HBR.ORG NOVEMBER–DECEMBER 2017

Harvard Business Review

DOUBLE ISSUE

LAUNCHING SUCCESSFUL LEADERS

HOW TO MAKE SURE YOUR MOST PROMISING PEOPLE REACH THEIR HIGHEST POTENTIAL

PAGE 86


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SPOTLIGHT
A MANAGER'S GUIDE TO AUGMENTED REALITY

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IDEA WATCH

New Thinking and Research in Progress

HOW I DID IT

EXPERIENCE

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MATT KALINOWSKI; BILL INGALLS/NASA

DEPARTMENTS

FROM THE EDITOR

THE NEW REALITY OF BUSINESS

Adi Ignatius with Harvard Business Publishing CEO David Wan

When most of us think of augmented reality—if we think of it at all—we probably see Pokémon Go monsters or weird Snapchat filters. But AR, the technology that superimposes digital images on the physical world, is a lot more than a few cool apps. As Michael Porter, of Harvard Business School, and James Heppelmann, the CEO of PTC, explain in this issue's Spotlight package, the technology is poised to reshape how we learn, make decisions, and operate within the physical world. The implications for business are both strategic and staggering: AR will "change how enterprises serve customers, train employees, design and create products, and...ultimately, how they compete."

Though still in its infancy, the technology is already being used to powerful effect. Organizations as diverse as Facebook, Amazon, GE, the U.S. Navy, and Mayo Clinic are putting AR to work and seeing substantial improvements in quality, productivity, and other measures of performance.

What makes these early successes even more impressive is that most companies are still grappling with the two great challenges of the technological age: the struggle to turn vast amounts of information into truly useful insights and the mounting fear that automation is going to wipe out most jobs. With AR we actually see how data can be transformed into very real business benefits by bridging the gap between man and machine.

ADI IGNATIUS, EDITOR IN CHIEF

CHRISTOPHER CHURCHILL

CONTRIBUTORS

When Steve Blank was planning a business trip to San Jose in 1978—he was an electrical engineer at the time—the travel agent initially booked a flight to San José, Costa Rica; he hadn't heard of the one in Silicon Valley yet. When Steve arrived in California, he saw 43 pages of ads for engineering jobs in the Sunday newspaper, so he decided to stay. Since then he's helped launch eight start-ups, and he now teaches entrepreneurship at Stanford, Columbia, and UC Berkeley. In this issue he writes about how venture capitalists are giving "unicorn" founders too much control of boardrooms—and how to fix the problem.

94 FEATURE
When Founders Go Too Far

When he became the dean of research at IMD, **N. Anand** began an unwieldy project: reading all the articles and books written by current and emeritus faculty members to absorb the essence of their collective work. For support, he roped in principal research fellow Jean-Louis Barsoux. The undertaking seemed like a fool's errand, but they were inspired by Neil MacGregor, a former director of the British Museum, whose deep understanding of the institution's body of knowledge fueled the museum's revival. Together, Anand and Barsoux identified a common aspiration in IMD's scholarship: to help organizations change for the better. This was the impetus for their article on corporate transformations.

78 FEATURE
What Everyone Gets Wrong About Change Management

Jeff Bussgang learned the art of entrepreneurship from his father, a Holocaust survivor who came to the U.S. with nothing and built a successful technology business from scratch. Jeff began his career at a start-up. He then founded one, and eventually he formed the VC firm Flybridge Capital Partners. At Harvard Business School, he teaches "Launching Technology Ventures" and has helped hundreds of students figure out their own start-up career paths, coaching both founders and joiners. In this issue, he presents his best advice for the latter group.

150 MANAGING YOURSELF
Are You Suited for a Start-Up?

For more than a decade, **Linda Hill** has been studying why some companies are able to innovate time and again, while others are not. She has found that innovative executives think and behave in ways that differ from accepted notions of "great leadership." She has also observed that CEOs become very animated whenever discussions about innovation touch on the board's role in driving breakthrough thinking. In her new research, Hill and coauthor George Davis uncover a new risk paradigm that upends boards' "dependably cautious" attitudes toward innovation.

102 FEATURE
The Board's New Innovation Imperative

Andrew Archer is an illustrator and art director based in Melbourne, Australia. He takes his inspiration from a broad mix of art forms, including pop culture, fashion, and woodblock prints.

94 FEATURE
When Founders Go Too Far

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INTERACTION

WHY CMOs NEVER LAST

HBR ARTICLE BY **KIMBERLY A. WHITLER** AND **NEIL MORGAN,** JULY-AUGUST

Something is amiss in the relationship between chief executives and their top marketing officers. Four-fifths of CEOs say they don't trust or are unimpressed by their CMOs. Not surprisingly, CMOs have the briefest tenure in the C-suite, and the churn can mean serious internal business disruptions. To end this pattern, companies need to understand the three main roles that CMOs play: Some focus on strategy, some focus on commercialization, and some do both. It's crucial to figure out which type of CMO a firm needs and tailor the duties and success metrics accordingly.

This is a great piece, one every CEO and CMO should read—especially those in large companies. I would add that sometimes you can't discern the marketing department's functional boundaries simply by looking at the org chart and budget distribution. A company might allocate large sums to a huge department that actually does little beyond commercialization. It is imperative to know how much the marketing department actually influences the formation and evolution of corporate strategy. Fancy names and job titles can be deceptive; marketing will play no strategic role if the CEO positions it merely as a strategy interpreter fashionably seasoned with a graph-producing analytics team.
Po-Wei Chen, web designer, marketing and branding department, Acer

In the past few years I've seen arguments that the CMO should be in charge of virtually every aspect of the company. I still see that as the role of the CEO. However, the issue of alignment raised in this piece is critical. I don't know that it is reasonable to hold marketing accountable for P&L in most scenarios. In most B2B and consumer retail business models, sales drives performance far more powerfully. So the CMO role must be crafted to have authority, responsibility, and scope appropriate to both the industry vertical and the individual company's distribution model.

Under the old 4 P's model, marketing should generally have strong authority for promotion across the board but will optimize results when acting in concert with product and distribution management. Marketing should almost always have strong and early input on products, especially new-product development, on the basis of market research (which should be powerfully informed by sales). Pricing should be strongly influenced by marketing in consumer goods and consumer markets; in B2B markets, sales will drive most large-order pricing. Marketing should also strongly influence distribution, especially when disruption of and coordination with brick-and-mortar outlets is required.
Terry Nugent, director, MMS

> "In some cases the marketing function is its own worst enemy, focusing on tactics instead of on value creation and value capture."
>
> —KHEEPE LAWRENCE MOREMI

Most of the trouble I have seen around the CMO role begins with the company itself. If a company believes in a sales lead strategy, it is likely that the CMO will eventually have issues. But if a company is truly market-driven, the CMO role is pivotal. Success can be measured in a number of ways: Traction in the marketplace, analysts' rankings, strategic partnerships, increased awareness, and thought leadership are all good indications of quality. In a market-driven company, branding is absolutely essential, along with proper competitive positioning, unique value propositions, and vertically focused go-to-market strategies.
Michael Antonucci, managing director and market development specialist, EarlyStageProducts

Marketing has two very different roles. The first is leading the company to serve customers better than competitors do. The second is leading its communication efforts. CMOs have historically done the latter. The former is a much bigger driver of sales and profits, but it is beyond the skills of most CMOs. The result is disappointed CEOs and absurdly high CMO turnover. When CMOs are held accountable for profit (rather than for KPIs), they are better able to deliver the former.
Jim Schroer, president, Adagio on the Bay; principal, EngageNextGen

The philosophy, function, and practice of marketing are often misunderstood. As a result, the role of the CMO is misunderstood as well. In some cases the marketing function is its own worst enemy, focusing on tactics instead of on the key underlying principles—namely, value creation and value capture, which happen elsewhere in the business.
Kheepe Lawrence Moremi, partner, VC Capital

A CMO's role and success are related to the organization's ability to invest in having a chief transformation officer and a chief technology officer.
Heesun Yu, health care marketing consultant

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HBR SURVEY

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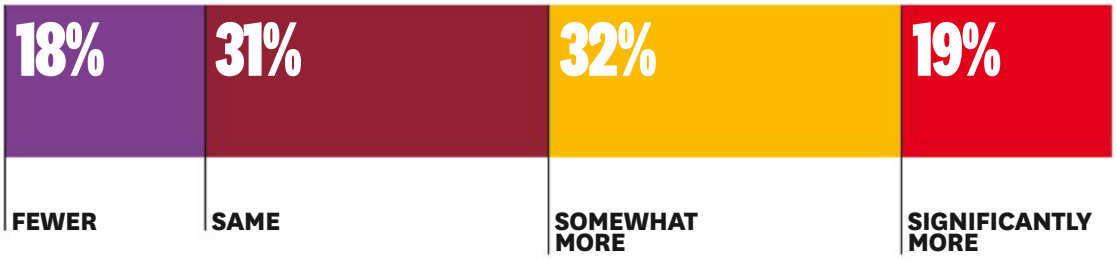


SOURCE "HOW SUCCESSFUL WAS YOUR COMPANY'S REORG?" BY STEPHEN HEIDARI-ROBINSON AND SUZANNE HEYWOOD

THE OVERCOMMITTED ORGANIZATION

HBR ARTICLE BY **MARK MORTENSEN** AND **HEIDI K. GARDNER,** SEPTEMBER–OCTOBER

By assigning people to multiple teams at once, organizations can make more-efficient use of time and brainpower and do a better job of solving problems and sharing knowledge across groups. But competing priorities and other conflicts can make it hard for teams with overlapping membership to stay on track. The authors identify several ways to reduce the costs of multiteaming and better reap its advantages.

A solid onboarding process with countless small tweaks is very helpful in building trust and connections in our matrix organization. For example, we have a booklet that outlines our mission and goals and the structure that supports them. We give it to newcomers before they arrive so that they will have some grounding in who we are and how we work. To build bonds among new staff members, we have a two-day interactive foundation program in which people collaborate in a nonwork context. We work hard to extend those bonds to the rest of the organization. And small things, such as adding employees' photos to their e-mails, help people get to know one another quickly.
Paul Sewell, organizational culture and development

As a team development practitioner, I appreciate your highlighting the importance of investing time to build a strong, cohesive, trusting foundation for such teams. Many leaders believe they don't have time for this, and their teams' progress is slowed as a result.
Andy Robbins, principal, West Haven Coaching

COMPETING ON SOCIAL PURPOSE

HBR ARTICLE BY **OMAR RODRÍGUEZ VILÁ** AND **SUNDAR BHARADWAJ,** SEPTEMBER–OCTOBER

Consumers increasingly expect brands to have a social purpose beyond mere functional benefits. As a result, companies are taking social stands in very visible ways. For example, TOMS donates shoes and other goods for every product sold. Such programs can benefit society and the brand, but if not carefully managed, they may fizzle or even harm the company. The authors developed an approach that ties a brand's most ambitious social aspirations to its most-pressing growth needs.

A distinction needs to be made between social legitimacy and social purpose. The former focuses on a company's "license to operate"—the corporate social Hippocratic oath to "do no harm." The second focuses on whether "making the world a better place" is core to the business purpose (because of the type of customers the company aims to serve or the way in which it organizes its operations and sources its inputs).

This is the difference between reputation and brand. The goal of a good reputation is to be seen as a worthy company by all stakeholders. The goal of a brand is to communicate a distinctive value proposition to a specific set of customers. Consumers made Google the top search engine because it was the best product, not because of the company's social mission to "organize the world's information."

The construct of "competing on social purpose" confounds the requirements of social legitimacy (where the dominant logic is risk mitigation) with those of social purpose (which is explicitly designed to make social concerns an integral aspect of the "reason to buy").

Every company needs a broad population of stakeholders to "buy into" the fact that it is a desirable member of the community. But commercial success is driven by what paying customers actually want to "buy." Unless they want to buy social purpose, your social purpose strategy will leave you with a strong reputation and languishing sales.
Jonathan Knowles, CEO, Type 2 Consulting

RECENTLY TRENDING ON HBR.ORG

5 Questions to Help Your Employees Find Their Inner Purpose
BY KRISTI HEDGES

High-Performing Teams Need Psychological Safety. Here's How to Create It
BY LAURA DELIZONNA

The Problem with Saying "Don't Bring Me Problems, Bring Me Solutions"
BY SABINA NAWAZ

How I Remade GE
BY JEFFREY R. IMMELT

7 Reasons Salespeople Don't Close the Deal
BY STEVE W. MARTIN

The Dark Side of Resilience
BY TOMAS CHAMORRO-PREMUZIC AND DEREK LUSK

Tesla Shows How Traditional Business Metrics Are Outdated
BY EDDIE YOON

Harvard Business Review
Idea Watch

NOVEMBER–DECEMBER 2017

RETHINKING CROWDSOURCING
Consumer voting should be taken with a grain of salt. *Plus* the skills founders need, why extraverted CEOs win in acquisitions, the pitfalls of to-do lists, and more

DEFEND YOUR RESEARCH
Women Respond Better Than Men to Competitive Pressure

HOW I DID IT
The CEO of Kronos on Launching an Unlimited Vacation Policy

It can be unwise to rely on the crowd.
page 20

ILLUSTRATION BY ELLIOT LIM

SOCIAL TIES CAN SKEW RESULTS.

RETHINKING CROWDSOURCING

When the Swiss soft drink company Rivella was looking to launch new flavors in 2012, it used an open innovation platform to ask consumers for ideas and received 800 responses. As managers sorted through them, they noticed that one in particular—for a health-oriented ginger-flavored drink—appeared to be extremely popular. But on closer examination they saw that much of the buzz around it was coming from just a handful of participants who were working feverishly to elicit votes and comments. "It was a very small group of consumers who were rallying one another and generating a lot of noise," says Silvan Brauen, who oversaw Rivella's innovation pipeline. Despite the strong online feedback, the company concluded that the ginger flavor would flop in the market and abandoned the idea.

That buzz is an example of social bias, and new research shows that it's a hazard companies should be aware of when tapping into consumers' opinions during crowdsourced innovation exercises. To understand how social bias can skew results, Reto Hofstetter, a marketing professor at the University of Lucerne, in Switzerland, studied 87 crowdsourcing projects posted by 18 companies during a 14-month period on Atizo, one of the leading European open innovation platforms, which is routinely used by companies including BMW and Nestlé. In all, Hofstetter's team examined 31,114 ideas submitted by 1,917 consumers.

A key part of the Atizo system is a process for consumer voting. The companies in the study received 358 suggestions, on average; sorting and evaluating large numbers of suggestions requires significant management resources. To make that task easier, Atizo lets consumers "like" and comment on others' ideas, much in the way that people can like posts on Twitter and Facebook. And the likes and comments are influential: Every company the researchers studied used the voting system as a first screen to help them judge ideas and decide which consumers to reward for their submissions.

As Hofstetter examined the voting system, however, he discovered that it wasn't as meritocratic as it appeared. As often happens on social media, when someone liked an idea, that idea's progenitor tended to reciprocate, liking an idea the other person had submitted. What's more, Atizo has a mechanism that lets users "friend" one another, and the researchers discovered that users were far more likely to vote for online friends' ideas than for those submitted by people with whom they had no connection. The data showed that these social biases had a lot to do with which ideas received the most votes and comments—but when the researchers spoke with the companies, they learned that the firms were unaware of that fact. "I didn't see any evidence that the companies were de-emphasizing the likes," Hofstetter says. "On the contrary, the likes played a very large role in informing their decisions about which ideas to reward and develop."

To further probe whether consumer voting holds real predictive value, the researchers conducted interviews and surveys at companies more than a year after the brainstorming was completed to see how things had panned out. They gave managers a randomly ordered list of the crowdsourced ideas each had received and asked them to rate each one in response to the statement "This idea was useful to implement, or this idea had a great impact on the success of an innovation." The results showed no correlation between the ideas consumers preferred and the ones that led to successful products.

Seeking to understand the disconnect, the researchers had 145 outside evaluators independently rate each of the crowdsourced ideas for feasibility, originality, and customer benefit; they then compared the evaluators' ratings with the results of the crowdsourced voting. They found that consumers undervalue feasibility and overvalue moderate originality, whereas firms prefer feasible and either highly original or very common ideas.

The bottom line, the researchers write: "Online consumer votes are unreliable indicators of actual idea quality."

That's not to say that crowdsourcing isn't a useful technique. But the study suggests that firms should look beyond likes, comments, and other signs of

SILVAN BRAUEN
"YOU CAN'T RELY JUST ON WHAT'S POPULAR WITH THE CROWD"

Silvan Brauen is the head of business development at Rivella, a leading Swiss manufacturer of soft drinks, which over the past five years has used open innovation to create new products. He recently spoke with HBR about the pros and cons of that approach. Edited excerpts follow.

Why did you choose to crowdsource? We didn't want a technology-driven innovation, where we add a random new flavor and hope that consumers like it. We wanted to go new ways and, most important, to start with consumer needs.

How well does it work? Very well. When we first did this, in 2012, we received more than 800 ideas. They ranged from obvious ones we could have come up with ourselves to crazy ones, such as licorice-flavored drinks and strange colors. The diversity of ideas has expanded our imagination, because we may have blind spots or be overly influenced by something we tried years ago that didn't work.

How did consumers' "likes" influence your evaluation of ideas? We viewed them as qualitative, not quantitative, data. An idea that has eight likes isn't necessarily better than one that has seven—it's not an exact science. But we did view likes as an indication that there was emotion or controversy around an idea, which is a good thing. An idea that triggers no discussion and gets no attention on the crowdsourcing platform will probably get little attention in the marketplace.

What did you do with the crowdsourced suggestions? We narrowed the 800 ideas down to 20, and then we went to work with internal workshops, focus groups, and taste tests. It was a collaborative, iterative process, and 80% of the work took place after the crowdsourced ideas were submitted. You can't rely just on what's popular with the crowd—you have to turn on your brain and evaluate what makes sense, also with regard to the overall company strategy. We ended up launching two new flavors: peach and rhubarb. Both were among the top 10% of the ideas on the platform, but they weren't the very top finishers. The launch was very successful and increased Rivella's penetration rate by one-third, from 30% to 40% of Swiss households.

Are you using open innovation less than you used to? Yes, and I think other companies are too. But part of the reason crowdsourcing became so popular had to do with marketing, not innovation. For a time, if you advertised that a product was created in collaboration with consumers, people reacted quite positively, and it increased your chances of a successful launch. Now many companies have done that, so it's not a useful selling point anymore. However, open innovation can still be a great resource.

PHOTOGRAPHY BY SCANDERBEG SAUER

CONTINUED FROM PAGE 20

consumer preference and find more-effective ways to evaluate the ideas that are generated. Hofstetter and his colleagues cite prior research showing that product developers who identify "idea hubs," or similar ideas submitted by different people, may get better results. One platform replaced simple "likes" with more-complex evaluative questions, which reduced the incidence of reciprocal voting. And the researchers suggest that platforms develop algorithms or other mechanisms to control for social ties.

Adrian Gerber, the CEO of Atizo 360°, agrees that companies should pay less attention to consumer voting and give more weight to their own criteria when winnowing hundreds of ideas down to a handful of viable ones. As crowdsourcing evolves, he says, companies are beginning to show a preference for a more carefully selected crowd, one that brings special expertise to the innovation puzzle. For instance, they are increasingly using open innovation platforms with groups of employees or suppliers rather than consumers. Some firms also seek out specialized consumers whose views may be especially relevant. To brainstorm new kinds of avalanche protection gear, Mammoth, the Swiss outdoor clothing and equipment company, recently asked Atizo to convene an online group of mountaineers who have design or engineering experience. As that example suggests, the right answer may come from tapping a small number of the right people rather than from polling a crowd of random idea generators.

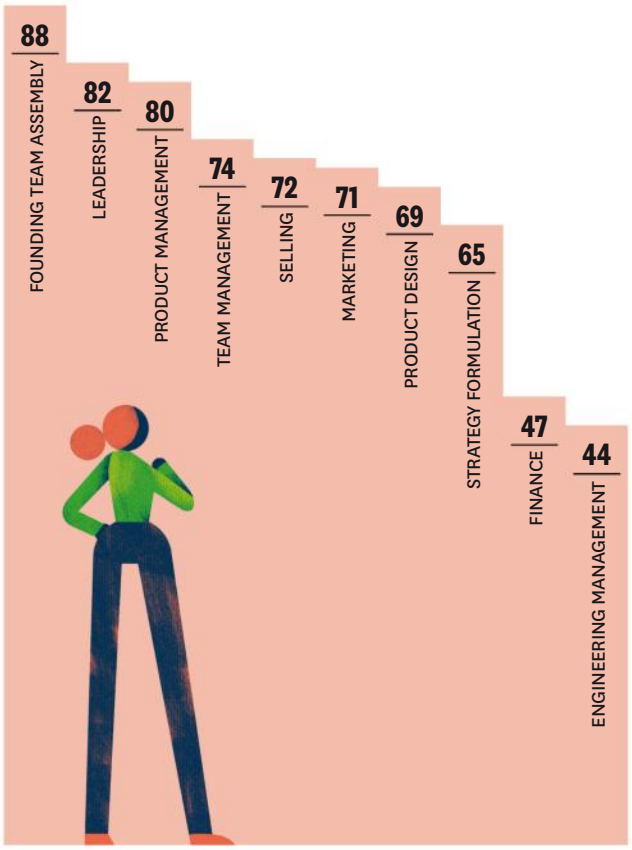
HBR Reprint F1706A

ABOUT THE RESEARCH "Should You Really Produce What Consumers Like Online? Empirical Evidence for Reciprocal Voting in Open Innovation Contests," by Reto Hofstetter, Suleiman Aryobsei, and Andreas Herrmann (*Journal of Product Innovation Management*, forthcoming)

START-UPS
WHAT SKILLS SHOULD A FOUNDER PRIORITIZE?

How well do college and MBA programs prepare students to launch technology ventures? Researchers surveyed 141 Harvard Business School alumni who had founded companies, mostly venture capital–backed tech start-ups. They also questioned 20 non-MBA founders. Both groups said that aspiring founders should aim to become jack-of-all-trades managers, with emphasis on putting together and leading a team and identifying and responding to customer needs. They listed specialized skills, including finance and engineering, as lower priorities. One respondent noted, "Every one of these skills is important. The question is: For which will the CEO build deep personal expertise, and for which will they outsource to other founding team members?" ■

PERCENTAGE OF FOUNDERS WHO SAY THAT "HIGH" OR "VERY HIGH" PRIORITY SHOULD BE GIVEN TO:



SOURCE THOMAS R. EISENMANN, ROB HOWE, AND BETH ALTRINGER

M&A
WHY EXTRAVERTED CEOs WIN IN ACQUISITIONS

Companies collectively spend billions of dollars a year on mergers and acquisitions—often destroying rather than creating value. New research uses a novel linguistic technique to explore one factor that may influence M&A behavior and outcomes: CEO extraversion. Researchers examined the quarterly earnings calls of 2,381 global CEOs over a period of 10 years, using textual analysis software to assess each person's degree of extraversion; they then looked at the M&A activity of the leaders' companies. They found that extraverted CEOs engaged in more acquisitions, targeted larger companies, and were more likely to earn above-average returns after their deals. Why? They tend to serve on more corporate boards than their less-extraverted counterparts, giving them broader networks and providing access to intelligence that may help them identify and pursue promising targets. Their personalities may also give them a leg up in persuading shareholders of the value of their acquisitions. ■

ABOUT THE RESEARCH "The Acquisitive Nature of Extraverted CEOs," by Shavin Malhotra et al. (*Administrative Science Quarterly, 2017*)

HARVARD BUSINESS REVIEW MARCH–APRIL 1972

"In some respects, the **middle manager** is the leader of his unit who delegates, guides, and plans; in other respects, however, he has specific operating responsibilities and must 'roll up his sleeves' to achieve output and to meet his targets. Therefore, he is both a delegator and a doer, both a strategist and an operator, or, to use [a] sports analogy, both a coach and a player. In contrast, his superiors are usually coaches and his subordinates are normally players."

"GENERAL MANAGERS IN THE MIDDLE," BY HUGO E.R. UYTERHOEVEN

RETAIL
WHY FASHION BRANDS NEED OUTLET MALLS

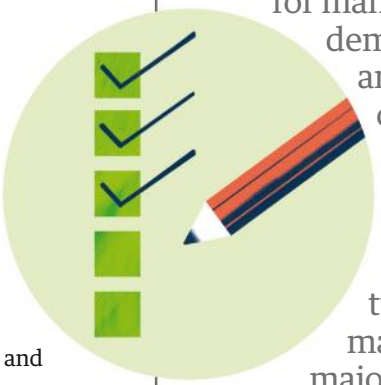
Conventional wisdom holds that high-end retailers use outlet stores to unload old or slow-selling merchandise on customers who can't afford their full-price offerings. But a new study reveals a more complicated reality. A researcher analyzed five years' worth of sales data from a U.S. fashion firm with hundreds of regular and outlet stores. He found that outlet and full-price shoppers actually have comparable incomes; the main distinctions are that the former care less about having up-to-date fashions and are more willing to travel long distances to save money (outlets are typically located far from urban centers). Because outlets absorb the value-conscious segment of the market, he says, they let retailers' regular stores cater to consumers willing to spend more for new arrivals; they also lower the risk of introducing products that might fail. If outlets vanished, he calculates, profits would fall by 23% and product introductions would drop by 16%.

These findings have important implications for retailers as they increasingly embrace e-commerce, which eliminates the geographic distance that has kept outlets from cannibalizing full-price stores. "Retailers lose the ability to play with location and travel distance when they go online, requiring new and creative ways of providing different experiences for different customer segments," the researcher says. ■

ABOUT THE RESEARCH "Why Outlet Stores Exist: Averting Cannibalization in Product Line Extensions," by Donald Ngwe (*Marketing Science*, 2017)

PRODUCTIVITY
STOP CHECKING OFF EASY TO-DOS

When work piles up, how do you react? If you're like most people, you begin by working longer. But as the to-do list grows, people tend to shift to another form of triage, which researchers call "task completion bias." In simple terms, this means that we gravitate toward easy-to-finish tasks, to create a sense of accomplishment—even if those tasks aren't very important. This phenomenon was illustrated by a two-year study of 90,000 patients in a hospital emergency room, in which researchers examined how doctors chose which patients to focus on next. Doctors are supposed to take cases on the basis of severity and time spent waiting, and most followed that guideline. But as patient volume increased, some of them tended to select the easiest cases instead. (The researchers controlled for many variables, including patient demographics and insurance status and seasonality.) An examination of billing records revealed that doctors who favored easier cases were less productive than others over the long term. In follow-up lab experiments involving typing, transcription, and word manipulation exercises, solid majorities of participants exhibited task completion bias. "Completing tasks leads individuals to feel good and that increases short-term performance," the researchers write. "However, when we examine long-term productivity, workers who exhibit TCB tend to be significantly less productive." ■



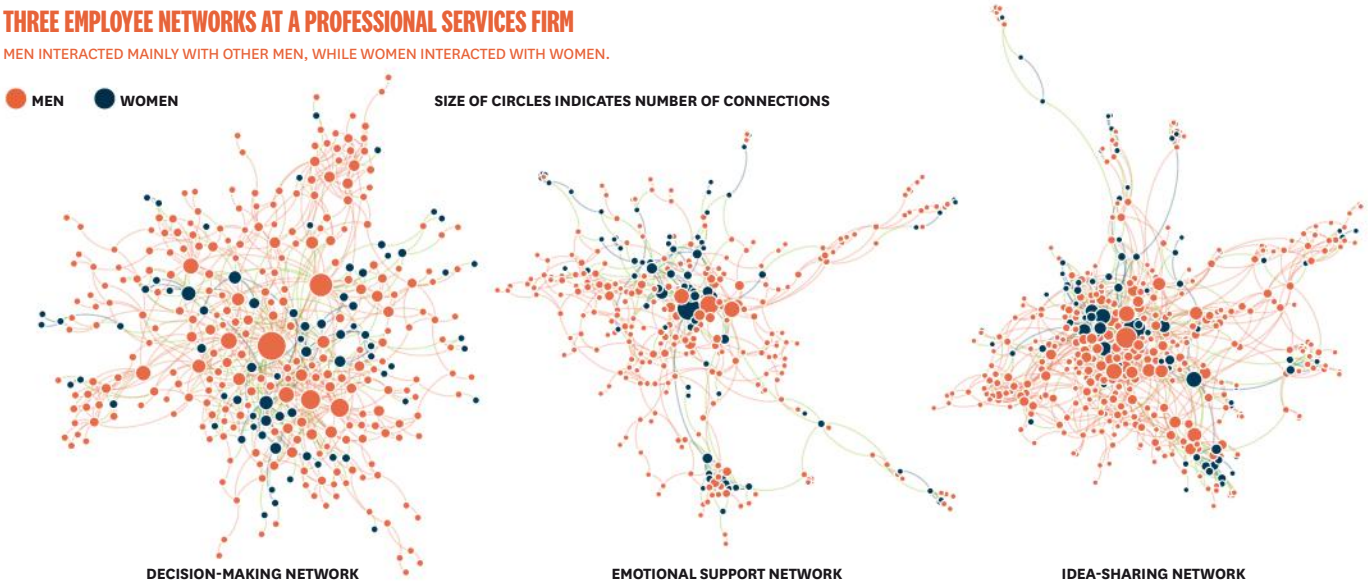
ABOUT THE RESEARCH "Task Selection and Workload: A Focus on Completing Easy Tasks Hurts Long-Term Performance," by Diwas S. KC et al. (working paper)

DIVERSITY
MAPPING EMPLOYEE INTERACTIONS

Assessing how inclusive an organization's culture is involves more than counting the number of employees from underrepresented groups. It requires measuring how often workers from different groups actually interact. Researchers worked with a large professional services firm to create a network analysis depicting who each employee turned to for help with decisions or other advice—and which relationships were reciprocal. Men outnumber women at the firm by a ratio of 5:1, but the mapping shows that women are even less likely to be involved in decision making and innovation than that ratio suggests. "A healthier network would show women having a similar number of connections as men, and show fewer women isolated on the periphery," the researchers write. ■

THREE EMPLOYEE NETWORKS AT A PROFESSIONAL SERVICES FIRM

MEN INTERACTED MAINLY WITH OTHER MEN, WHILE WOMEN INTERACTED WITH WOMEN.



SOURCE HEIDRICK & STRUGGLES

ENTREPRENEURSHIP
WRITING A PLAN DOES INCREASE THE ODDS OF SUCCESS

Entrepreneurship experts are divided: Some believe that a written business plan is crucial to creating a viable start-up—one that achieves profitability—while others think it's better to skip that step and immediately begin testing ideas with consumers (as Steve Blank argues in "When Founders Go Too Far," on page 94). In recent years the latter approach, popularized by the Lean Startup movement, has held sway. But a new study suggests that written plans have more value than we think. Researchers examined 1,088 nascent U.S. entrepreneurs over a six-year period. They separated founders who had written plans from those who hadn't and paired members from each group according to attributes such as education and experience, allowing them to isolate the effects of having a plan. "It pays to plan," the researchers conclude. "Entrepreneurs who write formal plans are 16% more likely to achieve viability than the otherwise identical nonplanning entrepreneurs." The research suggests that a written plan focuses a founder on goal attainment and supports better decision making about allocating and coordinating resources. ■

ABOUT THE RESEARCH "Are Formal Planners More Likely to Achieve New Venture Viability? A Counterfactual Model and Analysis," by Francis J. Greene and Christian Hopp (*Strategic Entrepreneurship Journal*, 2017)

The stock of companies whose top executives visited the White House from 2009 to 2015 showed positive cumulative abnormal returns of 0.9% from 10 days before to 40 days after the visit.

"ALL THE PRESIDENT'S FRIENDS: POLITICAL ACCESS AND FIRM VALUE," BY JEFFREY R. BROWN AND JIEKUN HUANG

MOTIVATION
TRASH TALK CAN BACKFIRE

Some CEOs routinely say negative things about competitors, engaging in a corporate form of trash talk: Think of Virgin's Richard Branson and T-Mobile's John Legere. Trash talking is common at lower organizational levels as well: 57% of *Fortune* 500 employees surveyed said it happens in their workplace at least monthly. Past research suggests that the tactic is effective, distracting or upsetting people and diminishing their performance. But a new study reveals a downside: Trash talk often instills a desire for retaliation and inspires the target to perform *better*.

In six lab experiments, the researchers found that participants who were taunted by someone they believed to be a competitor ("You're a total loser"; "I'm going to crush you") did better on most computer tasks than participants who received neutral messages; they were more motivated than others and sought to see the person who'd insulted them lose. (Their ability to think imaginatively was diminished, though, and they were likelier to cheat.) "Habitual trash-talkers need to recognize that they are unintentionally boosting their targets' motivation and performance," the researchers write. "[They should] engage in deeper perspective-taking to gauge the interpersonal consequences of their rude behavior." ■

ABOUT THE RESEARCH "Trash-Talking: Competitive Incivility Motivates Rivalry, Performance, and Unethical Behavior," by Jeremy A. Yip, Maurice E. Schweitzer, and Samir Nurmohamed (*Organizational Behavior and Human Decision Processes*, forthcoming)

MARKETING
EXPLOITING THE POWER OF COMPLETE SETS

Some beer retailers let customers buy bottles à la carte, filling a six-pack with six different brands of beer. In such cases, how often does someone buy just five?

In a field study and several lab experiments, researchers explored people's drive for complete sets—looking specifically at behaviors around items grouped arbitrarily into "pseudo-sets." In the field study, some donors to the Canadian Red Cross were urged to give six items that would make up a "global survival kit," while others were asked simply to donate individual items. Members of the first group were seven times as likely as members of the second to donate all six items. In one of the lab experiments, subjects could accept each of four increasingly risky gambles or decline at any point and cash out; the gambles were presented to some as belonging to a set. Those subjects were twice as likely as others to take the unattractive fourth bet. "Even without providing an explicit target or a goal," the researchers write, "pseudo-set framing creates the notion of a group or set, which alters people's perceptions of and activates their desire for completeness." It's an urge upon which marketers can capitalize. ■

ABOUT THE RESEARCH "Pseudo-Set Framing," by Kate Barasz et al. (*Journal of Experimental Psychology: General*, forthcoming)

U.S. VENTURE-CAPITAL INVESTMENT IN CLEAN TECHNOLOGY DROPPED FROM NEARLY 17% OF TOTAL VC INVESTMENT IN 2011 TO LESS THAN 8% IN 2016, OWING IN PART TO THE AVAILABILITY OF CHEAP NATURAL GAS AND THE FAILURE OF SOME HEAVILY VC-FUNDED CLEANTECH COMPANIES.

"CLEANTECH VENTURE CAPITAL: CONTINUED DECLINES AND NARROW GEOGRAPHY LIMIT PROSPECTS," BY DEVASHREE SAHA AND MARK MURO

BRIGHTLINE™ INITIATIVE

The Brightline™ Initiative is a non-commercial coalition of leading global organizations dedicated to helping executives bridge the expensive and unproductive gap between strategy design and delivery. Brightline conducts thought leadership research and promotes best practices designed to improve an organization's ability to deliver on strategic intent.

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Successfully Bridging the Gap Between Strategy Design and Delivery

LEADERSHIP
WAS THE CEO FIRED OR NOT?

Among corporate euphemisms, few are more common than the announcement that an executive has resigned "to spend more time with family"—a signal to most observers that the leader was fired. But it's often hard to know for sure. The financial journalist Daniel Schauber devised the "push-out score," a model that gauges the likelihood that a resignation was voluntary. It draws on publicly available data along nine dimensions, including the form and length of the announcement, the reason given, the age and tenure of the departing leader, the length of time between the announcement and the departure, and the succession plan. Researchers subsequently plotted 226 push-out scores for resignations occurring over a six-month period, determining that 43 of the CEOs were probably forced out and that 72 probably left of their own accord. (The rest occupied an ambiguous middle ground.) They then looked at each company's stock price returns on the date of the announcement, finding that the higher the push-out score, the more dramatic investors' reactions, both positive and negative. By more clearly identifying situations in which the CEO has been pushed out, investors can better recognize when a company's strategy isn't working and identify investment risks that might not be apparent if a resignation is presumed to be voluntary. ■

ABOUT THE RESEARCH "Retired or Fired: How Can Investors Tell If a CEO Was Pressured to Leave?" by Ian D. Gow, David F. Larcker, and Brian Tayan (Stanford Closer Look Series, 2017); *"Push-Out Score: The Number You Need to Know"* (Exechange, 2017)

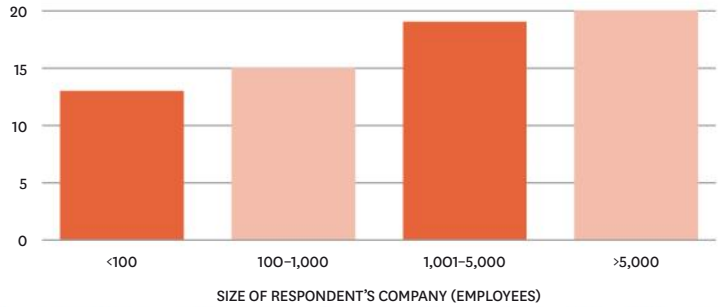
A PROGRAM TO TEACH INDIAN GARMENT WORKERS TIME MANAGEMENT, COMMUNICATION, AND OTHER LIFE SKILLS YIELDED A 250% RETURN. NOT ONLY DID THOSE WORKERS BECOME MORE PRODUCTIVE, BUT THE EFFECTS SPILLED OVER TO OTHERS ON THE ASSEMBLY LINE.

"SOFT SKILLS TO PAY THE BILLS: EVIDENCE FROM FEMALE GARMENT WORKERS," BY ACHYUTA ADHVARYU, NAMRATA KALA, AND ANANT NYSHADHAM

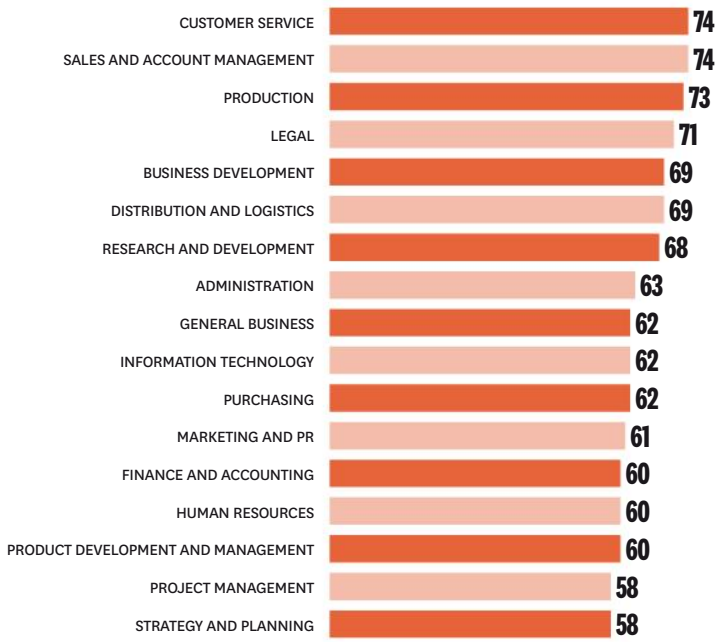
ORGANIZATIONS
THE COSTS OF BUREAUCRACY

Many employees complain that their company is overly bureaucratic, which slows decision making. To quantify this problem, researchers created a "bureaucracy mass index," or BMI, and surveyed more than 7,000 HBR readers about how bureaucracy affects their work. Among the findings: Larger companies have more bureaucratic drag, and two-thirds of employees say it has become worse in recent years, with customer-facing functions such as customer service and sales suffering some of the biggest impacts. ■

AVERAGE NUMBER OF DAYS NEEDED TO GET A DECISION ABOUT A NONBUDGETED EXPENDITURE



PERCENTAGE OF RESPONDENTS WHO SAY THEIR ORGANIZATION HAS GROWN MORE BUREAUCRATIC IN THE PAST FEW YEARS, BY FUNCTION



SOURCE GARY HAMEL AND MICHELE ZANINI

COMPILED BY HBR EDITORS | SOME OF THESE ARTICLES PREVIOUSLY APPEARED IN DIFFERENT FORM ON HBR.ORG.

TO BREAK THE RULES, YOU MUST FIRST MASTER THEM.

THE VALLÉE DE JOUX. FOR MILLENNIA A HARSH, UNYIELDING ENVIRONMENT; AND SINCE 1875 THE HOME OF AUDEMARS PIGUET, IN THE VILLAGE OF LE BRASSUS. THE EARLY WATCHMAKERS WERE SHAPED HERE, IN AWE OF THE FORCE OF NATURE YET DRIVEN TO MASTER ITS MYSTERIES THROUGH THE COMPLEX MECHANICS OF THEIR CRAFT. STILL TODAY THIS PIONEERING SPIRIT INSPIRES US TO CONSTANTLY CHALLENGE THE CONVENTIONS OF FINE WATCHMAKING.

ROYAL OAK
PERPETUAL
CALENDAR
IN PINK GOLD

AUDEMARS PIGUET
Le Brassus

DEFEND YOUR RESEARCH

In analyzing more than 8,200 games from Grand Slam tennis matches, Alex Krumer of the University of St. Gallen and his colleagues found that the male players' performance showed a larger drop in high-stakes games (relative to low-stakes games) than the female players' performance did. Their conclusion:

WOMEN RESPOND BETTER THAN MEN TO COMPETITIVE PRESSURE

DR. KRUMER, DEFEND YOUR RESEARCH

KRUMER: We looked at the performance of servers—who normally have an advantage—in every first set played at the 2010 French, U.S., and Australian Opens and at Wimbledon, and we found that the men's performance deteriorated more than the women's when the game was at a critical juncture. For example, in sets that went to 4-4, the number of men's serves that were broken rose more than seven percentage points after the players had reached the tie. Among women, we saw barely any difference between pre- and post-tie performance. And even when female athletes' play did deteriorate as pressure increased, the drop in performance was about 50% less, on average, than that of their male counterparts. So my coauthors—Danny Cohen-Zada and Mosi Rosenboim from Ben-Gurion University and Offer Moshe Shapir from NYU Shanghai—and I feel we can confidently say that in the world of elite tennis, women are better under pressure than men are. They choke less. Whether that translates to other competitive settings remains to be seen.

HBR: Why look at only tennis, and only first sets, and only Grand Slams? Tennis is a sport in which it's very easy to measure performance and competitive pressure. There's a clear winner of every point, game, set, and match, and you can assess the extent to which victory in a particular game—when the score is, say, 1-1, 3-1, or 5-0—affects the probability of winning the match. We looked at only first sets because we thought asymmetry, fatigue, and momentum might become factors in later ones. Also, winning the initial set provides a huge advantage: In our data, 85% of women and 77% of men who won the first set also won the match. And we focused on Grand Slams because their monetary incentives and ranking points are the largest, and they're the only tournaments that give the same prize money to men and women. Men do play more sets in those matches—five, compared with three for women—but if anything, that makes it even more important for women to take that first set.

MEN ARE MORE AFFECTED BY PSYCHOLOGICAL MOMENTUM THAN WOMEN ARE.

So Grand Slam–level money and points increase the pressure even further? There's a lot of research on the inverse relationship between performance and incentive-induced pressure. Dan Ariely at Duke University and his colleagues published a paper called "Large Stakes, Big Mistakes," which described experiments with villagers in India and college students. In them, subjects who were given very large performance-related incentives did worse on tasks than subjects given relatively small incentives. Other studies have shown that Australian basketball players sink more free throws in practice than in games, and that professional golfers are more likely to miss a shot on the final hole of a high-stakes tournament.

Did you expect to find differences between the sexes? We weren't sure, because the evidence on gender, pressure, and performance is limited and mixed. Some studies have found no difference between men and women. Some have found that men do better when the heat is on; others have found that women outshine men in certain environments. M. Daniele Paserman at Boston University actually looked at this Grand Slam data before we did and found that both sexes play more conservatively on key points, making fewer unforced errors and hitting fewer winning shots. But he didn't directly assess the effect of competitive pressure on the likelihood of winning. We thought it would be interesting to look at those

unambiguous, objective results and ask: Which group choked less when it mattered?

But wait. You were looking at women playing women and men playing men. If one player was underperforming because of the pressure, wasn't his or her opponent—a person of the same sex—outperforming in the same circumstances? That's why we focused on the server. There's wide agreement among tennis experts that any given point depends more on the performance of the server, who has complete control over the first shot of the point, than of the receiver, who simply reacts to it. On average, the person serving wins 72.6% of the time. So when a server loses a critical point, it's more often because he or she choked than because the other player came through in the clutch.

WOMEN CHOKED LESS THAN MEN IN SITUATIONS THAT MATTERED.

Isn't there more parity in men's professional tennis, though? Maybe the male servers were just up against tougher competition? Or Federer's and Djokovic's stellar returns skewed the results? Our estimations controlled for player characteristics within a given match, including world ranking, body-mass index, height, and home-court advantage.

Still, what if you looked at mixed doubles Grand Slam games—high-stakes competition involving both sexes? Do you think you'd get different results? It's certainly possible. At least one lab experiment has shown that women respond more positively to increasing pressure in a single-sex environment than they do in a mixed-sex one, while men perform better in the latter. So we do have to be careful about making generalizations. And in most real-life arenas, including the labor market, women obviously have to compete with men.

IN BRONZE MEDAL JUDO FIGHTS, WOMEN WERE UNAFFECTED BY PERFORMANCE IN PRIOR ROUNDS.

We're not all Serena Williams either. I get your point. Our study looked at the best of the best in tennis. Perhaps these elite female athletes have something that most women don't, which enables them to be more clutch than men at the same high level. But think about other roles in which you'd want people who stay calm under pressure—CEO positions at large companies, for example. You don't generally see average Joes or Janes filling them. You see a different type of elite, experienced performer. And still only about 4% of *Fortune* 500 chief executives are women.

Even if we stick to the narrow finding—in Grand Slam tennis matches women choke less than men do—how do you explain it? We don't know, but it could be biological. If you look at the literature on cortisol, the stress hormone, you'll find that levels of it increase more rapidly in men than in women—in scenarios from golf rounds to public speaking—and that those spikes can hurt performance. We weren't able to get blood samples from the tennis players, but I wonder if we might have found similar evidence. Danny Cohen-Zada, Ze'ev Shtudiner, and I have also published some research suggesting that men are more affected by psychological momentum than women are. We looked at bronze medal judo fights from 2009 to 2013 and found that men who had prevailed in their previous contests were more likely to win in bronze medal rounds than men who had just lost, whereas female competitors' prior-fight record had no effect on their probability of victory. Again, that makes sense biologically because we know that testosterone, a proven performance enhancer, spikes after triumph and ebbs after defeat in men, but not in women. While winners who keep winning might sound like a good thing to you, outside the athletic world, there's a risk it leads to overconfidence.

So we're not the weaker, more emotional sex after all? It's funny: I'm from Israel, where everyone is required to serve in the national military, and we're having a big debate right now about whether women should take on combat roles. In a recent televised discussion of the issue, one speaker cited our study to justify a shift to gender equality in the military. Physically speaking, men are still stronger than women, on average. But if you're talking about mental toughness, maybe in certain circumstances it's women who have the edge.

Interview by **Alison Beard**
HBR Reprint F1706B

THE CEO OF KRONOS ON LAUNCHING AN UNLIMITED VACATION POLICY

by Aron Ain

PHOTOGRAPHY BY MATT KALINOWSKI

When I joined Kronos as one of its first employees, straight out of college in 1979, the company gave new employees two weeks of paid vacation. Every year you stayed at the company, you earned an additional day, up to a certain level. That was how most companies handled vacation time, and although the numbers may vary, it's the way most of them still do. By 1984 I'd been promoted to national sales manager, and four years later I became the vice president of global sales and service, an executive position. Kronos, which creates workplace management software and services, had a long-standing policy that top executives needn't track their vacation time and could take as many days as they deemed appropriate. That made sense. Even back then, people in senior roles were required to perform 24/7. When you're constantly working nights, weekends, and during family travel, tracking your hours or declaring an official "vacation day" becomes almost meaningless. I've been in executive roles at Kronos ever since then, and CEO for the past 12 years. So I haven't been required to track my vacation time for almost 30 years.

A CHANGE LIKE THIS REQUIRES FUNDAMENTAL TRUST IN THE PEOPLE WHO WORK FOR YOU.

What's changed since I joined Kronos is that, partly owing to technology, professionals at every level of companies are now routinely on their phones, answering e-mail, or doing some sort of work after business hours. I see this firsthand with my daughter, who is early in her own career. Her recent positions have provided only two weeks of vacation, limiting her ability to travel with my wife and me. When she comes home for Thanksgiving, it's not unusual to see her working several hours a day over the long weekend. In an era when so many employees are plugged in around the clock, official policies that depend on clearly delineating when they're "at work" or "on vacation" strike me as antiquated or even foolish.

HURDLES TO HIRING

This sensibility provided important context when our chief people officer asked to meet with me in late 2014. For months we'd been experiencing recruiting challenges. Kronos has 5,000 employees around the world, with almost 1,500 of them at our headquarters in Massachusetts, where the job market for college-educated professionals tends to be very tight. At that point we had more than 300 open positions and were having trouble filling them; if that continued, it would affect our growth plans. We talked about specific hurdles to hiring, and one of the issues was our vacation policy. By then we were offering new employees three weeks of paid vacation, which is comparable to what local companies with which we compete for talent were offering. But when our recruiters tried to hire people in their thirties or forties with significant tenure at other companies, they often learned that those people had four or five weeks' vacation. Vacations are important, and persuading people to take a job with less time off was a real challenge.

I asked our HR department to come up with strategies that would make us more competitive in recruiting. It created a menu of options. One was shifting to an "open" vacation policy, the kind pioneered by Netflix. Under an open system there is no set limit on how many days off an employee may take; instead, individuals work things out in consultation with their supervisors.

We decided to launch this system, which we call myTime, at the beginning of 2016. Although most employees were happy about the change, a vocal minority were *really* unhappy. To be honest, I wasn't prepared for how much emotion and pushback this change would evoke, even from a small number of people. But we've since worked through those challenges, and we have data that proves the new policy has been good for Kronos. Unlimited vacations won't work for every company—but employers that are considering them can learn from our experience.

You can't even think about making a change like this unless you have fundamental trust in the people who work for you. I've always tended to have such trust, partly because every time I've extended it, people have shown my judgment to be correct. More than 25 years ago several superstar employees on my team went out on maternity leave at about the same time. In each case, when her leave ended, the employee

was wavering about coming back. Each woman worried that it would be too difficult to balance a full-time office job with parenting. I didn't want to lose them. "What can we do to make this manageable?" I asked. One wanted to work three-day weeks. Done. Several wanted to work from home when necessary. No problem. This flexibility is common now, but it wasn't back then, when e-mail didn't exist and companies still used fax machines. But I trusted those employees to get their jobs done, and they did. Experiences like that made my trust in our people grow.

FAMILY FIRST

As a CEO, I've also been extremely outspoken about prioritizing family over business. I talk about it so often that I worry employees are tired of hearing it, but it's really important to me. I constantly tell our people that if their job or career is the most important thing in their life—the activity they care most about and invest the most in—they're making a profound and tragic mistake. Family and relationships should be the clear priority. I try to behave in ways that model that behavior. When my children were on high school sports teams, I tried never to miss a game, even if it meant leaving work at 2 PM on Wednesdays. And I didn't sneak out of the office—I told people exactly what I was doing and encouraged them to do the same thing. I'm a big believer in what the management writer Jim Collins says: If you get the right people on the bus, people who have the talent and the work ethic needed to perform, you don't have to spend time closely supervising them. They'll get the job done, no matter what hours they keep.

After our HR team proposed an unlimited-vacation policy, I started doing some research—basically just going online and reading about other companies' experiences. I quickly discovered cases in which the new policy didn't work well or companies had tried it and then reverted to a traditional approach. Reading that didn't concern me much. Just because it hadn't worked for them didn't mean it wouldn't work for Kronos.

I also read specific complaints from employees whose companies had shifted to an open vacation policy. Most of the complaints were driven by people's realization that companies adopt this policy not out of the goodness of their hearts but to save money: When employers offer traditional "accrual" vacation policies, people who resign or retire with unused time off have to be paid for those accrued days. For large companies, that can be a substantial expense; even at a company our size, it added up to $2 million or $3 million a year. When a company adopts an open policy, no more accrued days are banked, so whatever

HARRY ZERNIKE

Q&A

UNEXPECTED CHALLENGES

Rich Fuerstenberg is a senior partner in Mercer's health consulting business and specializes in absence management. HBR spoke with him about why some companies shift to an unlimited vacation policy—and how far this trend might grow. Edited excerpts follow.

When did corporate interest in open vacation policies accelerate?
I'd heard about random companies having them, but around 2013 many Silicon Valley companies began adopting them. That's when this changed from a blip to a trend.

What typically sparks a company to explore moving to an unlimited vacation policy?
It's driven by several things. One of them is technology. With more of the workforce becoming 24/7, using flexible work schedules and working from anywhere, how can we distinguish between when people are working and when they're not? Companies

are recognizing that even when people record vacation time, they're often working. Another factor is that under a traditional policy, companies accrue unused vacation as a liability. As that liability increases, they become interested in a different way of handling paid time off, or PTO.

Your data shows that more companies offer unlimited PTO to executives only. Does that cause morale problems for other workers?
In those situations only a few executives are getting unlimited vacation days—the same group that might be getting access to the corporate jet or other perks. It's a small number of people, so oftentimes the broader workforce doesn't know about the policy. It can get a little noisier as the circle expands—when it's not just the C-suite but also senior vice presidents and directors, and goes from 10 people to 100. At a certain point it becomes impossible to keep quiet, and you may face communications issues.

When companies consider this shift, what challenges do you warn them about?
That depends on the company and its culture. The company is likely to have pockets in which people might be prone to abuse an unlimited-PTO policy. The fix for that is to not offer it for that function. Managers face uncertainty about how much vacation time people will actually take—and we know from our surveys that when companies make the shift, many people actually take less time off. That creates a risk for burnout. In that case, the company needs to foster a culture in which people see that it's OK to take time off. The other challenge is that some workers—especially longer-tenured ones—may have accrued a large amount of unused vacation time. Many companies pay employees for that time, usually in cash—either as a lump sum when they leave the company or over several years. These are significant issues. We see many companies exploring the shift, but relatively few actually go ahead with it.

If those are the expected challenges, what unexpected ones do you observe?
I've read about some employers—not our clients—that go from a traditional plan to unlimited PTO and then revert to some form of more-defined limits, such as "Take up to four weeks of vacation." Putting a number out there helps people feel safe if they take time off. Too often these systems can result in gamesmanship—one person thinks he shouldn't take time off until the person he sits next to does—and if that person takes two days, he'll take only one. So companies that opt for unlimited PTO sometimes make an effort to counter that behavior.

How far do you think unlimited PTO could extend?
We are seeing it expand among executives and extend to the executive team. We do think there are limits, however. When you extend it too far, you include people who aren't really in 24/7 roles. And in some industries I see unlimited time off as totally untenable. Retailers. Nursing. Call centers. Those are places where you need to have a certain number of bodies predictably in their seats. It seems to me unrealistic for the majority of employers to do this, so I think you'll see a gradual expansion as opposed to mass adoption.

money it formerly paid departing employees goes to the bottom line.

From the beginning we decided not to try to profit from abandoning an accrual system. We felt it made more sense to reinvest those savings in other employee benefits. So in addition to offering an open vacation policy, we increased maternity leave, parental leave, and adoption leave; we increased the 401(k) match; we created a scholarship program for employees' children; we launched a child care assistance program; and we began contributing up to $500 a year toward employees' student loans. In the end those new benefits exceeded the savings from changing our vacation policy, but I believe they were worth it.

THE LEADING COMPLAINTS

While I was educating myself about open vacation policies, our HR people were doing more-systematic research. They hired a consultant who had helped other companies make the shift. He gave a presentation on the pros and cons, saying that at most companies, 95% of employees prefer unlimited vacation, but 5% typically object—for reasons I'll discuss shortly. The consultant also said that the biggest problem with the change is that some employees actually take less time under the new policy than they did under the old one, because they're afraid of asking for too much time off. We wanted to be sure that didn't happen at Kronos, because it would defeat the purpose.

We made one important decision early on: Although we would no longer set formal limits on time off, we would continue to track every employee's requests and time taken, because we wanted to be able to analyze how well the new policy was working and to be sure that managers were implementing it fairly.

We announced the new policy on December 18, 2015. "Thank you for creating an environment where we trust each other so much that we can take a step like this," I said in a companywide video. The new policy would take effect on January 1. Just as the consultant had predicted, most people reacted favorably—but a minority did not. They spoke up quickly and loudly.

Their complaints generally fell into three categories. The first came from a handful of managers who thought the lack of a formal policy would make their jobs more difficult. They worried that employees might request excessive time, or that supervisors would spend too much energy adjudicating requests on a case-by-case basis. They were uncomfortable with the ambiguity of the new system and preferred a black-and-white policy that would automate their decision making.

The second unhappy group was made up of people who'd been treating their accrued vacation like a bank. They thought of it as dollars rather than hours, and they expected to get a cash reimbursement for unused time when they left the company. I recall one of these employees in particular: He was in his sixties and planned to retire in a year or two. He didn't care about maternity leave, student loan assistance, or the other new benefits, because they didn't apply to him. His vacation time was equal to a couple of months' salary, and he'd been counting on receiving it when he left.

The third category of complaints came from people who thought the new policy was unfair because it gave every employee something that had previously been reserved for long-tenured employees. The typical lament went like this: "I've stayed here 15 years in order to get this much vacation time, and it's not fair that new employees get as much time as I do from their first day."

To address managers' concerns, we provided training and individual coaching along with assurances that HR would offer support as needed. We also emphasized that we wanted people to take more time, not less, under the new policy, so managers were encouraged to approve most requests. We addressed the other complaints in informal conversations. I probably had a dozen of those; I'm sure our HR people had many more.

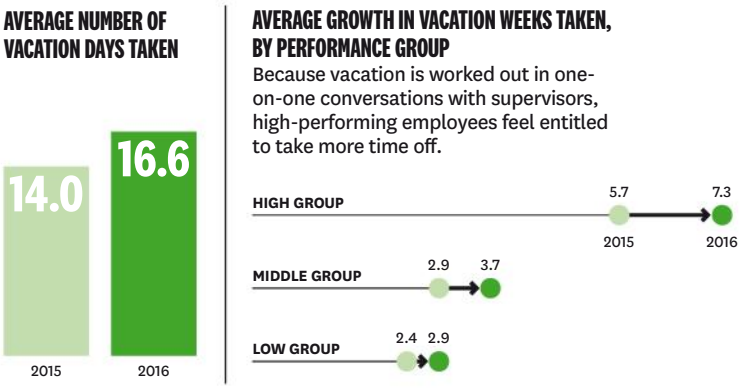
A FEW MANAGERS THOUGHT THAT THE LACK OF A FORMAL POLICY WOULD MAKE THEIR JOBS HARDER.

I learned a long time ago that people are entitled to their feelings. It's never my job to tell them how they should or shouldn't feel. When talking with people who'd been hoarding vacation time to get a cash windfall, I sympathized, but I pointed out that this wasn't its intended purpose. "You're supposed to use this time, not save it up for conversion into a retirement bonus," I said. When talking with employees concerned about "fairness," I gently pushed back on their logic. "We're not taking anything away from you—in fact, we're giving you the potential for more time off," I said. "And how much vacation time another employee gets has no impact on you." A few people were so upset that they talked about quitting, but in the end I don't think anyone really left Kronos over the policy change.

We couldn't roll out the new policy everywhere. Certain countries have very strict rules about how companies need to account for vacation time and what workers are entitled to, which makes it necessary to stick with a traditional accrual system. So initially we've implemented myTime in the United States and Canada.

HOW UNLIMITED TIME OFF HAS AFFECTED VACATIONS

Kronos's new policy took effect in 2016.
The figures below are for U.S. employees.



ENCOURAGING ANECDOTES

When we launched the new policy, we began watching the numbers to see whether people took more time off. Vacation time did inch higher. The tracking allowed for transparency and communication around the issue. If an HR person or a second-line manager noticed that an employee hadn't taken any days off in the first quarter, the likely result was a conversation beginning with "Why aren't you taking more time?" And in cases where managers weren't approving requests, HR could intervene. I'd estimate that 10% of managers fell into this camp. Generally they ran customer-facing teams in which absences cause scheduling complications or worked in functions in which, they believed, people's taking more time off

might have a negative effect on P&L. We told managers clearly that it was important for employees in different departments to feel they were being treated similarly. We also reminded them that employees' ratings of their supervisors have a direct impact on compensation, so they might want to behave in ways that reflected the stated policy of the company.

We heard encouraging anecdotes about how employees were making the most of their newfound flexibility. One spent several weeks participating in a fundraising motorcycle ride through 48 states while continuing to support his customers as needed. Another accompanied her daughters while they took part in a traveling production of *Annie* and got her work done while on the road. One employee had previously saved all her vacation time to visit her family in India, which meant she could take no days off the rest of the year; now she can spend a few weeks in India and still take time during the holidays. I've received e-mails from people saying that the new policy makes it much less stressful to get to medical or dental appointments. Even some of those who complained about the plan when it was announced have become big fans, which is gratifying.

AS FAR AS I KNOW, NO EMPLOYEE HAS ABUSED THE POLICY, AND NO CUSTOMER HAS SUFFERED.

From what I've heard, the employee who used the most vacation time last year took slightly more than six weeks. (Under the old policy, a long-standing employee with four weeks of vacation who carried unused time over from the previous year could have taken nearly that much.) But as far as I know, not a single employee has abused the policy, and not a single customer has been negatively affected by it.

At first I thought Millennials would be the most enthusiastic about an open vacation policy. But in fact employees in their thirties and forties with school-age children seem to be the biggest beneficiaries. In the past they struggled to figure out how to spread vacation time over various school holidays. Now they feel free to take more time, reducing this strain.

OUR BEST YEAR EVER

Because we tracked the data, we don't need to rely on anecdotes to know whether the policy is working. On average, Kronos employees took off 2.6 more days in 2016 than in 2015. In some departments the number was significantly higher. Even so, from a financial standpoint 2016 was our best year ever. I don't think that's a coincidence. Happy, engaged employees can make a company more profitable, and our policy makes employees happier and more engaged. We can prove that with data too. We've tracked employee engagement for 15 years, and for a few years prior to 2016, the share of employees who agreed or strongly agreed that Kronos was a great place to work had been stuck at 84%. (Nothing wrong with 84%, especially when you consider that global IT companies' engagement numbers average about 60%.) A year after we launched myTime, engagement rose to 87%. Our voluntary turnover dropped from 6.4% to 5.6%, which is significant. And anonymous employee comments on Glassdoor, a website many job seekers use to research potential employers, express positive feelings about the policy. As one commenter put it: "With its unlimited vacation policy, Kronos has upped their game when it comes to benefits."

In a way it seems ironic that we've shifted to this system, because our core business is providing workforce management software, and one of the things our product does is track and manage vacation accruals. If every company shifted to an open vacation policy, wouldn't one of the benefits of our product disappear? Not if open vacation was deployed the right way. That we track our employees' time off is a major reason our new policy works. If you don't track it, how else will you know whether people are taking enough time to refresh and recharge, and whether managers are setting a poor example or unfairly managing time off? Tracking enables transparency and better communication, and if it's done properly, it will build even more trust and loyalty among your employees.

Right now unlimited vacation for all employees is offered at fewer than one in 20 U.S. companies. There's a reason for that. Not every organization has the combination of high-performing employees, passionate concern for work/life balance, and deep trust in its people necessary to make this kind of system work. I feel very fortunate to lead a company that does.

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Harvard Business Review
Spotlight
NOVEMBER–DECEMBER 2017

A MANAGER'S GUIDE TO AUGMENTED REALITY

WHY EVERY ORGANIZATION NEEDS AN AUGMENTED REALITY STRATEGY
AR will become the new interface between humans and machines.

HOW DOES AUGMENTED REALITY WORK?
The key is a digital twin.

AUGMENTED REALITY IN THE REAL WORLD
Companies are investing and testing.

ONE COMPANY'S EXPERIENCE WITH AR
A conversation with ABB's chief digital officer, Guido Jouret

THE BATTLE OF THE SMART GLASSES
Money is pouring into development.

INSIDE: Explore interactive experiences that show what augmented reality can do. Grab your mobile device, download the HBR Augmented Reality app, and then turn to pages 46 and 51.

Available on the iPhone App Store
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WHY EVERY ORGANIZATION NEEDS AN AUGMENTED REALITY STRATEGY

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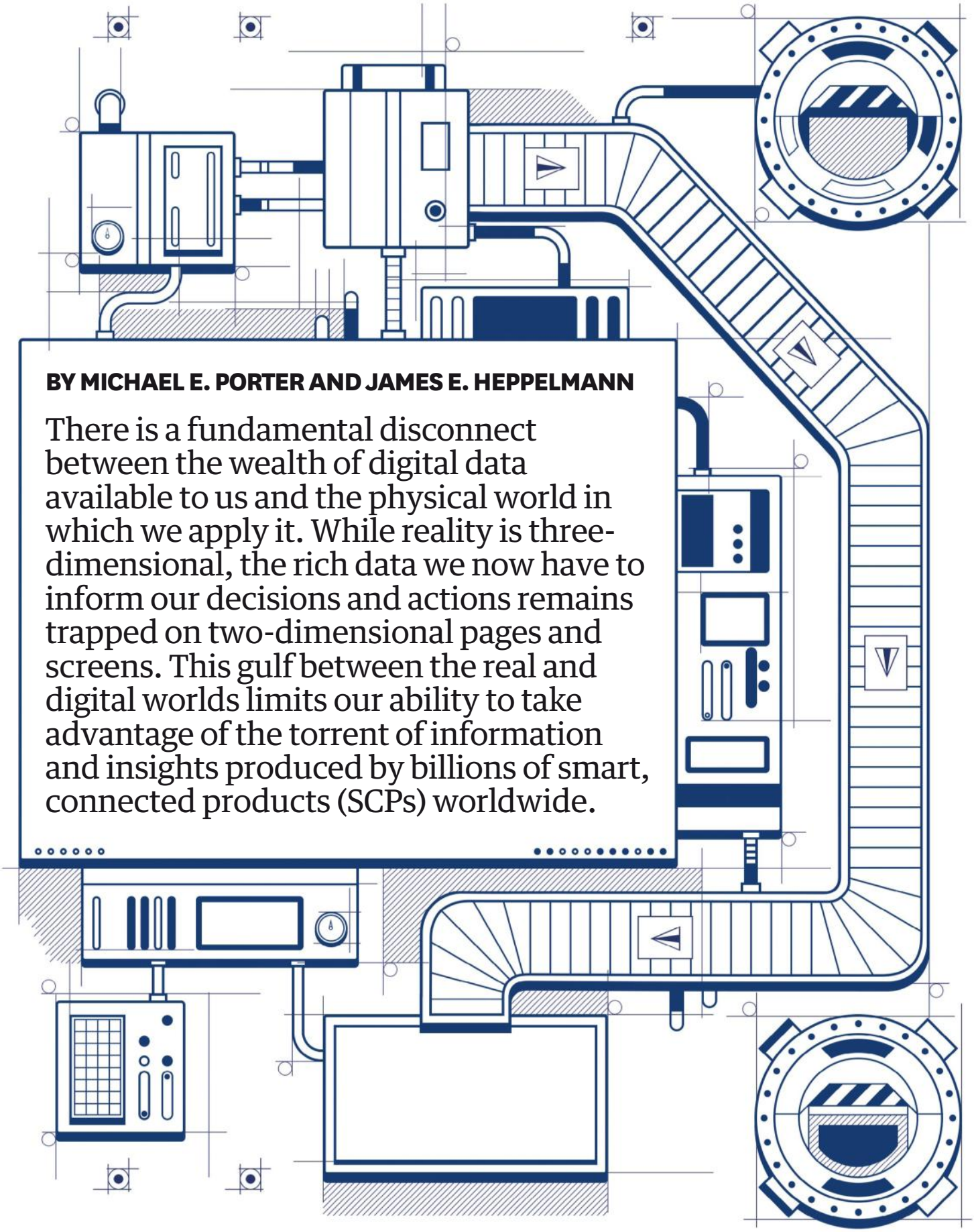


BY MICHAEL E. PORTER AND JAMES E. HEPPELMANN

There is a fundamental disconnect between the wealth of digital data available to us and the physical world in which we apply it. While reality is three-dimensional, the rich data we now have to inform our decisions and actions remains trapped on two-dimensional pages and screens. This gulf between the real and digital worlds limits our ability to take advantage of the torrent of information and insights produced by billions of smart, connected products (SCPs) worldwide.

Augmented reality, a set of technologies that superimposes digital data and images on the physical world, promises to close this gap and release untapped and uniquely human capabilities. Though still in its infancy, AR is poised to enter the mainstream; according to one estimate, spending on AR technology will hit $60 billion in 2020. AR will affect companies in every industry and many other types of organizations, from universities to social enterprises. In the coming months and years, it will transform how we learn, make decisions, and interact with the physical world. It will also change how enterprises serve customers, train employees, design and create products, and manage their value chains, and, ultimately, how they compete.

In this article we describe what AR is, its evolving technology and applications, and why it is so important. Its significance will grow exponentially as SCPs proliferate, because it amplifies their power to create value and reshape competition. AR will become the new interface between humans and machines, bridging the digital and physical worlds. While challenges in deploying it remain, pioneering organizations, such as Amazon, Facebook, General Electric, Mayo Clinic, and the U.S. Navy, are already implementing AR and seeing a major impact on quality and productivity. Here we provide a road map for how companies should deploy AR and explain the critical choices they will face in integrating it into strategy and operations.

WHAT IS AUGMENTED REALITY?

Isolated applications of AR have been around for decades, but only recently have the technologies required to unleash its potential become available. At the core, AR transforms volumes of data and analytics into images or animations that are overlaid on the real world. Today most AR applications are delivered through mobile devices, but increasingly delivery will shift to hands-free wearables such as head-mounted displays or smart glasses. Though many people are familiar with simple AR entertainment applications, such as Snapchat filters and the game Pokémon Go, AR is being applied in far more consequential ways in both consumer and business-to-business settings. For example, AR "heads-up" displays that put navigation, collision warning, and other information directly in drivers' line of sight are now available in dozens of car models. Wearable AR devices for factory workers that superimpose production-assembly or service instructions are being piloted at thousands of companies. AR is supplementing or replacing traditional manuals and training methods at an ever-faster pace.

More broadly, AR enables a new information-delivery paradigm, which we believe will have a profound impact on how data is structured, managed, and delivered on the internet. Though the web transformed how information is collected, transmitted, and accessed, its model for data storage and delivery—pages on flat screens—has major limits: It requires people to mentally translate 2-D information for use in a 3-D world. That isn't always easy, as anyone who has used a manual to fix an office copier knows. By superimposing digital information directly on real objects or environments, AR allows people to process the physical and digital simultaneously, eliminating the need to mentally bridge the two. That improves our ability to rapidly and accurately absorb information, make decisions, and execute required tasks quickly and efficiently.

AR displays in cars are a vivid illustration of this. Until recently, drivers using GPS navigation had to look at a map on a flat screen and then figure out how to apply it in the real world. To take the correct exit from a busy rotary, for example, the driver needed to shift his or her gaze between the road and the screen and mentally connect the image on the map to the proper turnoff. AR heads-up displays lay navigational images directly over what the driver sees through the windshield. This reduces the mental effort of applying the information, prevents distraction, and minimizes driver error, freeing people to focus on the road. (For more on this, see the sidebar "Enhancing Human Decision Making.")

AR is making advances in consumer markets, but its emerging impact on human performance is even greater in industrial settings. Consider how Newport News Shipbuilding, which designs and builds U.S. Navy aircraft carriers, uses AR near the end of its manufacturing process to inspect a ship, marking for removal steel construction structures that are not part of the finished carrier. Historically, engineers

IN BRIEF

THE PROBLEM
While the physical world is three-dimensional, most data is trapped on 2-D screens and pages. This gulf between the real and digital worlds limits our ability to make the best use of the volumes of information available to us.

THE SOLUTION
Augmented reality solves this problem by superimposing digital images and data on real objects. By putting information directly into the context in which we'll apply it, AR speeds our ability to absorb and act on it.

THE OUTCOME
Pioneering organizations, including GE, Mayo Clinic, and the U.S. Navy, are using AR to improve productivity, quality, and training. By combining the strengths of humans and machines, AR will dramatically increase value creation.

had to constantly compare the actual ship with complex 2-D blueprints. But with AR, they can now see the final design superimposed on the ship, which reduces inspection time by 96%—from 36 hours to just 90 minutes. Overall, time savings of 25% or more are typical for manufacturing tasks using AR.

AR'S KEY CAPABILITIES

As we've previously explained (see "How Smart, Connected Products Are Transforming Competition," HBR, November 2014), the SCPs spreading through our homes, workplaces, and factories allow users to monitor product operations and conditions in real time, control and customize product operations remotely, and optimize product performance using real-time data. And in some cases, intelligence and connectivity allow SCPs to be fully autonomous.

AR powerfully magnifies the value created by those capabilities. Specifically, it improves how users visualize and therefore access all the new monitoring data, how they receive and follow instructions and guidance on product operations, and even how they interact with and control the products themselves.

Visualize. AR applications provide a sort of X-ray vision, revealing internal features that would be difficult to see otherwise. At the medical device company AccuVein, for instance, AR technology converts the heat signature of a patient's veins into an image that is superimposed on the skin, making the veins easier for clinicians to locate. This dramatically improves the success rate of blood draws and other vascular procedures. AR more than triples the likelihood of a successful needle stick on the first try and reduces the need for "escalations" (calling for assistance, for example) by 45%.

Bosch Rexroth, a global provider of power units and controls used in manufacturing, uses an AR-enhanced visualization to demonstrate the design and capabilities of its smart, connected CytroPac hydraulic power unit. The AR application allows customers to see 3-D representations of the unit's internal pump and cooling options in multiple configurations and how subsystems fit together.

Instruct and guide. AR is already redefining instruction, training, and coaching. These critical functions, which improve workforce productivity, are inherently costly and labor-intensive and often deliver uneven results. Written instructions for assembly tasks, for instance, are frequently hard and time-consuming to follow. Standard instructional videos aren't interactive and can't adapt to individual learning needs. In-person training is expensive and requires students and teachers to meet at a common site, sometimes repeatedly. And if the equipment about which students are being taught isn't available, they may need extra training to transfer what they've learned to a real-world context.

AR addresses those issues by providing real-time, on-site, step-by-step visual guidance on tasks such as product assembly, machine operation, and warehouse picking. Complicated 2-D schematic representations of a procedure in a manual, for example, become interactive 3-D holograms that walk the user through the necessary processes. Little is left to the imagination or interpretation.

At Boeing, AR training has had a dramatic impact on the productivity and quality of complex aircraft manufacturing procedures. In one Boeing study, AR was used to guide trainees through the 50 steps required to assemble an aircraft wing section involving 30 parts. With the help of AR, trainees completed the work in 35% less time than trainees using traditional 2-D drawings and documentation. And the number of trainees with little or no experience who could perform the operation correctly the first time increased by 90%.

ENHANCING HUMAN DECISION MAKING

At its core, the power of augmented reality grows out of the way humans process information. We access information through each of our five senses—but at different rates. Vision provides us with the most information by far: An estimated 80% to 90% of the information humans get is accessed through vision.

The ability to absorb and process information is limited by our mental capacity. The demand on this capacity is referred to as "cognitive load." Each mental task we undertake reduces the capacity available for other, simultaneous tasks.

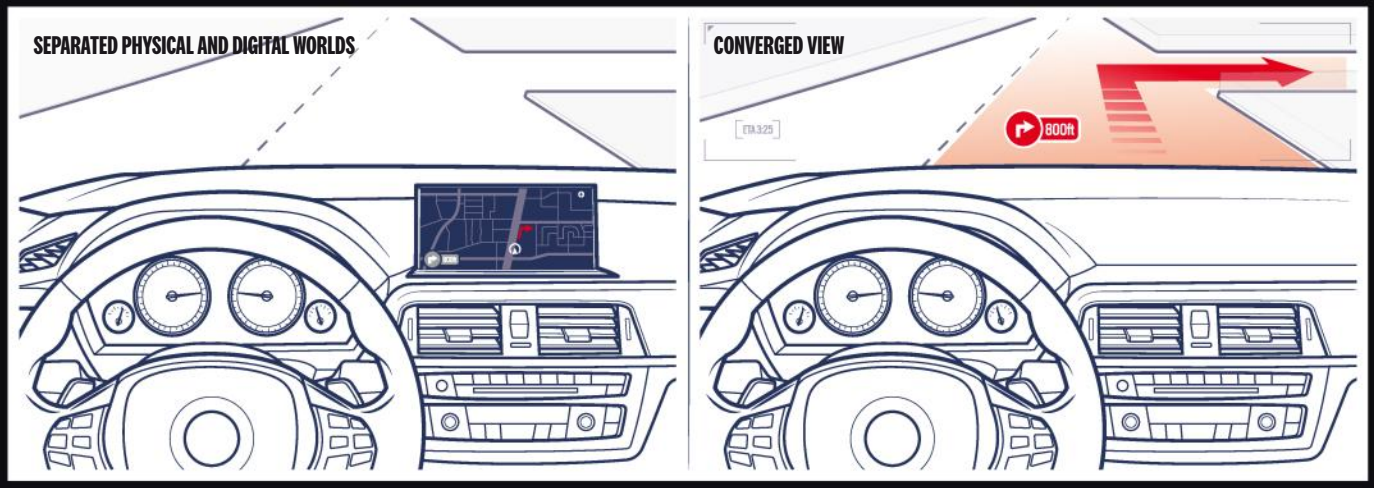
Cognitive load depends on the mental effort required to process a given type of information. For example, reading instructions from a computer screen and acting on them creates a greater cognitive load than hearing those same instructions, because the letters must be translated into words and the words interpreted. Cognitive load also depends on "cognitive distance," or the gap between the form in which information is presented and the context in which it is applied. Consider what happens when someone refers to a smartphone for directions while driving. The driver must consume the information from the screen, retain that information in working memory, translate the directions into the physical environment in front of him, and then act on those directions, all while operating the vehicle. There is significant cognitive distance between the digital information on the screen and the physical context in which information is applied. Dealing with this distance creates cognitive load.

The combination of the speed at which information is transmitted and absorbed and the cognitive distance involved in applying it lies at the root of the much-repeated phrase "A picture is worth a thousand words." When we look at the physical world, we absorb a huge amount and variety of information almost instantaneously. By the same token, an image or picture that superimposes information on the physical world, placing it in context for us, reduces cognitive distance and minimizes cognitive load.

This explains why AR is so powerful. There is no better graphical user interface than the physical world we see around us when it is enhanced by a digital overlay of relevant data and guidance where and when they are needed. AR eliminates dependence on out-of-context and hard-to-process 2-D information on pages and screens while greatly improving our ability to understand and apply information in the real world.

CONVERGING PHYSICAL AND DIGITAL

Augmented reality reduces the mental effort needed to connect digital information about the physical world with the context it applies to.



Mentally transposing GPS images onto the road ahead is demanding and prone to errors.

AR superimposes digital data directly on the real world.

AR-enabled devices can also transmit what an on-site user is seeing to a remote expert, who can respond with immediate guidance. In effect, this instantly puts the expert at the user's side, regardless of location. This capability not only improves worker performance but substantially reduces costs—as Lee Company, which sells and services building systems, has discovered. It uses AR to help its field technicians with installations and repairs. A remote expert can see what the tech is viewing through his or her AR device, guide the tech through the work to be done, and even annotate the tech's view with instructions. Getting expert support from a central location in real time has increased Lee's tech utilization dramatically. And, by reducing the number of repeat visits, Lee saves more than $500 per technician per month in labor and travel costs. The company calculates a return of $20 on every dollar invested in AR.

Interact. Traditionally, people have used physical controls such as buttons, knobs, and, more recently, built-in touch-screens to interact with products. With the rise of SCPs, apps on mobile devices have increasingly replaced physical controls and allowed users to operate products remotely.

AR takes the user interface to a whole new level. A virtual control panel can be superimposed directly on the product and operated using an AR headset, hand gestures, and voice commands. Soon, users wearing smart glasses will be able to simply gaze at or point to a product to activate a virtual user interface and operate it. A worker wearing smart glasses, for instance, will be able to walk a line of factory machines, see their performance parameters, and adjust each machine without physically touching it.

The interact capability of AR is still nascent in commercial products but is revolutionary. Reality Editor, an AR app developed by the Fluid Interfaces group at MIT's Media Lab, provides a glimpse of how it is rapidly evolving. Reality Editor makes it easy to add an interactive AR experience to any SCP. With it, people can point a smartphone or a tablet at an SCP (or, eventually, look at it through smart glasses), "see" its digital interfaces and the capabilities that can be programmed, and link those capabilities to hand gestures or voice commands or even to another smart product. For example, Reality Editor can allow a user to see a smart light bulb's controls for color and intensity and set up voice commands like "bright" and "mood" to activate them. Or different settings of the bulb can be linked to buttons on a smart light switch the user can place anywhere that's convenient.

The technologies underpinning these capabilities are still emerging, but the accuracy of voice commands in noisy environments is improving, and advances in gesture and gaze tracking have been rapid. GE has already tested the use of voice commands in AR experiences that enable factory workers to perform complex wiring processes in wind turbines—and has achieved a 34% increase in productivity.

COMBINING AR AND VIRTUAL REALITY

AR's well-known cousin, virtual reality, is a complementary but distinct technology. While AR superimposes digital information on the physical world, VR replaces physical reality with a computer-generated environment. Though VR is used mostly for entertainment applications, it can also replicate physical settings for training purposes. It is especially useful when the settings involved are hazardous or remote. Or, if the machinery required for training is not available, VR can immerse technicians in a virtual environment using holograms of the equipment. So when needed, VR adds a fourth capability—simulate—to AR's core capabilities of visualize, instruct, and interact.

CLINT FORD

EXPERIENCE AUGMENTED REALITY

Launch this interactive demo to see AR's key capabilities in action.

VISUALIZE

AR can reveal features or systems that would be difficult to see with the naked eye. Here, it exposes the internal components of a hydraulic power unit and provides data on their status.

INSTRUCT AND GUIDE

AR can replace hard-to-understand 2-D instructions, such as those for a repair process in a manual, with interactive 3-D holograms that walk the user through each step. This AR shows how to replace a power-unit filter.

INTERACT

AR can replace physical controls—such as buttons, knobs, and built-in touchscreens—with virtual ones that are visually superimposed on the target. You can operate a power unit that drives a robotic arm in this AR experience.

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2 OPEN THE APP AND POINT YOUR DEVICE AT THIS PAGE TO LAUNCH AN AUGMENTED REALITY EXPERIENCE.

VISUALIZE
An AR showroom demo developed by Microsoft and Volvo provides an X-ray view of a car's engine and undercarriage.

AR will be far more widely applied in business than VR will. But in some circumstances, combining AR and VR will allow users to transcend distance (by simulating faraway locations), transcend time (by reproducing historical contexts or simulating possible future situations), and transcend scale (by allowing users to engage with environments that are either too small or too big to experience directly). What's more, bringing people together in shared virtual environments can enhance comprehension, teamwork, communication, and decision making.

Ford, for example, is using VR to create a virtual workshop where geographically dispersed engineers can collaborate in real time on holograms of vehicle prototypes. Participants can walk around and go inside these life-size 3-D holograms, working out how to refine design details such as the position of the steering wheel, the angle of the dashboard, and the location of instruments and controls without having to build an expensive physical prototype and get everyone to one location to examine it.

The U.S. Department of Homeland Security is going a step further by combining AR instructions with VR simulations to train personnel in responding to emergency situations such as explosions. This reduces costs and—in cases in which training in real environments would be dangerous—risk. The energy multinational BP overlays AR training procedures on VR simulations that replicate specific drilling conditions, like temperature, pressure, topography, and ocean currents, and that instruct teams on operations and help them practice coordinated emergency responses to disasters without high costs or risk.

HOW AR CREATES VALUE

AR creates business value in two broad ways: first, by becoming part of products themselves, and second, by improving performance across the value chain—in product development, manufacturing, marketing, service, and numerous other areas.

AR as a product feature. The capabilities of AR play into the growing design focus on creating better user interfaces and ergonomics. The way products convey important operational and safety information to users has increasingly become a point of differentiation (consider how mobile apps have supplemented or replaced embedded screens in products like Sonos audio players). AR is poised to rapidly improve such interfaces.

Dedicated AR heads-up displays, which have only recently been incorporated into

automobiles, have been a key feature in elite military products, such as fighter jets, for years and have been adopted in commercial aircraft as well. These types of displays are too expensive and bulky to integrate into most products, but wearables such as smart glasses are a breakthrough interface with wide-ranging implications for all manufacturers. With smart glasses, a user can see an AR display on any product enabled to communicate with them.

If you view a kitchen oven through smart glasses, for example, you might see a virtual display that shows the baking temperature, the minutes remaining on the timer, and the recipe you are following. If you approach your car, an AR display might show you that it is locked, that the fuel tank is nearly full, and that the left-rear tire's pressure is low.

Because an AR user interface is purely software based and delivered via the cloud, it can be personalized and can continually evolve. The incremental cost of providing such an interface is low, and manufacturers also stand to save considerable amounts when traditional buttons, switches, and dials are removed. Every product manufacturer needs to carefully consider the disruptive impact that this next-generation interface may have on its offering and competitive positioning.

AR and the value chain. The effects of AR can already be seen across the value chain, but they are more advanced in some areas than in others. In general, visualize and instruct/guide applications are now having the greatest impact on companies' operations, while the interact capability is still emerging and in pilot testing.

Product development. Though engineers have been using computer-aided design (CAD) capabilities to create 3-D models for 30 years, they have been limited to interacting with those models through 2-D windows on their computer screens, which makes it harder for them to fully conceptualize designs. AR allows 3-D models to be superimposed on the physical world as holograms, enhancing engineers' ability to evaluate and improve designs. For example, a life-size 3-D hologram of a construction machine can be positioned on the ground, and engineers can walk around it, peer under and over it, and even go inside it to fully appreciate the sight lines and ergonomics of its design at full scale in its intended setting.

AR also lets engineers superimpose CAD models on physical prototypes to compare how well they match. Volkswagen is using this technique—which makes any difference between the latest design and the prototype visually obvious—to check alignment in digital design reviews. This improves the accuracy of the quality assurance process, in which engineers previously had to painstakingly compare 2-D drawings with prototypes, and makes it five to 10 times faster.

We expect that in the near future AR-enabled devices such as phones and smart glasses, with their embedded cameras, accelerometers, GPS, and other sensors, will increasingly inform product design by exposing when, where, and how users actually interact with the product—how often a certain repair sequence is initiated, for example. In this way the AR interface will become an important source of data.

Manufacturing. In manufacturing, processes are often complex, requiring hundreds or even thousands of steps, and mistakes are costly. As we've learned, AR can deliver just the right information the moment it's needed to factory workers on assembly lines, reducing errors, enhancing efficiency, and improving productivity.

In factories, AR can also capture information from automation and control systems, secondary sensors, and asset management systems and make visible important monitoring and diagnostic data about each machine or process. Seeing information such as efficiency and defect rates in context helps maintenance technicians understand problems and prompts factory workers to do proactive maintenance that may prevent costly downtime.

Iconics, which specializes in automation software for factories and buildings, has begun to integrate AR into its products' user interfaces. By attaching relevant information to the physical location where it will be best observed and understood, the AR interfaces enable more-efficient monitoring of machines and processes.

Logistics. Warehouse operations are estimated to account for about 20% of all logistics costs, while picking items from shelves represents up to 65% of warehouse costs. In most warehouses, workers still perform this task by consulting a paper list of things to collect and then searching for them. This method is slow and error-prone.

The logistics giant DHL and a growing number of other companies are using AR to enhance the efficiency and accuracy of the picking process. AR instructions direct workers to the location of each product to be pulled and then suggest the best route to the next product. At DHL this approach has led to fewer errors, more-engaged workers, and productivity gains of 25%. The company is now rolling out AR-guided picking globally and testing how AR can enhance other types of warehouse operations, such as optimizing the position of goods and machines in layouts. Intel is also using AR in warehouses and has achieved a 29% reduction in picking time, with error rates falling to near zero. And the AR application is allowing new Intel workers to immediately achieve picking speeds 15% faster than those of workers who've had only traditional training.

Marketing and sales. AR is redefining the concept of showrooms and product demonstrations and transforming the customer experience. When customers can see virtually how products will look or function in a real setting before buying them, they have more-accurate expectations, more confidence about their purchase decisions, and greater product satisfaction. Down the road, AR may even reduce the need for brick-and-mortar stores and showrooms altogether.

When products can be configured with different features and options—which can make them difficult and costly to stock—AR is a particularly valuable marketing tool. The construction products company AZEK, for instance, uses AR to show contractors and consumers how its decking and paver products look in various colors and arrangements. Customers can also see the simulations in context: If you look at a house through a phone or a tablet, the AR app can add a deck onto it. The experience reduces any uncertainty customers might feel about their choices and shortens the sales cycle.

In e-commerce, AR applications are allowing online shoppers to download holograms of products. Wayfair and IKEA both offer libraries with thousands of 3-D product images and apps that integrate them into a view of an actual room, enabling customers to see how furniture and decor will look in their homes. IKEA also uses its app to collect important data about product preferences in different regions.

After-sales service. This is a function where AR shows huge potential to unlock

the value-creating capabilities of SCPs. AR assists technicians serving customers in the field in much the same way it helps workers in factories: by showing predictive analytics data generated by the product, visually guiding them through repairs in real time, and connecting them with remote experts who can help optimize procedures. For example, an AR dashboard might reveal to a field technician that a specific machine part will most likely fail within a month, allowing the tech to preempt a problem for the customer by replacing it now.

At KPN, a European telecommunications service provider, field engineers conducting remote or on-site repairs use AR smart glasses to see a product's service-history data, diagnostics, and location-based information dashboards. These AR displays help them make better decisions about how to resolve issues, producing an 11% reduction in overall costs for service teams, a 17% decrease in work-error rates, and higher repair quality.

Xerox used AR to connect field engineers with experts instead of providing service manuals and telephone support. First-time fix rates increased by 67%, and the engineers' efficiency jumped by 20%. Meanwhile, the average time it took to resolve problems dropped by two hours, so staffing needs fell. Now Xerox is using AR to connect remote technical experts directly with customers. This has increased by 76% the rate at which technical problems are resolved by customers without any on-site help, cutting travel costs for Xerox and minimizing downtime for customers. Perhaps not surprisingly, Xerox has seen its customer satisfaction rates rise to 95%.

Human resources. Early AR adopters like DHL, the U.S. Navy, and Boeing have already discovered the power of delivering step-by-step visual worker training on demand through AR. AR allows instruction to be tailored to a particular worker's experience or to reflect the prevalence of particular errors. For example, if someone repeatedly makes the same kind of mistake, he can be required to use AR support until his work quality improves. At some companies, AR has reduced the training time for new employees in certain kinds of work to nearly zero and lowered the skill requirements for new hires.

This is especially advantageous for the package delivery company DHL, which faces surges in demand during peak seasons and is heavily dependent on the effective hiring and training of temporary workers. By providing real-time training and hands-on guidance on navigating warehouses and properly packing and sorting materials, AR has reduced DHL's need for traditional instructors and increased the onboarding speed for new employees.

AR DRAMATICALLY REDUCES ERRORS AND INCREASES PRODUCTIVITY IN FACTORIES.

AR AND STRATEGY

AR will have a widespread impact on how companies compete. As we've explained in our previous HBR articles, SCPs are changing the structure of almost all industries as well as the nature of competition within them—often expanding industry boundaries in the process. SCPs give rise to new strategic choices for manufacturers, ranging from what functionality to pursue and how to manage data rights and security, to whether to expand a company's scope of products and compete in smart systems.

The increasing penetration of AR, along with its power as the human interface with SCP technologies, raises some new strategic questions. While the answers will reflect each company's business and unique circumstances, AR will become more and more integral to every firm's strategy.

Here are the essential questions companies face:

1. What is the range of AR opportunities in the industry, and in what sequence should they be pursued? Companies must weigh AR's potential impact on customers, product capabilities, and the value chain.

2. How will AR reinforce a company's product differentiation? AR opens up multiple differentiation paths. It can create companion experiences that expand the capabilities of products, give customers more information, and increase product loyalty. AR interfaces that enhance products' functionality or ease of use can be big differentiators, as can those that substantially improve product support, service, and uptime. And AR's capacity to provide new kinds of feedback on how customers use products can help companies uncover further opportunities for product differentiation.

The right differentiation path will depend on a company's existing strategy; what competitors are doing; and the pace of technology advances, especially in hardware.

3. Where will AR have the greatest impact on cost reduction? AR enables new efficiencies that every firm must explore. As we've noted, it can significantly lower the cost of training, service, assembly, design, and other parts of the value chain. It can also substantially cut manufacturing costs by reducing the need for physical interfaces.

Each company will need to prioritize AR-driven cost-reduction efforts in a way that's consistent with its strategic positioning. Firms with sophisticated products will need to capitalize on AR's superior and low-cost interface, while many commodity producers will focus on operational efficiencies across the value chain. In consumer industries and retail, marketing-related visualize applications are the most likely starting point. In manufacturing, instruct applications are achieving the most immediate payoff by addressing inefficiencies in engineering, production, and service. And AR's interact capability, though still emerging, will be important across all industries with products that have customization and complex control capabilities.

4. Should the company make AR design and deployment a core strength, or will outsourcing or partnering be sufficient? Many firms are scrambling

INSTRUCT AND GUIDE
An employee at the agricultural equipment company Agco views AR instructions for work on a tractor hydraulic valve stack.

to access the digital talent needed for AR development, which is in short supply. One skill in great demand is user experience or user interface (UX/UI) design. It's critical to present 3-D digital information in ways that make it easy to absorb and act on; companies want to avoid making a stunning but unhelpful AR experience that defeats its core purpose. Effective AR experiences also require the right content, so people who know how to create and manage it—another novel skill—are crucial too. Digital modeling capabilities and knowledge of how to apply them in AR applications are key as well.

Over time we expect companies to create teams dedicated to AR, just as they set up such teams to build and run websites in the 1990s and 2000s. Dedicated teams will be needed to establish the infrastructure that will allow this new medium to flourish and to develop and maintain the AR content. Many firms have started to build AR skills in-house, but few have mastered them yet.

Whether to hire and train AR employees or partner with specialty software and services companies is an open question for many. Some companies have no choice but to treat AR talent as a strategic asset and invest in acquiring and developing it, given AR's potentially large impact on competition in their business. However, if AR is important but not essential to competitive advantage, firms can partner with specialty software and services companies to leverage outside talent and technology.

The challenges, time, and cost involved in building the full set of AR technologies we have described are significant, and specialization always emerges in each component. In the early stages of AR, the number of technology and service suppliers has been limited, and companies have built internal capabilities. However, best-of-breed AR vendors with turnkey solutions are starting to appear, and it will become increasingly difficult for in-house efforts to keep up with them.

5. How will AR change communications with stakeholders? AR complements existing print and 2-D digital communication approaches and in some cases can replace them altogether. Yet we see AR as much more than just another communication channel. It is a fundamentally new means of engaging with people. Just consider the novel way it helps people absorb and act on information and instructions.

The web, which began as a way to share technical reports, ultimately transformed business, education, and social interaction. We expect that AR will do the same thing for communication—changing it in ways far beyond what we can envision today. Companies will need to think creatively about how they can use this nascent channel.

DEPLOYING AR

AR applications are already being piloted and deployed in products and across the value chain, and their number and breadth will only grow.

Every company needs an implementation road map that lays out

INTERACT
An operator of a Wemo sheet-metal production line uses AR gesture commands to run several machines at once and switch between operations.

how the organization will start to capture the benefits of AR in its business while building the capabilities needed to expand its use. When determining the sequence and pace of adoption, companies must consider both the technical challenges and the organizational skills involved, which vary from context to context. Specifically, organizations need to address five key questions:

1. Which development capabilities will be required? Some AR experiences involve more complexity than others. Experiences that allow people to visualize products in different configurations or settings—like those created by IKEA, Wayfair, and AZEK—are a relatively easy place for companies to start. Consumers just need to be encouraged to download and launch AR apps, and only a mobile device is needed to use them.

Instruction applications, like the ones Boeing and GE employ in manufacturing, are more difficult to build and use. They require the capacity to develop and maintain dynamic 3-D digital content and often benefit greatly from the use of head-mounted displays or smart glasses, which are still in the early stages of development.

Apps that produce interactive experiences, which create significant value for both consumers and businesses, are the most challenging to develop. They also involve less-mature technology, such as voice or gesture recognition, and the need to integrate with software that controls SCPs. Most companies will start with static visualizations of 3-D models, but they should build the capability to move quickly into dynamic instructional experiences that have greater strategic impact.

2. How should organizations create digital content? Every AR experience, from the least to the most sophisticated, requires content. In some cases it's possible to repurpose existing digital content, such as product designs. Over time, however, more-complex, dynamic contextual experiences must be built from scratch, which requires specialized expertise.

Simple applications, such as an AR-enhanced furniture catalog, may need only basic product representations. More-sophisticated business instruction applications, however, such as those used for machine repair, will require accurate and highly detailed digital product representations. Companies can create these by adapting CAD models used in product development or by using digitization techniques such as 3-D scanning. The most sophisticated AR experiences also need to tap real-time data streams from enterprise business systems, SCPs, or external data sources and integrate them into the content. To prepare for broadening the AR portfolio, companies should take an inventory of existing 3-D digital assets in CAD and elsewhere and invest in digital modeling capabilities.

3. How will AR applications recognize the physical environment? To accurately superimpose digital information on the physical world, AR technologies must recognize what they're looking at. The simplest approach is to determine the location of the AR device using, say, GPS and show relevant information for that location without anchoring it to a specific object. This is known as an "unregistered" AR experience. Vehicle heads-up navigation displays typically work this way.

Higher-value "registered" experiences anchor information to specific objects. They can do this through markers, such as bar codes, logos, or labels, which are placed on the objects and scanned by the user with an AR device. A more powerful approach, however, uses technology that recognizes objects by comparing their shape to a catalog of 3-D models. This allows a maintenance technician, for example, to instantly recognize and interact with any type of equipment he or she is responsible for maintaining and to do so from any angle. While markers are a good starting point, shape-recognition technologies are advancing quickly, and organizations will need the capability to use them to tap into many of the highest-value AR applications.

4. What AR hardware is required? AR experiences aimed at broad consumer audiences have typically been designed for smartphones, taking advantage of their simplicity and ubiquity. For more-sophisticated experiences, companies use tablets, which offer larger screens, better graphics, and greater processing power. Since tablet penetration is lower, companies will often provide them to users. For certain high-value applications—notably those in aircraft and automobiles—manufacturers are building dedicated AR heads-up displays into their products—a costly approach.

Eventually, however, most AR applications for service, manufacturing, and even product interfaces will require head-mounted displays that free users' hands. This technology is currently both immature and expensive, but we expect that affordable smart glasses will become widely available in the next few years and will play a major part in releasing AR's full power. Microsoft, Google, and Apple now offer AR technologies optimized for their own devices. However, most organizations should take a cross-platform approach that allows AR experiences to be deployed across multiple brands of phones and tablets and should make sure they're ready for smart glasses when they arrive. (See "The Battle of the Smart Glasses.")

5. Should you use a software-development or a content-publishing model? Many early AR experiences have been delivered through stand-alone software applications that are downloaded, complete with digital content, to a phone or a tablet. This approach creates reliable, high-resolution experiences and allows organizations to make apps that don't require internet connectivity. The problem with this model is that any change to the AR experience requires software developers to rewrite the app, which can create expensive bottlenecks.

An emerging alternative uses commercial AR-publishing software to create AR content and host it in the cloud. The AR experience can then be downloaded on demand using a general-purpose app running on an AR device. Like website content, the AR content can be updated or supplemented without changing the software itself—an important benefit when large amounts of information and frequent content changes are involved. The content-publishing model will become common as more and more machines and products include real-time AR interaction and control. A content-publishing capability is essential to scaling AR up across the organization.

THE BROADER IMPACT

The digital revolution, with its SCPs and explosion of data, is unleashing productivity and unlocking value across the economy. Increasingly, the constraint is not a lack of data and knowledge but how to assimilate and act on them—in other words, the interface with humans. AR is emerging as a leading solution to this challenge.

At the same time, the rapid evolution of machine learning and automation is raising serious concerns about human opportunity. Will there be enough jobs for everyone, especially for people without advanced education and knowledge? In a world of artificial intelligence and robots, will humans become obsolete?

It is easy to conclude that new technology diminishes human opportunity. Yet new inventions have been replacing human labor for centuries, and they have led to growth in employment, not a decline. Technology has dramatically increased our productivity and our standard of living. It has given rise to new kinds of offerings that meet new needs and require new types of workers. Many of today's jobs involve products and services that did not even exist a hundred years ago. A lesson of history is that today's digital revolution will generate new waves of innovation and new kinds of work that we cannot yet imagine.

The role of humans in this future is misunderstood. People have unique strengths that machines and algorithms will not replicate anytime soon. We have sophisticated motor skills—well beyond what robots are capable of today—that allow us to do the subtle manipulation that's needed in, say, replacing a machine part or wiring a turbine. Even relatively less skilled work, such as drawing blood, pruning a garden, or repairing a flat tire, requires human dexterity and defies automation. Human cognition adapts instantaneously to novel situations; people easily adjust the way they interpret information, solve problems, exercise judgment, and take action to suit their circumstances. Humans have flexibility, imagination, intuition, and creative ability that for the foreseeable future are beyond the reach of any machine.

While the advances in artificial intelligence and robotics are impressive, we believe that combining the capabilities of machines with humans' distinctive strengths will lead to far greater productivity and more value creation than either could generate alone. What's needed to realize this opportunity is a powerful human interface that bridges the gap between the digital and physical worlds. We see AR as a historic innovation that provides this. It helps humans enhance their own capabilities by taking full advantage of new digital knowledge and machine capabilities. It will profoundly change training and skill development, allowing people to perform sophisticated work without protracted and expensive conventional instruction—a model that is inaccessible to so many today. AR, then, enables people to better tap into the digital revolution and all it has to offer.

HBR Reprint R1706B

MICHAEL E. PORTER is a University Professor at Harvard, based at Harvard Business School. **JAMES E. HEPPELMANN** is the president and CEO of PTC, a leading maker of industrial software.

How Does Augmented Reality Work?

Augmented reality starts with a camera-equipped device—such as a smartphone, a tablet, or smart glasses—loaded with AR software. When a user points the device and looks at an object, the software recognizes it through computer vision technology, which analyzes the video stream.

The device then downloads information about the object from the cloud, in much the same way that a web browser loads a page via a URL. A fundamental difference is that the AR information is presented in a 3-D "experience" superimposed on the object rather than in a 2-D page on a screen. What the user sees, then, is part real and part digital.

AR can provide a view of the real-time data flowing from products and allow users to control them by touchscreen, voice, or gesture. For example, a user might touch a stop button on the digital graphic overlay within an AR experience—or simply say the word "stop"—to send a command via the cloud to a product. An operator using an AR headset to interact with an industrial robot might see superimposed data about the robot's performance and gain access to its controls.

As the user moves, the size and orientation of the AR display automatically adjust to the shifting context. New graphical or text information comes into view while other information passes out of view. In industrial settings, users in different roles, such as a machine operator and a maintenance technician, can look at the same object but be presented with different AR experiences that are tailored to their needs.

A 3-D digital model that resides in the cloud—the object's "digital twin"—serves as the bridge between the smart object and the AR. This model is created either by using computer-aided design, usually during product development, or by using technology that digitizes physical objects. The twin then collects information from the product, business systems, and external sources to reflect the product's current reality. It is the vehicle through which the AR software accurately places and scales up-to-date information on the object.

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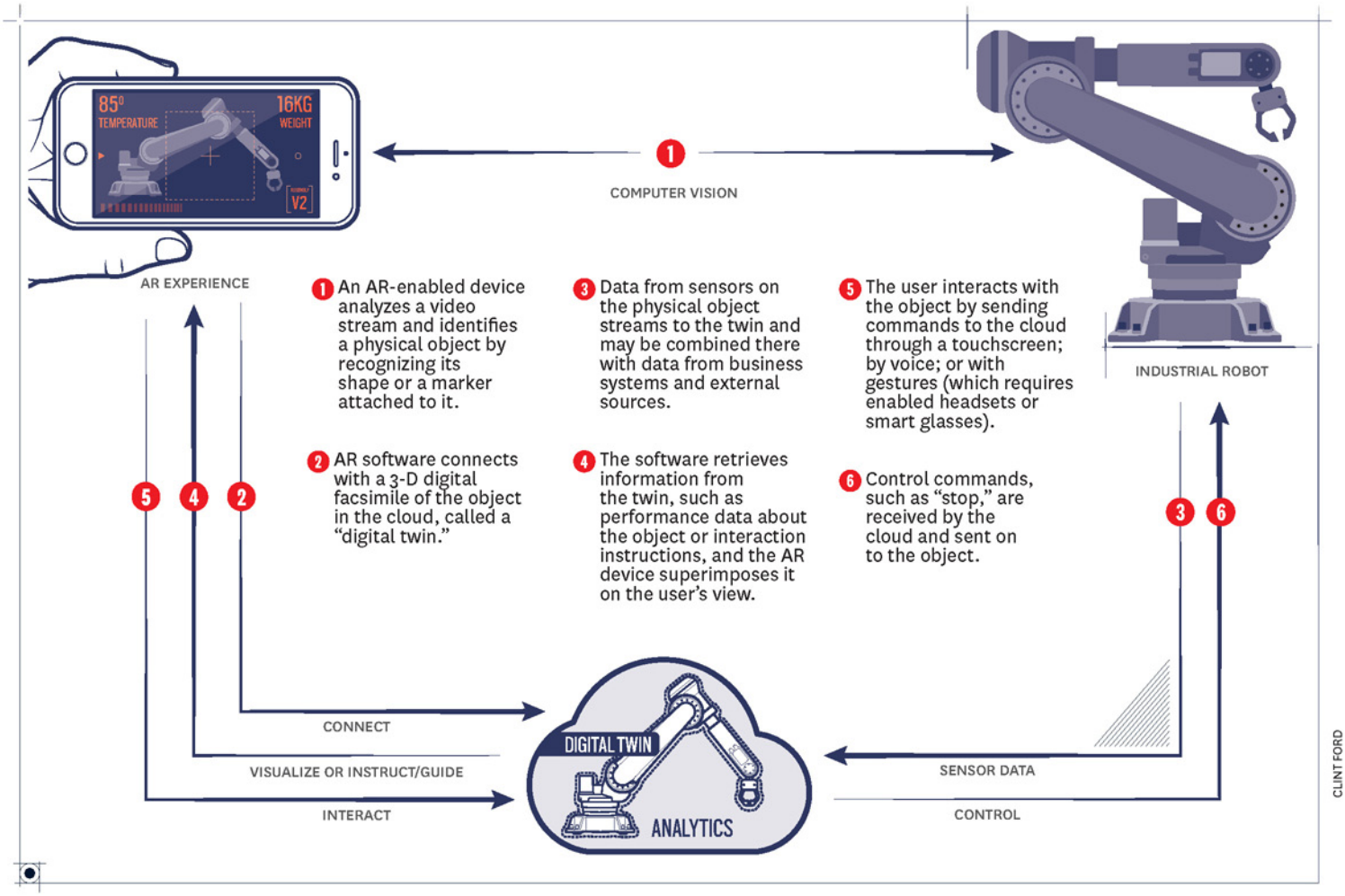
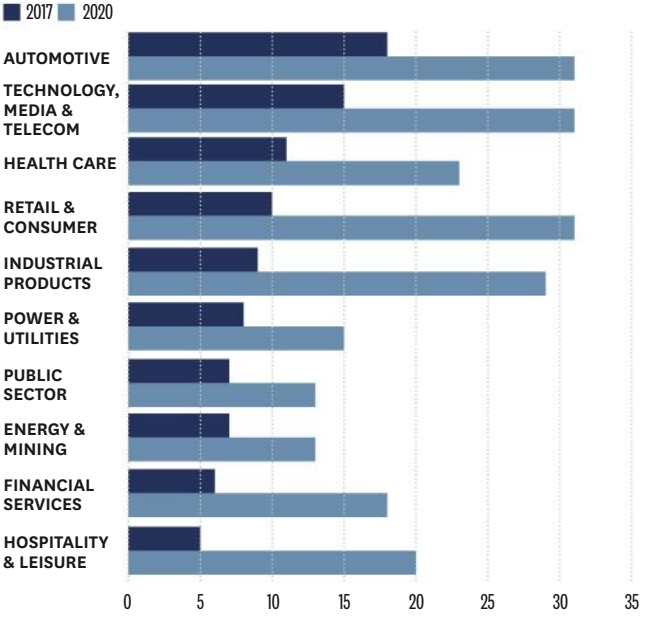


Augmented Reality in the Real World

WHO'S INVESTING THE MOST?

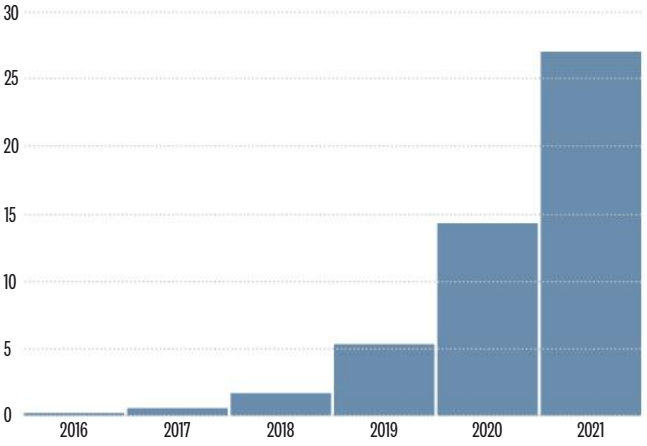
Percentage of executives in each industry who say they are currently making substantial investments in AR, and percentage anticipating substantial investments in three years



SOURCE PWC 2017 GLOBAL DIGITAL IQ SURVEY, TAKEN BY 2,216 BUSINESS AND IT EXECUTIVES FROM 53 COUNTRIES

AR HEADSETS TAKE OFF

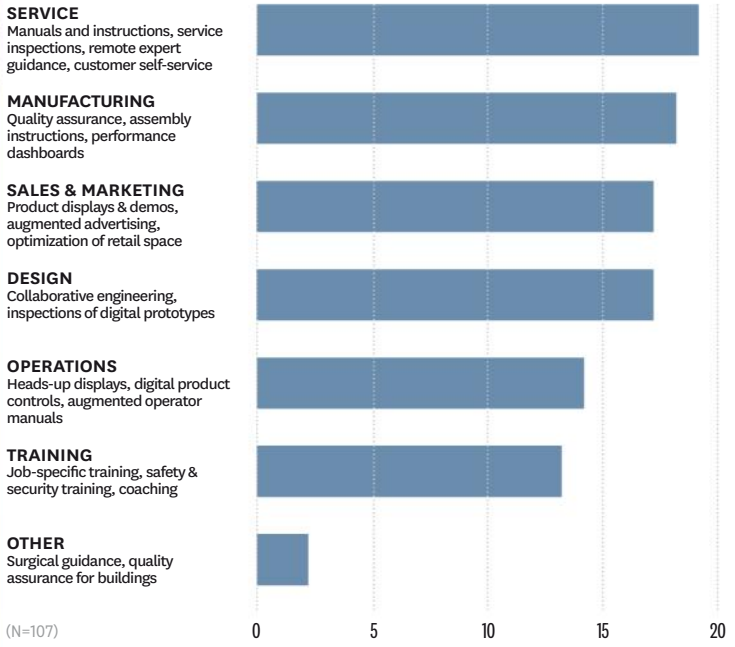
Projected growth in augmented reality headset unit shipments worldwide (in millions)



SOURCE INTERNATIONAL DATA CORPORATION 2017 WORLDWIDE QUARTERLY AUGMENTED AND VIRTUAL REALITY HEADSET TRACKER

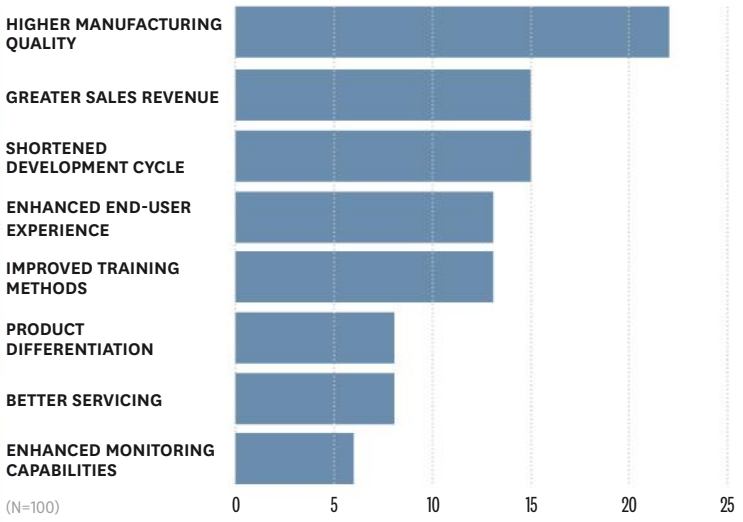
ENTERPRISE ROLES...

Percentage of surveyed developers creating AR experiences in each use category



...AND STRATEGIC GOALS

Percentage of respondents citing each reason as the primary goal of their AR development program



SOURCE PTC SURVEY OF THINGWORX STUDIO PILOT PROGRAM PARTICIPANTS

One Company's Experience with AR

A CONVERSATION WITH ABB'S CHIEF DIGITAL OFFICER, GUIDO JOURET

BY GARDINER MORSE

Guido Jouret joined the Swiss industrial giant ABB in 2016, after spending more than two decades in technology leadership roles at Cisco and Nokia. As chief digital officer, he helps lead the $34 billion company's technology strategy in green power, transportation, robotics, and automation in over 100 countries, and he champions its AR initiatives. Here, Jouret describes AR's transformative potential—and why many businesses underestimate the change that's coming.

Why is ABB interested in augmented reality?

AR can help address three macroeconomic challenges that we—and our customers—are facing. The first is the aging of the skilled workforce. In the oil and gas industry, for example, there was a massive employment surge in the 1960s and 1970s and then a hiring lull. As a result, you now have a lot of older workers retiring, taking skills and institutional knowledge with them. A similar dynamic is happening in many other industries. Second, we have a lot more machines in remote locations, and we want to be able to monitor, operate, and fix those machines with fewer people on-site. And the third challenge is the growing complexity of new technologies, which require new technical skills.

What pilots are you doing?

In our pulp and paper business, we're working on AR that will allow us to service the equipment of remote customers without sending in technicians. Today a customer

needing guidance on repairs gets a binder with documentation. We're developing AR on a HoloLens headset that will let the customer be guided by a remote technician who can see what the customer is looking at and walk them through a repair. We're at the early stage. We've put together some prototypes, and we're sharing those with customers to get their feedback.

In our marine business, we're working with a coalition of companies on pilot projects involving autonomous vessels—like Google self-driving cars but ships. You can imagine starting with small autonomous ferries on lakes but eventually scaling up to container ships. You wouldn't need large crews on these ships. If somebody on shore needs situational awareness of what's happening on a vessel, they could use AR technology. We think we could bring this capability to market within a few years.

How would that work, remotely checking in on an autonomous ship?

A captain onshore might use AR to see the view from the ship's bridge and contextual information about the ship's speed and course and other telemetry data. This is a case where you'd be integrating virtual reality and augmented reality. The VR would be the view from the bridge. The AR would be live telemetry overlaid on that view. If sensors showed that something was going on in the engine room, you could teleport there from the bridge and have a look around a virtual engine room that had AR information superimposed on top of it. You can imagine needing only a few people actually on board at any time.

What other sorts of jobs do you see AR doing?

There are three overlapping areas where I see AR taking off. The first is in dangerous jobs. You want to make sure people have the best information possible at exactly the right moment, because the cost of not having that—people getting injured, equipment being destroyed—is so high. So I would imagine AR applications in refineries, chemical plants, construction, and mining, for example. The second area is jobs in remote locations, like on an oil rig or an offshore wind farm, where it's really valuable to make sure that the people you do have on-site have the skills they need. Third, AR will be really useful in cases where people are working with products or machines that are extremely complex, so they can't be easily automated. Servicing an industrial 3-D printer would be an example. Or work done in semiconductor labs.

Those are all pretty cutting-edge. Are there less-cool applications that will be as important?

This doesn't sound superexciting, but it could have a big impact: If people use AR simply to adhere to a best-in-class process, it can prevent mistakes and injuries. You can have the best standard operating procedures in the world, but if your workers don't follow them, it doesn't matter. AR can ensure compliance with processes. For instance, imagine you're working with an industrial motor and there's a step in the manual that says, "Turn off the power." It would be easy to overlook the step and damage the equipment or get hurt. With AR, the software could say, "Turn off the power and glance at the switch to confirm it's off." When you looked at the switch, the AR could take a picture of the state of the switch, time-stamp it, and record the location of the motor using GPS. So you would now be certain that the switch on a motor was off at a specific location and time during a specific step in a process.

Do businesses have unrealistic expectations about AR because of hype on the consumer side?

Actually, I think it's sometimes the reverse—press about consumer uses of new technology negatively influences the perception of that technology in business. It's a recurring theme. Think of the press around consumer drones, for instance, which suggests that they're a nuisance or a toy. But of course we're finding important applications in industry now for inspecting refineries, pipelines, and high-voltage transmission lines. Same thing goes for blockchain, which at first was seen as the technology behind bitcoin, the digital currency used by drug dealers. But businesses are beginning to understand that blockchain will have a huge impact on contracts. AR was seen as a game platform, and there was bad press when Google Glass stalled, which may have colored how businesses saw the technology—maybe as a science experiment that wasn't going anywhere. But people who actually work with AR in the industrial space are quite excited.

How should a company get started with AR?

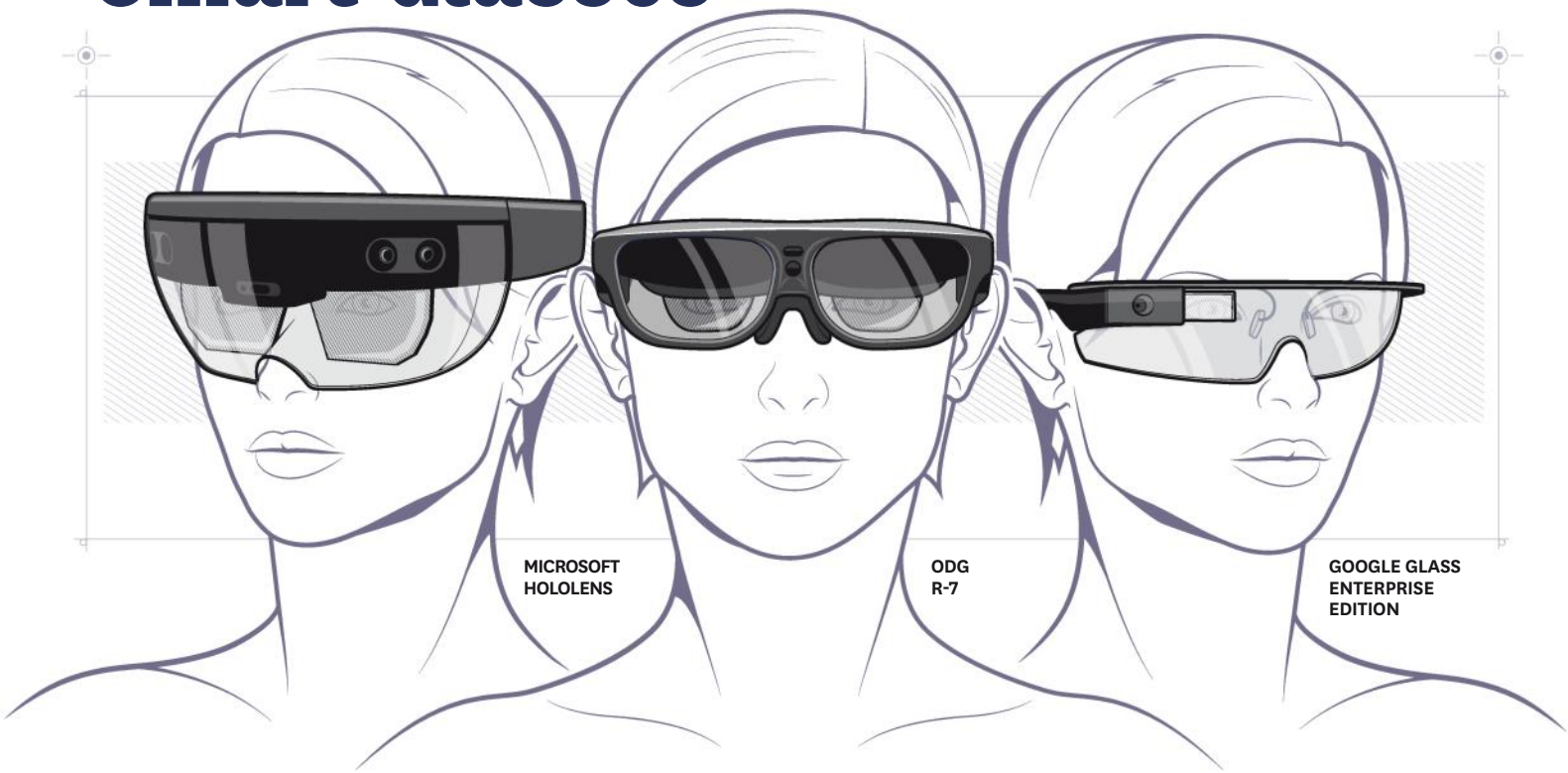
First, if you haven't already done so, you should design and build your products digitally so that you'll have digital models of them to use in developing AR and VR. Otherwise, you'll need to create those digital models later, which is complicated. Second, figure out where AR could generate the most value in your operations or services. I'd gauge that using those three dimensions I've mentioned: danger, remoteness, and complexity of the task. It probably shouldn't be a priority to add AR to a simple machine that's easily accessible. On services, I'd ask where AR could enhance an existing service rather than what new service you could build from scratch with AR. It's much easier to get a customer that's already using some of your maintenance services to try an enhanced version. If you and a competitor provide the same service, and yours has an AR component that allows customers to do some of their own work, that creates value for them and differentiates you.

How do you see augmented reality and artificial intelligence coming together?

Today we can create really good artificial intelligence that can play Jeopardy! or a game like Go, but it's harder for AI to figure out how to respond to situations where it has no training. It will come up with an informed response, but the outcome can be unpredictable. If you train an automated ship to handle clear skies and a calm sea, and a hurricane hits, you don't know what the AI will do. People, at least for quite some time, will be better at reasoning in context in novel situations. So we can imagine that with the fusion of AI and AR, the AI will provide a set of recommendations about, say, what step to take next in a repair; a human with the contextual expertise will make the final call; and at that point AR could provide useful guidance. If there's a noise coming from a motor, it could be many things. AI could look at the data and suggest 10 possible causes and recommend a few to consider first. But the tech's decision about which to follow up on will be based on his experience, his team's design knowledge, what he finds when he opens up the machine, and so on. He will make the final call about what the problem most likely is and then select an AR program that guides the repair.

HBR Reprint R1706B

The Battle of the Smart Glasses



To date, the lack of affordable, lightweight, high-performance smart glasses has been a barrier to augmented reality's widespread adoption. The head-mounted displays (HMDs) most businesses use for AR tend to be expensive and cumbersome, and none of the options available to consumers have achieved broad acceptance.

But the race to develop a popular version of this new digital interface is on—and is attracting both tech titans and upstart inventors. Investors are pouring money into wearables development, betting that HMDs running AR will ultimately disrupt the market for phones and tablets. The screens in consumers' pockets will be replaced by AR interfaces that people put on—and keep on—without a second thought, just as they do sunglasses.

In this Spotlight package we have described how businesses are using AR to improve visualization, instruction, and interaction. These same capabilities will allow HMDs to become the consumer interface for many products and forms of data. Consumers will use hand gestures and voice commands to access information about and interact with the machines and devices around them, including appliances; audio systems; and home heating, cooling, lighting, and alarm systems. Smart glasses will guide people through the world, allowing them to summon instructions (How do I change a tire?), directions (Where's the subway entrance?), and even tourist information (What does that sign say in my language?) on a virtual screen that hovers before them whenever and wherever needed.

What will the next generation of wearables look like? Google was first to market with Google Glass, a visionary effort that stalled for a variety of reasons, including high cost and privacy concerns. Microsoft subsequently launched the HoloLens, which many view as promising, but it is expensive ($3,000), has a narrow field of view, and is somewhat bulky. (It's more of a headset than a pair of glasses.) The HoloLens may prove adequate for some business applications but is not yet ready for consumer use. Famously secretive Apple is rumored to be developing user-friendly smart glasses; the mid-2017 launch of its ARKit developer software for AR apps and the fall 2017 introduction of the AR-capable iPhone X hint at that possibility. Google recently released an improved Glass and launched ARCore, a direct response to ARKit. Numerous other companies are jumping into the market. Among them are Magic Leap, a start-up that has already raised $1.4 billion to develop a head-mounted virtual retinal display, and three companies converging on a sunglasses-like concept: Osterhout Design Group (ODG), Vuzix, and Meta.

The stakes are high. Whoever wins the glasses wars will control a technology that transforms how people interface with the digital and physical worlds—far more than the iPhone did a decade ago. In this next round of the mobile-device arms race, the title of world's most valuable company could be up for grabs. **HBR Reprint** R1706B

CLINT FORD

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Which corporate leaders rose to the top? page 66

HOW WE CALCULATED THE RANKINGS

To compile our list of the world's best-performing CEOs, we began with the companies that at the end of 2016 were in the S&P Global 1200, an index that reflects 70% of the world's stock market capitalization and includes firms in North America, Europe, Asia, Latin America, and Australia. We identified each company's CEO but, to ensure that we had a sufficient track record to evaluate, excluded people who had been in the job for less than two years. We also excluded executives who had been convicted of a crime or arrested. All told, we ended up with 898 CEOs from 887 companies. (Several companies had co-CEOs.) They ran enterprises based in 31 countries.

Our research team, headed by Nana von Bernuth and assisted by the coders Christina von Plate and Phachareeya Ratchada and the data consultants Morand Studer and Daniel Bernardes of Eleven Strategy & Management, gathered each firm's daily financial data from the CEO's first day on the job until April 30, 2017, as compiled by Datastream and Worldscope. (For CEOs who took office before 1995, we calculated returns using a start date of January 1, 1995, because prior industry-adjusted returns were unavailable.) We then calculated three metrics for each CEO's

THE BEST-PERFORMING

BY DANIEL MCGINN

More than 15 years ago the management writer Jim Collins introduced the flywheel as a metaphor for the enduring power of strong business leadership. A company doesn't shift from "good to great" overnight, he wrote in his 2001 book of that name. Rather, it achieves excellence by "relentlessly pushing a giant heavy flywheel in one direction, turn upon turn, building momentum until a point of breakthrough, and beyond." And once that flywheel starts spinning, Collins said, it tends to keep going.

The power of momentum is evident in our 2017 ranking of the world's best-performing CEOs, a list that is remarkably consistent with last year's tally. Two of this year's top three CEOs were among the top three leaders in 2016, and 16 of the top 25 were in the top quartile. Seventy-two of last year's 100 leaders are repeats, and 23 are appearing for the fourth straight year. Of the 28 CEOs who fell off the list after last year, 11 retired from their companies. (Most of the rest, including the CEOs of Heineken and Vodafone, dropped off because of a significant decline in stock price.) On average, these 100 CEOs generated a 2,507% return on stock (adjusted for exchange-rate effects) during a 17-year tenure, for a 21% average annual return.

There are reasons for this consistency. Unlike rankings that are based on subjective evaluations or short-term metrics, our list relies on objective performance measures over a chief executive's entire tenure—numbers that often hold steady. We continue to view the ranking as a work in progress and to look for ways to improve the methodology—but this year we made no changes to our measurement system, which accounts in part for the lack of big surprises. (For more on our methodology, see "How We Calculated the Rankings," above.)

This year's top performer—his first time in that spot—is Pablo Isla of Inditex, the parent of the retail fashion chains Zara, Pull&Bear, Massimo Dutti, Bershka, Stradivarius, Oysho, and Uterqüe and of the housewares retailer Zara Home. Since becoming CEO, in 2005, Isla has led Inditex on a global expansion during which the company has opened, on average, one store a day. That growth has increased its market value sevenfold and made it Spain's most valuable company. Colleagues describe Isla's management style as humble and at times almost shy. Although he spends much of his time traveling to visit stores, he rarely attends store openings, choosing to avoid the limelight. At headquarters he prefers management by walking around over holding formal meetings—part of his attempt to maintain an entrepreneurial, small-company culture even as the firm has grown very large.

Among apparel retailers, Inditex stands out for two things: Its success in helping consumers easily migrate

tenure: the country-adjusted total shareholder return (including dividends reinvested), which offsets any increase in return that's attributable merely to an improvement in the local stock market; the industry-adjusted total shareholder return (including dividends reinvested), which offsets any increase that results from rising fortunes in the overall industry; and change in market capitalization (adjusted for dividends, share issues, and share repurchases), measured in inflation-adjusted U.S. dollars.

We then ranked each CEO—from 1 (best) to 898 (worst)—on each financial metric and averaged the three rankings to obtain an overall financial rank. Incorporating three metrics is a balanced and robust approach: While country-adjusted and industry-adjusted returns risk being skewed toward smaller companies (it's easier to get large returns if you start from a small base), the change in market capitalization is skewed toward larger companies.

To measure performance on nonfinancial issues, HBR consulted with Sustainalytics, a leading provider of environmental, social, and governance (ESG) research and analytics that works primarily with financial institutions and asset managers, and with CSRHub, which collects, aggregates, and normalizes ESG data from nine research firms and works mainly with companies that want to improve their own ESG performance. We computed one ESG rank using Sustainalytics ratings and one using CSRHub ratings for every firm in our data set. To calculate the final ranking, we combined the overall financial ranking (weighted at 80%) and the two ESG rankings (weighted at 10% each), omitting CEOs who left office before June 30, 2017.

HBR's list of best-performing CEOs was conceived by Morten T. Hansen, Herminia Ibarra, and Urs Peyer. Previous rankings were published in HBR in 2010, 2013, 2014, 2015, and 2016, but the methodology was updated in 2015.

CEOs IN THE WORLD 2017

between physical stores and online shopping, and its "proximity sourcing" system, under which more than half of production takes place close to home. This allows it to keep inventories low and jump on trends to get new merchandise into stores quickly.

Measured on financial returns alone, Isla comes in 18th in our ranking; his company's performance on environmental, social, and governance (ESG) factors, which count for 20% of a leader's score, propelled him to the top spot. ESG-rating firms praise Inditex's transparency in managing, monitoring, and auditing its supply chain. The company encourages consumers to bring worn-out clothing to its stores for recycling (in Spain it runs an at-home-pickup recycling program), and the Join Life brand of Zara, its largest chain, is produced using recycled fibers and with careful attention to the consumption of water and other resources.

If we judged CEOs solely on the basis of financial performance—as we did prior to 2015—the top-ranked leader would be Amazon's founder, Jeff Bezos, who topped the list in 2014 and has been the best financial performer in every subsequent year. Since 2015, when ESG ratings became a factor in our ranking, Bezos has climbed from #87 to #76 to #71. To be sure, Amazon's ESG ratings remain low: This year 88% of global companies scored higher on ESG measures. But those ratings are improving. The company's massive Web Services division generates its own solar and wind energy. And in the past two years Amazon has hired several seasoned sustainability executives, creating optimism about changes likely to come.

Although all investors of course pay close attention to financial performance, there's evidence that many are beginning to watch ESG measures carefully, too. Earlier this year Amir Amel-Zadeh of Oxford University's Saïd Business School and George Serafeim of Harvard Business School published the results of a survey of 413 investment executives, whose firms collectively manage $31 trillion in assets. Half reported using ESG information because they believe it is material to investment performance, and nearly half said they believe that a company with a high ESG score is a less risky investment. Today money managers most frequently use ESG scores as a negative screen—they decline to invest in companies that have very low scores—but the managers surveyed said they expect that more investors will seek high-scoring companies over time and will use the scores to urge companies to do better. "Overall, the evidence in our sample suggests that the use of ESG information is driven primarily by financial rather than ethical motives," the researchers write.

The CEOs listed in the following pages deserve praise for excelling in both arenas.

20

OF THE CEOs LEAD COMPANIES BASED OUTSIDE THEIR COUNTRIES OF BIRTH

1

PABLO ISLA

COMPANY	INDITEX
START YEAR	2005
INDUSTRY	RETAIL
INSIDER	X
COUNTRY	SPAIN
MBA	X
FINANCIAL RANKING	18
SUSTAINALYTICS RANKING	76
CSRHUB RANKING	142

2

MARTIN SORRELL

COMPANY	WPP
START YEAR	1986
INDUSTRY	CONSUMER SERVICES
INSIDER	X
COUNTRY	UNITED KINGDOM
MBA	✓
FINANCIAL RANKING	20
SUSTAINALYTICS RANKING	170
CSRHUB RANKING	65

3

JENSEN HUANG

COMPANY	NVIDIA
START YEAR	1993
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	5
SUSTAINALYTICS RANKING	157
CSRHUB RANKING	259

4

JACQUES ASCHENBROICH

COMPANY	VALEO
START YEAR	2009
INDUSTRY	AUTOMOBILE
INSIDER	X
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	52
SUSTAINALYTICS RANKING	21
CSRHUB RANKING	49

9

ELMAR DEGENHART

COMPANY	CONTINENTAL
START YEAR	2009
INDUSTRY	AUTOMOBILE
INSIDER	X
COUNTRY	GERMANY
MBA	X
FINANCIAL RANKING	34
SUSTAINALYTICS RANKING	121
CSRHUB RANKING	407

10

FLORENTINO PÉREZ RODRÍGUEZ

COMPANY	ACS
START YEAR	1993
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	SPAIN
MBA	X
FINANCIAL RANKING	28
SUSTAINALYTICS RANKING	176
CSRHUB RANKING	415

11

RICHARD COUSINS

COMPANY	COMPASS
START YEAR	2006
INDUSTRY	CONSUMER SERVICES
INSIDER	X
COUNTRY	UNITED KINGDOM
MBA	X
FINANCIAL RANKING	42
SUSTAINALYTICS RANKING	304
CSRHUB RANKING	188

12

MARC BENIOFF

COMPANY	SALESFORCE.COM
START YEAR	2001
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	11
SUSTAINALYTICS RANKING	306
CSRHUB RANKING	447

18

HISASHI IETSUGU

COMPANY	SYSMEX
START YEAR	1996
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	65
SUSTAINALYTICS RANKING	266
CSRHUB RANKING	171

19

WES BUSH

COMPANY	NORTHROP GRUMMAN
START YEAR	2010
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	58
SUSTAINALYTICS RANKING	309
CSRHUB RANKING	184

20

SUH KYUNG-BAE

COMPANY	AMOREPACIFIC
START YEAR	2006
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	SOUTH KOREA
MBA	✓
FINANCIAL RANKING	98
SUSTAINALYTICS RANKING	109
CSRHUB RANKING	105

21

MICHAEL MUSSALLEM

COMPANY	EDWARDS LIFESCIENCES
START YEAR	2000
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	27
SUSTAINALYTICS RANKING	349
CSRHUB RANKING	456

5

BERNARD ARNAULT

COMPANY	LVMH
START YEAR	1989
INDUSTRY	CONSUMER GOODS
INSIDER	X
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	9
SUSTAINALYTICS RANKING	240
CSRHUB RANKING	192

6

MARTIN BOUYGUES

COMPANY	BOUYGUES
START YEAR	1989
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	62
SUSTAINALYTICS RANKING	209
CSRHUB RANKING	81

7

JOHAN THIJS

COMPANY	KBC
START YEAR	2012
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	BELGIUM
MBA	X
FINANCIAL RANKING	73
SUSTAINALYTICS RANKING	90
CSRHUB RANKING	114

8

MARK PARKER

COMPANY	NIKE
START YEAR	2006
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	36
SUSTAINALYTICS RANKING	272
CSRHUB RANKING	237

13

CARLOS BRITO

COMPANY	ANHEUSER-BUSCH INBEV
START YEAR	2005
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	BELGIUM
MBA	✓
FINANCIAL RANKING	44
SUSTAINALYTICS RANKING	244
CSRHUB RANKING	247

14

BERNARD CHARLÈS

COMPANY	DASSAULT SYSTÈMES
START YEAR	1995
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	53
SUSTAINALYTICS RANKING	282
CSRHUB RANKING	195

15

LARS RASMUSSEN

COMPANY	COLOPLAST
START YEAR	2008
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	DENMARK
MBA	✓
FINANCIAL RANKING	80
SUSTAINALYTICS RANKING	37
CSRHUB RANKING	228

16

BENOÎT POTIER

COMPANY	AIR LIQUIDE
START YEAR	1997
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	83
SUSTAINALYTICS RANKING	200
CSRHUB RANKING	63

17

ANDERS RUNEVAD

COMPANY	VESTAS
START YEAR	2013
INDUSTRY	INDUSTRIALS
INSIDER	X
COUNTRY	DENMARK
MBA	✓
FINANCIAL RANKING	101
SUSTAINALYTICS RANKING	39
CSRHUB RANKING	104

22

JOHAN MOLIN

COMPANY	ASSA ABLOY
START YEAR	2005
INDUSTRY	INDUSTRIALS
INSIDER	X
COUNTRY	SWEDEN
MBA	X
FINANCIAL RANKING	87
SUSTAINALYTICS RANKING	149
CSRHUB RANKING	185

23

FRANÇOIS-HENRI PINAULT

COMPANY	KERING
START YEAR	2005
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	FRANCE
MBA	✓
FINANCIAL RANKING	112
SUSTAINALYTICS RANKING	42
CSRHUB RANKING	111

24

ROBERT IGER

COMPANY	DISNEY
START YEAR	2005
INDUSTRY	CONSUMER SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	39
SUSTAINALYTICS RANKING	358
CSRHUB RANKING	379

25

FABRIZIO FREDA

COMPANY	ESTÉE LAUDER
START YEAR	2009
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	76
SUSTAINALYTICS RANKING	284
CSRHUB RANKING	159

#23 DAVID SIMS

26

HUGH GRANT

COMPANY	MONSANTO
START YEAR	2003
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	15
SUSTAINALYTICS RANKING	472
CSRHUB RANKING	481

27

RICHARD TEMPLETON

COMPANY	TEXAS INSTRUMENTS
START YEAR	2004
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	90
SUSTAINALYTICS RANKING	108
CSRHUB RANKING	273

28

STEPHEN LUCZO*

COMPANY	SEAGATE TECHNOLOGY
START YEAR	2009
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	54
SUSTAINALYTICS RANKING	79
CSRHUB RANKING	615

29

PAOLO ROCCA

COMPANY	TENARIS
START YEAR	2002
INDUSTRY	ENERGY
INSIDER	✓
COUNTRY	ARGENTINA
MBA	X
FINANCIAL RANKING	51
SUSTAINALYTICS RANKING	198
CSRHUB RANKING	523

29

TAI-MING "TERRY" GOU

COMPANY	HON HAI PRECISION INDUSTRY
START YEAR	1974
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	TAIWAN
MBA	X
FINANCIAL RANKING	6
SUSTAINALYTICS RANKING	411
CSRHUB RANKING	670

34

FREDERICK SMITH

COMPANY	FEDEX
START YEAR	1971
INDUSTRY	TRANSPORTATION
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	31
SUSTAINALYTICS RANKING	374
CSRHUB RANKING	579

35

MARILLYN HEWSON

COMPANY	LOCKHEED MARTIN
START YEAR	2013
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	100
SUSTAINALYTICS RANKING	221
CSRHUB RANKING	183

36

XAVIER HUILLARD

COMPANY	VINCI
START YEAR	2006
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	97
SUSTAINALYTICS RANKING	335
CSRHUB RANKING	94

37

TAKASHI TANAKA

COMPANY	KDDI
START YEAR	2010
INDUSTRY	TELECOMMUNICATION
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	69
SUSTAINALYTICS RANKING	328
CSRHUB RANKING	338

38

RENATO ALVES VALE

COMPANY	CCR
START YEAR	1999
INDUSTRY	TRANSPORTATION
INSIDER	✓
COUNTRY	BRAZIL
MBA	X
FINANCIAL RANKING	72
SUSTAINALYTICS RANKING	319
CSRHUB RANKING	330

29 HAVE AN MBA

44

BLAKE NORDSTROM

COMPANY	NORDSTROM
START YEAR	2000
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	82
SUSTAINALYTICS RANKING	208
CSRHUB RANKING	450

45

MICHAEL MAHONEY

COMPANY	BOSTON SCIENTIFIC
START YEAR	2012
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	75
SUSTAINALYTICS RANKING	374
CSRHUB RANKING	341

46

GILLES SCHNEPP

COMPANY	LEGRAND
START YEAR	2004
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	163
SUSTAINALYTICS RANKING	8
CSRHUB RANKING	10

*STEPPED DOWN IN OCTOBER

ON AVERAGE, THEY BECAME CEO AT AGE 44 AND HAVE BEEN IN OFFICE 17 YEARS

31

RICHARD FAIRBANK

COMPANY	CAPITAL ONE
START YEAR	1994
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	22
SUSTAINALYTICS RANKING	566
CSRHUB RANKING	390

32

LAURENCE FINK

COMPANY	BLACKROCK
START YEAR	1988
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	3
SUSTAINALYTICS RANKING	464
CSRHUB RANKING	677

33

DANIEL AMOS

COMPANY	AFLAC
START YEAR	1990
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	19
SUSTAINALYTICS RANKING	518
CSRHUB RANKING	509

39

DOUGLAS BAKER JR.

COMPANY	ECOLAB
START YEAR	2004
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	105
SUSTAINALYTICS RANKING	316
CSRHUB RANKING	99

40

AJAY BANGA

COMPANY	MASTERCARD
START YEAR	2010
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	35
SUSTAINALYTICS RANKING	482
CSRHUB RANKING	501

41

SHIGENOBU NAGAMORI

COMPANY	NIDEC
START YEAR	1973
INDUSTRY	INDUSTRIALS
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	21
SUSTAINALYTICS RANKING	516
CSRHUB RANKING	587

42

TADASHI YANAI

COMPANY	FAST RETAILING
START YEAR	1984
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	14
SUSTAINALYTICS RANKING	440
CSRHUB RANKING	731

43

HAMID MOGHADAM

COMPANY	PROLOGIS
START YEAR	1997
INDUSTRY	REAL ESTATE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	110
SUSTAINALYTICS RANKING	72
CSRHUB RANKING	336

47

MICHEL LANDEL

COMPANY	SODEXO
START YEAR	2005
INDUSTRY	CONSUMER SERVICES
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	133
SUSTAINALYTICS RANKING	187
CSRHUB RANKING	73

48

HOCK TAN

COMPANY	BROADCOM
START YEAR	2006
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	X
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	8
SUSTAINALYTICS RANKING	610
CSRHUB RANKING	660

49

GERMÁN LARREA MOTA VELASCO

COMPANY	GRUPO MÉXICO
START YEAR	1994
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	MEXICO
MBA	X
FINANCIAL RANKING	24
SUSTAINALYTICS RANKING	533
CSRHUB RANKING	628

50

DEBRA CAFARO

COMPANY	VENTAS
START YEAR	1999
INDUSTRY	REAL ESTATE
INSIDER	X
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	32
SUSTAINALYTICS RANKING	513
CSRHUB RANKING	594

51

DAVID SIMON

COMPANY	SIMON PROPERTY
START YEAR	1995
INDUSTRY	REAL ESTATE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	9
SUSTAINALYTICS RANKING	670
CSRHUB RANKING	638

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FASHIONABLE GROWTH

A CONVERSATION WITH INDITEX CEO PABLO ISLA

BY DANIEL MCGINN

PHOTOGRAPHY BY ETHAN HILL

Most retail CEOs begin their careers in merchandising, choosing products for stores before they climb into the C-suite. Pablo Isla followed a different path, attending law school and working at a bank before becoming the CEO of Inditex, in 2005. Since then, even as many traditional retailers have faced challenges from e-commerce, he has led a dramatic global expansion: Today the company's eight brands have 7,300 stores in 93 countries. Isla spoke with HBR about what makes Inditex different from competitors. Edited excerpts follow.

HBR: You're known for an informal management style and for avoiding meetings. How do you manage without them?

ISLA: We have a very flat structure. We don't have many formal meetings. In fact, we don't even have a formal management committee. People are empowered—they make decisions themselves after a lot of informal conversation and walking around. Also, we focus on teamwork and avoid having star employees. Last year we promoted more than 25,000 of our 160,000 employees; that helps create an entrepreneurial spirit.

Let's talk about your industry. Many observers classify Zara, your flagship brand, as a fast-fashion company, one that competes with Sweden's H&M and Japan's Uniqlo. Do you agree with that comparison?

I don't like labels. We have our own very specific business model. It's based on the ability to react flexibly within a fashion season. We use what we call proximity sourcing, producing most of our goods in Spain, Portugal, and Morocco; this allows us to make deliveries at the very last minute. We pay a lot of attention to the design of every single product. It is not just a question of being fast. It is the concept of trying to know what our customers want and then having a very integrated supply chain among manufacturing, logistics, and design to get it to them. It has more to do with accuracy than with speed. We make deliveries twice a week to every store. We use technology and algorithms that propose what garments to stock, but the store manager can change the order, because we want the store manager to feel like the owner of the product. It's a combination of technology and human touch.

How are mall closings affecting your business?

I say the same thing about malls that I say about physical stores: High-quality ones will remain very relevant in retailing. In the United States there are many, many malls; we don't want to be in every one. We are very selective, in the U.S. and around the world. And our online operations and stores are highly integrated—they have been since we launched our website.

How is social media changing the way people approach fashion?

People are more connected and aware. It's made fashion more global—everybody knows what is going on in all the different areas of the world. If denim becomes trendy in one market, other markets are likely to follow. This is a good thing for us. Our brands have 100 million social media followers around the world.

Your company's founder, Amancio Ortega, controls more than half of the voting stock at Inditex. How does that change the way you lead?

It's very positive. Having the full support of our founder and our board allows us to take a long-term approach and invest in the business rather than focus on short-term results.

Does that ownership structure affect the way you approach sustainability?

Very significantly. Every decision we make, we consider sustainability—not just me personally, but also the board and all the employees. Sustainability includes the quality of our products, what they're made from, working conditions for the people making them, and the ability to recycle them. We have a public commitment that all our stores will be eco-efficient in the year 2020. That means they will use 40% less water and 20% less energy and that all materials will be environmentally certified. Today 70% of our stores meet that standard. Keep in mind that our workforce is very young. These people are committed to thinking about the planet and contributing positively to society.

As a CEO who was successful early in your career, is there a danger that you'll become less willing to take big risks, to avoid imperiling that track record?

With our business model, that's nearly impossible. We begin each season with the collections, building the product from zero. That requires a very creative culture in which people feel free to take risks.

You're 53. How long will you remain at Inditex, and what might you do after you leave?

I said in a public interview several years ago that I hope to spend my whole career at Inditex. This is the most fascinating job you can find.

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52

THIERRY BRETON

COMPANY	ATOS
START YEAR	2008
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	X
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	152
SUSTAINALYTICS RANKING	50
CSRHUB RANKING	133

53

SERGIO MARCHIONNE

COMPANY	FIAT CHRYSLER
START YEAR	2004
INDUSTRY	AUTOMOBILE
INSIDER	✓
COUNTRY	ITALY
MBA	✓
FINANCIAL RANKING	128
SUSTAINALYTICS RANKING	196
CSRHUB RANKING	181

54

WING KIN "ALFRED" CHAN

COMPANY	HONG KONG AND CHINA GAS
START YEAR	1997
INDUSTRY	UTILITIES
INSIDER	✓
COUNTRY	HONG KONG
MBA	X
FINANCIAL RANKING	91
SUSTAINALYTICS RANKING	202
CSRHUB RANKING	493

55

LEONARD SCHLEIFER

COMPANY	REGENERON PHARMACEUTICALS
START YEAR	1988
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	12
SUSTAINALYTICS RANKING	521
CSRHUB RANKING	810

61

HUATENG "PONY" MA

COMPANY	TENCENT
START YEAR	1998
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	CHINA
MBA	X
FINANCIAL RANKING	2
SUSTAINALYTICS RANKING	669
CSRHUB RANKING	787

62

SHANTANU NARAYEN

COMPANY	ADOBE SYSTEMS
START YEAR	2007
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	143
SUSTAINALYTICS RANKING	131
CSRHUB RANKING	219

63

BRAD SMITH

COMPANY	INTUIT
START YEAR	2008
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	96
SUSTAINALYTICS RANKING	455
CSRHUB RANKING	275

64

MARK BRISTOW

COMPANY	RANDGOLD RESOURCES
START YEAR	1995
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	UNITED KINGDOM
MBA	X
FINANCIAL RANKING	140
SUSTAINALYTICS RANKING	133
CSRHUB RANKING	252

65

MASAYOSHI SON

COMPANY	SOFTBANK
START YEAR	1981
INDUSTRY	TELECOMMUNICATION
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	13
SUSTAINALYTICS RANKING	682
CSRHUB RANKING	735

69

JAMIE DIMON

COMPANY	JPMORGAN CHASE
START YEAR	2005
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	122
SUSTAINALYTICS RANKING	291
CSRHUB RANKING	267

70

STEVE SANGHI

COMPANY	MICROCHIP TECHNOLOGY
START YEAR	1991
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	57
SUSTAINALYTICS RANKING	419
CSRHUB RANKING	671

71

JEFFREY BEZOS

COMPANY	AMAZON
START YEAR	1996
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	1
SUSTAINALYTICS RANKING	694
CSRHUB RANKING	850

71

DAVID CORDANI

COMPANY	CIGNA
START YEAR	2009
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	111
SUSTAINALYTICS RANKING	283
CSRHUB RANKING	381

56

LESLIE WEXNER

COMPANY	L BRANDS
START YEAR	1963
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	40
SUSTAINALYTICS RANKING	377
CSRHUB RANKING	740

57

DANIEL HAJJ ABOUMRAD

COMPANY	AMÉRICA MÓVIL
START YEAR	2000
INDUSTRY	TELECOMMUNICATION
INSIDER	✓
COUNTRY	MEXICO
MBA	X
FINANCIAL RANKING	38
SUSTAINALYTICS RANKING	553
CSRHUB RANKING	583

58

IGNACIO GALÁN

COMPANY	IBERDROLA
START YEAR	2001
INDUSTRY	UTILITIES
INSIDER	X
COUNTRY	SPAIN
MBA	✓
FINANCIAL RANKING	171
SUSTAINALYTICS RANKING	51
CSRHUB RANKING	35

59

REINHARD PLOSS

COMPANY	INFINEON TECHNOLOGIES
START YEAR	2012
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	GERMANY
MBA	X
FINANCIAL RANKING	160
SUSTAINALYTICS RANKING	93
CSRHUB RANKING	88

60

MARTIN GILBERT

COMPANY	ABERDEEN ASSET MANAGEMENT
START YEAR	1983
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	UNITED KINGDOM
MBA	X
FINANCIAL RANKING	159
SUSTAINALYTICS RANKING	120
CSRHUB RANKING	71

66

YASUYUKI YOSHINAGA

COMPANY	SUBARU
START YEAR	2012
INDUSTRY	AUTOMOBILE
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	61
SUSTAINALYTICS RANKING	484
CSRHUB RANKING	554

32

HAVE AN ENGINEERING DEGREE

67

PIERRE NANTERME

COMPANY	ACCENTURE
START YEAR	2011
INDUSTRY	INFORMATION SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	173
SUSTAINALYTICS RANKING	118
CSRHUB RANKING	26

68

OSCAR GONZÁLEZ ROCHA

COMPANY	SOUTHERN COPPER
START YEAR	2004
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	MEXICO
MBA	X
FINANCIAL RANKING	26
SUSTAINALYTICS RANKING	574
CSRHUB RANKING	749

73

BRUCE FLATT

COMPANY	BROOKFIELD ASSET MANAGEMENT
START YEAR	2002
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	CANADA
MBA	X
FINANCIAL RANKING	33
SUSTAINALYTICS RANKING	583
CSRHUB RANKING	706

74

GREGORY CASE

COMPANY	AON
START YEAR	2005
INDUSTRY	FINANCIAL SERVICES
INSIDER	X
COUNTRY	UNITED KINGDOM
MBA	✓
FINANCIAL RANKING	50
SUSTAINALYTICS RANKING	569
CSRHUB RANKING	586

75

MARK BERTOLINI

COMPANY	AETNA
START YEAR	2010
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	74
SUSTAINALYTICS RANKING	542
CSRHUB RANKING	437

76

KENT THIRY

COMPANY	DAVITA
START YEAR	1999
INDUSTRY	HEALTH CARE
INSIDER	X
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	49
SUSTAINALYTICS RANKING	568
CSRHUB RANKING	616

77

BRIAN ROBERTS

COMPANY	COMCAST
START YEAR	2002
INDUSTRY	CONSUMER SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	59
SUSTAINALYTICS RANKING	444
CSRHUB RANKING	666

78

STEPHEN HEMSLEY*

COMPANY	UNITEDHEALTH
START YEAR	2006
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	79
SUSTAINALYTICS RANKING	465
CSRHUB RANKING	494

79

JAMES TAICLET JR.

COMPANY	AMERICAN TOWER
START YEAR	2003
INDUSTRY	REAL ESTATE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	16
SUSTAINALYTICS RANKING	620
CSRHUB RANKING	846

80

ANDRÉ DESMARAIS

COMPANY	POWER CORPORATION OF CANADA
START YEAR	1996
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	CANADA
MBA	X
FINANCIAL RANKING	105
SUSTAINALYTICS RANKING	250
CSRHUB RANKING	508

80

PAUL DESMARAIS JR.

COMPANY	POWER CORPORATION OF CANADA
START YEAR	1996
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	CANADA
MBA	✓
FINANCIAL RANKING	105
SUSTAINALYTICS RANKING	250
CSRHUB RANKING	508

86

THOMAS EBELING

COMPANY	PROSIEBENSAT.1
START YEAR	2009
INDUSTRY	CONSUMER SERVICES
INSIDER	X
COUNTRY	GERMANY
MBA	X
FINANCIAL RANKING	68
SUSTAINALYTICS RANKING	512
CSRHUB RANKING	614

87

JEAN-PAUL AGON

COMPANY	L'ORÉAL
START YEAR	2006
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	199
SUSTAINALYTICS RANKING	80
CSRHUB RANKING	1

ONLY 2 ARE WOMEN

88

JEF COLRUYT

COMPANY	COLRUYT
START YEAR	1994
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	BELGIUM
MBA	X
FINANCIAL RANKING	104
SUSTAINALYTICS RANKING	361
CSRHUB RANKING	482

89

REED HASTINGS

COMPANY	NETFLIX
START YEAR	1998
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	4
SUSTAINALYTICS RANKING	774
CSRHUB RANKING	870

93

JOHN WREN

COMPANY	OMNICOM
START YEAR	1997
INDUSTRY	CONSUMER SERVICES
INSIDER	✓
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	48
SUSTAINALYTICS RANKING	594
CSRHUB RANKING	729

94

TIMOTHY RING

COMPANY	C. R. BARD
START YEAR	2003
INDUSTRY	HEALTH CARE
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	55
SUSTAINALYTICS RANKING	488
CSRHUB RANKING	781

95

ROB SANDS

COMPANY	CONSTELLATION BRANDS
START YEAR	2007
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	44
SUSTAINALYTICS RANKING	689
CSRHUB RANKING	678

96

XAVIER ROLET

COMPANY	LONDON STOCK EXCHANGE
START YEAR	2009
INDUSTRY	FINANCIAL SERVICES
INSIDER	X
COUNTRY	UNITED KINGDOM
MBA	✓
FINANCIAL RANKING	134
SUSTAINALYTICS RANKING	420
CSRHUB RANKING	230

*STEPPED DOWN IN AUGUST

81 ARE INSIDERS

82

PAUL POLMAN

COMPANY	UNILEVER
START YEAR	2009
INDUSTRY	CONSUMER GOODS
INSIDER	X
COUNTRY	UNITED KINGDOM
MBA	✓
FINANCIAL RANKING	177
SUSTAINALYTICS RANKING	168
CSRHUB RANKING	17

83

HIROO UNOURA

COMPANY	NIPPON TELEGRAPH AND TELEPHONE
START YEAR	2012
INDUSTRY	TELECOMMUNICATION
INSIDER	✓
COUNTRY	JAPAN
MBA	X
FINANCIAL RANKING	144
SUSTAINALYTICS RANKING	255
CSRHUB RANKING	216

84

BOBBY KOTICK

COMPANY	ACTIVISION BLIZZARD
START YEAR	1991
INDUSTRY	INFORMATION TECHNOLOGY
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	7
SUSTAINALYTICS RANKING	743
CSRHUB RANKING	851

85

RICHARD FAIN

COMPANY	ROYAL CARIBBEAN CRUISES
START YEAR	1988
INDUSTRY	CONSUMER SERVICES
INSIDER	X
COUNTRY	UNITED STATES
MBA	✓
FINANCIAL RANKING	119
SUSTAINALYTICS RANKING	216
CSRHUB RANKING	491

90

LUI CHE WOO

COMPANY	GALAXY ENTERTAINMENT
START YEAR	1991
INDUSTRY	CONSUMER SERVICES
INSIDER	✓
COUNTRY	HONG KONG
MBA	X
FINANCIAL RANKING	22
SUSTAINALYTICS RANKING	714
CSRHUB RANKING	790

91

JOHN MACKEY

COMPANY	WHOLE FOODS MARKET*
START YEAR	1978
INDUSTRY	RETAIL
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	63
SUSTAINALYTICS RANKING	518
CSRHUB RANKING	668

92

STEPHEN SMITH

COMPANY	EQUINIX
START YEAR	2007
INDUSTRY	REAL ESTATE
INSIDER	X
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	66
SUSTAINALYTICS RANKING	489
CSRHUB RANKING	675

97

ENRIQUE CUETO

COMPANY	LATAM AIRLINES
START YEAR	1994
INDUSTRY	TRANSPORTATION
INSIDER	✓
COUNTRY	CHILE
MBA	X
FINANCIAL RANKING	114
SUSTAINALYTICS RANKING	482
CSRHUB RANKING	329

98

SEAN BOYD

COMPANY	AGNICO EAGLE MINES
START YEAR	1998
INDUSTRY	MATERIALS
INSIDER	✓
COUNTRY	CANADA
MBA	X
FINANCIAL RANKING	149
SUSTAINALYTICS RANKING	261
CSRHUB RANKING	276

99

JEAN-LAURENT BONNAFÉ

COMPANY	BNP PARIBAS
START YEAR	2011
INDUSTRY	FINANCIAL SERVICES
INSIDER	✓
COUNTRY	FRANCE
MBA	X
FINANCIAL RANKING	203
SUSTAINALYTICS RANKING	87
CSRHUB RANKING	31

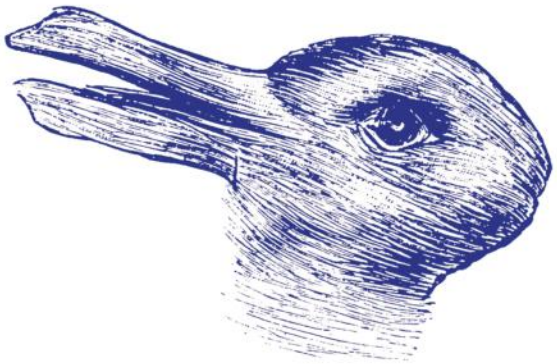
100

IAN COOK

COMPANY	COLGATE-PALMOLIVE
START YEAR	2007
INDUSTRY	CONSUMER GOODS
INSIDER	✓
COUNTRY	UNITED STATES
MBA	X
FINANCIAL RANKING	186
SUSTAINALYTICS RANKING	167
CSRHUB RANKING	89

#82 EMANUELE SCORCELLETTI

*ACQUIRED BY AMAZON IN AUGUST



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What Everyone Gets Wrong About Change Management

Poor execution is only part of the problem.

BY N. ANAND AND JEAN-LOUIS BARSOUX

Corporate transformations still have a miserable success rate, even though scholars and consultants have significantly improved our understanding of how they work. Studies consistently report that about three-quarters of change efforts flop—either they fail to deliver the anticipated benefits or they are abandoned entirely.

Because flawed implementation is most often blamed for such failures, organizations have focused on improving execution. They have embraced the idea that transformation is a process with key stages that must be carefully managed and levers that must be pulled—indeed, expressions such as "burning platform," "guiding coalition," and "quick wins" are now common in the change management lexicon. But poor execution is only part of the problem; our analysis suggests that misdiagnosis is equally to blame. Often organizations pursue the wrong changes—especially in complex and fast-moving environments, where decisions about what to transform in order to remain competitive can be hasty or misguided.

Before worrying about *how* to change, executive teams need to figure out *what* to change—in particular, what to change *first*. That's the challenge we set out to investigate in our four-year study of 62 corporate transformations.

When companies don't choose their transformation battles wisely, their efforts have a negative effect on performance. Consider what happened after Ron Johnson took over as CEO of J.C. Penney: He immediately gave store design and pricing an overhaul to attract younger, trendier customers. Sales sank by a quarter, and the stock plummeted by half.

Johnson's first priority should have been a better integration of JCP's in-store and online operations. At that time customers could not find in the stores what was being showcased online, and vice versa. The two channels were run separately, each with its own merchandise and supply chain. Johnson's eventual replacement, Marvin Ellison, recognized the misalignment and restored JCP to profitability. Under Ellison's leadership, JCP became nimbler and more responsive to customers looking for deals (who had left in droves because of Johnson's changes). The retailer redesigned its shopping app to make it easier for in-store customers to find discounts, improved its website, and caught up with rivals by offering same-day in-store pickup of items ordered online.

As JCP and many other companies have learned, the costs of setting off on the wrong transformation journey are significant: First, underlying problems will persist and worsen as attention is invested elsewhere (JCP fell further behind in online sales as it freshened up store design). Second, new problems may emerge (JCP alienated loyal, deal-driven customers with its new pricing strategy and saddled itself with more than $5 billion of debt, which hampered its ability to invest in technology). And third, the executive team risks undermining employee commitment to future initiatives (Ellison had to remobilize a workforce still traumatized by JCP's near collapse under Johnson). Having "fixed the plumbing," Ellison's leadership team has turned its attention to making JCP more relevant to shoppers in the coming decade. Although it has averted disaster, the company still has a lot of work to do. After a rough holiday season in 2016, the executive team decided to close almost 140 stores to compete more effectively with online retailers. The need for transformation is ongoing.

So how can leaders decide which changes to prioritize at the moment? By fully understanding three things: the catalyst for transformation, the organization's underlying quest, and the leadership capabilities needed to see it through. Our analysis of stalled transformations suggests that failing to examine and align these factors drastically reduces the odds of producing lasting change. In this article we illustrate this dynamic with several classic case studies that provide enough distance to observe and compare clear, verifiable outcomes. We also offer tools to help diagnose what's needed in your company's transformation efforts.

IN BRIEF

THE PROBLEM
Failed corporate transformations are usually attributed to execution—but often leaders misdiagnose what changes need to be made.

THE COSTS
When organizations pursue the wrong changes or tackle them in the wrong order, existing problems get worse, new ones are created, and employees, having been burned, become wary of future initiatives.

THE SOLUTION
Before setting their change priorities, leaders should analyze three things: the catalyst for transformation, the underlying quest, and the leadership capabilities needed to pursue it.

THE CATALYST: PURSUING VALUE

The trigger for any corporate transformation is the pursuit of value. Ideally, that entails both improving efficiency (through streamlining and cost cutting) and reinvesting in growth. But many transformation efforts derail because they focus too narrowly on one or the other.

In some cases, attempts to streamline the business through productivity improvements, outsourcing, divestments, or restructuring undermine growth. The cuts are so deep that they hollow out capabilities, sap morale, and remove the slack that could have fueled new endeavors.

Consider Norske Skog, once the world's largest newsprint producer—now, according to Bloomberg, the third largest in Europe, in a dwindling market. Hit by falling demand for paper more than a decade ago, the Norwegian company was forced to divest unprofitable operations across four continents. Thanks to its profitability improvement program, it became so good at identifying where to make cuts that it was praised by *BusinessWeek* in 2009 for turning "shrinking into a science." But although the company has survived, it has not found a way to rebound. Like many companies in contracting or commoditizing industries, it is stuck in turnaround mode, with its share price consistently in decline. By contrast, its Swedish-Finnish paper rival Stora Enso also went through several rounds of painful restructuring but has since reinvented itself as a renewable-materials company.

In other cases, reinvestment in growth spins out of control. Lego had this problem. The Danish toy maker made two large-scale attempts to transform itself through greater innovation. The first, launched in 2000, delivered a wealth of freewheeling experimentation that over the next few years drove the company to the brink of bankruptcy. The second, launched in 2006 (once the company had recovered its financial stability), catapulted Lego past the two U.S. giants Hasbro and Mattel to become the world's most profitable toy company by 2014, with margins greater than 30%. Why the big difference? The second time around, under then CEO Jørgen Vig Knudstorp, Lego maintained a dual focus on growth *and* discipline. The company set up a cross-functional committee (the Executive Innovation Governance Group) to fund, monitor, and strategically coordinate innovation activities, ensuring that they remained "around the box" rather than drifting way outside it.

This example brings us to a larger point about catalysts for change: While you're striving for growth, discipline—through governance, metrics, and other controls—allows you to stay on track later on, after you have chosen your journey's direction. Without such controls in place, your company can easily lose its way. This often happens through the hasty purchase of an overpriced or tough-to-integrate "transformative acquisition" that is meant to redirect the strategy but just ends up sucking value out of the corporation. Hewlett-Packard is a notable recidivist in this domain: Recall its ill-fated acquisitions of Compaq, EDS, and Autonomy.

But how can you and others on the leadership team figure out what kind of transformation to pursue, once growth opportunities or declining performance has alerted you to the need for major change of some kind? That's the second step in the process—defining the quest.

THE QUEST: CHOOSING YOUR DIRECTION

Next the organization must identify the specific quest that will lead to greater value generation. Executives increasingly use the term "transformation" as shorthand for "digital transformation." But the ongoing digital revolution does not itself constitute a transformation—it is a means to an end, and you must define what that end should be.

Studies and analysis that we have conducted show that most corporate transformation efforts are either derivatives or combinations of five prototypical quests:

1. *Global presence:* extending market reach and becoming more international in terms of leadership, innovation, talent flows, capabilities, and best practices
2. *Customer focus:* understanding your customers' needs and providing enhanced insights, experiences, or outcomes (integrated solutions) rather than just products or services
3. *Nimbleness:* accelerating processes or simplifying how work gets done to become more strategically, operationally, and culturally agile
4. *Innovation:* incorporating ideas and approaches from fresh sources, both internal and external, to expand the organization's options for exploiting new opportunities
5. *Sustainability:* becoming greener and more socially responsible in positioning and execution

Each quest has its own focus, enablers, and derailers, and each requires the company to do something more or different with its operating model, customers, partners, internal processes, or resources. "Going digital" can support any of the five quests, and all of them call for discipline. (See the exhibit "Understanding the Five Quests.")

Let's return to the paper giant Stora Enso to see how it defined its quest. The catalyst for transformation was the plunging demand

for paper along with the rise of digitization. Stora desperately needed not only to cut costs but also to rethink its business focus.

Members of the top team consulted widely with various divisions and layers of the company and engaged in lengthy deliberations. Weighing the options, they concluded that pursuing nimbleness, global presence, or customer focus would merely yield more market share in a declining industry. Innovation would not solve the main issue either. But the company had developed some breakthrough green offerings, including environmentally friendly packaging for the expanding e-commerce delivery market. Its greatest opportunity lay in shifting the whole axis of the business to specialize in offerings made with renewable and bio-based materials. So Stora's was a sustainability quest. That turned out to be a shrewd pivot. Traditional paper-based products now represent only 8% of Stora's profits, and the company's share price has almost tripled since November 2011.

It can be difficult to choose the right quest. Should the company expand into new regions, get closer to customers, innovate with more partners, get faster and more responsive, or become more sustainable? Executives sometimes say "all of the above"—but that's too much to handle at once. The right quest should be a compelling and uncontested priority. In some of the cases we analyzed, companies straddled quests (customer focus and agility, for instance, or innovation and sustainability). That can work as long as the components are fused into one cogent focus.

With multiple organizational challenges jostling for attention, top teams are liable to disagree on the transformation priority. That's why we created a 15-question audit. (See the exhibit "Conduct a Quest Audit.") In our research and consulting engagements, we've found that this tool allows executives to do their own systematic review so that they can make smart decisions regarding transformation. For example, at a French utility company we worked with, the top 200 executives participated in a "transformation jam" where they all filled out a status report that identified the critical enablers and blockers for each potential quest. This and the quest audit helped to clarify and reconcile the priorities of different parts of the organization, from the boardroom and the C-suite to the front lines.

Choosing the right quest can be hard. It should be a compelling and uncontested priority.

THE CAPABILITIES: DEVELOPING LEADERS

Finally, to support the chosen quest, the company must develop leaders who can see it through. Sustained transformation depends on this.

Again Stora Enso is a useful case in point. Jouko Karvinen, the company's CEO until July 2014, realized that his executive team—all Nordics, all industry veterans—could continue to squeeze costs out of core businesses but would struggle to explore prospects for fresh growth. So, in close consultation with then HR head Lars Häggström, he set up a parallel "Pathfinders" leadership team—a dozen managers from various parts of the organization—and gave them a mandate to identify sustainability opportunities that were falling between silos and, more broadly, to challenge the old ways of doing business. Each year the organization replaces its Pathfinders with a new cohort of up to 16 members. At first this was mainly a way to keep bringing new perspectives into high-level decision making, but it expanded into a program for identifying and developing change agents within the organization who would then serve as internal management consultants. The Pathfinders program became the centerpiece of the company's new leadership-development activities.

Transformation journeys run out of steam when companies neglect leadership development. In order to keep an organization moving in the desired direction, executives and managers at all levels must understand which mindsets and behaviors will take the company there and then take care to model them so that employees know how to act in the new context.

Any mismatch between the leadership-development effort and the transformation quest is bound to impair value generation. The need for alignment is well demonstrated by the familiar but instructive story of two Asian rivals in personal computing.

In 2008 Taiwan's Acer and China's Lenovo ranked third and fourth respectively in global market share, well behind HP and Dell. By 2015 Lenovo had claimed the top spot and Acer had slipped to sixth. They had defined similar quests—achieving global reach—and they pursued similar strategies, seizing opportunities to generate value and transform their global presence by acquiring embattled Western businesses. Lenovo grabbed IBM's PC division in 2005; Acer snapped up Gateway in the United States

UNDERSTANDING THE FIVE QUESTS

The best execution in the world won't lead to a successful transformation if your organization pursues the wrong change. Quests fall into five categories, and more than one may be relevant, so leadership teams must decide which to prioritize and which to postpone. Pursuing too many quests at once is a recipe for failure.

QUEST	ENABLERS	BLOCKERS
GLOBAL PRESENCE Become more international in mindset as well as market reach *by reconfiguring the operating model*	• Rewiring systems and networks to leverage capabilities, knowledge, and ideas wherever they are • Preserving corporate principles while remaining flexible on cultural practices • Using diversity as a source of competitive advantage	• Acquiring weak businesses in haste to develop a global footprint • Honoring the "dominant" culture while paying lip service to the rest • Failing to integrate talent on a global scale
CUSTOMER FOCUS Provide tailored solutions to user problems *by reconfiguring the customer experience*	• Organizing, equipping, training, and rewarding the workforce to better understand and address customers' needs • Redefining relationships with vendors, intermediaries, and suppliers • Reframing customer relations to learn rather than simply to close deals	• Failing to reshape an entrenched culture that emphasizes pushing products • Continuing to depend on former sales intermediaries • Not coordinating front- and back-office units to deliver seamless solutions
INNOVATION Tap multiple sources of ideas and approaches *by reconfiguring R&D partners*	• Navigating the full innovation spectrum, from value chain partners to competitors to lead users and crowdsourcing • Collaborating to convert new ideas into tangible innovation • Articulating innovation needs clearly and creating win-win outcomes with partners	• Relying too much on one or two parts of the innovation spectrum • Resorting to rigid contracts with innovation partners • Lacking oversight that ensures frugal investment
NIMBLENESS Become more strategically, operationally, and culturally agile *by reconfiguring business processes*	• Developing the capability to detect and respond to major changes in the environment • Leveraging diversity to exploit opportunities • Learning to prototype rapidly and institutionalizing what works	• Allowing blind spots to produce an incomplete picture • Responding too slowly because of red tape • Taking too long to cut your losses when something doesn't work
SUSTAINABILITY Become greener and more socially responsible *by reconfiguring resources*	• Engaging all stakeholders to become sustainable • Leveraging sustainability as a source of strategic advantage • Communicating top-team commitment to the sustainability agenda	• Undermeasuring or -reporting progress toward sustainability • Broadcasting shallow PR victories ("greenwashing") • Failing to balance efficiency and sustainability goals

in 2007 and Packard Bell in Europe in 2008. But a key difference between Lenovo and Acer was their commitment to globalizing the senior leadership ranks.

Acer's board struggled with "de-Taiwanization," rejecting CEO Gianfranco Lanci's bold plans to hire foreign talent with expertise in mobile technology and to triple the number of engineers. (It's worth noting that Lanci soon left Acer to head up Lenovo's PC group.) In 2010 Acer had six foreigners among its top 24 executives; by 2014 it was down to three out of 23. In the same period, the board went from having two foreign directors to having none. Predictably, the top team's decision making became increasingly cautious and inward-looking. In 2016, for example, it hired the founder's son to head up the company's cloud services, which prompted the *TechNews* headline "Is Acer Becoming a Family Business?"

By contrast, leadership development at Lenovo was fully in line with the company's quest for a greater global presence. By 2012 its top team of nine represented six nationalities. Its Chinese CEO, Yang Yuanqing, relocated to the United States, and other members of the team were scattered globally, gathering for one week each month in a different strategic market. Aware of the challenges his team faced as a result of its members' varied backgrounds, the CEO brought in a coach to work with the executives on cross-cultural issues. And to promote diversity as a source of competitive advantage—in both hiring and operations companywide—Lenovo elevated the role of cultural integration and diversity VP to the C-suite. Such efforts paved the way for ambitious acquisitions and joint ventures with German, Japanese, Brazilian, and U.S. companies—enabling Lenovo to extend into new software and services categories globally.

TRANSFORMATION TRAPS

Many transformation efforts are set up to fail at the quest stage. Top teams get sidetracked or overreach when they lose focus on what value is worth pursuing—or they take on more change than their leadership capabilities can steer. Our investigations reveal three common failings:

Neglecting the quest. In companies that don't identify a mobilizing theme, value generation and leadership development can become ends in themselves—generic efforts,

not really linked to the strategy. For example, India's Infosys developed a widely admired approach to leadership development but ran into trouble because it failed to tie that to the transformational needs of the business—forcing the IT giant to turn to an outside CEO to drive the necessary changes.

Being seduced by the wrong quest. The board and the top team may be led astray by the vision of a forceful CEO (like Ron Johnson at J.C. Penney), try to copy the strategic moves of competitors, or fall for recommendations from consultants who favor particular quests. In those situations, the chosen quest misfires because it was not the product of deep deliberation or shared conviction or it fails to address the central issue. For example, GE transplant Bob Nardelli tried to transform Home Depot by selling supplies to construction professionals as well as to homeowners. The pursuit of customers in adjacent markets distracted attention from Home Depot's core problem of slumping store sales. When Nardelli resigned, under intense pressure from shareholders, the strategy was immediately reversed and the wholesale arm sold off to allow the company to refocus on its core retail business. From seventh-largest global retailer, Home Depot has since jumped to third.

Focusing on multiple quests. The quest choice may be muddled if leaders can't agree on which direction to go. Different parts of the business (regions, functions, levels) see different problems and priorities. Some corporations overreach, taking on too many quests at once or overestimating their leadership capabilities in a given area. Back in 2009 the incoming Carrefour CEO, Lars Olofsson, launched an ambitious transformation plan for the retail giant based on seven strategic initiatives, including enhanced innovation, customer engagement, agility, and global expansion. The result was confusion, a loss of domestic market share, and a 53% plunge in share price in one year. Olofsson lasted barely two years in the job. His replacement, Georges Plassat, panned the leadership capability of the previous team, labeling the members "incompetent in mass retailing." In a successful recovery plan, Plassat first focused on shedding operations in noncore markets and streamlining internal operations. He then reignited domestic sales by cutting prices and diversifying stores. Three years later Carrefour had regained a clear lead in the French market.

CONDUCT A QUEST AUDIT

Rate each of these competencies on a 1-to-7 scale (7 is strongest). Your lowest scores will identify your most urgent priorities for change.

GLOBAL PRESENCE
How well do we...
- pursue expansion with a strategic global perspective?
- share local learning about business practices globally?
- use digital technology to bring together key populations?

CUSTOMER FOCUS
How well do we...
- create offerings with meaningful value to customers?
- recognize team-based efforts in developing and selling solutions?
- use analytics to identify which solutions customers need most?

INNOVATION
How well do we...
- cooperate with external partners to create new technologies and offerings?
- create an environment of trust for effective collaboration?
- leverage digital platforms for innovation?

NIMBLENESS
How well do we...
- sense changes in the environment?
- act on those changes in a timely way?
- share information across the organization?

SUSTAINABILITY
How well do we...
- integrate our sustainability strategy into the overall corporate vision and strategy?
- implement sustainability in decision making, processes, and systems throughout the organization?
- use digital technology to catalog and evaluate sustainability initiatives?

GETTING STARTED

It can be useful to think of value generation and leadership development as the chariot wheels that support a transformation, and the quest as the horse that provides direction and momentum. Alignment among the three is critical if you want to reach your destination.

The quest audit facilitates alignment by making it easier to diagnose the current situation, identify which transformation could be a game changer, and decide which enablers and blockers to target to make it happen. This tool has been validated with more than 500 executives and road tested by a dozen companies (across industries and continents) seeking to transform themselves. It helps address these underlying challenges:

Facing reality. Having a structured way to solicit and gather input allows senior teams to take a cold, hard look at the company. Knowledge, competencies, or activities that were once central to the organization may have become what Harvard's Dorothy Leonard-Barton calls core rigidities. If so, they need to be adapted or jettisoned. The more radical the transformation, the greater the chance that such limitations will be exposed. Confronting harsh reality may also involve identifying and addressing blind spots.

For the HR head of a European postal services group, a quest audit revealed a disconcerting pattern. "The low scores on value, customer focus, and innovation seem to highlight our company's ineffectiveness in listening respectively to the market, to our customers, and to suppliers or partners," she told her team. "It's hard to admit, but it's better to recognize now the inertia of our organization that needs to be tackled urgently." Similarly, the head of HR at a Japanese food group observed that doing the exercise opened up team dialogue on issues that were previously off-limits: "It provided 'permission' to reflect on the current reality and how we got to where we are. That immunity led us to frame some breakthrough questions to understand our challenge and what we needed to do to solve it."

Debating priorities. Often the diagnosis reveals multiple challenges and the debate centers on which of them matters most—or which can be tackled immediately, given the company's current leadership capabilities. Conceptual tools can't tell top teams what to do, but they can support a

smarter discussion, with much of the critical information visible at a glance.

By mapping out where various parties see opportunities and hazards, executives can avoid a major decision-making trap: getting stuck with a false choice between pursuing one strategic option and doing nothing. Articulating the pressures and challenges makes it easier to debate and evaluate the relative merits of various responses.

Take the case of Cosentino, a Spanish manufacturer of engineered surfaces for kitchens and bathrooms. Because the company had established a solid distribution foothold in the United States, the most obvious strategy was to keep extending its global presence. But after using the quest audit to weigh their options, the top 70 executives decided instead to prioritize co-innovation—not just with Cosentino's supply chain partners but with other high-end kitchen and bathroom businesses (facades, flooring, and equipment)—to anticipate new trends. They elected to work on their biggest weakness rather than to build on an obvious strength.

Reconciling perspectives or priorities and developing a shared understanding of the cause of the current state of affairs is not painless. But sidestepping that discomfort only reduces the chances of selecting a viable transformation objective. According to the head of finance of an Italian fashion group, "Our discussions highlighted areas where we perhaps were not as aligned as we thought and emphasized common pain points regardless of where you sit in the organization. The reflection drove convergence about what we needed to do and stop doing."

Joint consultation also builds a sense of involvement that boosts the perception of fair process and therefore commitment to the chosen course of action.

Communicating choices. Having debated the priorities and challenges, an organization's leaders can feel more confident in advocating a particular course of action and communicating the message to others. They are better equipped to explain how they reached this conclusion, what alternatives they scrutinized, and why they think this is the right transformation journey. If employees feel that the analytical work was thorough and inclusive, they are more likely to accept the decision, even if they don't like it.

Of course, analysis alone seldom inspires people to act in unfamiliar and perhaps unwelcome ways. When leading people into an uncertain future, it helps if the decision makers can get people talking about enablers and blockers. That gives everyone a sense of where the organization stands, what it must transform—and why, beyond "survival," the journey is worth making.

Here's an example of how this can play out: At GroupM, the world's largest media investment group, the top team of the South Asia operation concluded that its competition in the digital age consisted of not just the traditional agency networks but also disruptive start-ups and digital platforms that could cultivate direct access to its clients. As the team debated priorities, innovation through deeper partnerships with potential new competitors emerged as number one. Further discussions, including one mediated by a "youth committee" made up of highfliers under the age of 30, revealed that a key enabler was the ability to pick the right innovation partners. A key blocker, according to C.V.L. Srinivas, the division's CEO, was "getting people working in a successful organization to change their mindset and accept that we needed to change in order to stay relevant." So the top team chose a communication strategy that balanced hard and soft approaches: setting tough targets for employees to increase their proportion of digital work while making it clear that they would receive the support and training to achieve those goals.

With multiple challenges jostling for attention, top teams are liable to disagree on the transformation priority.

AS THE SHELF LIFE of business strategies grows shorter, a corporation's transformation capability becomes its only enduring advantage. A quest for innovation provided a focus for Lego's transformation under Knudstorp. But now, as Lego nears saturation in its lead markets, such as the United States and Germany, its attention is on fast-growth emerging economies—the new quest being to transform a Danish brand with global appeal into a truly global corporation.

With serial transformations becoming the norm, a key strategic question for any corporate leader is, How can we make our next transformation flourish? This article will help you answer that question.

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TURNING POTENTIAL

THE MISSING LINK IN LEADERSHIP

TO SUCCESS
DEVELOPMENT

BY CLAUDIO FERNÁNDEZ-ARÁOZ, ANDREW ROSCOE, AND KENTARO ARAMAKI

Organizations around the world are failing on one key metric of success: leadership development. According to research from the Corporate Executive Board (CEB), 66% of companies invest in programs that aim to identify high-potential employees and help them advance, but only 24% of senior executives at those firms consider the programs to be a success. A mere 13% have confidence in the rising leaders at their firms, down from an already-low 17% just three years ago. And at the world's largest corporations—which each employ thousands of executives—a full 30% of new CEOs are hired from the outside.

VALDUM/DREAMSTIME

The problem isn't a lack of internal talent. At Egon Zehnder we've been measuring executive potential for more than 30 years, and we've identified the predictors that correlate strongly with competence at the top. The first is *the right motivation.* This generally means a fierce commitment to excel in the pursuit of big, collective goals but, to a great extent, is contextual. For example, the leaders of a large charity and of an investment bank will need different kinds of motivation. This predictor can't easily be rated or compared meaningfully across individuals. However, the other predictors—*curiosity, insight, engagement,* and *determination*—can be measured and compared. And when we look at how managers in our global database (who come from thousands of companies in all sectors and are mostly in the top three levels of the hierarchy) score on those four key hallmarks, we find that 72% of them demonstrate the potential to grow into C-suite roles. In addition, 9% have what it takes to become competent CEOs.

Unfortunately, many organizations haven't figured out how to fully develop their prospective leaders. That limits these people's advancement and eventually their engagement and, ultimately, leads to turnover. Recent research from Gallup shows that 51% of U.S. managers feel disconnected from their jobs and companies, while 55% are looking for outside opportunities. And the problem cascades down: According to two comprehensive studies from Indeed.com, the most popular U.S. job-search website, 71% of employees are either actively hunting for or open to a new job, while 58% review postings at least monthly. The average rate of employee turnover (of which about three-quarters is voluntary) has been growing steadily for the past six years. In 2016 it hit a new high of 20.3% in the United States, and it's much higher in the most attractive sectors. The stats in other countries are comparable.

Low engagement and high turnover are extremely costly for organizations, especially if the people jumping ship are high potentials in whom much has already been invested. How can companies prevent this massive waste of talent and create more-effective development programs?

- First, by determining the most important competencies for leadership roles at their organizations. In our leadership advisory services at Egon Zehnder, we've identified seven that we believe are crucial for most executive positions at large companies: *results orientation, strategic orientation, collaboration and influence, team leadership, developing organizational capabilities, change leadership,* and *market understanding.* In addition, many leading companies are finding that an eighth—*inclusiveness*—is essential to executive performance.
- Second, by rigorously assessing the potential of aspiring managers: checking their motivational fit and carefully rating them on the four key hallmarks—curiosity, insight, engagement, and determination. (See the June 2014 HBR article "21st-Century Talent Spotting" for a primer on this.)
- Third, by creating a growth map showing how a person's strengths in each of the hallmarks aligns with the competencies required in various roles.
- Fourth, by giving high potentials the right development opportunities—including job rotations and promotions they might not seem completely qualified for but that fit their growth maps—as well as targeted coaching and support.

Companies like Japan Tobacco and Prudential PLC, the British multinational life insurance and financial services group, have used this approach to enhance their talent development programs and boost their internal leadership pipelines. Following it requires deep commitment from senior executives and some investment in the human resources function. But the cost of inaction is greater: As competition for smart and able managers heats up around the world, organizations can't keep ignoring and demoralizing internal talent while filling their C-suites with expensive external hires. They must learn to grow their own leaders.

GETTING A READ ON NEEDS AND SKILLS

Before an organization can begin mapping managers' potential to required competencies, it must determine what exactly it needs. That will vary from business to business. A company recently acquired by a private equity firm would probably want to make results orientation a priority, while the management of an old-fashioned bank trying to stay relevant in a digital age might need keen market understanding and a strategic orientation.

Requirements will vary from role to role within firms as well. Let's consider the competencies that the board of one pharmaceutical company we worked with projected that its CEO, CFO (who was also the chief strategy officer), and business unit heads would need three years down the road, given its midterm strategy. Like all chief executives, the CEO had to have strong strategic and results orientations. But this particular company was trying to adapt to the digital era and to become more diverse in its people and more flexible in its way of working, so the board also highlighted inclusiveness and team and change leadership as priorities. For the CFO—who would be tasked with overseeing the implementation of the new strategies—collaboration and influence, change leadership, and strategic orientation were deemed must-haves. And for the unit heads, who would be on the front lines of strategic and cultural change and also responsible for hitting demanding budgets, the key competencies were results orientation, developing organizational capabilities, team leadership, and inclusiveness.

IN BRIEF

THE PROBLEM
Corporate leadership development programs aren't working. Less than a quarter of executives at the organizations that have them think they're effective.

THE ANALYSIS
Evaluations of managers at thousands of corporations suggest that 72% have what it takes to grow into C-suite roles. How can we bridge the gap between this raw talent and executive success?

THE SOLUTION
By following four steps:
- Determine the most important competencies for leadership roles in your organization.
- Assess employees' potential by looking at the five predictors associated with success—motivation, curiosity, insight, engagement, and determination.
- Map people's potential to the competencies required in various roles.
- Give emerging leaders the opportunities, coaching, and support they need to strengthen the critical competencies.

LEVELS OF COMPETENCE

We evaluate executives on their mastery of eight leadership competencies (listed in the far left column), assessing where they fall on a spectrum from 1 (baseline) to 7 (extraordinary). We have found that four traits—curiosity, insight, engagement, and determination—predict how far managers will progress. Below each competency are the traits linked to strength in it.

	1	2	3	4	5	6	7
RESULTS ORIENTATION PREDICTED BY • DETERMINATION • CURIOSITY	Completes assignments	Works to make things better	Achieves goals	Exceeds goals	Improves firm's practices and performance	Redesigns practices for breakthrough results	Transforms business model
STRATEGIC ORIENTATION PREDICTED BY • INSIGHT • CURIOSITY	Understands immediate issues	Defines plan within larger strategy	Sets multiyear priorities	Defines multiyear strategy for own area	Changes business strategy in multiple areas	Creates high-impact corporate strategy	Develops breakthrough corporate strategy
COLLABORATION AND INFLUENCE PREDICTED BY • ENGAGEMENT • DETERMINATION • CURIOSITY	Responds to requests	Supports colleagues	Actively engages with colleagues	Motivates others to work with self	Facilitates cross-group collaboration	Establishes collaborative culture	Forges transformational partnerships
TEAM LEADERSHIP PREDICTED BY • ENGAGEMENT • CURIOSITY	Directs work	Explains what to do and why	Gets input from team	Inspires team commitment	Empowers teams to work independently	Motivates diverse teams to perform	Builds high-performance culture
DEVELOPING ORGANIZATIONAL CAPABILITIES PREDICTED BY • ENGAGEMENT • INSIGHT • CURIOSITY	Supports development efforts	Encourages others to develop	Actively supports team members' growth	Systematically builds team's capability	Aids development outside team	Builds organizational capability	Instills culture focused on talent management
CHANGE LEADERSHIP PREDICTED BY • ENGAGEMENT • DETERMINATION • INSIGHT • CURIOSITY	Accepts change	Supports change	Points out need for change	Makes compelling case for change	Mobilizes others to initiate change	Drives firmwide momentum for change	Embeds culture of change
MARKET UNDERSTANDING PREDICTED BY • INSIGHT • CURIOSITY	Knows immediate context	Knows general marketplace basics	Investigates market and customer dynamics	Deeply understands market	Generates insights about market's future	Identifies emerging business opportunities	Sees how to transform industry
INCLUSIVENESS PREDICTED BY • ENGAGEMENT • INSIGHT • CURIOSITY	Accepts different views	Understands diverse views	Integrates other points of view	Functions well across diverse groups	Facilitates engagement between factions	Strategically increases employee diversity	Creates inclusive culture

SOURCE EGON ZEHNDER

Your organization should similarly aim to identify the competencies that are most crucial for its top roles in light of its own challenges and goals. We suggest rating the level of proficiency needed in each competency for each role on a scale from 1 to 7. (For a more detailed explanation of how to translate skill levels into numerical scores, see the exhibit "Levels of Competence.") C-level positions typically require a rating of at least 4 in the competencies critical for those roles, and CEO positions, a rating of at least 5.

You should cascade this process down through the ranks so that you have a clearer idea of the key skills needed to do lower-tier managerial jobs, too. With all positions, however, you must resist the temptation to demand high levels of all competencies, because you'll never find leaders who are perfect. In a study of more than 5,000 executives at 47 companies we conducted with McKinsey, we found that only 1% had an average proficiency score of 6 or better, and just 11% had an average score of 5. So even for the most senior

positions, you should seek above-par scores in most competencies and stand-out scores in just two or three.

The next step is to comprehensively assess future leaders' current competencies and their potential for growth. You can do this through a deep review of their work experience; direct questioning; and conversations with their bosses, peers, and direct reports. To get the best information out of people and their colleagues, pose open-ended questions and probe. For instance, to get a read on how much determination managers have, ask about a time something went badly for them and how they responded. To assess their competence at developing organizational capabilities, press for details about the people they've mentored. You should score each person on each hallmark of potential; at Egon Zehnder we use a scale of 1 (emerging) to 4 (extraordinary) for this. You should also score each person on his or her current level of each core competency (using the 1-to-7 scale), creating a snapshot of where he or she stands.

RESIST THE TEMPTATION TO DEMAND HIGH LEVELS IN ALL COMPETENCIES. YOU'LL NEVER FIND PERFECT LEADERS.

With this information, you can now take the critical third step: predicting where each executive is likely to succeed. Having compared our 30 years' worth of executives' baseline scores with information about their eventual career growth, we can tell you that there are patterns in how individual hallmarks translate to the eventual mastery of leadership competencies. Curiosity is significantly correlated with all eight, so strong scores in it are a prerequisite for anyone being considered for development and promotion. However, the three other hallmarks are each correlated with different competencies and can therefore help us project how leaders will develop. For example, and perhaps not surprisingly, insight is a good predictor of the ability to develop a strategic orientation and market understanding. On a more granular level, we estimate that someone with a score of at least 3 (out of 4) on that hallmark (and on curiosity) should be able to achieve, with the right support, a level 5 competency (out of 7) in strategic orientation. We've also found that people with high determination scores can build the strongest results orientation and change leadership competencies, while those with high engagement scores are likely to be strongest in team leadership, collaboration and influence, and developing organizational capabilities.

Armed with assessments of your emerging leaders' current competencies and potential for growth in each area, you will be in a much better position to make development and succession plans throughout your organization. And that will help you ensure that you have a strong pipeline of people to fill C-suite roles in the future.

The experiences of a major global manufacturer we advised illustrate how this works. The company's CEO was due to retire in a year, and the board was trying to decide who should replace him. When we appraised two internal candidates, X and Y, we found that they had comparable strengths but very different profiles. At the time X, a veteran operator in the company's core business, had a higher level of two competencies critical to the CEO job—results orientation and market understanding. But his lower scores on determination, insight, and curiosity revealed that his potential for growth was more limited. Y, who had come up through the ranks in an emerging business, was by contrast slightly weaker on current competencies but, with strong scores on all the hallmarks, showed significantly more potential to perform well as a CEO. (See the exhibit "Comparing Two Candidates.")

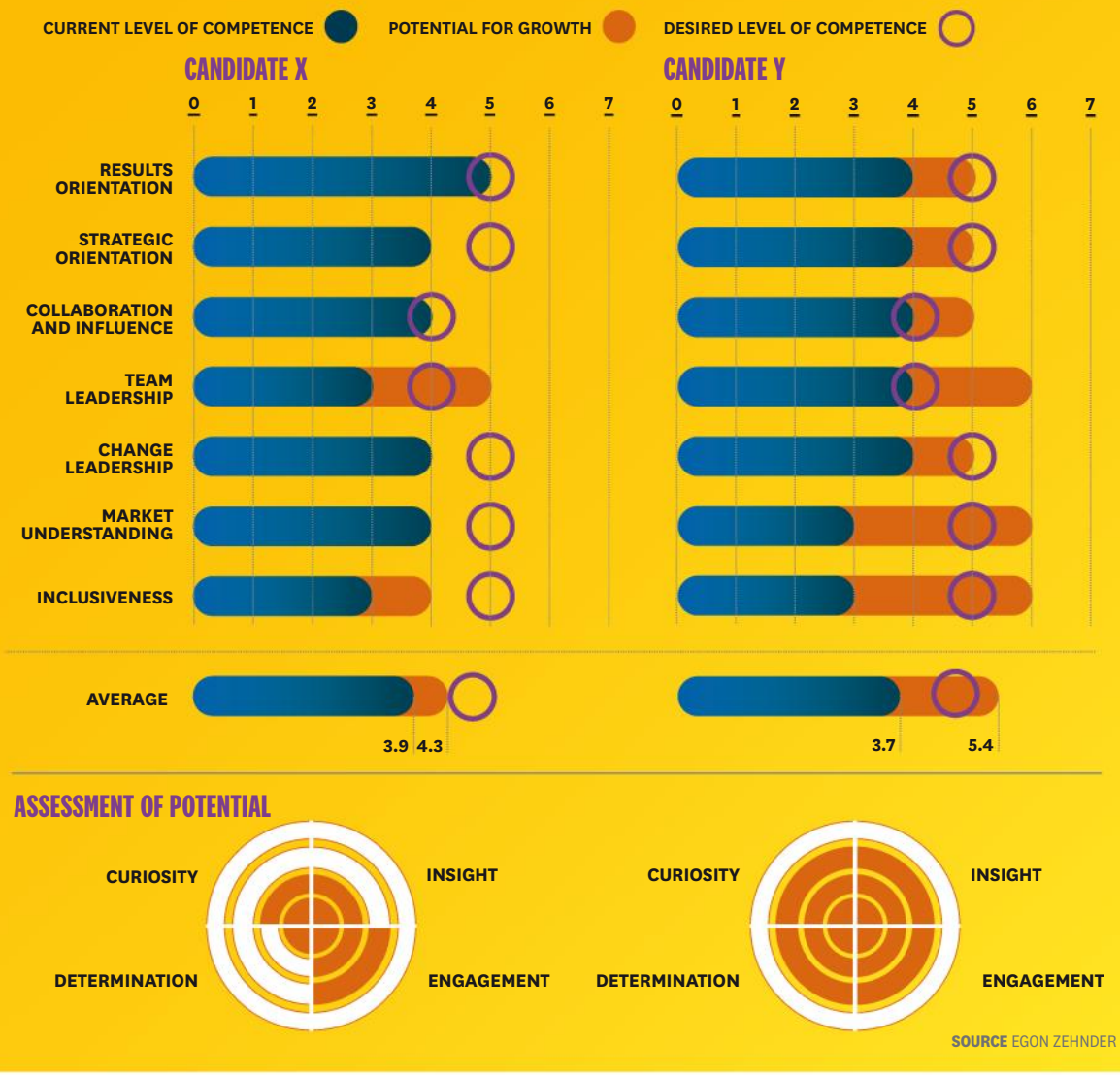
When the board reviewed these findings, a heated discussion ensued. One senior director argued adamantly for the appointment of X, who had slightly stronger competencies and had deep exposure to the core business. Another director strongly favored Y because of his higher potential. A third director favored an external search given the need for a fully qualified, competitive CEO in just one year. Eventually, the group landed on a creative solution: Ask the current chief executive to stay an extra year, during which he and the board could offer customized development programs to both internal candidates and then monitor their growth.

This is the fourth key step in turning high potentials—at all levels—into leaders: Give them the opportunities, coaching, and support they need to close the gap between their potential and their current competencies. For example, a highly curious, insightful person might be assigned to strategic-planning and innovation projects. Highly determined people should be involved in business-unit turnarounds and cultural-change efforts. Employees with high levels of engagement should be asked to manage small teams and work with key clients.

COMPARING TWO CANDIDATES

When X and Y are evaluated on their current levels of the competencies needed for the CEO position at a global manufacturer, X looks like the better candidate. He is closer to the company's targets for the role.

But when potential is measured, Y begins to shine. His assessment indicates that he could develop his skills beyond X's.



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Well-planned job rotations are also crucial. A survey of 823 highly successful senior executives conducted by Egon Zehnder revealed that the vast majority of them consider stretch assignments and job rotations to be the most important way to accelerate a career. Yet according to a yearly survey of 500 companies by HBS professor Boris Groysberg, these talent practices are actually ones that organizations are the worst at.

The most effective rotations are tailored to individuals' development needs. To strengthen results orientation, for instance, you should move managers through jobs where they'll have P&L responsibility, oversee a start-up initiative, or help implement a restructuring. If the goal is to strengthen someone's inclusiveness competency, rotations through regional businesses and corporatewide functions are a good approach. (For more on how to use assignments to build specific competencies, see the exhibit "Matching the Hi-Po to the Job.")

To help your high potentials build their strengths and make the most of opportunities, you can provide individual coaching and group interventions (which might, say, help their teams create a better sense of identity and purpose). At the global manufacturer that was preparing to replace its CEO, candidate X was given coaching to help him build people-related competencies, while candidate Y was tasked with leading P&L improvements in multiple regions to increase his

MATCHING THE HI-PO TO THE JOB

Specific kinds of stretch assignments help executives build individual leadership competencies. To strengthen their results orientation, for instance, you can put them in jobs where they'll manage a P&L, run a start-up, or oversee a restructuring.

COMPETENCY	LEADING A LARGE ORGANIZATION	MANAGING A P&L	LEADING MULTIPLE REGIONS OR BUSINESSES	MANAGING A CORPORATE-WIDE FUNCTION	RUNNING A START-UP OPERATION	OVERSEEING A RESTRUCTURING
RESULTS ORIENTATION		●			●	●
STRATEGIC ORIENTATION				●	●	
COLLABORATION AND INFLUENCE			●	●		
TEAM LEADERSHIP	●	●				●
DEVELOPING ORGANIZATIONAL CAPABILITIES	●				●	
CHANGE LEADERSHIP				●		●
MARKET UNDERSTANDING		●	●		●	
INCLUSIVENESS			●	●		

ASSIGNMENT

SOURCE EGON ZEHNDER

ORGANIZATIONS MUST MAKE TRADE-OFFS BETWEEN CURRENT COMPETENCE AND DEVELOPMENT POTENTIAL.

market understanding and his inclusiveness, which were significantly below the level the firm thought a "fully qualified" CEO should have. A year later the executives were assessed again, and while both had improved, Y's growth well outpaced that of X, to the point where their competencies were nearly equal. The board decided to offer the CEO job to Y, who went on to successfully implement major change programs and growth initiatives, including mergers and acquisitions. He quadrupled the company's operating income while increasing return on equity from 3% to 11%.

An example of how targeted development works at lower levels comes from an Asia-based global manufacturer, whose CEO was concerned about the slow progress of a diversity initiative. One of its goals was to propel women up the ranks (see the sidebar "Capturing the Female Advantage"), but none had so far been identified as high potentials by their bosses. The CEO decided to launch a pilot program that involved assessing 10 female managers selected by the head of HR for both potential and competence. The results were striking: The assessments showed that most of them had the attributes necessary to succeed in senior executive roles down the road.

Z, a 30-something corporate planning officer, was one of the women selected. Because of her strong curiosity and engagement, her average potential competency was a high 4.7, but her average current competency score was a low 2.6. And in a couple of areas—strategic orientation and the development of organizational capabilities—she fell well under the target levels for her next possible role and far short of those needed for more-senior jobs.

However, further research showed that the company had failed to help her build those skills. She'd never been asked to manage her own team or lead strategy projects. Her bosses worried about "burdening" someone so "junior" with such big assignments, and Z herself admitted that she lacked confidence.

But the assessment results helped change those attitudes. As the person with the strongest potential scores among all her peers in her department, Z started to get—and embrace—more challenging work. The CEO soon appointed her to head up strategy at a large U.S.

subsidiary and supported her by enrolling her in an executive business program and asking the chief human resources officer to serve as her mentor. Z spent a year and a half overseeing multinational projects and proved to be an excellent team builder and strategist. The CEO then asked her to return to headquarters and promoted her to head of alliance management, where she is now effectively leading a sizable group.

The stories of Z and X and Y highlight the fact that for most executive appointments, and especially successions at the top, organizations must make tradeoffs between current competence and development potential. A sound estimate of how far each of your top leaders can go will allow you to do that in a less risky, more effective way.

REAL RESULTS IN PRACTICE

When companies take this approach to leadership development—focusing on potential and figuring out how to help people build the competencies they need for various roles—they see results.

Shortly after Japan Tobacco's privatization, in 1985, the company decided to globalize and to diversify into various businesses, including food and pharmaceuticals. Because of this it needed a new class of leaders. But in Japan hiring executives from the outside has long been highly unusual. In addition, most companies still tend to favor tenure over competence or potential in promotions. Japan Tobacco decided to stick with the first tradition but abandon the second. It began to rigorously assess current leaders' potential and accelerate their development through frequent rotations and focused training. Since then, the company's high potentials have been "owned" by HR and "leased" to key departments under an initiative, currently labeled New Leadership Program, that is constantly tweaked with an eye toward future business scenarios. This approach to leadership development, together with sound strategic decisions, has produced impressive corporate results: After acquiring the British company Gallaher, in 2007, Japan Tobacco became the third-largest global player in the cigarette sector, and thanks to its profitable diversification across geographies and industries, it became the sixth-largest Japanese company in corporate value across all sectors.

Four years ago, Prudential PLC also decided to redesign its leadership development practices to match its global ambitions. At the time, management acknowledged that the existing talent-review process was "assessment-heavy but insight-light" and too focused on current capabilities. Senior leaders set out to revamp it by emphasizing rigorous succession planning across all divisions and regions. Though this change was led by the executive committee and board, development now cascades up rather than down and starts with conversations between HR leaders and line managers, who have been trained to spot future stars. Team managers openly discuss business imperatives, critical roles, and successors, all through the lens of potential, and unit leaders report back up to the group's CHRO and CEO, Tim Rolfe and Mike Wells, sharing details about why people were deemed high potentials and how over time they can grow into different roles across the organization. What have the results been? In 2016, Prudential had 19 openings in its top 100 global roles, including five at the executive committee level, and all but one were filled through internal promotions. The new approach has helped the firm find great leaders even for its most quantitative and analytical businesses, such as asset management, and allowed it to put unexpected people in highly critical roles. For example, Prudential recently announced that it would move Raghu Hariharan, the director of strategy and capital market relations in the group head office, into a position as CFO of the firm's Asia business.

More organizations should follow these models. A scientific approach to talent development—focused on spotting high potentials, understanding their capacity for growth in key competencies, and giving them the experience and support they need to succeed—will be an extraordinary source of competitive advantage in the coming decades. And it will help many more managers transform themselves into the great leaders they were always meant to be.

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CAPTURING THE FEMALE ADVANTAGE

Women are still underrepresented in the top echelons of corporations today. In an effort to learn why, we dug into our global database of ratings of executives' potential and competence, to see how the women compared with their male counterparts. The results were telling:

On average, women's scores trail men's on five of the seven key competencies of leaders. While all the differences are statistically significant, they're large in only two areas: strategic orientation and market understanding.

However, women score higher than men on three of the four hallmarks of potential—curiosity, engagement, and determination—while men have a slightly stronger level of insight. Again, the differences are statistically significant but not too large, except in the case of determination, where the female executives we've assessed scored much higher than their male peers.

How can we reconcile these findings? Why do women have higher potential but less competence than men? We believe it's because women are typically not given the roles and responsibilities they need to hone critical competencies. How can you develop team leadership if you're not given the chance to manage a team, or strengthen your strategic orientation if you never participate in any planning discussions or strategic projects?

WHEN FOUNDERS GO TOO FAR

SOME START-UP CEOS HAVE TOO MUCH POWER. HERE'S WHAT TO DO ABOUT IT.

BY STEVE BLANK

When the directors of Uber ousted its CEO and cofounder, Travis Kalanick, in June 2017, the move was paradoxically both long overdue and somewhat unexpected. For months Kalanick and the company had suffered a string of scandals, any one of which might have undone a typical chief executive. A female engineer had posted a long public account of rampant sexual harassment and the company's "bro culture," to which Uber's HR department had turned a blind eye. The company had been caught ordering and canceling rides from its competitor Lyft, poaching Lyft's drivers, and using software to surreptitiously track its own customers even

ILLUSTRATION BY ANDREW ARCHER

if they closed the Uber app. During years of jousting with local taxi authorities over the legality of its car service, Uber had been discovered using a tool called Greyball that disguised the location of its cars and showed a fake version of the app to city officials. Kalanick himself was captured on video condescendingly berating an Uber driver who complained about falling fares.

Yet despite the near-weekly scandals, which led to customer boycotts and increasing calls for Kalanick's dismissal, the 40-year-old founder seemed, for a time at least, untouchable. Even after the former U.S. attorney general Eric Holder, who'd been hired by the board to investigate, issued a scathing report on Uber's culture, Kalanick and his directors initially decided that vague promises of coaching, the hiring of a chief operating officer, and a slap-on-the-wrist "leave of absence" for the CEO were sufficient remedies. That changed when key investors staged a revolt.

Why was Kalanick shown such extraordinary deference by Uber's board? In a word, power. Kalanick controls the majority of Uber's voting shares and until recently controlled most of its board seats. He is part of a generation of company founders who've managed to remain at the helm long past the point when VCs would traditionally have brought in "professional" CEOs. Although the specifics of this scandal may be unique, the governance issues Uber has faced are not. Zenefits, Hampton Creek, Tanium, Lending Club, and Theranos are all start-ups that have endured scandal and founder misbehavior—but some of their founders are still calling the shots. Rather than being an outlier, Uber illustrates the remarkable and little-understood ways in which founders, no longer systematically pushed aside as their start-ups grow, have come to dominate their boardrooms. I think of this trend as "the founders' revenge."

In this article I will outline the forces that have allowed founders to accrue such power. I will also argue that this trend has resulted in a power imbalance that can negatively affect employees, customers, and investors. To remedy that, I'll offer some initial prescriptions for creating a more equitable and sustainable system of start-up governance.

But first, to understand how 21st-century founders have come to hold such a powerful hand, we must recall why venture capitalists were once allowed to walk all over the people who launched some of the world's greatest companies.

WHEN VCs SET THE RULES

In the 1980s and 1990s tech companies and their investors made money through initial public offerings. In that era an IPO was the eventual goal for nearly every start-up. Turning illiquid private-company stock into cash by selling shares to the public required engaging a top investment bank, which typically wouldn't take a company public until it had had five profitable quarters of increasing revenue. To achieve that, companies generally had to be able to *sell stuff*—not just acquire nonpaying users or build a compelling freemium app. Persuading customers to pay for something involved creating a stable product and organizing a professional sales staff to sell it.

Many founders were wildly creative but lacked the discipline or skills to drive profitable growth. They also lacked the experience and the credibility to manage a large company, which is what everyone hopes a start-up will become someday. To the investment banks that acted as gatekeepers, such credibility was crucial for an IPO. Part of the IPO process was the road show, for which the bankers would fly the company CEO and CFO around the country to present to institutional investors; the last thing institutions wanted to see was an inexperienced founder at the helm of a company. To venture capitalists, who generally controlled the majority of a start-up's equity and board seats, green and unskilled founders were a problem that had to be solved if they were to reach their IPO payday.

VCs WERE ONCE ALLOWED TO WALK ALL OVER THE PEOPLE WHO LAUNCHED SOME OF THE WORLD'S GREATEST COMPANIES.

So after a product gained a foothold, VCs routinely removed founding CEOs and replaced them with "suits"—experienced executives from large companies—to scale up the sales force, build a true organization (including an HR department that would prevent problems like those at Uber), and lead the public offering.

The best-known example of this, albeit with a somewhat different backstory, is Apple. At its IPO, in 1980, Steve Jobs was still at the four-and-a-half-year-old company, as an executive VP and vice chairman, largely because of his charisma and ability to articulate a vision for the evolution of computing. But because Jobs and his cofounder, Steve Wozniak, had taken several rounds of VC funding by then, they together owned just 23% of Apple's equity, and Jobs had few allies on its six-person board. Jobs's firing in 1985 and his replacement by PepsiCo president John Sculley may be Silicon Valley's Shakespearean tragedy, but it was hardly surprising. In fact, what's surprising is that Jobs held on as long as he did.

This stereotypical fire-the-founder pattern has notable exceptions. Hewlett and Packard founded their company in 1939, many years before the advent

IN BRIEF

THE PROBLEM
Founders, who were once routinely thrown overboard by venture capitalists as a start-up scaled, have acquired too much power in the boardroom.

WHY IT HAPPENED
The decline of IPOs and less focus on management credentials have reduced the need for "adult supervision," and VCs have come to respect founders' ability to maintain a fast-moving, innovative culture.

HOW TO FIX IT
Pair founders with seasoned COOs, recruit directors with public-company experience, and encourage VCs to limit investments in companies whose founders have voting control of the stock.

of modern venture capital, so they retained control of HP for decades. Microsoft, founded in 1975, became profitable so quickly that it didn't need much venture funding; when it went public, in 1986, Bill Gates, Paul Allen, and Steve Ballmer owned 85% of the company, and its sole VC owned just 4.4%. Likewise, Jeff Bezos controlled 48.3% of Amazon's equity when it went public, in 1997, and even today he holds three times as much stock as Amazon's largest institutional shareholder. But until fairly recently, ousting the founder was standard on a start-up's journey to an IPO.

The convention had solid theoretical underpinnings. Venture capitalists sought to mitigate the agency costs and moral hazards created when a start-up founder has much more information about what's happening inside a company than the board does. Because investors bear most of the financial risk if a start-up fails, preferred shareholders (primarily VCs) were given protective provisions (such as the right to block a sale of the company) and the majority of board seats. As start-ups required successive rounds of VC funding, founders saw their ownership in the company (and with it, their control) dwindle. Over time, Silicon Valley filled up with people who had founded iconic firms but spent the remainder of their careers telling woeful stories of how "the VCs stole my company." The luckiest of them retained nominal titles, such as chief technical officer.

For three decades, from the mid-1970s to the early 2000s, the rules of the game were that a company

must become profitable and hire a professional CEO before an IPO. During most of this era, founders faced a buyer's market, because there were many more good companies looking to get funded than there were venture capitalists to fund them. With a deep supply and limited demand, investors could set the terms.

In fairly short order that dynamic began to change.

THE DECLINE OF THE IPO GATEKEEPERS

The shift began in 1995, when Netscape changed one of the rules. The web browser company was a little more than a year old—and unprofitable—when it made its IPO. Its cofounders, Marc Andreessen (then 24 years old) and Jim Clark, hired James Barksdale, an experienced CEO, but otherwise ignored the investment bankers' conventional wisdom about the need to show consistent, profitable growth. Netscape's blowout IPO launched the dot-com boom and led to a new era, in which tech companies would be valued not for what they had done but for what they might deliver someday.

The elimination of a traditional hurdle for an IPO meant that new start-ups needn't endure long, patient growth to become profitable companies. Instead they could go public *right now,* with the founder still in place. From 1980 to 1998 the median age of a VC-backed company that went public was seven years; in 1999–2000, at the height of the dot-com boom, it was four-and-a-half years.

The gatekeeping bankers' expectations weren't the only thing that changed. Founders still started out lacking the skills and experience to scale up a company, but

they had newfound access to information that would help them gain those skills. In the 20th century there were no start-up blogs or useful books on how to launch and grow a company. Business schools taught entrepreneurship, but they focused on how to write business plans, which sounds useful but has limited utility once you actually start exposing products to the market. (Modern start-up founders recognize that no business plan survives first contact with customers.) The only way for aspiring founders to get effective training was to apprentice at other start-ups—a time-consuming detour that many would just as soon skip.

Founders in the 21st century can learn best practices far more easily. Anyone can read online all there is to know about running a start-up. Incubators and accelerators like Y Combinator have institutionalized experiential training in crucial tasks such as finding product-market fit, figuring out when and how to pivot, utilizing agile development, and dealing with VCs. In Silicon Valley and elsewhere, mentors abound.

Two financial shifts have also allowed founders to stay in control. The first is the emergence of secondary markets, in which founders and employees can liquidate some pre-IPO stock and thus stay private longer. Before secondary markets became popular, founders had a big incentive to rush toward an IPO (and meet investment bankers' requirements for doing so), because they lacked an alternative way to monetize and diversify their wealth. By further reducing the power of the IPO gatekeepers, secondary markets enhanced the power of founders.

The second shift is the growth in acquisitions. In 2016 there were 3,260 acquisitions of technology companies and only 98 tech IPOs, according to CB Insights. If that ratio holds, a start-up is 30 times as likely to be acquired as to go public. When a larger tech company acquires a smaller one, having the smaller company's founder retain a leadership role can make a deal more attractive. VCs recognize this, so they're more inclined to leave founders in charge.

THE EMERGENCE OF "FOUNDER FRIENDLY" VCs

At a certain point those changes were supplemented by an attitudinal shift: VCs began to see founders not as a problem that needed to be solved but as a valuable asset that needed to be retained. That stemmed in part from a change in their own backgrounds. Twentieth-century VCs typically had MBAs or a finance background or both. A handful, including John Doerr at Kleiner Perkins and Don Valentine at Sequoia, had operating experience at a large tech company. Very few were themselves entrepreneurs. But in the 21st century, VC firms began hiring experienced founders as partners, and not surprisingly, this cohort was more optimistic about other founders' ability to become successful long-term company leaders.

The pivotal figure in this shift was, once again, Marc Andreessen. In July 2009, when Andreessen cofounded the VC firm Andreessen Horowitz with Ben Horowitz, also an experienced entrepreneur, it was with a key philosophical difference from rival firms: a "founder friendly" focus. "Above all else, we are looking for the brilliant and motivated entrepreneur," Andreessen wrote when he announced the firm's launch. "We are hugely in favor of the technical founder....We are hugely in favor of the founder who intends to be CEO. Not all founders can become great CEOs, but most of the great companies in our industry were run by a founder for a long period of time, often decades, and we believe that pattern will continue. We cannot guarantee that a founder can be a great CEO, but we can help that founder develop the skills necessary to reach his or her full CEO potential."

IN THE 21ST CENTURY, VCs CAME TO SEE FOUNDERS AS A VALUABLE ASSET THAT NEEDED TO BE RETAINED.

Understandably, advertising your firm as "founder friendly" creates a competitive advantage in a business where success has much to do with your ability to source and negotiate deals with founders. So in short order, many venture capital firms began emulating Andreessen's outlook.

Founder friendliness was driven partly by context. Twentieth-century companies, which competed in slower-moving hardware and software markets, could thrive for long periods on a single innovation. If the VCs threw out the founder, the professional CEO who stepped in might grow a company to dominance without creating something new. In that environment, replacing a founder was the rational decision. But 21st-century companies face compressed technology cycles, which create the need for continuous innovation. Who leads that process best? Often it is founders, whose creativity and restlessness, comfort with disorder, and propensity for risk taking are more valuable at a time when companies need to retain a start-up culture even as they grow large. VCs love how professional managers can bring discipline to the chaotic environment created by a founder, but today they recognize that too much discipline may kill off the culture that made the start-up so innovative.

The retain-the-founder mentality was also driven by, again, that most fundamental of economic forces: supply and demand. Whereas once too many start-ups chased limited amounts of capital from a relatively

small number of VC firms, today, some would argue, too much capital is chasing too few quality start-ups. Angel and seed funds have usurped the role of what used to be Series A venture capital investments. Hedge funds and mutual funds have begun investing in large, more mature private companies. Now operating between those two stages are nearly 200 VC firms with funds that exceed $200 million, and for funds this large, buying stakes in the hottest unicorns—private companies valued at more than $1 billion—feels essential, because it's very difficult to earn respectable returns for a fund that size by making smaller bets.

That dynamic gives start-up founders much more leverage. There are two visible indicators of how they have used that leverage to gain power: a change in the typical start-up board composition, and a more frequent use of new kinds of stock that allow founders to dominate the boardroom.

STACKING THE BOARDROOM

In his 2008 HBR article "The Founder's Dilemma," Noam Wasserman, now a professor at the University of Southern California, demonstrated why entrepreneurs who create a successful company must ultimately choose a priority: to get rich or to be king. To get rich, founders sell equity, diluting control. To be king, they retain ownership in the company and control over the board, but at a cost: Their wealth remains illiquid, undiversified, and at risk if anything should happen to the company's value. The rise of unicorns has changed that calculus, as founders have used their leverage to negotiate deals that give them the potential to be rich *and* kings.

Until 10 years ago a start-up board typically had five members: two founders, two VCs, and one independent director. In the event of a conflict, independent directors tended to side with the VCs, which is why so many founders were ousted.

Contrast that with the composition of Uber's board, which isn't atypical for a unicorn. The company's corporate charter designates 11 board seats, but until Kalanick's ouster, only seven of them were filled. Three were held by Kalanick, his cofounder Garrett Camp, and an early employee, Ryan Graves. Only two were held by outside investors. One independent director, Arianna Huffington, served as a key Kalanick ally. By leaving four seats empty, Kalanick increased his control: If the outside directors ever challenged him, he could quickly stack the board with allies.

Founders' power goes even further. Traditionally, when a start-up takes money from VCs, the investors receive preferred stock, leaving the founders and employees with common stock. Preferred stock typically gives investors control over when to sell a company, when to take it public, the number of board seats, and when to hire or fire a CEO.

In the unicorn era, special powers are flowing the other way, to founders. Today many start-ups implement a dual-class structure whereby the founders' common stock confers 10 times the voting rights of other stockholders. Historically, family-owned companies have used dual-class stock to reap the benefits of liquidity through an IPO without giving up control. Ford Motor Company is one example: When it went public, in 1956, it created a special class of stock that gives Ford family members 40% of voting shares, despite holding just a 4% economic interest in the firm. Berkshire Hathaway, News Corp., Nike, and The New York Times Co. are other examples. In its 2004 IPO Google was the first tech company to implement dual-class ownership. Facebook, Zynga, Snap, Workday, Square, and others did the same in their IPOs. Dual-class shares give these publicly traded companies the freedom to operate without fear of undue influence by hedge funds.

IN THE UNICORN ERA, SPECIAL POWERS ARE FLOWING THE OTHER WAY—TO FOUNDERS RATHER THAN TO INVESTORS.

In the past five years, however, tech founders have gone a step further, setting up dual-class shares even in pre-IPO companies. This allows them to outvote their preferred-stock-holding VCs, giving founders extraordinary control. Theranos founder and CEO Elizabeth Holmes, for instance, has received $686 million in venture capital funding, but she retains 98.3% of voting shares.

These formal governance rules aren't the only factor reducing the power of directors. Today many VCs sit on five to 10 boards, where they nominally provide oversight to companies that are many times larger than the pre-IPO start-ups of 15 years ago. That stretches many of them thin. I often hear directors of private companies say that they read about a critical incident involving the company in the press or on social media before they hear about it from the CEO or in the boardroom. And when a crisis does develop, the VC directors who used to act with wisdom and authority have a new incentive to behave meekly: Because unicorns are staying private longer than earlier start-ups did, they require additional rounds of funding—and VCs who earned a board seat by investing in a previous financing round generally want to remain in the founder's good graces to obtain preferred access during subsequent rounds. This weakens their motivation to ask hard questions, to push back, or to rein in a founder who begins crossing ethical lines.

Given the extraordinary power imbalance that's now the norm in Silicon Valley boardrooms, it should be no surprise that many founder-CEOs are behaving badly. In fact, the real surprise may be that so many of them still behave well.

FIXING A BROKEN SYSTEM

So what should we do?

The first step is to recognize and define the problem. To be clear, I'm not saying that founders should not or cannot become high-performing CEOs; we see any number of examples—notably Jeff Bezos—of ones who have. [See "The Best-Performing CEOs in the World 2017," in this issue.] Rather, this is a problem of too much control and not enough oversight. Pre-IPO companies like Uber are becoming much larger but, by staying private, avoiding many of the regulatory and governance requirements that public companies face. For context, Uber currently has a $50 billion market cap (on par with Monsanto and General Motors) and 12,000 employees (comparable to McKinsey & Co.).

Mary Jo White, then the SEC chair, described the problem in a 2016 speech at Stanford. "As the latest batch of start-ups mature, generate revenue, achieve significant valuations, but stay private, it is important to assess whether they are likewise maturing their governance structures and internal control environments to match their size and market impact," said White, who suggested asking a list of questions: "Is your board expanding from founders and venture seats to include outsiders with larger, and ideally public, company experience? Do you have the right regulatory and financial expertise on your boards to appropriately make decisions on behalf of all investors? Do you have the relevant expertise in the particular industry in which your company functions to bring to bear different viewpoints and spot critical issues? Is your company, in short, being run and governed for the benefit of all of your investors—a requirement whether the company is public or private?"

To White's insightful questions, let me add several suggestions. First, even as "founder friendly" VCs opt to allow founders to remain on as CEOs, they should aggressively adhere to the best practice of pairing those leaders with strong, experienced chief operating officers—and this should be done *before* the CEO suffers a misstep, not as an after-the-fact remedy, as at Uber. Facebook hired Sheryl Sandberg as COO just four years after its founding and four years before its IPO; her partnership with a very young technical founder has been exemplary. Getting this hire in place should be a standard part of scaling up a company—and a prerequisite for subsequent rounds of funding.

Second, the general partners who are the active leaders of VC firms should engage with their limited partners (the institutional investors who put up the capital) about the trade-offs between ethical issues, heightened agency risk, expected returns, and the amount of power and control they are ceding to founders. Do the LPs expect firms to invest in unicorns despite concern over the treatment of employees, a lack of diversity, or questionable behavior toward regulators and other authorities? Is it acceptable for a VC to say, "We think this will be a great, valuable company, but we're going to pass on investing because of concern over these issues"? Similarly, VCs should consider establishing a formal policy regarding their willingness to invest in companies where the founder has voting control. If several prominent VCs decided not to invest in companies with dual-class shares, for instance, the practice might abate. Better yet, VCs might work through the National Venture Capital Association or some other industry group to try to implement broad guidelines; this cooperative approach would avoid putting any one firm at a competitive disadvantage because it went first.

Third, everyone in Silicon Valley should read the recommendations Eric Holder delivered to Uber's board—in particular, the section on enhancing board oversight. Holder suggested that Uber add additional independent directors; install an independent board chair; increase the size, role, and independence of its audit committee; and create an oversight board. Again, these steps should become the norm as a company grows—not something done in response to a crisis or a black eye.

Finally, everyone involved should recognize the lessons conveyed by the Uber story. The *Wall Street Journal* chronicled how, despite Kalanick's control of voting shares and board seats, the venture capital firm Benchmark persuaded four other large Uber investors to sign an ultimatum asking the CEO to resign. If Kalanick refused, the investors would publicly release the letter, putting the onus on directors to continue defending him. Within hours Kalanick e-mailed employees to say he was leaving. Weeks later, Benchmark sued Kalanick for fraud, breach of contract, and breach of fiduciary responsibility; the complaint focuses on Kalanick's control over Uber's board makeup.

Even as Uber's governance problems illustrate how a founder's power can go too far, Kalanick's dismissal serves as an important reminder: No matter what a board's composition or who holds how many voting shares, a determined and cohesive group of shareholders can still effectively wield soft power. More of them should consider doing so to offset the power imbalance that has become prevalent in the boardrooms of Silicon Valley.

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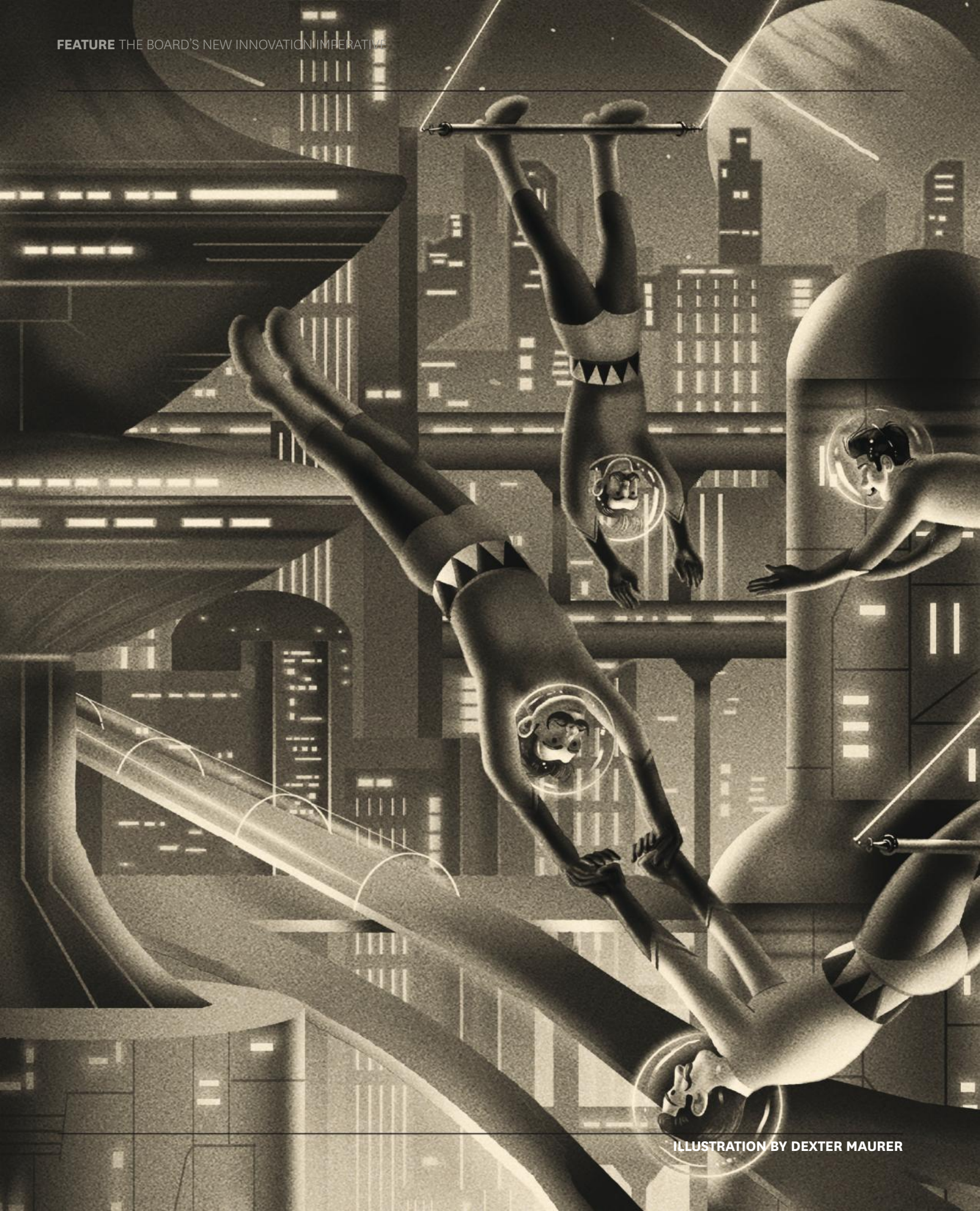

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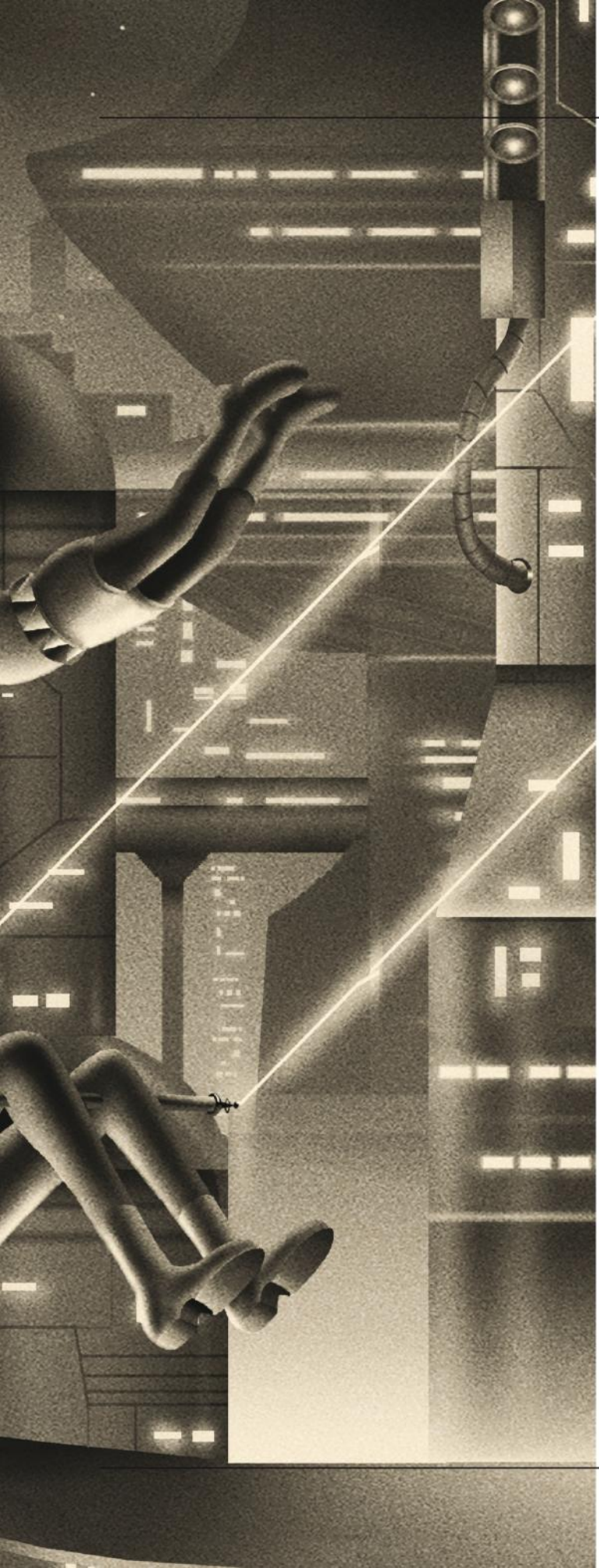

THE BOARD'S NEW INNOVATION IMPERATIVE

Directors need to rethink their roles and their attitude to risk.

BY LINDA A. HILL
AND GEORGE DAVIS

The challenge OF LEADING INNOVATION IS BRINGING ABOUT A SEA CHANGE IN CORPORATE GOVERNANCE. BOARDS, ONCE THE DEPENDABLY CAUTIOUS VOICES URGING MANAGEMENT TO MITIGATE RISK, ARE INCREASINGLY CALLING FOR BREAKTHROUGH INNOVATION IN THE SCRAMBLE FOR COMPETITIVE ADVANTAGE. WE SEE THIS SHIFT PLAYING OUT ACROSS INDUSTRIES—NOTABLY AT SUCH COMPANIES AS FORD, COCA-COLA, NESTLÉ, AND UNILEVER, WHICH ARE ALL STRUGGLING TO ADDRESS SLOWING SALES IN THEIR CORE BUSINESSES.

IN BRIEF

THE SITUATION
As firms scramble for competitive advantage, boards—once the cautious voices tempering management's—are now calling for breakthrough innovation.

THE CHALLENGE
Directors face four concerns in governing innovation: an outdated risk agenda, insufficient time, lack of expertise, and a relationship with management that needs retuning.

THE SOLUTION
To bolster out-of-the-box thinking, boards should promote diversity among members. They should foster "creative abrasion" to keep ideas flowing and rethink traditional methods of governing. And they must learn to embrace and encourage risk.

Embracing innovation and its inherent risks requires that boards and senior management develop new ways of working together. As Mark Ganz, the CEO of Cambia Health Solutions—a company at the forefront of innovation in the health care space—told us, board meetings no longer consist of PowerPoint presentations by management followed by a few perfunctory questions from the board. "The model has changed," he explained. "We now bring the board ideas that are not fully baked and say, 'Help us with this.'" It took some time for the board to realize that management was asking not for the answer but for engagement, he said, but "once they got used to it, it dramatically improved the board-management partnership and the value board members bring to the work of the company."

The desire to create new and different ways of working is not always accompanied by the ability to do so, however. Adopting new roles and norms feels uncomfortable—even unnatural—to most people. To help address this knowing-doing gap, we spoke with directors and CEOs from a range of industries about their boards' capacity to support innovation and risk management. The results were sobering, though the tide seems to be turning. A few of the directors in our study were clearly laggards, even going so far as to argue that innovation was irrelevant in their very mature industries. A handful were trailblazers, like Mark Ganz. The majority were just beginning to work their way through the challenges of governing innovation, some more deliberately and successfully than others.

Through our research, we identified the common obstacles most boards face and gleaned insight into how boards can reshape their roles to effectively foster and support the kind of innovation that leads to substantial growth.

WHY BOARDS STRUGGLE WITH INNOVATION

Boards increasingly believe that to fulfill their obligation to ensure the long-term well-being of their companies, they have to support management in developing a compelling innovation strategy. And that means learning to embrace risk while continuing to mitigate and manage it as much as possible. In this inverted risk paradigm, boards are discovering that avoiding risk is the riskiest proposition of all. Paula Price, a director at Accenture, Dollar General, and Western Digital Corporation, told us that boards should aim to develop the organization's "capacity to pivot" into uncharted territory with new products, services, business models, or ways of organizing or getting work done. Standing still or waiting to see how things turn out are not considered serious options in today's often tumultuous environment. A member of one automobile company's board confessed that they had discouraged management from making the leap to electric cars for years; now he feared that the company was playing catch-up.

CEOs and top management appropriately have more power than board members over corporate affairs and major decisions. But without the full support of the board, management is unlikely to take the big bets required to innovate. What frustrations do board members report when asked about fulfilling their growing obligation to govern innovation? We found four main concerns:

An outdated innovation and risk agenda. Most board members report that the lion's share of their attention around innovation goes toward improving the organization's capacity to execute its current strategy—that is, innovation to sustain the core: developing product line extensions, reducing cost structures to maintain healthy operating margins,

improving customer-intimacy and -centricity to address rising customer expectations, and responding to new regulatory regimes and cybersecurity threats.

At the same time, these board members realize that doing the same things better, faster, and more cheaply is not enough. It is not enough, for instance, to make improvements that reduce costs in the supply chain. Companies are now trying to deploy digital supply chains that will allow them to offer different value propositions to customers and even create new business models. As one director put it, "Significant disruption is taking place, and whatever company is at the top today will not be at the top in 10 years. [We] must differentiate ourselves." Another observed that his board's "bias for short-term results" was stifling innovation; instead of pursuing breakthrough initiatives, the company was focused on evolutionary ones. Many directors acknowledged that it was not easy for CEOs to make the bold moves required to keep their companies competitive—especially given the growing demands of activist investors—and that boards were not doing enough to encourage management to pursue admittedly riskier initiatives that could reinvent the business.

Insufficient time. Making time for innovation as an ongoing topic of boardroom conversation is a luxury few board members feel they have. Especially in industries undergoing regulatory changes, such as financial services, energy, and health care, directors reported feeling "overwhelmed" simply attending to the basics of compliance and financial monitoring. Even companies that were performing well struggled to dedicate time to innovation activities. Hasbro CEO Brian Goldner acknowledged the challenge: "It's easy to focus only on the core business when it's going great, but you have to find board time to focus on growth and disruptive activities." Directors we spoke with understood the need to invest in strategic discussion and debate about innovation—as another CEO put it, "To think you can sit in the boardroom and talk strategy once a year means you're out of the game and out to lunch"—yet competing pressures on their attention made it hard to find the time for proper consideration.

Lack of expertise. Many directors—particularly CEOs—express frustration that their boards lack the level of industry expertise and innovation experience necessary to make well-informed risk-reward assessments about proposals. One CEO we spoke with said he actually avoided innovation discussions with the

ABOUT THE RESEARCH

Our research into the governance of innovation focused on boards of public companies in the United States. We interviewed 31 *Fortune* 500 CEOs and independent directors and conducted a survey of *Fortune* 500 firms that yielded 21 responses. In addition, we held dinners, hosted by Egon Zehnder, in four major U.S. cities, at which 85 board members came together to discuss board trends and the most-pressing challenges facing directors. For the vast majority, innovation made the list. Finally, we interviewed three CEOs of privately held companies and their lead directors or chairpersons. The CEOs and board members with whom we spoke represented all major industries, with additional representation from the academic, nonprofit, and consulting sectors. Although all the firms are based in the United States, most (with a handful of notable exceptions) have significant non-U.S. operations.

ASKING THE THORNY QUESTIONS

Today's boards need to rigorously challenge management if they want to ensure that their companies are thinking boldly enough about innovation. Here are some questions that we recommend boards ask themselves:

- Are we devoting enough time to innovation in our board meetings?
- What is our risk appetite? Is it aligned with that of management? What message do our leadership and culture send to the rest of the organization about risk and innovation?
- Have we agreed on metrics to evaluate innovation efforts?
- What is our response when an innovation initiative fails? Are we encouraging or discouraging management to experiment?
- Does our board have the diversity of talent, perspective, and style to make tough choices on innovation? Are we hearing from everybody?
- What are we doing to ensure that we are aware of the cutting edge in our industry and in adjacent ones? Is it time to create some advisory committees to support the board?
- Are our board meetings about innovation truly a dialogue, or more of a presentation?
- Would senior leaders describe their relationship with us as a partnership? Would management describe us as supportive of its efforts to innovate?
- Are we sending a clear message to management about the need to be bold, not only to protect the core business but also to reimagine the business and move us to a new future?

board because he believed that the directors "were too far from the market" to assess the true expected value of a particular innovation project.

Unproductive interactions between the board and management. Historically, companies have maintained a bright line between the board of directors and senior management. Under this governance model, management's role evolved into "telling and selling" strategy and the board's role became to ratify the senior team's vision. Many of the directors we spoke with consider these practices to be outdated; however, navigating new roles for the board and management in setting innovation strategy is proving to be the toughest challenge of all.

Many board members reported a reluctance to ask their most-pressing questions, because they don't want to be perceived as "micromanaging" or "second-guessing management" or as criticizing the CEO in front of his or her team. Meanwhile, several CEOs told us that their boards' arm's-length behavior inhibited the understanding and support required to forge ahead and innovate. When boards do dig into the details of management's innovation proposals, their tough questioning can sometimes be perceived as hostile. Several CEOs experienced such interactions as evaluative of their own performance rather than of the quality of the ideas under discussion, and many complained that the board's responses can be "harsh" or "unfair." In some of our interviews, we could see the emotional toll of these often-heated interactions on the faces of board members and CEOs.

(RE)BUILDING THE BOARD FOR INNOVATION

The research is clear: Innovation requires passionate discussion, debate, and even conflict—most often among individuals with diverse perspectives. To find better ways of governing innovation, more boards are revisiting both their board composition and the way in which they interact. However, directors are often reluctant to speak publicly—including to us—about how their boards operate, making it hard for boards to share best practices. This is especially problematic when it comes to innovation—an area where directors often feel there is work to be done. Our research revealed four key areas for improvement:

Diversity and collective literacy. When adding or replacing members, boards should take a disciplined approach, seeking members whose expertise complements that of the existing board and, more important, that of management. For example, a director of a traditional operations-focused company reported seeking board members with experience leading exceptional customer-service-oriented companies. Tom Wilson,

> **“Sometimes you need to create tension to stimulate thinking, ideas, and innovation.”**

the CEO of Allstate, pointed out that it was a board member from the manufacturing sector working with OEMs and some of the hot start-ups in the connected car space who was able to offer unique insights into consumer behavior.

In addition, most board members we spoke with wanted more people with technology experience—so-called “digital directors.” They believed that directors from organizations reputed to be tech pioneers were likely to be more familiar with the challenges that come with doing innovative work and better prepared to offer informed advice on how to address them. They also wanted directors with the capacity to assess whether or not their companies were investing sufficiently in technology and associated talent.

To further bolster out-of-the-box thinking, a few boards are explicitly including intellectual or problem-solving diversity—difficult qualities to assess—in their composition matrices. Most directors we spoke with expressed concerns about whether their board composition was representative of their customers and stakeholders (with regard to factors such as gender, nationality, race, and ethnicity). And a handful of boards are making serious efforts to bring in younger-than-usual candidates, including Millennials, betting on potential rather than experience—a dramatic shift from the traditional approach.

For diverse individuals to collaborate effectively, they need shared experiences and knowledge to serve as a foundation for their interactions and decision making. Forward-thinking companies actively develop the collective literacy and contextual intelligence of the board—cultivating, in particular, a shared set of assumptions about where their industry and markets are going so that they are prepared to make the right risk/reward judgment calls together with management. Nearly half of the directors we spoke with bring in experts from different or adjacent industries to hold “master classes.” Some hold sessions with angel investors and venture capitalists to gain their industry insight. Others make visits to technology hubs such as Silicon Valley, accelerators in emerging markets, and companies and academic laboratories working on the cutting edge of a given area. A few told us they meet with key customers in small groups, while others say that their entire boards attend industry conferences together. Directors reported that all these activities prompt important discussions about their appetite for innovation by exposing them to “next practices,” not just best practices.

Creative abrasion. This is the ability to develop a marketplace of ideas not from a single flash of insight but from a series of sparks generated through rigorous discourse and debate. Boards today recognize that creative abrasion is a core capability needed to engage in innovative problem-solving. One board member remarked, “Critical thinking is imperative, and that involves putting some friction into [the discussion] to fight the status quo.” Another stated, “Sometimes you need to create tension to stimulate thinking, ideas, and innovation.”

Indeed, the “mostly silent” board member is no longer seen as doing the job. The outspoken director once perceived as a “gadfly” is now accepted, even welcomed, in the boardroom. Boards need to learn to “tolerate some chaos” in meetings, according to one board member, if they expect management to engage in creative thinking. They must build a culture in which contrarian viewpoints are heard, even actively seeking directors with the “willingness and the dynamism to really mix it up in the boardroom,” as one CEO told us.

We weren’t surprised to hear that many boards are reluctant to have the frank conversations required for innovation because the dynamics of creative abrasion are so tough to manage. The default for many board members is to avoid conflict and become “too polite.”

Directors say they are wary of CEOs who "play it safe."

Facilitating creative abrasion is a delicate dance: Boards that are too supportive fail to sufficiently challenge proposals, but too much confrontation can stifle people's willingness to offer ideas.

Redefining the partnership. Balancing the board's legal power and management's executive power is not easy, but for innovation discussions to happen, neither side can dominate. Boards need to build a strong partnership with management and a sense of shared ownership of the innovation strategy. Allstate CEO Tom Wilson told us that unlike most boards, which meet to discuss strategy once a year, his board holds two separate strategy meetings: One is a dialogue about the company's capabilities and market position and is focused on learning; the other is for decision making.

Some CEOs are getting more comfortable using the board as a thought partner. One described his board meetings now as "great idea-sparring sessions," with a healthy degree of conflict and debate. As one of his board members admitted, she had to learn "how to have her nose in, but her fingers out." Understandably, these sessions can be emotionally draining; some CEOs said they felt that their boards sometimes overstepped or "came on too strong." The CEO of a *Fortune* 100 retailer told us, "I've learned from watching other CEOs and boards that if a board gets too far in the weeds, it is deadly." Boards can avoid these issues by clarifying expectations at the outset.

Our research indicates that management teams are increasingly willing to make themselves vulnerable, embracing the board's probing questions about their big-bet ideas and even discussing efforts that didn't pan out. The more courageous CEOs we spoke with said they now seek more input from their board rather than less. One said he encourages dialogue with the board by asking management to share not only recommendations but also the other alternatives that were considered and rejected. Without this transparency, he explained, board members get frustrated and feel as though they are being "sold stuff" by management.

Getting to a place where management teams feel they can bring forward a portfolio of ideas, some of which are more developed than others, requires a real partnership mindset with boards—a shift in the conventional relationship between the two bodies. As former CEO of Mastercard Bob Selander told us, "Some people like to think that one big idea will lead to massive change, yet great boards recognize that it takes ongoing discussions about lots of ideas—the good and the bad—to produce breakthrough results." For one CEO, this meant coaching his executives to expect and be open to hard questions and criticism, acknowledging that it's not easy for his team to expose themselves (and their proposals) to negative reactions from individuals who often have less expertise about the matters at hand. "We had to be very explicit about saying, 'We are not asking for your approval; we are still trying to figure this out,'" another CEO told us. Another said that trust was essential in building a collaborative mindset. "There's a sense now that when we get done with a conversation, neither side feels beat up. Instead we feel like we got to a better decision."

Encouraging risk and living with failure. Boards know their companies must pursue not only incremental improvements but also breakthrough innovation. To foster both kinds of activity, they have to create a culture that is receptive to risk and the inevitable failure that comes with innovative problem solving. However, boards are not—and should not be—interested in innovating for innovation's sake. To avoid innovation activity that doesn't "move the needle," CEOs and board members we spoke with focused on taking risks on efforts that were most likely to create shareholder value in the long term.

Determining whether an innovation at scale will be worth the investment is a very difficult proposition. One board member told us, "Discounted cash flow analyses won't help us make a discussion about a breakthrough idea." This is especially the case in large companies where, as one CEO observed, it is always difficult to make a significant impact on top-line growth.

Most board members in our study admit that they struggle with how to weigh shorter-term financial outcomes against other measures—such as customer-experience or market-share metrics, which might be better indicators of whether an innovation will bear fruit and improve the company's competitive position in the long run. Rather than rely on outcome metrics, some boards are beginning to depend more on process measures when evaluating innovation initiatives. For example, one board member said that he frequently asked his team what the company was learning about its customers as it experimented. In some cases, boards also track vitality indices—the percentage of total revenue that comes from new products and services—to measure the organization's innovation capacity as a whole.

We know from a deep body of research that many—even most—innovation efforts fail. So boards must learn to recognize when an initiative should be abandoned. A number of board members said they wanted their companies to figure out how to "fail fast and learn fast" so that they can get on with other endeavors. Some directors said they now make sure to state aloud in board meetings that some innovation efforts should be expected to fail. Although none of the board members we interviewed reported having discussions about the difference between "praiseworthy" and "blameworthy" failures, as Harvard Business School professor Amy Edmondson calls them, they recognize that you can't plan your way to an innovation, you have to act your way there, and that there are bound to be missteps along the way. Indeed, board members say they are wary of CEOs who "play it safe," as one described. A sizable number of the search committee chairs we spoke with said they are skeptical of executive candidates who have never experienced failure and look for potential CEO successors to show, as another director said, "stretch efforts that included missteps and learning from them."

GOVERNING INNOVATION IS not for the faint of heart. The journey takes time and determination. It takes the courage to act in the long-term interests of the organization even when markets are more short-sighted. It takes the determination to fight the natural human aversion to risk and the fortitude to engage in creative abrasion.

Balancing power between the board and management has never been easy, but our study suggests that as more boards are embracing new norms, a new contract between boards and management is emerging, making it possible, at last, for directors and CEOs to work together to support and facilitate innovation.

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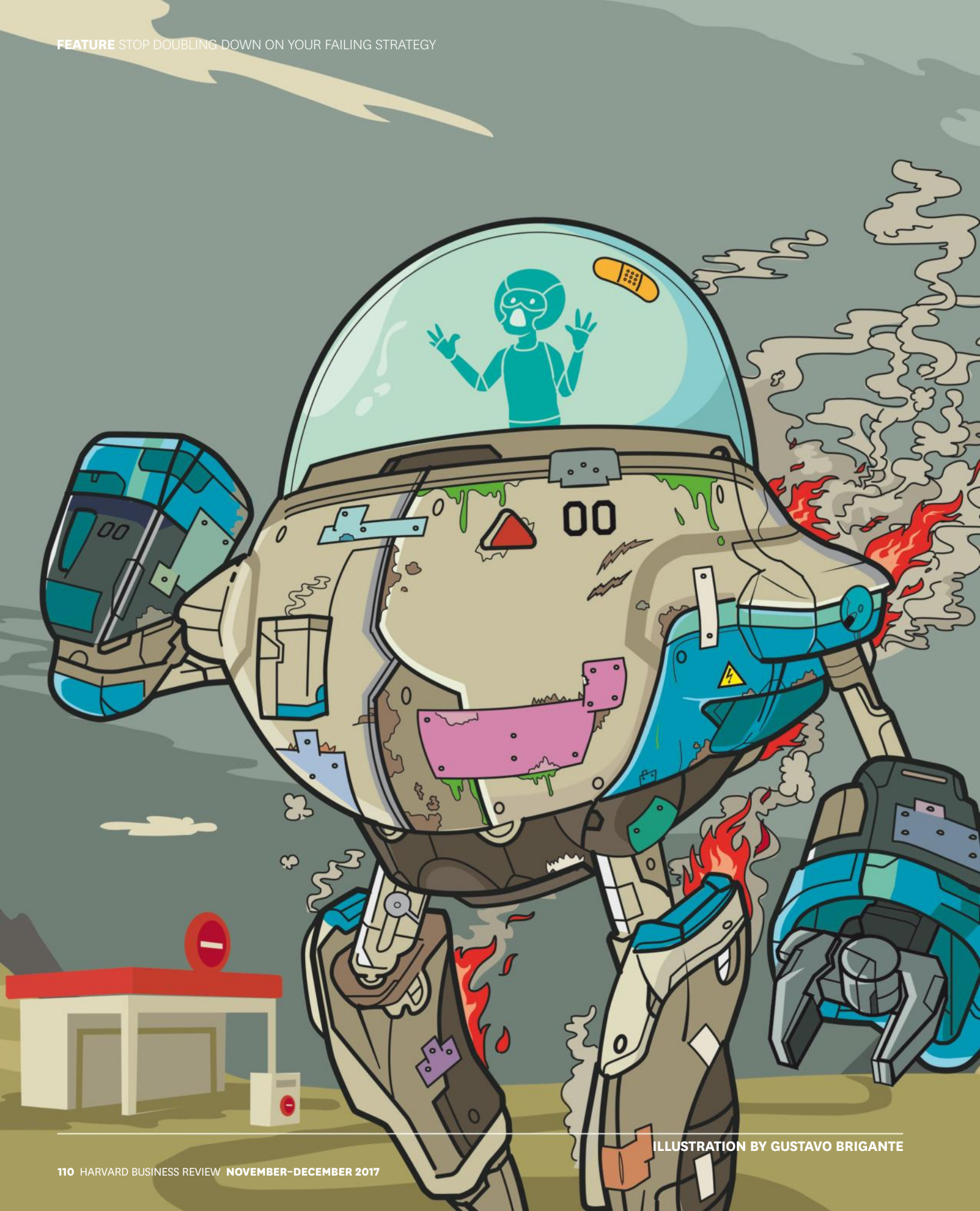

ILLUSTRATION BY GUSTAVO BRIGANTE

STOP DOUBLING DOWN ON YOUR FAILING STRATEGY

HOW TO SPOT (AND ESCAPE) ONE BEFORE IT'S TOO LATE

BY FREEK VERMEULEN AND NIRO SIVANATHAN

By the end of the 1990s the British music company HMV was on top of the world. Its business model—operating Main Street stores in which customers could browse through a wide collection and listen to tracks with an in-store headset before they decided whether to buy a CD—had delivered the company an enviable 40% market share in Britain.

HMV's rise started with the pop music revolution of the 1960s, when the company began expanding its retail operations in London. It doubled in size in the 1970s and had established itself as the country's leading specialist music retailer by the early 1980s. It opened stores in Ireland and Canada in 1986 and in the United States, France, Germany, and Japan soon afterward. By the 1990s it had more than 320 stores, about 100 of them in the United Kingdom. In 2002 HMV floated on the London Stock Exchange, valued at about £1 billion.

By then, however, some employees and analysts had started to express doubts about the long-term sustainability of HMV's business model. Although the arrival of DVDs and computer games initially boosted store profits, supermarket chains had begun selling popular CDs at a discount, and in early 1998 Amazon had started selling CDs online. A few years later downloadable music appeared on the internet, culminating in the launch of Apple's iTunes store in 2003.

But HMV's top management doggedly stuck to its strategy. In 2004 the company opened its 200th store in the UK and began acquiring rival chain stores, sometimes out of bankruptcy. By 2008 the company

was running a global network of more than 600 outlets. As early as 2002 its advertising agency had tried to alert the board to pending dangers—online retailers, downloadable music, and supermarket discounting—but HMV's managing director, Steve Knott, had angrily rejected the warning: "I have never heard such rubbish. I accept that supermarkets are a thorn in our side, but not for the serious music...buyer, and as for the other two, I don't ever see them being a real threat; downloadable music is just a fad."

Not until 2010 did HMV open a digital music store. By then, of course, the company was far too late to the party, and in January 2013 it went into receivership.

HMV's story is a classic example of what is known in the management literature as an *escalation of commitment:* holding on too long to a strategy that was once successful. Of course, many factors can contribute to the failure of a specific company, but in nearly every academic case study on the demise of a former leader in its industry, escalation was shown to play a major role. Nokia's failure, for example, which has been well documented, was to a large extent caused by the company's continued investment in its proprietary operating system even as Android and iOS were dominating the market.

Once escalation takes hold, it can be difficult to reverse, but you can reduce the chances of falling into that trap. The psychological and sociological dynamics underlying escalation have been researched by one of us (Sivanathan) and countless other scholars from many academic perspectives; in the following pages we draw on this rich body of work to offer tried and proven organizational rules to help managers design their decision-making processes. But first we'll look at the causes of escalation.

WHY IT HAPPENS

Escalation of commitment is deeply rooted in the human brain. In a classic experiment, two groups of participants were asked whether they would be willing to invest $1 million to develop a stealth bomber. The first group was asked to assume that the project had not yet been launched and that a rival company had already developed a successful (and superior) product. Unsurprisingly, only 16.7% of those participants opted to commit to the funding.

The second group was asked to assume that the project was already 90% complete. Its members, too, were told that a competitor had developed a superior product. This time 85% opted to commit the resources to complete the project.

These results underscore the fact that people tend to stick to an existing course of action, no matter how irrational. The project's likely outcome was identical

ESCALATION OF COMMITMENT—CLINGING TO A ONCE SUCCESSFUL STRATEGY—IS DEEPLY ROOTED IN THE HUMAN BRAIN.

IN BRIEF

THE PROBLEM
Companies often stick too long to a once successful but failing strategy. The British music company HMV did so, and it went from commanding a 40% share of Britain's music market to receivership in just over a decade.

WHY IT HAPPENS
Research has identified many biases that explain why decision makers may escalate a prior commitment, including the sunk cost fallacy, loss aversion, the illusion of control, preference for completion, pluralistic ignorance, and personal identification.

THE SOLUTION
Companies can reduce their exposure to escalation by adopting six practices: Set decision rules; pay attention to voting rules; protect dissenters; expressly consider alternatives; separate advocacy and decision making; and reinforce the anticipation of regret.

for both groups. Because a competitor had beaten the company to the market with a superior product, the new product was almost bound to fail. The only difference between the two situations was the timing of the question: before commitment to the project versus when it was nearing completion.

What exactly is going on? Research has identified a number of mutually reinforcing biases that collectively explain why people's judgment may be swayed by a prior commitment to a course of action. The six most important are:

- **The sunk cost fallacy.** This bias is well known in management literature. When making investment decisions, people often factor in costs they have already incurred. If they abandon a project, those costs won't be recovered. Their hope is that if the project continues, the costs can be recouped, vindicating earlier decisions to invest. But a rational decision maker will look only at future costs, not at past ones.
- **Loss aversion.** This bias, too, is well established. If withdrawing from a course of action implies certain and immediate losses, decision makers often prefer to allocate more resources to continue with it—despite low expected returns—if they see any chance of turning the situation around.
- **The illusion of control.** This bias clearly reinforces the previous two: People habitually overestimate their ability to control the future. In one experiment two groups of participants bought lottery tickets for $1. One group was assigned random lottery numbers and asked at what price they would be prepared to sell their tickets. The average answer was $1.96. The second group, whose members were allowed to pick their numbers, wanted at least $8.67. Prior success—as in HMV's case—tends to amplify the illusion; people are quick to take credit for the outcomes of decisions and also confuse having correctly predicted the future with having made it happen.
- **Preference for completion.** A wealth of psychological experimentation suggests that people have an inherent bias toward completing tasks—whether that means finishing a plate of food or seeing a project through.
- **Pluralistic ignorance.** Dissenters often believe that they alone have reservations about a course of action; as a consequence, they remain silent. Others, meanwhile, interpret their silence as agreement. In extreme cases this can result in everyone's agreeing to a decision that no one believes in. Jerry Harvey, of George Washington University, called this the Abilene paradox. He described a trip that he and his wife and parents made one 104° July afternoon in his parents' unairconditioned 1958 Buick from Coleman, Texas, to Abilene. They had all tacitly agreed to the trip, but as it turned out, none of them had wanted to take it.
- **Personal identification.** Research in both psychology and sociology suggests that people's identities and social status are tied to their commitments. Thus withdrawing from a commitment may result in a perceived loss of status or a threat to one's identity. At the same time, no executive likes to admit that a decision was wrong, because the ability to make smart decisions is part of what defines a good executive.

In combination, these biases lead a company's decision makers to ignore signals that their strategy is no longer working. It is what Karl Weick, of the University of Michigan, calls *consensual neglect:* the tendency of organizational decision makers to tacitly ignore events that undermine their current strategy and double down on the initial decision in order to justify their prior actions.

Powerful as these biases are, the research also shows that it is possible to counteract them by applying certain processes and practices in decision making. In the remainder of this article we'll describe the six of them that have proved most effective in a business context. A company that applies all six practices will significantly reduce its likelihood of falling into the escalation trap.

01 SET DECISION RULES

One way to stimulate more-objective decision making is to agree to decision rules in advance. Intel, for example, when it was still focused on producing DRAM memory chips rather than microprocessors, made a rule that production capacity would be allocated to products according to several criteria, particularly margin per wafer. This objective formula was designed when no concrete decisions were yet at stake.

Some time later, when production capacity had to be allocated between the new technology of microprocessors and the old one of DRAMs (to which several top managers at the time were still firmly committed), managers helped sway the company toward the new technology by pointing to the objective formula, which favored microprocessors.

When hard figures aren't available and judgment must be applied, non-numerical rules can serve. A large television production group, for example, which owns companies across the globe, created a decision rule to guide investments in new series, which were always proposed by local companies rather than developed centrally. After a series had been prototyped, it would be shown to the other production companies. If some of them signed up to license it for their home

markets, the series would automatically get funded. But if no other company was interested in the license, the project would cease to exist. Thus, instead of leaving the decision to a small number of top managers, this decision rule tapped into the collective wisdom of the company's highly knowledgeable on-the-ground executives.

When we asked the company's CEO why he didn't just make these investment decisions himself, he replied, "Why would I know any better than all the other very experienced television executives in my firm? It is not my job to make the decision; it is my job to make sure the best decision gets made."

02 PAY ATTENTION TO VOTING RULES

Creating a decision rule requires careful reflection, because quite subtle differences can lead to opposite outcomes. Consider the following situation: The three members of a top management team are debating whether to continue investing in the company's current technology or switch to a new one. They agree that two criteria are relevant: (1) whether the current technology is likely to require substantial additional investment; (2) whether the new technology is likely to improve significantly over time. They also agree that they should switch only if it appears that *both* criteria are met.

Let's suppose that Team Member 1 thinks that both criteria are met, Member 2 thinks that only the first is met, and Member 3 thinks that only the second is. The team's recommendation will depend on how those opinions are aggregated. As shown in the exhibit "Rethink How You Count Votes," if you tally by team member (which academics describe as *conjunctively*), the team will continue investing in the existing technology, because it's clear that two out of three members don't believe both criteria have been met. But if you tally by criterion (*disjunctively,* in academic jargon), each garners two votes for and only one against, meaning that the company should switch to the new technology.

Note that in both situations, the criteria are exactly the same and the team members hold exactly the same opinions. It's the procedure that makes the difference.

Most companies follow a conjunctive procedure (simply tallying people's overall judgments). But as the example above suggests, this procedure is likely to lead to escalating commitment, because it tends to overwhelm reservations about the status quo. We argue that when a company is evaluating whether to switch to an alternative strategy, a disjunctive procedure will better reflect any growing unease with the current course of action.

EXECUTIVES CAN MAKE DISSENT SAFER FOR SUBORDINATES BY VOICING THEIR OWN DOUBTS.

03 PROTECT DISSENTERS

Companies that have doubled down on a failing strategy are usually not without dissenters. The trouble is that dissenters can be ruthlessly suppressed—and the knowledge that this might happen itself acts as a suppressant. We also know from various studies in social psychology that people are reluctant to speak up if they think they are alone in their disagreement.

That's because they're engaging in what scholars call a *tacit calculus*: balancing the immediate risk of speaking up against a course of action (and potentially being dismissed by the group) against the longer-term consequences of not speaking up (and possibly witnessing the failure of their organization). When the probability of being dismissed appears high, they will opt to remain silent. Chances are, moreover, that loss aversion bias will cause them to overweight the probability of being dismissed.

To prevent escalation, it is essential that leaders create an environment in which people do speak up, share dissenting information, and challenge the organization's course of action. Amy Edmondson, of Harvard Business School, refers to this as *psychological safety*: a belief that one will not be punished or humiliated for sharing ideas, questions, or concerns. Organizations can create this safety by:

Providing anonymous feedback channels. Creating safe channels that lower-level executives can use to share opinions is one way to surface dissent. These channels can take multiple forms, such as an

online system or a third party. Research indicates that management consultants, for example, can play this role effectively—provided they are explicitly hired for that purpose.

Deploying larger teams. CEOs often rely heavily on a kitchen cabinet or an executive committee consisting of just three or four trusted colleagues. But in a small team, a dissenter may well be a lonely voice. A review of 97 studies in social psychology showed that single-person minorities consistently had minimal influence on majority opinions, because they were easily discounted as reflecting an idiosyncratic perspective. In a team of four, therefore, three people who agree are inclined to dismiss the differing opinion of the fourth person, even though she represents 25% of the team. The good news is that it takes only two to get a hearing: Research shows that in a team of 12, people will pay attention if only two members disagree, even though they represent less than 17% of the team.

RETHINK HOW YOU COUNT VOTES

A team of three must recommend whether its company should change its core technology. Managers agree that this should happen only if both of two criteria are met. What this team recommends will depend on how the members' votes are counted.

	CRITERION #1 FURTHER INVESTMENT IN THE OLD TECHNOLOGY IS NEEDED	**CRITERION #2** THE NEW TECHNOLOGY IS LIKELY TO IMPROVE	**CONJUNCTIVE PROCEDURE (TALLY BY MEMBER):** SWITCH TECHNOLOGIES?
TEAM MEMBER 1	YES	YES	YES
TEAM MEMBER 2	YES	NO	NO
TEAM MEMBER 3	NO	YES	NO
DISJUNCTIVE PROCEDURE (TALLY BY CRITERION): SWITCH TECHNOLOGIES?	YES	YES	

In general, therefore, we suggest that CEOs avoid delegating input on strategic decision making to groups of only four or five people. To be sure, smaller teams reduce coordination and communication costs and reach consensus faster. But larger teams have more information-processing capacity and a greater diversity of perspectives. We recommend enlisting 10 to 14 executives when it comes to debating the company's long-term strategy. (More than 14 is inadvisable, because members of very large teams tend to disengage.)

Calibrating diversity. In addition to enlarging the strategy-making team, companies should increase its diversity. More than two decades' worth of research demonstrates that diverse groups produce more innovative and creative solutions, are better at solving complex problems, and are more capable of incorporating novel information. But diversity must be carefully calibrated. Consider the two teams in the exhibit "Make Sure Your Teams Have Subgroups." On Team 1, every member is demographically unique. Team 2, however, has two distinct subgroups. Research by one of us (Vermeulen) shows that teams with subgroups are more likely to develop alternative courses of action, because the probability is greater that no dissenter will be alone.

Modeling doubt. Executives can make dissent safer for subordinates by expressing their own doubts about a current strategy. To be sure, leaders are not used to doubting themselves—a situation reinforced by the fact that followers expect them to be decisive and confident. But the payoff for occasionally admitting some fallibility can be significant.

Consider this example from a large European airline. The top management team had been planning a major new investment for one of its key divisions. During the final meeting with the three senior executives involved in the plan, the CEO decided to make sure that everybody was really on board. He stood up and declared that he was willing to proceed, but he thought they should know that he felt unsure about it. After a short silence, another executive spoke up, admitting that he, too, had been having doubts. He was swiftly followed by a third person, who carefully explained his reasons for lacking confidence in the venture's chances of success. It appeared that of the four people in the room, only one really wanted the project to go ahead.

Yet until then, none of them had openly opposed the investment. Not until the CEO's public admission of doubt did the other executives feel psychologically safe enough to admit reservations and surface arguments to end the course of action. The team abandoned the project, and the division concerned remained one of the corporation's most profitable.

MAKE SURE YOUR TEAMS HAVE SUBGROUPS

Diversity helps creativity, but if *everyone* is different, there's a risk that no one will speak up. In building a team, therefore, make sure each member can identify a potential fellow dissenter. Both teams shown below include men, women, whites, and Asians of various ages, functions, and tenures. But in Team 1 no two members are alike, whereas Team 2 has two distinct subgroups. Team 2 is therefore more likely to have a debate around decisions.

TEAM 1				
Age	28	29	52	54
Sex	male	female	male	female
Ethnicity	Asian	white	white	Asian
Function	finance	sales	production	finance
Tenure	2	11	3	13

TEAM 2				
Age	28	29	52	54
Sex	male	male	female	female
Ethnicity	Asian	Asian	white	white
Function	finance	finance	sales	production
Tenure	2	3	11	13

04 EXPRESSLY CONSIDER ALTERNATIVES

For a study published in 2009, Shane Frederick, a professor at Yale, ran a revealing experiment with two groups of participants. Both groups were asked to assume that they had a sum of money available to buy themselves a present. They were told to imagine that on a trip to a video store, they came across a DVD on sale for $14.99 that included their favorite actor or actress and was their favorite type of movie.

The first group was given a simple binary choice: (1) buy the video; (2) don't buy the video. In this group 75% bought the video. The second group, however, was given a slightly different choice: (1) buy the video; (2) don't buy the video and keep the $14.99 for something else. Only 55% of this group chose to buy the video. The simple reframing of options to include doing something else with the money was sufficient to significantly shift people's decisions.

This experiment suggests that framing strategic questions to include the possibility of alternatives is an effective way to avoid an escalation of commitment to one course of action. Of course, it also means that you must have alternatives available (and research shows that spending time and money on considering them is generally well worth it). Paul Nutt, of the Ohio State University, analyzed 137 key decisions in as many North American companies and found that when only one course of action had been considered, 52% of the decisions resulted in failure. By contrast, when just one alternative had been considered, the failure rate dropped to 32%.

05 SEPARATE ADVOCACY AND DECISION MAKING

Managers who initiate a course of action are more likely to continue funding it (even in the face of failure) than managers who assume leadership after a project is started. You can reduce the likelihood of escalation if you give responsibility for a strategic move to people who did not advocate or initiate that move.

Research in banking, for example, shows that loan officers who have approved a loan to a particular client often escalate their commitment to the borrower by assigning further loans, even if the borrower is relatively likely to default. Banks that make a practice of separating initial credit decisions from subsequent requests outperform banks that place those decisions in the same hands. Similarly, other research has found that new managers tend to rate underperforming employees less favorably than the managers who hired them; likewise, entrepreneurs who buy existing businesses invest less capital than the entrepreneurs who established them.

The British bank Barclays offers a good example of the wisdom of separating decision making from strategy advocacy. In 2007, after much preparation and internal negotiation, Barclays decided to make a £43 billion bid for the Dutch bank ABN AMRO. Unexpectedly, the Royal Bank of Scotland (RBS) made an unsolicited rival bid of £48 billion. A takeover battle was in the cards, and the Barclays executive team was gearing up to raise its bid. The Barclays board, however, was persuaded by independent directors to vote against the move, and the bank withdrew its offer.

RBS ended up acquiring ABN AMRO, taking on a lot of debt in the process. Barclays's decision proved smart: When the financial crisis struck, RBS was among the hardest hit of the big UK clearing banks because of its high leverage.

06 REINFORCE THE ANTICIPATION OF REGRET

The social psychologist Marcel Zeelenberg has defined regret as an "emotion that we experience when realizing or imagining that our present situation would have been better had we decided differently." A good way to prevent doubling down on a failing strategy is to get managers to anticipate the regret they may feel at not having taken a different road. This can be done in two ways:

By taking a temporal perspective. The first approach is to get people to explicitly consider what might go wrong with the current strategy. Of course, companies claim to routinely undertake this sort of exercise, but in most cases they simply ask managers to look forward in time. That's unlikely to be helpful. Ample research in social psychology, including our own, has shown that people—especially those in leadership positions—are inherently overoptimistic about the future and their ability to affect it (the illusion of control).

A far better exercise is to get people to imagine a concrete scenario and then work backward, using what is called *prospective hindsight*. For example, instead of asking people to imagine why a strategy might fail, try telling them, "It is January 2025, and the unexpected has occurred: Our strategy has failed to deliver even a respectable market share. Think about the reasons why." J. Edward Russo, of Cornell, conducted several experiments along these lines with various colleagues. They found that participants who were prompted to apply prospective hindsight to a course of action came up with about 25% more ways it could fail than those presented with an exercise in forecasting—and the reasons surfaced through prospective hindsight tended to be more specific and relevant to the situation.

One form of this, introduced by the research psychologist Gary Klein, is the "premortem." At a point when a management team had almost come to an important decision but was not yet formally committed, he would say, "Imagine that we are a year into the future. We implemented the plan as it now exists. The outcome was a disaster. Please write a brief history of that disaster."

By taking an interpersonal perspective. You can also persuade managers to question commitment and consider alternatives by getting them to step into different roles. If they end up imagining a compelling new strategy as a result, the potential for regret will increase.

Intel again provides a classic example. CEO Gordon Moore was initially reluctant to withdraw from DRAM, because it was "the product that had made Intel." He changed his mind only after the company's cofounder Andy Grove famously asked him, "If we got kicked out and the board brought in a new CEO, what do you think he would do?"

We recommend a similar exercise: Create three groups of no more than five members of your top management team and ask them to prepare answers to the following questions for presentation to the full team:

Group 1: Imagine that an entirely new executive team enters the company. What would it change?

Group 2: A hedge fund has shorted our stock. Please explain its reasoning.

Group 3: A small group of middle managers have produced a memo urging us to change course. Please write down their arguments.

Variants of this exercise can be developed according to the strategic issue at hand. Whatever its precise form, purposeful perspective taking can enable decision makers to imagine dissent.

BY ITS NATURE, an escalation of commitment is difficult to detect. Rather like the apocryphal frog that doesn't know until too late that it's being boiled alive, overcommitted executives are prone to ignore signs of their company's imminent collapse. That is precisely why companies need to establish organizational processes and practices of the kind we've laid out—to encourage managers at all levels to make decisions more objectively and explicitly consider alternative strategies and perspectives.

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WHAT MANAGERS NEED TO KNOW ABOUT SOCIAL TOOLS

AVOID THE COMMON PITFALLS SO THAT YOUR ORGANIZATION CAN COLLABORATE, LEARN, AND INNOVATE.

BY PAUL LEONARDI AND TSEDAL NEELEY

Workplaces have adopted internal social tools—think stand-alone technologies such as Slack, Yammer, and Chatter, or embedded applications such as Microsoft Teams and JIRA—at a staggering rate. In an ambitious study of 4,200 companies, conducted by the McKinsey Global Institute, 72% reported using them to facilitate employee communication. That figure grabbed our attention, so we asked leaders of both large and small organizations for more insight into why they were turning to social tools and platforms. They said things like "Other companies are, so we should too" and "That's what you have to do if you want to attract young talent." Although the bandwagon effect was not a surprise, this was: Few of the rationales were

ILLUSTRATION BY JUAN DÍAZ-FAES

based on a solid business case, which leaders normally require when considering other technologies, such as CRM software or computer-simulation tools.

To more systematically identify the performance value that social tools can bring to companies, we split employees at a large financial services firm into two groups and observed them for six months. The first group used an internal social platform called Jive-n, while the other group did not.

The results were remarkable. The employees who had used the tool became 31% more likely to find coworkers with expertise relevant to meeting job goals. Those employees also became 88% more likely to accurately identify who could put them in contact with the right experts. They made these gains by observing what their coworkers talked about on Jive-n and with whom. The group that had no access to the tool showed no improvement on either measure over the same period.

Since then we have studied internal social tools in various work settings, including banking, insurance, telecommunications, e-commerce, atmospheric science, and computing. The mounting evidence is clear: These tools can promote employee collaboration and knowledge sharing across silos. They can help employees make faster decisions, develop more innovative ideas for products and services, and become more engaged in their work and their companies.

Over the past two decades organizations have sought some of these benefits through knowledge management databases, but with limited success. That's because determining who has expertise and understanding the context in which it was created are important parts of knowledge sharing. Databases do not provide that type of information and connection. Social tools do.

But we have found that companies that try to "go social," as many of them call it, often fall into four traps. Here we'll look at those traps and share recommendations for capitalizing on the promise of social tools.

TRAP 1 FLAWED ASSUMPTIONS ABOUT MILLENNIALS

Leaders assume that young people "breathe" social media, as one senior executive at a large insurance company put it. This view of Millennials *outside* the workplace is certainly backed by good evidence—they're avid consumers of Facebook, Twitter, Instagram, Snapchat, Reddit, and countless dating sites. So managers often look to them to set an example in the organization, expecting that they will be pioneering users of social tools at work. But that's a mistake. In our extensive interviews and company surveys, we've found the opposite to be true. Millennials actually have a difficult time with the notion that "social" tools can be used for "work" purposes, the way they might use a spreadsheet or a PowerPoint deck. They see social media as a space for self-expression and communication with friends and family. It's integral to their personal lives but—aside from LinkedIn and other career-building sites—it has little or nothing to do with their professional lives.

This may be in part because few Millennials encounter workplace technologies before college or their first serious jobs—at which point they have been active on social media for several years. They're wary of conflating those two worlds; they want to be viewed and treated as grown-ups now. "Friending" the boss is reminiscent of "friending" a parent back in high school—it's unsettling. And the word "social" signals "informal" and "personal." As a 23-year-old marketing analyst at a large telecommunications company told us, "You're on there to connect with your friends. It's weird to think that your manager would want you to connect with coworkers or that they'd want to connect with you on social media [at work]. I don't like that."

Most managers we have worked with want employees to use internal social tools to communicate informally about work—but not to discuss personal matters. Millennials aren't interested in crossing that line either, but they have trouble imagining how they *could* use social tools without getting personal.

Another problem is the way organizational leaders talk about the social tools they're implementing. In nearly every rollout we've seen, senior executives—trying to provide a cognitive link to a familiar technology—have referred to them as "Facebook for the company" or "Twitter for the company." But after hearing that from a manager, a 22-year-old data analyst at the

IN BRIEF

A MISSED OPPORTUNITY
Internal social tools can improve collaboration, innovation, decision making, and employee engagement. But four common traps get in the way: Organizations make flawed assumptions about Millennials, struggle with personal and professional boundaries, overlook the learning that takes place, and derive faulty insights by focusing on the wrong data.

A BETTER WAY
To realize the potential of social tools, organizations should clearly define why they're adopting them, encourage informal communication and even "lurking" to promote knowledge sharing and learning, and articulate the rules of conduct. And leaders should exhibit the behaviors they'd like to see from employees.

insurance company mentioned above asked, "Why would I want to use Facebook at work? I don't think I necessarily want my boss knowing that I went to a party last night."

In our surveys, about 85% of young professionals said they struggle with social tools at work. Ironically, about 90% of older professionals viewed these tools as new and often useful modes of communication with their colleagues.

TRAP 2 REPRESSING INFORMAL COMMUNICATION

The second trap is related to the first: Managers and other employees are generally not interested in sharing details about their *own* personal lives on social tools at work. Many companies even explicitly prohibit the discussion of nonwork topics on their internal sites. And yet we find that a key motivator for employees to engage with their company's social tools is curiosity about *others'* personal lives. That's true for people of all ages and ranks.

Although such voyeurism might seem problematic at first glance, our research shows that it's a missed opportunity, because it can make work interactions easier and more productive. It's hard to strike up a conversation with someone you don't know well. It's even more difficult to ask that person for help or a favor. Employees feel better equipped for such exchanges when they have gained personal insights about their coworkers by watching them communicate on internal social tools. Our research at a large telecommunications company, for example, revealed that employees who do so are three times as likely as others to get pertinent *work* information from colleagues.

Jose, a mid-level manager in the telecom company's marketing division, shared an illustrative story about connecting with his coworker Alex: "I was following [on the company's Chatter site] this guy in the e-commerce division who posted about soccer statistics. I thought it was cool and interesting because it was a hobby of mine too. So I went to his page to see if he'd written anything about the Euro Cup, and I saw a communication between him and another guy in marketing about a promotion they were working on. I was like, 'Whoa, this promotion is a great idea.' So I called him up and introduced myself and told him I kind of stalked him because of his soccer posts, and we both laughed. And then I said, 'Hey, I saw [your posts] about this promotion you're doing. Can you tell me about it so we maybe could do something like this in my division?'" Like many other employees we talked to, Jose was drawn to a particular coworker because of a shared interest. That gave him material for his opening bid for important work-related knowledge.

By watching colleagues talk about hobbies and pastimes on internal social tools, employees can also assess whether their coworkers are likable. An engineer at a large e-commerce company told us that he often did this to "size people up" and determine how "safe" they were to approach. Others made similar comments. How coworkers responded to people's queries or joked around suggested how accessible they were; it helped colleagues gauge what we call "passable trust" (whether somebody is trustworthy enough to share information with). That's important, because asking people to help solve a problem is an implicit admission that you can't do it alone. It can make you feel vulnerable, especially if you're afraid of developing a reputation for lacking certain knowledge.

Still, as valuable as it may be to observe personal, informal communication at work, our investigation kept bringing us back to this paradox: The content that attracts people to their companies' social tools and keeps them coming back can also inhibit them. Employees often worry that interaction on these tools will be seen as wasting time—and many managers do assume that productivity is suffering when they see a lot of chitchat there. If internal social tools are to deliver on their promise, companies and individuals must become comfortable with both personal and professional interactions online.

TRAP 3 FAILURE TO RECOGNIZE LEARNING

Lew Platt, a former CEO of Hewlett-Packard, was fond of saying, "If only HP knew what HP knows, we would be three times more productive." Our work shows that internal social tools provide a space for employees to

BECAUSE LEARNING ON SOCIAL TOOLS HAPPENS AT A REMOVE, PEOPLE DON'T THINK OF IT AS LEARNING.

acquire knowledge by watching their colleagues. But when we asked more than 400 people across various companies to tell us what they had learned on these tools, we got blank stares. The most common response was "Nothing." That's because learning on social tools happens at a remove, while others go about their work, so people don't think of it as learning.

It's actually a bit like spying or eavesdropping. Research shows that people spend much more time as "lurkers" or "observers" on social tools than they do as content producers—writing posts, sharing information, or creating documents and videos. We've found that people can acquire at least two types of knowledge this way: *direct knowledge* and *metaknowledge*.

Employees gather direct knowledge when they observe others' communications about solving problems. Take Reagan, an IT technician at a large atmospheric research lab. She happened to see on her department's social site that a colleague, Jamie, had sent a message to another technician, Brett, about how to fix a semantic key encryption issue. Reagan said, "I'm so happy I saw that message. Jamie explained it so well that I was able to learn how to do it." Employees share this kind of information with one another all the time in hallway conversations and e-mails. But because Jamie and Brett decided to communicate via the company's social site, their exchange was visible to Reagan, too, and she learned something unexpected and useful.

Employees who gain metaknowledge don't learn how to *do* something; instead they learn who has the expertise they need or who knows someone who has it. Consider Amanda, a marketing coordinator at the financial services firm mentioned above. Her manager asked her to analyze trends in an enormous data set, and she was unsure how best to structure the report query. After trying (unsuccessfully) to figure it out by herself, she decided to log on to the company's internal social tool to see if anyone had posted documentation that would help her. She couldn't find any, but she did see an exchange between two employees in marketing—Rick and Alicia—who were discussing that very issue. Rick recommended that Alicia contact Mark, in the analytics department, because he knew how to write the proper script.

Excited, Amanda left Mark a voicemail asking for help. She didn't get a response, so she tried again the next day—still no response. Fortunately, by observing the conversation between Rick and Alicia, she had learned not only "who knows what" but also "who knows whom"—both important components of metaknowledge. So she asked Rick if he would broker an introduction. Rick texted Mark to ask if Amanda could talk with him about writing a script, and Mark texted back immediately to say that she could call him in five minutes. Amanda called, Mark wrote the script, and Amanda estimates that she saved nearly a week's worth of time on her project.

Employees who observe others' communications pick up bits and pieces of seemingly unimportant information over time. Eventually they begin to form a picture of who knows what and whom. As the tech writer Clive Thompson has observed, using social tools is like staring at a pointillist painting. No dot by itself makes much sense. But when you step back to see all the dots together, you comprehend a rich image. The slow process whereby people see the individual dots makes it difficult for them to realize they are learning. Unless managers explicitly highlight the potential for knowledge sharing and skill building when rolling out social tools—and have developmental conversations with employees—people may underutilize or even abandon them.

TRAP 4 FOCUSING ON THE WRONG DATA

Employees' communications and behaviors become highly visible on internal social tools, which can make

it easier to collaborate. But not all that is visible is important or useful. Sometimes social content leads people to focus—and act—on the wrong data.

To illustrate, let's return to the atmospheric research lab. A reorganization brought together IT technicians who had never collaborated before. At first they relied on seniority as a proxy for expertise—they sought advice from their most seasoned colleagues. To help them share knowledge more effectively and learn who knew what and whom, the IT director implemented a social tool for the department. As is usually the case, employees started using it slowly. But as communication on the site increased, people began to read messages between coworkers about solutions they had devised for computing and network problems across the lab. Eventually it became clear that Jill, the most junior technician in the department, was actually the most knowledgeable in certain areas—and people started turning to her with questions.

Peggy, the group's most senior technician, quit after several months of this, frustrated that her coworkers, who had initially come to her for help and advice, no longer seemed interested in her recommendations. Her colleagues were very clear about why they had shifted from Peggy to Jill: Jill's messages and posts were chock-full of useful technical details. One coworker noted, "Jill just seems to really know a lot about the issues I face."

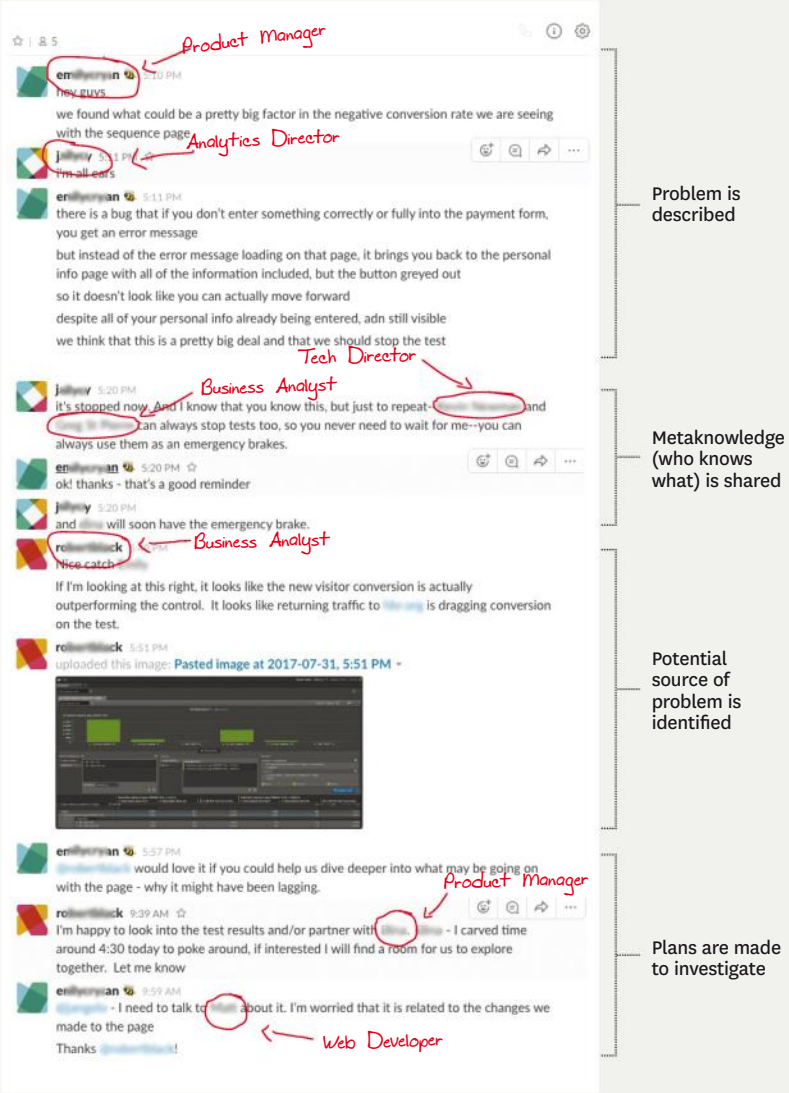
The IT director was not sad to see Peggy leave. He reasoned that the social tool had exposed the fact that she was not as knowledgeable as everyone had thought, and he was pleased that his employees were now going to the "smartest" person for help. But barely two months after Peggy's departure, the IT department's evaluations from scientists across the organization plummeted. Peggy might not have been the most technically sophisticated employee in the department, but she had the most cultural and political knowledge. She knew which scientists' problems should be highest priority, and she knew what preferences various scientists had for technology in their labs.

Because the technicians were thinking of "expertise" solely as technical knowledge, Peggy's value to the group was hidden. To salvage the department's customer satisfaction scores, the IT manager hired Peggy back at a 30% premium and began to encourage her and others in the department to diversify the types of knowledge they shared on the site.

Across all the companies we studied, the most visible information and knowledge were perceived as most important. If employees' contributions and strengths weren't showing up in their posts or messages, they were likely to be overlooked—and the organization

A SOCIAL SNAPSHOT

This real exchange illustrates how social tools can be used to solve problems and collaborate across functions. After a product manager at a midsize media company raised some concerns on Slack about an A/B test, colleagues in analytics stopped the test, provided valuable context for the results, and organized a quick meeting to explore what was happening.



INTERNAL SOCIAL TOOLS CAN GIVE GLOBAL EMPLOYEES A WINDOW ONTO BROADER COMPANY DISCOURSE THAT IS OTHERWISE UNAVAILABLE.

wouldn't benefit from them. Our findings support the old adage that what gets recorded gets remembered.

CAPITALIZING ON SOCIAL TOOLS AT WORK

Although these four traps are common, your organization needn't fall into them. In our consulting work we've found that to reap the benefits of internal social tools, companies can define the purpose, strengthen ambient awareness, spell out rules of conduct, and lead by example.

Define the purpose. Most employees don't know exactly why they're meant to use internal social tools. As a result, people may shy away from them—or, without realizing it, use them in ways that undermine rather than enhance performance. For instance, at the financial services company in which we did our experiment, executives hadn't made it clear that one of their goals was to strengthen employee relationships. Consequently, many employees grew afraid over time that management—after observing what they shared online—would think they were "socializing" too much at work. So they began to disengage from the site, even though they thought it provided value. It takes a critical mass of employees to make internal social tools useful. Thus leaders need to clearly explain what employees and the organization as a whole stand to gain through these new technologies. We have found the following to be the most significant ways social tools provide value in organizations:

Improving collaboration. Internal social tools can enable employees to engage with coworkers more widely, building awareness of expertise and increasing collaboration across the organization. That's what happened when Jose, the manager at the telecom company, parlayed his coworker Alex's love of soccer into a productive partnership. Their initial conversation sparked other discussions about common issues in their respective departments. They hatched an idea to develop a new branding campaign (using Jose's marketing expertise) for one of Alex's businesses (in the e-commerce division) that ended up increasing customer retention by more than 200%. Alex said, "No one from my department had ever worked with marketing before. Who knew we could complement each other so well?"

Enhancing knowledge sharing. Companies are increasingly using social tools to gain a competitive advantage through internal knowledge sharing. Often this benefit emerges organically and is then put to strategic use. For example, a group of engineers at a large e-commerce company struck up a useful conversation on Yammer. One engineer in the German office learned about a web-analytics application that the more advanced Tokyo office had implemented locally. He contacted a Tokyo engineer to get detailed information about the application and the network environment required to support it and then adopted the application and posted his satisfaction with it to the group. American and French engineers expressed interest in the tool for their local markets. Observing its success in Tokyo and Germany and its potential elsewhere, the manager of the group required that it be adopted across all markets. We observed a similar spread of knowledge in the marketing, sales, and legal groups.

Creating a connected global company. Employees who work in different locations around the world often have a hard time building relationships and forging a shared identity. Social tools can facilitate personal and professional connections, increasing trust and

rapport across geographic and cultural borders. Many global employees report that internal social tools give them a window onto broader organizational discourse that is otherwise unavailable to them. As Sam, who works for the e-commerce company, explained, "I get a feel for what everyone's doing over there [at headquarters], the types of projects, and how they're doing. So I definitely feel more connected." Others at the company echoed Sam's sentiment, saying, "I feel like I am part of the family" and "We're the same company. We're the same people. We look different, we might sound different, but we're doing the same thing at the end of the day." In a dynamic and global marketplace, far-flung employees value this sense of belonging.

Preventing duplication of work. Social tools allow employees to learn about existing projects and initiatives that overlap with their own and to coordinate efforts. This can reduce work duplication and free up time and money to generate new knowledge. At the insurance company we studied, one employee, Sheila, was asked by her manager to put a hold on her current project and perform an urgent analysis for a new vertical market. She told her manager that the analysis would most likely take two weeks, pushing her current project past the deadline and over budget. The manager was willing to pay that price. As Sheila began to dig into the problem, she remembered a series of exchanges on the internal social tool among colleagues in another department about a project they were working on in that same vertical market. With this metaknowledge, she sent them a note asking if they could suggest where to start. They replied that they had completed a market analysis and asked if she would like to see it. Sheila said that when she received the report, "I couldn't believe it. It was exactly what my boss asked me to do. This just saved me two weeks, and it saved my project over a million dollars. I had no idea they were working on this. Neither did my boss."

Increasing innovation. With the help of social tools, employees can sometimes borrow ideas and solutions from other parts of the organization and combine them in fresh ways to create new products or processes. A clear example of innovation comes from the financial services firm we studied. Tim, an employee in the consumer finance division, was working out the details of a new loan program. He couldn't quite figure out how to make his idea work. But then inspiration struck: "I suddenly remembered that I'd seen a communication exchanged between these two guys....One of them, Joe Franklin, who's in the pricing department, mentioned something—I forget the context—about rate variation depending upon risk factors. That caught my eye, so I read the history of the conversation he had, and it turns out that there was some flexibility in rate assignment based on risk class. I sent him an e-mail to see if I could learn more about it, and it made sense. So I developed the program around it, and it's been pretty successful so far—really innovative, so it made me proud."

Tim's director was very happy too. The product came in on time and under budget, and carved out a new niche for the company in a crowded market.

Social tools bring the greatest benefits when employees are exposed to ideas and insights from people across the organization—particularly people they wouldn't normally encounter. The challenge, however, is that focusing attention on content coming from multiple departments—many of which have different goals and may seem unrelated to one's own work—is difficult. For this reason, organizations tend to deploy social tools within departments. But if patterns of communication are too insular, the expanded network that these tools promise won't materialize.

Once you've defined your organization's key purpose and made a plan for deploying social tools, clearly articulate all that through internal marketing campaigns, messaging from the top, and one-on-one or group training sessions to focus employees' efforts.

Strengthen ambient awareness. Whatever purpose you define, you'll be more likely to achieve it if you allow the tools to hone employees' "ambient awareness"—a social-science term for awareness of

communication and behavior around you in which you are not directly involved. You can do this in a couple of ways. First, make clear to everyone that management sees the value of friendly interaction—even when it has nothing to do with work. And then let it happen. That's how people make unexpected fruitful connections across the organization. If you see some chattiness online and start to worry about lost productivity, quash the urge to limit exchanges to "work only" topics. Encourage people to befriend and follow new coworkers—preferably in other departments or divisions—instead of solely paying attention to those they already talk to off-line. They'll develop a richer sense of who knows what and whom. Second, occasionally remind employees that it's productive to absorb seemingly unimportant or uninteresting details about their colleagues. Noticing that someone is working on closing a deal with a wireless antenna company may not seem immediately relevant to an employee. But it's still important to file that sort of detail away—it may become useful later. And every piece of information contributes to a full, vibrant picture of the organization.

FORMALITY MAY BE APPROPRIATE FOR OTHER CHANNELS, BUT IT THWARTS THE INFORMATION EXCHANGE AND KNOWLEDGE FLOW YOU WANT ON SOCIAL TOOLS.

Spell out rules of conduct. Companies often have three concerns about employee behavior on internal social tools: that it is too informal, that people can share confidential information, and that people might inadvertently violate externally mandated regulatory policies. The first concern is misplaced. The emerging norm is casual, brief communication, and for good reason: Though formality may be appropriate for other channels (such as e-mails to superiors or memos to the staff), it thwarts the kind of information exchange and knowledge flow you want to see on social tools.

However, it's critical to address the other two concerns—respecting confidentiality and adhering to regulations. This involves managing visibility. Not all social communications should be made public. Leaders must be clear about which types of information and data cannot be shared broadly—client account numbers and revenue projections, for instance—and which can.

Lead by example. Finally, people take their behavioral cues from above. If leaders aren't present on internal social tools, employees won't be either. And if leaders post mostly formal announcements about changes in policy or personnel (which happens often), employees will view the tools as just another vehicle for management to broadcast information, rather than as a way for them to communicate with one another. The organization will fail to achieve its purpose for implementing social tools.

As with any initiative that requires cultural change, leaders must model the behavior they would like to see. When they notice a good idea streaming on their company's social tool, they should publicly engage the person who posted it. And when employees share information that's not related to work, leaders should chime in with interest.

BRINGING SOCIAL TOOLS into a company may look simple. Most of them are cloud-based applications, so they require virtually no investment in infrastructure. What's more, today's employees have experience using social media in their personal lives, making the learning curve easy for most people. But belying this apparent simplicity is a much more complicated reality: To achieve the benefits of a social enterprise, companies must work hard to avoid the common traps we've described—traps that can ensnare even the most adventurous enterprise. Some of the organizations we've studied have succeeded by using the strategies in this article. As a result, their employees are more engaged with their global companies, do a better job of communicating and sharing skills and knowledge, and collaborate and innovate more effectively.

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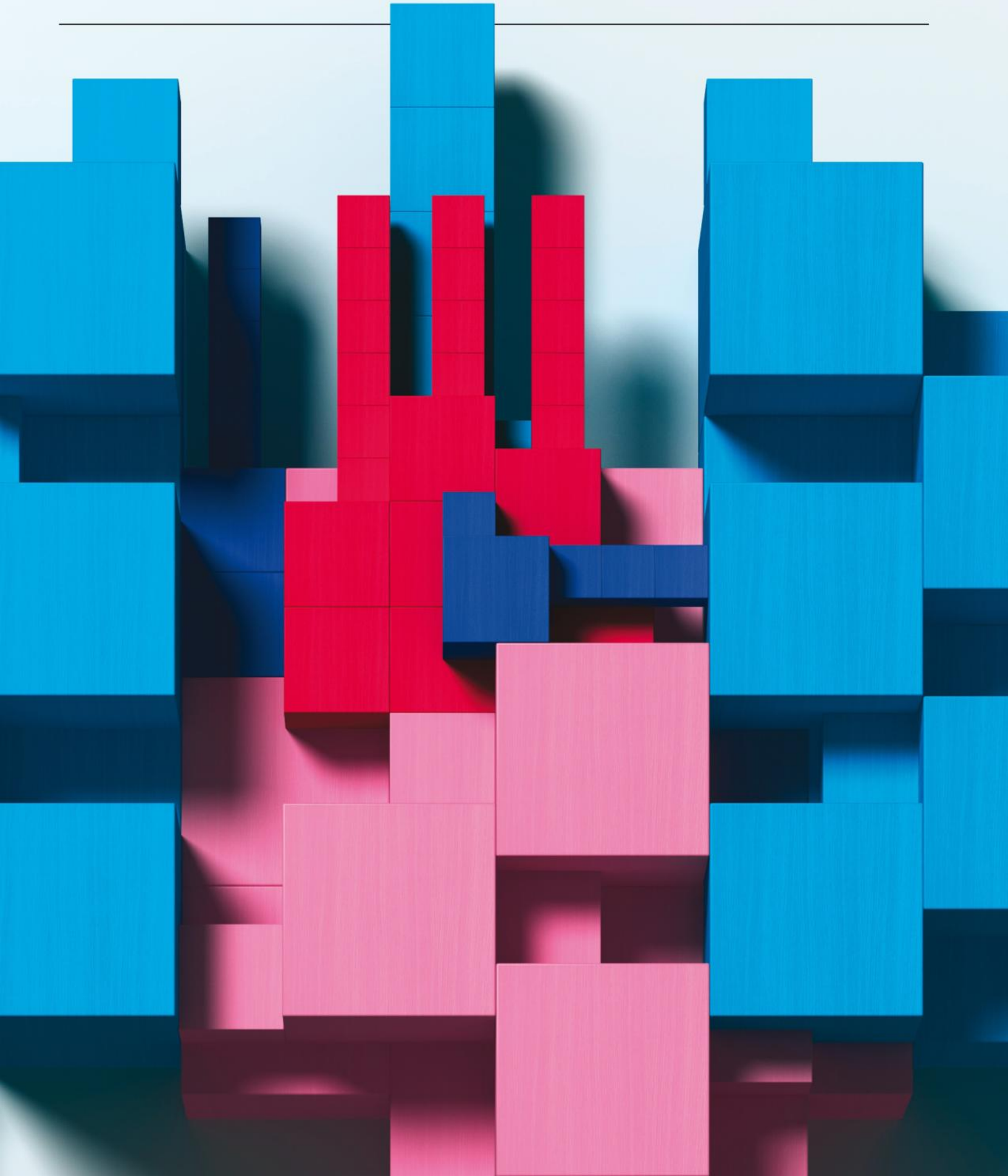


The IT Transformation Health Care Needs

BY NIKHIL R. SAHNI, ROBERT S. HUCKMAN, ANURAAG CHIGURUPATI, AND DAVID M. CUTLER

GETTY IMAGES/HIROSHI WATANABE

THE MID-1990S, EVERYONE knew that health care organizations across the United States were plagued by wasteful spending. The question for Intermountain Healthcare, which serves residents of Utah and Idaho, was where to start looking for savings internally. Data analyses quickly identified the most promising targets: 104 of the 1,440 clinical conditions that Intermountain treated accounted for 95% of the care it provided, and two services—newborn delivery and treatment of ischemic heart disease—accounted for 21% of its work.

Quality-improvement teams focused first on those two services. Armed with a sophisticated electronic health record (EHR) system and a separate information technology system that detailed the costs of activities, the teams used evidence-based guidelines and the experience of Intermountain's physicians to redesign clinical workflows. The top executives, the board of trustees, physicians, and nurses all worked together to support the drive to improve care. Today more than 60 services have been revamped, and Intermountain is recognized as a national leader in quality improvement and cost management. None of it would have been possible without its IT systems.

This example is impressive. Unfortunately, it is still a rarity. The more common story in health care is one of large IT investments but little to show for them. Spurred by examples like Intermountain, the U.S. government's Centers for Medicare and Medicaid Services spent $37 billion just in incentive payments for health care IT from 2011 to May 2017. By 2016, more than 50% of office-based physicians and over 80% of hospitals had installed a "basic" EHR system—one that meets minimum standards set forth by the Office of the National Coordinator for Health Information Technology. Yet such systems have had little impact on quality improvement and cost reduction to date. Indeed, clinicians routinely criticize them, lamenting that they waste their time, are rigid and not user-friendly, and interfere with their patient interactions. Many health care organizations are suffering more pain than gain as they struggle to integrate new IT systems into their operations. For example, in January 2017, MD Anderson Cancer Center announced that it would lay off 900 employees, or about 5% of its workforce, largely because of financial losses attributable to a new EHR system. More broadly, efforts to persuade health care organizations to share information continue to lag, as do efforts to enable different IT systems to communicate with one another, causing data to remain "stuck" within siloed databases.

A central reason the negatives seem to outweigh the positives is the way IT systems are being used. To date, the priorities of most health care organizations have been replacing paper records with electronic ones and improving billing to maximize reimbursements. Although revenues have risen as a result, the impact of IT on reducing the costs and improving the quality of clinical care has been modest, limited to facilitating activities such as order entry to help patients get tests and medications quickly and accurately. Relatively few organizations have taken the important next step of analyzing the wealth of data in their IT systems to understand the effectiveness of the care they deliver. Put differently, many health care organizations use IT as a tool to monitor *current* processes and protocols; what only a small number have done is leverage those same IT systems to see if those processes and protocols can be *improved*—and if so, to act accordingly. This is a significant reason that productivity growth in health care has been anemic and weaker than that in many other industries (see the exhibit "Health Care's Productivity Woes").

So how can health care organizations realize the promise of their large and growing investments in IT to help lower costs *and* improve patient outcomes? While substantial attention has been paid to the potential medical benefits of new technologies such as inexpensive genetic screening, artificial intelligence, and wearable sensors that continuously monitor vital signs, our main focus is on how the organizations that deliver care can get much more out of their recent or planned investments in enterprisewide IT systems.

Our research on the ways health care could apply the experiences of other industries suggests that instead of viewing IT as a transactional tool for billing, monitoring, and error checking, organizations should embrace it as an instrument to help transform the way they deliver medical care. This will entail prioritizing quality improvement over cost cutting, making data collection easier and better, turning the data into actionable information for clinicians, and forging new operating and business models. We have found that

IN BRIEF

THE PROBLEM
In recent years, health care organizations and the U.S. government have invested tens of billions of dollars in information technology. So far they have little to show for it: The impact on the cost and quality of clinical care has been modest, and productivity growth in the sector continues to lag that of other industries.

THE ROOT CAUSE
The priorities of most providers have been replacing paper records with electronic ones, improving billing to maximize reimbursements, and monitoring existing clinical processes.

THE SOLUTION
Use IT to transform clinical care. This entails emphasizing the improvement of care over cost cutting, making data collection easier and better, turning the data into actionable information for clinicians, and forging new operating and business models.

while numerous health care organizations are moving in this direction, the majority are not making the holistic changes needed for transformation.

IMPROVING QUALITY

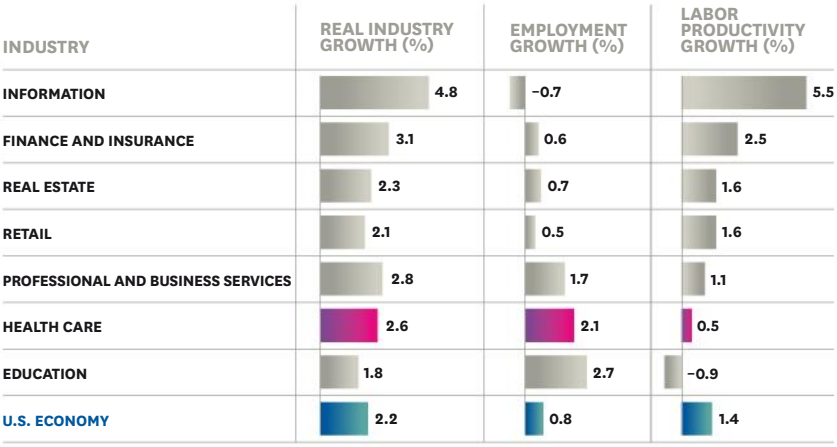
Historically, the adoption and management of health care IT has been left to an organization's chief information officer and other technical personnel. This is a mistake. A number of organizations—including Boston Medical Center, Geisinger Health System in Pennsylvania, Intermountain, Mayo Clinic, and New York University (NYU) Langone Health—have shown that health care IT is effective only when all members of an organization work to unlock its potential. (Full disclosure: One of us, Robert Huckman, has taught in executive education programs for two organizations related to this article—Intermountain Healthcare and Brigham and Women's Hospital, which is owned by the same parent company as Massachusetts General Hospital.)

Two key constituencies outside of technical personnel—senior leaders and clinicians—must play significant roles. Leaders are crucial because they will have to enlist clinicians in the cause by persuading them that the effective use of IT is central to delivering higher quality. The urgent need to reduce health care costs has led many leaders to become preoccupied with that objective. The happy reality is that improving clinical work processes can achieve both lower costs and higher quality, and we'll discuss later what it takes to use IT systems to do this.

The pledge to improve quality should be more than words; it must be translated into visible practices. Geisinger, for one, has done just that. It has made its IT system part of a broad strategy to establish a surgical "warranty": If complications arise within 90 days of a surgical procedure, the patient bears no additional cost to have the problem addressed. Starting with coronary artery bypass grafting (CABG), a team of clinicians developed a five-stage protocol that begins at the time of diagnosis and extends through the warranty period. The team initially identified 40 evidence-based guidelines that, according to a case study conducted by the Commonwealth Fund, were then embedded in the EHR system "through templates, order sets, and reminders," driving up adherence from 59% to 100%. Furthermore, the integrated IT system improved communication among various clinical personnel (including physicians and advanced-practice nurses) to coordinate care for the patient. The results were significant: Postoperative mortality fell by two-thirds, post-acute-care spending decreased by nearly 50%, and the overall profitability of cardiac surgical services actually improved. Thanks to the success of the CABG program, the model was expanded to 14 other clinical conditions as well as to primary care, with a focus on the chronically ill.

HEALTH CARE'S PRODUCTIVITY WOES

Some industries use technology better than others, and labor productivity statistics reflect that. In the case of U.S. health care, the industry has been growing faster than the overall economy, but because the number of health care workers has been rapidly increasing and the use of information technology has lagged, productivity growth has been minimal.

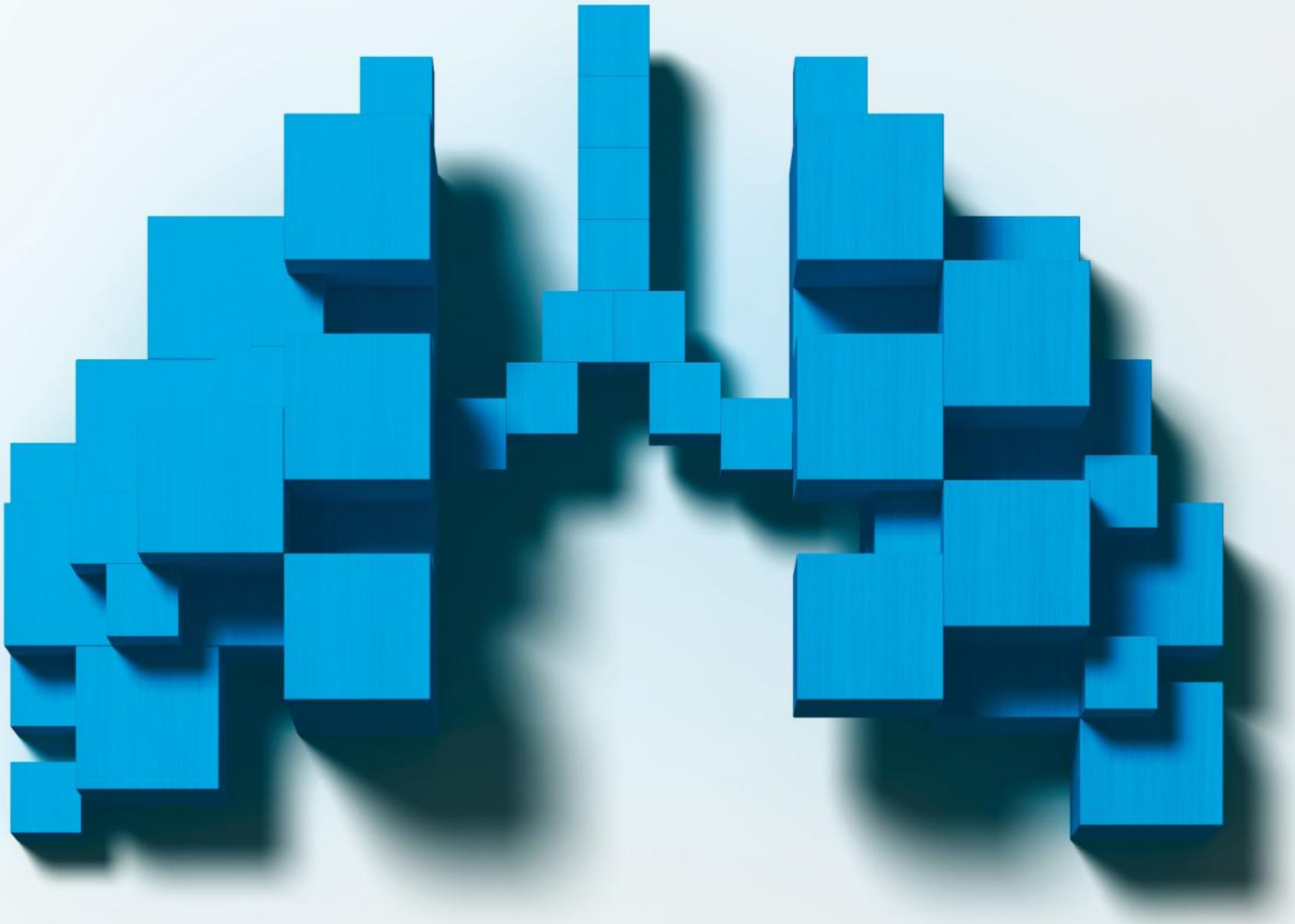


NOTE PERCENTAGES ARE COMPOUND ANNUAL GROWTH RATES (CAGRS) FROM 1997 TO 2016. REAL INDUSTRY GROWTH IS THE INCREASE IN VALUE-ADDED GDP LESS INFLATION. LABOR PRODUCTIVITY GROWTH WAS APPROXIMATED AS THE REAL INDUSTRY CAGR MINUS THE EMPLOYMENT CAGR.

SOURCE AUTHORS' ANALYSIS OF U.S. BUREAU OF ECONOMIC ANALYSIS AND BUREAU OF LABOR STATISTICS DATA

NYU Langone Health has also backed up its words about improvement with action. When Dr. Robert Grossman became the center's CEO and the dean of NYU School of Medicine in 2007, his first major initiative was to merge the school's disparate information systems into a single data warehouse for both the hospital and the medical school. He stressed that the reason was to evaluate the system's quality performance against external benchmarks and to support changes in administrative and clinical workflows. The resulting information increased the willingness of department chairs and administrators to challenge norms and to design and implement improvements. For example, the need to establish data fields in the IT system forced discussions about the definition of "excellence" and the best ways to assess the impact of frontline staff.

In 2016, NYU Langone received multiple national quality awards and was ranked by *U.S. News & World Report* among the top 10 hospitals in the United States, alongside the likes of Mayo Clinic, Cleveland Clinic, and Massachusetts General Hospital. The organization's financial performance was similarly impressive: From 2007 to 2015, patient revenues more than doubled.



NYU Langone now generates more than $220 million in operating profit, with an operating margin above 9%.

Notably, both Geisinger and NYU Langone found that achieving their quality goals did not come at the expense of financial performance. In fact, that also improved.

MAKING DATA COLLECTION EASIER AND BETTER

Having high-quality data at the right time is critical to tracking and measuring outcome improvement. Yet the data collection methods that most health care organizations use are inefficient, administratively burdensome, and likely to produce errors.

It is nearly impossible to speak to a group of clinicians without the conversation quickly turning to the time-consuming task of gathering medical information and entering it into a new IT system. A time and motion study published in the *Annals of Internal Medicine* in 2016 found that physicians spend one to two hours each night after their workday mostly on EHR tasks. This addition to their already heavy workload is contributing to the epidemic of physician burnout in the United States. And studies show that these problems cause physicians to take shortcuts such as copying and pasting notes and rapidly clicking through alerts, undermining the quality of the data that's collected.

In response, many organizations now employ medical scribes to enter information into EHR systems on behalf of clinicians. Yet the awkwardness of having a third party in an examination room—not to mention the added cost—makes the use of medical scribes controversial. Moreover, patient information that is gathered and entered into the system in this manner is prone to error.

The remedy: Shift data collection from an "event" that takes time and may be performed inaccurately to one that occurs "in the background" as clinicians and patients engage in their natural activities. The retail industry shows what's possible. During the past few decades, retail has experienced two significant shifts with respect to who collects data and how. One example is checkout. Cashiers used to have to key the price of each item into a cash register. The introduction of bar code scanners sharply reduced the amount of time cashiers spent on that task, decreased data-entry mistakes, and greatly improved inventory management. Next, it became possible for many customers to scan their own items. Amazon is now taking things one step further by piloting its Amazon Go brick-and-mortar store, which eliminates checkout lines altogether. Instead, a passive data-collection system relies on computer vision, deep-learning algorithms, and sensors to automatically read what exiting customers have in their shopping baskets. Other retailers, including Kroger and Apple, are experimenting with analogous models.

One trend is to shift the job of collecting information from clinicians to patients. Ultimately, the goal should be to move to truly passive data collection.

In health care, a similar transition has begun but is moving slowly. One trend is to shift the job of collecting information from clinicians to patients. For example, after a primary care physician and a patient agree to address a clinical goal such as reducing blood pressure or blood sugar levels, they can enter that goal and the associated treatment plan into one of the health-monitoring apps offered by a number of companies. Patients then measure and report their activity and clinical information on a regular basis through the app. In some cases, data collected by the patient at home is automatically shared with his or her clinician. One example is the Hypertension Digital Medicine (HDM) program developed by Ochsner Health System. Through smartphone technology, blood pressure readings taken remotely by patients are fed directly into Ochsner's EHR system, allowing physicians to review data between visits and course-correct a patient's care plan. In a controlled trial reported in the *American Journal of Medicine,* 71% of participants brought their blood pressure down to the normal range within 90 days, compared to only 31% in the control group. The patients using HDM also reported 10% higher satisfaction with their health care.

Ultimately, the goal should be to move to truly passive data collection. Some pioneers are using passive collection to track operational issues related to workflow and resource utilization. Mayo Clinic developed a real-time location system (RTLS) that uses radio-frequency identification tags and sensors to track staff, patients, and equipment in its emergency department. This data allowed the department to better understand how care was delivered, identify

operational barriers, and fix workflow issues. Then the information was used to develop systems for automatically collecting process-quality metrics (such as the time between a patient's registering at the emergency department's front desk and being put in a bed and seen by a clinician) and automatically reporting that information to government agencies and regulatory bodies. (See "How RFID Technology Improves Hospital Care," at hbr.org.)

Similarly, Rush University Medical Center in Chicago built a new outpatient practice with RTLS sensors for each room, clinician, patient, and piece of equipment. The system alerts staff when a patient leaves his or her exam room, eliminating the need for a practice manager to inform cleaning staff that a room needs to be serviced and preventing awkward interruptions of patients who are still dressing after an appointment. The time saved per patient is relatively small—perhaps just one minute. But over the course of a day, the total savings allow clinicians to see more patients, thereby improving productivity.

Over time, as passive-data-collection technologies become less costly and as clinicians and patients become more comfortable with them, the benefits will increase. This will help organizations justify the upfront cost and make it easier to overcome hurdles such as employee concerns about being monitored.

TURNING DATA INTO ACTIONABLE INFORMATION

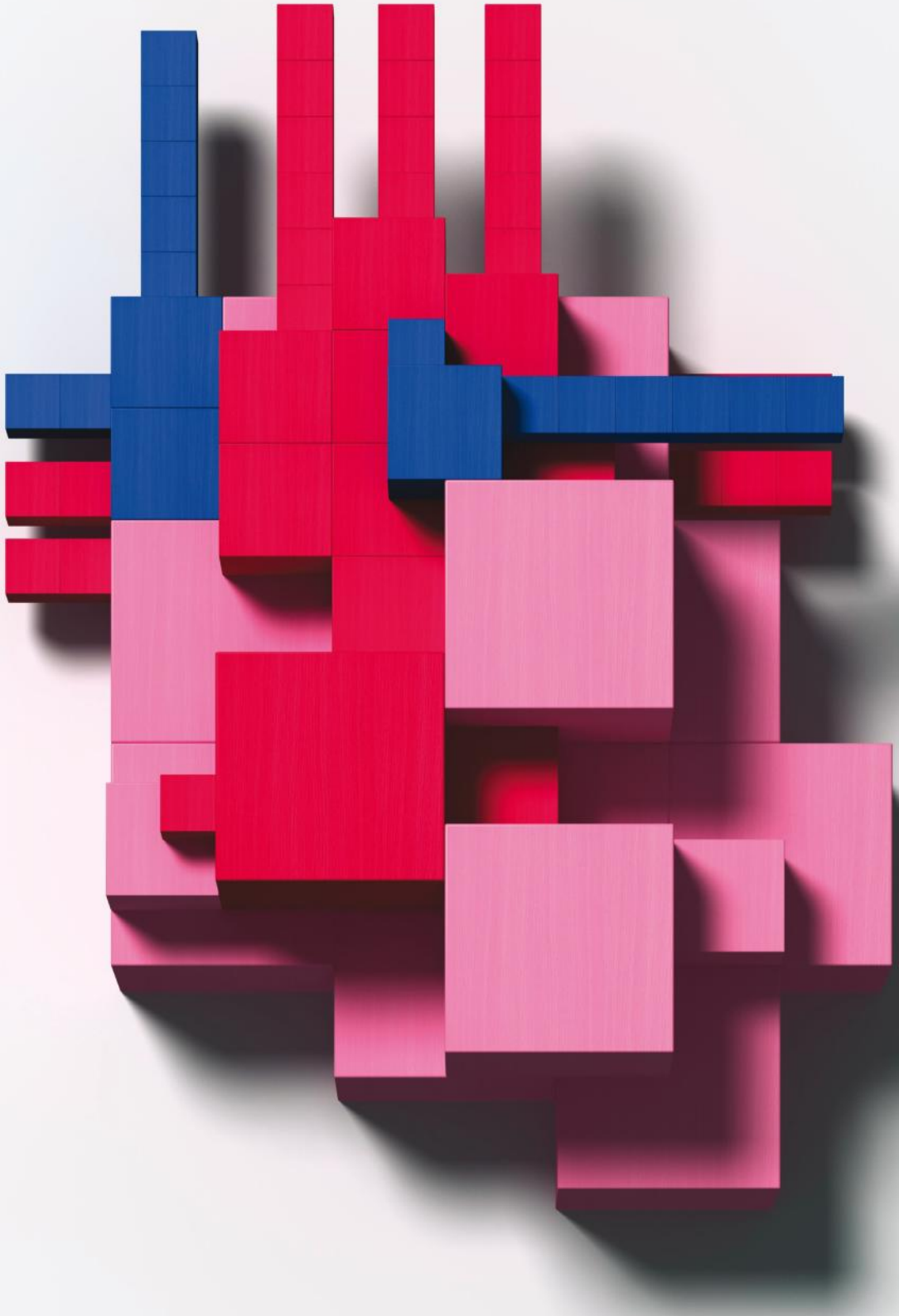
Persuading clinicians to engage with a new IT system—and making it less burdensome for them to do so—is only half the battle. Turning the data collected into actionable information is also vital and requires senior leadership's support. One of the most critical tasks for a leader is to set expectations for how the system will be structured. We're talking not about the technical specifications but about organizational or cultural guidelines for using the data to support daily care-related activities.

A key step is establishing a core data warehouse for the organization and getting clinicians to understand its importance. In making the case to the staff of NYU Langone, Grossman emphasized the value of having a single source of truth across inpatient facilities, outpatient centers, and the medical school. In the process of developing the data warehouse, various parties at NYU Langone that were previously protective of their turf and information were forced to work together. Disputes over which of several data sources were accurate ended, and Grossman persuaded department chairs to start using tools such as data dashboards to assess what was (and was not) working across departments. Over time, as the benefits of the resulting transparency became apparent, clinical leaders' initial skepticism about the IT system subsided. Departments would receive data on quality metrics for peer departments within NYU Langone (the rates of hospital-acquired infection in different parts of the hospital, patients' length of stay, and so on), and they could then determine whether and how to change their own workflows.

Beyond encouraging the development of the necessary data infrastructure, senior leaders must also help establish a vision for how the collected data will be used to improve productivity. In many cases, pursuing the vision may involve supporting the creation of entirely new measures of performance. Sabermetrics, the mathematical analysis of baseball data, offers an example of how new measures—and technologies to collect and analyze the information related to them—can revolutionize an industry. Developed by statisticians (the most prominent of whom is Bill James), sabermetrics involves measuring aspects of the performance of individual players and calculating their contributions to team outcomes. Initially, gathering the data was tedious. As sabermetrics pioneers found homes in big-league clubs, however, data warehouses were developed to ease collection and analysis. Since 2015, high-resolution cameras and Doppler radar have been installed in all stadiums to glean previously hard-to-track information, such as speed and acceleration, to quantify a player's defensive prowess. This in turn has led to the creation of entirely new metrics such as "wins above replacement," which has become the standard, all-inclusive measure of an individual's value to a team.

Compared to other industries, health care is in a relatively early stage of applying analytics. But the promise is great. For example, a small but growing number of health care organizations have built sophisticated systems that facilitate a deep understanding of costs and quick illustration of how innovations in providing care can improve both outcomes and costs. Intermountain was a pioneer in this realm, but others are following suit. Recently, University of Utah Health created a system with a 200 million–row database that yields information on key operational metrics such as cost per minute in the emergency room. According to a *New York Times* article, the organization has used this information to change operational workflows, reducing costs by 0.5% a year over the past few years, whereas other academic medical centers in its market area averaged annual increases of 2.9%.

Another important use of analytics is identifying unnecessary variation in treatment. A good example is New York–based Crystal Run Healthcare, a physician-owned multispecialty medical group that wanted to standardize treatment for 15 diagnoses that were common among its patients. As reported in a *Health Affairs* blog post, the organization first calculated the total annual cost per patient—segmented by professional, laboratory, radiology, and procedure charges—and then examined the cost of care across physicians so that each could see how he or



she compared to colleagues on each dimension. With this information, Crystal Run analyzed the variation, determined its root cause, and instituted some new practices. Within a year, variation in treating 14 of the 15 diagnoses declined, saving over $4 million. By our estimates, that represented more than 10% of Crystal Run's medical costs.

IT systems also offer health care organizations an opportunity to use predictive analytics to guide future clinical and operational decision making. Predictive models in precision medicine are being developed to correlate particular genetic mutations with specific forms of treatment. Although the use of precision medicine has been most prevalent and publicized in cancer care, it is now being applied in a wider range of specialties. For example, the GeneSight test can improve the management of depression by using a patient's genetic information to predict a response to each of 26 available psychotropic medications.

Besides acquiring the necessary hardware and software, leaders must invest in dedicated information-technology and analytics staff.

Health care organizations can also use predictive analytics to make better operational decisions about allocating resources and setting priorities for clinical innovations. For instance, Massachusetts General Hospital identified cohorts of high-risk patients and developed a proactive care-management program around this population. The result: Hospitalizations of such patients dropped by 20%, their emergency-department visits declined by 13%, and the annual cost of caring for them fell by 7% over a three-year period. Mortality, physician satisfaction, and patient experience also improved.

Similarly, Boston Medical Center (BMC) used its health care IT system to predict when its inpatient units could expect a surge in demand. The tool estimated the number of discharges needed in 24 hours by incorporating current demand in the emergency department, demand predicted for the following day, surgical cases requiring an inpatient bed the following day, and current bed and physician capacity. In its first year of implementation, the number of "code yellows"—warnings that occur when there is not enough capacity to absorb expected demand—decreased by nearly 50%.

Predictive models have the potential to become increasingly useful, and that might happen soon. As natural-language processing and machine learning expand, more insights will surface from the wealth of data available in health care IT systems. (See "How Machine Learning Is Helping Us Predict Heart Disease and Diabetes," at hbr.org.)

FORGING NEW OPERATING AND BUSINESS MODELS

In its 2012 report *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America,* the Institute of Medicine (IOM) highlighted ways to leverage IT to improve the U.S. health care system. Five years later, the first recommendation—the creation of digital infrastructure to capture clinical, care process, and financial data—is approaching completion.

The IOM's second recommendation was to make data available to clinicians when they are deciding how to treat patients. This is being done sporadically. For example, Intermountain recently partnered with Cerner to create a flexible clinical-support system containing protocols that can be easily updated with the latest knowledge. To facilitate the right inputs, Intermountain's clinical-development teams continuously monitor the various specialties' evidence-based practice guidelines and are translating them into IT tools that assist medical personnel as they work.

Besides acquiring the necessary hardware and software, leaders must make complementary changes in their operating and business models to generate and capture value. Of primary importance is investment in dedicated information-technology and analytics staff—individuals tasked with managing the IT system or analyzing the data it contains. After installing its new EHR system, BMC expanded its permanent IT staff by more than 40% to manage and further develop its IT infrastructure. It also expanded its strategy team to seven FTEs who extract information from the vast troves of data. This group investigates and coordinates responses to key operational challenges, including managing inpatient bed capacity and reducing readmission rates. The savings for BMC amount to millions of dollars, far exceeding the cost of the FTEs.

Specialized teams of clinical personnel are also needed to translate the insights from the analyses into better ways of providing care. For example, BMC's efforts to reduce code yellows involved the redesign of a bed-control team—a group of frontline staff and managers who track current inpatient demand and assess potential demand for the next day. The team members originally entered data into a simple spreadsheet; now they trigger a set of actions—such as adding ancillary support staff, alerting medical units, and opening additional beds—according to data and analysis from BMC's IT systems.

Business Resilience and Energy Innovation

Business leaders have significant concerns about energy. A Harvard Business Review Analytic Services report, sponsored by Siemens in conjunction with a national series of seminars focused on energy innovation, found that approximately 90 percent of executives feel significant pressure to reduce their energy spend, and more than 80 percent said fluctuating energy prices are a challenge. Lengthy business interruptions from weather-related events and the specter of cyber-attacks on the utilities and power grids were also major concerns among this group.

Yet most companies reported that they still manage energy on a short-term, reactive basis. Only a third of the executives surveyed said their organization has an energy management strategy or has the ability to generate power onsite. Even fewer have an energy procurement strategy backed by senior management.

However, a small group of leading-edge companies report they now see energy as a key business value driver, and are deploying new technologies and strategies to turn energy into a competitive advantage.

Tackling the Challenge

Traditionally, energy has been a major cost. But, according to Matthew Walters, Siemens' Head of Distributed Energy Systems, U.S. Center of Competence, organizations haven't tackled it because capital investment in distributed energy can be high and, therefore, has longer paybacks than other strategic uses of an organization's capital budget.

However, the survey found that changes in energy technology and business models, along with major environmental, social, and business trends are starting to change that picture.

About 35 percent of organizations in the survey, for instance, said they are generating power onsite, often through solar energy. That trend is expected to continue: Nearly 80 percent believe their organizations' use of solar energy will significantly increase in the next 10 years. Nearly half see similar levels of growth in wind power.

Such onsite power generation can have a major impact on costs. Walters points out that a 25% reduction in energy costs could add millions to a large company's bottom line.

But cost cutting is only part of the story behind these new energy strategies. Reducing carbon emissions is also a top driver for those companies, amid the changing expectations of customers and mainstream investors who increasingly expect companies to demonstrate environmental responsibility.

Businesses Want Government Involvement

Companies are entering a new era where they can turn energy management into competitive strength by taming costs, reducing risk, and deploying new energy business models in their communities. And individual organizations realize they can't do this alone. The leaders in the survey support a strong government role in energy innovation—nearly 90 percent said that businesses and municipal governments should work together to assure resiliency on the part of both.

They point to places like Pittsburgh, which has spearheaded public/private partnerships for energy resilience as part of its economic renaissance. Dubbed "The Pittsburgh Way," the city is working with universities, utilities, and businesses to make the case for energy innovation, achieve broad-based understanding of the energy market, and assure that investments in energy innovation pay off for businesses and the city.

"Companies are increasingly turning to onsite power generation," says Walters."They are using it to reduce costs, improve their organization's environmental footprint, and assure the resiliency of their operations."

Siemens helps organizations stay connected to the grid while generating and managing power themselves. The company's solutions cover the entire energy value chain—from generation to management to consumption. To learn more about how Siemens can help your organization address the energy challenges it faces, please visit www.usa.siemens.com/onsite-power.

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The data that robust IT systems can provide also plays a crucial role in securing clinicians' support for workflow changes. For example, when Grossman first shared a dashboard with NYU Langone's clinical leaders, he heard complaints about the quality and consistency of data. Instead of letting that derail the project, he put the onus on the leaders, telling them to either work with IT to fix the data or accept the results. At the end of this process, the data was considered the single source of truth throughout the medical center and the basis for future analytical efforts. This made it easier for the organization to track metrics consistently. The dashboard now helps clinical leaders work with frontline staff to implement interventions to improve care delivery, track what is and isn't working, persuade resistant clinicians to adopt new protocols, and reduce variation in treatment practices.

Beyond these workforce and operational changes, health care organizations will have to rethink their business models in order to capture the full value of their IT investments. One insight emerging from BMC's analytics work was that certain inpatients needed rehabilitation care, which was expensive to provide within a hospital and could be better delivered by dedicated rehab centers. Moving these patients to outside facilities, however, was not easy: BMC's position as a safety-net hospital in Boston meant that many of the people it served lacked insurance to cover rehabilitation care. Nonetheless, it was clear that keeping a rehab candidate in a hospital bed was not only suboptimal in terms of the patient's health; it also limited BMC's ability to admit other individuals needing inpatient beds. Accordingly, the hospital decided to pay the costs of treating uncovered patients in an outside rehabilitation facility. That benefited everyone: Rehab patients got more-appropriate care, and the hospital's incurred costs were exceeded by the revenue from additional acute-care patients.

The change in BMC's business model for rehabilitation patients is part of a broader shift in the United States away from the predominant *fee-for-service* model (under which clinicians get paid only when they see a patient for an office visit, a hospital admission, a test, or a procedure) and toward a *value-based* payment system that awards health care organizations a fixed fee per patient for a specified period or care episode. Both public and private payers are involved in this transformation. A well-functioning IT system that equips clinicians to improve the quality of their care and to understand and control their costs enables them to be proactive in accepting—even proposing—such arrangements with payers.

For example, Intermountain's sophisticated IT system has played a major role in its development of a population-based business model that relies on value-based reimbursement. (See "The Case for Capitation," HBR, July–August 2016.) One element of its model is its SelectHealth Share insurance plan, which offers large employers a three-year contract that limits premium increases to the consumer price index plus one percentage point a year—significantly below historic increases. As a greater proportion of its patient base shifts into models like this, Intermountain will be motivated to draw further on its substantial investments in IT, data analytics, protocol development, and workflow changes to improve the quality and lower the cost of its care delivery.

POLICYMAKERS AND ECONOMISTS talk constantly about "bending the cost curve" in health care—turning a bloated, wasteful system that is growing more rapidly than the economy into one that spends much less and grows at a slower pace. We have seen IT bend the cost curve in many other industries. Our research suggests that the same can be true in health care, and there are pockets of success to point to. But the necessary work is only just beginning.

Big problems in IT infrastructure must be overcome. Many of today's systems are too rigid: It's not easy to customize them, enter and extract information, or continuously update them to incorporate new clinical protocols. Furthermore, different systems can't readily share information, making it difficult to create a health record that contains a patient's full medical history and is accessible to any clinician in any health care organization. The lack of information sharing is also an obstacle to pooling the huge amounts of anonymized patient data required to find new ways to treat diseases.

In addition to tackling these technological challenges, leaders of many health care organizations will have to do what their progressive peers have done: revamp so that they can use IT to produce better patient outcomes at a lower cost. The hurdles keeping organizations from harnessing their IT systems to transform health care are surmountable. What's needed most is the will and support of an organization's leaders and clinicians.

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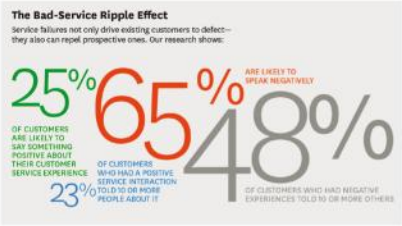
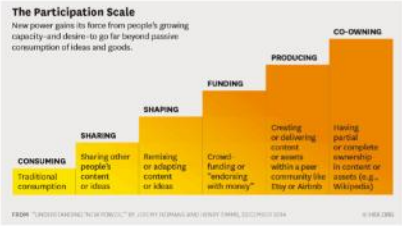
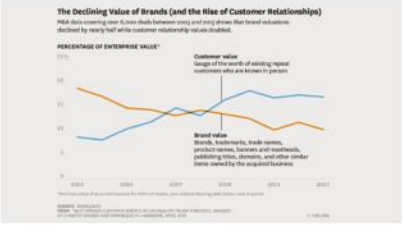
Q: I need a professional-looking infographic yesterday. Is there anyone who can help me?

A:







Harvard Business Review

TRANSFORMING THE WORLD OF WORK

As technology has rapidly reshaped business models and strategies, it has also sparked a rethinking of how and when work gets done. Casey Sutton, Brand Ambassador for Lenovo, recently talked about how computing devices are changing to keep employees happy and productive, while ensuring that the business has the security and manageability it needs to move forward.

The buzzword today in business is "digital transformation." What does this mean for workplace computing?

Digital transformation in the workplace is all about giving end users the path of least resistance to reach productivity. Whether I'm in front of my desk, 10,000 feet in the air, or in line at the grocery store, I want to be able to grab my closest device and immediately be productive. Mobility and productivity rule the day. When you've got the responsibility of maintaining an entire IT infrastructure, though, digital transformation becomes all about finding that sweet spot where mobility and productivity meet manageability and security. Fortunately, Lenovo's ThinkPad line is made up of the kinds of products that give end users the flexibility and mobility they crave to foster productivity, without having to compromise on the tenets that are top concerns for their business.

What has changed to meet the expectations of the millennial workers?

This one demographic is driving a lot of positive change in the IT industry, prompting us to consider how we can help businesses offer their employees PCs that are just as flexible as the employees who will use them. This is an area where the ThinkPad portfolio really shines. We've taken a brand that has a long-standing reputation for durability and reliability, and integrated incredible features that really sing to millennials, like the convertible-style Yoga hinge for multimode usage, narrow bezels for more screen real estate, and options for a silver finish instead of the traditional ThinkPad matte black, all without ever sacrificing durability, reliability or the overall user experience.

Innovation demands more collaboration – what new features meet that challenge?

The trends of digital and workplace transformation are inspiring opportunities for collaboration between colleagues like never before, and we're focused on making that collaboration as effortless as possible. For example, our X1 Yoga can help people you are working with visualize concepts with our on-screen annotations using Windows Inking. If I'm on the go constantly, the last thing I want to worry about is keeping up with my Active Pen that I use to make those annotations. We eliminated that pain point by incorporating a "garage" within the frame of the X1 Yoga itself that not only stores, but also charges your Active Pen.

Cybersecurity is a growing concern. How will the new generation of computers help address that issue?

At Lenovo, our latest generation of computers is focused on helping customers find that path to productivity without compromising on client security. Incorporating Windows Hello login procedures like touch fingerprint reader or advanced facial recognition is one great way to maximize security and simplicity, and at Lenovo we take these precautions to the next level. We utilize "Match on Chip" technology for our fingerprint reader, so your fingerprint data points are stored and matched all within the chip. This reduces the likelihood that malicious interference could intercept and "spoof" your fingerprint to gain unauthorized access. We've also integrated our "Glance" technology, which uses the infrared camera (an option on several ThinkPad models) to not only recognize when you arrive, using Windows Hello to log you in, but also log you out automatically when you've stepped away, so you never accidentally leave your PC unlocked and unguarded.

To learn more about how Lenovo can help transform how your company works, visit cdw.com/lenovo.

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"NUMBERS TAKE US ONLY SO FAR"

FACEBOOK'S GLOBAL DIRECTOR OF DIVERSITY EXPLAINS WHY STATS ALONE WON'T SOLVE THE PROBLEM OF ORGANIZATIONAL BIAS.

BY MAXINE WILLIAMS

I was once evicted from an apartment because I was black. I had secured a lovely place on the banks of Lake Geneva through an agent and therefore hadn't met the owner in person before signing the lease. Once my family and I moved in and the color of my skin was clear to see, the landlady asked us to leave. If she had known that I was black, I was told, she would never have rented to me.

PHOTOGRAPHY BY ANASTASIIA SAPON

Terrible as it felt at the time, her directness was useful to me. It meant I didn't have to scour the facts looking for some other, nonracist rationale for her sudden rejection.

Many people have been denied housing, bank loans, jobs, promotions, and more because of their race. But they're rarely told that's the reason, as I was—particularly in the workplace. For one thing, such discrimination is illegal. For another, executives tend to think—and have a strong desire to believe—that they're hiring and promoting people fairly when they aren't. (Research shows that individuals who view themselves as objective are often the ones who apply the most unconscious bias.) Though managers don't cite or (usually) even perceive race as a factor in their decisions, they use ambiguous assessment criteria to filter out people who aren't like them, research by Kellogg professor Lauren Rivera shows. People in marginalized racial and ethnic groups are deemed more often than whites to be "not the right cultural fit" or "not ready" for high-level roles; they're taken out of the running because their "communication style" is somehow off the mark. They're left only with lingering suspicions that their identity is the real issue, especially when decision makers' bias is masked by good intentions.

I work in the field of diversity. I've also been black my whole life. So I know that underrepresented people in the workplace yearn for two things: The first is to hear that they're not crazy to suspect, at times, that there's a connection between negative treatment and bias. The second is to be offered institutional support.

The first need has a clear path to fulfillment. When we encounter colleagues or friends who have been mistreated and who believe that their identity may be the reason, we should acknowledge that it's fair to be suspicious. There's no leap of faith here—numerous studies show how pervasive such bias still is.

But how can we address the second need? In an effort to find valid, scalable ways to counteract or reverse bias and promote diversity, organizations are turning to people analytics—a relatively new field in business operations and talent management that replaces gut decisions with data-driven practices. People analytics aspires to be "evidence based." And for some HR issues—such as figuring out how many job interviews are needed to assess a candidate, or determining how employees' work commutes affect their job satisfaction—it is. Statistically significant findings have led to some big changes in organizations. Unfortunately, companies that try to apply analytics to the challenges of underrepresented groups at work often complain that the relevant data sets don't include enough people to produce reliable insights—the sample size, the *n,* is too small. Basically they're saying, "If only there were more of you, we could tell you why there are so few of you."

Companies have access to more data than they realize, however. To supplement a small *n,* they can venture out and look at the larger context in which they operate. But data volume alone won't give leaders the insight they need to increase diversity in their organizations. They must also take a closer look at the individuals from underrepresented groups who work for them—those who barely register on the analytics radar.

SUPPLEMENTING THE *N*

Nonprofit research organizations are doing important work that sheds light on how bias shapes hiring and advancement in various industries and sectors. For example, a study by the Ascend Foundation showed that in 2013 white men and white women in five major Silicon Valley firms were 154% more likely to become executives than their Asian counterparts were. And though both race and gender were factors in the glass ceiling for Asians, race had 3.7 times the impact that gender did.

It took two more years of research and analysis—using data on several hundred thousand employees, drawn from the EEOC's aggregation of all Bay Area technology firms and from the individual reports of 13 U.S. tech companies—before Ascend determined how bias affected the prospects of blacks and Hispanics. Among those groups it again found that, overall, race had a greater negative impact than gender on advancement from the professional to the executive level. In the Bay Area white women fared worse than white men but much better than all Asians, Hispanics, and blacks. Minority women faced the biggest obstacle to entering the executive ranks. Black and Hispanic women were severely challenged by both their low numbers at the professional level and their lower chances of rising from professional to executive. Asian women, who had more representation at the professional level than other minorities, had the lowest chances of moving up from professional to executive. An analysis of national data found similar results.

By analyzing industry or sector data on underrepresented groups—and examining patterns in hiring, promotions, and other decisions about talent—we can better manage the problems and risks in our own organizations. Tech companies may look at the Ascend reports and say, "Hey, let's think about what's happening with our competitors' talent. There's a good chance it's happening here, too."

> Executives tend to think—and have a desire to believe—they're hiring and promoting people fairly when they're not.

Their HR teams might then add a layer of career tracking for women of color, for example, or create training programs for managing diverse teams.

Another approach is to extrapolate lessons from other companies' analyses. We might look, for instance, at Red Ventures, a Charlotte-based digital media company. Red Ventures is diverse by several measures. (It has a Latino CEO, and about 40% of its employees are people of color.) But that doesn't mean there aren't problems to solve. When I met with its top executives, they told me they had recently done an analysis of performance reviews at the firm and found that internalized stereotypes were having a negative effect on black and Latino employees' self-assessments. On average, members of those two groups rated their performance 30% lower than their managers did (whereas white male employees scored their performance 10% higher than their managers did). The study also uncovered a correlation between racial isolation and negative self-perception. For example, people of color who worked in engineering generally rated themselves lower than those who worked in sales, where there were more blacks and Latinos. These patterns were consistent at all levels, from junior to senior staff.

In response, the HR team at Red Ventures trained employees in how to do self-assessments, and that has started to close the gap for blacks and Latinos (who more recently rated themselves 22% lower than their managers did). Hallie Cornetta, the company's VP of human capital, explained that the training "focused on the importance of completing quantitative and qualitative self-assessments honestly, in a way that shows how employees personally view their performance across our five key dimensions, rather than how they assume their manager or peers view their performance." She added: "We then shared tangible examples of what 'exceptional' versus 'solid' versus 'needs improvement' looks like in these dimensions to remove some of the subjectivity and help minority—and all—employees assess with greater direction and confidence."

GETTING PERSONAL

Once we've gone broader by supplementing the *n,* we can go deeper by examining individual cases. This is critical. Algorithms and statistics do not capture what it feels like to be the only black or Hispanic team member or the effect that marginalization has on individual employees and the group as a whole. We must talk openly with people, one-on-one, to learn about their experiences with bias, and share our own stories to build trust and make the topic safe for discussion. What we discover through those conversations is every bit as important as what shows up in the aggregated data.

An industry colleague, who served as a lead on diversity at a tech company, broke it down for me like this: "When we do our employee surveys, the Latinos always say they are happy. But I'm Latino, and I know that we are often hesitant to rock the boat. Saying the truth is too risky, so we'll say what you want to hear—even if you sit us down in a focus group. I also know that those aggregated numbers where there are enough of us for the *n* to be significant don't reflect the heterogeneity in our community. Someone who is light-skinned and grew up in Latin America in an upper-middle-class family probably is very happy and comfortable indeed. Someone who is darker-skinned and grew up working-class in America is probably not feeling that same sense of belonging. I'm going to spend time and effort trying to build solutions for the ones I know are at a disadvantage, whether the data tells me that there's a problem with all Latinos or not."

This is a recurring theme. I spoke with 10 diversity and HR professionals at companies with head counts ranging from 60 to 300,000, all of whom are working on programs or interventions for the people who don't register as "big" in big data. They rely at least somewhat on their own intuition when exploring the impact of marginalization. This may seem counter to the mission of people analytics, which is to remove personal perspective and gut feelings from the talent equation entirely. But to discover the effects of bias in our organizations—and to identify complicating factors within groups, such as class and colorism among Latinos and others—we need to collect and analyze qualitative data, too. Intuition can help us find it. The diversity and HR folks described using their "spidey sense" or knowing there is "something in the water"—essentially, understanding that bias is probably a factor, even though people analytics doesn't always prove causes and predict outcomes. Through conversations with employees—and sometimes through focus groups, if the resources are there and participants feel it's safe to be honest—they reality-check what their instincts tell them, often drawing on their own experiences with bias. One colleague said, "The combination of qualitative and quantitative data is ideal, but at the end of the day there is nothing that data will tell us that we don't already know as black people. I know what my experience was as an African-American man who worked for 16 years in roles that weren't related to improving diversity. It's as much heart as head in this work."

A CALL TO ACTION

The proposition at the heart of people analytics is sound—if you want to hire and manage fairly, gut-based decisions are not enough. However, we have to create a new approach, one that also works for small data sets—for the marginalized and the underrepresented.

Here are my recommendations:

First, analysts must challenge the traditional minimum confident *n,* pushing themselves to look beyond the limited hard data. They don't have to prove that the difference in performance ratings between blacks and whites is "statistically significant" to help managers understand the impact of bias in performance reviews. We already know from the breadth and depth of social science research about bias that it is pervasive in the workplace and influences ratings, so we can combine those insights with what we hear and see on the ground and simply start operating as if bias exists in our companies. We may have to place a higher value on

the experiences shared by five or 10 employees—or look more carefully at the descriptive data, such as head counts for underrepresented groups and average job satisfaction scores cut by race and gender—to examine the impact of bias at a more granular level.

In addition, analysts should frequently provide confidence intervals—that is, guidance on how much managers can trust the data if the *n*'s are too small to prove statistical significance. When managers get that information, they're more likely to make changes in their hiring and management practices, even if they believe—as most do—that they are already treating people fairly. Suppose, for example, that as Red Ventures began collecting data on self-assessments, analysts had a 75% confidence level that blacks and Latinos were underrating themselves. The analysts could then have advised managers to go to their minority direct reports, examine the results from that performance period, and determine together whether the self-reviews truly reflected their contributions. It's a simple but collaborative way to address implicit bias or stereotyping that you're reasonably sure is there while giving agency to each employee.

Second, companies also need to be more consistent and comprehensive in their qualitative analysis. Many already conduct interviews and focus groups to gain insights on the challenges of the underrepresented; some even do textual analysis of written performance reviews, exit interview notes, and hiring memos, looking for language that signals bias or negative stereotyping. But we have to go further. We need to find a viable way to create and process more-objective performance evaluations, given the internalized biases of both employees and managers, and to determine how those biases affect ratings.

This journey begins with educating all employees on the real-life impact of bias and negative stereotypes. At Facebook we offer a variety of training programs with an emphasis on spotting and counteracting bias, and we keep reinforcing key messages post-training, since we know these muscles take time to build. We issue reminders at critical points to shape decision making and behavior. For example, in our performance evaluation tool, we incorporate prompts for people to check word choice when writing reviews and self-assessments. We remind them, for instance, that terms like "cultural fit" can allow bias to creep in and that they should avoid describing women as "bossy" if they wouldn't describe men who demonstrated the same behaviors that way. We don't yet have data on how this is influencing the language used—it's a new intervention—but we will be examining patterns over time.

Perhaps above all, HR and analytics departments must value both qualitative and quantitative expertise and apply mixed-method approaches everywhere possible. At Facebook we're building cross-functional teams with both types of specialists, because no single research method can fully capture the complex layers of bias that everyone brings to the workplace. We view all research methods as trying to solve the same problem from different angles. Sometimes we approach challenges from a quantitative perspective first, to uncover the "what" before looking to the qualitative experts to dive into the "why" and "how." For instance, if the numbers showed that certain teams were losing or attracting minority employees at higher rates than others (the "what"), we might conduct interviews, run focus groups, or analyze text from company surveys to understand the "why," and pull out themes or lessons for other parts of the company. In other scenarios we might reverse the order of those steps. For example, if we repeatedly heard from members of one social group that they weren't seeing their peers getting recognized at the same rate as people in other groups, we could then investigate whether numerical trends confirmed those observations, or conduct statistical analyses to figure out which organizational circumstances were associated with employees' being more or less likely to get recognized.

> Algorithms and statistics do not capture what it feels like to be the only black or Hispanic member of a team.

Cross-functional teams also help us reap the benefits of cognitive diversity. Working together stretches everyone, challenging team members' own assumptions and biases. Getting to absolute "whys" and "hows" on any issue, from recruitment to engagement to performance, is always going to be tough. But we believe that with this approach, we stand the best chance of making improvements across the company. As we analyze the results of Facebook's Pulse survey, given twice a year to employees, and review Performance Summary Cycle inputs, we'll continue to look for signs of problems as well as progress.

EVIDENCE OF DISCRIMINATION or unfair outcomes may not be as certain or obvious in the workplace as it was for me the time I was evicted from my apartment. But we can increase our certainty, and it's essential that we do so. The underrepresented people at our companies are not crazy to perceive biases working against them, and they can get institutional support.

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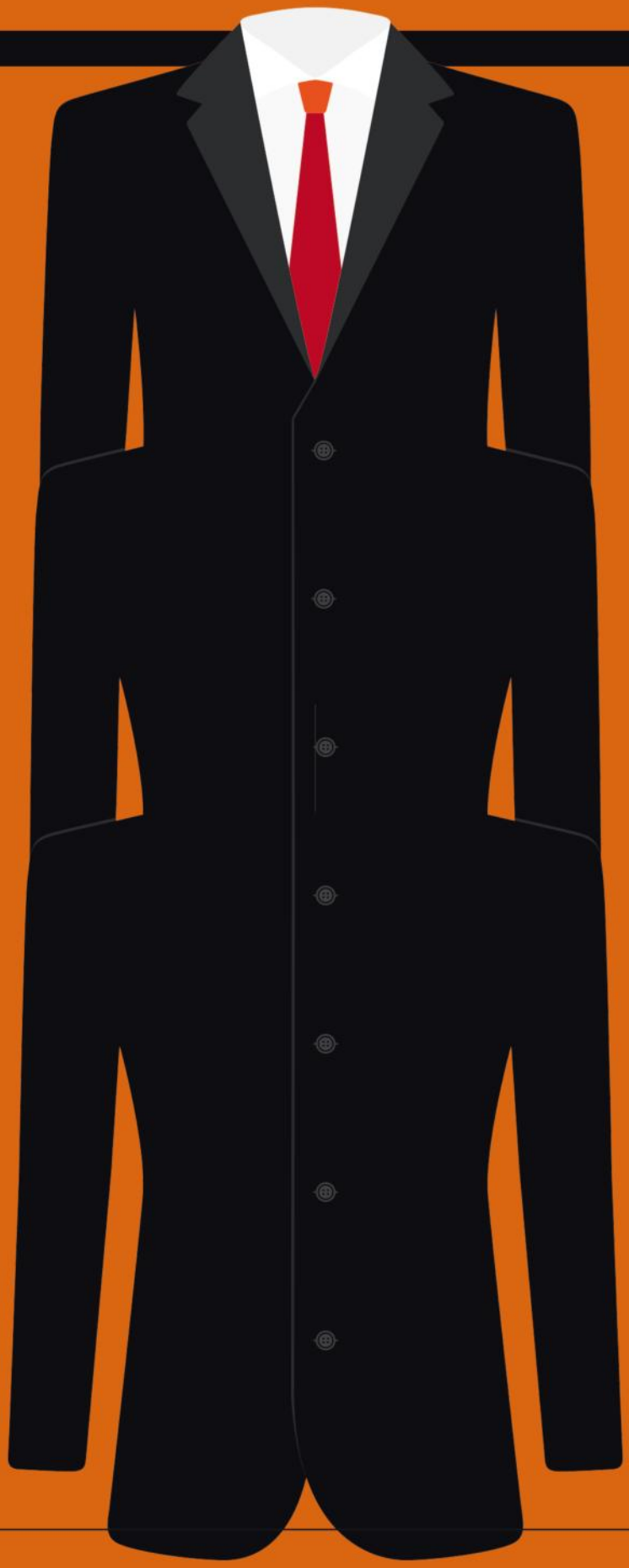

ILLUSTRATION BY DENIS CARRIER

BY JEFFREY BUSSGANG

ARE YOU SUITED FOR A START-UP?

When I finished business school, I had two job offers. The first was from the Boston Consulting Group, where I'd worked before my MBA program—the obvious choice for a young professional in search of a stable, lucrative career. The second was from a Series A-stage venture-backed start-up with only 30 employees that wanted to transform the internet into a secure business environment—a much riskier bet. I accepted the second offer and never looked back.

In the years since, I've worked for three start-ups and, as a venture capitalist, invested in more than a hundred. I've learned a lot not just about how to *found* a company—raising money, finding initial customers, hiring a team—but also about what it takes to *join* a start-up and help build it into a large, successful organization. Joiners are employees number two to 2,000 who work alongside founders to develop their ideas into real businesses.

Making this leap is rarely easy. Relative to established organizations, start-ups can be hard to figure out. What are the jobs to be done? The best entry points? How can you tell whether a company has potential for success and is the right fit for you?

Start-ups have no clear hierarchies or paths to advancement. But from their embryonic stages through more-mature ones, they need good managers to create and effectively run departments such as marketing, product development, and sales. And one can accrue numerous personal and professional rewards working for these young organizations. In nearly every interview I've conducted with start-up joiners, they have emphasized how much they value the autonomy, creativity, and growth they experience in their jobs—all elements critical to fulfillment.

So it's important for those in business—from newly minted MBAs and junior executives to seasoned leaders—to better understand how these companies operate, to envision how they themselves might contribute, and, if the situation feels right, to make the leap.

ASSESSING YOUR FIT

To work at a start-up, you'll need to do three things you might not have learned in school or in jobs at larger companies: manage uncertainty, push the limits, and think like an owner.

Manage uncertainty. Start-ups represent giant experiments. Every initiative is new. One hypothesis after another is being tested. Titles, functional boundaries, roles, and responsibilities are often fluid. The team works as one, inventing, creating, moving toward shifting goals—all while working without a playbook. Given this organizational dynamism, which continues even through the later stages, anyone working for a start-up has to be comfortable with large doses of ambiguity and uncertainty.

Push the limits. My father was an entrepreneur, and I remember that whenever he was confronted with an obstacle—having to stand in a long line at a popular museum, for example—he would look for a way around it, not by cutting in line but by testing assumptions. "Can't we design a more efficient system?" he would ask. "How can we get around this obstacle and speed things up?" This tendency to actively question rather than passively settle is key to success at a start-up. If you want to work for one, you should be the sort of person who's always looking to solve a problem, make the solution more efficient, make it repeatable, and keep iterating from there.

START-UPS REPRESENT GIANT EXPERIMENTS. EVERY INITIATIVE IS NEW. SO ANYONE WORKING FOR ONE HAS TO BE COMFORTABLE WITH LARGE DOSES OF AMBIGUITY AND UNCERTAINTY.

Think like an owner. Working at a start-up, you're expected to become emotionally invested. The sense of mission and adventure is greater than at a traditional organization, and your efforts are clearly and directly linked to the value and success of the enterprise. You must therefore be someone who can care deeply about not just your own work but all aspects of your company. My dad's measure of employee commitment involved a hypothetical staple on the rug near the front desk of his company: He wanted people who, no matter their position, would stop, pick up the staple, and throw it out. At a big company you might walk past thinking, *Someone else—the cleaners—will get it*. But not at a start-up. In an entrepreneurial organization everyone must think like an owner, always asking, "What can I personally do to make this place even more awesome?"

PICKING THE RIGHT COMPANY

If you feel that you're right for a start-up, you next have to choose the right company for you. My advice is to approach this important decision methodically, in four steps.

Pick a domain. First, find a field you're passionate about. This means asking yourself a series of questions: "Do I prefer a business that focuses on consumers or on businesses? What kind of customers would I like to serve? Which brands do I admire the most? What are my favorite websites, apps, or subjects to read about?" These questions can force you to think very tangibly. For example, if TripAdvisor is your favorite app, you clearly love to travel and should perhaps look for a start-up in that sector. When you're reading a newspaper, a website, or a magazine, which stories do you read immediately and thoroughly? If you tend to skip past headlines about, say, the media business, you shouldn't join a new online video service. If you dive into stories about autonomous vehicles or virtual and augmented reality because you find the subjects intellectually stimulating, narrow your focus to those domains. I suggest

limiting yourself to three areas; otherwise your search will become too broad.

Pick a city. Not everyone can relocate anywhere for work. But for those who do have that flexibility, I recommend thinking very carefully about where you'd like to live. If you're not currently based in an entrepreneurial hub such as Silicon Valley, New York, Boston, Los Angeles, Tel Aviv, or Berlin, you should consider moving to one—not only for the job you are about to take, but to position yourself for the next several jobs, since start-up life can be fluid and unpredictable. These hubs are tight communities, often clusters of local universities, established technology companies, venture capitalists, and successful entrepreneurs. Each has its own pros and cons, quirks, and vibe. For example, L.A. blends media, entertainment, and technology while offering the benefits of the beach and an active lifestyle. Boston is the world's best intersection of health care and information technology and represents a more professional environment. Tel Aviv is the cybersecurity capital of the world and crackles with raw energy. Figure out in which place you'd like to settle and build relationships. Once people choose a start-up community, they tend to stay. Your coworkers in one company could become your cofounders in another.

Pick a stage. When describing the various stages of a start-up, I often use a road-building metaphor. In the *jungle* stage you have no idea where the paths are. You're surrounded by a tangled mess; you grab a machete and hack away. Many use the term "preproduct/market fit" to characterize this nascent period. In the *dirt road* stage the path is bumpy and winding, but it's there, and the goal is to move down it as quickly as possible. You've developed a well-defined product and are pursuing a clear market. You're starting to figure out your business model and addressing the early challenges of growth. In the *highway* stage you're speeding down a straight open road. You're improving operations incrementally while executing, scaling up, and iterating. If you are a risk-taker and a figure-it-out person, the jungle phase is for you. You should focus your search on seed-stage or Series A–funded companies. If you're someone who enjoys building systems, look for businesses in later funding rounds. If you're an improver and operator who wants slightly more stability and a higher salary, a highway-stage company—perhaps just before or just after an IPO—is the right choice.

Pick a winner. This step—choosing a company that you think will be a huge success and therefore provide you with tremendous growth opportunities—is the hardest to get right. Even the most brilliant and experienced investors in the world are wrong more than half the time, and whereas they have the benefit of holding a portfolio of companies, you get to pick only one to work for. How can an outsider identify the likely winners in a given domain, market, and stage? One way is to ask a handful of insiders. Find the top three VCs, angels, start-up lawyers, and headhunters in your target geography and ask them to name the three hottest start-ups in your chosen domain and stage. Pressure-test the companies on their combined lists by looking for more evidence of success and momentum. Do your own due diligence, using the simple criteria that we venture capitalists employ:

• *Team.* Is the founding team compelling? Can its members articulate a vision that inspires you and others around them? Are they of high integrity? Would you want to work with them again in their next company?

• *Market.* Is the market in which the company is operating huge—that is, greater than $1 billion in revenue potential? Is it experiencing some kind of disruption that might lead to opportunity for a new entrant? How crowded is the market, and does this start-up have a sustainable advantage over the competition?

• *Business model.* Are the unit economics—the ratio of net revenue to costs for each customer or product unit—attractive? Can the company articulate and compare the lifetime value and acquisition cost of each customer? Does its business model include network effects—that is, will value grow as the network of users does? If the company already has customers, do they appear loyal and provide growth potential, or are they churning out?

Discuss these issues with the advisers from whom you solicited recommendations and with others who have experience across multiple start-ups and whose

judgment you trust. If you're in touch with the founders or current leaders of the companies you're considering, ask them these questions directly. And develop your own point of view according to what you see in the marketplace.

These four steps—picking a domain, a city, a stage, and potential winners—will generally produce a short, targeted list on which to focus.

SELLING YOURSELF

The next challenge is to position yourself so that the start-ups on your list want to hire you. You'll need to do two things well:

Arrange a warm introduction. Many start-ups are full of people with large social networks. It is your job to identify key players at the companies you're interested in and find ways to connect with them. Websites such as Crunchbase and Mattermark list valuable information about start-ups, including their key executives. LinkedIn searches can help you find other employees. Then look for mutual connections, or friends of friends, who might put you in touch with these people. Through those various networks and databases you should be able to identify an "in." Ask the contacts you've found not just for an introduction but for some endorsement based on what you've told them about your enthusiasm, experience, or other assets. That sort of inquiry trumps a cold voicemail every time.

VC and angel investors are also a great channel. They are often happy to pass along the résumé of a qualified manager who could be an asset to one of their portfolio companies. In general, the start-up community is incredibly generous with its time, and it has such a strong "pay it forward" culture that with tenacity you can get to almost anyone. In fact, I recommend that you aim high. List 10 people with whom you'd most like to have 30 minutes of face-to-face networking. Then go after them—without stalking or being a noodge. Even if it turns out the job fit isn't right, meetings like this will help you establish relationships and will lead to more valuable connections.

Articulate how you can contribute. Start-ups run lean, so they're willing to take on only those people who can drive

THE START-UP COMMUNITY IS INCREDIBLY GENEROUS WITH ITS TIME. WITH TENACITY YOU CAN GET TO ALMOST ANYONE.

their success and have a point of view on their business. Before meeting with management, do your homework. Read everything you can online. Talk to a couple of friends or colleagues who are customers. Try the product or service yourself and analyze the business model; then develop ideas for improvements and present them in your meeting or interview. If you're a designer, you might recommend tweaks to make the product more attractive. If you're a marketer, you might suggest a new campaign or message. If you're in finance, you might distill a few of the company's key performance indicators into a mock chart to be used as part of a monthly review.

In addition to pitching yourself, remember to engage your interviewers in content-rich conversation about *their* work. Almost all start-up CEOs and executives blog or are on social media, so begin by commenting on their tweets or LinkedIn posts. If you've attended conferences, company open houses, meetups, or other industry events where they've presented, ask about the issues they covered. Show that one of your contributions will be to constantly listen and learn.

Finally—and this is something few people do well—*come bearing gifts.* Yes, you're the one looking for a job. But you can flip the relationship by immediately offering help—expertise, advice, contacts—with no expectation of reciprocity. Ask, "How can I help? What are you challenged with?" Perhaps the company needs a designer and you know a great one. Make the connection, and suddenly you'll be perceived as someone who is already adding value.

MAKING THE LEAP

After Erin Warren earned her MBA at Babson College, she followed the traditional path by taking an entry-level marketing job at a big company. But within five years she was restless. When the company offered her a promotion that would require relocating, she balked and decided to make a change.

Although Warren didn't know anything about start-ups and, as the mother of young children, was anxious about taking on too much risk, she was not reluctant to work hard or navigate twists and turns. (She had been a member of two U.S. Olympic luge teams, after all.) She was passionate about a few new online services that had a double-bottom-line orientation, including the college savings loyalty program Upromise, which she'd used herself. When she learned that the company was looking to hire a director of member acquisition at its Boston headquarters, she was excited: The sector, role, and city all matched her target.

Warren networked through friends and recruiters, persuaded a contact who was friendly with the chief marketing officer to advocate for her, and secured an interview. Then, rather than come to the meeting empty-handed, she brought specific suggestions for making the marketing message more playful and improving the user experience. Her enthusiasm and engagement matched those of the earliest employees. By the end of the interview she had the job. A few years after the company was acquired by Sallie Mae, she moved on to become the CMO at another start-up.

Not every entry to and ascension in the start-up world is as smooth as Warren's. But if you make the leap in a strategic way—assessing your fit, picking the right company, and effectively selling yourself—you'll be rewarded with a type of personal and professional fulfillment that's increasingly hard to find in big, traditional organizations.

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CASE STUDY

SPREAD TOO THIN

A TV PRODUCER STRUGGLES TO BALANCE THE DEMANDS OF THREE HIT SHOWS—AND DREAMS OF A NEW ONE. BY ALISON BEARD

Carla was killing off her leading man. And it felt good—but not perfect. She drummed her fingers on the editing desk and squinted at the monitors in front of her as she scrolled through footage from the season finale of *Dope,* her production company's long-running drama series about DEA agents.

"What's wrong?" asked Melanie, who had written and directed the episode.

"In that last scene, we need quicker cuts between the fire at the lab and the flashbacks. And the song isn't right. Viewers should be sad, yes, but mostly shocked. This is their hero dying—without any warning."

Melanie looked upset, and Carla felt a pang of guilt. *Dope* was supposed to be Melanie's now. Carla had handed over showrunner responsibilities to her protégé last year so that she'd have more time to spend on the other two series that C3 Productions had on the same network, RBN. But this scene—capping *Dope*'s 10th season with the surprise death of a main character—was too important to Carla. She'd pushed Melanie to go for a blockbuster finale and helped her write the script. She had to make sure the execution was right, too.

"The network wants a final cut by midnight," Melanie said tensely.

Carla looked at the time: 3 PM. She'd been on the set of *911,* her police drama now in its second year, since early morning and was scheduled to do a script read-through with the cast of *Forty Stories,* her newest series, about the residents of a Manhattan high-rise, from afternoon into evening. She'd intended to stop by the *Dope* set only briefly, to give Melanie's work a final sign-off. But now she'd have to come back, sacrificing the 9-to-midnight window she'd hoped to spend working on a new idea: a sitcom-length "dramedy" about aging that would be something totally new—and exciting—for C3. She'd been trying to write

CASE STUDY CLASSROOM NOTES

"Showrunner" is an industry term for the person who oversees day-to-day operations of a show, including script writing, directing, and editing.

ALISON BEARD is a senior editor at HBR. HBR's fictionalized case studies present problems faced by leaders in real companies and offer solutions from experts. This one is inspired by the HBS Case Study "Shonda Rhimes' ShondaLand" (case no. 516026-PDF-ENG), by Anita Elberse and Henry McGee, which is available at **HBR.org**. Elberse teaches this case in her MBA and executive education course "The Business of Media, Entertainment, and Sports" at Harvard Business School.

Should this work schedule be expected for someone in Carla's position? Is it sustainable?

Networks sell the bulk of their prime-time ads during the "upfront" period, which typically occurs in late May.

Most network series run for 22 to 24 episodes from late September through May. Many cable series, by contrast, run markedly fewer, often around 10 episodes a year.

In order to maintain *Dope*'s high quality but also free up time in her own schedule, what level of oversight should Carla be giving Melanie?

the pilot for months, but working 13 hours or more a day, she just couldn't find the time. Melanie wasn't the only one feeling frustrated.

"I'll come back tonight," Carla said. "It's almost there," she added.

"Sure," Melanie said glumly. "But we still need 'that Carla magic.'"

Carla gave a tight smile. Michael Love, RBN's head of programming, had first used those words nine months before, at the annual "upfront" presentation, when networks give ad buyers a preview of their new seasons and shows. Word had leaked that Melanie was taking over *Dope,* though Carla would stay on as co-executive producer. When people asked what that meant, Michael had assured them that every C3 show on RBN would still have "that Carla magic"—an emotional center, sharp dialogue, and surprising plot twists—that garnered high ratings, especially in the coveted 18- to 34-year-old demographic.

Now the term had become something of a catchphrase with the network suits. When Carla nominated assistant producers to write scripts or direct, the concern was always "Do they have your magic?" When RBN sent notes on first cuts of shows, the feedback was often "Needs more C.M."

Though Carla had initially been flattered by Michael's endorsement, she'd come to resent it. Juggling three shows, all on demanding 24-episode schedules, she wasn't sure she had enough magic to go around anymore.

UNDER PRESSURE

As Carla headed to the *Forty Stories* set, her phone rang. It was Michael. "Did you see last night's ratings?"

"Michael, you know I don't check next-day numbers."

"It wasn't good."

"It was a busy night with the NBA playoffs. People DVR'd us. We'll see pickup over the weekend."

"We didn't last week—not enough. Look, Melanie's a capable producer. But she still needs your oversight."

"I know, and she has it," Carla said.

"How's the finale shaping up? I hope you're taking the reins back for this one. It's important."

"I'm working on it with Melanie tonight. But Michael, I can't manage three shows without delegating. I tried last season, and it's just not sustainable. I barely slept. I need Melanie to run *Dope,* and I'm hoping that next year, on *911,* Keston can do more directing and script writing."

"We can't do that—it's too soon. We were lucky to avoid a second-year slump. We need you to be completely hands-on."

"Then we have to think about cutting episodes. We could move from 24 to 16, start later in September, and take a longer winter hiatus. I'd have more time for all three shows if the schedule weren't so tight."

"Carla, we—you—have three of the top 15 shows on television. The market is shrinking—and getting more fragmented—but the revenue from your shows is going up. *Dope* still pulls in $150 million a year in ads, and the others are close. That's huge money—for us and for you. And you want to cut back? If I suggested that to Bill," he said, referring to RBN's president, "I'd be laughed out of the room."

"If you want me to keep giving you good shows with high ratings, I need time to be creative," she countered. "And I don't have that right now."

"You'll have the summer."

"To write scripts and plot story lines. It's the same treadmill. I can't work on anything new."

"You know you'll never really give up control. These are C3 shows: Carla Tremont Productions. It's your name. They're your babies. And you're a perfectionist. That's why we love you."

He was right; they *were* her babies, and she couldn't imagine ever fully letting them go. But she had to do something to give herself more time to think. "Michael, I was due at a read-through 10 minutes ago."

"Sure—just one more thing: Did you say you're working on something new?"

"No," she answered, with only a moment's hesitation. It was technically the truth—but she still felt guilty.

When she'd first conceived of *911* and *Forty Stories,* she'd floated them with RBN right away. C3 was under contract to give the network the right of first refusal to any new shows, and Michael had been

How will Carla know when her assistants are ready for more responsibility?

Today there are more than 50 national U.S. television networks. Owing to this fragmentation and the advance of digital media, the most popular scripted shows on TV now draw about 14 million viewers per episode, on average, down from averages of more than 20 million per episode in the 1980s.

Given Carla's first-look agreement with RBN, what obligation does she have to create only shows appropriate for that network? Could pitching elsewhere jeopardize her relationship with Michael and RBN?

a terrific, if tough, partner since the early days of *Dope*. But her new idea was edgier, more explicit—not at all right for RBN. She envisioned it airing on a cable network like AMC or HBO, or maybe Netflix, Amazon, or the new media upstart that was getting so much buzz, Cascade.

How could she explain to Michael that she wanted to scale back on her existing shows so that she could create a new one she'd most likely pitch to a competitor? And what if the dramedy idea failed? She'd worked incredibly hard for her three hits and knew that the ride—an amazing and lucrative one—wouldn't last forever. Maybe she should suck up the workload and enjoy her success while it lasted.

HEART TO HEART

The *Forty Stories* read-through took longer than expected. The script, from another of Carla's up-and-coming producers, needed tweaking, and she'd been too busy to eat dinner. Munching on a bag of almonds, she made her way back to C3. Two hours later, at a little before midnight, she and Melanie had nailed their scene. She was exhausted but exhilarated.

"Just in time," Melanie said, yawning. "Thanks. I didn't want to ask you for help, but I clearly needed it. I feel mostly on top of things, but it's good to work together again."

"Next year will be easier," Carla said.

"Maybe," Melanie said. "But I'll never be you. I had a drink with Keston the other night, and he feels the same way. At the end of the day, these are your shows, not ours, and it's hard to run them without you."

"No one's asking you to be me. What we need is more 'Melanie magic.'"

Melanie brightened. "Hey, are we still going to that top-women-in-TV breakfast tomorrow?"

Carla groaned inwardly. "I'm not speaking, am I? Do we both need to go?"

"You're not presenting, but it won't be pretty if I show up without you."

"OK, then. Let's call it a night."

A PROPOSITION

Carla walked into the Beverly Hilton ballroom the next morning and ran into Dale Grossman, the new head of content at Cascade. She'd met him at the previous year's Emmys, when he was still at HBO.

"Carla, great to see you again."

"You, too, Dale. Congrats on the move to Cascade."

"Thanks; I'm really fired up about it. Huge shows coming up—one from Tarantino, the other from Clooney, acting and directing. Limited series, of course. Can't tie these big stars down. But top-notch production, filmed on location, amazing scripts and casts."

"Expensive," Carla replied.

"Well, our investors believe that content is still king. Of course, I don't have to tell you that! You're the queen of RBN."

"You're too kind."

"Seriously, three shows—on that grueling network timetable. And you still find time for business breakfasts!"

"I try," Carla said drily.

"Would you have time for lunch at Cascade? Our CEO would love to hear your perspective on the industry, what audiences really want, how our shows stack up. I know you're locked in at RBN, but—"

"I'm not locked in," she interrupted. "RBN gets a first look, but we're not tied to them."

"Of course. Well, if you're ever ready to do something different, we'd love to discuss it."

He handed her a card, and Carla took it. Part of her wanted to leave right then and there to write the pilot, schedule the meeting, make the pitch. But she couldn't. She had to be on the *Forty Stories* set in an hour, to make sure that finale was perfect, too.

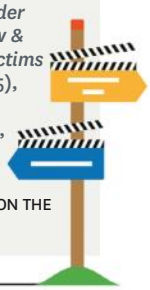
Later, she considered her situation. She had more magic left in her. But she wasn't sure she could sprinkle it across three shows and a new venture. She'd have to cede control to Melanie and Keston, or she'd have to convince Michael that the series would benefit from fewer episodes in the long run, even if RBN and C3 took a financial hit in the short term. The only other option was to convince *herself* that the dramedy idea wasn't so urgent; she could set it aside and wait for things to slow down in a few years, as they surely would.

That was all the thinking she had time for, though: Her casts and crews and viewers were waiting.

The formal pitching season for broadcast networks runs from July to October. Networks might see 500 ideas, buy the rights to 60, and, after discussions with show creators, order 12 pilot episodes to be produced.

Streaming services that offer high-profile shows such as *House of Cards* and *Transparent* have fundamentally changed the dynamics of the TV industry in recent years. Is this a trend Carla needs to be a part of?

The longest-running drama series in the modern era include *Law & Order* (20 seasons), *Law & Order: Special Victims Unit* (19), *NCIS* (15), *CSI: Crime Scene Investigation* (15), and *ER* (15).



SEE COMMENTARIES ON THE NEXT PAGE

SHOULD CARLA FOCUS ON HER HIT SERIES OR CEDE CONTROL AND START THE NEXT NEW THING? THE EXPERTS RESPOND

CARLA NEEDS TO have a candid discussion with Michael and other RBN executives about the production philosophy of *Dope, 911,* and *Forty Stories* going forward. Obviously, Carla, C3, and RBN want to maintain high quality, strong viewership, and robust revenues. But to ask Carla to bring her "magic" touch to every episode of all three shows is not sustainable.

And the process of making television is changing. The disruption brought on by cable and now streaming services has opened the door to new approaches. Broadcast networks are still more entrenched in a certain model and rhythm, so it's no surprise that RBN is clinging to that tradition. But the fact that Carla's three series started at 24 episodes per season, fall to spring, doesn't mean they have to continue that way. Many networks have begun to show more flexibility and order fewer episodes, especially when high-level talent is involved.

A few years ago, I was overseeing a very auteur-driven scripted show. The creator worked in a handcrafted, sequential way, similar to how films and European TV shows are made. This meant that on some occasions it took more time to deliver a batch of shows than was typical, and so we had to premiere new seasons at different times of year. The number of episodes per season also varied. In my judgment, forcing the show into a more standardized format would have killed its genius. The creator had such a particular point of view, and we thought—rightly, I hope—that fans of his storytelling cared more about integrity of tone and substance than about regular air dates.

Of course, more and better delegation is also something Carla needs to put into action, given that she has so many shows on the go. This would require significant cultural and behavioral change at both C3 and RBN, and from Carla herself. She is very nurturing of Melanie and Keston—always ready to give advice, run interference with the network, and play the 11th-hour savior when needed. However, her protégés won't stop thinking of themselves as number twos until she weans herself off that role, trusts them to execute on their own, and empowers them to communicate directly with RBN. The tension for her will be in accepting that people won't always make the choices she would.

In her phone call with Michael, Carla pitched both ideas—rethinking the production schedule and downsizing her responsibilities—yet she backed off after he resisted. She needs to make him see that it is as much in the network's interest as hers to find new ways to collaborate.

In a face-to-face meeting somewhere "human" (that is, outside the office), she should explain that although they are both invested in the C3-RBN relationship and in keeping the three hit series healthy over the long term, she is stifled creatively and wants time to work on a new idea that's important to her. Together—with thoughtful honesty and input from her team and other network executives—they should then problem-solve and agree on a more sustainable schedule and set of expectations and roles for the existing shows, thereby freeing Carla up for a set period of time.

WHEN A STAR PERFORMER SAYS "I'M BURNED-OUT," THE MANAGER HAS TO LISTEN.

Media executives today understand that different shows are suited to different platforms. While Michael may not like the idea that Carla wants to develop a show that's not a fit for his network, he will most likely realize that RBN will benefit from giving its hitmaker the chance to regain her creative energy, potentially generating some industry buzz, and, crucially, not killing the goose that lays the golden eggs.

When a star performer says "I'm burned-out and unable to give you my best work," his or her manager has to listen. It's time for Carla to have that conversation with Michael.

SARAH BARNETT IS THE PRESIDENT AND GENERAL MANAGER OF BBC AMERICA

MELISSA JAMES GIBSON
IS A CO-SHOWRUNNER FOR THE NETFLIX SERIES *HOUSE OF CARDS.*

CARLA HAS BUILT a brand and a business around her three hit shows, so I understand her reluctance to disrupt the status quo. She has a responsibility to keep her hits—and the C3 enterprise—running smoothly. But she is also a highly ambitious artist, and if that creative self is pushing her to try something new, I think she needs to pay attention. What's best for her might not be best for her company, and vice versa. But if her brand doesn't evolve with her, it will lose its relevance.

Creators of popular TV series have successfully handed the reins to new showrunners and transitioned to other projects without the shows' suffering declines in viewership or accolades. *Veep,* on HBO, went through a handoff last year and continues to get Emmy nominations. *The Walking Dead,* on AMC, and *The West Wing,* which ran on NBC from 1999 to 2006, also survived changes in creative leadership. And along with Frank Pugliese, I was lucky enough to take over the showrunning of *House of Cards* when Beau Willimon moved on.

But changes at the top work only when everyone involved understands that new leadership will inevitably precipitate an evolution in content. Melanie's and Keston's decisions will never exactly mirror Carla's. But different isn't necessarily wrong. It's possible that Carla and especially Michael are underestimating the abilities of her protégés. Even if they're not unicorns like her, they are certainly rare breeds—hired and promoted because she sensed they had their own "magic."

No manager can know with 100% certainty if and when an employee is ready for a top job. However, Carla seems to think that Melanie is, with Keston close behind. So why wait? Given Carla's desire to explore new territory, now seems like a good time to give them a chance, just as Michael took a chance on her.

And Carla has the clout to make this happen. Although RBN might prefer that she stay in a more hands-on role, it has a vested interest in keeping her happy and engaged, and there's no reason why *Dope, 911,* and *Forty Stories* can't keep going while she takes a few months to write a pilot. She has given the network so much; the least it can do is let her scratch this itch. One thing is clear: Carla needs time to stare at a wall and dream a little.

If the network stonewalls, she might need to get really brave and break her contract. But I suspect that they'll be able to find a compromise. After all, Carla will always be emotionally invested in the shows she developed from the germs of ideas. After a constructive break, she may well choose to reinvolve herself to some degree—deferring most decisions to the new showrunners and weighing in when necessary.

In the end, Carla is craving a change. She has mastered the realm of network drama and is now drawn to the world of cable/streaming, an arena in which there are fewer restrictions and greater opportunities to push the artistic envelope. At times, she'll no doubt feel destabilized—all eyes will be on her in a sometimes unforgiving industry—but she's talented and smart and will figure it out.

Even though so many decisions in entertainment are driven by fear, Carla's fearlessness has always served her well. If she doesn't make the leap now, I think she'll regret it. In an era of peak TV, her idea could lose currency within a year or two; the moment for it might pass, or a peer might develop a similar show. So she needs to trust her gut. She's not the same artist or person that she was when she first developed *Dope.* There's a reason she can't stop thinking about the new project: In her heart, she knows it will leave her much more exhilarated and artistically satisfied than limiting herself to territory she's already conquered. Carla's instincts are her most valuable asset.

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Reprint Case only R1706X
Reprint Commentary only R1706Z

COMMENTS FROM THE HBR.ORG COMMUNITY

Proceed with Caution
Carla's three series are not only making RBN good money but also they are enhancing the reputation of C3. And any major change in the way they are run could have an impact on that. So in my view, ceding control is not advisable. To avoid a possible slump, the ongoing shows still need Carla's urgent attention. Delegating and handing over the reins gradually, as she appears to be doing already, is the way to go. Later, when she has greater confidence in the abilities of Melanie and Keston, she can move on to her new idea without spreading her creative resources too thin. Carla may have plans to go big with different networks, but she needs to ensure that bridges are not burned with her current one should the new venture fail to pan out. Any decision that threatens her relationship with RBN requires careful thought.
Rachit Malhotra,
management consultant, KPMG

Winning in the 21st Century

Capitalize on Technology-Driven Disruption, Accelerate Change

As digital technologies permeate all aspects of their operations, companies around the world anticipate the need for massive change over the next five years, according to a new global survey by Harvard Business Review Analytic Services. But can these organizations adapt fast enough?

Almost all the 376 business leaders in the survey said they expect the pressure to transform will only accelerate and intensify. Three-quarters of these executives—primarily from large organizations in financial services, manufacturing, technology, healthcare, retail and many other industries—say their organizations will require substantial or extensive change to become even more digital.

But when asked about what worries them most about their company's future, most of these executives focused on their organization's inability to change fast enough to survive and thrive in an increasingly digital world.

Indeed, only seven percent of the executives said their organization is extremely open to change, with another 35 percent saying their organization is somewhat open to change.

This raises concern about the viability of some organizations during the next waves of disruption. About a third of respondents said their organization currently is not very digital, meaning that less than a quarter of their products, operations and business models depend on their ability to exploit digital information and technologies. Over a third (39 percent) are moderately digital.

Just 29 percent were very digital, with more than half of products, operations and business models dependent on their ability to exploit digital information and technologies.

This emerging group of "digital leaders"—those who have moved their organizations forward—offer guidance for business and technology leaders in all industries. The path is not easy; the shift starts with creating and broadly communicating a compelling digital strategy, but it also demands changes to organizational structures, systems and processes.

And because digital demands new skills, aptitudes and ways of working, it requires a greater investment in employee support and culture change. IT departments need to move into leading roles in innovation.

There is no one-size-fits-all pattern or timetable for creating change initiatives, but the study identified key steps for companies to consider as they seek to capitalize on disruption.

Communicate the Strategy: People can't change what they don't understand. Transformation begins with creating a sense of purpose and a common understanding by defining and communicating a compelling strategy for the digital economy. While more than three-quarters of the very-digital companies in the survey have taken this step, only 40 percent of the not very digital have done so. Indeed, a majority of respondents said that communication from leadership about the need for change is one of the three most effective means of building a change-embracing culture—more than any other single factor.

Build New Structures: Most respondents (89 percent) are creating new organizational structures and teams to support digital operations and business models, with more than a fifth making major changes—not just in pockets of the organization. Very-digital organizations are twice as likely as the not very digital to be doing this to a great extent. These digital leaders focused on breaking down silos and keeping the organizational structure more fluid than fixed in order to respond to the dynamic nature of the digital economy. In the survey, very-digital organizations were almost four times as likely as not-very-digital companies to be somewhat or very fluid (42 percent versus 11 percent).

Think Teams: In launching transformation efforts, the leading companies bring together cross-functional teams, including employees with deep industry knowledge, analytics skills, creative skills, policy knowledge and more. Innovation accelerates when people think about problems differently. These teams often focus on using an agile approach to development; the survey found 51 percent of companies using design thinking and 42 percent deploying a minimum viable product approach to new-product rollouts.

Experiment and Learn: Digital innovation means working with and exploiting data in completely new ways. And digital organizations must adopt a mindset of speed and experimentation. As they make this shift, companies are focusing on developing faster response to customer insights and market shifts, as well as making full use of assets and capabilities that are available in the cloud, from outside talent and from ecosystem partners.

Rethink IT: Many legacy IT systems are too slow and rigid for digital business. As companies modernize their IT infrastructure, they are looking to gain flexibility, scalability and, above all, speed. Increasingly this means cloud and an API/services-based infrastructure. But along with using new technology, organizations are rethinking the role of IT. With IT being incorporated into new products, services and business models, it's not surprising that almost half of respondents report that IT and product development collaborate closely at their companies—though they remain separate organizational units. Only 16 percent say they are part of the same organization.

This innovation approach to IT is still the exception rather than the norm. Overall executive confidence in internal IT is mixed, with only 17 percent viewing their own IT organization as being extremely capable of executing their company's digital agenda and another 45 percent seeing it as moderately capable. But this varies dramatically based on organizations' digital maturity. Forty-three percent of respondents at very-digital companies view their IT organization as extremely capable, compared with only four percent of the not very digital. Conversely, 61 percent of the not very digital firms view their IT organization as not at all capable.

The Payoff

More than half of the very-digital companies said they have experienced a significant financial lift from their digital efforts. This compares with only 20 percent of moderately-digital organizations and just six percent of the not very digital.

To catch up, these organizations will have to determine which area will provide the greatest benefit for their business—digitizing their core operations, creating a new kind of customer engagement, or innovating around new digital products and business models—and then provide the means to get there. This will require leadership, investment, restructuring within the organization, and new relationships inside and outside the organization. Companies must also find ways to overcome inertia and resistance to change. Above all, it will require flexibility. As disruption accelerates, the requirement to adapt is more urgent.

JEFF GLUECK

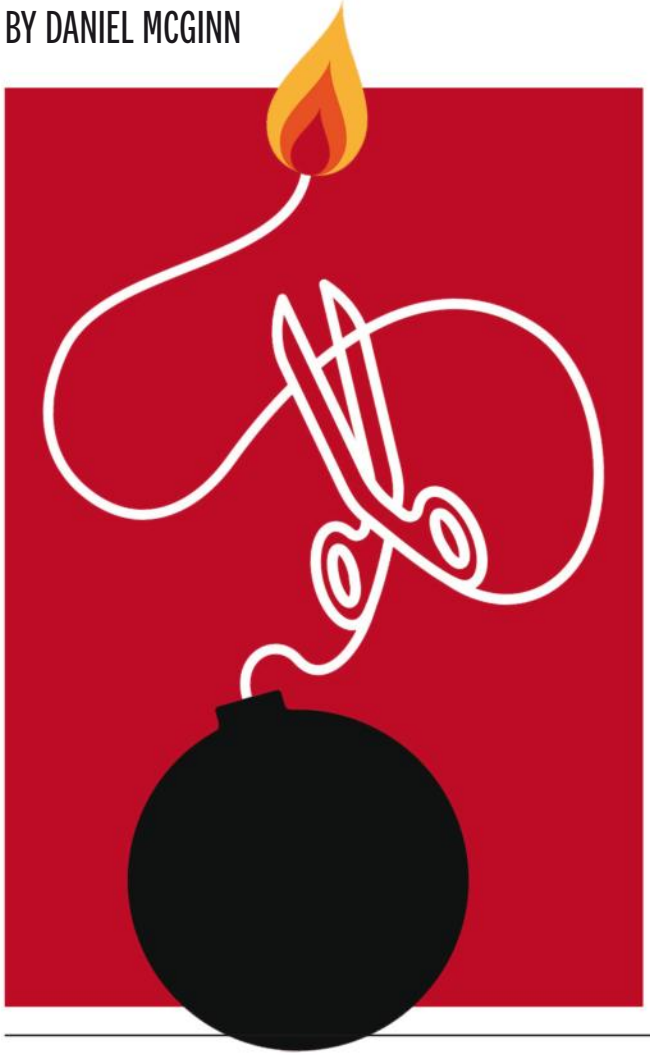
CEO OF FOURSQUARE

WHAT I'M READING...

I'm a big fan of the *New Yorker*'s long-form articles. You don't find that kind of coverage on Venezuela or Syria elsewhere. My wife gets *Vanity Fair*, so I sometimes turn to that for lighter reading and some incredible business journalism. Other favorite websites and newsletters include *Business Insider*, the *Verge*, *TechCrunch*, the *New York Times*, the *Wall Street Journal*, and the *Skimm*. I have a few books on my nightstand: *The Genesis Code*, on genetic engineering; *Ratf**ked*, about how gerrymandering is distorting American democracy; and *Stirring It Up*, a memoir by Gary Hirshberg, the former CEO of Stonyfield Farm. I'd hoped to finish *Alexander Hamilton*, by Ron Chernow, before I saw the musical *Hamilton*, but I got through only three-quarters before the show. Both are moving character studies that put you into the historical moment.

SYNTHESIS
LEADING, NOT MANAGING, IN CRISIS

BY DANIEL MCGINN

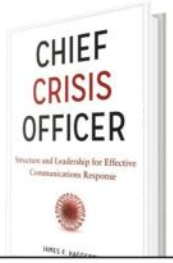


Imagine you were the person at BP headquarters in 2010 who got the first call: A drilling platform in the Gulf of Mexico had exploded and sunk, killing 11 workers—and allowing oil to leak into the ocean at a rate of 43 barrels a minute. What would you do? Which colleagues would you convene, and which of the myriad problems would you address first? Would you put out a press statement or a tweet or send a spokesperson to the scene? Would your focus be on managing the situation—or actually leading the company through it?

Particularly in the age of Twitter, it's more important than ever for organizations to swiftly and adeptly respond to a crisis—whether it's a full-blown disaster or merely a disgruntled customer's tweet that's starting to spread. In surveys, executives now rank "reputation risks" among their top worries, largely because bad news travels so much faster than it used to. A *Forbes* headline, written after video of a passenger being dragged off a plane went viral last spring, succinctly sums up the danger: "How United Became the World's Most Hated Airline in One Day."

For many companies in such predicaments, the first call often goes to a crisis management consultant, or "fixer." But according to James Haggerty, who specializes in this work, if you're caught so flat-footed that you need outside help immediately, you're already behind. In *Chief Crisis Officer*, he suggests that companies take three preemptive steps: designate an insider who will manage any situation that might arise (not the CEO, but someone trusted enough to make a big decision—such as the CEO's chief of staff, an experienced PR hand, or an assistant general counsel); appoint a rapid response team to help that person; and give that team some scenario training.

Haggerty classifies crises according to their speed (an "exploding" crisis versus an "unfolding," slower-moving one, such as a big lawsuit), and examines nuts-and-bolts issues, such as limiting media access. His focus is tactical: He argues that companies should create a laminated, one-page crisis playbook, similar to what an NFL coach carries on the sidelines. Calling BP's response to Deepwater Horizon "one of the worst PR responses the world has



Chief Crisis Officer: Structure and Leadership for Effective Communications Response
James F. Haggerty
American Bar Association, 2017

VALENTYN VOLKOV/ISTOCK; FREEPIK/FLATICON

WHO I'M FOLLOWING...

I'm interested in technology, politics, and the intersection of the two, so I look to smart pundits such as Anil Dash, the blogger; Nicholas Thompson, the editor of *Wired;* David Fahrenthold, of the *Washington Post;* Amy Davidson Sorkin, of the *New Yorker;* and Sundar Pichai, the CEO of Google. I enjoy Malcolm Gladwell's podcast Revisionist History. I remember an episode about the song "Hallelujah." It took Leonard Cohen nearly 10 years to get it right. That's true of so many works of art and start-ups: You tweak and tweak, suddenly magic arrives, and you take off.

"HISTORY TEACHES US THAT THERE ARE ALWAYS HEADWINDS WHEN YOU'RE TRYING TO CREATE SOMETHING THAT LASTS."

WHAT I'M WATCHING...

My wife and I loved the first season of *Billions,* on Showtime, but now we're hooked on Amazon's *Mozart in the Jungle,* which Foursquare's CFO recommended. It perfectly depicts what it's like to be at the start of your career and fighting your way up alongside a lot of other talented people with whom you need to mesh well.

ever seen," Haggerty says that blame lies not just with then-CEO Tony Hayward but with the entire leadership team's lack of preparedness to communicate should an oil spill—an obvious risk for the company—occur: "The fault, as I see it, lies not in the weak, fumbling messages that BP put out in the initial phases... but rather the lack of an adequate, *executable* plan that led directly to those fumbled responses."

Tim Johnson, a London-based crisis consultant and the author of *Crisis Leadership,* argues for a slightly different approach. Drawing on academic research, he focuses less on the need for flowcharts and checklists and more on developing a "crisis-ready culture" and leaders who are steady enough to make deliberate, wise decisions even as the world speeds up—which is essentially what happens during a crisis.

Johnson describes two kinds of bias that arise from a fight-or-flight response and lead to bad choices: "intervention bias," or the urge to overreach and take on tasks for which an organization is ill equipped; and "abdication bias," which causes one to eschew responsibility or blame others. (Lawyers are particularly fond of the latter.) Actually leading in a crisis, he argues, requires avoiding these impulses and instead figuring out what's really happening, thinking hard about stakeholders' needs, and creating a purposeful mission to guide the response. "Resist the urge to do anything immediately," he writes. Ignore the adrenaline, work with a high-performing team, get the facts, ask questions, and listen; then make a plan.

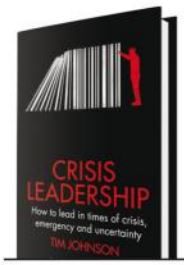
Counterintuitively, Johnson points to President George W. Bush's reaction on 9/11—when he continued sitting with Florida schoolchildren even after being alerted that New York City was under attack—as exemplary. "By not outwardly reacting, [Bush] bought himself *space* to think and *time* to react," he writes.

Nancy Koehn, a historian at Harvard Business School, examines a different kind of crisis: one that drags on, putting a leader in a vise of unending decisions. In *Forged in Crisis,* she draws profiles of five leaders who experienced such stress: Ernest Shackleton, Abraham Lincoln, Frederick Douglass, Dietrich Bonhoeffer (an anti-Nazi German clergyman), and the 1960s environmentalist Rachel Carson. Koehn sees in these historical figures some of the characteristics Johnson prescribes: a cool deliberateness and a willingness to be patient even under pressure. Lincoln, for instance, "discovered the power of mastering his emotions in a specific situation carefully enough to take no immediate action or, in some instances, to do nothing at all," she writes. "In our own white-hot moment, when so much of our time and attention is focused on instantaneous reaction, it seems almost inconceivable that *nothing* might be the best something we can offer." Yet history suggests that in some crises, it is.

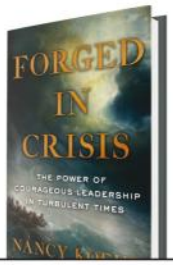
As should be clear, these are three very different books. It's hard to imagine a CEO asking, "What would Lincoln do?" when his company's stock is tanking because of a viral video. Still, the recommendations offered aren't mutually exclusive. It's probably smart for a CEO to delegate tactical crisis management to a deputy, preappoint a team, and have some version of a playbook (laminated or not) at the ready. But that same leader should also aim to stay calm and above the fray, to keep an eye on the long game, and to understand that in many situations "Let's wait and see" is the wisest response.

"[THESE LEADERS] LEARNED HOW TO STEP BACK FROM A SPECIFIC INSTANT, ASSESS THE LARGER LANDSCAPE, TAKE THE MEASURE OF THEIR OWN EMOTIONS, AND ONLY THEN MAKE A DECISION ABOUT WHAT, IF ANYTHING, THEY WANTED TO DO."
Nancy Koehn, *Forged in Crisis*

DANIEL MCGINN is a senior editor at *Harvard Business Review.*



Crisis Leadership: How to Lead in Times of Crisis, Emergency and Uncertainty
Tim Johnson
Bloomsbury Business, 2017

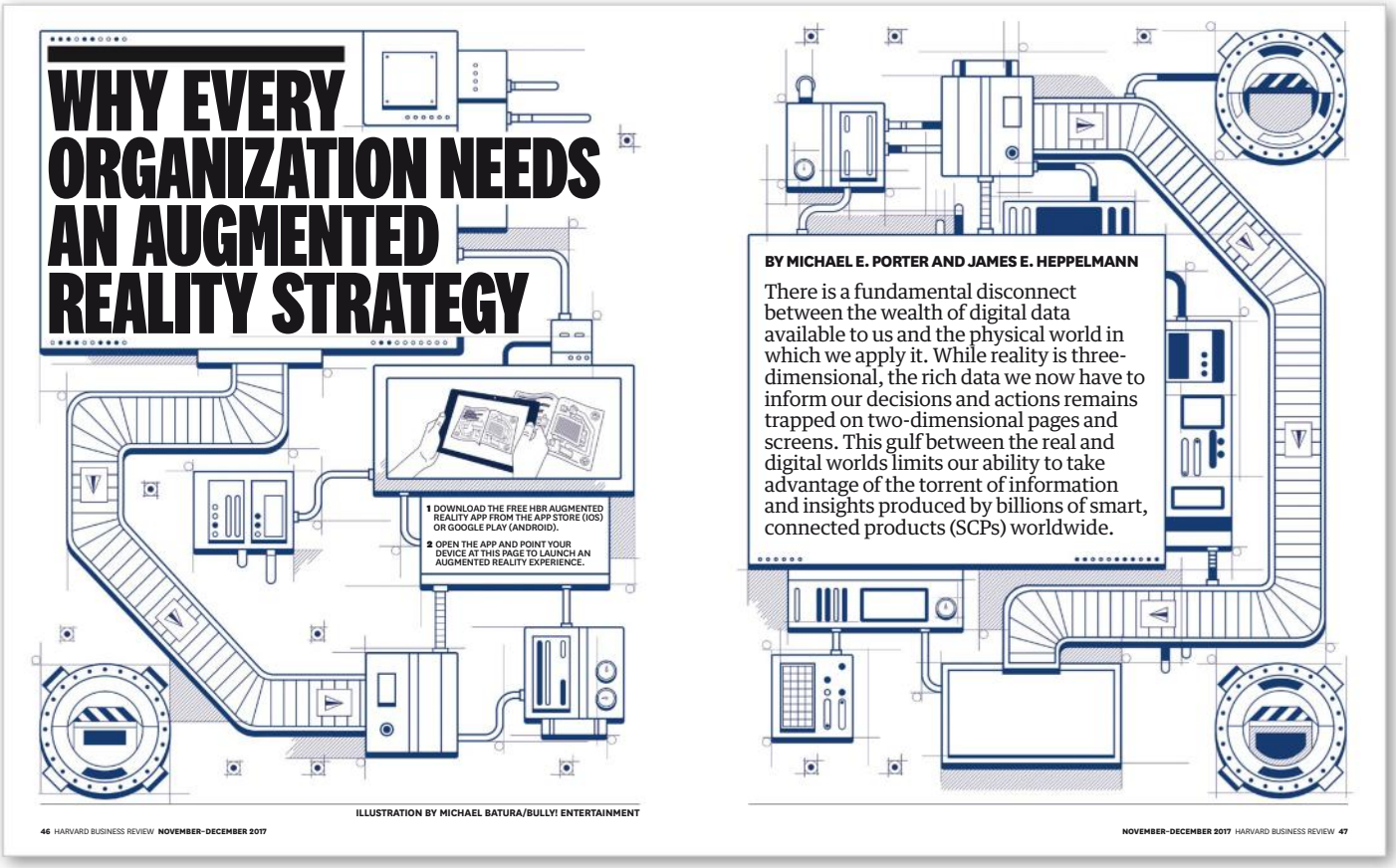


Forged in Crisis: The Power of Courageous Leadership in Turbulent Times
Nancy Koehn
Scribner, 2017

SPOTLIGHT

A MANAGER'S GUIDE TO AUGMENTED REALITY

Augmented reality technologies promise to transform how we learn, make decisions, and interact with the physical world. In this package we explain what AR is, how its applications are evolving, and why it's so important.



WHY EVERY ORGANIZATION NEEDS AN AUGMENTED REALITY STRATEGY

BY MICHAEL E. PORTER AND JAMES E. HEPPELMANN

There is a fundamental disconnect between the wealth of digital data available to us and the physical world in which we apply it. While reality is three-dimensional, the rich data we now have to inform our decisions and actions remains trapped on two-dimensional pages and screens. This gulf between the real and digital worlds limits our ability to take advantage of the torrent of information and insights produced by billions of smart, connected products (SCPs) worldwide.

1 DOWNLOAD THE FREE HBR AUGMENTED REALITY APP FROM THE APP STORE (IOS) OR GOOGLE PLAY (ANDROID).

2 OPEN THE APP AND POINT YOUR DEVICE AT THIS PAGE TO LAUNCH AN AUGMENTED REALITY EXPERIENCE.

ILLUSTRATION BY MICHAEL BATURA/BULLY! ENTERTAINMENT

46 HARVARD BUSINESS REVIEW NOVEMBER–DECEMBER 2017

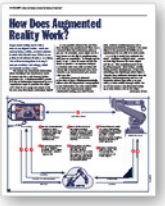
NOVEMBER–DECEMBER 2017 HARVARD BUSINESS REVIEW 47

While the physical world is three-dimensional, most data is trapped on two-dimensional pages and screens. This gulf between the real and digital worlds prevents us from fully exploiting the volumes of information now available to us. Augmented reality, a set of technologies that superimposes digital data and images on physical objects and environments, is closing this gap. By putting information directly into the context in which we'll apply it, AR increases our ability to absorb and act on it.

AR will become the new interface between humans and machines, say Michael E. Porter of Harvard and James E. Heppelmann, the CEO of the industrial software maker PTC. Many people are familiar with AR entertainment applications, such as Snapchat filters, but AR is being applied in far more consequential ways in business. Pioneering organizations are already implementing it in product development, manufacturing, logistics, marketing, service, and training—and are seeing major gains in quality and productivity.

AR improves how users visualize information, receive and follow instructions, and interact with products. AccuVein, for instance, uses AR technology that converts the heat signature of a patient's veins into an image superimposed on the skin, making them much easier to locate. Boeing uses AR to show trainees how to assemble an aircraft wing—and has cut the time it takes them to do that task by 35%. At GE, factory workers have achieved a similar gain in efficiency by using voice commands in AR experiences to perform complex wiring.

AR will have a wide impact on how companies compete. This article walks readers through the questions firms need to ask when integrating it into their strategies and operations. The article also includes HBR's first embedded AR experiences, which readers can launch by downloading a new HBR app on their mobile devices and then pointing them at targeted images in the magazine's pages.



HOW DOES AUGMENTED REALITY WORK?

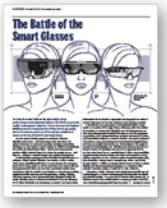
A step-by-step explanation of how interactive three-dimensional experiences come to life

AUGMENTED REALITY IN THE REAL WORLD

Data on who's investing the most, the explosive growth of headsets, and the most popular uses of AR

ONE COMPANY'S EXPERIENCE WITH AR

A conversation with Guido Jouret, the chief digital officer of the industrial giant ABB



THE BATTLE OF THE SMART GLASSES

Money is pouring into development, and whoever wins the race may earn the title of world's most valuable company.

THE COMPLETE SPOTLIGHT PACKAGE IS AVAILABLE IN A SINGLE REPRINT. **HBR Reprint** R1706B

MANAGING YOURSELF

ARE YOU SUITED FOR A START-UP?

Jeffrey Bussgang | page 150

Relative to established organizations, start-ups can be hard to figure out. What are the jobs to be done? The best entry points? How can you tell whether a company has potential for success and is the right fit for you?

The author advises that you first assess whether you're suited for a young, entrepreneurial organization. Start-up joiners need to do three things well: manage uncertainty, push the limits, and think like an owner.

He then outlines four steps for choosing the right company: Pick a domain (find a field you're passionate about); pick a city (preferably in an entrepreneurial hub); pick a stage ("jungle," "dirt road," or "highway"); and pick a winner (do due diligence on the founding team, the market, and the business model).

Once you've made those choices, you'll need to sell yourself, and Bussgang suggests how: Identify key players at the companies you're interested in and find ways to connect with them. When you meet, articulate how you can contribute, engage your interviewers about *their* work, and offer expertise, advice, or contacts with no expectation of reciprocity. Suddenly you'll be perceived as someone who is already adding value.

HBR Reprint R1706M

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Sales through dealers and carriers, street vendors, counter sales, and other non-USPS paid distribution	205,061
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Edward Crowley, GENERAL MANAGER

FEATURES

LEADERSHIP

THE BEST-PERFORMING CEOS IN THE WORLD

page 66

More than 15 years ago Jim Collins, the author of the management best seller *Good to Great*, introduced the flywheel as a metaphor for the enduring power of strong business leadership. A company achieves excellence, he wrote, by "relentlessly pushing a giant heavy flywheel in one direction, turn upon turn, building momentum until a point of breakthrough." The power of momentum is evident in HBR's 2017 ranking of the world's best-performing CEOs—the 100 leaders who have delivered top results on both financial and ESG measures over their entire tenures, which average 17 years.

Heading this year's list—his first time in that spot—is Pablo Isla of Inditex, the parent of several retail fashion chains including Zara and Pull&Bear. In an accompanying interview with HBR senior editor Daniel McGinn, Isla discusses some of the factors—a flat structure and an informal management style; "proximity sourcing," or production close to home; and a continual focus on sustainability—that have propelled the company's success.

HBR Reprint R1706C

CHANGE MANAGEMENT

WHAT EVERYONE GETS WRONG ABOUT CHANGE MANAGEMENT

N. Anand and Jean-Louis Barsoux
page 78

Corporate transformations still have a miserable success rate: About three-quarters of change efforts either fail to deliver the anticipated benefits or are abandoned entirely. And because flawed implementation is most often blamed for such failures, organizations have focused on improving execution. But poor execution is only part of the problem; the authors' four-year study of 62 corporate transformations suggests that misdiagnosis is equally to blame. Before worrying about how to change, they write, executive teams need to figure out what to change—in particular, what to change first. They can do this by fully understanding three things: the catalyst for transformation, the organization's underlying quest (is it global presence, customer focus, nimbleness, innovation, or sustainability?), and the leadership capabilities needed to see it through.

J.C. Penney, Norske Skog, Acer, and other classic cases illustrate the authors' points, and the article includes a "quest audit" to help companies identify their transformation priorities.

HBR Reprint R1706D

TALENT MANAGEMENT

TURNING POTENTIAL INTO SUCCESS

Claudio Fernández-Aráoz, Andrew Roscoe, and Kentaro Aramaki
page 86

Most leadership development programs aren't working. Only 24% of senior executives at firms that have them consider them to be a success.

Companies must take a more scientific approach to turning their raw talent into leaders, say three authors from Egon Zehnder, which has been measuring executive potential for 30 years. Begin by identifying which of seven key

SEVENTY-TWO PERCENT OF MANAGERS HAVE THE POTENTIAL TO GROW INTO C-SUITE ROLES.

leadership competencies *(results orientation, strategic orientation, collaboration and influence, team leadership, developing organizational capabilities, change leadership,* and *market understanding)* are critical to your top roles. Next, assess employees' potential by looking at five predictors of strong competencies *(motivation, curiosity, insight, engagement,* and *determination)* and then map people's potential to role requirements to see how far they can go. Last, to help them get there, provide the right coaching and development opportunities.

HBR Reprint R1706E

ENTREPRENEURSHIP

WHEN FOUNDERS GO TOO FAR

Steve Blank | page 94

Silicon Valley venture capitalists used to routinely oust start-up founders—who were viewed as green and unskilled—as part of the process leading to an IPO. The author, an adjunct professor at Stanford and a well-known entrepreneurship thinker, describes how VCs gradually came to see founders not as a problem that needed to be solved but as a valuable asset that needed to be retained. In July 2009, when Mark Andreessen cofounded the VC firm Andreessen Horowitz with Ben Horowitz, it was with a key philosophical difference from rival firms: a "founder friendly" focus. Blank argues that this trend has gone too far, and the situation at Uber is just the most obvious example of that. He offers prescriptions for how to begin correcting this power imbalance.

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INNOVATION

THE BOARD'S NEW INNOVATION IMPERATIVE

Linda A. Hill and George Davis
page 102

As firms scramble for competitive advantage, boards—once the cautious voices urging management to mitigate risk—are now calling for breakthrough innovation. Indeed, avoiding risk is now seen as the riskiest proposition of all.

In speaking with CEOs and board members from a range of industries, the authors identified four common obstacles most boards face in governing innovation: an outdated risk agenda, insufficient time, lack of expertise, and a relationship with management that needs retuning.

Embracing innovation and its inherent risks requires that boards and senior management develop new ways of working together. To bolster out-of-the-box thinking at their companies, boards should promote diversity among members. They should foster "creative abrasion" to keep ideas flowing and rethink traditional methods of governing. And they must learn to embrace and encourage risk.

HBR Reprint R1706G

STRATEGY

STOP DOUBLING DOWN ON YOUR FAILING STRATEGY

Freek Vermeulen and Niro Sivanathan | page 110

People have a tendency to stick to an existing course of action, no matter how irrational. In the management literature, this is known as an *escalation of commitment,* and in nearly every academic case study on the demise of a former industry leader, it played a major role. The story of the British music company HMV—whose managing director dismissed downloadable music as "just a fad"—is a classic example.

Escalation of commitment is explained by a number of mutually reinforcing biases, among them: the sunk cost fallacy, loss aversion, the illusion of control, the preference for completion, pluralistic ignorance, and personal identification. The authors describe six practices that can help counteract these biases: (1) Set decision rules. (2) Pay attention to voting rules. (3) Protect dissenters. (4) Expressly consider alternatives. (5) Separate advocacy and decision making. (6) Reinforce the anticipation of regret. Overcommitted executives, they write, are prone to ignore signs of their company's imminent collapse. These practices will encourage managers at all levels to make decisions more objectively.

HBR Reprint R1706H

FEATURES

MANAGING ORGANIZATIONS

WHAT MANAGERS NEED TO KNOW ABOUT SOCIAL TOOLS

Paul Leonardi and Tsedal Neeley
page 118

To identify the value that social tools can bring to companies, the authors split employees at a large financial services firm into two groups, only one of which used an internal social platform, and observed them for six months. Those who had used the tool became 31% more likely to find

THESE TOOLS CAN HELP EMPLOYEES BECOME MORE ENGAGED IN THEIR WORK.

coworkers with relevant expertise and 88% more likely to discover who had useful connections.

Internal social tools can help employees make faster decisions, develop more innovative ideas for products and services, and become more engaged in their work and their companies. But companies that try to "go social" often fall into four traps: They (1) assume that Millennials will embrace social tools at work; (2) struggle to foster personal interaction that builds trust and promotes knowledge sharing; (3) fail to recognize how learning occurs on social tools; and (4) focus on the wrong data. The authors offer advice on how to avoid these traps.

HBR Reprint R1706J

HEALTH CARE

THE IT TRANSFORMATION HEALTH CARE NEEDS

Nikhil R. Sahni, Robert S. Huckman, Anuraag Chigurupati, and David M. Cutler | page 128

In recent years, health care organizations have made sizable investments in information technology. They've used their IT systems to replace paper records with electronic ones and to improve billing processes, thereby boosting revenue. But so far, IT has been of little value in making medical care delivery more effective or less expensive.

How can health care organizations change this? One key is to prioritize quality improvement over cost cutting. By harnessing IT to help design better clinical practices, it's possible to achieve better patient outcomes *and* better financial performance. It is also vital to gather good information—by using simpler, more-organic collection methods—and to make it actionable by applying analytics. Finally, many organizations will need to forge new business and operating models, expanding their IT staffs, revamping how their clinical staffs work, and creating new payment structures.

The authors provide numerous examples of health care organizations that are taking these steps—and seeing impressive results.

HBR Reprint R1706K

DIVERSITY

"NUMBERS TAKE US ONLY SO FAR"

Maxine Williams | page 142

Though executives tend to think—and want to believe—they're hiring and promoting fairly, bias still creeps into their decisions. They often use ambiguous criteria to filter out people who aren't like them or deem people from minority groups to be "not the right cultural fit," leaving those employees with the uneasy feeling that their identity might be the real issue.

Companies need to acknowledge that it's fair for employees from underrepresented groups to be suspicious about bias, says Williams, Facebook's global director of diversity. They also must find ways to give those workers more support. To that end, many organizations are turning to people analytics, which aspires to replace gut decisions with data-driven ones. Unfortunately, firms often say that they don't have enough people from marginalized groups in their data sets to produce reliable insights.

But there are things employers can do to supplement small *n*'s: draw on industry or sector data; learn from what's happening in other companies; and deeply examine the experiences of individuals who work for them, talking with them to gather critical qualitative information. If firms are systematic and comprehensive in these efforts, they'll have a better chance of improving diversity and inclusion.

HBR Reprint R1706L

HOW I DID IT

MANAGING ORGANIZATIONS

THE CEO OF KRONOS ON LAUNCHING AN UNLIMITED VACATION POLICY

Aron Ain | page 37

Technology has made it possible for employees to be plugged in around the clock, even when they're "on vacation." In view of this reality, Kronos launched its open vacation policy in early 2016. To Ain's surprise, some employees were very unhappy about it, largely for three reasons: Because the new policy required individuals to work out time off with their supervisors, some managers thought their jobs would become more difficult. Some employees who had been banking unused vacation time resented the loss of a bundle of cash when they retired. And some felt that it was unfair for new hires to get as much vacation as they themselves had earned over time. But Kronos now considers the switch a success—and 2016 was financially the company's best year ever.

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Between issues of HBR, we continue to examine the most important ideas and challenges facing business leaders today. Join us every other month as we roll out a weeklong program offering a new HBR feature from a leading management thinker, along with a full complement of related articles, videos, events, and more.

COMING IN NOVEMBER: THE "GOOD JOBS" SOLUTION

TENS OF MILLIONS of jobs in retailing and other parts of the service sector are low-paid, dead-end positions that don't capitalize on employees' talents. MIT's Zeynep Ton will examine how a growing number of major companies are adopting or experimenting with a radically different model that transforms bad jobs into good ones. But they've found it's hard to get from here to there. This program looks at their experiences, what it takes to make the journey, and the potential impact on companies, the economy, and workers' lives.

JANUARY 2017

MANAGING YOURSELF

GENEROSITY BURNOUT

Adam Grant and Reb Rebele

GIVING TOO MUCH of yourself at work can hurt the very people you're trying to help. Learn how to be a better giver. Listen to CEOs discuss their burnout. Watch a webinar with Grant and Rebele. Take an assessment to learn whether you're likely to burn out.

MARCH 2017

ECONOMY

THE BUSINESS OF INEQUALITY

Nicholas Bloom

INCOME INEQUALITY is a big problem, and it starts with firms. Understand how a winner-take-all economy drives it. See top economists' inequality charts. Read an interview with former White House economist Jason Furman and a call to action by Harvard Business School's Rebecca Henderson.

MAY 2017

TECHNOLOGY

THE DRONE ECONOMY

Chris Anderson

DRONES ARE HERE to do real work. Learn how to get started with this disruptive technology platform. See how AT&T uses drones. Watch the founder of iRobot talk about her drone start-up. Learn about the breadth of jobs that drones do. Understand the legal and regulatory landscape.

JULY 2017

TECHNOLOGY

AI, FOR REAL

Erik Brynjolfsson and Andrew McAfee

AI IS finally for real. It's not magic, but its effect on business will be profound. Go inside Facebook's AI team. Watch AI help chefs make a meal. Read why AI can't yet write an HBR executive summary. Watch Coursera cofounder Andrew Ng and HBR's Adi Ignatius discuss AI.

SEPTEMBER 2017

MANAGING YOURSELF

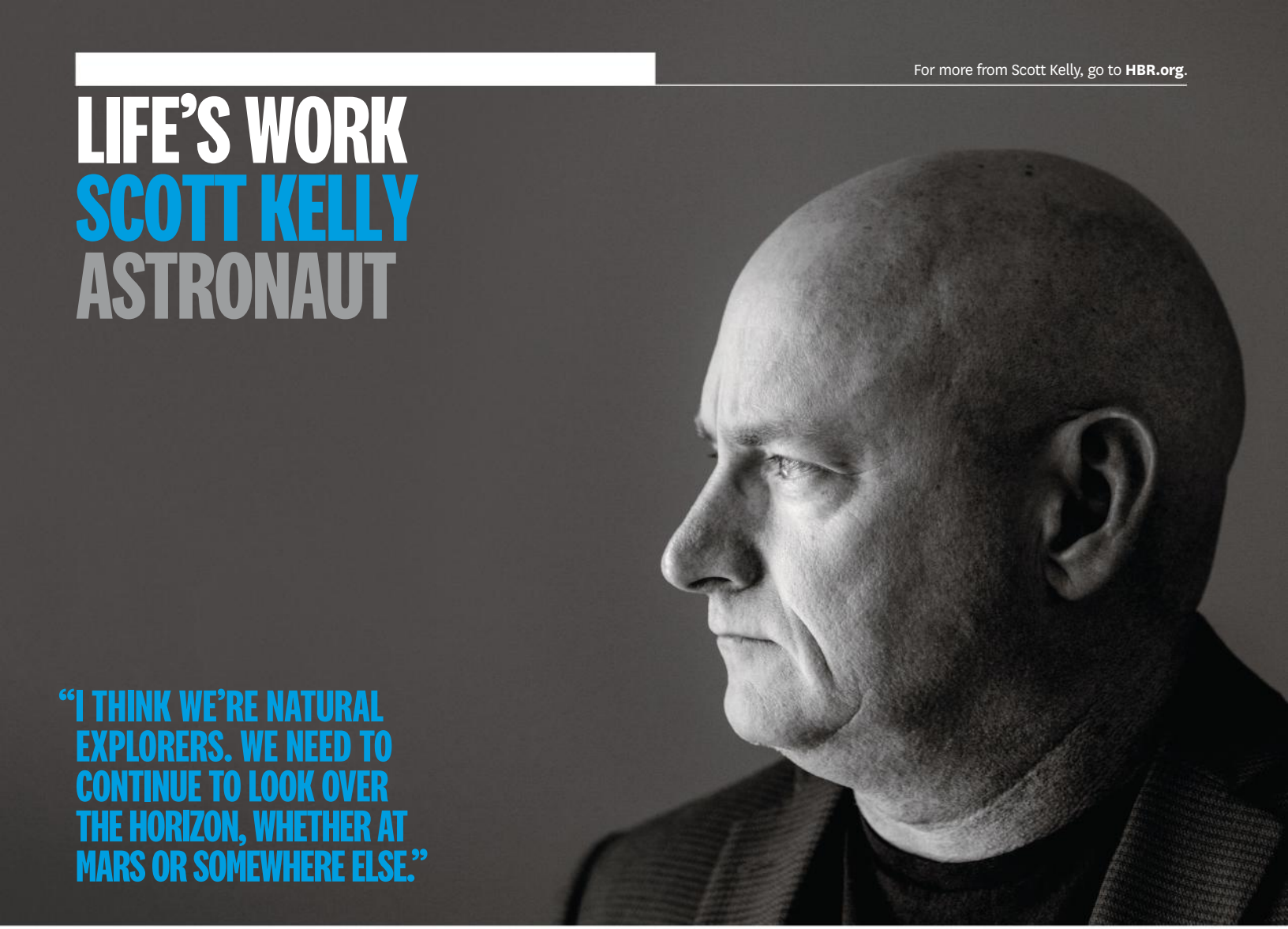
CONNECTING AT WORK

Vivek H. Murthy

MURTHY, the 19th U.S. surgeon general and a tech entrepreneur, argues that cultivating emotional well-being at work can lessen people's loneliness and improve business. Leading researchers and executives contribute to an interactive conversation about us, our jobs, and our health.

For more from Scott Kelly, go to **HBR.org**.

LIFE'S WORK SCOTT KELLY ASTRONAUT



"I THINK WE'RE NATURAL EXPLORERS. WE NEED TO CONTINUE TO LOOK OVER THE HORIZON, WHETHER AT MARS OR SOMEWHERE ELSE."

During his 20 years as a NASA astronaut, Scott Kelly ventured into space four times, capping his career with a yearlong stay on the International Space Station, during which he served a stint as commander. His memoir, *Endurance,* is out now. Interviewed by JM Olejarz

HBR: When you're up in space, does it feel like a job?
KELLY: Yes. When you wake up, you're at work, and when you go to sleep, you're still at work. You're living in your office. It's magical in some ways. But it's still work.

You've been in leadership roles throughout your career. How has your style changed over time?
I'd say my style is based on the situation. If there's a fire on the Space Station, I'm like a tyrant—I tell people what to do, and I don't want questions. But sometimes I'm more collaborative—getting the opinions of the group and then making a decision. Determining what to use in what situation—that's the skill.

How do you build relationships with foreign astronauts, especially when the politics are fraught?
That's one of the great things about the program. You draw on the strengths of people with different backgrounds. There's potential for conflict and challenges, particularly with the Russians, who we're not always the friendliest with. But in space we set all that aside, because we rely on those cosmonauts, and they rely on us. You can work together for something you both believe in. Space is a great place to do that, because it's common ground where peaceful collaboration can occur.

How do you handle stress and avoid burnout?
Exercise and having a sounding board at home help. For me, it also depends on what the stress is from. If ground control is asking me to do something I feel doesn't make sense, I'll say, "Hey, we can do this better—or maybe we shouldn't be doing this at all." But sometimes, so long as it's not a safety issue, you just have to go with the flow. On the Space Station, I recognized that I can put focus and energy on the stuff that needs to get done and not care about the stuff that doesn't matter. A lot of my colleagues don't have that same capability. They have this type A personality that has to do everything perfectly all the time. You can't do that for a year in space.

So few people are chosen to be astronauts. How can you work toward a goal you might never achieve?
You need to recognize that these are real jobs, and people do get them. Even though the odds are against you, they're just as much against everybody else, so just keep plugging away. I knew that I wanted to do this, but also that I might never have the chance. And I would have been content with continuing my navy career. It's important to choose a field because it interests you, not because it's going to help you become an astronaut.

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Bank of America	BAC	7.89%
Wells Fargo	WFC	7.63%
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Goldman Sachs	GS	2.72%
US Bancorp	USB	2.70%
Chubb Limited	CB	2.19%
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Morgan Stanley	MS	2.15%

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