the CEOs’ tenures.

This finding suggests that even if a dearth of women in the management pipeline limited progress during the transition period, those same CEOs didn’t change the pipeline and promotion picture during their tenures. The trend was consistent across time as well: CEOs who took charge in recent years were no more likely to promote women to senior roles than those who became corporate leaders 20 or 30 years ago. And though our data focused solely on gender, research by our colleagues on the additional difficulties faced by women of color suggests that top-team transitions do little to help on that front either.⁴ Behind all the apparent inaction—and missed opportunities—we found three complex underlying patterns.

Up from the bottom

First, new CEOs in the *least* diverse companies and industries seem to make the most significant improvements in gender diversity over the course of their tenures (exhibit). Chief executives who took over companies where women made up less than 15 percent of the senior-management team, for example, increased female representation, on average, to 14 percent, from 10 percent—twice the level of improvement achieved by all CEOs who undertook management reshuffles. While the sample size is unfortunately small, the same effects are seen when looking at female incoming CEOs specifically.

Digging deeper, we found that CEOs who take the helm of companies in historically male-dominated industries made the most significant improvements, although the sample size was small. For instance, new CEOs in heavy-industry sectors, which had the lowest levels of female representation at the start of their tenures, more than doubled it on their executive teams, to 13 percent, from an average of 5 percent. Although the companies these CEOs led started from a lower base and had the greatest room to improve, it is still positive that their companies are addressing major imbalances even when the talent pipeline doesn’t make this easy.

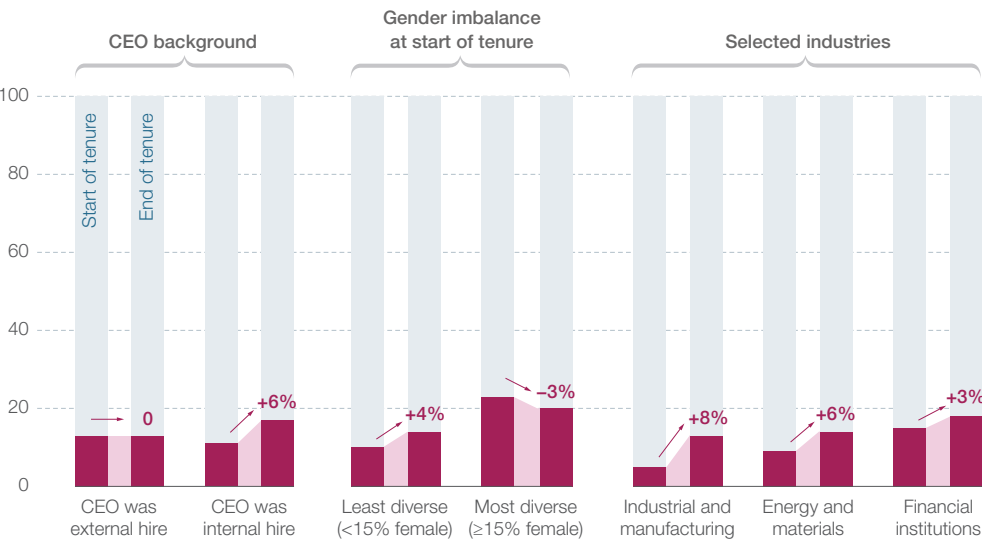
The cost of complacency

Our second finding was that, eventually, diversity appears to hit a ceiling. New CEOs at companies with the highest percentage of women in senior roles at the point of transition were the least likely to improve gender diversity. On average,

Exhibit

New CEOs hired internally and CEOs in industries with less diverse teams are more likely to make gains in gender diversity.

Female representation in senior management at start and end of a CEO's tenure, %



in fact, companies with new CEOs where women made up 15 percent or more of the management team actually saw a *reduction* in the proportion of women in senior roles during reshuffles.

We take this finding to mean that more diverse companies tend to become complacent over time: the arrival of a new CEO is more likely to result in stagnation or decline than to help the organization capitalize on its momentum or positive starting position. The evidence suggests that once companies reach a minimum standard of diversity, the perceptions of their leaders—and, as a result, their priorities—change. This conclusion is consistent with the finding that nearly 50 percent of men believe

that women are well-represented in leadership roles in companies when they account for only one in ten executives.

The insider's edge

Finally, as the exhibit shows, our research reveals that CEOs promoted from *within* companies increase their gender diversity to a much greater extent, on average, than those hired *externally*. The difference is stark: internal CEOs raised female representation on management teams by nearly six percentage points more than external CEOs, who kept gender ratios stable, on average. Again, this is also the case when looking only at the female CEOs in our data set.

About the research

To understand how new CEOs reshape their top teams, we used our CEO-transitions database to track the moments when companies change CEOs; the strategic moves CEOs make, including management reshuffles; and these CEOs' sector exposure and history before becoming chief executives. We combined this information with data from BoardEx to measure the gender change in the composition of the senior-management teams of these CEOs, from the start to the end of their tenures. (BoardEx defines senior managers as C-suite officers and divisional and regional heads.) These new data were complemented by insights from McKinsey's ongoing *Women in the Workplace* research, which explores, in more detail, the corporate pipeline, the support women receive from their managers, the opportunities women believe they have, and the promotion and attrition experienced by women relative to men.

This finding offers an interesting counterpoint to some conclusions of our earlier research on transitions more broadly. In that work, we found that CEOs hired from outside companies were typically bolder in the number of strategic moves they made early in the game. As a result, they outperformed other CEOs over their tenures, on average.

The apparent divergence between bold strategic moves, on the one hand, and a lack of corresponding boldness in addressing gender issues, on the other, may result at least partly from the difficulties some leaders face in overcoming unconscious bias among other members of the top-management team. CEOs promoted from inside tend to know where the talent is, and that helps them mitigate the impact of biases among other senior executives. External appointees are less likely to have the same richness of information and may therefore find themselves defaulting to male-skewing conventional picks recommended by other leaders or the


board. Of course, both inside and outside CEO hires are also susceptible to—and must guard against—their *own* unconscious biases.

Tough questions

Even if CEOs do make progress on gender balance early in their tenures, when they have a mandate to undertake significant management reshuffles, the job isn't finished. New CEOs who aspire to create an inclusive culture that drives significant progress on gender diversity must ask and answer several difficult questions:

- How do I communicate the economic and strategic imperative of creating a diverse top team and make this a shared goal throughout the organization?
- What specific measures to improve gender diversity are appropriate for my organization, and how will I ensure that they take effect lower down the ladder?

- How do I make sure that women are moving into roles with profit-and-loss responsibility, as well as roles overseeing support functions, to prepare them for broader executive roles?
- How can I accelerate the pipeline of female talent while ensuring that fast-tracked women are supported and helped to succeed?

Success in this context is perhaps best measured by the legacy that CEOs create for their successors: Will those who follow them be starting afresh from a disappointing position, or maintaining momentum on the back of real progress? 

³ For a perspective on why CEOs should make bold strategic moves early in their tenures, see Michael Birshan, Thomas Meakin, and Kurt Strovink, "How new CEOs can boost their odds of success," *McKinsey Quarterly*, May 2016, McKinsey.com.

⁴ For a deeper assessment of gender-diversity initiatives and the importance of addressing intersectional issues with race, see *Women in the Workplace 2017*, LeanIn.Org and McKinsey, 2017, McKinsey.com.

Michael Birshan is a senior partner in McKinsey's London office, where **Thomas Meakin** is a partner; **Carolyn Dewar** and **Kurt Strovink** are senior partners in the San Francisco and New York offices, respectively.

The authors wish to thank Denis O'Connor and Markian Mysko von Schultze for their contributions to this article, as well as Lareina Yee and Vivian Hunt for their expertise as leaders of McKinsey's overall research on diversity.

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¹ McKinsey research indicates that companies in the top quartile for gender diversity in the executive team are, for example, 21 percent more likely to outperform bottom-quartile peers on EBIT margin and 27 percent more likely to outperform them on long-term-value-creation metrics, such as economic profit. See Vivian Hunt, Lareina Yee, Sara Prince, and Sundiatu Dixon-Fyle, "Delivering through diversity," January 2018, McKinsey.com.

² For a review of the characteristics of exceptional CEOs and the kinds of moves they make, see Michael Birshan, Thomas Meakin, and Kurt Strovink, "What makes a CEO 'exceptional'?", *McKinsey Quarterly*, April 2017, McKinsey.com.

THE SYMBIOTIC RELATIONSHIP BETWEEN ORGANIZATIONAL HEALTH AND SAFETY

Management practices focusing on “hard” incentives, rewards, and consequences, as well as on employees’ mind-sets and values, make workplaces safer.

by Randy Lim, Jean-Benoît Grégoire Rousseau, and Brooke Weddle

We have long observed that while safety standards in the workplace generally improve across industries over time, individual organizations improve at different speeds. Many companies, moreover, struggle to improve their safety performance beyond a certain level.

A high level of safety for all employees is important in itself, of course, and when companies fall short they expose themselves to greater liability, reputational risk, and the danger of burdensome regulation. What distinguishes companies that do well in safety from those that don’t?

It may come as little surprise to learn that companies with superior organizational health—those that align most successfully around a clear strategy, execute it well, and renew themselves over time—also tend to have the best safety records. But recently, when we looked more closely at this relationship for companies with similar risk profiles such as those in the global energy and materials (GEM) sector, what struck us was not only the extent of the connection but also the interesting mix of management practices most correlated with safety performance.

Companies in the top quartile in organizational health, we discovered, have six times fewer safety incidents than those in the bottom quartile, which have almost three times as many incidents leading to lost work time as companies in the top quartile.

Successful actions to improve safety predictably include “harder” health-related practices, such as habit-reinforcing incentive systems. But companies that have achieved unusually high safety standards also tend to focus on “softer” practices, such as encouraging employees to “own” safety problems and to take leadership in the search for solutions. They also embed strong values among their employees.

Health and safety

McKinsey’s Organizational Health Index (OHI), our unique database tracking thousands of companies across sectors and regions, provides ample evidence that organizational health improves financial and operating results.¹ We measure it by aggregating the views of employees and managers about nine key organizational

dimensions that have proved critical to health (“what employees see”), as well as 37 management practices that promote those outcomes (“what leaders and managers do”).

To test the link between organizational health and safety, we drew upon two widely accepted measures of safety: the total recordable incident rate and the lost-time incident rate.² The US Occupational Safety and Health Administration and writers of environmental, social, and governance reports use these metrics to compare industries and groups.

McKinsey has both safety and OHI data—responses from almost 100,000 managers and employees—for 52 companies in our database. When we analyzed them, we found a strong relationship between organizational health and safety (exhibit). Companies with good safety records outperform their counterparts on all nine key organizational outcomes that contribute to organizational health. In addition, they are eight points above the sector benchmark in outcomes related to innovation and learning. We also tested the relationship in a single global mining company and discovered that better organizational health was associated with safety improvements at the site level.

Health and safe management practices

Leaders of organizations where safety is important, such as those in the GEM sector, all recognize the importance of corporate cultures. They might strive to create a culture of interdependence—a

term widely used by safety practitioners to describe a high state of safety maturity, in which employees look out for one another from genuine concern. Yet it is sometimes unclear how companies should create such a culture. Our analyses of the management practices associated with good safety outcomes are therefore instructive.

With the help of statistical techniques, we have developed a short list of critical management practices correlated most strongly with safety. These can be grouped into three broad themes.

Financial and nonfinancial incentives

We found that consequence management (creating accountability by linking rewards and consequences to the performance of individuals and teams) is a critical management practice associated with safety. So far, so predictable. Interestingly, however, two practices—providing both financial incentives and nonfinancial rewards and recognition—are also important. Many companies focus a lot of effort on consequence management to, for example, try to mitigate unsafe employee behavior. But our findings suggest that it is equally important to identify, reward, and explicitly recognize the sort of behavior that encourages safety, not least because it forces managers to think through what kind of behavior is required.

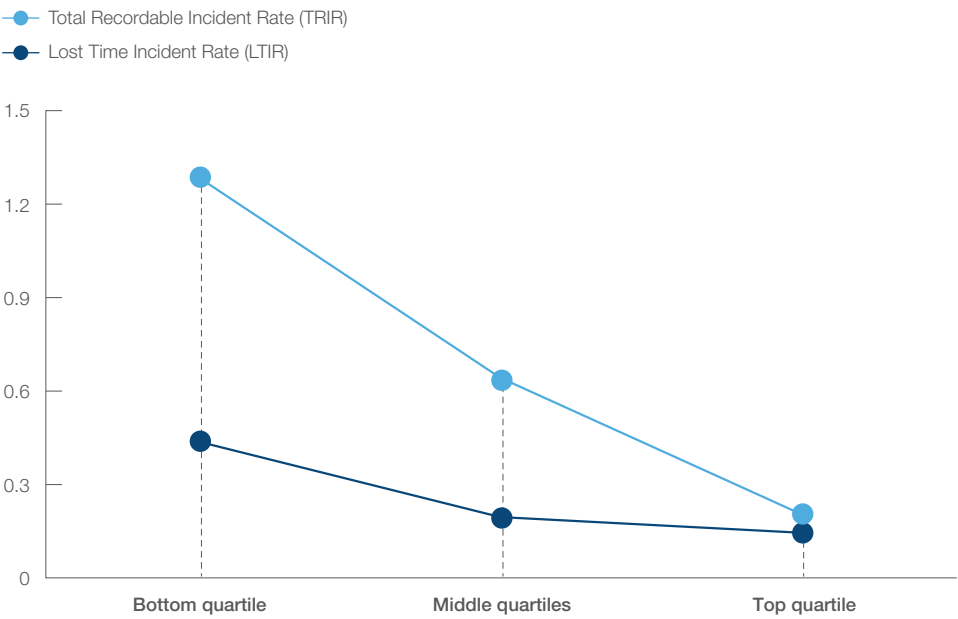
Employee ownership of solutions and learning

Another important group of management practices emerging from our data encourages employees to take ownership of innovation and learning.³ Bottom-

Exhibit

Top-quartile companies on organizational health perform better on health and safety metrics.

Incidents per 200,000 hours worked¹



Companies' performance on Organizational Health Index

¹ Global energy and materials sector example based on responses from almost 100,000 managers and employees in 52 companies. LTIR and TRIR figures were standardized per 100 full-time-equivalent employees, with the assumption that employees work 40 hours a week and 50 weeks a year.
Source: McKinsey Organizational Health Index

up innovation involves encouraging and rewarding employee participation in the development of new ideas and improvement initiatives. Top-down innovation means that senior leaders actively and publicly champion and sponsor high-priority initiatives. Both are particularly correlated with safety. Knowledge sharing and a culture that emphasizes creativity and entrepreneurship are other key ingredients.

Some organizations worry that fostering innovation might jeopardize safety by

introducing change, which many see as a source of risk. Our results, however, highlight the significance of line ownership: in our experience, one of the most effective bulwarks against accidents is the use of “near miss” programs, which encourage employees to identify hazardous situations and propose solutions before safety is jeopardized. Engaging employees in the identification of problems and involving them in the design of solutions raises the organization’s awareness, lowers its tolerance for risk, and improves the chances of actually adopting a solution.

Leading with values

Cultivating meaning—in other words, ensuring that employees know how their work fits into the bigger picture—also emerged as a critical management practice for safety. So did supportive leadership, exemplified by leaders who build positive environments marked by harmonious teams and care for the welfare of employees.

Change programs of all kinds, including those designed to improve safety, can succeed only when employees see their leaders as authentic. When actions follow words, employees take note. By promoting safety as a value—as something that follows you home—leaders create a true sense of commitment and increase their chances of fostering conviction among employees. Supportive leaders also help to create the learning culture essential for improving safety. Ultimately, organizations focused on safety want employees to speak up and share their concerns with one another. That can't happen without support from the top.

actions such as providing supportive leadership and encouraging employee ownership. They should remember, moreover, that bolstering innovation and creativity isn't necessarily at odds with robust safety procedures and high safety standards. [Q](#)

¹ See Chris Gagnon, Elizabeth John, and Rob Theunissen, "Organizational health: A fast track to performance improvement," *McKinsey Quarterly*, September 2017, [McKinsey.com](https://www.mckinsey.com).

² Both numbers, standardized per 100 full-time-equivalent employees, assume that employees work 40 hours a week and 50 weeks a year.

³ These practices are central to a continuous-improvement performance culture, one of four winning combinations of practices (which we call "recipes") that we identified through the OHI.

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These research findings show that healthy organizations are safer places to work than unhealthy ones and that building organizational health ultimately improves safety standards. Companies need to balance traditional hard incentives with

SETTING THE FRAMEWORK FOR CAR CONNECTIVITY AND USER EXPERIENCE

The connectivity experience of drivers and passengers will soon be transformed, with the potential for significant value creation. Here is a framework to measure progress.

by Michele Bertoncetto, Asad Husain, and Timo Möller

In the automotive sector, as elsewhere in the economy, digital forces are blurring traditional industry boundaries, spurring the formation of new ecosystems, and placing large profit pools up for grabs. Vehicle data, spun off by surging vehicle connectivity, will be critical for generating revenue, reducing costs, and increasing safety and could represent a value pool of up to \$750 billion by 2030.

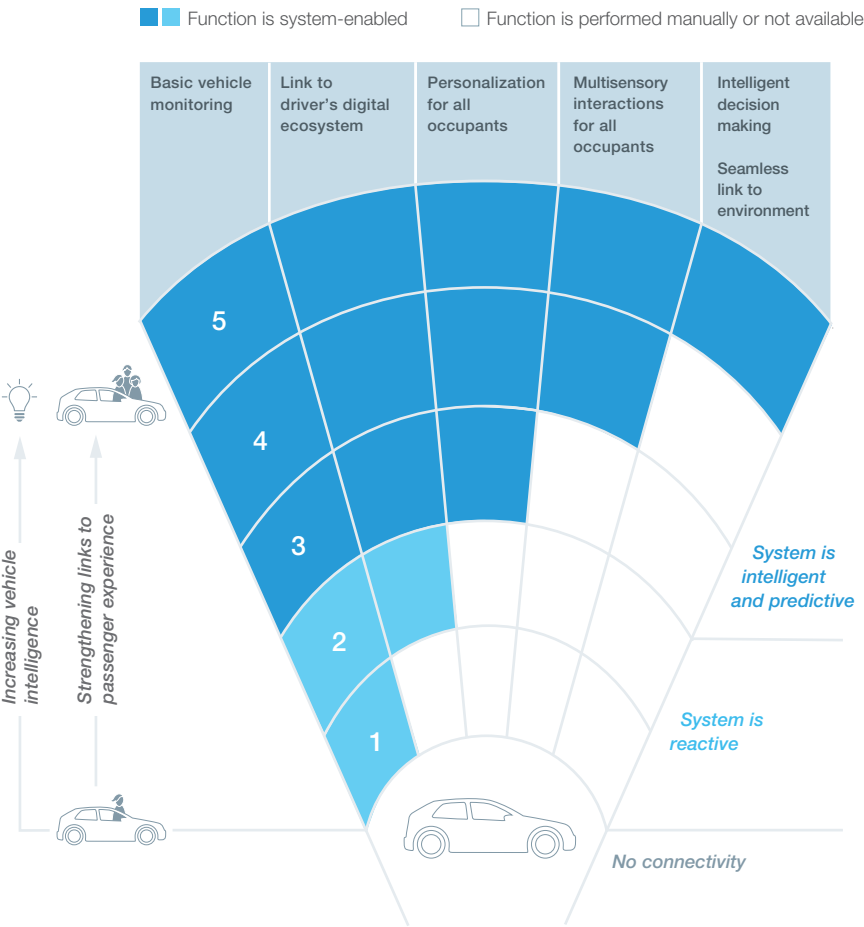
The value of this data will depend in part on the acceptance of clear-cut standards. A common understanding and shared language will help players across the ecosystem communicate about current and emerging opportunities. It will also make it easier for consumers to compare features and capabilities of different offerings. No such standard exists today for user experience in a connected car, one of the key foundations for data-driven value creation in mobility. As connectivity systems become progressively more complex, understanding the changes underway will become increasingly problematic in the absence of a universal framework. In this article, drawn from years studying this topic, we propose one.

The role of frameworks

To understand the role of generally accepted standards, look no further than the framework for levels of vehicle autonomy, advanced by the Society of Automotive Engineers (SAE) automation taxonomy. The SAE taxonomy is at once comprehensive and simple. At each ascending level of automation capability, only one new element is introduced at a time. Such stark classification reflects an engineering-oriented approach—yes or no, zero or one. Through three years of cross-industry research, multiple global roundtables, 3,000 consumer interviews and more than 100 interviews of executives from companies ranging from start-ups to large corporations, as well as our experience serving clients on this topic, the McKinsey Center for Future Mobility has been seeking to bring similar clarity to each distinct step change in connectedness achievable in the coming months and years. The product of those efforts is a framework to measure vehicle connectivity and the user's experience: the McKinsey Connected Car Customer Experience (C³X) framework (exhibit).

Exhibit

The McKinsey Connected Car Customer Experience (C³X) framework describes five levels of user experience in connected cars, ranging from the most basic to the highly complex.



1 General hardware connectivity

Driver able to track basic vehicle usage and monitor technical status

2 Individual connectivity

Driver uses personal profile to access digital services via external digital ecosystems and platforms

3 Preference-based personalization

All occupants enjoy personalized controls, their own infotainment content, and targeted contextual advertising

4 Multimodal live dialogue

All occupants interact live with vehicle and receive proactive recommendations on services and functions

5 Virtual chauffeur

All occupants' explicit and unstated needs fulfilled by cognitive AI that predicts and performs complex, unprogrammed tasks

Connectivity, in large part, will be key to using car data to generate revenue, optimize costs, and improve safety.

Whereas autonomy and its levels can be defined as the extent to which drivers control how automobiles move (from full driver control to no human intervention at all), connectivity should be defined based on what car riders experience. The distinction is not academic. Connectivity, in large part, will be key to using car data to generate revenue, optimize costs, and improve safety. Artificial intelligence (AI) will be used to anticipate and respond to vehicle occupants' needs and commands, leveraging in-vehicle sensors and data on consumer preferences from multiple digital domains, including social media, connected home, and connected office.

The more seamless a rider's experience becomes, the more opportunities there will be to affect revenue, cost, and safety. As technology in the connected-car ecosystem becomes more sophisticated, consumer expectations will evolve in parallel, creating a need to deliver higher-value user experiences. The C³X framework makes it easier to quantify value-creation opportunities associated with increased connectivity. Players across the entire ecosystem will be able to understand with greater precision what's necessary to take user experience to (quite literally) the next level and how

much value they will be able to generate through a connected vehicle across these levels.

Breaking down vehicle connectivity

Under the C³X framework, general hardware connectivity (level one) means that the vehicle allows for only basic monitoring of its use and technical status, and individual connectivity (level two) means that the vehicle can use a driver's personal profile to access services on external digital platforms such as Android Auto and Apple CarPlay. The data monetization for these levels is already core to how multiple businesses make money, particularly (but not exclusively) digital natives. Automakers too are starting to monetize connectivity; consumers are coming to demand and pay for basic connectivity features such as in-vehicle hot spots and usage-driven maintenance checkups.


Moving up the scale, when the user experience shifts from reactive to intelligent and predictive thanks to artificial intelligence, the value-creation opportunities are amped up significantly. At level three, focus expands beyond the driver and onto all occupants, who are afforded

personalized controls, infotainment, and advertising. Level four provides live interaction through various modes (such as voice and gestures), allowing drivers and passengers to have a “dialogue” that feels natural with the vehicle and that enables them to receive proactive recommendations on services and functions. At the top of the scale, level five, the system becomes a “virtual chauffeur”—cognitive AI performs highly complex communication and coordination tasks, enabling it to anticipate needs and fulfill complicated, unplanned tasks for the riders.

Connectivity today—and tomorrow

About four out of five of vehicles on the road today are at or below level one of the C³X framework. This demonstrates significant space for improvements. Many vehicles in the premium segment, such as the Audi Q7, BMW 7 Series, Cadillac Escalade, Lexus LX, Mercedes-Benz GLE, and Tesla Model X, to name a few, already meet the criteria for level two, delivering a compelling connected in-vehicle experience to consumers. Currently, no commercialized vehicles

meet full level-three capabilities as a standard offering yet, though some models have these features in select trims only. Our research shows, however, that by 2030, nearly half of new vehicles sold worldwide could be at level three or higher.

A common standard for connected-car user experience would go a long way toward enabling that reality. The C³X framework allows disparate players across industries to speak the same language, brings clarity to complexity, and sets clear markers for what comes next: a seamless, connected, and intelligent in-vehicle experience. Now, consumers and eco-system players alike can share a common understanding of exactly what that means. 

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The authors wish to thank Saral Chauhan for his contributions to this article.

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WHAT IT TAKES TO GET AN EDGE IN THE INTERNET OF THINGS

Three practices can help differentiate successful companies from those that struggle to gain traction.

by Michael Chui, Brett May, and Subu Narayanan

Internet of Things (IoT) technologies have evolved rapidly in recent years and continue to change how we interact with our surroundings. For companies, IoT brings new ways to monitor and manage objects in the physical world, while massive new streams of data offer better avenues for decision making (often mediated by machines). The steady fall in prices of sensors and communications technologies, combined with a parallel rise in understanding of how they can be applied, have raised the strategic importance of IoT. As we have shown elsewhere, this can produce immense value in settings ranging from retail and healthcare to manufacturing and technology.

Despite the promise, we continue to see substantial differences in how well companies apply IoT in their businesses. Targeting IoT applications correctly and managing them effectively is far from easy, leaving many companies stuck and unable to move beyond pilots. To better understand what differentiates successful initiatives from struggling ones, we surveyed IoT executives at 300 companies—those that have moved beyond experiments and have scaled up IoT use in their businesses.¹ We asked them about the practices that directly

support their IoT strategy, as well as other factors that may influence it, and sorted leaders from laggards based on their self-reported economic impact from IoT.² We found that while a number of IoT “habits” play a role in successes, three are particularly relevant for C-level executives who may be considering heavier investment in IoT or searching for reasons their programs have failed to gain traction.

Habit 1: Begin with what you already do, make, or sell

There’s no single path to IoT success. Some companies focus on connecting existing products to make them more attractive and useful to customers. Others exploit opportunities to achieve operational improvements that increase efficiency and lower costs. Still others push more boldly, using connectivity to create entirely new products or remake business models (even moving into separate IoT businesses). Our survey found that companies that achieved scale in IoT did so by pursuing a variety of strategies—and all with at least some degree of success. However, when we looked more closely at the gains, we found that the most successful companies often played to their strengths—rather than betting on unfamiliar markets or new products

(Exhibit 1). These IoT leaders, the group getting the most economic benefit from IoT, were nearly three times more likely to add IoT connectivity to *existing* products they sell than the laggards were. Conversely, laggards—those in the bottom quintile of economic returns—were significantly more likely to focus on developing *new* IoT products or services.

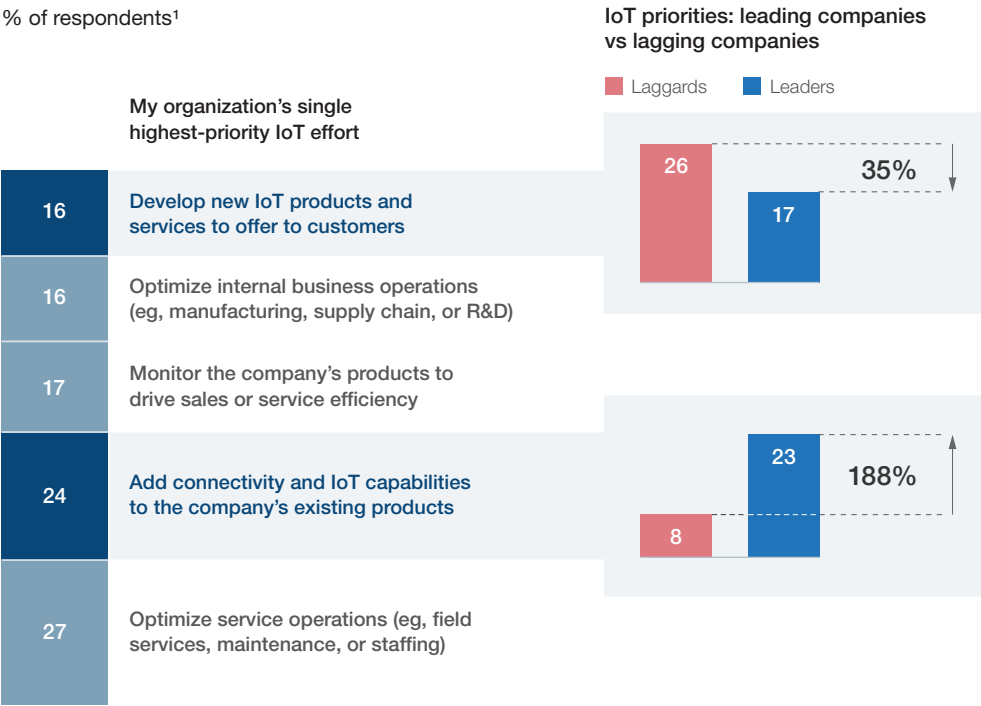
Playing to market strengths was the course chosen by strategists at an agricultural-equipment manufacturer, after they observed digital players from outside the industry sizing up opportunities to offer sophisticated analytics services

to farmers. In response, the company shifted R&D investments to “IoT-enabled” products and services in existing lines of business. Their new system used farm-based sensors to read soil conditions continuously, relaying the information to a cloud-based analytics platform that farmers could use to monitor variations on their mobile devices. Other sensors tracked irrigation levels and sent alerts whenever moisture readings hit predefined levels demanding attention. With these real-time insights, farmers were able to optimize their water and fertilizer use. That, in turn, increased yields over the growing season while substantially

Exhibit 1

There are several strategies to achieve scale in IoT, but the most successful companies often play to their strengths rather than bet on the new or unfamiliar.

% of respondents¹



¹ 300 executives across 11 industries in Canada, China, Germany, and the United States.

reducing water, fertilizer, and fuel costs for equipment. As the manufacturer added users, the growing quality and breadth of data improved the predictive capabilities of the system, further increasing value to farmers who joined the ecosystem.

The success of the agriculture manufacturer underscores the advantages incumbents often have in their ability to define use cases for IoT that build upon existing product lines, as well as their better line of sight on how improvements can create value for customers.

Habit 2: Climb the learning curve with multiple use cases

Many companies become frustrated when they don't see early signs of transformative impact from an IoT pilot. Our research points to one key reason: a single use case just won't get you there. Scale, both in terms of number of use cases as well as the breadth of application, helps maximize impact. Leading companies in our survey implemented on average 80 percent more IoT applications than laggards. More widespread usage, it seems, forces a cultural shift. It stokes organizational energy behind changes and creates new mindfulness about the benefits of IoT. In a ripple effect, this momentum often exposes weakness in technology along with gaps in talent—both in terms of in-house IoT skill levels and the numbers of experts needed to implement IoT at scale.

This “go big” approach may seem counter-intuitive, particularly among executives who have fewer resources to deploy and feel more comfortable focusing on a small number of applications. While a

smaller scale may be good for very early days, there is a clear learning curve that companies climb as they add use cases—and one that has a powerful impact. Our research shows that a greater number of use cases correlates with economic success (Exhibit 2), regardless of the use case or type of company.

Take the experience of one major transportation-equipment manufacturer whose initial IoT deployment, executives soon realized, just wasn't bold enough. It had launched the IoT strategy with four minimum viable products (MVPs) but soon found that this narrow focus wasn't improving performance as much as expected. A cadre of IoT leaders pushed against voices of caution and expanded the number of MVPs to 11. Executives also found that giving managers a larger number of IoT projects (and products) to oversee focused their attention, creating a bias toward action. That momentum built on itself as the company's best talent wanted to be part of the innovative push. A broad base of 30 IoT scrum teams, meanwhile, helped loosen bureaucratic decision-making rules. Finally, unexpected efficiencies turned up as engineers were able to use similar data architectures for multiple offerings and found numerous synergies among the digital end products. The more aggressive use-case strategy produced in excess of \$1 billion in new revenue.

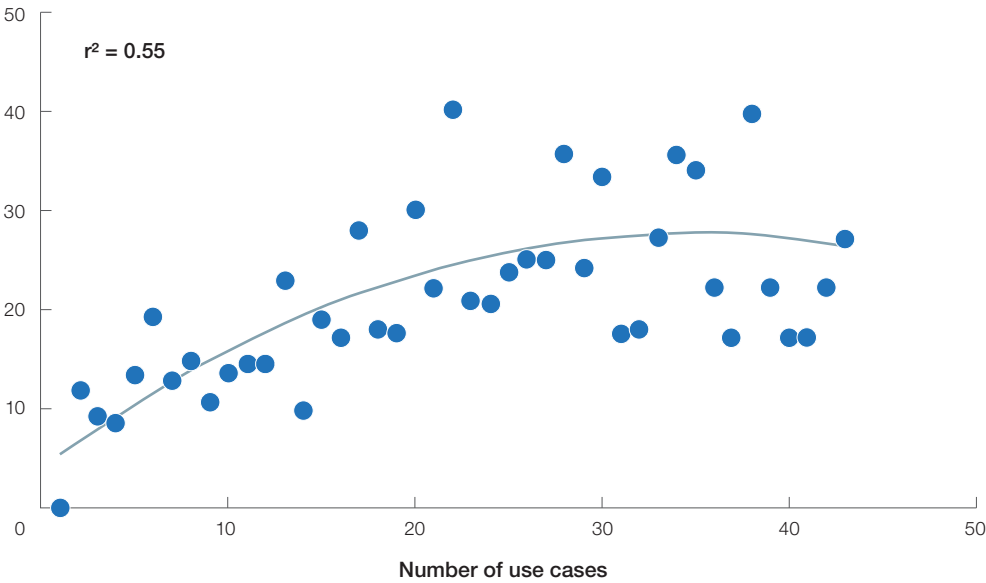
Habit 3: Embrace opportunities for business-process changes

IoT is one of today's most promising (and exciting) technologies. But people

Exhibit 2

Implementing a greater number of IoT use cases correlates with financial success, with the effect leveling off at around 30.

Financial-impact score¹
(higher = better)



¹ Financial-impact score: a metric synthesized from several cost, revenue, and/or margin-impact metrics, as measured on a per-use-case basis.

create the conditions for value creation. IoT has often been portrayed primarily as a technical-implementation challenge, with the drive for adoption spearheaded by specialists in the CIO function. Yet time and again we see that deriving real business gains from IoT efforts requires changes to a business process—the hard job of modifying the way a company does things. Connecting production equipment to the internet, for example, will allow a company to manage usage more effectively and predict when maintenance is needed. However, if the surrounding business processes aren’t modified and optimized, then value won’t be maximized.

Those second-order challenges were manifest at one metals manufacturer. The


company had connected three rolling mills with sensors in an IoT deployment. The goal was to capture and analyze previously unused data from the machines. Executives were pleased that they were able to get the system up and running in just three weeks, to help solve nagging capacity constraints at the facility. However, there was a problem: the insights generated by the system weren’t being used by the frontline employees.

The management team responded by modifying a range of plant-floor processes. For starters, they simplified the complex analytics that the system was churning out, synthesizing the output into one number that measured operator wait time. This change enabled line operators to recognize

immediately when bottlenecks in the process were forming. The company then changed the inspection routes of plant-area supervisors, whereby they circled back to bottlenecked lines four times daily, checking in with the operators on how many times they had to wait—and why. Those discussions resulted in a change to daily plant-area “huddles” that included the operators, who were given greater latitude to adjust frontline processes to resolve underlying issues before they caused product-flow backups. The IoT-informed process changes had a big effect. Operators were able to identify several hidden causes of slowdowns and stoppages, issues that earlier problem-solving efforts had missed. Overall equipment efficiency increased by 50 percent, saving hundreds of millions of dollars in planned capital expenditures.

This metals manufacturer learned that, in order to maximize IoT value, people have to behave differently, make decisions differently, and operate in a new normal of rapid information flow. It’s not surprising, then, that IoT leaders were three times more likely than IoT laggards to claim that having a strong ability to manage business-process change was a top-three IoT capability.

As we noted earlier, companies need to be attuned to other reasons why IoT deployment may fall short. For one thing, if the CEO and top team aren’t focused on potential IoT gains, providing visible encouragement (and adequate resources) for the efforts, they are likely to stall. Leaders need also to be mindful

that IoT increases the potential for privacy breaches and data-security risks, since there are many more information nodes for hackers to penetrate. These risks need robust and continuous management, and those costs need to be incorporated into projected returns. Finally, even companies with a good IoT track record shouldn’t think they can go it alone. Technical IoT ecosystems are growing—and improving—by the day. Collaboration, often with smaller players that have high levels of expertise in areas such as software development, will provide a solid source of competitive advantage. That will help companies accelerate their programs and better position themselves to become IoT leaders. 

¹ We surveyed 300 executives in Canada, China, Germany, and the United States, across 11 industries, including C-suite, vice president, general manager, or above, and all involved in the Internet of Things on a daily basis in production, beyond the pilot phase.

² Among those surveyed, leaders reported at least 15 percent aggregate cost and revenue impact from Internet of Things usage. Laggards reported less than 5 percent impact in revenues and costs.

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CHOOSING THE RIGHT PATH TO GROWTH

To boost organic growth, most companies need a diverse set of initiatives—and how you sequence them matters.

by Abhinav Goel, Duncan Miller, and Ryan Paulowsky

Innovation and growth are often lumped together as management concepts, for good reason: it's self-evident that innovation drives growth, and conspicuous fast growers often benefit from high-profile innovations. Our research, however, suggests growth-minded companies stand to benefit by disaggregating the two concepts. There are, in fact, multiple paths to growth, and the most common growth characteristics among above-average growers often aren't related to innovation. Significant as well, companies aspiring to the highest levels of growth need to sequence their initiatives carefully. Put differently: you probably can't do everything at once.

How many levers?

In earlier research, we explored three broad profiles that describe how companies achieve organic growth.¹ “Investors” tap new sources of funding or reallocate existing funds to capture new growth for their goods and services. “Creators”

build business value with new products or through business-model innovation. “Performers” grow by steadily optimizing commercial functions and operations. Our latest findings suggest that focusing on two of these growth levers simultaneously will spur growth more effectively than emphasizing one.²

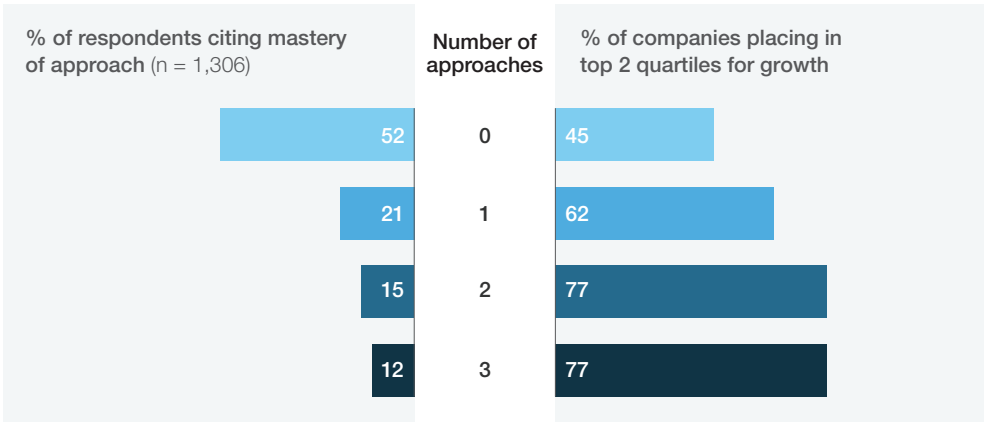
In fact, we found that more than three-quarters of companies that mastered two or more levers grew faster than their industry (Exhibit 1). This makes intuitive sense; combining two approaches allows for synergies that can multiply impact. Companies with strong reallocation practices (investors), for example, can provide managers with the needed additional resources to optimize higher-potential assets (performers). Too often, this sort of helpful one-two punch is the exception: companies instead tend to emphasize what worked in the past, and thus to rely too heavily on a single lens—which leaves potential growth on the table.

There are multiple paths to growth, and the most common growth characteristics among above-average growers often aren't related to innovation.

Exhibit 1

Few organizations follow more than one approach to growth ...

... yet those that do are more likely to **beat their industry's average**.



What about three levers? In some sense, it's the gold standard; a healthy proportion of top-growth-quartile companies were investors, performers, *and* creators.³ That said, executing on every front simultaneously is more than many companies can handle. That's particularly the case for large organizations, where complexity tends to multiply as growth initiatives proliferate.⁴

The power and limitations of innovation-led growth

Creative companies are more heavily represented among the fastest growers. And the ability to innovate consistently appears to separate the *good* growers in the second quartile from *exceptional* ones in the top quartile. We found that exceptional growers were 56 percent more likely to have mastered creative practices (that is, reached the 70 percent successful adoption level) than the second-quartile firms (Exhibit 2).

What's also true, however, is that it's hard to get innovation right: nearly half of all the companies surveyed were weakest in creative practices, while fewer than one in five said innovation was an area of greatest strength. In addition, our research suggests that the pursuit of innovation is not the surest way to move into the top-growth tiers. Rather, the most prevalent practices among above-average growers reflected mastery of core *investor* and *performer* levers (Exhibit 3). Three of the top five practices characterizing upper-tier growers were related to investing: aligning on priority markets, engaging in portfolio management informed by prospective returns, and overseeing resources top down. Two more were tied to performing: developing high-value customer development across business units and measuring the voice of customers. The prevalence among high performers of strengths related to smart resource allocation and strong commercial

performance suggests that they are more than mere table stakes for growth and that executives should not take them for granted, even if they seem rudimentary.

Sequencing the growth journey

Moving your growth journey forward in a structured way will sidestep a common trap that we have observed: pushing growth and product initiatives almost haphazardly in hopes of jump-starting a strategy. Instead, companies need a more deliberate, stepwise approach to building growth initiatives and capabilities. While there is no iron law of sequencing,

the data are clear that a steady pace of change is vital: we found a positive correlation between the number of growth best practices adopted by a company and the company’s growth-performance quartile (Exhibit 4). Across all companies surveyed, we found that employing two additional practices, on average, correlated with an organic-growth edge ranging from one to three percentage points. Companies that regularly fine-tune and add to their capabilities appear to improve their odds of generating steady performance gains, providing additional resources that leaders can reallocate, as needed, to further their growth agenda.

Exhibit 2

Innovative companies that have mastered creative capabilities are more heavily represented among the fastest growers.

Companies’ likelihood to have mastered a lens compared with those in a lower quartile, %

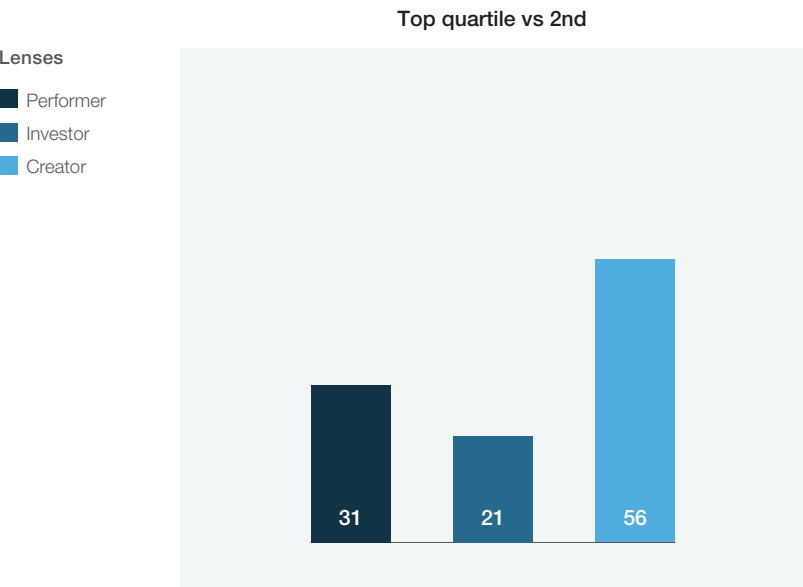
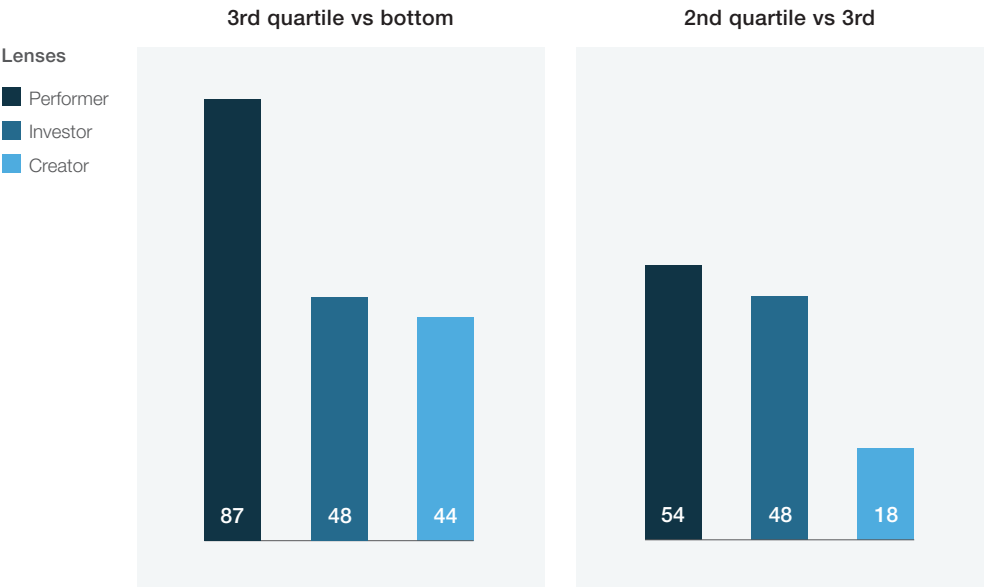


Exhibit 3

Third-quartile companies emphasized performance, while those in the second quartile **worked equally on performance and investment.**

Companies' likelihood to have mastered a lens compared with those in a lower quartile, %

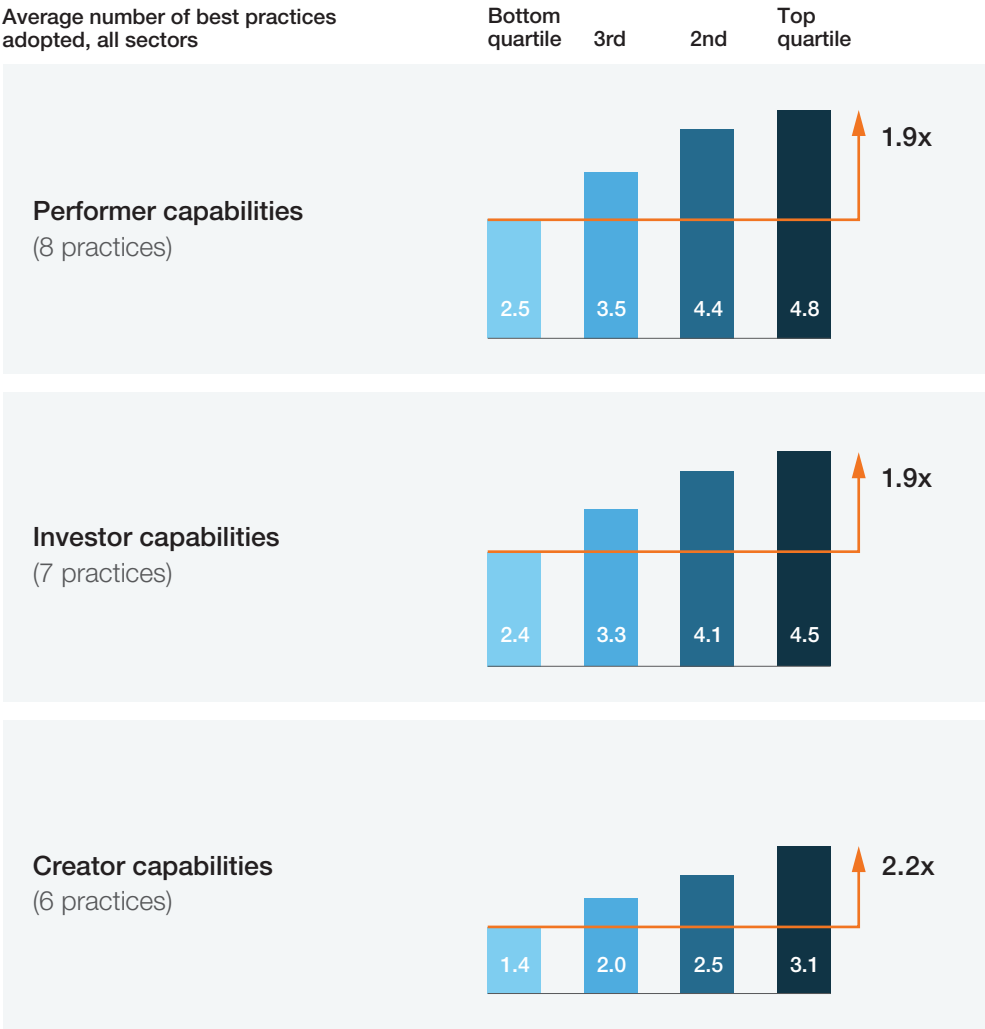


Getting this right, in our experience, goes hand in hand with rigorous initiative and performance management, which includes rallying organizational support for growth priorities; supporting them with capability building, incentives, and cultural change; and looking for opportunities to exploit synergies among new business initiatives. That's the path a global manufacturer is following as it strives to shift its growth performance in critical markets from lagging to leading. The company has started by upgrading the effectiveness of its transactional pricing, marketing tactics, and core sales force—priorities that, leaders believe, will help it

hold its own against rivals. Looking forward, the senior team is studying more ambitious initiatives to accelerate growth, surpass competitors, and increase market share. One avenue, for example, would boost the use of advanced data analytics, to gather deeper insights on customer-procurement practices and emerging product preferences. Those data and greater mobilization across functions would help managers uncover and share insights about untapped growth opportunities. Margin improvements from the initial steps would provide the means, confidence, and capabilities for more innovative


Exhibit 4

Higher rates of best-practice adoption are correlated with higher growth-performance quartiles.



Companies that regularly fine-tune and add to their capabilities appear to improve their odds of generating steady performance gains, providing additional resources to further their growth agenda.

efforts. Sales teams, R&D, and product-development functions, for example, would be able use the data-driven knowledge about customers and markets to collaborate more closely on new, higher-margin offerings aimed at nascent customer preferences.

Growth is difficult, but our research shows that it's possible to bring a disciplined approach to improving your growth trajectory. Build momentum through well-sequenced initiatives. Support them with the right capabilities. And get your organization on board with a multifaceted approach that often will rest on a strong foundation of resource allocation and execution before taking on the tougher discipline of innovation. While this may challenge some traditional growth tenets, it also offers a reason to start moving—with confidence. What you do well today prepares the way for the next leg of the climb. 

² We studied dozens of corporate-growth programs and paired those findings with insights from a panel of approximately 1,500 managers and executives globally, across 17 industries. We surveyed executives on 36 practices and capabilities that supported their growth strategies. About half were foundational capabilities such as contract management and transactional pricing. The rest were advanced capabilities that supported the three key levers or approaches: creativity (6), investment (7), and performance (8). We defined mastery of an individual lever as successful adoption of 70 percent of the supporting practices.

³ Top-quartile (exceptional) growth beats industry growth rates by more than four percentage points.

⁴ Fewer than 15 percent of executives in our survey said they were in the top quartile for mastery of all three levers.

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¹ See Kabir Ahuja, Liz Hilton Segel, and Jesko Perrey, "The roots of organic growth," *McKinsey Quarterly*, August 2017, McKinsey.com. In related research, McKinsey looked at the share-price performance of 500 US and European companies over 15 years, which showed that for all levels of revenue growth, those with more organic growth generated higher shareholder returns than those whose growth relied more heavily on acquisitions. For more, see Marc Goedhart and Tim Koller, "The value premium of organic growth," January 2017, McKinsey.com.

LEARNING FROM DIGITAL THREATS

Incumbent companies are finding they have strong hands to play as competition intensifies.

WHY BANKS ARE WELCOMING THE DISRUPTORS

Partnerships with fintech companies are getting broader as start-ups offer new digital capabilities and competitive business models.

by Jay Datesh, Miklós Dietz, and Miklós Radnai

As digital competition intensifies among financial institutions, banks are finding that the start-ups they once considered threats can be valuable strategic and operational allies. Many are moving aggressively to widen collaboration with fintech companies rather than develop solutions in-house, gaining access to innovative technologies and business models that are more efficient and offer customers greater convenience. Other advantages associated with such partnerships include new customers, lower costs, and, perhaps more critically, exposure to an innovative culture that might help banks reinvent themselves.

Our latest research finds that approximately four out of every five of the top 100 banks by assets (and other digitally advanced banks) have now partnered with at least one fintech company (exhibit), up from 55 percent just two years ago. On average, each bank has forged four such tie-ups.¹ Deals range from basic buyer-supplier transactions to complex, exclusive partnerships.

In related moves, we found banks are also stepping up their business-accelerator

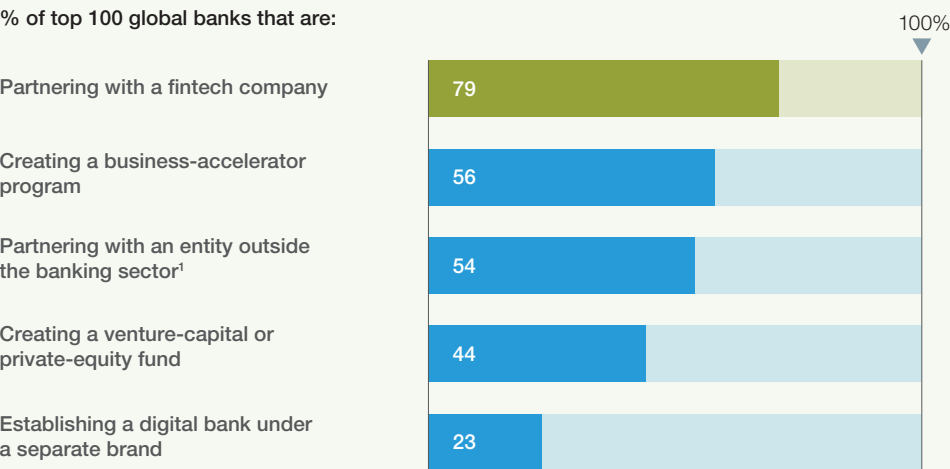
programs. These programs typically involve them providing early-stage financial businesses with management expertise, funding, and office space, often as a prelude to deeper collaboration.

Formal partnerships span a spectrum of activities, with payments—including real-time payments and cross-border, blockchain-based transactions—being especially fertile ground (37 percent of all partnerships). In operations (18 percent of partnerships), example activities include anti-money-laundering technology and video-based identification methods. In lending, fintech companies drive new customer referrals, while their robust digital platforms, from customer interfaces to back-end loan processing, can sharpen bank offerings. Other collaborations have spawned the creation of highly personalized financial-management apps, fraud-detection systems based on advanced-analytics expertise, and improved conversational customer-service automation.

There are remaining rough patches with partnerships, such as the misalignment of incentives and capability gaps in

Exhibit

In pursuit of digital transformation, banks are **partnering with fintechs** rather than considering them as threats.



¹ For example, with a telecom or e-commerce company offering opportunities for customer-relationship marketing or cross-selling.

banks' own arsenals. Banks also need to improve their execution game and speed up decisions to avoid having fintechs turn away in frustration after an initial period of collaboration. But as banks strive to stay ahead of peers that are digitizing, and ahead of the big digital natives that are entering banking markets, we expect the partnership landscape only to become strategically more important. (Q)

¹ The actual number of partnerships could be higher; the database includes only those that have been publicly announced.

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HOW OEMS CAN BEAT BACK DIGITAL CHALLENGERS

Loyal customers such as farms and contractors are looking to equipment suppliers for help with advanced technologies.

by Kevin Laczkowski, Niranjana Rajagopal, and Paolo Sandrone

Original-equipment manufacturers (OEMs) face a host of challenges as the machinery industry reaches a tech tipping point.

Value is shifting from hardware to software, making OEMs' central role in hardware product development less attractive.


Online channels for aftermarket parts are becoming more prominent, putting pressure on traditional dealer channels. And high-tech companies are emerging as strong competitors in this space, as they are viewed by customers as trusted suppliers, raising the stakes for OEMs.

Despite these threats, our recent survey of contractors and farmers found that OEMs still have strong cards to play.¹ Respondents in both sectors are enthusiastic about many new technology use cases, particularly those that can be integrated into existing operations. And they have high levels of confidence in OEMs to help them navigate through this new era (exhibit).

Contractors most favorably viewed predictive maintenance and remote monitoring, connectivity to project-management software, digital aftermarket sales, and operator-guidance systems.

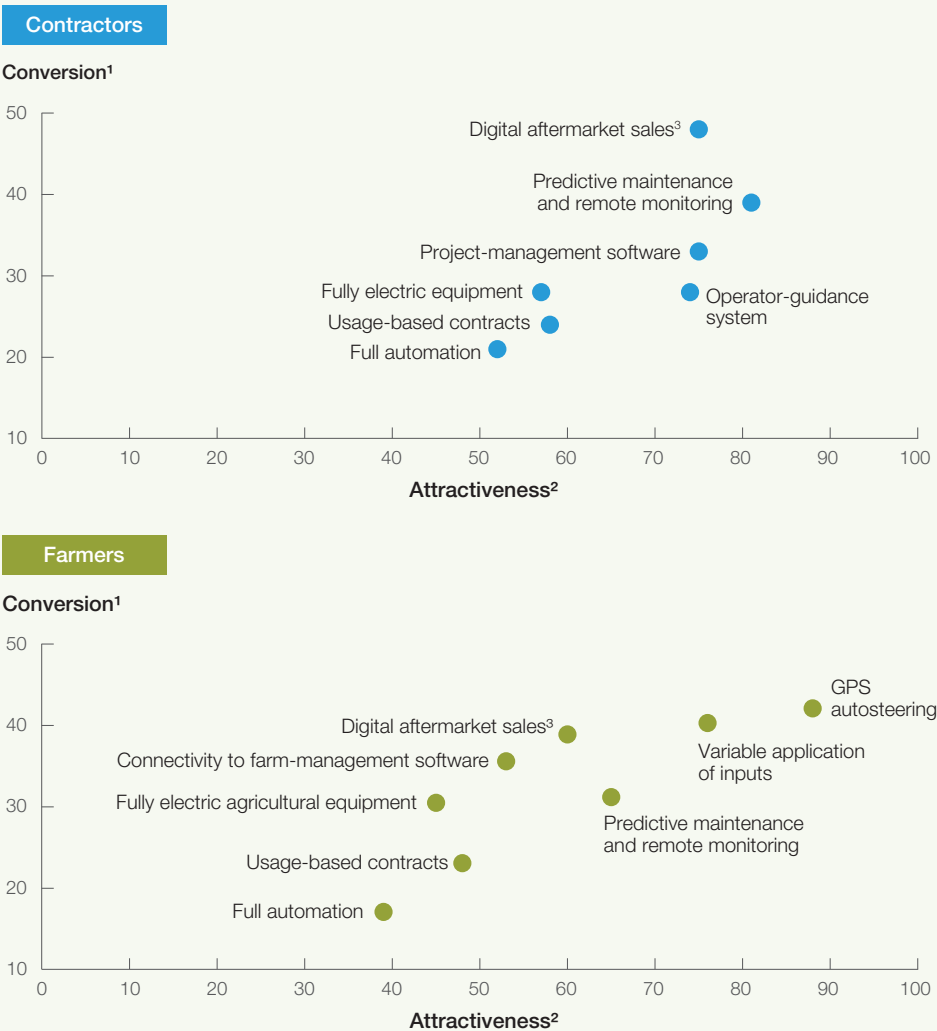
For farmers, GPS autosteering topped the list of compelling uses for new technologies. Farmers also liked variable application of inputs, such as determining the right mix of seeds, water, fertilizer, and other soil enhancements, as well as predictive maintenance.

Yet customers are also becoming more demanding: they value data privacy, data access,² and connectivity between their equipment.³ To navigate industry disruptions successfully, OEMs must better understand both their customers' decision journeys and their changing preferences. OEMs will need to stay on their toes to fund these new offerings through productivity improvements. And they should start thinking ahead by bolstering their position in emerging technology ecosystems, improving their talent base, and revamping R&D processes.

Our research shows that many construction and agriculture OEMs in the United States ought to be able to generate value from these new technologies that is four to six times their current profits. The opportunity is there for those who can seize it. 

Exhibit

Contractors and farmers find new technologies that are easily integrated into existing operations more attractive than those that require an entire redesign.



¹ Conversion = average % of fleet expected to be converted to this technology.
² Attractiveness = % of respondents who find this technology attractive or very attractive; based on a survey of 646 contractors and 753 farmers.
³ Conversion here is defined as projected % of aftermarket parts not purchased through dealers in next 5 years.

¹ In the autumn of 2017, we surveyed nearly 1,400 North American businesses, split between contractors (646) and farmers (753). They had varying numbers of employees (from fewer than 10 to more than 1,000), revenue, acreage, and activities.
² Ninety-nine percent of contractors and 95 percent of farmers say that it is somewhat or very important to have access to their equipment data, as many of them perform on-site maintenance and repair.
³ Many respondents anticipate fewer brands in their fleet because of greater connectivity, so OEMs will need to think about integrating their offerings.

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The authors wish to thank Asutosh Padhi for his contributions to this article.

➔ For more, see “How OEMs can seize the high-tech future in agriculture and construction,” on [McKinsey.com](#).

LESSONS FROM THE BEAUTY UPSTARTS


Beauty players are embracing digital and social media to tap into the industry's hottest growth areas.

by Sara Hudson, Aimee Kim, and Jessica Moulton

Digital marketing and social media have disrupted the \$250 billion global beauty industry more severely than most other consumer-goods sectors. “Born digital” brands, such as eyebrow specialist Anastasia Beverly Hills and makeup producer NYX, have used social-media tools to capture the attention of engaged, beauty-conscious customers. This generation of upstarts has already taken 10 percent of the color-cosmetics market and is growing four times as fast as legacy players (exhibit). And the growth of born-digital challenger brands could accelerate, with venture capital pouring into the sector.

Born-digital brands recognize that younger consumers engage with products differently than older consumers do. Their use of channels, such as online videos (“vlogs”) and influencer marketing through social media to build a following, has been critical to their success. Charlotte Tilbury, for example, has ten times as many YouTube subscribers—many of them looking for tips on applying makeup—as the average legacy brand. Through these channels, the born-digital brands have created a way of marketing that is more than transactional. Rather, it’s about creating a relationship with consumers and making them feel part of a community centered on the brand.

This has not gone unnoticed: established players are stepping up their digital game, often with excellent results. One approach is to buy into this new expertise: in 2016, traditional companies made 52 acquisitions, many of them upstarts. Estée Lauder, for example, bought BECCA Cosmetics (makeup foundations), Too Faced (cosmetics), and a minority stake in Deciem (skin care). Another approach is imitation. The big beauty companies are making significant investments in digital media and influencer marketing: L’Oréal alone has hired 1,600 digital experts. A third is incubation, in the form of corporate venture-capital funds, such as LVMH’s Kendo, which has recently been successful with Rihanna’s Fenty Beauty.

The established beauty companies have shown that they can and must adapt to defend their position. It is a lesson that other consumer-goods companies would do well to heed. 

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For more, see “What beauty players can teach the consumer sector about digital disruption,” on [McKinsey.com](#).

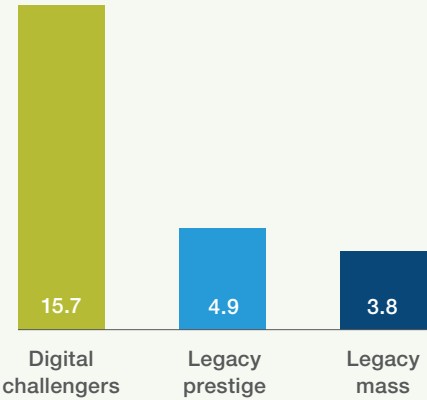
Exhibit

In the beauty sector, some digital challengers are gaining share and growing nearly four times faster than legacy companies.

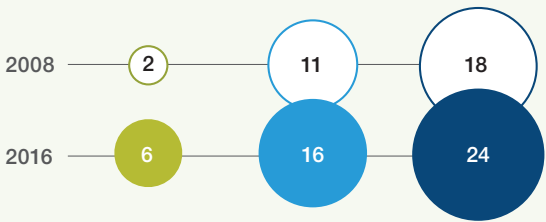
Global color cosmetics¹



Sales growth, CAGR,²
2008–16, %



Sales, \$ billion



¹ Examples by category: Digital challengers = Anastasia, Too Faced, Urban Decay; Legacy prestige = Chanel, Dior, Lancôme; Legacy mass = CoverGirl, L'Oréal, Revlon.

² Compound annual growth rate; sales measured by retail selling price at fixed exchange rates.

³ Remaining 25% of market share held by smaller/private-label brands.

Source: Euromonitor; McKinsey analysis

THE NEW ENTERPRISE DNA



Illustrations by Alessandro Gottardo

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The cornerstones of large-scale technology transformation

A clear playbook is emerging for how to integrate and capitalize on advanced technologies—across an entire company, and in any industry.

by Michael Bender, Nicolaus Henke, and Eric Lamarre

How does your company use advanced technologies to create value? This has become the defining business challenge of our time. If you ignore it or get it wrong, then anything from your job to your entire organization could become vulnerable to rivals who get it right. The new technologies come with many labels—digital, analytics, automation, the Internet of Things, industrial internet, Industry 4.0, machine learning, artificial intelligence (AI), and so on. For incumbent companies, they support the creation of all-new, digitally enabled business models, while holding out the vital promise of improving customer experiences and boosting the productivity of legacy operations. Advanced technologies are essential to modern enterprises, and it's fair to say that every large company is working with them to some extent.

In private discussions over the past year, we've asked more than 500 CEOs whether they think technology can improve business growth and productivity sufficiently to lift profits and shareholder value by 30 to 50 percent; a great many have said yes. So far, though, that prize has remained elusive for a lot of companies. Consider, for example, McKinsey research highlighting the

large number of digital laggards, and the wide gap between them and leaders: digitally reinvented incumbents—those using digital to compete in new ways, and those making digital moves into new industries—are twice as likely as their traditional peers to experience exceptional financial growth.¹

Most senior executives recognize the magnitude of the task before them. Although incumbents possess advantages such as hard assets, customer relationships, and valuable brands, those strengths—and the scale that accompanies them—also vastly increase the complexity of digital transformation. Some enterprise-wide technology transformations come up short simply because leaders have a difficult time creating coherent strategies that stitch together their digital priorities with other major business objectives.²

What's more, even companies that devise sound strategies are likely to encounter two formidable obstacles to using advanced technologies at a transformative scale. The first challenge is the sheer number and breadth of technology solutions required to truly transform an enterprise, often in the hundreds. The second one might be called the “last-mile” challenge: redesigning a company's processes to capture the value of new technologies, in line with its strategic goals. Both sound technical, but they play out far from the traditional IT organization and create headaches for the business leaders who will need to guide their people toward new patterns of thinking and operating.

A playbook for overcoming these challenges is starting to emerge across industries. In this article, we'll explore five cornerstone practices underpinning the progress of successful companies:

- Develop technology road maps that strategically focus investments needed to reinvent their legacy businesses and create new digital ones.
- Train managers to recognize new opportunities and build in-house capabilities to deliver technologies.
- Establish a modern technology environment to support rapid development of new solutions.

¹ See “How digital reinventors are pulling away from the pack,” October 2017, McKinsey.com.

² For more on this problem, see Jacques Bughin, Tanguy Catlin, Martin Hirt, and Paul Willmott, “Why digital strategies fail,” *McKinsey Quarterly*, January 2018, McKinsey.com.

- Overhaul data strategy and governance to ensure data are reliable, accessible, and continuously enriched to make them more valuable.
- Focus relentlessly on capturing the strategic value from technology by driving rapid changes in the operating model.

DISTRIBUTED OPPORTUNITIES

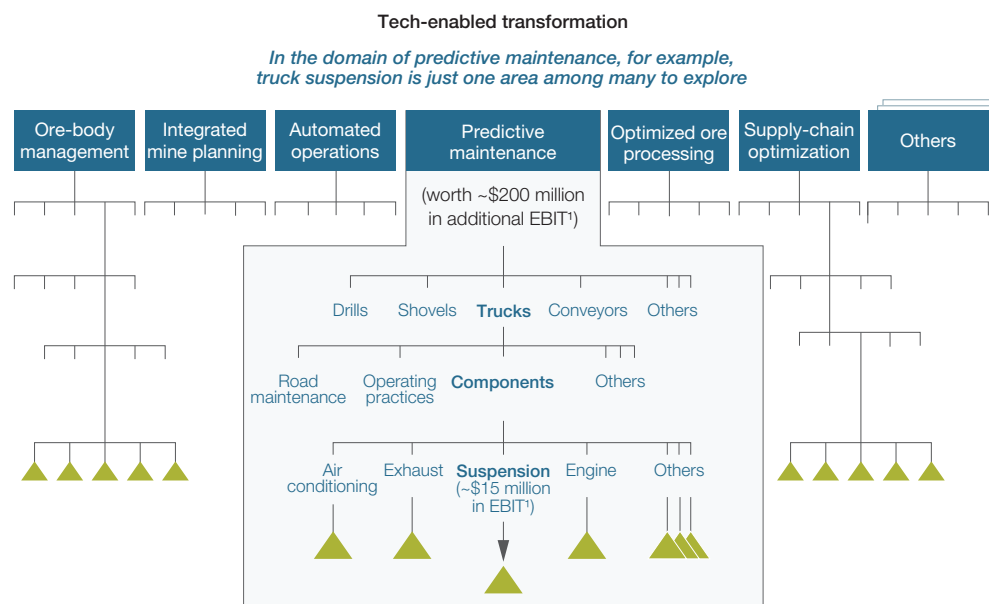
The first scaling challenge is rooted in the sheer number of solutions that a company typically needs to carry out its digital strategy successfully. Consider, for example, a global mining company seeking dramatic productivity improvement through technology. Boosting the productivity of a mine would typically involve deploying solutions in a half-dozen broad domains such as “better ore-body management through advanced analytics” or “predictive maintenance to reduce maintenance costs and increase uptime.” Each domain, in turn, might contain dozens of more specific opportunities. Predictive maintenance, for instance, can be applied to drills, shovels, and heavy-hauling trucks. For hauling trucks, specific solutions might be needed to deal with operating conditions, drivers’ behind-the-wheel behavior, and the reliability of truck components and systems. All told, we estimate that it takes more than 100 technology solutions to maximize the productivity of a mining operation (Exhibit 1). In industries as diverse as banking, electric power, and retail, we have found that the benefits of technology are distributed among a similarly large number of opportunities. Across the business landscape of AI alone, McKinsey has inventoried more than 400 meaningful use cases.

While some solutions deliver more bottom-line impact than others, none will typically be a “silver bullet” that makes a genuinely transformative impact on its own. And since many technology innovations can be replicated by rivals within a year or two, the advantages they confer seldom last for long. Enduring advantages are more likely to accrue to companies that can sustain a high rate of innovation, consistently introducing new solutions and improving them with proprietary data.

Creating a few pilot solutions is relatively straightforward, and many companies have done so. During an initial experimentation phase, it’s normal to use technology contractors and vendors to create solutions. But relying on third parties becomes impractical once a company establishes a digital strategy that calls for building a hundred or more solutions. Technology solutions must be tightly aligned with business needs, and as users try them out, they’re likely to discover shortcomings—necessitating progressive refinement. The many handoffs that take place with external providers over multiple revision

Deploying technology solutions in half a dozen or more broad domains can yield a significant gain in annual EBIT: potentially \$1 billion or more for a global mining company.

■ **Opportunity domains**—each contains a rich set of potential technology solutions, any one of which may yield a moderate gain.



cycles make this iterative mode of collaboration expensive and inefficient. Scaling up effectively therefore requires ample in-house technology-development capabilities—capabilities that few companies possess.

The second challenge that arises in technology transformations is capturing the business value of new solutions. Consider the predictive-maintenance opportunity for the mining company described earlier: technology makes it possible to boost productivity by performing maintenance only when a truck's condition warrants it, rather than adhering to a schedule of preventive measures that are sometimes premature.

But the mining company won't spend any less on labor and parts or keep its trucks in service longer, unless it changes the work routines of many maintenance-related experts. The reliability engineer minimizes excess effort by learning to triage predicted maintenance events. To prevent the

downtime that can occur when trucks no longer come in on a known schedule, the maintenance-planning team creates a new scheduling procedure, and the inventory-management team finds a way of restocking that ensures the right parts are on hand when trucks are brought in. The maintenance team accelerates repair work based on new diagnostic information. And finally, the financial-planning team reallocates the money saved on maintenance to other activities or additional profits.

This example illustrates a decisive, often overlooked fact about technology transformations: the value of advanced technologies largely comes from performance gains beyond the operating unit or process where a technology is applied. To realize this last-mile value, companies have to train people in R&D, procurement, operations, marketing, sales, support, and other areas to work in different ways. Incumbents routinely underestimate the effort required—if they think about it at all. And the last-mile journey may be even more challenging when the goal is to build entirely new businesses with advanced technologies.

When a business commits to transforming itself with technology, the cost of changing its operating model can easily exceed the cost of developing the technology solutions. McKinsey has learned that businesses with highly successful analytics programs, for example, are four times as likely as other companies to devote more than half of their analytics-related spending to embedding the use of analytics in their workflows and decision-making processes. A company must therefore look at the release of each technology solution not as the final act in a project but as a turning point that sets up a new phase of operational changes.

ACHIEVING SCALE AND CAPTURING BENEFITS

The need for a large number of technology solutions and the last-mile challenge may be familiar hurdles to readers who lived through the lean revolution some 25 years ago. Capturing value from lean initiatives involved driving each process change all the way through the operating model of the business. No single lean project could generate a major performance improvement, but a rich portfolio of lean projects could.

To make the transformation manageable, companies implemented lean projects in waves, tackling processes or units of roughly 200 people at a time. They first developed a vision for how each process or unit would be transformed. Then they built benches of lean experts (often called black belts) to manage change and ensure the new operating practices were adopted. Even though lean methods were never proprietary, companies such as Toyota used them

to ceaselessly pursue small performance improvements, and thereby build and protect an advantage over their competitors.

Our experience working with digitally reinvented incumbents suggests that a similar playbook is emerging in tech-enabled transformations encompassing five cornerstone practices described below.

Creating business-led technology road maps

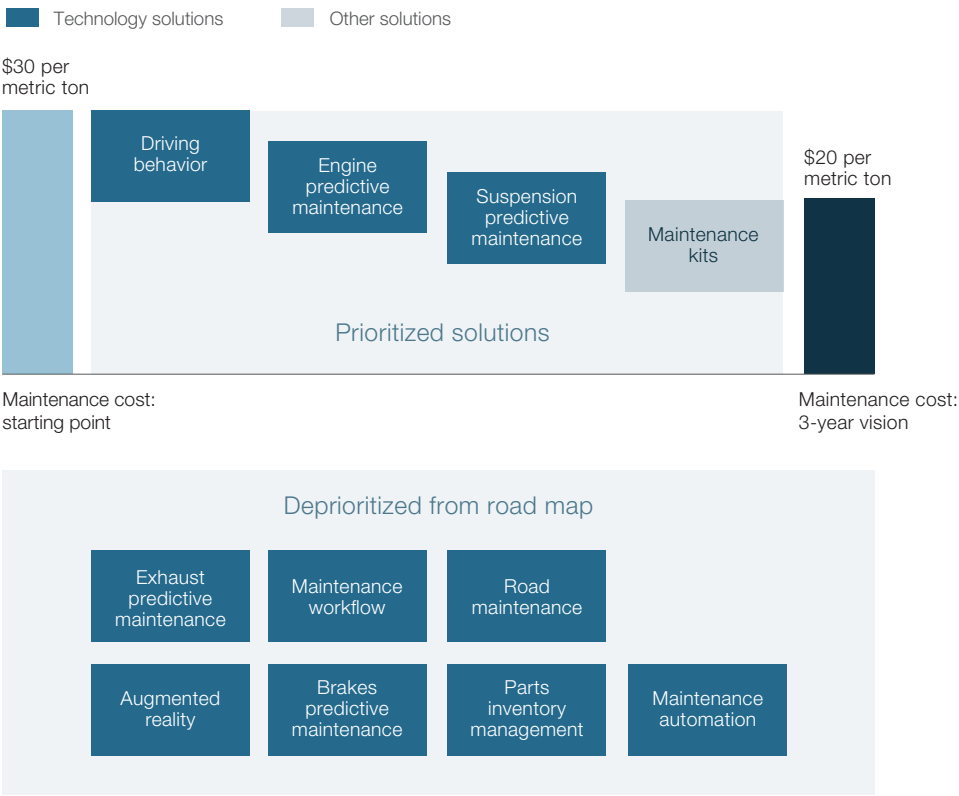
Large-scale technology transformations can begin once CEOs and top leaders have agreed on a bold, comprehensive digital strategy and an overarching vision for how technology can enhance their companies' performance. (For more on crafting a digital strategy, see "Digital strategy: The four fights you have to win," on page 78.) The critical next step, one that too few executive teams take with sufficient diligence, is to develop a road map of technology solutions that will achieve the transformation vision. The road map is a powerful tool because it aligns business and technology leaders on the sequence of solutions to be developed (and, likewise, on the solutions that should be deprioritized). It also articulates clear, ambitious objectives, whether for building a new digital business that taps large, nontraditional revenue pools or for steadily improving the productivity, quality, or customer satisfaction of the core business. The mining business described earlier, for example, devised a road map of solutions to help it deliver on a high-level vision for using technology to significantly reduce hauling costs (Exhibit 2).

It's crucial for business leaders, in collaboration with technology specialists, to direct the creation of technology road maps for their units personally, because they are best positioned to know the unmet needs of customers and the sources of waste in their operations, and best able to target solutions accordingly. They also can be held accountable for ensuring the successful development and implementation of solutions, as well as the capture of their expected benefits.

One global designer and maker of electronics products demonstrated a sound approach to creating road maps when it plotted the transformation of its manufacturing operations, as part of a broader effort to continue leading the industry on cost, quality, and lead time. The leader of each major unit in its value chain—inbound supply and logistics, circuit-board fabrication, assembly, and outbound logistics—began by assembling a cross-functional team of people to analyze the unit's business processes from end to end, paying close attention to customer or user pain points and sources of waste. Next, the team articulated potential improvements (such as greater output from circuit-board fabrication, lower assembly labor costs, and shorter

Exhibit 2

A mining company created a road map that prioritized specific technology solutions to reach the targeted reduction in hauling costs.



production lead times) and identified suitable technology applications. In all, the teams defined more than 100 applications. Only 32 of those were selected for development, based on the maturity of the underlying technologies and the potential returns on investment.

Unit leaders grouped the 32 solutions into three waves to roll out over two years, starting with low-cost options. In inbound supply and logistics, for example, the first wave of solutions focused on using robots and AI to automate in-plant logistics or the movement of materials and components within factories. The second wave called for automating warehouses in a similar fashion, and the third wave anticipated the use of emerging technologies, such as augmented reality, that would improve the accuracy and efficiency of manual labor. Each unit prepared its road map independently, making connections with other units where necessary. This way, each unit could focus on building and implementing the solutions it needed to transform its area of operations.

Digitally reinvented incumbents—those using digital to compete in new ways, and those making digital moves into new industries—are twice as likely as their traditional peers to experience exceptional financial growth.

Building in-house capabilities

An essential component of achieving scale in a technology-enabled transformation is having sufficient in-house technology expertise and talent. One proven model for building a technology bench is the “technology factory.” Such a factory is wholly at the service of the business and governed by the business. It provides the sort of work setting that is necessary to attract technology talent and achieve high-velocity development.

Scotiabank, a large international bank, set up such a factory in 2015. Headed by the bank’s chief digital officer, the factory employs 700 technologists and functional specialists, who are grouped into small agile teams that share expertise, development tools and methods, and proprietary software and analytics. Scotiabank structured its factory as a network of five hubs, with one co-located in each of its five core geographic business units to promote close collaboration. Scotiabank’s factory ordinarily develops 20 to 25 solutions at a time. Over the past two years, factory-built solutions have helped the bank to nearly double the share of sales made through online channels from 11 percent of revenues to 20 percent, on the way to a medium-term goal of 50 percent.

Scotiabank’s factory, like other successful ones we’ve seen, exhibits several distinguishing features. Depending on the size of the company, a technology factory typically employs between 50 and 1,000 technology specialists: designers, software developers, data scientists, data engineers, platform architects, AI experts, automation engineers, analytics translators, product owners, and digital marketers, among others. The composition, scale, and skill set of the factory’s workforce reflect the portfolio of solutions and the development pace specified in business units’ technology road maps. With

road maps focused on optimizing customer journeys, Scotiabank initially skewed its technology bench toward designers and software developers.³

To fill out a factory's roster, companies usually have to search far and wide. In our experience, it's not unusual for half of a factory's staff, particularly in technical domains, to be recruited externally, which is partly why it can take 12 to 18 months to set up a well-functioning factory. A staffing campaign of this scale will falter if it is not directed by a leader with a proven ability to recruit and retain digital talent. At Scotiabank's factory, external hires make up about 60 percent of the workforce, and the remainder hail from the bank's IT department and other business units. Scotiabank also provided training to help the factory's workforce establish a common working style and set of methods. Internally hired business and technology experts, for example, received coaching in agile development if they weren't already familiar with it.

Arguably, it's even more important to spread knowledge of advanced technologies and their uses throughout the business. Interventions to effect cultural change and skill building can take any number of forms. At DBS Bank, CEO Piyush Gupta has noted, "One of the big things we focused on was how to get the company technology literate." After it learned that "classroom sessions didn't work," DBS staged a series of 72-hour hackathons in which its employees teamed up with people from tech start-ups to build apps. Coming out of the hackathons, Gupta said, "The renewed confidence and self-belief among employees was astounding."⁴

By contrast, one of the world's leading steel plants, the Tata Steel IJmuiden plant, in the Netherlands, offered on-the-job technology training with a "field and forum" approach. The company provided some 200 operations managers and engineers with enough training in advanced analytics that they could serve as analytics "translators," capable of spotting potential new opportunities to use sophisticated techniques and then deploying them or acting as business champions. Tata achieved this by cycling cohorts of managers through classroom training forums while having them perform hands-on projects in the field. The training curriculum left managers with a shared vocabulary and understanding of concepts such as agile, technology stacks, data governance, and data management. This common understanding of technology enables

³ Each technology factory will have particular staffing needs. For example, a steel company seeking to maximize yields might need a main contingent of data scientists and analytics translators who can effectively bridge the worlds of steel operations and analytics.

⁴ See "The digital reinvention of an Asian bank," *McKinsey Quarterly*, March 2017, McKinsey.com.

senior executives and managers to quickly align in the pursuit of new opportunities and to “pull” for the services and support of technology specialists (versus having IT “push” solutions).

Modernizing the technology environment

Two features define the core of a modern technology environment: a data platform and a development environment for producing software and analytics code.⁵ Without these, a company’s tech-enabled transformation quickly stalls and becomes mired in complexity. The good news is that technological tools have evolved rapidly over the past two to three years, and it is now possible to deploy these cloud-based solutions quickly and at relatively low cost.

Nutrien, a global supplier of agricultural inputs, built a data platform—a cloud-based middle layer—that centralizes information from 13 different in-house systems, as well as from external data sources. The platform makes the data readily available to a range of newly built employee- and customer-facing applications, such as online commercial transactions and agronomic services for farmers. Technology architects linked both legacy systems and new digital applications to the data platform through application programming interfaces (APIs). Whenever a core system or a digital application is upgraded or added, architects unhitch the old program from the data platform and hook up the new one—with minimal disruption. Introducing a data platform made Nutrien’s enterprise architecture modular and flexible, creating a so-called two-speed architecture that easily integrates fast-evolving customer- and user-facing solutions with slow-evolving legacy systems.

In addition, Nutrien set up a modern software-development environment. The environment enables multiple developers to work on the same application in parallel and automates software testing and in-production release of new applications, reducing cycle times from months to hours. This new way of working is key to developing and improving software at a swift pace, especially once a company moves beyond the pilot phase of its transformation.

Data platforms and code-development environments should be among the first investments that companies make to facilitate the expansion of their technology programs. Although the cost and complexity of such efforts

⁵ There are other aspects of a modern technology environment not addressed here such as bandwidth, computing power, connectivity, real-time processing, storage, and virtualization.

increase with the number of legacy systems and external data sources, as well as with the volume, sensitivity, and real-time nature of data in play, these additions are now easier to make with modern, cloud-based tools. The Nutrien business unit described above went from concept to live operations in less than six months, using off-the-shelf tools, and spent less than \$10 million.

Overhauling data strategy and governance

Every executive understands that data are a source of competitive advantage, but surprisingly few have put in place the business practices to capitalize on the value of data. As companies move beyond piloting solutions, they find that their data are messy, hard to access, and undifferentiated from their competitors'. Scaling beyond a few solutions becomes complex and slow for them, and often yields unimpressive results because the underlying data are poor.

It doesn't have to be this way. The value of data is directly related to the technology solutions that the data enable. Data strategies therefore should start with the technology road map described earlier and, for each tech solution, articulate the data needed. If you want to automate insurance underwriting by relying solely on the customer's name (rather than using medical tests and customer form filling), you need a vast array of external data—and a permissive regulator. If you seek instead to automate claims management, your data requirements may be very different. Prioritizing the data domains that support the initial set of solutions on the technology road map is a critical first step.

Next, the prioritized data domains should guide the data ingestion efforts, be it from legacy systems or external data sources. Value in data is often unlocked by linking data from very diverse sources. For example, Aston Martin substantially reduced the development time of new luxury cars by linking data from around 30 different sources, ranging from team composition and product drawings to parts features. In parallel, the chief data officer should be developing the appropriate data-management processes, such as establishing conventions (a "master data model") for defining data down to the syntax of customer names and assigning, to explicit data owners, responsibility for maintaining high-quality data. Data management has become an essential capability to any successful technology transformation.

Many leading players regard their data strategies and models as a long-term, multiperiod chess game. Ping An, a leading Chinese financial institution, started with data in banking and insurance and over time developed a customer-data ecosystem across nine industries ranging from automotive to healthcare.

The value of data is directly related to the technology solutions that the data enable. Data strategies therefore should start with a technology road map and, for each tech solution, articulate the data needed.

(For more, see “Building a tech-enabled ecosystem: An interview with Ping An’s Jessica Tan,” on page 90.) Some companies obtain data assets through M&A. IBM’s acquisitions of Explorys and Phytel, for example, were healthcare-data plays. Many innovative companies, not satisfied with the data “exhaust” they can collect or buy, strive to create new data that are directly relevant to their anticipated use cases. An energy-trading business, for instance, is deploying webcams next to power-generation sites to understand the volume and mix of fossil fuels being burned and to better predict future regional demand. Examples such as these speak to the iterative nature of data-strategy efforts and to the importance of continually enriching your data assets. We strive for the same at McKinsey, by conducting an annual strategic process to consider which data sources and partnerships, among nearly 200 functional and industry data domains, should be expanded in the following year.

Changing the operating model to capture technology’s value

Scotiabank’s road map for enhancing its online credit-card application highlighted an array of technology solutions: digital marketing tools to find, target, and attract customers on the web; a streamlined application process that would cut the rate at which customers abandoned partly completed applications; and advanced analytics to improve pre-approvals, for example. While these solutions stood to improve customer satisfaction and reduce unit costs, Scotiabank could only capture the benefits by making corresponding operating-model changes across many different areas such as rebalancing online and offline marketing investments, and reducing staffing levels in the back- and mid-offices. These changes, some of which are still underway, are helping the bank to increase online card sales substantially while cutting acquisition costs compared with in-branch applications.

Time and again, though, we have seen companies succumb to the last-mile challenge, deploying new technologies in one area of the business but failing

to make value-creating adjustments to its operating model in other areas. Last-mile value capture must begin with understanding how technology will change the business model and its underlying economics. By tracking the expected impact of technology systematically across many organizational units, companies can learn to work across silos and capture the full benefit. (For more on capturing the full benefits of transformation, see the online sidebar to this article, “The big roadblock to digital implementation,” on McKinsey.com.) Reconciling competing incentives across organizational units is a classic example of this. A plan to sell more credit cards online, for instance, might go over badly with the head of the retail-branch network who is rewarded for in-branch revenue increases.

We’ve seen several CEOs accelerate their companies’ technology transformations by appointing a senior executive to a multifaceted leadership role that includes driving cross-unit collaboration, mapping where technology benefits are expected, holding leaders accountable for capturing those benefits, resolving conflicting incentives, and removing impediments to value-capture efforts. Once issues such as these are clarified for business-unit and functional leaders, it’s easier to lock in their value-capture commitments, to link that value to real-world performance improvements, and to help them recognize the necessary, supporting changes to their operating model. For example, asking a bank’s head of back-office operations to reduce her staff by one full-time equivalent for every 1,000 credit cards sold online (rather than through the branch network) helps the bank progressively capture the benefits of its online credit-card application.

Ultimately, a technology-enabled transformation calls for a continuous, enterprise-wide effort to improve the operating model. It is no longer a one-time, big-bang, IT system deployment. As customers and internal users adopt technology solutions, every business area that is affected adjusts its processes accordingly. That can happen rapidly when the technology is disruptive or a new digital business is being created, but more often, the change unfolds progressively.

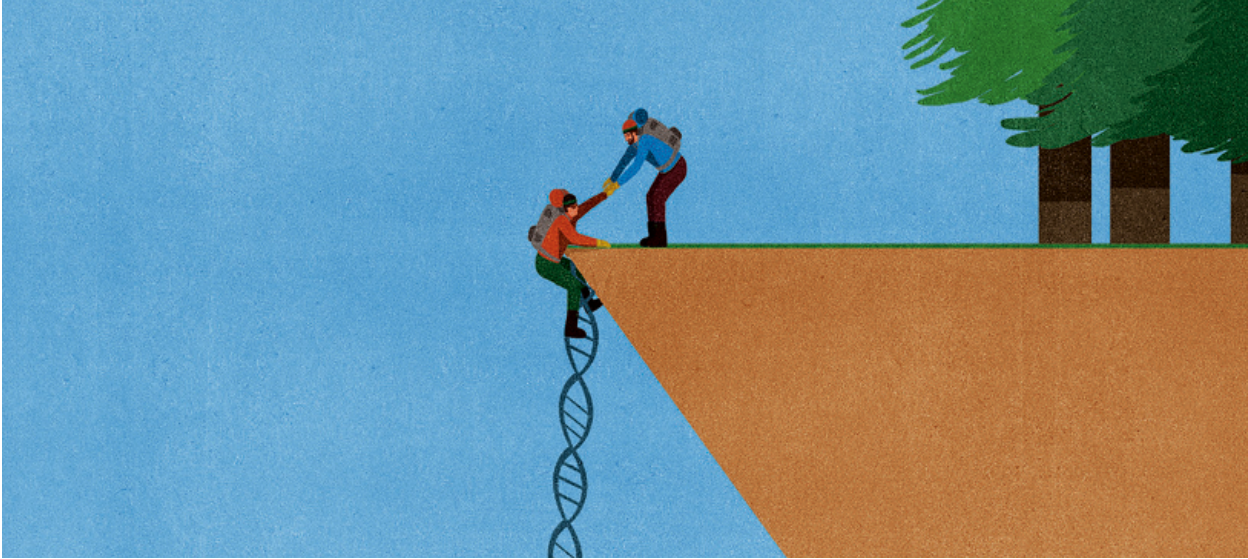
At many large traditional companies, a moment of reckoning has arrived. Not only is it difficult to scale up technology transformations beyond a handful of pilot projects, but broad-based efforts to apply and integrate advanced technologies are placing new demands on senior leaders. They must define technology road maps to drive strategic use of resources, invest in technology-development capabilities while training their managers, build a modern

technology environment that can support multiple, fast-evolving solutions, ensure a strategic evolution of data assets across the enterprise, and reinforce a commitment to operating-model changes that will capture the business value of new technology solutions.

These enterprise-wide changes are critical to seizing today's technology opportunities, and tomorrow's. After all, the real competitive edge comes from repeatedly being first to market with innovative technological solutions and integrating them deeply into the operating model of the enterprise. This is a final lesson from the lean-management revolution. Lean methods were widely known, yet Toyota and other companies still developed competitive advantages by using lean to orient their organizations comprehensively—from the CEO to the shop floor—toward the achievement of world-class performance. The information-technology revolution is playing out in a similar way. The companies that derive a true competitive advantage from technology will be those that make tech-enabled transformation a permanent business discipline. (Q)

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Taking digital transformation to the limits at Koç Holding

The CEO and HR director of Turkey's largest industrial conglomerate describe how a leadership-development program is preparing the company for a digital future—and shaking up the status quo.

Digital transformation requires the full support of a company's top leaders. But how do you instill a sense of urgency and purpose in leaders who believe they are already at the top of their game? This was the case at Koç Holding, Turkey's \$27 billion conglomerate with divisions in energy, automotive, finance, consumer goods, retail, food, tourism, and other industries. In 2016, CEO Levent Çakıroğlu, with his top team, launched a digital-transformation program aimed at remaking each of Koç's 25 major businesses—most of which were already market leaders in their respective sectors.

As Çakıroğlu and HR director Özgür Burak Akkol explain in this interview with McKinsey's Peter Gumbel and Bengi Korkmaz, part of the answer was to use the extreme conditions found in nature to push company leaders to see their strengths and grow their capacity to lead in both familiar and unfamiliar environments—a tall order for Koç's traditionally conservative culture.

The Quarterly: *If all your businesses were performing well, why was a digital transformation necessary?*

Levent Çakıroğlu: Koç has been a leader in Turkey for decades and has always adapted to change. But now, everything is changing faster than ever

before, thanks to the mobile-phone revolution, AI [artificial intelligence], robotics, and other technologies—all of which are causing disruption. So, this time we needed more than adaptation. We needed a full transformation. Koç could not slip into the position of follower. Instead, we must lead the change.

The Quarterly: *How did you decide where to place your resources?*

Levent Çakıroğlu: To start, we needed a groupwide assessment to understand where we were in terms of our digital maturity. We needed to create tailored road maps for each business based on its own strategic targets and its specific industry dynamics and to be sure that we were all using the same language across the group to describe the effort. At the end of the first year, each company had a clear vision, a road map and yearly targets regarding the transformation initiatives.

➔ To learn more about the company's transformation journey, see a series of short videos featuring Koç CEO Levent Çakıroğlu and HR director Özgür Burak Akkol in the online version of this article, on McKinsey.com.



Levent Çakıroğlu is the CEO of Koç Holding. Prior to joining the company, in 1998, Levent served in various positions in Turkey's Ministry of Finance, and from 1997 to 1998 was a part-time instructor at Bilkent University.



Özgür Burak Akkol has been the HR director for Koç Holding since 2014. Özgür joined the company in 2003 as an HR assistant specialist.

We also structured four central initiatives—like advanced analytics and Industry 4.0—which were not industry specific but relevant for the majority of our companies. We supported and encouraged our company leaders and experts to work in collaboration on these subjects. All of this helped us start the journey together, with all the group companies. It was not an easy task.

The Quarterly: *What was the key to getting the transformation off to a strong start?*

Levent Çakıroğlu: We knew that to build a new culture we needed the full support of the CEOs of our individual [subsidiary] businesses right from the beginning. We needed them to assume ownership of the transformation, and they have, very strongly. Remember: these are people who were delivering double-digit growth annually. Our success could have been the biggest barrier to change, but instead the CEOs have become the true drivers of this transformation. Their belief in our underlying objectives was crucial.

To drive change further, we asked our group companies to identify and nominate managers, directors, and others from their respective companies to be change leaders and advocates of the transformation program from within. I stressed that this needed to be a multidisciplinary approach. We needed to have colleagues from sales, marketing, manufacturing, purchasing, finance, supply chain—not just IT—to do this properly.

The Quarterly: *How did you approach the challenge of changing behaviors across such a disparate group of leaders?*

Levent Çakıroğlu: We knew that success would involve a lot more than just gaining new technological or digital skills. The new business challenges we face have new and different dynamics, and they impact people in many different ways. We wanted our leaders to start by getting to know themselves. Only if we built a digital leadership program that enabled them to better know and understand themselves—and understand their purpose—could they develop the skills they needed.

This is ultimately how we determined that the focus of our leadership program would be the top 200 leaders across Koç Holding.

“A digital transformation is the smartest way to invest in our people. If we do that, if we value them in the right way, they will be the drivers of success no matter what kind of change we encounter.”

—Levent Çakiroğlu, CEO of Koç Holding

The Quarterly: *How did this thinking influence the design of the leadership program?*

Özgür Burak Akkol: To convey the need for change, we felt the program needed to get as far away from “expected” as possible, to break away from what the leaders had experienced before. The food, the location, the language, the rules, the KPIs [key performance indicators], the follow-ups—everything needed to be different than what people expected.

We designed the program to happen in three separate stages that take place over the course of several months. The first stage focused on helping the leaders build self-awareness, so they could see what it means to be an adaptive leader. The next stage looked at applying what the leaders had learned to digital change—working on skills like agile thinking, design thinking, managing big data, and so on. Finally, we wanted to get the leaders to directly adapt to uncertainty in a new way—so we had the program culminate in five days of wilderness experience in the Alps and in Norway. This phase was meant to help the leaders test their boundaries, work together as a team, and overcome challenges, as well as to inspire them to lead.

The Quarterly: *Why was the trip to the mountains so important?*

Levent Çakiroğlu: One leader said that while they were in the mountains, she wondered if the course was designed to develop leaders—or to get rid of them! [Laughs.] Of course, it was a joke. But it speaks to how we wanted the participants to understand their physical and mental capacity under difficult circumstances. Sometimes, we need such extreme experiences to understand our real potential.

In fact, I believe there's a direct link between the skills the leaders used in the mountains and the skills needed to lead in a global company. We need people with strong personalities who can take initiative and are willing to support one another. We need people who aren't afraid to challenge and test the ideas of top management in a healthy way—and then work very hard together as a team to deliver on a shared goal once we are aligned.

The Quarterly: *By your own reckoning, you are two years into your digital transformation, and you are beginning to see results across the company. What would you say are the most important takeaways for the company thus far?*

Levent Çakıroğlu: The heart of our strategy has always been our colleagues, our people. The real success factor behind Koç Holding will always be our people. Some business people think of transformation in terms of processes and new technologies. But I don't look at it that way. A digital transformation is the smartest way to invest in our people. If we do that, if we value them in the right way, they will be the drivers of success no matter what kind of change we encounter. (Q)

Levent Çakıroğlu is the CEO of Koç Holding, where **Özgür Burak Akkol** is the HR director. This interview was conducted by **Peter Gumbel**, editorial director of the McKinsey Global Institute, who is based in McKinsey's Paris office, and **Bengi Korkmaz**, a partner in the Istanbul office.

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The business value of design

How do the best design performers increase their revenues and shareholder returns at nearly twice the rate of their industry counterparts?

by Fabricio Dore, Garen Kouyoumjian, Hugo Sarrazin, and Benedict Sheppard

We all know examples of bad product and service design. The USB plug (always lucky on the third try). The experience of rushing to make your connecting flight at many airports. The exhaust port on the Death Star in *Star Wars*.

We also all know iconic designs, such as the Swiss Army Knife, the humble Google home page, or the Disneyland visitor experience. All of these are constant reminders of the way strong design can be at the heart of both disruptive and sustained commercial success in physical, service, and digital settings.

Despite the obvious commercial benefits of designing great products and services, consistently realizing this goal is notoriously hard—and getting harder. Only the very best designs now stand out from the crowd, given the rapid rise in consumer expectations driven by the likes of Amazon; instant access to global information and reviews; and the blurring of lines between hardware, software, and services. Companies need stronger design capabilities than ever before.

So how do companies deliver exceptional designs, launch after launch? What is design worth? To answer these questions, we have conducted what

we believe to be (at the time of writing) the most extensive and rigorous research undertaken anywhere to study the design actions that leaders can make to unlock business value. Our intent was to build upon, and strengthen, previous studies and indices, such as those from the Design Management Institute.

We tracked the design practices of 300 publicly listed companies over a five-year period in multiple countries and industries. Their senior business and design leaders were interviewed or surveyed. Our team collected more than two million pieces of financial data and recorded more than 100,000 design actions.¹ Advanced regression analysis uncovered the 12 actions showing the greatest correlation with improved financial performance and clustered these actions into four broad themes.

The four themes of good design described below form the basis of the McKinsey Design Index (MDI), which rates companies by how strong they are at design and—for the first time—how that links up with the financial performance of each company (Exhibit 1).

Our research yielded several striking findings:

1. We found a strong correlation between high MDI scores and superior business performance. Top-quartile MDI scorers increased their revenues and total returns to shareholders (TRS) substantially faster than their industry counterparts did over a five-year period—32 percentage points higher revenue growth and 56 percentage points higher TRS growth for the period as a whole.
2. The results held true in all three of the industries we looked at: medical technology, consumer goods, and retail banking. This suggests that good design matters whether your company focuses on physical goods, digital products, services, or some combination of these.
3. TRS and revenue differences between the fourth, third, and second quartiles were marginal. In other words, the market disproportionately rewarded companies that truly stood out from the crowd (Exhibit 2).

AN ELUSIVE PRIZE

In short, the potential for design-driven growth is enormous in both product- and service-based sectors (Exhibit 3). The good news is that there are more

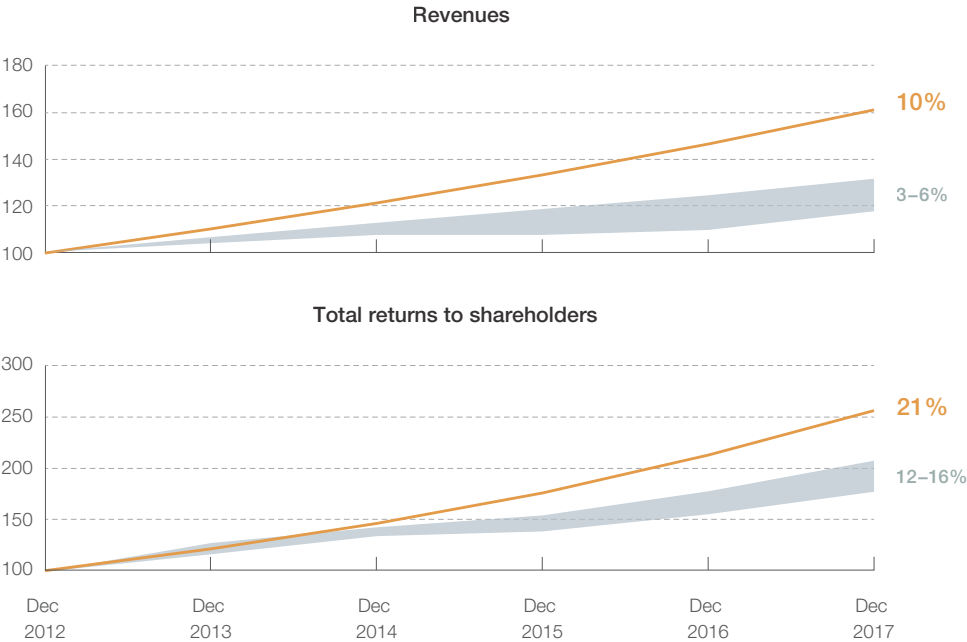
¹ An example of a design action would be putting someone on the executive board with a responsibility for design, user experience, or both. Another would be tying management bonuses to design quality or customer-satisfaction metrics.

Exhibit 1

Companies with top-quartile McKinsey Design Index scores outperformed industry-benchmark growth by as much as two to one.

Annual growth (normalized), %

- Top-quartile McKinsey Design Index performers
- Industry benchmarks¹



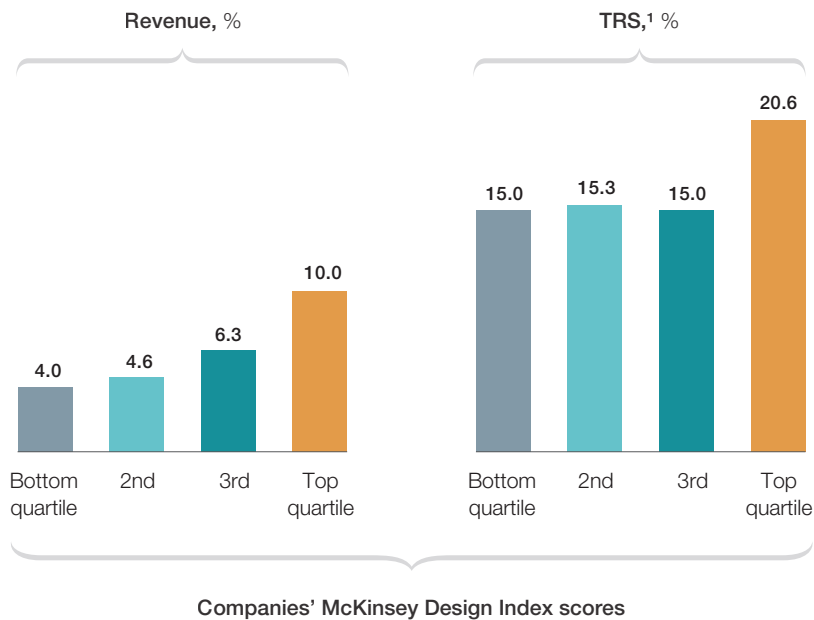
¹ The envelope was set by the minimums and maximums of three independent data sets: MDI 2nd, 3rd, and 4th quartiles; the S&P 500; and a McKinsey corporate database of 40,000 companies.

opportunities than ever to pursue user-centric, analytically informed design today. Customers can feed opinions back to companies (and to each other) in real time, allowing design to be measured by customers themselves—whether or not companies want to listen.

Lean start-ups have demonstrated how to make better decisions through prototyping and iterative learning. Vast repositories of user data and the advance of artificial intelligence (AI) have created powerful new sources of insights and unlocked the door for new techniques, such as computational design and analytics to value. Fast access to real customers is readily available through multiple channels, notably social media and smart devices. All of these developments should place the user at the heart of business decisions in a way that design leaders have long craved.

Exhibit 2

Higher McKinsey Design Index scores correlated with higher revenue growth and, for the top quartile, higher returns to shareholders.



¹ Total returns to shareholders.

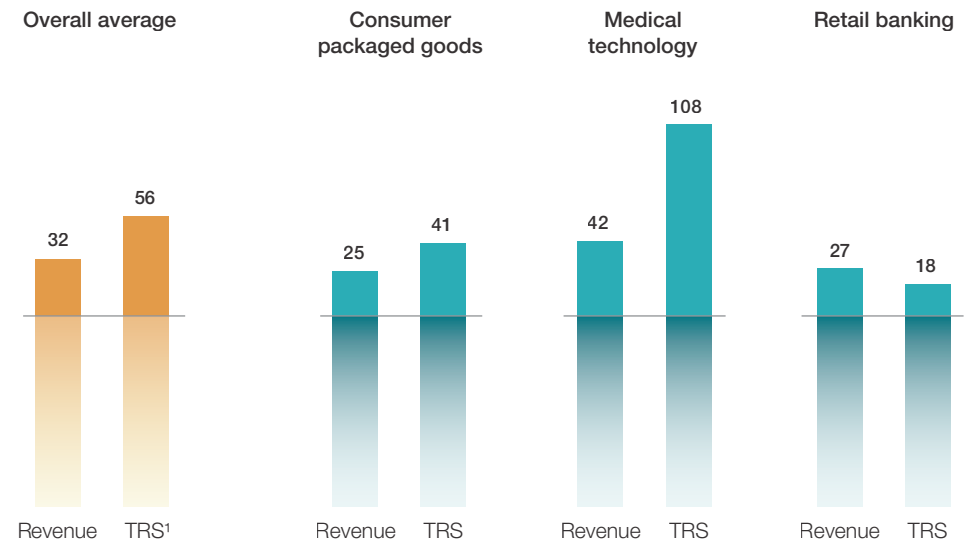
What our research demonstrates, however, is that many companies have been slow to catch up. Over 40 percent of the companies surveyed still aren’t talking to their end users during development. Just over 50 percent admitted that they have no objective way to assess or set targets for the output of their design teams. With no clear way to link design to business health, senior leaders are often reluctant to divert scarce resources to design functions. That is problematic because many of the key drivers of the strong and consistent design environment identified in our research call for company-level decisions and investments. While many designers are acutely aware of some or all of the four MDI themes, these typically can’t be tackled by designers alone and often take years of leadership commitment to establish.

Top-quartile companies in design—and leading financial performers—excelled in all four areas. What’s more, leaders appear to have an implicit understanding of the MDI themes. When senior executives were asked to name their organizations’ single greatest design weakness, 98 percent of the responses mapped to the four themes of the MDI (see following spread).

Exhibit 3

The financial outperformance of top-quartile companies holds true across the three industries studied.

McKinsey Design Index: difference between top quartile vs peers, 2013–18, percentage points



¹ Total returns to shareholders.

UNPACKING THE MDI

In the remainder of this article, we’ll describe the four clusters of design actions that showed the most correlation with improved financial performance: measuring and driving design performance with the same rigor as revenues and costs; breaking down internal walls between physical, digital, and service design; making user-centric design everyone’s responsibility; and de-risking development by continually listening, testing, and iterating with end-users.

More than a feeling: It’s analytical leadership

The companies in our index that performed best financially understood that design is a top-management issue, and assessed their design performance with the same rigor they used to track revenues and costs. In many other businesses, though, design leaders say they are treated as second-class citizens. Design issues remain stuck in middle management, rarely rising to the C-suite. When they do, senior executives make decisions on gut feel rather than concrete evidence.

The value of design

It's analytical leadership

Measure and drive design performance with the same rigor as revenues and costs.

It's cross-functional talent

Make user-centric design everyone's responsibility, not a siloed function.



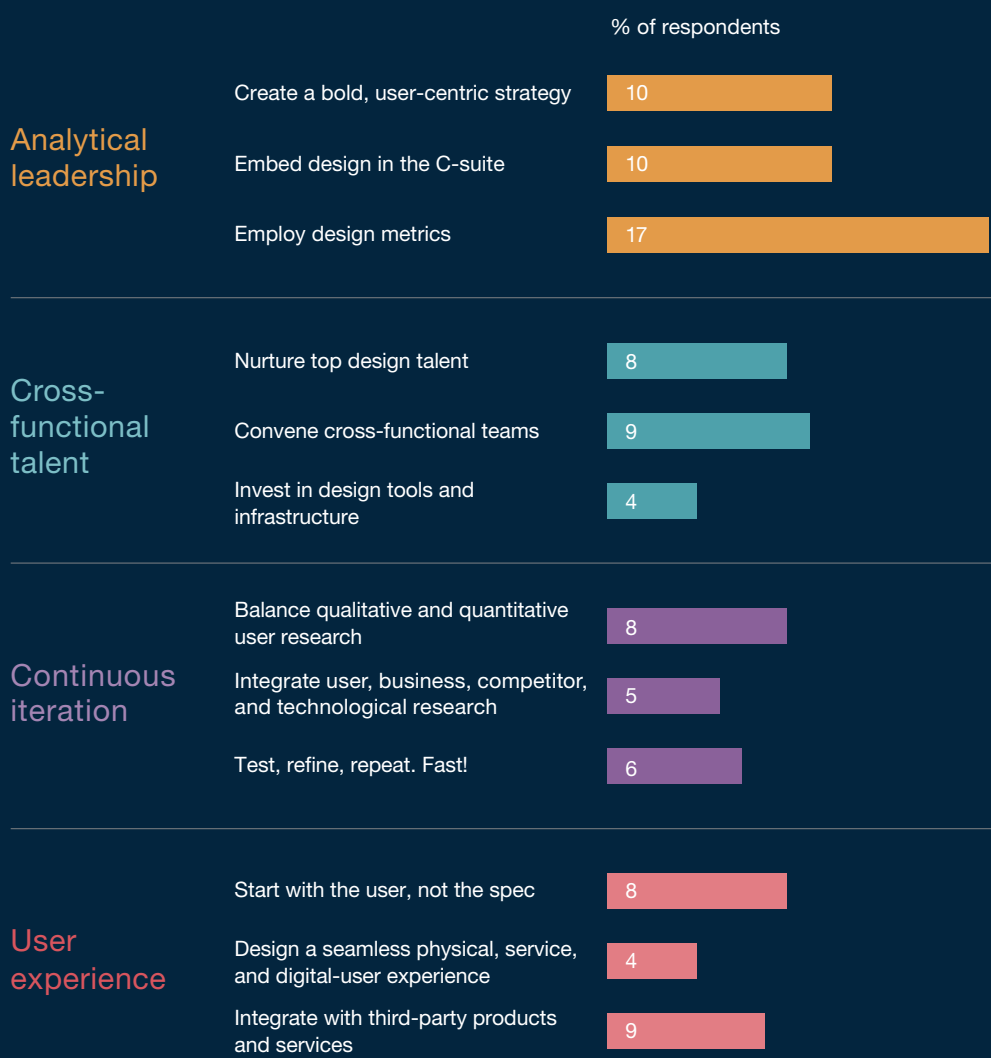
It's continuous iteration

De-risk development by continually listening, testing, and iterating with end-users.

It's user experience

Break down internal walls between physical, digital, and service design.

When senior executives were asked to name their organizations’ single greatest design weakness, their unprompted responses indicated an implicit understanding of the four themes.



Note: The 2% of leaders who provided answers outside the MDI four themes are not shown.

Source: McKinsey Value of Design survey of 300 global companies, July 2018

Designers themselves have been partly to blame in the past: they have not always embraced design metrics or actively shown management how their designs tie to meeting business goals. What our survey unambiguously shows, however, is that the companies with the best financial returns have combined design and business leadership through a bold, design-centric vision clearly embedded in the deliberations of their top teams.

A strong vision that explicitly commits organizations to design for the sake of the customer acts as a constant reminder to the top team. The CEO of T-Mobile, for example, has a personal motto: “shut up and listen.” IKEA works “to create a better everyday life for the many people.” And as Pixar cofounder Ed Catmull told readers in a *McKinsey Quarterly* interview, to “wow” movie-goers continually, his company encourages its teams to take risks in their new projects: Pixar considers repeating the formulas of its past commercial successes a much greater threat to its long-term survival than the occasional commercial disappointment.

It’s not enough, of course, to have fine words stapled to the C-suite walls. Companies that performed best in this area of our survey maintain a baseline level of customer understanding among all executives. These companies also have a leadership-level curiosity about what users need, as opposed to what they say they want. One top team we know invites customers to its regular monthly meeting solely to discuss the merits of its products and services. The CEO of one of the world’s largest banks spends a day a month with the bank’s clients and encourages all members of the C-suite to do the same. Through personal exposure or constant engagement with researchers, executives can act as role models for their businesses and learn firsthand what most frustrates and excites customers.

Many companies, though, acknowledge a worrying gap in understanding at the top of their organizations.

Less than 5 percent of those we surveyed reported that their leaders could make objective design decisions (for example, to develop new products or enter new sectors). In an age of ubiquitous online tools and data-driven customer feedback, it seems surprising that design still isn’t measured with the same rigor as time or costs. Companies can now build design metrics (such as satisfaction ratings and usability assessments) into product specifications, just as they include requirements for grades of materials or target times to market.

The value of such accurate insights is significant—one online gaming company discovered that a small increase in the usability of its home page was followed by a dramatic 25 percent increase in sales. Moreover, the company also discovered that improvements beyond these small tweaks had almost no additional impact on the users' value perceptions, so it avoided further effort that would have brought little additional reward.

More than a product: It's user experience

Top-quartile companies embrace the full user experience; they break down internal barriers among physical, digital, and service design. The importance of user-centricity, demands a broad-based view of where design can make a difference. We live in a world where your smartphone can warn you to leave early for your next appointment because of traffic, and your house knows when you'll be home and therefore when to turn on the heat. The boundaries between products and services are merging into integrated experiences.

In practice, this often means mapping a customer journey (pain points and potential sources of delight) rather than starting with “copy and paste” technical specs from the last product. This design approach requires solid customer insights gathered firsthand by observing and—more importantly—understanding the underlying needs of potential users in their own environments. These insights must be championed at every meeting. Yet only around 50 percent of the companies we surveyed conducted user research before generating their first design ideas or specifications.

Combining physical products, digital tools, and “pure” services provides new opportunities for companies to capture this range of experience. A hotel, for example, might do more than just focus on the time between check-in and check-out (the service element) by promoting early engagement through social media or its own apps (the digital dimension) and providing physical mementos aimed at encouraging customers to rebook. The reception team of one big hotel chain we know gives departing guests a rubber duck adorned with an image of their host city (such as clogs and tulips for Amsterdam). The team includes a note suggesting that guests might like to keep the duck at home as a reminder of their stay and could build a collection by visiting the group's other properties. This small touch led to a 3 percent improvement in retention over time.

Design-driven companies shouldn't limit themselves to their own ecosystems. The best businesses we interviewed think more broadly. Ready-made meals are popular with the hard-working singles who grab them on their way

home. A retailer of these meals has considered teaming up with Netflix to devise a one-click meal-ordering system, which would come into play two hours into an evening's binge viewing when the customer would receive a screen prompt. Mobile-payment services such as Google Pay and Apple Pay were the result of a willingness to think across boundaries to devise easier ways to access cash. A piece of plastic in your wallet is one solution, but how much easier is it to use a device you already carry in your pocket?

More than a department: It's cross-functional talent

Top-quartile companies make user-centric design everyone's responsibility, not a siloed function. In the tired caricature of traditional design departments, a group of tattooed and aloof people operate under the radar, cut off from the rest of the organization. Considered renegades or mavericks by their colleagues, these employees (in the caricature) guard access to their ideas, complaining that they have too often been burned by narrow-minded engineering or marketing heads unwilling to (or incapable of) realizing the designers' grand visions.

We are not suggesting that this stereotype is still common—or that other functions are necessarily to blame—but it can be surprisingly resilient. One company we know, for example, unveiled a new flagship design studio to much jubilation from the design community. Before long, all the designers had moved their desks inside the studio, and had deactivated door access for the marketing, engineering, and quality teams. These moves drastically reduced the level of cooperative work and undermined the performance of the business as a whole.

Our research suggests that overcoming isolationist tendencies is extremely valuable. One of the strongest correlations we uncovered linked top financial performers and companies that said they could break down functional silos and integrate designers with other functions. This was particularly notable in consumer-packaged-goods (CPG) businesses, where respondents from companies that were top-quartile integrators reported compound annual growth rates some seven percentage points above those that were weakest in this respect.

Nurturing top design talent—the 2 percent of employees who make outsized contributions in every business—is another important dimension of team dynamics. Getting the basic incentives right is a part of this: in our survey, companies in the top quartile for design overall were almost three times more

likely to have specific incentive programs for designers. These programs are tied to design outcomes, such as user-satisfaction metrics or major awards.

Crucially, though, retaining great design talent requires more than promising a big bonus or a career path as a top-flight manager. Carrots such as these are not enough to retain top design talent if not accompanied by the freedom to work on projects that stir their passion, time to speak at conferences attended by their peers, and opportunities to stay connected to the broader design community. Talented designers at a CPG company well-respected for its design credentials started leaving because of the amount of time they had to spend styling slideshow packs for the marketing team. Conversely, Spotify's appeal to top designers is often attributed to its autonomy-with-connectivity culture and to a working environment characterized by diversity, fun, and speed to market.

Design already touches many parts of a business: human-machine interactions, AI, behavioral economics, and engineering psychology, not to mention innovation and the development of new business models. While not a new concept, "T-shaped" hybrid designers, who work across functions while retaining their depth of design savvy, will be the employees most able to have a tangible impact through their work.

They will only be able to do so, though, if they have the right tools, capabilities, and infrastructure. That calls for the sort of design software, communication apps, deep data analytics, and prototyping technologies that drive productivity and accelerate design iterations. All of this requires time and investment. We found a strong correlation between successful companies and companies that resisted the temptation to cut spending on research, prototyping, or concept generation at the first sign of trouble. Formal design allocations should be agreed to in partnership with design leaders instead of appearing (as they often do) as line items in the marketing or engineering budgets.

More than a phase: It's continuous iteration

Design flourishes best in environments that encourage learning, testing, and iterating with users—practices that boost the odds of creating breakthrough products and services while simultaneously reducing the risk of big, costly misses. That approach stands in contrast to the prevailing norms in many companies, which still emphasize discrete and irreversible design phases in product development. Compartmentalization of this sort increases the risk of losing the voice of the consumer or of relying too heavily on one iteration of that voice.

The best results come from constantly blending user research—quantitative (such as conjoint analysis) and qualitative (such as ethnographic interviews). This information should be combined with reports from the market-analytics group on the actions of competitors, patent scans to monitor emerging technologies, business concerns flagged by the finance team, and the like. Without these tensions and interactions, development functions may end up in a vacuum, producing otherwise excellent work that never sees the light of day or delights customers.

In a successful effort to improve the user experience, one cruise company we know talked directly to passengers, analyzed payment data to show which food and activities were most popular at different times, and used AI algorithms on security-camera feeds to identify inefficiencies in a ship's layout. At a medical-technology company, blending sources of inspiration meant talking to a toy designer about physical ergonomics and to a dating-app designer about the design of digital interfaces. These moves helped the company to refine a device so that it appealed to customers with limited dexterity. The resulting product was not only safer and easier to use but also beat the market by more than four percentage points when launched.

Despite the value of iteration, almost 60 percent of companies in our survey said they used prototypes only for internal-production testing, late in the development process. In contrast, the most successful companies consciously foster a culture of sharing early prototypes with outsiders and celebrating embryonic ideas. They also discourage management from driving designers to spend hours perfecting their early mock-ups or internal presentations.

Design-centric companies realize that a product launch isn't the end of iteration. Almost every commercial software publisher issues constant updates to improve its products postlaunch. And the Apple Watch is one among many products that have been tweaked to reflect how customers use them "in the wild."

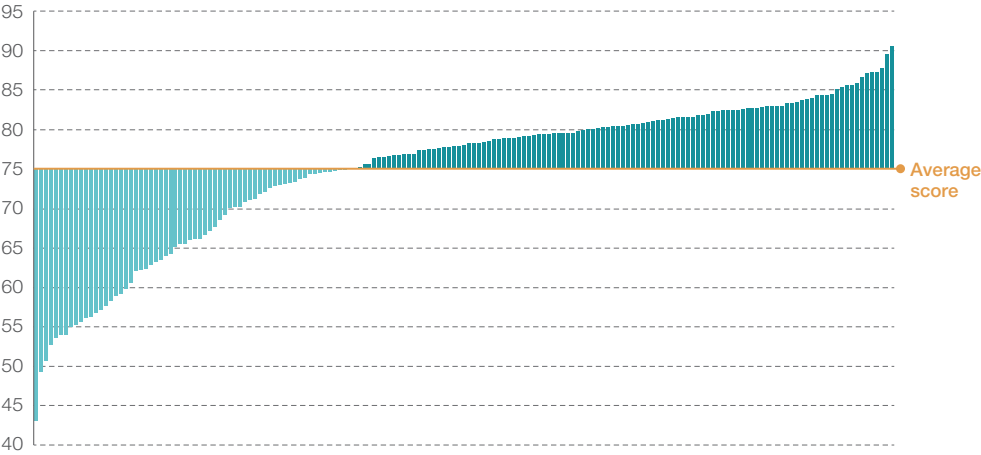
A FIRST STEP TOWARD GREAT DESIGN

We realize that many companies apply some of these design practices—a strong voice in the C-suite, for example, or shared design spaces. Our results, however, show that excellence across all four dimensions, which is required to reach the top quartile, is relatively rare. We believe this helps account for the dramatic range of design performance reflected in the observed companies' MDI scores, which were as low as 43 and as high as 92 (Exhibit 4).

Exhibit 4

Initial survey results reveal a wide range of design performance.

McKinsey Design Index: companies' score vs the average (n = 173)



Source: McKinsey Value of Design survey of global companies, July 2018


The diversity among companies achieving top-quartile MDI performance shows that design excellence is within the grasp of every business, whether product, service, or digitally oriented. Through interviews and our experience working with companies to transform their strength in design, we’ve also discovered that one of the most powerful first steps is to select an important upcoming product or service and make a commitment to using it as a pilot for getting the four elements right. This approach showed far better financial results than trying to improve design as a theme across the whole company—for example, conducting trials of cross-functional work in isolation from real products or services.

One medical-equipment group we know rallied around the design of a new surgical machine as it sought to head off a growing threat from competitors. The commitment of the CEO and senior executives was intense; executive bonuses were tied to the product’s usability metrics and surgeon-satisfaction scores. Cross-functional and co-located teams carried out more than 200 user tests over two years, from the earliest concepts to the detailed design of features. In all, more than 110 concepts and prototypes were created and iterated. The final design’s usability score—a measure of customer satisfaction—exceeded 90 percent, compared with less than 76 percent for

the machines of its two main competitors. The ultimate solution combined a physical device, a digital data pad that could seamlessly connect with more than 40 third-party operating-theater devices, and a service contract.

In the past six months, the company's market share has jumped 40 percent, in part as investors understand the upcoming user-centric products and services that set the company apart from its competition and—even more important—that will improve patients' lives.

The McKinsey Design Index highlights four key areas of action companies must take to join the top quartile of design performers. First, at the top of the organization, adopt an analytical approach to design by measuring and leading your company's performance in this area with the same rigor the company devotes to revenues and costs. Second, put the user experience front and center in the company's culture by softening internal boundaries (between physical products, services, and digital interactions, for example) that don't exist for customers. Third, nurture your top design people and empower them in cross-functional teams that take collective accountability for improving the user experience while retaining the functional connections of their members. Finally, iterate, test, and learn rapidly, incorporating user insights from the first idea until long after the final launch.

Companies that tackle these four priorities boost their odds of becoming more creative organizations that consistently design great products and services. For companies that make it into the top quartile of MDI scorers, the prizes are as rich as doubling their revenue growth and shareholder returns over those of their industry counterparts. 

Fabricio Dore is an associate partner in McKinsey's São Paulo office; **Garen Kouyoumjian** is a consultant in the London office, where **Benedict Sheppard** is a partner; **Hugo Sarrazin** is a senior partner in the Silicon Valley office.

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Building the workforce of tomorrow, today

Software giant SAP is helping its workforce keep pace with technological change and new strategic thrusts.

Finding and training the talent that companies will need if they are to thrive in the future has become a defining issue for business leaders in our era of advanced technologies. While hiring and contracting are options for individual companies, across the corporate landscape as a whole, retraining—or “reskilling”—is inescapable. So far, only a few companies have embarked on large-scale programs to upgrade the skills of their workforce. SAP, a global software company based in Walldorf, Germany, is one of them.

The company’s digital-business-services (DBS) division, one of the main divisions in the company, with around 20,000 employees, began implementing a comprehensive workforce skills upgrade in 2017, to support shifts in its product portfolio toward more digital innovation and cloud products. The upgrade is a multiyear “learning strategy,” which includes a sequence of learning journeys featuring boot camps, shadowing senior colleagues, peer coaching, and digital learning. Many roles are changing, including those of engineers, who are moving from purely technical roles to providing advice to customers.

The company took a strategic planning approach to the task. It started by mapping the skills of all employees today and comparing that map with estimated future requirements and business plans. One year into the program, 4,700 employees have engaged globally in the transformational learning framework. A strategic hiring plan for priority roles and capabilities has also been initiated.

What are the lessons from the experience, and how relevant could they be for other companies? Here, some of the main architects and implementers of the program discuss the experience. They are Michael Kleinemeier, member of the SAP executive board and head of digital business services; Stefan Ries, member of the SAP executive board and chief human-resources officer (CHRO); Tom Janoshalmi, head of digital business services strategy and portfolio; Heike Laube, chief learning officer for digital business services; and Jochen Keller, head of HR for digital business services. McKinsey's Peter Gumbel and Angelika Reich, who conducted the interviews, also sought the views of Walter Kern, who serves on the company's works council and headed negotiations on the reskilling program. The council represents employees and, under German law, has a say in people-management issues (see sidebar, "The employees' perspective").

The Quarterly: *What sparked the decision to launch this program?*

Michael Kleinemeier (DBS head): We are the service arm of a software company. As we moved into the cloud, with more industrialization of services—a massive change of the service portfolio—it was very important to say, “What is your strategy? What is the answer from the portfolio point of view?” And then the next, logical step is to say, “OK, fine. What does that mean from a skill-set point of view? What kind of skill sets do we need?” We needed a totally different approach.

Stefan Ries (CHRO): We saw the first signals in the market that if we don't change we will be successful maybe for the next two or three years, but then there will be a cliff, and at that point it will be too late. We had to act now, as one simply can't build a bridge to the other side of the ocean.

The Quarterly: *This initiative required a significant increase in the budget for training, 2.6 times the previous amount. How did you win board support for that?*

Michael Kleinemeier (DBS head): I had to build a sense of urgency. Sometimes you look too much at your short-term numbers and cut back on education or training investment. But this is a fatal error. The numbers were too good. The temptation was to say, “please do it in the next quarter.” I said no—I will not lead an organization without the right investment to do this reskilling.

The Quarterly: *You are calling this skills program a “transformation.” Can you give some detail about its transformational nature? To what extent does the program go beyond providing incremental skills?*

Tom Janoshalmi (head of strategy and portfolio, DBS): What made this approach transformative was the role of end-to-end “learning journeys”: guided sequences of learning experiences that helped employees learn and mature into new roles or target skill areas over time. The journeys included face-to-face boot camps with participants, as well as opportunities to apply new knowledge on the job and to exchange experiences in communities of learners and practitioners.

Learning journeys went beyond “function and feature” learning. For example, embedding design-thinking elements into the IoT [Internet of Things] learning journey helped to change the mind-set and skills toward a service-led innovation discussion with our customers. We invited our participants to join an internal IoT challenge that offered them the opportunity to apply their newly acquired skills in teams around the globe, competing for the best ideas and ultimately presenting their ideas to executive management.

The Quarterly: *Once the initiative was approved, what were key elements of the implementation?*

Heike Laube (chief learning officer, DBS): The success of a skills transformation in the current environment is to make people understand that changes are required. It’s the customer that asked for it—but none of what you did in the past is, per se, wrong. People also need to see and touch the investment: “Is there a learning framework? Are there opportunities for me? Where can I grow?”

Tom Janoshalmi (head of strategy and portfolio, DBS): We intentionally didn’t call it a restructuring. It was a transformational program for growth. The key was to emphasize “growth” by sketching out future tasks, responsibilities, and personas for changing roles. For example, in order to build up future architects it was not only important for us to equip them with a good understanding of their future role, the required methodologies, and market standards for architecture, but also to help them evolve their soft skills, through improved communication skills or via peer-coaching concepts.

Jochen Keller (HR head, DBS): Trust is essential in any transformation effort. Trust and employee engagement have long been focus topics at SAP. At the beginning of this initiative, there were many questions. In such a situation, it is key that you fortify people’s trust that SAP management is doing the right thing for the company and for its people. And you need to reassure them that we count on their strengths and to convey to them a clear prospect of professional growth, an explicit career philosophy.

This is particularly important as roles and responsibilities are changing and acquiring new skills is on the agenda. When people go through that, they will ask, “What is in it for me?” and we need to answer them explicitly. Feedback mechanisms were important, too. We conducted surveys and sounding-board meetings. These confirmed to us that we were on the right path.

Stefan Ries (CHRO): Two words best describe this: intuitive learning. You hardly recognize that you’re learning while doing it. I think that’s the magic key for the future. Through intuitive learning, employees don’t just take massive classroom trainings or attend online courses—it’s embedded in their daily employee experience. Employees learn because it’s fun and we can play with it. Intuitive learning is this constant willingness to learn more about very sophisticated programs or tools. Why? Because I’m eager to learn and don’t want to be outdated.

THE EMPLOYEES’ PERSPECTIVE

Employees in German companies have a voice in major decisions, including training. At SAP, management had to negotiate the retraining program with the company’s works council, which ended up agreeing to support it after several months of negotiations. Walter Kern, a 27-year veteran at SAP, co-led the works council team.

We had no doubt about the necessity of the transformation. The whole environment changed, the demand changed, and the technology changed. As a result, we as a company needed to change. We are together in one boat. As the works council, we are just as interested as management is in the success of the company. Upskilling and reskilling ensures the employability of everyone.

What was new was that we made a move from “the skills we have” to “the skills we need.” In the past, there was no database with profiles of every employee. This time we knew the base and thus had a better idea of what needed to change—which doesn’t happen overnight. People are creatures of habit, and to acquire new habits takes time.


Making this skills transformation a journey was the right way to do it. Nietzsche said that whoever has a life purpose can bear any pain. You need to communicate the “why.” If employees understand what the “why” is and why it is important, then they will be more understanding when something doesn’t go exactly according to plan. It was always clear that there were people responsible for individual aspects, and someone with overall responsibility: the chief transformation officer. That was very helpful, and it gave us the possibility to address issues that came up immediately.

The Quarterly: *You placed a lot of emphasis on communication. Tell us about that.*

Heike Laube (chief learning officer, DBS): One of the key success elements was the repetitive momentum. There was not a single speech of our executive board where the skills transformation was not mentioned. That was seconded by another message by the executive-leadership team, one by one. And then reinforced by all managers' calls, where the skills team was always present to explain, "How does the framework look? How does the entire process work? How can you be nominated?" So we always made the full 360 degrees from strategy into full execution. People have a solid memory. They come back to you after three months. They come back, again, after six months, and ask: "Is this still going?" And whenever the team then says, "Yeah, we are still there. Look, this is the new schedule. This is how many people already participated. This is where the content is evolving," that's when you're in a winning team.

The Quarterly: *So where do you go from here?*

Michael Kleinemeier (DBS head): It's very important that this is not a one-time effort. It has to be permanent. If you look at the technological changes that will happen in the next five years, they will be greater than what has happened over the past 20 and maybe even 30 years. The question, "What is the skill set of tomorrow?" becomes a permanent one.

This is a lifelong journey. The world is changing so fast. Lifelong learning is a critical success factor—I would say the number-one critical success factor for companies in the future. If you are not able to reinvent yourself and build up a sense of urgency, you can't move an organization with tens of thousands of people. 

These interviews were conducted by **Peter Gumbel**, editorial director of the McKinsey Global Institute, who is based in McKinsey's Paris office, and **Angelika Reich**, a partner in the Zurich office. They wish to thank Chandra Gnanasambandam and Matthias Winter for their contributions to the interviews.

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Digital strategy: The four fights you have to win

Yesterday's tentative approaches won't deliver; you need absolute clarity about digital's demands, galvanized leadership, unparalleled agility, and the resolve to bet boldly.

by Tanguy Catlin, Laura LaBerge, and Shannon Varney

If there's one thing a digital strategy *can't* be, it's incremental. The mismatch between most incumbents' business models and digital futures is too great—and the environment is changing too quickly—for anything but bold, inventive strategic plans to work.

Unfortunately, most strategic-planning exercises *do* generate incrementalism. We know this from experience and from McKinsey research: on average, resources don't move between business units in large organizations. A recent book by our colleagues, *Strategy Beyond the Hockey Stick*,¹ seeks to explain what causes this inertia (strategy's social side, rooted in individual interests, group dynamics, and cognitive biases) and to suggest a way out (understanding the *real* odds of strategy and overhauling your planning processes to deliver the big moves that can overcome those long odds).

All this holds doubly true for digital strategy, which demands special attention. Leaders in many organizations lack clarity on what “digital” means for strategy. They underestimate the degree to which digital is disrupting the

¹ Chris Bradley, Martin Hirt, and Sven Smit, *Strategy Beyond the Hockey Stick: People, Probabilities, and Big Moves to Beat the Odds*, Hoboken, NJ: Wiley, 2018.

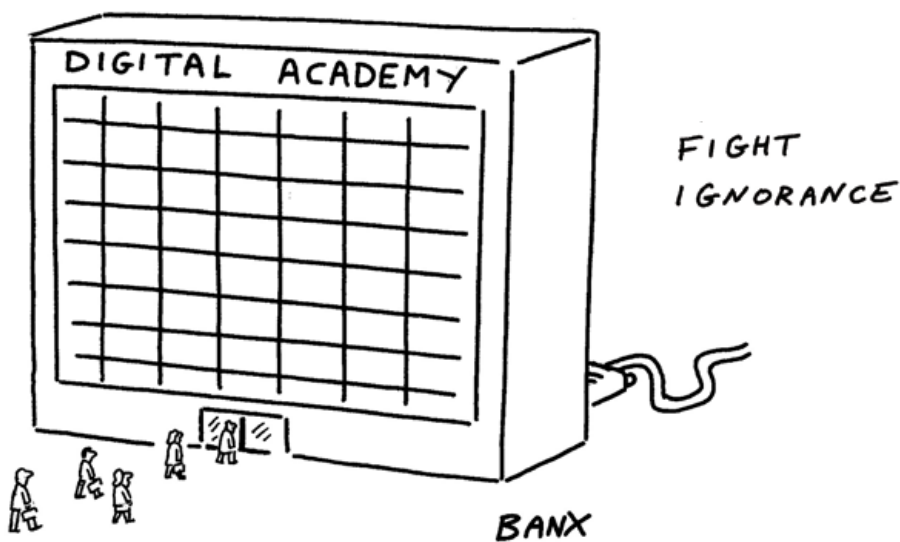
economic underpinnings of their businesses. They also overlook the speed with which digital ecosystems are blurring industry boundaries and shifting the competitive balance. (For more on why companies often fall short, see “Why digital strategies fail,” on McKinsey.com.) What’s more, responding to digital by building new businesses and shifting resources away from old ones can be threatening to individual executives, who may therefore be slow to embrace (much less drive) the needed change.

In our experience, the only way for leaders to cut through inertia and incrementalism is to take bold steps to fight and win on four fronts: You must fight ignorance by using experiential techniques such as “go-and-sees” and war gaming to break leaders out of old ways of thinking and into today’s digital realities. You must fight fear through top-team effectiveness programs that spur senior executives to action. You must fight guesswork through pilots and structured analysis of use cases. And you must fight diffusion of effort—a constant challenge given the simultaneous need to digitize your core and innovate with new business models.

In this article, we will describe how real companies are winning each of these fights—overcoming inertia while building confidence about how to master the new economics of digital. You can join these companies in that effort, thereby giving your digital strategy a jolt and accelerating the shift of your strategy process as a whole, from old-fashioned annual planning to a more continuous journey yielding big moves and big gains even when the end point isn’t entirely clear.

FIGHTING IGNORANCE

Many senior executives aren’t fully fluent in what digital *is*, much less up to speed on the ways it can change how their businesses operate or the competitive context. That’s problematic. Executives who aren’t conversant with digital are much more likely to fall prey to the “shiny object” syndrome: investing in cool digital technologies (which might only be relevant for other businesses) without a clear understanding of how they will generate value in the executives’ own business models. They also are more likely to make fragmented, overlapping, or subscale digital investments; to pursue initiatives in the wrong order; or to skip foundational moves that would enable more advanced ones to pan out. Finally, this lack of grounding slows down the rate at which a business deploys new digital technologies. In an era of powerful first-mover advantages, winners routinely lead the pack in leveraging cutting-edge digital technologies at scale to pull further ahead. Having only a remedial understanding of trends and technologies has become dangerous.



Raising your technology IQ

For inspiration on how to raise your company's collective technology IQ, consider the experience of a global industrial conglomerate that knew it had to digitize but didn't think its leadership team had the expertise to drive the needed changes. The company created a digital academy to help educate its leadership about relevant digital trends and technologies and to provide a forum where executives could ask questions and talk with their peers. Academy leaders also brought in external experts on a few topics the company lacked sufficient internal expertise to address.

Supplementing the academy effort (aimed at leaders) was an organization-wide assessment of digital capabilities and an evaluation of the company's culture. This provided a fact base, which everyone could understand, about what the organization needed to build over the course of the digital transformation. As business leaders developed digital plans, they were accountable for explaining and defending them to other executives. They also had to help gather those plans into an enterprise-wide digital strategy that every business leader understood and had helped to create.

Overcoming competitive blind spots

If your company resembles many we know, it's still stuck in some old ways of thinking about where money gets made and by whom. You're also likely to be overlooking ways digital is changing both the economics of the game and the players on the field in your industry. If any of this sounds familiar, you probably need a jolt—something that forces you to think differently about your business. More specifically, you need to start thinking about it as digital disruptors do. In our experience, this demands a process that begins with

a sprint to get everything moving, to see what your industry (and your company's role in it) could look like if you started from scratch, and to redraw your road map.

The financing division of a European financial-services company went through such a process when it tried to understand digital's impact on its current lines of business. For example, a conversation began in the auto-loans division with the question "how can we make it easier for people to get their loans online?" It turned into a deeper examination of "how does our business model change if people stop buying cars and start buying mobility?" Similarly, an auto insurer might move from asking "how can I sell car insurance online better" to "what does car insurance mean in the context of autonomous vehicles?" There's no substitute for exploring such questions, which emerge when digital, regulatory, and societal trends collide with today's value chain (for more on these collisions, see "Digital strategy: Understanding the economics of disruption," on McKinsey.com).

Once the new realities are discovered, companies should speed up the process of understanding how other players—including nontraditional ones—will respond. The financial-services provider jump-started things by holding a series of war-gaming workshops. It divided its leadership team into groups and assigned them to role-play potential attackers such as Amazon, Google, or small, cherry-picking start-ups. Seeing through the eyes of "baggage-free" attackers inspires an awareness of how players with very different core competencies are likely to act in the new landscape. It can also propel a shared sense of urgency to change the old ways of thinking and acting.

These sessions radically changed the way the company's leaders thought about their business, their industry, and the digital shifts remaking both. The end result was a set of leading-edge ideas for deploying digital to make the current operating model faster and more effective, for investing in new digital offerings, for designing and launching a new digital ecosystem to meet the emerging needs of digital consumers, and for partnering with start-ups beginning to emerge as leading players in advanced mobility.

FIGHTING FEAR

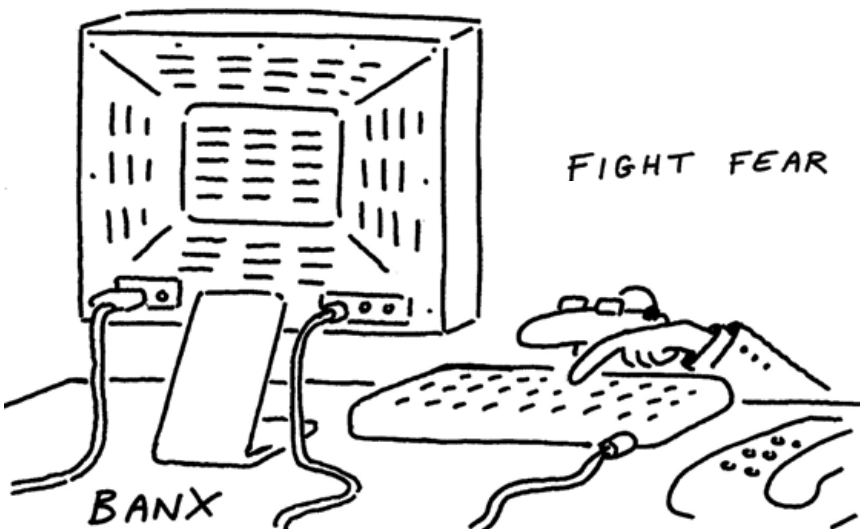
Getting left behind by digital first movers can be hazardous to your company's future. But many of your executives may perceive *responding* to digital—making the big bets, building new businesses, shifting resources away from old ones—as hazardous to *their own* future. As we've noted, that exacerbates the social side of strategy and breeds strategic inertia. If you want to make

big digital moves, you must fight the fear that your top team and managers will inevitably experience.

From what we have seen, this kind of fight doesn't happen organically. You need to design a programmatic effort with the same rigor you would insist on to redesign key processes across your organization. This typically involves making a clear case that executives can't hide from the changes digital is bringing and that encouraging and accelerating change—rather than chasing it—can create more value. Then you need to give executives the tools and support network they must have to succeed as leaders of that journey. Many companies focus on the extensive detailing of digital-initiative plans but skip the critical step of building an equally rigorous program to sustain the leaders driving change.

Honest dialogue

At the industrial company we discussed earlier, the move to digital implied significant change in the characteristics leaders required to be effective. Naturally, concerns about waning influence, or worse, followed for many of the company's 20 or so business-unit leaders. The industrial conglomerate confronted these fears head-on by organizing a top-team effectiveness program to surface anxieties, build awareness of how they were affecting decision making, and define how leaders could remain relevant. In workshops, executives discussed the specific mind-sets and behavioral shifts needed to gain “ownership” of digital initiatives as a group and to become role models for their organizations.



Support networks

Leaders also formed communities that cut across their businesses, initially to share best practices and coordinate the timing of implementation. Over time, the role of these communities grew to include skill-building activities, such as bringing in speakers with specialized capabilities and motivational messages and organizing Silicon Valley go-and-sees that reinforced the importance of leading digital change. The communities also provided peer support to help teams navigate the new landscape.

We have seen other organizations similarly coalesce around digital-leadership training (sometimes supported by digital advisory boards) that helps executives to become comfortable with—even embrace—the uncertainty of the destination and the career trade-offs needed for a well-executed digital strategy. These support networks dovetail with, and bolster, the digital IQ-raising efforts we described earlier. Indeed, we find that leaders who understand the shifting economics also understand that their careers will be affected one way or another.²

FIGHTING GUESSWORK

Pursuing an aggressive digital strategy involves leaps into the unknown: simultaneously, you are likely to be moving into new areas and overhauling existing businesses with new technologies. What's more, in many digital markets, the premium of being a first mover makes it necessary not only to shift direction but also to do so faster than your peers. The combination of ambiguity and the need for speed sometimes gives rise to guesswork and moves that are hasty or poorly thought out—and to anxiety about whether a move isn't going to work or just needs more time.

Building the proof points as you go

One way to fight guesswork is to anchor your strategy decisions to a thesis about the business outcomes that different digital investments will produce. This is less about elaborate business-school modeling and more about thinking that draws fast, ground-level lessons from the data to determine whether your business logic is correct. Put another way, it means figuring out if there is sufficient value to make it worthwhile to invest *something*—as part of a process of learning even more. This approach increases the odds of successful implementation: a well-articulated view of the outcomes means that you can track how well the strategy is working. It also makes it easier to assess whether the new direction is worth it in terms of both financial capital and organizational pain.

² For more on the mind-set changes needed for digital effectiveness, see Julie Goran, Laura LaBerge, and Ramesh Srinivasan, "Culture for a digital age," *McKinsey Quarterly*, July 2017, McKinsey.com.



Those proof points must be grounded in digital reality. Consider the experience of a global oil and gas company investigating the potential impact of several advanced technologies on its business. Rather than develop theoretical value-creation scenarios, the company’s digital center of excellence got busy exploring: How might sensors, robots, and artificial intelligence improve productivity and safety in unmanned operations? What operating hurdles, such as skill gaps among managers and frontline workers, would need to be overcome?

“Skunkworks” efforts began to give the company sharper insights into the timetables and financial profiles of different investments, so it avoided both the “finger in the air” syndrome (which dooms some digital efforts) and excessive modeling (which bogs down others). The end result was a value-thesis projection of a pretax cash-flow improvement exceeding 20 percent by 2025. That built the confidence of senior leaders and the board alike.

Pilots and stage gates

A second way to reduce the need for guesswork is to take full advantage of real-time data and the opportunities they provide for experimentation. Digital does amplify the gut-wrenching uncertainty by multiplying the strategic choices leaders face while reducing the time frame for making and implementing those decisions. But it also contains a silver lining: the potential for gaining rapid, data-driven insights into how things are going. Information on the progress of a product launch, for example, is available in days rather than

months. That makes rapid course corrections possible and, ultimately, considerably improves the chances of success.

The oil and gas company mentioned earlier got a rapid bead on the impact that its digital initiatives were having on its business performance when it automated the evaluation of several business cases. Testing was more or less continuous, which reduced the level of anxiety about the investments, because executives had hard data on how things were performing rather than relying on guesses or intuition in realms they didn't know extremely well. It also gave them more confidence to push cutting-edge solutions: they didn't need to see how other oil and gas companies did things when they could move first and see, in near real time, what worked and what didn't.

An important element of this nimble approach was breaking up big bets into smaller, staged investments. While the oil and gas company was ready to invest in digital, it was decidedly uncomfortable with throwing money at a problem and hoping for the best. It therefore developed a series of rigorous stage gates for investments managed by a new, central digital-transformation office. The office was charged with overseeing the portfolio of digital investments to ensure that the most promising projects were funded and others defunded before they soaked up valuable resources. In tandem, the head of the company's digital efforts was vested with the responsibility for approving which ideas would move to initial development, basing these decisions on the organization's overall vision for digital.

The ideas, which originated mostly with the business units, included clear requirements for testing. The "fail fast" mind-set was embedded from the outset because it allowed the company to learn quickly from mistakes and to minimize wasted funding. Another payoff was that the central team could identify synergies, which allowed the development costs of some investments to be shared rather than borne by a single business. These processes helped temper some of the risks of the bold investments the company was making, gave leaders the confidence to venture ahead as first movers, and kept open the option to correct course quickly when the data pointed in another direction.

FIGHTING DIFFUSION

Effective strategy requires focus, but responding to digital inevitably risks diffusion of effort, or "spreading the peanut butter too thinly." Most companies we know are trying, and struggling, to do two things at once: to reinvent the core by digitizing and automating some of its key elements, for example,

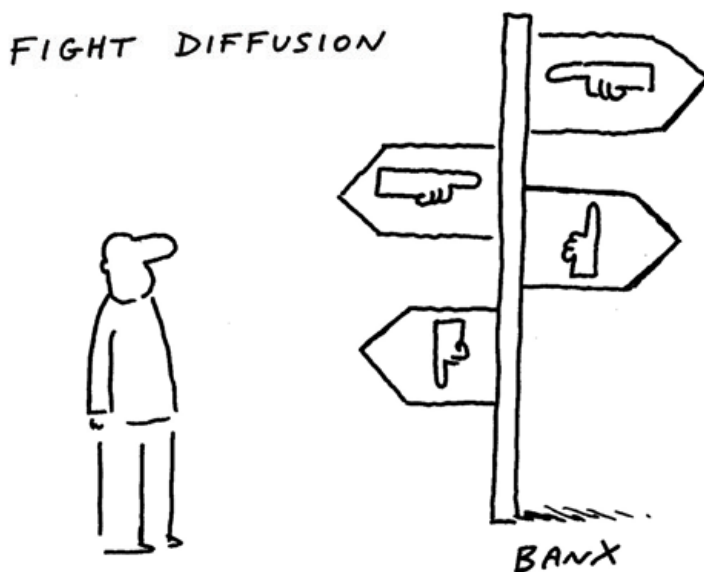
and to create innovative new digital businesses. The challenge is acute because of the dizzying pace of digital change and the uncertainty surrounding the adoption of new technology. Even if the technology for autonomous vehicles pans out, for instance, when will the majority of people really begin to use them? Given the impossibility of knowing, it's easy to wind up with an unfocused hodgepodge of digital initiatives—a far cry from a strategy.

Two concepts can help you navigate. First, view your company as a portfolio of initiatives³ at different stages of seeding, nurturing, growing, or pruning. Our colleague Lowell Bryan championed this view upward of 15 years ago, and it is more relevant than ever in our digital age because the opportunities, time frames, and economics of core businesses can be very different from those of new ones—so resources and efforts shouldn't be applied uniformly.

Second, embrace the necessity of “big moves,” such as the dramatic reallocation of resources, sustained capital investment, radical productivity improvements, and disciplined M&A. As our colleagues have shown,⁴ successful market-beating strategies nearly always rest on such moves. Making them *mutually reinforcing*, so that developments in the core help to support new digital businesses and vice versa, is a critical part of managing the risks of diffusion.

³ Lowell Bryan, “Enduring Ideas: Portfolio of initiatives,” *McKinsey Quarterly*, October 2009, McKinsey.com.

⁴ See Chris Bradley, Martin Hirt, and Sven Smit, “Strategy to beat the odds,” *McKinsey Quarterly*, February 2018, McKinsey.com.



To understand what the application of these ideas looks like in practice, consider the experience of a global IT-services company wrestling with how much to invest in digital over the next five years (rather than use standard R&D funding across all of the company's business lines). That meant scrutinizing which traditional businesses faced obsolescence as a result of digital, whether digital could stretch any of those lifetimes (or if immediate divestment was preferable), which new digital businesses to invest in, and how much to invest.

A portfolio approach

As a first step, the company went through its portfolio business by business, focusing on three questions: Which emerging digital products and services were missing from the portfolio? Which product offerings and elements of the existing operating model should be digitized or fully digitally reengineered to improve customer journeys? And what areas should be abandoned? The answers for the company's healthcare markets differed from those for banking, but the company became comfortable with hard choices and more attuned to new opportunities by tying all decisions to clear use cases.


As part of this exercise, the company developed scenarios for how the value pools in each of its industry verticals would probably shift across component customer value chains. It wanted to get a sense of the types of services that clients and potential clients were likely to demand and thus might try to obtain from new suppliers or IT outsourcers. For businesses where more revenue would be likely to shift, the company was comfortable placing bigger bets on new digital offerings, in contrast with its approach to businesses where the revenue at stake wasn't changing as much.

Big, mutually reinforcing moves

This systematic evaluation of value-pool opportunities across the portfolio generated a frank discussion of how the organization's risk appetite had to change. It also catalyzed a greater willingness to invest in new digital businesses—which the company did, to the tune of more than \$1.5 billion. As part of this strategic evolution, the company launched an aggressive program to better leverage foundational digital capabilities, such as automation, advanced analytics, and big data. These capabilities, to be sure, were key building blocks for the new digital businesses. Just as important, however, by deploying the capabilities at scale across existing businesses, the company was better able to stretch the life of its core offerings.

The portfolio strategy paid dividends both in revenue gains and cost reductions. For example, investing in a balanced fashion between core and new businesses led to faster than expected revenue streams from new offerings. The company estimated that 40 percent of its revenues would flow from them within two to three years. Moreover, its digitally improved core businesses, with a sizable base of existing customer revenues, provided additional funding for the new digital portfolio. That increased the leadership's commitment to the strategy, bolstering confidence that the new portfolio offerings would provide growth more than compensating for the eventual decline of core businesses.

Your best digital competitors—the ones you really need to worry about—aren't taking small steps. Neither can you. This doesn't mean that a digital strategy must be designed or put to work with any less confidence than strategies were in the past, though. Strategy has always required closing gaps in knowledge about complex markets, inspiring executive teams (and employees) to go beyond their fears and reluctance to act, and calibrating risks when you bet boldly.

The good news is that the digital era, for all its stomach-churning speed and volatility, also serves up more information about the competitive environment than yesterday's strategists could ever imagine. Simultaneously, analytically backed, rapid test-and-learn approaches have opened up new avenues to help companies correct course while staying true to their strategic goals. Today's leaders need to step up by persuading their organizations that digital strategies may be tougher than other strategies but are potentially more rewarding—and well worth the bolder bets and cultural reforms required, first, to survive and, ultimately, to thrive. 

Tanguy Catlin is a senior partner in McKinsey's Boston office, where **Shannon Varney** is an associate partner; **Laura LaBerge** is a senior practice manager of Digital McKinsey and is based in the Stamford office.

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Building a tech-enabled ecosystem: An interview with Ping An's Jessica Tan

A culture of innovation and failing fast drives the Chinese financial conglomerate's expansion beyond traditional sector boundaries and its early adoption of emerging technologies.

Many companies seeking to stay ahead of digital competition are making ambitious, strategic moves beyond their traditional sector boundaries. These bold ventures require a significant reallocation of resources and a more open, agile culture that embraces tough targets and an understanding of what it means to innovate but also to “fail fast.” This is particularly relevant in China, where the rapid rise and expansion of players such as Alibaba and Tencent has led to the creation of massive “ecosystems,” spanning e-commerce, finance, and logistics.

The Chinese financial conglomerate Ping An, which has expanded beyond insurance into a broader set of ecosystems, such as banking, healthcare, smart cities, and housing, is a prime example of such a first mover, at a scale that most companies only dream of. In the past five years, Ping An has accumulated nearly 500 million online users, created 11 new digital platforms across industries, and increased its number of insurance agents to 1.4 million, all armed with the company's digital tools and apps. Ping An's commitment to investing in emerging technologies has been a particularly important driver of this expansion: it now directs 1 percent of its annual revenue—around \$1 billion—toward tech investment. In this interview, conducted by McKinsey's Joe Ngai, the deputy CEO of Ping An, Jessica Tan, discusses recent developments and the power of freeing employees from the fear of failure.

The Quarterly: *In the past few years, Ping An has expanded far beyond traditional financial services. How did the company go about deciding where and how to expand its ecosystem?*

Jessica Tan: We looked at what sectors were most important, not only to the economy in general but to the consumer—such as autos, housing, and health. We then identified the key areas in each of these ecosystems where we could add value. In the health arena, for example, as an insurer, we're usually at the end of the customer experience, so we wanted to move further upstream to capture the customers as they start their journey. One of our health platforms that just went public, Good Doctor, now fields more than 500,000 online consultations a day from customers who are looking for health-related advice. Since 55 percent of health expenditures are government related in China, we now also serve about 258 cities, helping local governments to process medical claims and work more efficiently. And we continue to investigate how we could contribute to the patient side by providing technology solutions that facilitate affordable, easy-to-access primary care.

The Quarterly: *Ping An has made a conscious choice to distinguish between consumers who buy products and consumers whom you reach in your ecosystem. What's the thinking here?*

Jessica Tan: This was quite a significant conceptual change for us. Five years ago, we were really learning from what the internet guys were doing: everything was free. They got the users first, and only then started to monetize their offerings by cross-selling and up-selling.

So the idea was to create these platforms where we could draw in customers who would then later buy our financial-services products. We started with our five ecosystems by offering services for free—for instance, our Good Doctor app, which provides users with free medical consultations and other services. Gradually, over time, users then began to buy our products. In the first three years, frankly, it was difficult just building everything. Like any other start-up, our new platforms needed time to get to scale.

But over the last two years, about 35 to 40 percent of our new financial-services customers—people who open a bank account or buy an insurance product—have been users on our platform who are new to Ping An and hadn't previously purchased any products. We currently have around 486 million online users that we reach in our ecosystem. So we've created this virtual cycle, whereby our customers have developed some affinity with us, and naturally buy from us. We think this ecosystem model is much better than a more

traditional one where a customer has to buy a product first and then you provide services based on that customer's needs.

The Quarterly: *Ping An has built a lot of technology in-house, including facial recognition, artificial intelligence [AI], and blockchain. What was Ping An's motivation for investing in technology built in-house rather than licensing it from others?*

Jessica Tan: In the beginning, some of it was out of necessity. For example, when we were looking at facial recognition five years ago, the options out there didn't accurately register Asian faces. It was the same experience with voice recognition. We wanted to use it in our call center to recognize customer's voices, but the options available to us were not very good at recognizing Chinese dialects.

The other reason was that, particularly with AI, our needs were very specific to the scenarios we were solving for. Unfortunately, many technology companies might offer machine-learning techniques, but they don't really understand your business, and it takes a while to build that understanding. That was one of the challenges when we started doing this. How do you get people with the right domain knowledge and the right technical skills to be able to build something together?

We have scale and we have the resources, so we decided that it would be faster for us to put it all together ourselves. Now that we've done it, it has become much easier for us to use the technology in other areas across our ecosystem, because all these technologies were tailored to our use.

The Quarterly: *Financial-services companies are not predominantly known for innovation. What are some of the strengths of Ping An's culture that have helped it to succeed?*

Jessica Tan: We have a clear vision and set very aggressive targets. No matter your background or position, at the end of the year, the only thing that matters is whether you've delivered your results or not. That helps to galvanize people to work together because if they don't, they won't meet their targets. We also have a zero-based process every year, where next year's target is based on market potential, not on the previous year's growth trajectory. It's like playing a game: you go back to level zero; you don't ride on the success of the past.

In this culture, everyone is able to speak up with new ideas or objections. There's no sacred ground that you can't touch, and that's a philosophy that has really helped us over the years. Risk taking is strongly encouraged, and failure isn't stigmatized. When I first came to Ping An, I remember Peter Ma, our founder and CEO, telling me, "You don't have to worry about failing at all. We just need you to try really hard to find a way to make it work. As long as one of these ideas eventually works, we'll be successful."

Over time, our hit rate on innovation has gotten better, because what you learn is that often your original instinct—about why you need to make a certain move and the untapped potential that you see—is correct, but your first idea of how to actually execute it might be wrong. But if you keep trying, understandably making a few missteps as you make your way on an unpaved path, you'll eventually get there. What I've found is that with each new success, you become more confident in your abilities and your instincts to try the next big thing.

The Quarterly: *Ping An has grown at a tremendous rate over the past 15 years. What worries you the most? What keeps you awake at night?*

Jessica Tan: Not being fast enough. There's just so many things to do, and speed is of the essence. And what's especially exciting about China is that you may be the best now, but if you're not fast enough, a 70 percent solution can beat you. The market is too big and too competitive. There's a hunger that you can see in the market. You have to have good people who are motivated, driven, who want to go out and make things happen. We have been successful, but we can't slow down. **Q**

Jessica Tan is the deputy CEO of Ping An Insurance Group. This interview was conducted by **Joe Ngai**, a senior partner in McKinsey's Greater China office.

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For more about Ping An's innovation efforts, see our video interview with deputy CEO Jessica Tan in the online version of this article, on [McKinsey.com](https://www.mckinsey.com).

ACCIDENTALLY AGILE



© Photos courtesy of Rijksmuseum

AN INTERVIEW WITH THE RIJKSMUSEUM'S TACO DIBBITS





The director of the national museum of Dutch art and history describes the central role of agility in the museum's massive renovation project—and in its drive for perpetual renewal.

When its current building was completed in 1885, the Rijksmuseum, the national art museum of the Netherlands, was intended to serve as a cathedral to house the greatest treasures of Dutch art and history. Throughout the 20th century, it was increasingly deprived of its glory: its decorations were painted white, and it slowly became cluttered with modern offices and archives. To some, it had become a dusty labyrinth where people struggled to find their way.

At the turn of the millennium, the Dutch government, along with a group of corporate sponsors, offered a singular opportunity in the form of a major monetary gift: the chance to transform the entire museum all at once.¹ Despite bumps along the way, including a surprise discovery of asbestos in the building that stretched the museum's closure to ten years, the museum's physical transformation ultimately spurred an organizational one as well. As museum director Taco Dibbits describes in this interview with McKinsey's Wouter Aghina and Allen Webb, the museum's staff inadvertently embraced agile organizational principles—forming, dissolving, and reforming teams that were more interdisciplinary than those it had employed in the past—as it worked to redesign its galleries.

After a successful reopening in 2013, Dibbits, as director of collections at the time, first stepped back with his team from an agile process, then reintroduced it when he and the team embarked on a 21st-century vision for the museum. Along the way, Dibbits says, he learned a great deal about the characteristics of great teams, the power of constraints to inspire creative solutions, and the role of the leader to get people out of their comfort zones. Although the

¹ For more about the renovation, see rijksmuseum.nl.

Rijksmuseum differs in many respects from the typical company experimenting with agile approaches, Dibbitts's experiences as an accidental agile leader should be thought-provoking for a wide cross section of organization leaders.

The Quarterly: *How were things organized at the museum before the renovation?*

Taco Dibbitts: In the old museum, the art was arranged by specialization and was, in a sense, a reflection of the organizational diagram of the museum staff. The curator of ceramics had her gallery of vases and bowls, the curator of glass had his gallery of champagne flutes and pitchers, and so on. Within these galleries, separated by medium, the materials were then organized chronologically. So, for instance, in the paintings galleries you would start with the Middle Ages and walk up to the 20th century. With each new category, the public would have to start all over again.

The Quarterly: *What was the motivating idea for a new approach? How did it change the way things worked?*

Taco Dibbitts: What we sometimes forget is that when visitors come to a museum, they don't generally know what they're supposed to get out of it. We sought to change that by creating an experience that would give the public a sense of time and a sense of beauty. We thought the best way to do this was to create a more sweeping chronological arrangement, because a national museum like ours also serves as the physical memory of the nation. Therefore, if you want



to create a historical narrative for the public, you have to start mixing all the collections that traditionally had been arranged by material.

We decided that we would divide the gallery installations century by century, starting in the Middle Ages and working all the way up to the 20th century. The question we wanted to answer was not how to assign objects to spaces but how to place objects in groups that are linked aesthetically and historically in some significant way.

This would mean a change for our curators, who had previously worked quite autonomously. Now, everyone would have to start working together. We did this by establishing a working group for each century made up of different curators, as well as a person from the education department who would think about the right interpretation approach for the public.

The Quarterly: *Were these groups completely self-directed or was there some leadership role involved?*

Taco Dibbitts: Each working group was chaired by the person whose expertise was right for that century; for example, in the Netherlands, the 17th century was the Golden Age—with paintings by Rembrandt, Vermeer, and others—so the curator of paintings would chair that working group.



We encouraged the chairs to behave, to some degree, like enlightened despots, because we knew that otherwise, the groups would have tended not to make rigorous choices. We Dutch are all about consensus. But that kind of approach would have created a result that was too homogenous. We needed people in each group who could make their mark and say, “Well, the 18th century is the century of decorative arts. So that’s how we’re going to organize it.” You need a few people who push toward the highest-quality result, and those who are inspired by them to do the work and follow their lead.

The Quarterly: How did the proposal and selection process play out?

Taco Dibbits: It took about a year and a half for the groups to craft their proposals. There was very thorough research involved, and after that, each group presented its proposal to what we called the steering group.

Then the question for the management team became, “How are we going to slash the number of objects?” The 17th-century group, for example, presented far too many objects, around 3,000, which would never fit in the galleries. Any decision to cut down objects would naturally be frustrating for the working groups. It’s very difficult to “kill your darlings.” Our solution was to basically dissolve the task forces and assemble new ones. Their new mission was to create a selection one-third the size of what the first groups had proposed. They also had to write an argument for why they wanted to keep particular objects in, why they would be interesting to the public, and how these objects related to the others in the proposal. In this way, it gave all the specialists a feeling of ownership in the creation of the museum’s offerings, even beyond their own area of expertise.

The Quarterly: Did the reopening go as well as you had expected?

Taco Dibbits: We could not have imagined the scale of the success. The year of the reopening, in 2013, we had 2.25 million visitors, and the following year, the number of visitors increased by 250,000. At the time, we were so happy with how well things had gone—and so exhausted as a museum—that we didn’t immediately shift to new priorities. After two years, the previous director left, and I started in this role. Because I had been on the board in my previous role and I was an internal hire from within the museum, we could move quickly to draft a new vision and strategy. We didn’t include anybody else in that process, but once we had it on paper we opened it up for criticism. And we came away with a stronger vision, I think, because of those discussions with our supervisory board and works council.

The Quarterly: *What were some of the goals and ideas driving the new vision?*

Taco Dibbitts: We were asking ourselves, “If we want to remain relevant in society, what should we tackle next?” We don’t only keep history; we shape it. That responsibility brings with it a few key challenges. As a museum born in the 19th century, our collection is very Dutch oriented. Back then, there was a large influx of new immigrants from Belgium, but today we have people from all over the world. How could we reflect that in the museum’s exhibitions?

Another challenge is that the Rijksmuseum is everybody’s museum, but not everybody feels it is their museum. We needed to figure out how to reach more people, not only in the Netherlands but abroad as well. How do we craft narratives that will resonate with our visitors on a personal level? Our goal is not to just convey that Rembrandt is the greatest artist and that if you don’t accept it you can leave. We want to tell visitors more about Rembrandt the person, more about his art and the time in which he lived—engaging visitors in a dialogue with the museum. And finally, in today’s world, where many forms of digital communication are central to our lives, another question was, “How do we remain at the forefront of digital trends and stay innovative?”

The Quarterly: *How did you approach these various challenges?*

Taco Dibbitts: We felt that if we wanted to successfully tackle them, we had to change our organizational structure. Even though we had worked together in these groups to create entirely new gallery installations, we hadn’t changed the structure of the organization itself. Looking back, I think we should have tried then, despite how tired everyone was after our successful reopening. Eventually, though, our people wanted to be energized again. Restructuring the organization motivated people because they all understood how the bureaucracy in a 200-year-old institution mainly comes from the organizational diagram. We all wanted to break through it.

The Quarterly: *What did some of this restructuring look like?*

Taco Dibbitts: As we looked at how to move forward, I kept hearing that we should think about an agile way of working. I had never heard of this, but as I learned more it dawned on me that it was quite similar to what we had done with our working groups in designing a new museum.

As we began to apply this thinking, we initially considered changing how our departments were organized by specialty—painting, glassware, for example—but we decided not to do it. First of all, in our surrounding field, the universities and museums are not organized in that way, so our staff would not be able to talk to peers. Maybe in the future, somebody will be an expert in 18th-century glass and silver, because there are similarities. But for now, that would be one step too far. Still, we’ve gone from 18 departments down to 15.

We ultimately decided to create four new agile working groups, one for each aspect of our new vision: exhibitions, personal stories, the customer journey, and digital innovation. For each group, there was a chair who would lead the agenda and then a project manager to steer and support the process. Since we no longer had the luxury of working inside a museum that was closed to the public, speed was of the essence—so we set a goal for these groups to come up with results within three months.

TACO DIBBITS

Vital statistics

Born in 1968 in Amsterdam, the Netherlands

Education

Graduated in art history from the VU University Amsterdam and the University of Cambridge

Career highlights

The Rijksmuseum

(2016–present)

General director

(2008–16)

Director of collections

(2006–08)

Head of fine and decorative arts

(2002–06)

Curator, 17th-century painting

Christie’s London

(1997–2002)

Director, Old Masters

Rapid reflections

1. *What work of art has had the greatest impact on you and why?*

Everything Rembrandt did. It’s about us as human beings in all our shortcomings and all our successes.

2. *What are the best books you’ve read recently? Films you’ve watched?*

- Leo Tolstoy’s *War and Peace*
- Fritz Lang’s *M*

3. *In your experience, what common career advice is wrong or misleading?*

“Follow the money.”

4. *What’s the most important thing that business leaders in other industries could learn from the art world?*

Artists create new visions.





The Quarterly: *Was there anything that you did differently with these working groups, relative to the ones you'd established during the renovation?*

Taco Dibbits: One great decision that we made was to open up the groups to the entire organization, from curators to marketing. This gave everyone a feeling of empowerment to be able to use their specific knowledge and skills. It also provided the groups with more diverse perspectives that became crucial in tackling these multifaceted issues.

For example, a curator knows the collection and has an antenna out for what's currently important in the academic community. Meanwhile, a security guard has everyday contact with the public and sees how visitors move around in the museum. And somebody from the social-media team can argue, "Just because we're doing this exhibition on slavery doesn't necessarily mean that people from the Caribbean will visit. In fact, we aren't currently reaching them; we need to engage those groups on other platforms." We learned that having the involvement of people from many different disciplines ensures that we'll maintain a stronger connection between the museum and the community.



The Quarterly: *Did all the groups tackle their mandates in the same way, as the earlier-century groups had?*

Taco Dibbitts: Interestingly, they each went about it in different ways. The customer-journey group conducted a kind of agile research outside the museum on why different groups of people—international visitors, Dutch families, and so on—don’t come to the museum. They presented a few conclusions and laid out how much their solutions would cost and how much value they would bring to the museum. Today, we have smaller groups within our normal working structure actually implementing these recommendations.

The personal-stories working group took another tack: they decided to invite people from all kinds of professional backgrounds—entertainment, journalism—to brainstorm how we could craft stories that would resonate with visitors. At the end, the group identified the ingredients of a good story and how we might tell it. The group is currently thinking about how we tell our stories on different platforms, such as Facebook and Instagram.

The group working on digital innovation had the most difficulty working in an agile way. We usually think agile comes from the tech side, but they're also naturally very analytical. So they started out by making an inventory of what they were already doing. That took them a long time, and then they were just starting to ask what the next step should be and what innovation they should implement, when their three-month deadline arrived. It was interesting to see that not all four groups succeeded to the same degree.

The Quarterly: *How did you balance giving these teams the freedom to tackle these problems while also providing enough direction to keep them on course?*

Taco Dibbitts: In Dutch, we say, "Let everybody fly." But as leaders, we also have to let our teams know where they are flying to; otherwise there's a risk they will become frustrated and deflated. I think agile leaders need to understand that for teams to self-organize and self-direct, they also need to have a very clear and thoughtfully constrained task.

However, this doesn't mean going so far as to tell teams how to work toward the goal, because that will actually hamper them. And then they'll think, "Why should we do it that way, just because he or she says so?" It is better that leaders restrain themselves even though they may already think they know what the result will likely be. After all, the team's results might be surprising in a positive way.



***The Quarterly:** In your experience, what's the optimal number of people for these teams? Is there any tension around who's involved?*


Taco Dibbits: For one thing, once you start this agile way of working and create task forces, the people who are not initially placed on them feel excluded. So the first reaction of our task force chairs is often to ask, “Can we make the group bigger?” And I say, “No, you can’t.” The optimal size for these groups is really five to seven people.

This is, in part, for pragmatic reasons. If the group takes a vote, an even number of members makes it difficult to decide. Also, the group dynamics change with more people. If you have more than seven people, it’s difficult to have a fruitful discussion, because by the time everyone gets to have their say, you’ve lost speed. Also, with a smaller group, it’s harder for a person to remain silent. You can challenge people to say something and they often have very valuable insights.

Ultimately, it’s important to communicate from the start that everyone’s time on these task forces will come. We continue to regularly mix up the people in these groups so that everyone has a chance to participate.

***The Quarterly:** This nontraditional structure of working seems to strip away some of the traditional responsibilities of a leader. So what is the purpose of a leader in an agile way of working?*

Taco Dibbits: The role of our leadership team is to push people to think more broadly, to get them out of their comfort zone, and ultimately to do things they never imagined possible.

If you want to keep pushing forward, you have to make sure that you and your broader team are seeking out different perspectives, and not just from the usual places. It’s human nature to gather people around us who have a similar way of thinking. But it’s better when we find others who challenge us and expand our understanding. For instance, it may not be our first instinct to consult someone without a strong background in museum work, but if they have, say, a deep understanding of the cultural issues surrounding an upcoming exhibition, we can benefit greatly from their contributions—and the exhibition will be richer for it. It’s all about actively cultivating an open mind and a sense of curiosity. 

Taco Dibbits is the general director of the Rijksmuseum. This interview was conducted by **Wouter Aghina**, a partner in McKinsey’s Amsterdam office, and **Allen Webb**, editor in chief of *McKinsey Quarterly*, who is based in the Seattle office.



Making work meaningful: A leader's guide

People who find meaning in their work are happier, more productive, and more engaged. Four practical interventions can help make the search more likely to succeed.

by Dan Cable and Freek Vermeulen

By now, it is well understood that people who believe their job has meaning and a broader purpose are more likely to work harder, take on challenging or unpopular tasks, and collaborate effectively. Research repeatedly shows that people deliver their best effort and ideas when they feel they are part of something larger than the pursuit of a paycheck.

Most business leaders know this. They take pains to broadcast the company's strategy to employees. They say they really want employees to know that the organization has a higher purpose. And yet many of these messages aren't getting through: in one survey of senior executives around the world, only 38 percent of leaders said that their staff had a clear understanding of the organization's purpose and commitment to its core values and beliefs.¹ US and global Gallup polls confirm this, finding that about 70 percent of employees are not "involved in, enthusiastic about, or committed to their work."² Another study showed that nearly nine out of ten American workers believe

¹ *The business case for purpose*, a joint report from EY and Harvard Business Review Analytic Services, 2015, ey.com.

² Amy Adkins, "Majority of U.S. employees not engaged despite gains in 2014," Gallup, January 28, 2015, news.gallup.com.

they do not contribute to their full potential, because they don't feel excited about their work.³

At a time when many companies are engineering jarring transformational changes to become more agile, digitally enabled, and proactive competitors, it is more important than ever that employees find meaning in their work. Traditional rewards systems and career ladders are disappearing, so workers need new reasons to believe in their companies.

We have found four organizational-design interventions that can help (exhibit). They are simple, inexpensive, practical, and local and can help employees at any level of the organization. This kind of straightforward practice is often overlooked in ambitious corporate initiatives. But it is critical for any company hoping to create an environment where organizational change is personal and where innovation becomes a bottom-up process of purposeful actions initiated by employees themselves.

1. REDUCE ANONYMITY

Humans are collaborators. We have evolved that way, understanding that we can accomplish more by cooperating face-to-face with others. Modern organizations, with their siloed workplaces and increasingly digitized operations, can foster separation and anonymity. But perceptive leaders can find ways to establish deeper connections between any worker and his or her customers.

Consider a cafeteria experiment conducted by Ryan Buell, an associate professor at Harvard Business School, and his coauthors Tami Kim and Chia-Jung Tsay.⁴ In many cafeterias, cooks and diners do not see each other, since waiters serve as the intermediary between the two. Buell changed that dynamic by setting up a video feed from the grill station to an iPad in the kitchen. There was no sound and no interaction, but the chefs could see who was ordering the food that they would prepare.

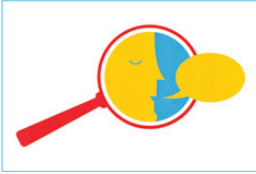
Immediately, the cooks started to work differently. For example, they began freshly preparing eggs for each customer, instead of grilling several eggs in advance and plating those when ordered. Simply seeing their customer

³ Susan Adams, "Unhappy employees outnumber happy ones by two to one worldwide," *Forbes*, October 10, 2013, forbes.com.

⁴ Ryan W. Buell, Tami Kim, and Chia-Jung Tsay, "Creating reciprocal value through operational transparency," *Management Science*, June 2017, Volume 63, Number 6, pp. 1673–95.

Exhibit

Four straightforward practices can help to create an environment where organizational change is personal.



Reduce anonymity

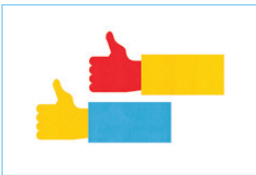
Talk with employees about who their customers are, and encourage each employee to connect with one.

Build regular, face-to-face interactions with customers into existing processes, stimulating employees to learn who is most affected by their work.



Help people grasp the impact of their work

Invite customers who have had the best—and worst—experiences with your products to talk with employees in person so your team can see how their work affects customers.



Recognize and reward good work

Periodically make a note of one good thing done by each team member, thank them for it, and describe why it made things better.

Create a “like” system on your company intranet or other network where colleagues or even customers can communicate satisfaction with a task or interaction (the “like” need only be visible to the recipient).



Connect work to a higher meaning

Push people to think about their work in a high-level way by asking employees a series of “why” questions for 3–5 of their most important job-related tasks.

changed everything. In short order (ahem), employee satisfaction soared. Better still, customer satisfaction went up 14.4 percent, according to Buell. Even though the chefs went unseen, the video feed had created a connection that added meaning to their work.

Alistair Spalding, artistic director and chief executive of Sadler’s Wells Theatre, in London, understands the value of direct contact.⁵ About ten years ago,

⁵ Freek Vermeulen, “Balance exploration with exploitation,” in *Breaking Bad Habits: Defy Industry Norms and Reinvigorate Your Business*, Boston, Massachusetts: Harvard Business Review Press, November 2017, pp. 179–208.

Spalding realized that he had to improve morale at the venerable dance venue—in particular, among its supporting staff of marketers, stagehands, and administrators, as well as others. The theater had endured a history of strikes, and the prep work for many shows lacked the precision and attention to detail that Spalding craved.

Spalding saw that the artists who performed at Sadler's Wells were essentially anonymous to the staff. The employees did their work during the day, the artists showed up at night to perform, and the groups never connected. Unsurprisingly, the employees demonstrated relatively little interest in the theater's overarching intent to become the center of innovation in dance. Indeed, the staff tended to have a somewhat negative attitude toward the artists.

Spalding decided to combat this by launching an “associate artists” program. Artists who performed at the theater regularly would get free office space at the theater and access to its rehearsal studios and cafeteria. Spalding went so far as to position Sadler's Wells as a center of innovation, where artists could meet, practice, dream big, or just hang out.

This was a great boon to the artists. But the employees benefited as well. As the theater became more of a home to a community of artists, the artists became much less anonymous to the employees. Gradually, Spalding began noticing proactive changes and improvements in the performance of the employees. For example, lighting staffers became more involved in the selection of lamps for performances, bringing a level of technical expertise that had been lacking before. Similarly, the cafeteria staff became more engaged as they saw how their work contributed to a dynamic atmosphere that, in turn, encouraged artists to spend time at the theater. The marketing and sales side benefited as well, and over the next four years, attendance at Sadler's Wells grew 25 percent, to 470,000 visitors a year.

Spalding believes that none of this would have occurred without the associate-artist program. “I thought that it was important that it wasn't just administrators around,” he said. “That there are actual living artists in the building reminds everyone of what we're doing. The whole organization is involved in the work of artists.” By replacing anonymity with familiarity, Spalding had altered attitudes and behavior, laying the groundwork for success.

2. HELP PEOPLE GRASP THE IMPACT OF THEIR WORK ON THE CUSTOMER

Many companies give workers data about their customers. But giving employees a clear sense of how their work directly affects specific customers is more profound.

Wharton School professor Adam Grant conducted a series of experiments with university fund-raisers.⁶ Fund-raising is a tough job; many people do not appreciate unsolicited calls, and yet the typical fund-raiser must make numerous calls before receiving a pledge. Most employers pay for performance: a fund-raiser's remuneration depends almost completely on the donations secured. But the job is so monotonous and taxing that productivity and morale are generally quite low.

Grant conducted two experiments. In one, he arranged for fund-raisers to hear a senior executive and a board member of a university speak about the significance of education in society and the importance of the fund-raisers' work to scholarship recipients. Nothing came of these supposedly motivational speeches. Productivity didn't improve at all.

In the other experiment, Grant arranged for fund-raisers to meet a student who had received a scholarship. The student explained that the scholarship had changed his life, allowing him to attend university and study abroad. By conversing with the student, the fund-raisers saw the impact of their work firsthand.

After meeting the student, fund-raisers placed many more calls than before and secured larger donations per call. Research shows that the person on the other end of the line can sense the caller's enthusiasm.⁷ The fund-raisers' new attitude made their phone conversations more engaging, convincing, and successful. In the two months after meeting the student, fund-raisers raised 295 percent more than they had in the two months before—an average of \$9,704.58 versus \$2,459.44.

⁶ Adam M. Grant, "Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity," *Journal of Applied Psychology*, January 2008, Volume 93, Number 1, pp. 48–58; Adam M. Grant, "The significance of task significance: Job performance effects, relational mechanisms, and boundary conditions," *Journal of Applied Psychology*, January 2008, Volume 93, Number 1, pp. 108–24; Adam M. Grant et al., "Impact and the art of motivation maintenance: The effects of contact with beneficiaries on persistence behavior," *Organizational Behavior and Human Decision Processes*, May 2007, Volume 103, Number 1, pp. 53–67; Adam M. Grant and David A. Hofmann, "Outsourcing inspiration: The performance effects of ideological messages from leaders and beneficiaries," *Organizational Behavior and Human Decision Processes*, November 2011, Volume 116, Number 2, pp. 173–87.

⁷ Amy Drahota and Scott Simon, "Hearing a smile in tone of voice," NPR, January 19, 2008, npr.org.

Helping people understand the impact of their work does not have to be complicated or expensive. It should be personal, however. These kinds of first-hand interactions should be built into an organization systematically. One useful practice is to insist that all employees—whether they are customer facing or not—make regular on-site visits to the end users of the company's products.

That is what Dorothee Ritz, Microsoft's general manager for Austria, did with her Vienna-based employees.⁸ Ritz insisted that everyone see for themselves how people were implementing the company's products and services. One manager spent several days out on the street with police officers to learn how they use remote data. Another manager spent two days in a hospital to see the impact of going paperless. Soon, Ritz noticed, employees were suggesting more pointed solutions for customers based on their on-site visits. According to Ritz, this simple practice gives employees a better sense of the real value of their work.

3. NOTICE, RECOGNIZE, AND REWARD GOOD WORK

Employees want to know that their work is noticed and valued. Smart companies find meaningful ways to do this without doling out raises and bonuses.

Wikipedia relies heavily on unpaid editors who volunteer to create and correct its pages. Retaining these editors is key to the success of the company. To further this effort, the company gave UCLA Anderson assistant professor Jana Gallus permission to randomly select a number of people from a group of 4,000 eligible editors to receive an award (the remainder served as the study's control group).⁹

The Wikipedia award had two components: an electronic image posted on the editor's personal page and recognition on an official Wikipedia page. Since editors use pseudonyms, the award conferred no direct personal gains in a traditional sense. Nevertheless, this symbolic award spurred productivity (up by 13 percent over 11 months) and retention (up 20 percent). Many of the award-winning editors started taking on more ambitious tasks, such as writing articles from scratch, while others tackled critical behind-the-scenes coordination and maintenance. The editors also became more engaged in helping others: reward recipients were twice as likely as other editors to answer requests for help from community members.

⁸ Daniel M. Cable, "Crafting narratives about purpose," in *Alive at Work: The Neuroscience of Helping Your People Love What They Do*, Boston, Massachusetts: Harvard Business Review Press, March 2018.

⁹ Jana Gallus, "Fostering public good contributions with symbolic awards: A large-scale natural field experiment at Wikipedia," *Management Science*, December 2017, Volume 63, Number 12, pp. 3999–4015.

“Thank you very much,” one editor posted on the award’s public discussion page. “I have spent much time with Wikipedia. The recognition . . . makes me very happy.” Another wrote, “I feel very honored to receive this award. It makes me realize that contributions, even if they may be small, are recognized here.”

Put simply, work becomes more meaningful when people know that their actions are noticed and appreciated. The recognition doesn’t necessarily need to be public, as Bryan Stroube from the London Business School and Robert Vesco from Bloomberg discovered when they studied the comments posted on the website Hacker News.

The site is part of Y Combinator, which provides seed money to start-ups in exchange for an equity stake. The company built Hacker News for entrepreneurs to post ideas for start-ups and get reactions from a relevant community. All users, for example, can “like” a particular comment when they value it. At one point in its history, Hacker News made the number of likes that someone had accumulated visible to the community, but at another time, it showed the number only to the individual commenter. By comparing the public and private periods, Stroube and Vesco showed that publicizing the numbers of likes did not increase useful comments across the system. The number alone gave commenters a sense that their feedback was being noticed and appreciated.

Many companies can create an internal network where employees can “like” the work of colleagues. But the personal touch is important as well. Good leaders make constructive praise a regular part of their management routine.

4. CONNECT DAILY WORK TO A GRANDER GOAL

Our first three suggestions offer simple ways to help employees feel that their work is valuable. Our fourth suggestion offers a concrete way to help employees understand how their daily responsibilities tie in to a higher meaning, to a purpose larger than themselves.

Almost every company says they would like to do this, but few succeed. Business leaders regularly communicate their company’s higher purpose in a vision or mission statement and try to reinforce it at conferences and workshops.

While these efforts are well intended, few have a positive or lasting impact. Sometimes, the problem is the vision itself. Gerard Langelier, a cofounder

of Mentor Graphics, said that his own company fell into such a “vision trap” when it defined its vision as “changing the way the world designs,” an expression of purpose that was too grand and too detached from daily tasks.¹⁰ Sometimes, the problem is the way that the vision is communicated. Remember the fund-raiser experiment? When leaders try to impose a vision, employees tend not to take the message to heart. Employees need to make the connection from their work to the company vision themselves.

To help leaders stimulate this bottom-up process, we recommend a simple intervention technique based on the work of Antonio Freitas and his colleagues from the State University of New York and New York University.¹¹ The exercise pushes people to think about their work in an increasingly high-level way and can be exercised one-on-one, during team meetings, or in internal workshops.

Here is how it works. Imagine a manager at XYZ Technology who regularly fills out performance-evaluation forms. The exercise begins by asking the manager, “Why are you completing these forms?” Perhaps she would answer, “In order to give my team members feedback about their performance and to help them improve.” A second question builds on her answer: “Why do you want to help them improve?” She might say, “so that my team can develop better enterprise software.” A third repetition of the question builds on the second answer: “Why do you want to build better enterprise software?” She might answer, “to improve the efficiency of our customers.” A fourth and final question gets to the essence of her work: “And why do you want customers to be more efficient?” The response might be, “so they are free to be their most creative and productive selves.” That is a grand goal—indeed, the kind of thing a company might say in its mission statement. As each of her answers builds on her previous ones, the manager comes to align her task with the organization’s loftiest goals.

Wharton School’s Andrew Carton examined how a similar exercise worked at NASA during the 1960s, when the agency was tasked with putting an astronaut on the moon. In four steps, employees discovered a meaningful connection between their work and NASA’s ultimate aspirations. These steps linked their daily tasks (“I am building electrical circuits”) to NASA’s

¹⁰ Gerard H. Langer, “The vision trap,” *Harvard Business Review*, March–April 1992, Volume 70, Number 2, pp. 46–55, hbr.org.

¹¹ Antonio L. Freitas et al., “Seeing oneself in one’s choices: Construal level and self-pertinence of electoral and consumer decisions,” *Journal of Experimental Social Psychology*, July 2008, Volume 44, Number 4, pp. 1174–9, sciencedirect.com.

objective (“I am putting a man on the moon”) and even to a greater purpose (“I am advancing science”). According to Carton, the personal connection to a meaningful common goal boosted employees’ “coordination and collective enthusiasm.” As one former NASA employee recalled, “We didn’t want to go home at night. We just wanted to keep going, and we couldn’t wait to get up and get back to work in the morning. The clarity of NASA’s strategic objective helps remind managers of another important point about meaning: namely, that employees must see clearly how their organization is trying to contribute to a higher purpose, in the form of concrete strategic intent.”¹²

Research confirms that people are more motivated and persistent when they think about why they are doing something (for instance, losing weight to become healthy) instead of what they are doing (eating a salad).¹³ After the fund-raisers met the student, they focused less on what they were doing (making unpleasant phone calls) and more on why (helping students fund their college education). When people understand and believe in the reasons behind their actions, they display greater resilience and stamina.

The idea that employees perform better when they feel a deep connection to their work is a fundamental part of many corporate reorganizations, where agile systems and other efforts are designed to tap a company’s greatest asset: the personal creativity of its employees. But it is not enough to institute systemic changes and hope that employees will rise to the task. Instead, senior executives should take the sorts of practical steps that help employees in their search for meaning at work. When successful, these efforts provide a road map for aligning the personal aspirations of employees with the most important goals of the organization—a combination that benefits everyone. (Q)

¹² For a deeper look at the importance of strategic clarity as it relates to meaning, we recommend the work of Claudine Gartenberg. See, for example, Claudine Madras Gartenberg, Andrea Prat, and George Serafeim, “Corporate purpose and financial performance,” *Organization Science*, forthcoming, ssrn.com.

¹³ Daniel M. Cable, *Alive at Work*.

Dan Cable is a professor of organizational behavior at the London Business School and the author of *Alive at Work: The Neuroscience of Helping Your People Love What They Do* (Harvard Business Review Press, 2018). **Freek Vermeulen** is the chair of strategy and entrepreneurship faculty at the London Business School and the author of *Breaking Bad Habits: Defy Industry Norms and Reinvigorate Your Business* (Harvard Business Review Press, 2017).



The link between meaning and organizational health

Employees are more likely to find meaning at work when the organizations they work in are healthy.

by Rodgers Palmer and Bill Schaninger

Meaning is an important but squishy concept, and we appreciate the efforts of London Business School professors Dan Cable and Freek Vermeulen to add some structure to it (see “Making work meaningful: A leader’s guide,” on page 106). Their observations, along with those of Stanford professor Jeffrey Pfeffer in another recent *McKinsey Quarterly* article,¹ resonate with our own, decade-plus effort to understand the importance and drivers of organizational health.


To understand the relationship between meaning and health, consider the recent work of a banking network to improve retention among 12,000 individuals. The bank found that demographic data, such as age, salary, and performance ratings, were far less correlated with employees’ intention to leave the bank than were their attitudes toward several determinants of organizational health—defined as the organization’s ability to align around a common vision, execute against that vision effectively, and renew itself through creative thinking. In the case of the bank, the organizational health and retention relationship was particularly strong with respect to variables connected to meaning—among them motivation, the work environment, and how open and trusting the workplace was.

This case example speaks to a broader trend seen in our research, which now encompasses more than five million survey responses, from employees at 1,700 organizations, regarding 37 workplace practices. Those responses

¹ See Jeffrey Pfeffer, “The overlooked essentials of employee well-being,” *McKinsey Quarterly*, September 2018, McKinsey.com.

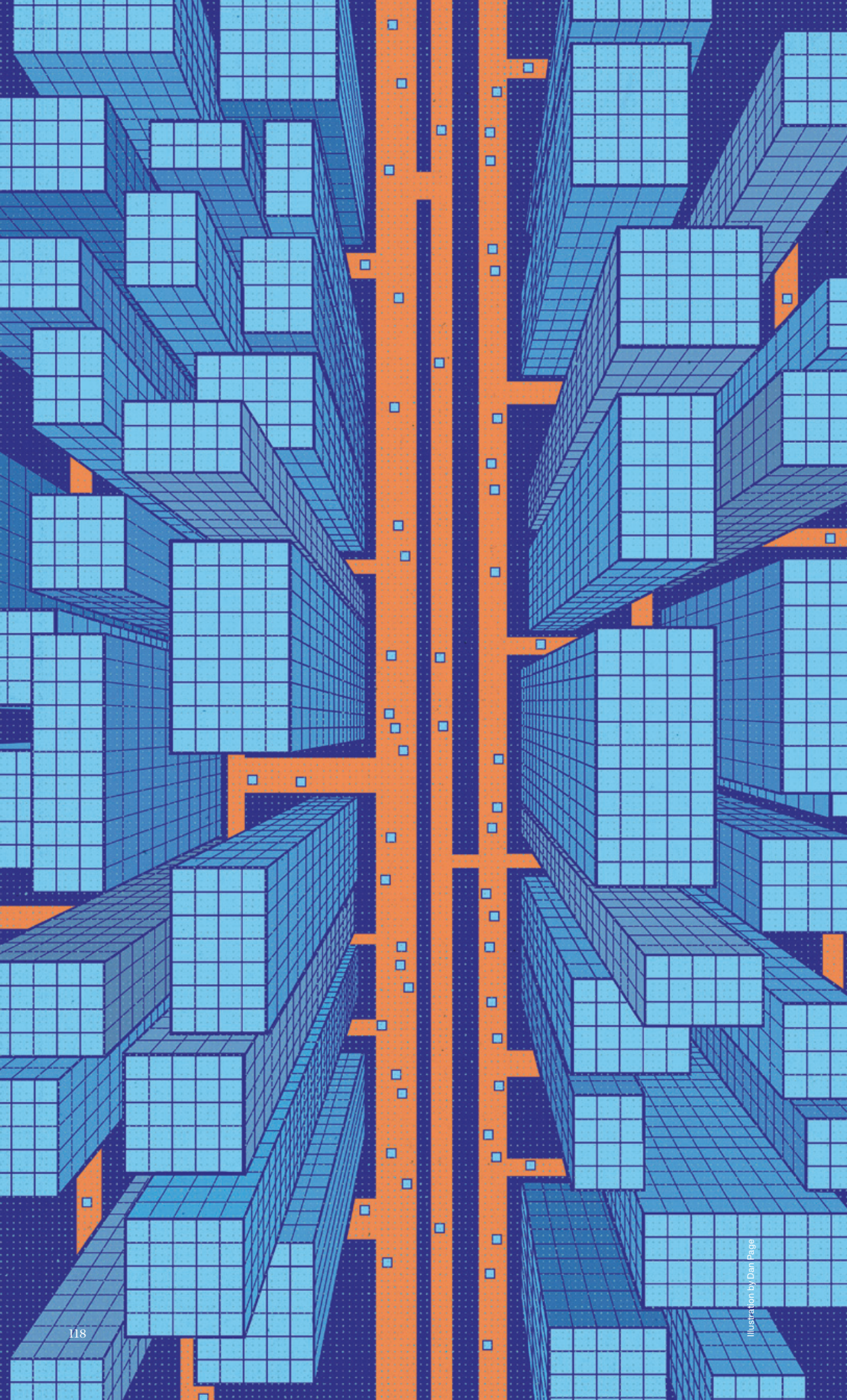
aggregate to nine outcomes related to health and, ultimately, to a single metric (McKinsey's Organizational Health Index, or OHI). As we've elaborated elsewhere, organizational health is correlated with financial performance. It also appears to reflect meaning and employee well-being, as described by Cable, Vermeulen, and Pfeffer:

- Cable and Vermeulen find that among the many ways that companies create meaningful workplaces, the ability of leaders to connect daily work to a grander goal stands out. Our work confirms that “direction”—the ability to give employees a clear sense of where an organization is headed—is a critical determinant of organizational health. And “employee engagement”—the extent to which leaders engage employees on the objectives of the organization—is among the three workplace practices that contribute most to strong direction.
- These findings are consistent with Pfeffer's conclusion that a sense of job control is central to the physical and mental health of employees. Pfeffer also shows that having strong personal connections and relationships at work improves employee well-being. Our research confirms that the quality of employee interactions, measured through the strength of the “work environment,” is a key driver of health, and that “open and trusting” workplace behavior is a critical contributor to a strong work environment.
- Finally, we've seen over and over that giving people a sense of ownership and control contributes to a greater sense of accountability, to a better work environment, and to stronger execution skills. While this may sound intuitive, we know from experience that it's challenging for employees to embrace true ownership, and for leaders to let go sufficiently for the ownership to become real. We're hopeful that the consistency between our ground-level analysis of individual workers and their organizations, on the one hand, and the academic pattern recognition of Cable, Vermeulen, and Pfeffer, on the other, will embolden more leaders to try.

Ultimately, leaders who create meaningful work environments contribute to the health of their employees and their organizations. Whether the relationship between individual and organizational health is causal or merely correlated, we don't yet know. Nor do we particularly care. The facts before us suggest that meaning, health, and performance go hand in hand—and that should be enough for leaders seeking to leave a legacy by improving their companies and the lives of their employees. 

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Blockchain beyond the hype: What is the strategic business value?

Blockchain can generate meaningful value for many companies. The key is figuring out what strategy makes sense, given your customers' pain points and your company's market position.

by Brant Carson, Giulio Romanelli, Patricia Walsh, and Askhat Zhumaev

Blockchain is all the rage. Bitcoin—the first and most infamous application of the technology—has grabbed headlines for its rocketing price and volatility. Predictions such as the World Economic Forum survey suggesting that 10 percent of global GDP will be stored on blockchain by 2027 have inspired government task forces, breathless press reports, and a multitude of conversations at Davos and in corporate conference rooms.¹

Tellingly, large investments are being made. Last year, venture capitalists put more than \$1 billion into blockchain start-ups.² Initial coin offerings (ICOs), the blockchain-backed sale of cryptocurrency tokens in a new venture, raised \$5 billion in 2017. Leading technology players are putting money and people into blockchain: IBM has invested \$200 million and more than 1,000 employees in the blockchain-powered Internet of Things (IoT).³

¹ *Deep shift: Technology tipping points and societal impact*, World Economic Forum, September 2015, weforum.org.

² "Blockchain startups absorbed 5X more capital via ICOs than equity financings in 2017," *CB Insights*, January 2018, cbinsights.com.

³ "IBM invests to lead global Internet of Things market—shows accelerated client adoption," IBM, October 2016, ibm.com.

Yet the fact remains that blockchain is an immature technology with a nascent market and no clear recipe for success. No wonder many corporate leaders are asking themselves a lot of questions. Is blockchain a disruptive threat? Is it a fad? Most importantly, can blockchain have strategic value for my company?

To help answer these questions, we embarked on an industry-by-industry analysis of existing blockchain strategies, interviewing a range of experts including the executives overseeing these efforts at a number of companies. We evaluated the strategic importance of blockchain to major industries and identified who can capture what type of value through what type of approach. Our research led us to three key insights on the strategic value of blockchain:

- Blockchain does not have to be a disintermediator to generate value.
- Blockchain's short-term value will be predominantly in reducing cost.
- Commercially viable blockchain solutions deployed at scale are three to five years away for most companies.

In this article, we'll explain how we arrived at these insights and we'll describe a structured approach companies can follow to evaluate blockchain strategies. Some organizations may discover ways to extract value from blockchain in the short term. Dominant companies may discover even more: if they are willing to invest now to establish their blockchains as market solutions, they can cement their leadership and forestall the incursion of disruptive digital natives.

WHAT IS BLOCKCHAIN?

Blockchain is not synonymous with Bitcoin, which is just one cryptocurrency application that uses it. Blockchain is a distributed ledger, or database, shared across a public or private computing network. Each computer node in the network holds a copy of the ledger, so there is no single point of failure. Every piece of information is mathematically encrypted and added as a new "block" to the chain of historical records. Various consensus protocols are used to validate a new block with other participants before it can be added to the chain. This prevents fraud or double spending without requiring a central authority. The ledger can also be programmed with "smart contracts," a set of conditions recorded on the blockchain, so that transactions automatically trigger when the conditions are met. For example, smart contracts could be used to automate insurance-claim payouts.

Blockchain's core advantages are decentralization, cryptographic security, transparency, and immutability. It allows information to be verified and value to be exchanged without having to rely on a third-party authority. Rather than there being a singular form of blockchain, the technology can be configured in multiple ways to meet the objectives and commercial requirements of a particular use case. Indeed, our research focused on more than 90 discrete use cases of varying maturity for blockchain across industries. To clarify this variety of applications, we structured use cases into six categories across blockchain's two fundamental functions: record keeping and transacting. Some industries have applications across multiple categories, while others concentrate on one or two.

Blockchain's disruptive potential lies partly in its technology, which eliminates the need for an entity to be in charge of managing, storing, and funding a database. A public blockchain, such as Bitcoin, has no central authority. This peer-to-peer model can become commercially viable due to blockchain's ability to compensate participants' contributions with "tokens" (application-specific cryptoassets), as well as with a stake in any future increases in the value. As a result, public blockchains can foster total disruptive disintermediation. However, as we explain in the following section, smart incumbent companies willing to engage with blockchain now can use the technology to *prevent* disintermediation.

THREE BLOCKCHAIN TRUTHS TO HELP SHAPE YOUR STRATEGY

Incumbents looking to defend against disintermediation—or to go on the offensive themselves—should start by understanding three key insights.

'Permissioned' blockchains generate value and ward off disintermediation

The commercial model that is most likely to succeed in the short term is a different kind of blockchain, a "permissioned" one, with controlled access and editing rights (exhibit). In this model, participants can benefit from securely sharing data while automating control of what is shared, with whom, and when. Equipped with meaningful transparency and fraud controls, these permissioned blockchains help existing companies reduce the complexity and cost of multiparty transactions. It's a way for incumbents to harness blockchain rather than be overtaken by it. Dominant players can maintain their positions as central authorities or join forces with other industry players to capture and share value.

Permissioned blockchains allow companies to develop distinctive value propositions in commercial confidence, with small-scale experimentation

Exhibit

Private, permissioned blockchain architecture offers a way to optimize network openness and scalability.

Blockchain-architecture options

| | | Permissionless | Permissioned |
|----------------------------------|---------|---|--|
| Ownership of data infrastructure | Public | Anyone can join, read, write, and commit Hosted on public servers Anonymous, highly resilient | Anyone can join and read Only authorized and known participants can write and commit |
| | | Low scalability | Medium scalability |
| | Private | Only authorized participants can join, read, and write Hosted on private servers | Only authorized participants can join and read Only the network operator can write and commit |
| | | High scalability | Very high scalability |

preceding scaled executions. At the Australian Securities Exchange, for example, a blockchain system is being deployed for equities clearing to reduce back-office reconciliation work for its member brokers.⁴ IBM and Maersk Line, the world’s largest shipping company, are working together to create a blockchain platform that would provide traders with a secure, real-time exchange of supply-chain data and paperwork.⁵

The potential for blockchain to become a new open-standard protocol for use cases such as trusted records, identity, and transactions offers incumbents a powerful safeguard against disintermediation. Industry players greatly reduce the aperture for radical new entrants by learning to extract value from blockchain, especially if that value benefits customers. The degree to which incumbents adapt and integrate blockchain technology will determine its disruptive force in their industry.

In the short term, blockchain’s strategic value is mainly in cost reduction

Initially, blockchain will drive operational efficiencies. It takes cost out of existing processes by removing intermediaries and rationalizing administrative processes such as record keeping and transaction reconciliation. In the cases we analyzed, approximately 70 percent of the value at stake in the short term was in cost reduction.

⁴“ASX selects distributed ledger technology to replace CHESS,” ASX, December 2017.
⁵“Maersk and IBM to form joint venture applying blockchain to improve global trade and digitize supply chains,” IBM, January 2018, ibm.com.

Certain industries' fundamental functions are inherently more suited to blockchain solutions. The core functions of financial-services firms, for example, such as verifying and transferring financial information and assets, align closely with blockchain's core transformative impact. This explains why approximately 90 percent of major Australian, European, and North American banks are already experimenting or investing in blockchain. Governments, too, can reap considerable savings by putting key record-keeping and verifying functions onto blockchain infrastructure. From birth certificates to taxes, blockchain-based records and smart contracts can simplify interactions with citizens and increase data security. More than 25 governments are actively running blockchain pilots supported by start-ups. In healthcare, blockchain applications could unlock the value of data availability and exchange for providers, patients, insurers, and researchers. Blockchain-based healthcare records can improve administrative efficiency and give researchers access to the historical, patient-identity-protected data sets crucial for advancements in medical research.

Significant, scaled commercial applications are likely three to five years away

Over time, the value of blockchain will shift from driving cost reduction to enabling entirely new business models and revenue streams. One promising use case is the creation of a distributed, secure digital identity. This could be helpful for individuals and lucrative for companies, which could customize services to people who grant them access in ways we can't imagine now. But these kinds of new businesses are more of a long-term possibility than a near-term reality. Why? Because time is needed for four key factors to mature: standards and regulations, technology, asset digitization, and ecosystem.

Common standards must be developed. The lack of common standards and clear regulations can be a major limitation on the scalability of blockchain applications. When cooperation between multiple players is necessary, establishing such standards is as complex as it is critical. Industry consortia, such as the 70-bank group that collaborated to develop the financial-grade open-source Corda blockchain platform, will be needed to establish common standards. That kind of work is time-consuming.

Thankfully, regulators are generally engaged rather than opposed or unaware. The US Securities and Exchange Commission, for example, is bringing ICOs under the agency's regulation and into the mainstream.⁶

⁶ Jay Clayton, "Statement on cryptocurrencies and initial coin offerings," U.S. Securities and Exchange Commission, December 2017, [sec.gov](https://www.sec.gov).

Technology must advance. The immaturity of blockchain technology is a major concern for companies today. Organizations need a trusted enterprise solution, particularly because they may not realize the cost benefits of blockchain until their old systems are decommissioned. Currently, few start-ups have sufficient credibility, technology stability, or industry expertise for government or industry deployment at scale. Major technology players are positioning themselves to address this gap with blockchain-as-a-service (BaaS) offerings in a model similar to cloud-based storage.

Assets must be digitally connected. Assets such as equities, which are digitally recorded and transacted, can be simply managed end to end on a blockchain system or integrated through application programming interfaces (APIs) with existing systems. However, connecting and securing physical goods to a blockchain requires enabling technologies like IoT and biometrics. This connection can be a vulnerability in the security of a blockchain ledger.⁷ While the blockchain record might be immutable, the physical item or IoT sensor can be tampered with. Certifying the chain of custody of commodities such as grain or milk, for example, would require a tagging system like radio-frequency identification, which could increase assurance even if it couldn't deliver absolute provenance.

The cooperation paradox must be resolved. Blockchains become more valuable with more participants, but they also become more complex to coordinate. For example, a blockchain solution for digital media, licenses, and royalty payments requires massive coordination among producers and consumers of digital content. Resolving this paradox of natural competitors having to cooperate is the toughest of these four factors. The issue is not identifying the network—or even getting initial buy-in—but agreeing on the governance decisions around how the system, data, and investment will be led and managed. The strategic incentives of the players must be aligned, a task that can be particularly difficult in highly fragmented markets. Overcoming this issue often requires a sponsor, such as a regulator or industry body, to take the lead.

A STRUCTURED WAY TO DEVELOP BLOCKCHAIN STRATEGY

Fear of missing out on a new technology sometimes leads companies to develop solutions to problems that don't exist. We believe companies can avoid this trap through a structured approach to blockchain.

⁷To be sure, blockchain does not eliminate the possibility of fraudulent data being written to the database, which could in turn be used to substantiate the existence of fraudulent assets.

First, identify and skeptically assess a specific use case that can create value. Most companies can find use cases by taking a close look at the pain points affecting their industry and their customers. Companies can decide whether these cases are feasible by considering a variety of factors, such as its capability to design a blockchain solution, technology and asset constraints, and the potential for passing on benefits and savings to customers. If a use case does not meet a minimum level of feasibility and potential return, then companies should avoid launching a project just to “be in the game.”

Companies that have identified a promising use case, however, will move on to the second part of our structured approach: understanding how their market position will impact that target use case.

Part of blockchain’s value comes from its network effects and interoperability, and all parties need to agree on a common standard to realize this value—multiple siloed blockchains provide little advantage over multiple siloed databases. As the technology develops, a market standard will emerge and investments into the nondominant standard will be wasted. Coordination with other industry players is critical. That’s why a company’s market dominance, or lack thereof, affects its ability to influence other key players in the industry and to help shape standardization and regulatory barriers. Here’s how market position shapes blockchain strategy.

Leaders: Build on existing strengths

Leaders are dominant players in industries with few requirements for coordination and regulatory approval. These companies should pursue use cases now. They have the potential to create solutions that can solidify their market position and set industry standards. The greatest risk for these companies is inaction, which could open a competitive window for disruptors.

Change Healthcare is an example of a company taking advantage of its market leadership. One of the largest independent healthcare IT companies in the United States, it launched an enterprise-scale healthcare blockchain for claims processing and payment.⁸

Conveners: Shape standards to gain an edge

Conveners are dominant players who cannot single-handedly direct blockchain adoption, since they operate in industries with considerable regulatory and standardization barriers. Conveners need to drive the conversations

⁸ “Change Healthcare announces general availability of first enterprise-scale blockchain solution for healthcare,” Change Healthcare, January 2018, [changehealthcare.com](https://www.changehealthcare.com).

and consortia that will shape the new standards poised to disrupt their current businesses. Then they can position themselves to shape and capture the value of new blockchain standards.

Convening tactics should be deployed for high-value use cases, such as trade finance, that cannot be realized without a broadly shared set of standards. An example of a convener following this strategy is Toyota, whose Research Institute set up the Blockchain Mobility Consortium with four global partners to focus on blockchain solutions for critical accelerators of autonomous vehicles: data sharing, peer-to-peer transaction, and usage-based insurance.⁹

Followers: Stay informed and be ready to move fast

Most companies are followers, in the sense that they lack the power to influence all necessary parties, especially when applications of blockchain require high standardization or regulatory approval. But followers cannot afford to ignore blockchain. They must be informed about market innovations, keeping a close watch on blockchain developments. They should also be prepared to move fast to adopt emerging standards. Just as businesses have developed risk and legal frameworks for adopting cloud-based services, companies should focus on developing a strategy for how they will implement and deploy blockchain technology.

Followership is risky, given the ability of dominant players to establish private-permissioned networks. A follower, no matter how fast, may find itself locked out of the exclusive club that establishes the initial proof of concept. Companies can mitigate this risk by joining select existing and emerging consortia early. The short-term investment costs of membership are often outweighed by the long-term costs of getting left behind.

Attackers: Leverage their market leadership

Attackers are often new market entrants without an existing market share to protect, armed with disruptive or transformative business models and blockchain solutions. Attackers offer a service intended to disintermediate existing players. Most peer-to-peer applications, from finance to insurance to property, fall into this category. A good example of an attacker is Australian start-up Power Ledger, a peer-to-peer marketplace for renewable energy that raised 34 million Australian dollars through its ICO.¹⁰ Sometimes, companies


⁹ "Toyota Research Institute explores blockchain technology for development of new mobility ecosystem," Toyota, May 2017, toyota.com.

¹⁰ "Power Ledger token generation event closes with A\$34million raised," Power Ledger, October 2017, web.powerledger.io.

pursuing an attacker strategy will try to partner with a dominant company in the market to leverage their leadership influence.

Incumbents can deploy an attacker's blockchain strategy in a separate, noncore digital business. Blockchain-as-a-service (BaaS) providers, for example, often adopt an attack strategy when they try to sell services into industries where they currently do not participate.

Blockchain has strategic value for many companies. In the short term, the technology can reduce costs without disintermediation, and in the long run it can create new business models. Existing digital infrastructure and the growth of BaaS offerings have lowered the costs of experimentation. However, a variety of fundamental factors limit the scalability of many use cases and extend the amount of time needed for return on investment on proof of concepts.

Assessing these factors with pragmatic skepticism about the scale of impact and speed to market will help reveal the correct strategic approach on where and how companies can extract value in the short term. Dominant players, however, have an enormous opportunity to establish their blockchain as the market solution. They should be making those moves now. 

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For the full article, which includes a snapshot of more than 90 use cases for blockchain across 14 industries, see "Blockchain beyond the hype: What is the strategic business value?" on [McKinsey.com](https://www.mckinsey.com).

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Illustration by Kagan McLeod

TAKING THE 'OUTSIDE VIEW'

In this new series, we highlight the cognitive and organizational biases that sometimes trip up executives and undermine good decision making.

This quarter's busted bias: the tyranny of inward focus.

by Tim Koller and Dan Lovallo

The problem

You are the head of a major motion-picture studio, and you must decide whether to greenlight a movie project. You need to predict whether it will be boffo (a box-office hit) or a bust. To make this decision, you must make two interrelated forecasts: the costs of production and potential box-office revenue.

Production costs are easy, you think: you know the shooting days, specific location costs, and computer-generated imagery costs. You can enter these into a spreadsheet that reflects the film's production plan. Potential box-office revenue is harder to predict, but you know roughly how many screens the film will be on during opening weekend, how "hot" your stars are right now, and how much you are going to spend on advertising.

Do you have enough data to make a decision? Maybe. Are the data enough to make the right decision? Probably not. Research shows that film executives overestimate potential box-office revenue most of the time.

The research

That's because film executives often take what Nobel laureate Daniel Kahneman and colleagues refer to as the "inside view."¹ They build a detailed case for what is going to happen based on the specifics of the case at hand rather than looking at analogous cases and other external sources of information. (If they do look at other data, it's often only after they've already formed impressions.) Without those checks and balances, forecasts can be overly optimistic. Movie projects, large capital-investment projects, and other initiatives in which feedback comes months or years after the initial decision to invest is made often end up running late and over budget. They often fail to meet performance targets.

The remedies

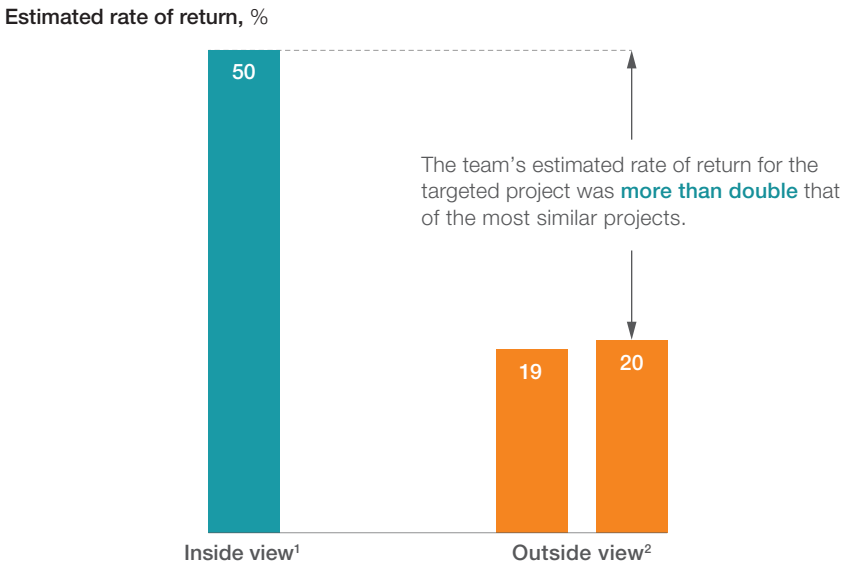
One way to make better forecasts, in Hollywood and beyond, is to take the "outside view," which means building a statistical view of your project based on a reference class of similar projects. Indeed, taking the outside view is essential for companies seeking to understand their positions on their industries' power curves of economic profit.² To understand how the outside view works, consider an experiment performed with a group at a private-equity company. The group was asked to build a forecast for an ongoing investment from the bottom up—tracing its path from beginning to end and noting the key steps, actions, and milestones required to meet proposed targets. The group's median expected rate of return on this investment was about 50 percent. The group was then asked to fill out a table comparing that ongoing investment with categories of similar investments, looking at factors such as relative quality of the investment and average return for an investment category. Using this outside view, the group saw that its median expected rate of return was more than double that of the most similar investments (exhibit).

The critical step here, of course, is to identify the reference class of projects, which might be five cases or 500. This process is part art and part science—but the overriding philosophy must be that there is "nothing new under the sun." That is, you can find a reference class even for ground-breaking innovations—something music company EMI (of The Beatles fame) learned the hard way.

In the 1970s, EMI entered the medical-diagnostics market with a computed tomography (CT) scanner developed by researcher and eventual Nobel Prize winner Godfrey Hounsfield. The company

Exhibit

Private-equity teams built a more accurate forecast using the outside view.




¹ Forecast for an ongoing investment based on specifics of case at hand.
² Comparison of ongoing investment with 2 categories of similar investments based on analogous cases and external sources of information.

had limited experience in the diagnostics field and in medical sales and distribution. But based on an inside view, senior management placed a big bet on Hounsfield’s proprietary technology and sought to build the required capabilities in-house.

It took about five years for EMI to release its first scanner; in that time, competitors with similar X-ray technologies as well as broader, more established sales and distribution infrastructures overtook EMI. In seeking to do everything alone, EMI suffered losses and eventually left the market. Building a reference class would have allowed the company to not only predict success in the market for CT scanners but also develop a more effective go-to-market strategy.³

Compared with EMI’s situation, finding a reference class for a film project might seem like a no-brainer: you figure there will be lots of movies in the same genre, with similar story lines and stars, to compare with the focal project. And yet, when we asked the head of a major motion-picture studio how many analogues he typically used to forecast movie revenue, he

answered, “One.” And when we inquired about the most he had ever used, he said, “Two.” Research shows that using the correct reference class can reduce estimation errors by 70 percent.⁴

Companies often think it is too hard and too time-consuming to build a reference class. It is not. In an effort to improve the US military’s effectiveness in Iraq in 2004, Kalev Sepp, a former special-forces officer in the US Army, built a reference class of 53 counterinsurgency conflicts with characteristics of the Iraq war, complete with strategies and outcomes. He did this on his own in little more than 36 hours. He and his colleagues subsequently used the reference class to inform their decisions about critical strategy and policy changes. Other organizations can do the same—learning as much from others’ experiences as they do from their own. 

¹ Daniel Kahneman and Dan Lovallo, “Timid choices and bold forecasts: A cognitive perspective on risk taking,” *Management Science*, January 1993, Volume 39, Number 1, pp. 17–31.

² The power curve is a global distribution of companies’ economic profit. For more on this concept, see *The Strategy & Corporate Finance blog*, “Is your strategy good enough to move you up on the power curve?,” blog entry by Martin Hirt, January 30, 2018, McKinsey.com.

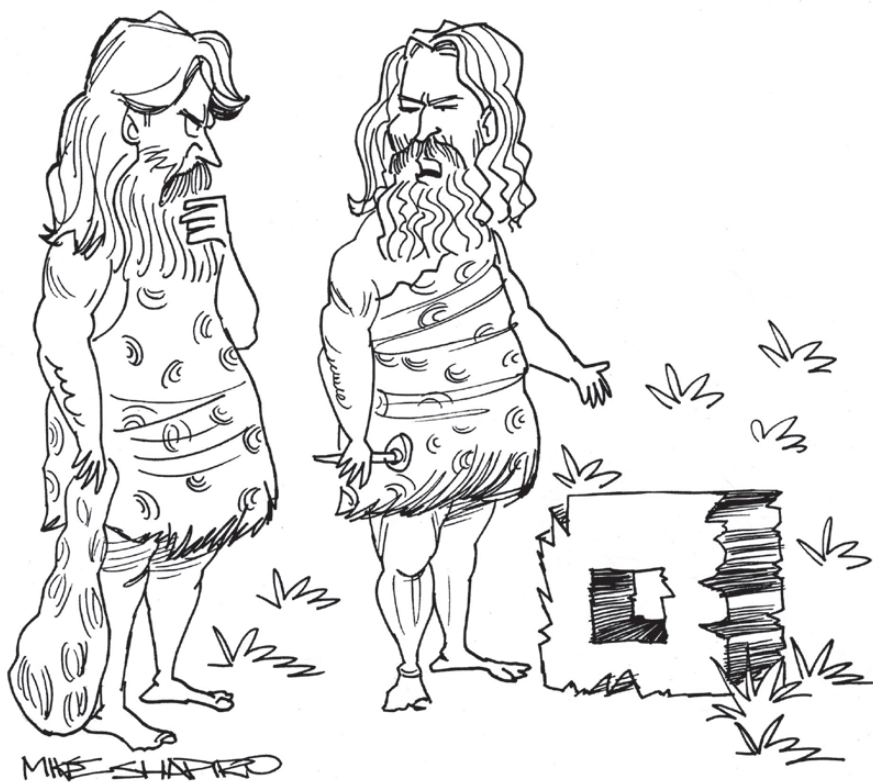
³ John T. Horn, Dan P. Lovallo, and S. Patrick Viguerie, “Beating the odds in market entry,” *McKinsey Quarterly*, November 2005, McKinsey.com.

⁴ Bent Flyvbjerg, Massimo Garbuio, and Dan Lovallo, “Delusion and deception in large infrastructure projects: Two models for explaining and preventing executive disaster,” *California Management Review*, Winter 2009, Volume 51, Number 2, pp. 170–93.

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Design for the ages

Learning, testing, and iterating with users is often the foundation of great design. Does your organization know how to rinse and repeat?



“I’m calling it the wheel . . . it might need a little more usability testing.”



For more on the foundations of great design, see “The business value of design,” on page 58.

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Highlights

The cornerstones of large-scale technology transformation: A playbook for CEOs

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Making work meaningful: A leader's guide

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Getting an edge in the Internet of Things

Digital strategy: The four fights you have to win

Closing the gender gap—a missed opportunity for new CEOs

Blockchain beyond the hype: What is the strategic business value?

How incumbent companies are responding to digital threats

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