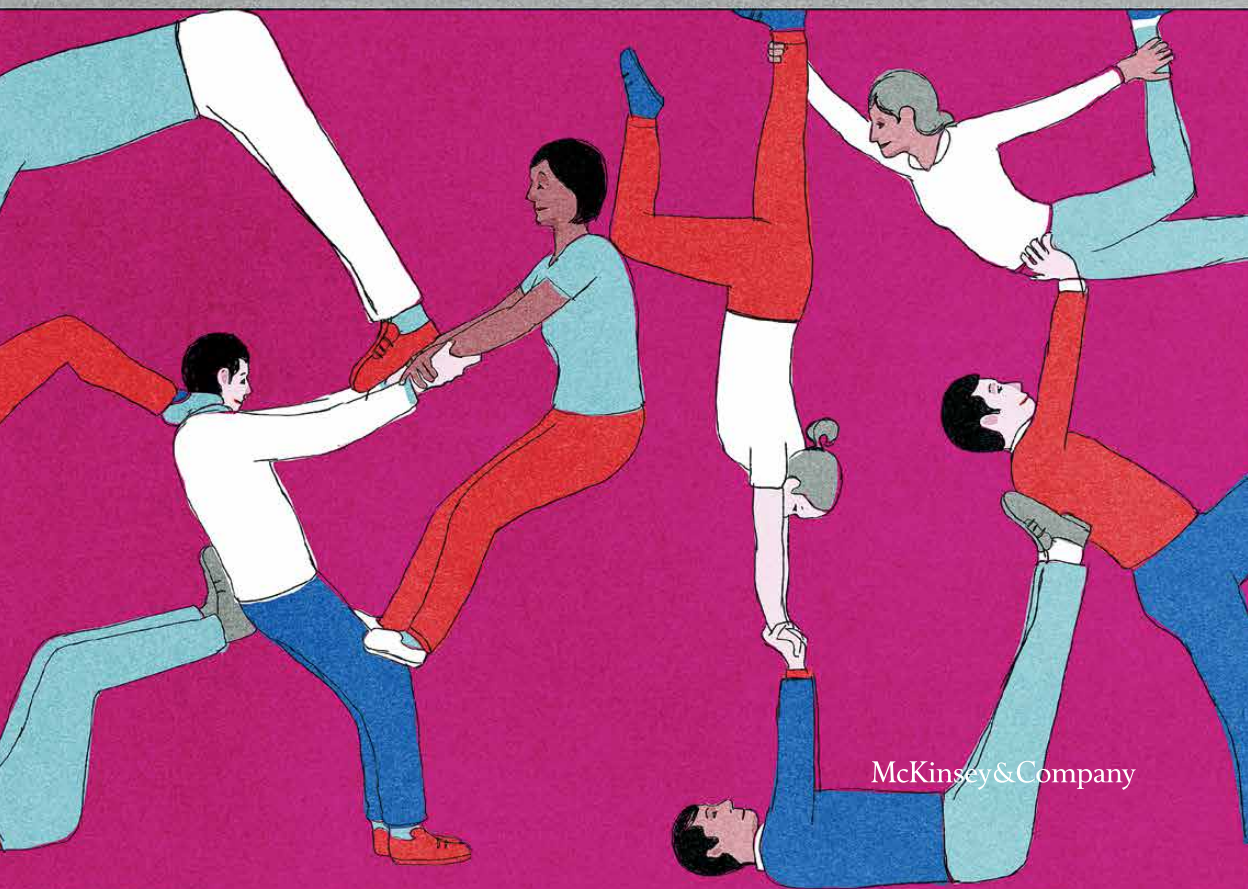
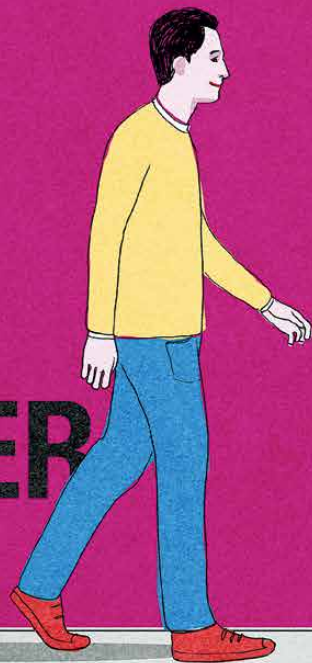


McKinsey Quarterly

ELEVATING THE CUSTOMER EXPERIENCE



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THIS QUARTER


It's probably not a stretch to say that top executives are some of the busiest people on the planet, and that time is their most precious resource. This issue of the *Quarterly* addresses the scarcity of time from two perspectives: that of the customers those leaders are trying to serve, and that of the executives themselves as readers.

Let's start with the customer. Time is of the essence in the digital age, as we've all experienced when using Amazon's quick-and-easy one-click purchasing and similar innovations from other digital pacesetters. As companies refashion their interactions with customers, fewer people will listen patiently to canned assurances that "your call is important to us." Customer experiences with Apple or Amazon or Uber are the new standard. Users have grown to expect best-in-class experiences from all their online and mobile interactions—and demand the same in offline ones.

Earlier this year, McKinsey's Marketing and Sales and Service Operations Practices published a collection of articles for leaders seeking to deliver state-of-the-art customer experiences. What we've done in this issue of the *Quarterly* is to offer time-starved senior executives a synthesis of the key ideas in that compendium: the central role played by customer journeys, rather than touchpoints, in aligning the organization to deliver great customer experiences; the fundamentals of customer interaction; and the steps necessary to redesign companies in a more customer-centric fashion.

My colleagues at the *Quarterly* call this synthesis a “CEO guide,” and they’ve designed it to make the attention you give to the *Quarterly* more productive. This new approach synthesizes multiple sources to make quick sense of complex issues. A glance at the opening infographic will give you the essence of the piece in about two minutes. Or you can read the whole thing in about ten. In the online version of the guide on mckinsey.com, you can dive in more deeply by following links into the source material underlying each section. Or download the full compendium of longer articles, *Customer experience: Creating value through transforming customer journeys*.

The CEO guide format reflects changes in the reading experience that we all recognize. While text-based articles, sometimes lengthy ones, remain at the center of how readers consume content, today’s digital environment makes it easy to offer new entry and exit ramps into and out of those articles—novel ways to get the gist of what’s on offer prior to reading the whole thing, and straightforward opportunities for further exploration and discovery.

This issue also includes articles, both shorter and longer, on a range of significant topics, including an incumbent’s guide to digital disruption, a data-driven look at how new CEOs can boost their odds of success, and a report on the way data analytics helps companies identify, recruit, and reward top personnel. By presenting the best McKinsey has to offer, this edition of the *Quarterly*, along with its accompanying digital elements, is designed to help focus your scarce attention where it matters most. 



Ewan Duncan
Senior partner, Seattle office
McKinsey & Company

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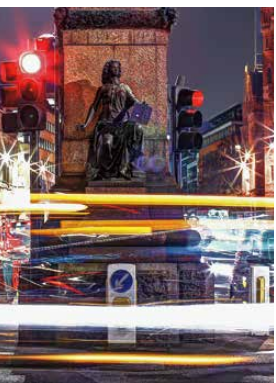
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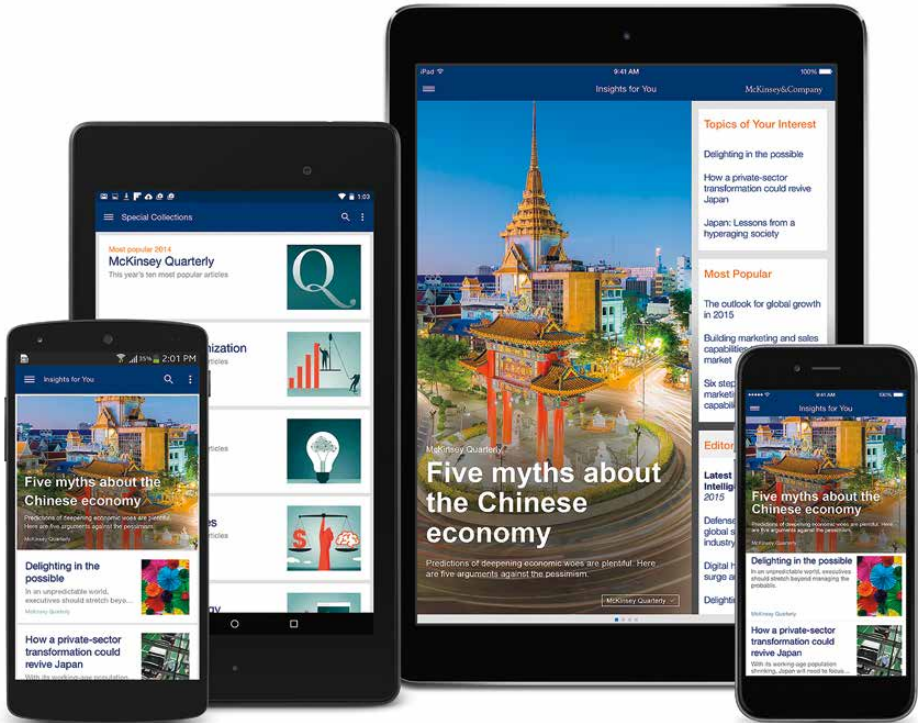
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THE EVOLUTION OF SOCIAL TECHNOLOGIES

Leading companies have passed through three distinct phases of organizational usage. What should we learn from them?

by Martin Harrysson, Detlef Schoder, and Asin Tavakoli

Since the dawn of the social-technology era, executives have recognized the potential of blogs, wikis, and social networks to strengthen lines of company communication and collaboration, and to invigorate knowledge sharing. Many leaders have understood that by harnessing the creativity and capabilities of internal and external stakeholders, they can boost organizational effectiveness and potentially improve strategic direction setting. But they have also found that spreading the use of these new technologies across the organization requires time to overcome cultural resistance and to absorb the lessons of early successes and failures. Social technologies, after all, raise new sensitivities, seeking to breach organizational walls and instill more collaborative mind-sets.

McKinsey's long-running research into enterprise use of social technologies provides a unique vantage point for examining the nature and pace of this evolution. Surveys of more than 2,700 global executives over each of the last ten years have probed technology diffusion within organizations and the patterns of technology adoption.¹

Our review of survey data spanning the years 2005 to 2015 suggests three distinct, progressively more sophisticated phases of usage. Companies in our sample began with trial-and-error applications—for example, using social platforms such as YouTube to expand their marketing mix to attract younger consumers. They then switched their focus to fostering collaboration. Most recently, some have deployed social

technologies to catalyze the cocreation of strategy. Across this spectrum, we also found that companies shifted the mix of technologies and expanded the terrain of application.

Climbing the learning curve

Exhibit 1 tracks how companies' choice of social tools, the boundaries of their

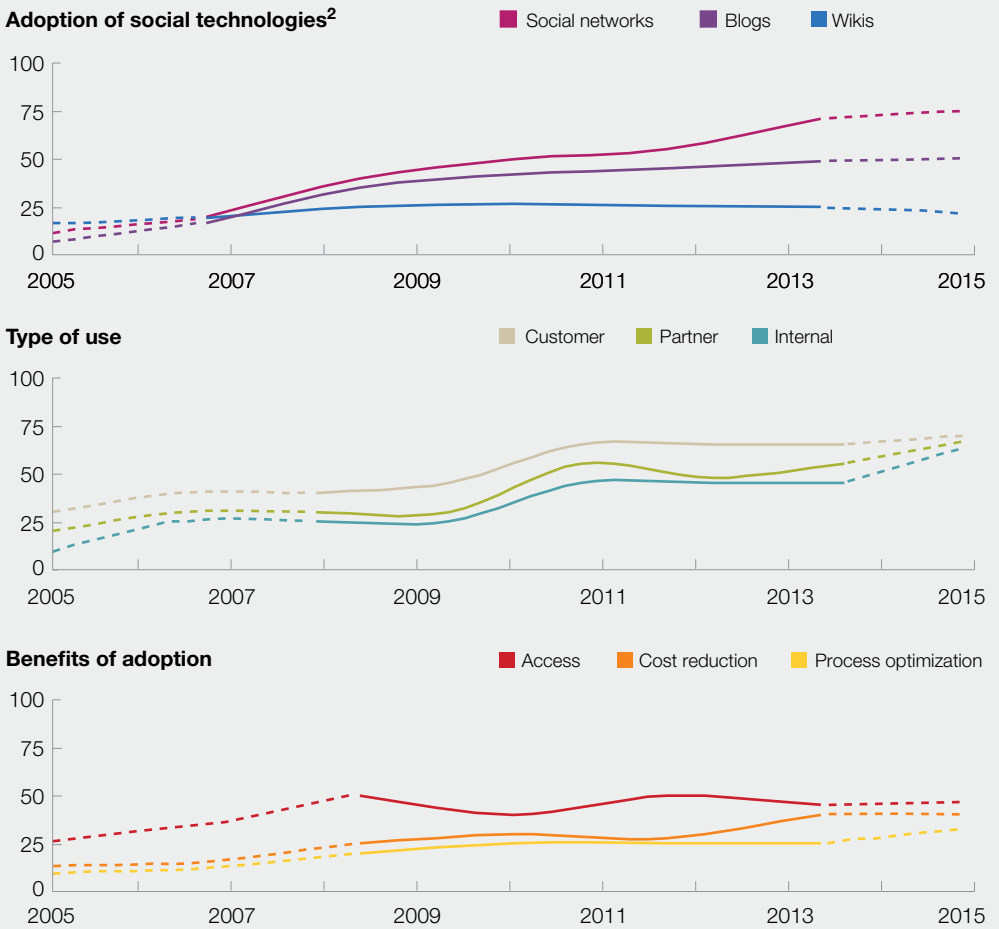
usage, and the benefits of applying them have evolved over the period. We found that overall adoption is plateauing. (McKinsey's Jacques Bughin, using this longitudinal data, described a similar pattern for "Enterprise 2.0" tools in a 2015 *Quarterly* article.²)

Social-networking sites (such as Facebook and LinkedIn) and microblogging platforms

Exhibit 1

Companies' approaches to social technologies have evolved over time.

% of respondents, dashed values estimated¹



¹ Estimates derived from those respondents who answered questions about future and prior use of social technologies; not all respondents did so.

² Net adoption adjusted for technology churn

Source: McKinsey Enterprise 2.0 surveys of 2,750 global executives over each year from 2005 to 2015

(such as Twitter and Yammer) remain the tools of choice in the pursuit of broad communication and collaboration. After an initial spate of enthusiasm, the adoption of blogging as a leadership-messaging tool leveled off. Wikis have had less impact historically, and their use has stalled. We also found clear evidence that social networks have expanded and become better integrated, with companies first moving to interact with customers, then creating networks linking both employees and outside stakeholders.

Finally, we observed benefits from adoption. The most widespread was greater access to knowledge and to experts within and outside the enterprise. More recently, companies have achieved cost reductions—for example, through more efficient internal communications and the use of video and knowledge-sharing platforms to engage with customers remotely rather than traveling to see them. The multiplication of knowledge channels drove process improvements such as faster time to market and improved product and service quality.

Three stages of enterprise usage

As these technology choices and capabilities evolved, we found that they defined three periods of usage. This evolution is dynamic, with some companies at the leading edge and others catching up (Exhibit 2).

Tryouts

Beginning in the mid-2000s, companies began testing social technologies within business units and within

functions such as marketing to improve critical functional tasks. Marketers used Facebook or YouTube to acquire new customers or for interactions with existing customers, for example, to build relationships with social influencers.

Collaboration and knowledge work

Our data show that starting around 2010, a more collaborative approach emerged, with advanced companies adopting internal platforms such as Chatter, Connections, and Yammer to connect employees. Two-thirds to three-quarters of respondents during this middle stage said they were using social technologies to foster more collaboration, gather insights, or manage knowledge systematically. For example, companies searched pools of knowledge and talent across the organization to assemble project teams with relevant expertise.

Strategic insights

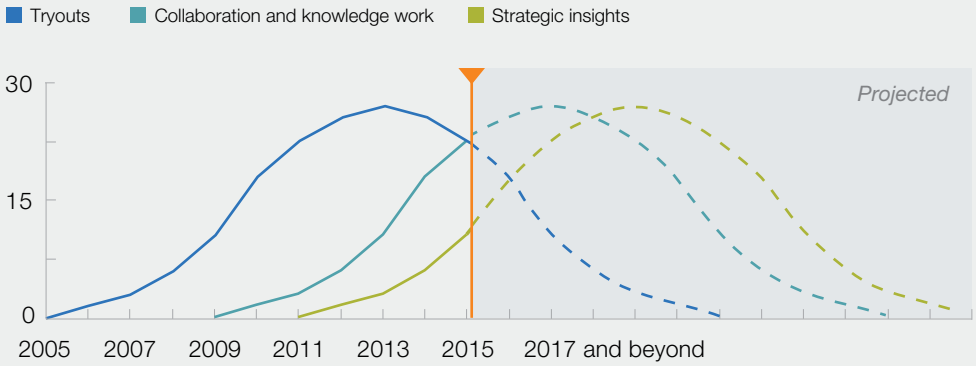
In the most recent evolutionary phase, social technologies have been supporting and shaping strategy, opening up to wider participation and scrutiny in an area that has long been considered the preserve of an organizational elite.³ Technology usage has matured at many companies that have forged internal and external networks, encouraging a range of stakeholders to participate in strategy development.

As part of this broadening base of participation, companies are encouraging enterprise crowdsourcing—systematically looking both inside and outside the organization for innovative new ideas for problem solving and augmenting products and services. LEGO is one

Exhibit 2

The evolution of organizational approaches to social technologies appears to be moving through three phases of usage.

Patterns of social-technology usage, % growth rate by pattern, dashed values estimated¹



Rising strategic value	2008–10	2011–13	2014–16
% of organizations using social tools for strategy development	20	25	30
% of organizations making decisions and setting strategic priorities from bottom up	16	18	25
Top 3 appropriated technologies for developing strategy	Prediction markets Video sharing Blogs	Prediction markets Collaborative document editing Social networks	Social networks Wikis Video sharing

¹ Curves in graph are based on tool usage sorted by purposes/benefits and reflect a normal distribution; projected values are based on responses to operational/tactical usage and insights from other new-technology adoption curves.

Source: McKinsey Enterprise 2.0 surveys of 2,750 global executives over each year from 2005 to 2015

well-known example of a company that has embedded crowdsourcing into its innovation processes, and it is far from an outlier. More than half of the surveyed organizations see further blurring of boundaries among employees, vendors, and customers as social technologies create new processes for marshalling ideas.


While this openness to crowdsourcing on an operational level is becoming more common, greater inclusiveness and transparency on a strategic level

has emerged only lately. Nearly half of respondents in recent surveys said they were using social technologies to develop competitive intelligence, while a quarter said they were using the tools to develop strategy or marketing plans. Thirty-seven percent said they were using social technology to cocreate and share the organization's mission and vision in some manner.

Daimler's Business Innovation Community (BIC), launched in 2008, is an example of an open strategy initiative

enabled by social technology. Charged with developing new business models in a transparent, inclusive way, BIC set out to identify new growth areas beyond car manufacturing. Some 30,000 registered practitioners have posted 2,000 ideas in BIC's digital space. After several successful pilot projects and spin-offs, such as new mobility concepts (for example, car sharing and end-to-end journey management) powered by mobile apps, Daimler now is planning a follow-up to the initiative.

Companies in our study that have tried to set strategic priorities from the bottom up report a flattening of management hierarchies and in some cases deeper employee involvement through allocation of resources using social-voting mechanisms. Forty-seven percent of executives said that such democratization of strategy would intensify over the next three to five years.⁴

Many companies are climbing the ladder in their use of social technologies. Continuing the expansion of their strategic role will open more pathways, allowing executives to tap new sources of creativity. It also will require a deeper understanding of the risks and unexpected outcomes that are part of a more porous and inclusive strategy-setting environment. We hope this ten-year perspective offers leaders who may feel behind the curve a view of what to expect on the way up. 

¹ We surveyed, on average, 2,750 global executives over the period 2005–15. We asked them about the social-media technologies they had adopted, how they were used within the organization, and the benefits they derived from their usage. Respondents represented a wide range of industries. To see the complete set of findings, read Jacques Bughin, “Reaping the benefits of big data in telecom,” Technology, Media, and Telecommunications working paper, forthcoming at the *Journal of Big Data*.

² Jacques Bughin, “Taking the measure of the networked enterprise,” *McKinsey Quarterly*, October 2015, McKinsey.com.

³ Daniel Schlagwein, Detlef Schoder, and Asin Tavakoli, *Open strategy: Consolidated definition and processual conceptualization*, 2015 International Conference on Information Systems, December 13, 2015, aisel.aisnet.org.

⁴ For additional ways companies are deploying social technologies strategically, see Arne Gast and Michele Zanini, “The social side of strategy,” *McKinsey Quarterly*, May 2012, McKinsey.com; and Arne Gast and Raul Lansink, “Digital hives: Creating a surge around change,” *McKinsey Quarterly*, April 2015, McKinsey.com.

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MAXIMIZING THE VALUE OF G&A

Reductions in general and administrative expenses flow right to the bottom line, but slash the wrong areas and you'll get burned. We suggest a more strategic approach.

by Robert Levin and Allison Watson

If there has ever been an earnings presentation where a CEO was asked why general and administrative (G&A) expenses were too low, we have yet to see it. On the contrary, it's practically a truism that reducing the cost of support functions will improve profitability and let management put the savings to more productive use—or return at least a portion of the savings to shareholders.

New McKinsey research suggests that while those cost-reduction opportunities are real, they don't all pack the same punch. Scale back too aggressively, in the wrong areas, and you may wind up sacrificing long-term value for short-term earnings. Increasingly, G&A functions (such as IT, HR, and finance) house some of an organization's most important work, including enabling digital innovation, finding and developing key talent, and allocating scarce resources. These and other missions are becoming ever more critical in our increasingly cross-border and digitally connected world.

The cost gap

Different industries are marked by different value chains and competitive landscapes. Within an industry, companies tend to allocate a similar percentage of revenues to G&A. Similar,

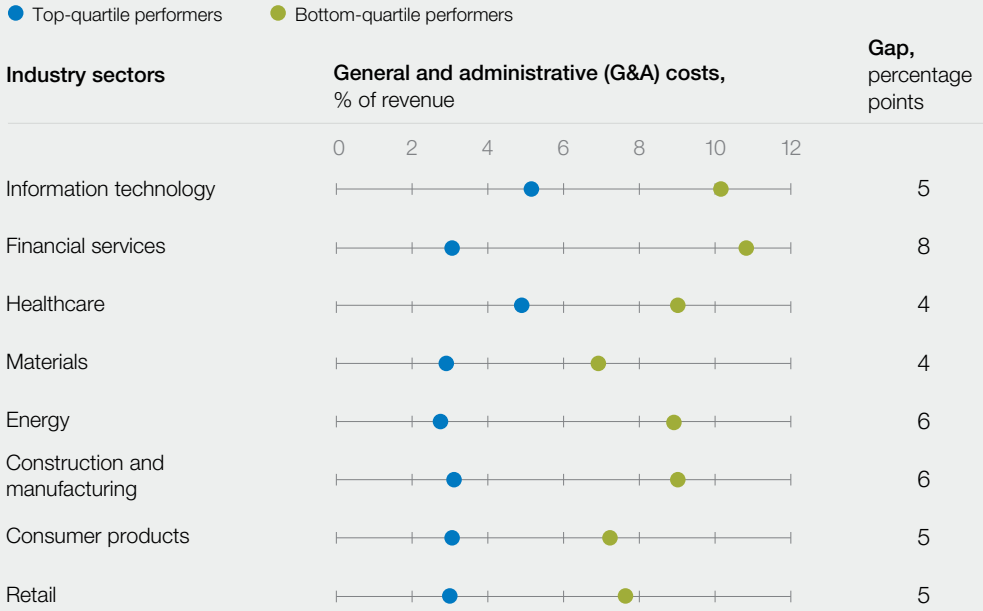
however, does not mean identical. Even within the same industries, we find measurable gaps in G&A spending among competitors—as much as 4 to 8 percent of revenues (Exhibit 1). Those big gaps, if closed, can make a meaningful difference in corporate performance. In our experience, successful programs to increase the efficiency of support functions can raise earnings before interest, taxes, depreciation, and amortization (EBITDA) by three percentage points, which can translate into a 25 percent or higher increase in valuation.

The value gap

Costs aren't the only area with big differences in G&A performance. Our research also suggests that there is a meaningful gap among companies in the share of support-function activities that can be categorized as transactional, on the one hand, versus value added, on the other. This distinction is easiest to understand in the context of specific support functions. In human resources, for example, value-added activities include recruiting, learning and development, organizational development, and compensation planning. Transactional activities, by contrast, include the tracking of hours

Exhibit 1

Across industries, top performers spend a significantly lower share of revenues on G&A support.



Source: Capital IQ; S&P Global 1200 Index

worked and days missed, the administration of benefits, and safety and health. A similar bifurcated categorization for finance activities would put the management of accounts receivable and payable in the transactional bucket, while financial planning and analysis would be in the value-added one.

We measured the amount of time the HR and finance functions spent on transactional versus value-added activities at 16 of the largest global financial-services companies and 8 of the largest global consumer companies. This analysis revealed striking differences across different companies—a value gap, if you will (Exhibit 2). The gap even appears to correlate

with differences in profitability and total returns to shareholders. However, we hesitate to place too much emphasis on those correlations, since they could reflect a variety of factors beyond G&A. The value gap is understandable when you consider the strong performance impact of value-added efforts—for example, analyzing new markets or products—compared with the effects of more transactional initiatives, such as programs to realize modest improvements in days payable.

Virtuous cycle or complexity cliff?

Differentiating between high-value and transactional activities is one key to mastering a classic challenge in G&A:

how to develop needed capabilities without letting costs creep out of control. Our research suggests that only about one in ten companies simultaneously performs exceptionally well on revenue growth and G&A efficiency over a sustained period of at least five years. However, we don't see any indication that decreasing G&A expenses will limit a company's revenue growth—at least for companies that approach the cost reductions in the right way. In fact, these high achievers enjoy a virtuous cycle: transactional activities stay on a tight leash, freeing up investment for more meaningful, value-adding drivers, such as marketing, research, and product development.

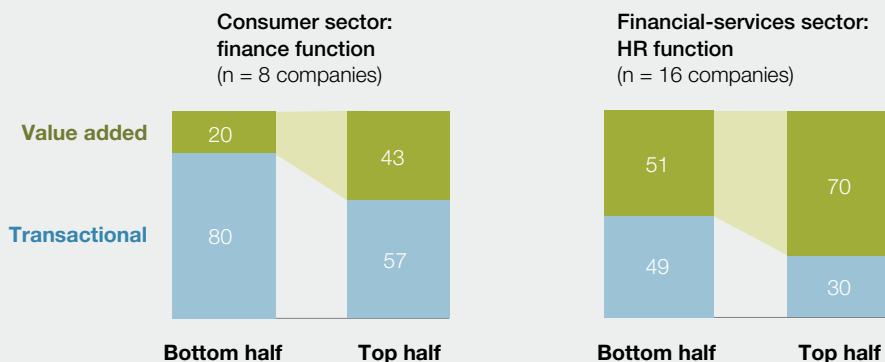
But more commonly, costs and complexity rise as support functions

expand across numerous business lines or geographic markets. Our research suggests that complex structures and processes are the primary contributors to G&A costs (Exhibit 3): that is, the number of business units in a company can contribute significantly to such costs, and the number of regions where a company operates can contribute, as well. Coping with such costs—both to ensure that G&A functions achieve their strategic mission and to avoid performance-dampening cost creep—is a formidable challenge. It's critically important for companies to institute a common philosophy for allocating resources to value-added (as opposed to transactional) activities. While every organization is unique, companies that adhere to this approach, no matter how many business lines they have or

Exhibit 2

Companies differ widely in the amount of time they allocate to value-adding activities as opposed to transactional ones.

Average time spent on G&A activities,¹ %

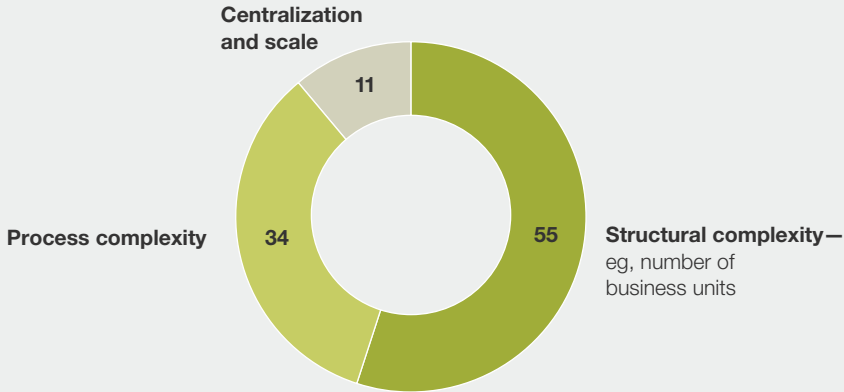


¹ G&A = general and administrative. Example drawn from 3-year analysis of 8 major consumer and 16 major financial-services companies ranked into 2 groups, based on the amount of time full-time equivalent (FTE) workers (both internal and outsourced) spent on various transactional and value-added G&A activities.

Exhibit 3

Structural and process complexity are the biggest contributors to administrative-support costs.

% of costs driven by each factor (regression analysis)



how many markets they compete in, can still capture benefits of scale.

Applying strategy to support

The implications of this research are consistent with our experience: effective G&A management has no one-size-fits-all solution, cutting costs across the board may mean underinvesting in critical capabilities, and the starting point of any G&A-improvement effort should be to bring a strategic mind-set to the back office. This typically involves focusing attention on where allocated resources will have the greatest impact given the state of a company’s business and the lay of its competitive landscape.

For example, a major European insurer we know dramatically reduced its costs without sacrificing its responsiveness to consumers. After meticulously identifying the key drivers in the finance

and risk functions, it separated transactional activities, business support, and expert roles. The company also made investments to strengthen its value-adding initiatives, such as exchange-to-exchange (E2E) operations, while managing many of its other functions for cost. As a result, it not only slashed its full-time-equivalent (FTE) expenses by 26 percent but also saw its customer-satisfaction score surge from 24 percent in 2010 to 71 percent in 2014, with many of the efforts bearing fruit in the first 18 months of the program. Meanwhile, the company’s Organizational Health Index score rose by 10 percent.¹

Similarly, a global logistics company willing to allocate significant resources to IT sought to revolutionize its responsiveness to customers by making digital investments (for example, to improve its tracking of performance, in real time) and by highlighting problems

on large screens in major operations centers. But IT wasn't the only priority. The company also recognized that it had major people challenges, such as helping its employees become more engaged with their work—which would, among other benefits, improve customer satisfaction—and developing new approaches to recruiting, which would make the company more of a magnet for leading-edge digital talent. By investing aggressively in these areas over several years, while adopting more standardized tools and processes for the transactional elements of the IT and HR functions, the company reduced the number of customer complaints by 25 to 30 percent and raised customer satisfaction by nearly 50 percent—to the top quartile of the industry. What's more, costs fell dramatically.

In each of these cases, it was essential to manage G&A in ways that not only minimized expense creep and complexity but also drilled down to find largely hidden cost drivers and solutions. Relentless commitment works best at the grass roots when the messaging begins from the top. Thus, when a leading European energy company sought to simplify 30 core processes aggressively, it made a point of demonstrating that it had no sacred cows: the corporate center set the precedent, shedding 40 percent of its staff within six months. Remarkably, this move had little or no impact on employee-retention rates, even as the company proceeded to cut more than 20 percent of its multibillion euro expense base.

That level of savings obviously has an impact. Unfortunately, companies too often delay a rigorous approach to managing G&A expenses until their businesses are seriously underperforming and a round of “slash and burn” cost cutting seems inevitable. This reactive approach, we submit, is a missed opportunity. Instead, companies should get in front of decision making about their support functions and establish a clear point of view about which value-adding activities should be great and which merely good enough. Meanwhile, they should standardize and simplify their transactional activities aggressively.

Those are often some of the hardest calls a leader has to make. But the outsized consequences of managing G&A effectively merit the C-suite's attention. Back office or not, the results may well command the spotlight during earnings presentations and beyond. [Q](#)

¹ McKinsey's Organizational Health Index (OHI) measures an organization's performance across 37 different management practices, looking at how behaviors, actions, and processes contribute to nine dimensions of organizational health.

Robert Levin is a partner in McKinsey's Boston office, and **Allison Watson** is a senior expert in the Los Angeles office.

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R&D READINESS

Leaders are struggling to stay ahead of the major trends reshaping the R&D landscape, according to a recent survey.

by Elia Berteletti, Thomas Morel, and Marc Teulieres

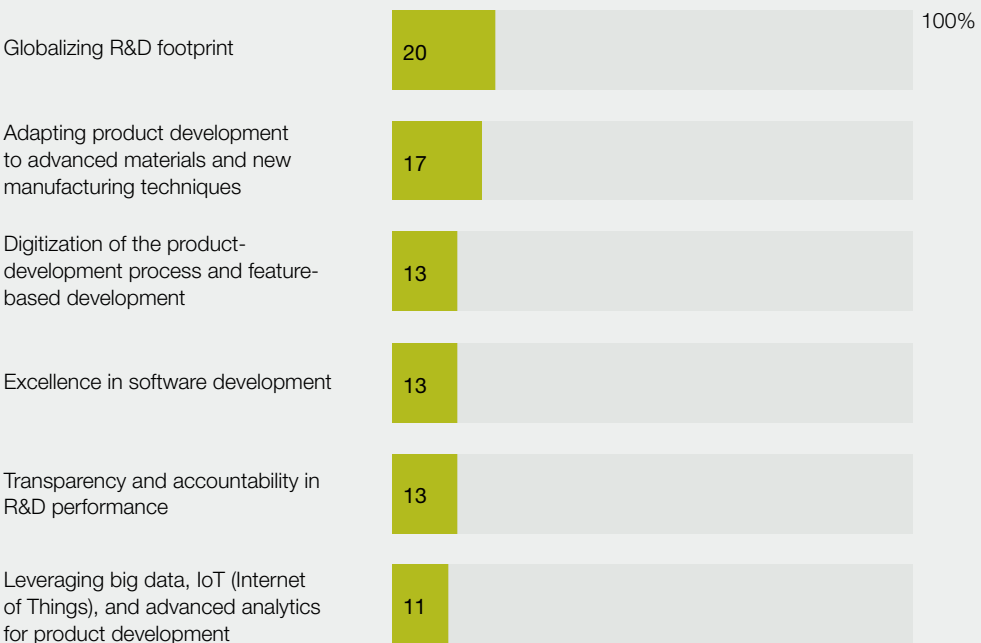
The changes confronting R&D leaders are significant: data flooding in from customers, devices, and sensors, combined with powerful analytical tools, are creating new sources of insight to fuel the development of products and services. New materials and breakthrough manufacturing techniques may vastly change the economics of many offerings. And unexpected pockets of knowledge and expertise are sprouting around the world.

Against this backdrop, we surveyed 200 executives, managers, and experts from top R&D organizations across regions in six industries. One-fifth or fewer of our respondents reported that their companies were ahead of the curve in implementing technology and building capabilities for six emerging R&D trends in areas ranging from data analytics to advanced software development (Exhibit 1).¹ The middle managers responsible for frontline

Exhibit 1

For each of the six individual trends, readiness was low.

% of respondents perceiving their companies as being ahead of the curve



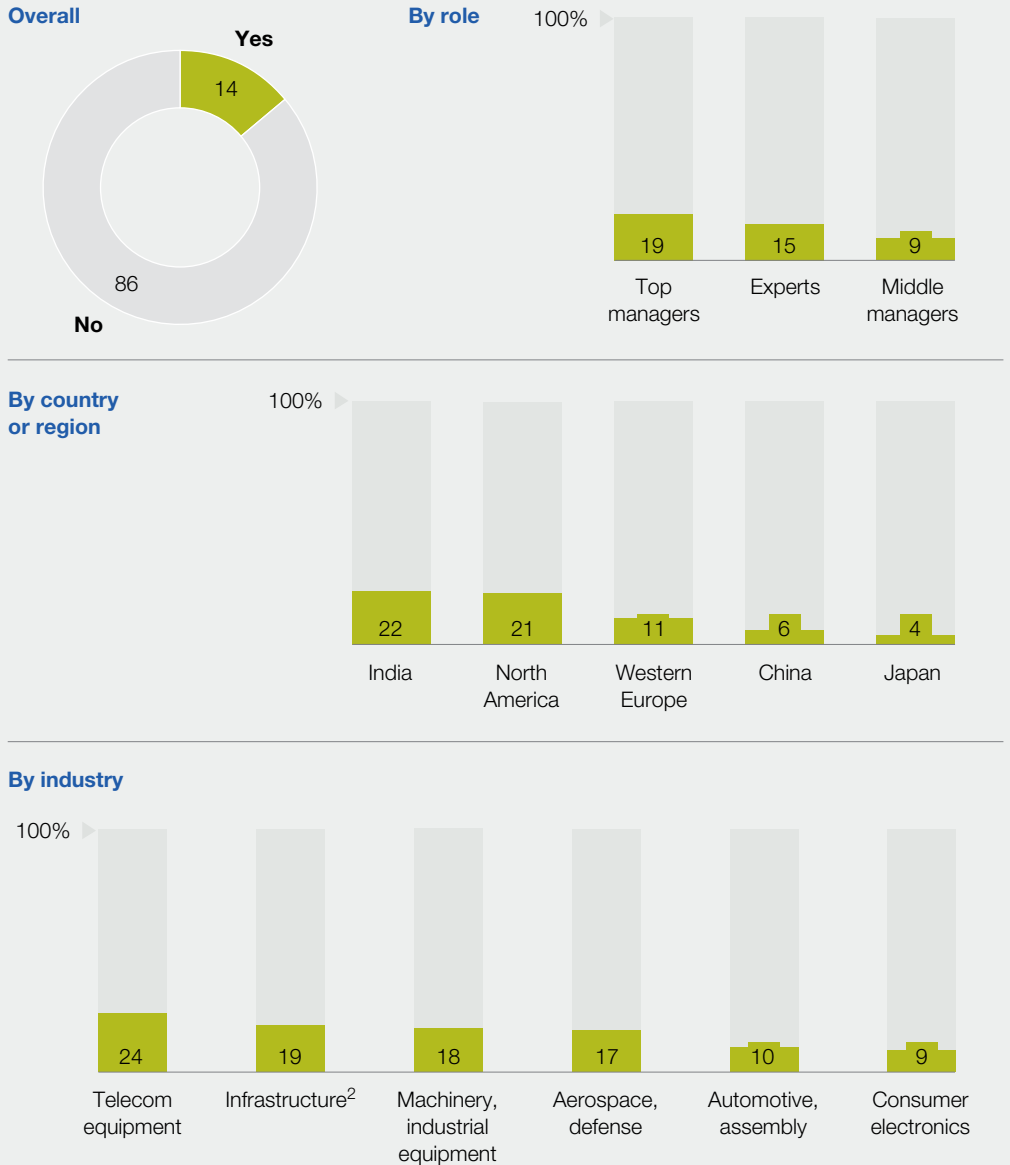
Source: 2016 McKinsey global R&D of the future survey

Exhibit 2

One-fifth or fewer of respondents reported their companies were ahead of the curve in six emerging R&D trends.

Is your company ahead of the curve in meeting the challenges of six emerging R&D trends?

% of respondents¹




¹ Pool of 200 respondents from top R&D organizations across regions and six industries.

² Includes civil engineering, construction, and megaprojects.

Source: 2016 McKinsey global R&D of the future survey

execution registered the lowest levels of confidence about the readiness of their organizations—9 percent, versus 19 percent for top managers. Regions varied, too: respondents in India and North America reported the highest levels of preparedness, and those in China and Japan the lowest. Industries differed, as well: respondents from companies that make telecom equipment reported higher readiness scores than the others did (Exhibit 2).

Finally, differences in perceptions seemed correlated with management practices, particularly for data analytics. Data from customer interactions, social-media feedback, and, increasingly, the Internet of Things (IoT) are the grist for analytics tools that guide the development and design of products, reduce complexity, and, ultimately, boost value. Overall, we found that these technologies are still at low levels of maturity—respondents from only 16 percent of the R&D organizations said they had adopted them widely. The companies of respondents who reported the highest levels of preparedness in

this area were much more likely than the rest to have designated a chief digital officer and forged external partnerships to gain new capabilities. They were also more likely to have focused attention and money on data and IoT strategies and hunted for new talent. It's too early to tell, of course, whether these investments, partnerships, and leadership roles will fully deliver on their potential. 

¹ The survey spanned 150 questions. We also asked respondents about the R&D-related business practices their organizations had adopted for each of the trends.

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WINNING THE RUSH FOR DATA SERVICES IN THE MIDDLE EAST AND AFRICA

Demand for data is set to explode. The region's telecom companies must position themselves now to take advantage.

by Daniel Boniecki and Chiara Marcati

Most new industries reach the same crossroads after a period of rapid growth. On one side lie territories where revenues, customers, and even margins will probably continue their dizzy upward path; on the other, maturing markets where it's starting to become clear that the old model has run its course.

This crossroads is precisely the position reached by the Middle Eastern and African telecom sector, which has enjoyed a spectacular ten-year run but now faces an important turning point. The region, home to some of the world's largest telecom operators, boasts penetration growth and profitability far above global averages (exhibit), contributing nearly 20 percent of the industry's global economic-profit pool and supporting a mobile-broadband subscriber base of well over one billion. Smartphone penetration is set to exceed 50 percent before long.

New McKinsey research, however, suggests that the next chapter for telecommunications in the Middle East and Africa will be defined more by exploding demand for data than by a further expansion in the number of subscribers. Granted, the region's young, increasingly

urban, and social media-savvy population still offers scope for subscriber growth—in some markets, of 50 percent per annum over the next five years. But shareholder returns have been slowing of late, though from high levels: 9 percent annually in the postcrisis years from 2009 to 2014, against 14 percent annually from 2004 to 2007. That decline reflects the new competitive terrain across the region.

We've identified three telecom-market archetypes—growth, polarized, and mature markets—defined by GDP per capita and the penetration of mobile phones, fixed-line phones, and smartphones. Our analysis reveals dramatic differences between these groups of countries in macroeconomic context, urbanization, stages of market development, and, importantly, competitive dynamics and future growth opportunities. The growth markets are Africa's low-income countries such as Tanzania, which present the greatest remaining opportunities for increased penetration. The mature markets are the high-income countries of the Middle East, such as Kuwait and Saudi Arabia. The polarized markets—wealthier economies of Africa such as Egypt, Nigeria, and South Africa—include two distinct segments:

a more affluent metropolitan population (mature) and a lower-income rural one (developing).

Operators in mature markets will have no easy wins. Cash flows will be under pressure from stagnating revenues and a need for increased investment—trends already reflected in diminishing enthusiasm for telecom assets in the region. Across the board, the economic challenge is acute: for example, our research suggests that the region's operators must realize significant cost savings to stay competitive. There are, however, tangible opportunities not just to reduce costs but also to

boost revenues. By applying advanced analytics to the data they continually collect, for instance, telecom companies can dramatically improve their accuracy in predicting churn and, accordingly, reduce their capital expenditures as much as 30 percent.

On the revenue side, video appears to be the lowest-hanging fruit. The Middle East and Africa generate much less revenue from video consumption than other countries and regions do: \$5 to \$6 per capita compared with, for example, \$30 per capita in Brazil, China, India, and Russia. This gap results only partly from low incomes—even in the more

Exhibit

The Middle Eastern and African telecom sector boasts penetration growth and profitability far above global averages.

MEA¹ telecom has expanded at 12 times the pace of the industry as a whole ...

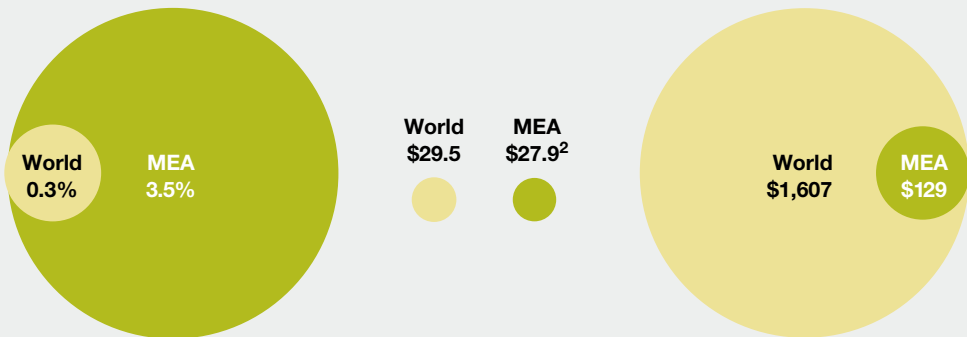
... generating \$27.9 billion in net growth ...

... and holding 8% of the global market in 2015.

Annual growth rate, 2008–15, %

Growth, 2008–15, \$ billion

Market size, 2015, \$ billion




¹ MEA = Middle Eastern and African.

² Excludes machine-to-machine revenue.

Source: Analysys Mason; McKinsey analysis

affluent countries of the Middle East and Africa, video's potential is still untapped. Operators that can crack the code on video and other "over the top" content should therefore enjoy rich rewards.

Consolidation and new types of partnerships are also likely. Historically, market share has been strongly correlated with margins, and scale has facilitated investment in essential infrastructure. In the data era, spectrum in attractive frequency blocks is a scarce asset that may give rise to consolidation (pending regulatory feasibility), asset sharing, or both.

As operators prioritize their opportunities, the need for continued digitization will be a constant. More digitized business models will help regional players to meet the high levels of customer satisfaction required in the data age and to reduce operating expenditures significantly. More specifically, the smart use of technology should help operators develop a digital ecosystem to propel demand for data services; invest in the core business of connectivity; adopt a segmented, targeted approach to customers; and foster innovative new customer relationships. While the exact details will differ by company, the broad contours of a more digital, data-driven business model will be important for all. 

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The authors would like to thank McKinsey's Middle Eastern and African telecommunications, media, and technology team, which developed the report on which this article is based.

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Download the full report on which this article is based, *Telecommunications industry at cliff's edge: Time for bold decisions*, on [McKinsey.com](https://www.mckinsey.com).

TELCOS: THE UNTAPPED PROMISE OF BIG DATA

The industry is awash in information, but only a few companies manage it effectively.

by Jacques Bughin

Now that subscribers constantly connect to their networks through voice, text, and other smartphone interactions, telecom companies have access to huge quantities of data. Yet relatively few of those that have adopted big data architectures and analytics technologies have pushed aggressively enough to profit from them significantly, our research suggests. Interestingly enough, however, a small group has achieved outsized benefits from such investments, in a performance pattern that resembles a “power curve” distribution.

We reached these conclusions after surveying executives from 273 global telecom companies representing nearly a quarter of industry revenues.¹ Nearly half of the respondents say that their companies are considering investments in big data and analytics, while 30 percent of companies surveyed have actually made them. To find out whether such efforts improved overall performance, we estimated big data’s contribution to earnings in two ways: by asking survey respondents and by conducting a statistical analysis that correlated the profits of companies with their capital and labor investment and their use of big data.

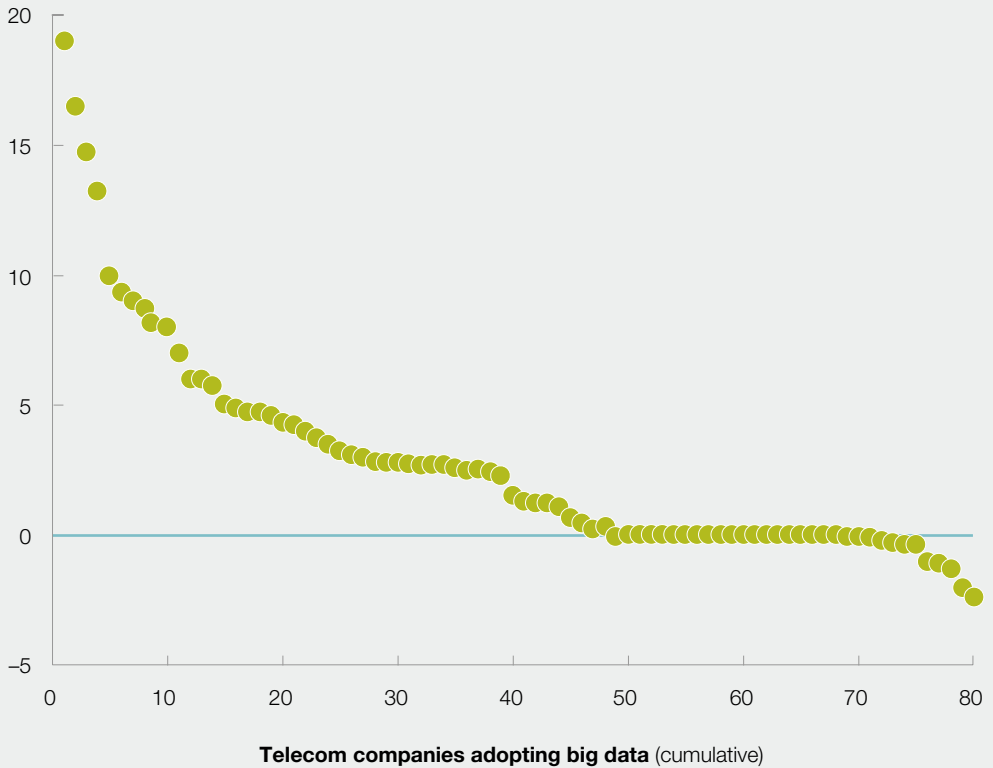
The first approach was possible for the 80 companies in our sample that reported making big data investments. The results of the other approach, using external data available for 47 of the companies, were similar.

When we plotted the performance figures for the 80 companies (exhibit), we found that in a few of them, big data had a sizable impact on profits, exceeding 10 percent. Many had incremental profits of 0 to 5 percent, and a few experienced negative returns. Most of the latter blame the poor quality of their data and a shortfall of talent for their inability to scale up big data activities. We also found that many organizations manage big data at a level too low to make it a strategic priority.


The potential for companies that apply data science effectively is substantial. One of them used analytics models to predict the periods of heaviest network usage arising from video streaming. It subsequently took targeted steps to relieve congestion during those times, reducing its planned capital expenditures by 15 percent. Another company had a machine-learning model that combined sociodemographic data, information

Among telecom companies that invested in big data, only a few enjoyed an incremental profit impact exceeding 10 percent.

Impact of big data on telecom companies' profits,
% of total profit



Source: 2015 McKinsey survey of 273 global telecom companies, 80 of which have made big data analytics investments.

from customer touchpoints (such as call centers and social media), and data on network usage. It was able to identify, in real time, the customers most likely to defect or have trouble paying their bills, as well as to cut churn by three percentage points and to improve the recovery of payments by 35 percent. To achieve similar results, other telecom companies could start by mapping out the wealth of data at their disposal and their opportunities to exploit it. 

¹ We asked the respondents about their investments (including those for IT and for hiring data-analytics talent) and returns for big data.

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IMPROVING SEMICONDUCTOR R&D


Using data-driven insights speeds up delivery time, helps change mind-sets, and allows companies to tackle more complex projects.

by Gaurav Batra, Zach Jacobson, and Nick Santhanam

R&D projects often miss their deadlines and exceed budgets. But by replacing instinct and guesswork with advanced analytics, companies should be able to better direct scarce resources, as well as speed up cycle times.

A case in point is the semiconductor industry, where we have found that some 80 percent of R&D projects need this kind of help. Our study of more than 2,000 integrated-circuit projects showed that companies often drastically underestimate staffing requirements and have to play catch-up later in the life of a project.¹

One company we know applied advanced analytics to 80 of the 209 projects in its R&D pipeline, statistically modeling their complexity to gain insights into optimizing staffing levels and speeding up completion across stages of the work. It found that by doing so, it significantly improved project delivery times over a five-year period. As the exhibit shows, the most dramatic result was achieved in year five, when schedule slippage dropped to near zero after management used the insights to change employee mind-sets. As the data on the right-hand side demonstrate, launching projects with more realistic schedules and

resources—the result of data-driven insights—also reduced overall project duration compared with past practice. The company found that projects with similar levels of complexity were completed up to 10 percent faster when using advanced analytics. And analytics made more complex projects possible. Of the projects that didn't use advanced analytics, none had more than about 3.5 complexity units.² 

¹ See Aaron Aboagy, Dorian Pyle, and Alexander Silbey, "By the numbers: R&D productivity in the semiconductor industry," *McKinsey on Semiconductors*, Autumn 2014, McKinsey.com.

² A complexity unit is a benchmark that accounts for the differing technical characteristics across projects.

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The authors wish to thank Aaron Aboagy, Eric Egleston, Taras Gorishnyy, Mithun Kamat, Eoin Leydon, Mark Patel, Dorian Pyle, and Bill Wiseman for their contributions to this article.

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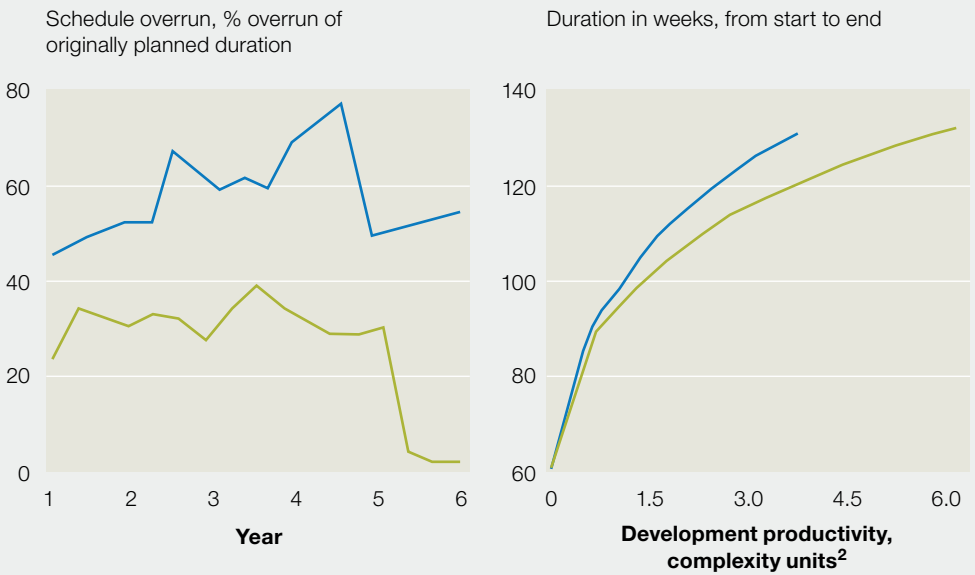


For more, see Gaurav Batra, Zach Jacobson, and Nick Santhanam, "Improving the semiconductor industry through advanced analytics," *McKinsey on Semiconductors*, Winter 2015, McKinsey.com.

Using advanced analytics in R&D decision making can lead to many improvements.

Integrated-circuit projects¹

— Did not use advanced analytics (n = 129)
 — Used advanced analytics (n = 80)



¹ All 209 projects were finished and released to volume production.

² A complexity unit is a benchmark that accounts for the differing technical characteristics across projects.

USING ANALYTICS TO TURBOCHARGE CHINA'S E-COMMERCE PERFORMANCE

Facing market saturation and more selective consumers, online retailers will need to make better use of data analytics to gain ground.

by Kevin Wei Wang

China's online retail market is the world's largest, and e-commerce now accounts for more than 13 percent of the country's total retail sales of consumer goods. In fact, the penetration of e-commerce has begun reaching saturation levels: in top-tier cities, roughly 90 percent of Internet users and 70 to 80 percent of consumers as a whole are shopping online (exhibit). As Chinese consumers enjoy the options and transparency available online, they also are becoming increasingly choosy—often visiting four to five sites before reaching a purchase decision, according to our research.

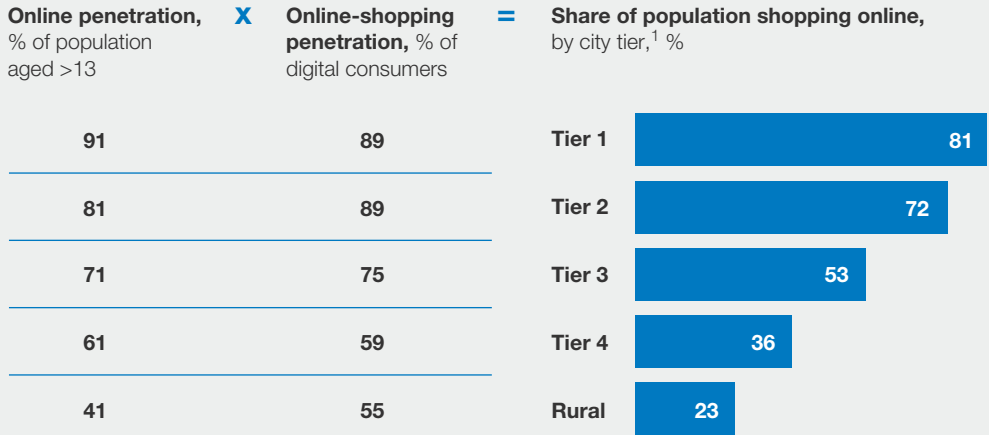
The implication is that grabbing e-commerce share will depend increasingly on coaxing customers to shop more frequently, to make larger purchases, and to buy from a broader array of online-shopping categories. E-commerce players have a fighting chance to do all this because they are sitting on an enormous volume of information. The growth of data on digital shoppers, product SKUs, price changes, promotional performance, and purchase habits has been exponential. This tidal wave of data is a strategic asset for

e-commerce players, and leaders have begun employing advanced analytics to up their game in at least three ways.

First, leading players are building models aimed at boosting retention rates and spending per customer. For example, e-commerce businesses can be far more effective in identifying “value leakage” points, such as losing too many customers after their first purchase or experiencing a deterioration in shopping frequency by customers with unhappy experiences. Insight comes from using data to scrutinize the way value migrates across the customer life cycle, which includes the conversion of new customers, first-time repeat-purchase behavior, and purchases that involve trading up or category expansion. In addition, the use of data to segment and identify customer cohorts at different life stages (such as young professionals, new mothers, or new-house decorators) helps leading e-commerce players target their offerings to stimulate consumption.

Second, leading players are starting to adopt analytics-backed pricing and promotional approaches. Some e-tailers

In China, e-commerce penetration in top-tier cities has begun to reach saturation levels.



¹ China's cities are categorized by tiers based on GDP; tiers 1 and 2 are more urban and developed, while the lowest tiers are more rural.

are even using machine learning to get a better read on price elasticity across their product lines and on the effectiveness of promotional activities. A one-percent price change on a key value item, such as a popular smartphone model, might greatly affect sales volumes. On the other hand, Chinese consumers (like many others) often are less sensitive to price differences for long-tail or unique items.

validation and rapid-response cycles bring the “analytics back room” much closer to business teams striving to keep up with China’s increasingly competitive e-commerce marketplace. 

Kevin Wei Wang is a senior partner in McKinsey’s Hong Kong office.

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Third, advanced-analytics systems are facilitating quick-cycle test-and-learn approaches. In some cutting-edge applications we have seen, e-commerce players have set up weekly test cycles to adjust prices (both upward and downward) or to launch targeted promotions on a select set of SKUs. Early results suggest a potential for 10 percent profit increases. A/B-testing

THE CEO GUIDE TO: CUSTOMER EXPERIENCE

Companies that create exceptional customer experiences can set themselves apart from their competitors.

What do my customers want? The savviest executives are asking this question more frequently than ever, and rightly so. Leading companies understand that they are in the customer-experience business, and understand that *how* an organization delivers for customers is beginning to be as important as *what* it delivers.

This CEO guide taps the expertise of McKinsey and other experts to explore the fundamentals of customer interaction, as well as the steps necessary to redesign the business in a more customer-centric fashion and organize it for optimal business outcomes. For a quick look at how to improve the customer experience, see the summary infographic on the opposite page.

Armed with advanced analytics, customer-experience leaders gain rapid insights to build customer loyalty, make employees happier, achieve revenue gains of 5 to 10 percent, and reduce costs by 15 to 25 percent within two or three years. But it takes patience and guts to train an organization to see the world through the customer's eyes, and to redesign functions to create value in a customer-centric way. The management task begins with considering the customer—not the organization—at the center of the exercise.

OBSERVE: UNDERSTAND THE INTERACTION THROUGH THE CUSTOMER'S EYES
Technology has handed customers unprecedented power to dictate the rules in purchasing goods and services. Three-quarters of them, research finds, expect “now” service within five minutes of making contact online. A similar share want a simple experience, use comparison apps when they shop, and put as much trust in online reviews as in personal recommendations. Increasingly, customers expect from all players the same kind of immediacy, personalization, and convenience that they receive from leading practitioners such as Google and Amazon.

Central to connecting better with customers is putting in place several building blocks of a comprehensive improvement in customer experience:

AT A GLANCE:

TO IMPROVE CUSTOMER EXPERIENCE, MOVE FROM TOUCHPOINTS TO JOURNEYS



OBSERVE

Customer journeys consist of a progression of touchpoints that together add up to the experience customers get when they interact with companies. Seeing the world as their customers do helps leading companies better organize and mobilize their employees around customer needs.

SHAPE

Designing the customer experience requires re-shaping interactions into different sequences and, though the effort may start small, soon entails digitizing processes, reorienting company cultures, and nimbly refining new approaches in the field.



PERFORM

Rewiring a company to provide leading customer experiences is a journey in itself, often taking two to four years and requiring high engagement from company leaders and frontline workers alike.

Identify and understand the customer's journey.

It means paying attention to the complete, end-to-end experience customers have with a company from their perspective. Too many companies focus on individual interaction touchpoints devoted to billing, onboarding, service calls, and the like. In contrast, a customer journey spans a progression of touchpoints, and has a clearly defined beginning and end.¹

The advantage of focusing on journeys is twofold.

First, even if employees execute well on individual touchpoint interactions, the overall experience can still disappoint (Exhibit 1). More important, McKinsey research finds that customer journeys are significantly more strongly correlated with business outcomes than are touchpoints. A recent McKinsey survey,² for example, indicates customer satisfaction with health insurance is 73 percent more likely when journeys work well than when only touchpoints do. Similarly, customers of hotels that get the journey right may be 61 percent more willing to recommend than customers of hotels that merely focus on touchpoints.

Quantify what matters to your customers.

Customers hold companies to high standards for product quality, service performance, and price. How can companies determine which of these factors are the most critical to the customer segments they serve? Which generate the highest economic value? In most companies, there are a handful of critical customer journeys. Understanding them, customer segment by customer segment, helps a business to maintain focus, have a positive impact on customer satisfaction, and begin the process of redesigning functions around customer needs. Analytical tools and big data sources from operations and finance can help organizations parse the factors driving what customers say satisfies them and also the actual customer behavior that creates economic value. Sometimes initial assumptions are overturned. In one airport case study, customer satisfaction had more to do with the behavior of security personnel than with time spent in line (Exhibit 2). For a full view of the airport's insightful customer-satisfaction exercise, see "Transports of delight," on page 120.

Define a clear customer-experience aspiration and common purpose.

In large, distributed organizations, a distinctive customer experience depends on a collective sense of conviction and purpose to serve the

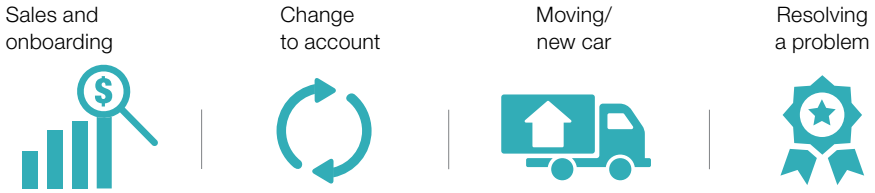
¹ See Nicolas Maechler, Kevin Neher, and Robert Park, "From touchpoints to journeys: Seeing the world as customers do," March 2016, on McKinsey.com.

² McKinsey US cross-industry customer-experience survey, June–October 2015 data.

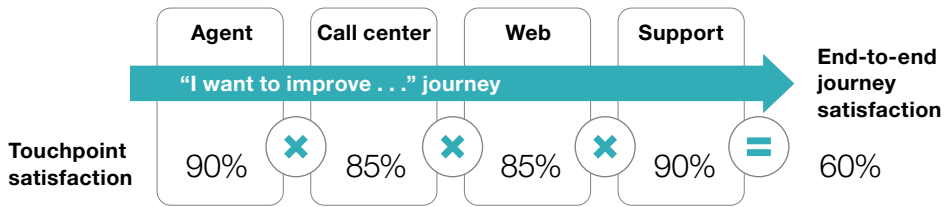
Exhibit 1

Best-in-class companies optimize customer journeys, not just touchpoints.

Customers experience companies through end-to-end experiences, not touchpoints



Individual touchpoints may perform well even if the overall experience is poor



Source: McKinsey Digital Labs

customer’s true needs. This purpose must be made clear to every employee through a simple, crisp statement of intent: a shared vision and aspiration that’s authentic and consistent with a company’s brand-value proposition. The most recognizable example of such a shared vision might be the Common Purpose³ of the Walt Disney Company: “We create happiness by providing the finest in entertainment for people of all ages, everywhere.” The statement of purpose should then be translated into a set of simple principles or standards to guide behavior all the way down to the front line.

Customer journeys are the framework that allows a company to organize itself and mobilize employees to deliver value to customers consistently, in line with its purpose. The journey construct can help align employees around customer needs, despite functional boundaries. As McKinsey’s Ron Ritter elaborated in a recent video, rallying around customers can bring the organization together.

SHAPE: REDESIGN THE BUSINESS FROM THE CUSTOMER BACK

Customer-experience leaders start with a differentiating purpose and focus on improving the most important customer journey first—whether it be

³ The Common Purpose is the intellectual property of The Walt Disney Company. See *Talking Points*, “Be our guest. . . again,” blog post by Jeff James, December 22, 2011, on disneyinstitute.com/blog.

Exhibit 2

Airport-security issues make up 4 of the top 10 consumer complaints about airports.

Top complaints by customers after airport travel



Confusing layout of security-screening checkpoint



Unfriendly security personnel



Lengthy security-screening process



Complete lack of seating after security-screening

opening a bank account, returning a pair of shoes, installing cable television, or even updating address and account information. Then they improve the steps that make up that journey. To manage expectations, they design supporting processes with customer psychology in mind. They transform their digital profile to remove pain points in interactions, and to set in motion the culture of continuous innovation needed to make more fundamental organizational transformations.



For the full video and accompanying article, see “Designing and starting up a customer-experience transformation,” on [McKinsey.com](https://www.mckinsey.com).



“It is a significant challenge to reorient a company towards the customer. That’s the hard part. The good part is you actually do have a customer to rally around and, as you go through this, you get to know your customers increasingly well—analytically, and also as humans, as people having an experience. Building that alignment and closeness to the customer brings the organization together and it keeps it together. You stop talking about yourselves and your processes and the things that you want to do and you start talking about customers and their experiences instead.”

—Ron Ritter

Apply behavioral psychology to interactions.

Deftly shaping customer perceptions can generate significant additional value. One tool leading customer-experience players deploy is behavioral psychology, used as a layer of the design process. Leading researchers have identified the major factors in customer-journey experiences that drive customer perceptions and satisfaction levels.⁴ For example, savvy companies can design the sequence of interactions with customers to end on a positive note.⁵ They can merge different stages of interactions to diminish their perceived duration and engender a feeling of progress. And they can provide simple options that give customers a feeling of control and choice. One pilot study at a consumer-services firm found that more improvements in net-promoter scores accrued from ‘soft’ behavioral-psychology initiatives rather than from ‘hard’ improvements in operations (Exhibit 3).

Reinvent customer journeys using digital technologies.

Customers accustomed to the personalization and ease of dealing with digital natives such as Google and Amazon now expect the same kind of service from established players. Research shows that 25 percent of customers will defect after just one bad experience.⁶

Customer-experience leaders can become even better by digitizing the processes behind the most important customer journeys. In these quick efforts, multidisciplinary teams jointly design, test, and iterate high-impact processes and journeys in the field, continually refining and rereleasing them after input from customers. Such methods help high-performing incumbents to release and scale major, customer-vetted process improvements in less than 20 weeks. Agile digital companies significantly outperform their competitors, according to some studies.⁷ To achieve those results, established businesses must embrace new ways of working.

PERFORM: ALIGN THE ORGANIZATION TO DELIVER AGAINST TANGIBLE OUTCOMES

As the customer experience becomes a bigger focus of corporate strategy, more and more executives will face the decision to commit their organizations to a broad customer-experience transformation. The immediate challenge

⁴ Richard Chase and Sriram Dasu, *The Customer Service Solution: Managing Emotions, Trust, and Control to Win Your Customer's Business*, Columbus, OH: McGraw-Hill Education, 2013.

⁵ See John DeVine and Keith Gilson, “Using behavioral science to improve the customer experience,” February 2010, on McKinsey.com.

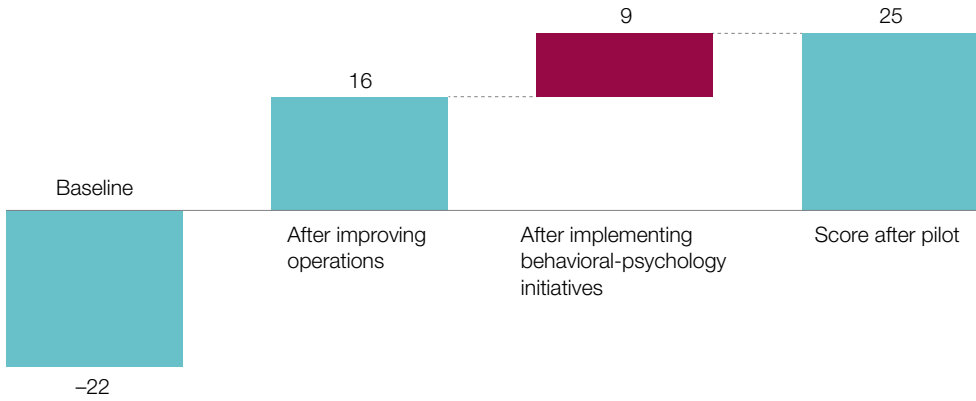
⁶ See “Infographic: The cost of crappy customer experiences,” August 6, 2015, on thunderhead.com.

⁷ See *The 2015 Customer Experience ROI Study*, Watermark Consulting, watermarkconsult.net.

Exhibit 3

Behavioral-psychology initiatives raised customer-experience scores in one consumer-services pilot.

Net promoter score¹



¹ Before n = 58, after n = 28.

Source: McKinsey analysis

will be how to structure the organization and rollout, and figuring out where and how to get started. Applying sophisticated measurement to what your customers are saying, empowering frontline employees to deliver against your customer vision, and a customer-centric governance structure form the foundation. Securing early economic wins will deliver value and momentum for continuous innovation.

Use customer journeys to empower the front line.

Every leading customer-experience company has motivated employees who embody the customer and brand promise in their interactions with consumers, and are empowered to do the right thing. Executives at customer-centered companies engage these employees at every level of the organization, working directly with them in retail settings, taking calls, and getting out into the field. In the early years, for example, Amazon famously staged “all hands on deck” sessions during the year-end holidays, a tradition that lives on in the employee-onboarding experience.⁸ Some organizations create boards or panels of customers to provide a formal feedback mechanism.⁹

⁸ Brad Stone, *The Everything Store: Jeff Bezos and the Age of Amazon*, New York, NY: Little, Brown, 2013.

⁹ See Dilip Bhattacharjee, Jesus Moreno, and Francisco Ortega, “The secret to delighting customers: Putting employees first,” on page 40.

Establish metrics that capture customer feedback.

The key to satisfying customers is not just to measure what happens but also to use the data to drive action throughout the organization. The type of metric used is less important than the way it is applied.¹⁰ The ideal customer-experience measurement system puts journeys at the center and connects them to other critical elements such as business outcomes and operational improvements. Leading practitioners start at the top, with a metric to measure the customer experience, and then cascade downward into key customer journeys and performance indicators, taking advantage of employee feedback to identify improvement opportunities (Exhibit 4).

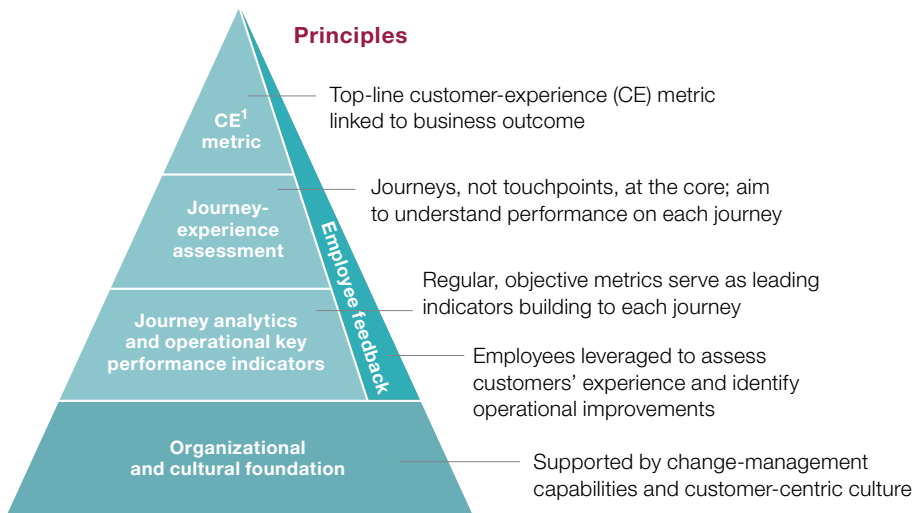
Put cross-functional governance in place.

Even for companies that collaborate smoothly, shifting to a customer-centric model that cuts across functions is not an easy task. To move from knowledge to action, companies need proper governance and leadership.¹¹

Exhibit 4

The ideal customer-experience measurement system puts journeys at the center and connects them to other critical elements.

Customer-experience measurement pyramid



¹ Customer experience.

Source: McKinsey analysis

¹⁰ See Harald Fanderl, Kevin Neher, and Alfonso Pulido, "Are you really listening to what your customers are saying?," March 2016, on McKinsey.com.

¹¹ See Ewan Duncan, Harald Fanderl, and Katy Maffei, "Designing and starting up a customer-experience transformation," March 2016, on McKinsey.com.

“In order to rewire a company to become a customer-experience leader—for most companies this will be a two-to-three-to-four-year journey. The reason it takes so long is quite frequently you need to work across functions, geographies, and customer segments, and it just takes a while. You need to start where you can show impact quickly before you can scale. Once you succeed, though, you’ll have a competitive differentiator that others will find hard to match.”

—Ewan Duncan



For the full video and accompanying article, see “Developing a customer-experience vision,” on [McKinsey.com](#).




Best-in-class organizations have governance structures that include a sponsor—a chief customer officer—and an executive champion for each of their primary cross-functional customer journeys. They also have full-time teams carrying out their day-to-day work in the existing organization. To succeed, the transformation must take place within normal operations. To foster understanding and conviction, leaders at all levels must role-model the behavior they expect from these teams, constantly communicating the changes needed. Formal reinforcement mechanisms and skill-building activities at multiple levels of the organization support the transformation, as well. In a recent video, McKinsey’s Ewan Duncan describes how rewiring a company in this way is typically a two-to-four-year journey.

Log early wins to demonstrate value creation.

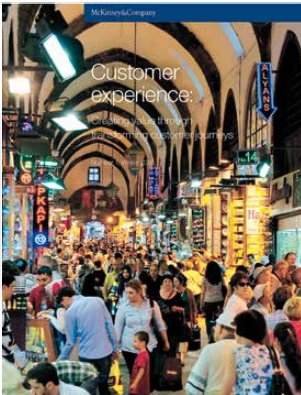
Too many customer-experience transformations stall because leaders can’t show how these efforts create value. Executives, citing the benefits of improved customer relations, launch bold initiatives to delight customers that end up having clear costs and unclear near-term results. The better way is to build an explicit link to value creation by defining the outcomes that really matter, analyzing historical performance of satisfied and dissatisfied

customers, and focusing on customer satisfaction issues with the highest payouts. This requires discipline and patience, but the result will be early wins that will build confidence within the organization and momentum to innovate further.¹²

Delighting customers by mastering the concept and execution of an exceptionally good customer experience is a challenge. But it is an essential requirement for leading in an environment where customers wield growing power. 

¹² See Joel Maynes and Alex Rawson, "Linking the customer experience to value," March 2016, on McKinsey.com.

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For more on customer journeys, see the full compendium on our Customer Experience collection page, at mckinsey.com/global-themes/customer-experience.





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The secret to delighting customers: Putting employees first

The main hurdle in customer experience is translating boardroom vision into action at the front line. Empowered employees are the key.

by Dilip Bhattacharjee, Jesus Moreno, and Francisco Ortega

Once upon a time, a little girl visited a Disney theme park. Sadly, while there, she dropped her favorite doll over a fence and into a mud puddle. When members of the park staff retrieved the doll, it was a mess. So they made it a new outfit, gave it a bath and a new hairdo, and even took photos of it with

other Disney dolls before reuniting it with the owner that evening. “Pure magic” was the way the girl’s mother described the doll’s return.

What may be most remarkable about this fairy-tale ending, which has since become part of Disney’s institutional lore, is what didn’t occur. The theme-park team didn’t panic, consult a corporate script on what to do in such a situation, or anxiously seek advice from managers so as not to botch their response to a small—but real—crisis for one of its customers. That’s because, at least in this case, the team’s understanding of what needed to be done for the young customer grew automatically from a systemic cultural emphasis that Disney puts on frontline customer service.

Such devotion pays dividends. Our research finds that emotionally engaged customers are typically three times more likely to recommend a product and to purchase it again. With an eye to these benefits, many companies are making customer experience a strategic priority. Yet, in our experience, we find that they typically struggle to gain traction with their efforts.

Improving customer experience is difficult to get right, because the primary hurdle is translating boardroom vision for a superior customer experience into action at the front line. The additional value that comes from focusing efforts on important customer journeys, rather than individual touchpoints (see “From touchpoints to journeys: Seeing the world as customers do,” on mckinsey.com), makes the task of training and deploying effective frontline workers all the more complex. (For more, see “From touchpoints to journeys: Seeing the world as customers do,” on McKinsey.com.)

Technological advances have made it much easier for companies to understand customers on an individual basis. Even so, engaging with customers is still undertaken largely through personal contact. And there’s no shortcut to creating emotional connections with customers; it requires ensuring that every interaction is geared toward leaving them with a positive experience. That takes more than great products and services—it takes motivated, empowered frontline employees. Creating great customer experiences requires having an engaged and energized workforce, one that can translate individual experiences into satisfying end-to-end customer journeys and can continue to improve the journeys to maintain a competitive edge. By appropriately motivating and rewarding such employees, a company will demonstrate its commitment to the employees’ work and will thus align their interests more closely with its own customer-strategy goals.

There are many ways to build frontline-employee commitment to superior customer experience. In our work with leading players, we have distilled four approaches to worker development and management that repeatedly show up in successful efforts. First, leading companies listen to their employees and seek to tackle their problems and needs. They hire with attitude, not aptitude, in mind and work to build on attitudinal strengths as part of employee development. They build motivation by instilling shared purpose in frontline workers rather than by applying behavioral rules. Finally, they tap into the creativity of frontline workers by assigning autonomy and responsibility as a way to stimulate innovative thinking.

PUTTING EMPLOYEES FIRST IN PRACTICE: ONE BANK'S EXPERIENCE

In the past few years, numerous companies around the world have embarked on customer-experience transformation efforts. But only a handful of them have made mobilizing frontline workers a pivotal element in their transformation journey. Such is the case for a Latin American bank—whose customer-experience strategy over a two-year period produced a double-digit improvement in profitability per client and customer acquisition while reducing churn 10 to 20 percent, gaining it widespread recognition for customer and employee satisfaction.

A few years ago, the bank was a leading player in a very competitive market in Latin America. Although the market was experiencing healthy growth rates, several international banks were competing for advantage. In order to win against well-diversified and funded competitors, the bank opted for an ambitious customer-experience strategy in order to differentiate itself in the long term. To pursue the strategy, the bank embarked on a multiyear customer-experience transformation program built upon two pillars. The first entailed designing and delivering a world-class customer experience. The second had to do with developing the culture, skills, and behaviors that would allow its frontline employees to deliver such an experience.

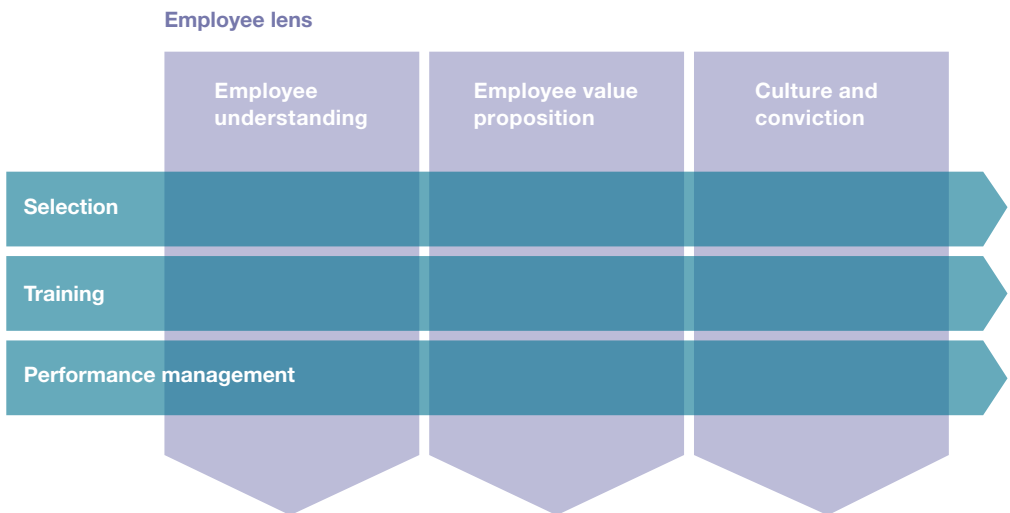
The bank assembled a multidisciplinary transformation team to tackle the change programs for both customers and employees. The team included process engineers, line managers, and HR specialists. In addition to a framework to address the contours of a superior customer experience, the team developed an overall framework to cover all employee experiences (exhibit). To transform the employee experience and frontline workers' engagement with the company and its customers, the team used an integrated and comprehensive set of interventions: a deep understanding of the employees'

needs, using quantitative surveys and qualitative research, including focus groups and individual interviews; a redesign of the employee value proposition; an overhaul of key HR practices such as recruiting and selection, capability building, and performance management; and a set of initiatives aimed at building a true customer-centric culture. These included promoting symbols, such as company mascots with different personalities, name tags and stationery, rites and celebrations such as breakfast with management, an award ceremony during the annual convention for leaders, and a peer-recognition portal. Management reinforced these efforts with repeated messages and encouraging habits such as demonstrating transparency in sales.

Deploying the program in waves over the course of more than two years, the team worked to motivate and empower frontline employees to build an emotional connection with the bank’s customers, deliberately emphasizing the principles derived from other successful employee-development efforts described earlier. They included the following.

Exhibit

Transforming the customer experience requires a methodical approach to understanding and engaging employees.



Source: McKinsey analysis

Listening to employees. During the initial phase of the transformation, the bank devoted a significant effort to thoroughly understanding employees' needs and wants. It segmented employees based on their attitudes, requirements, and preferences and analyzed the key attributes that motivated and attracted each type of employee; it also categorized the main behavioral traits. This allowed the bank to tailor value propositions for its employees to their concrete needs and preferences. Using polls, surveys, and focus groups, the team was able to segment whether an employee's attitude toward work was active or passive, map how conditional his or her level of commitment to company goals was, and gauge the behaviors that would motivate performance. For instance, based on its analysis, the bank changed its non-financial benefits for employees, introducing a system of points that the employees could redeem. For example, a parent could receive a day off to attend a child's school party, or a young employee might earn a discount for a mortgage rate.

Beyond one-off changes, the company put in place several mechanisms to better listen to employees on an ongoing basis. For instance, it created contests in which frontline teams would propose improvement ideas twice a year: one for improving employee experience and the other for improving customer experience. The teams ended up implementing several of the ideas, while the company centrally sponsored others that benefited a broader range of company functions.

Hiring for attitude, not aptitude—and then reinforcing attitude. To ensure that it recruited the best talent to deliver a great customer experience, the bank completely overhauled its recruiting and selection processes. Management changed several job descriptions to emphasize customer service as a key element for evaluation during the recruitment process. It also changed the interview process from a system based on one-on-one interviews by managers to a process that evaluated the service attitude of the candidates in realistic environments. For instance, the bank built a simulated branch in its recruiting department where candidates were placed in role-play situations to test their attitude and behavior toward customers and colleagues. It also included additional filtering criteria that would ensure the right behaviors toward customers, such as honesty and integrity in relationship managers. Finally, the bank introduced a welcome pack that would help improve how new employees were brought on board, including a manual to help new hires navigate the company, a letter from the president, and brochures with tips.

These measures resulted in a 5 to 10 percent increase in the satisfaction scores of customers served by new employees.

Other companies have also discovered the connection between hiring customer-oriented people and ensuring friendly service. JetBlue Airways, for example, has embedded this philosophy in its hiring process. To recruit frontline staff with a natural service bent, it uses group interviews. Watching how applicants interact with one another enables hiring managers to assess their communication and people skills to an extent that wouldn't be possible in a one-on-one setting.

Having hired people with the right attitude, leaders need to ensure they reinforce the behaviors they want to see. Although Disney hires janitors to keep its parks clean, everyone else in the organization knows that they share the responsibility for maintaining a clean and pleasant environment. Asked why he was picking up paper in the restroom, one team leader replied, "I can't afford not to." As Disney executives tell it, every leader is telling a story about what the company values.

Instilling frontline workers with purpose, not rules. Bank leadership understood early on that imposing strict rules on frontline customer representatives has its limits. Instead, it opted to provide a common purpose of meeting customer needs that employees could apply to every imaginable situation—as well as the criteria that would allow them to appropriately adjust their behavior, especially in the absence of a specific rule or protocol. (For more on the role of common purpose in promoting customer satisfaction, see "Developing a customer-experience vision," on McKinsey.com.) In order to mobilize and engage frontline workers as much as possible, leadership decided to build the common purpose and service criteria by using a bottom-up approach, rather than by mandating change. A group of employees was selected by their peers based on their merits and attitude in customer service, and they were entrusted with the responsibility of creating the common purpose and service criteria. While the common purpose gave meaning to employees' work, the service criteria chosen—such as safety, proximity to customers, image, and diligence—defined concrete behaviors that guided the front line to act in alignment with the common purpose.

To keep the common purpose from lapsing into some kind of conceptual framework, the company reinforced the concept and the service criteria


Currently, hundreds of teams in the bank hold daily huddles; in these 15-minute discussions, they talk through results and key performance indicators, many of them related to customer experience.

through several mechanisms. For instance, frontline leaders are awarded pins in recognition for reinforcing certain service criteria with their teams. The leaders display these pins proudly in the band that holds their name tag. Corporate image and communication provide another reinforcing mechanism. Each of the service criteria is represented by a color, and the bank color-codes most of its corporate communications to more closely associate them with the criteria.

Tapping into frontline creativity. The customer-experience transformation brought new mechanisms to capture and disseminate ideas from the front line, such as a biannual contest to generate ideas to improve customer and employee experience. Although these mechanisms demonstrated positive impact, bank leadership decided it wanted to do more to boost positive customer experiences in order to stay ahead of competitors. So it set out to accelerate the pace of continuous improvement and innovation generated at the front line. Its approach was to roll out a program to incorporate several lean-management practices across all areas and all organizational levels, with a focus on sustaining and improving the customer-experience strategy.

Currently, hundreds of teams in the bank hold daily huddles; in these 15-minute discussions, they talk through results and key performance indicators, many of them related to customer experience. They also bring to the surface improvement ideas and share customer-experience stories that reinforce the customer-service culture. The main improvement ideas are picked up again in weekly structured problem-solving sessions, where they are either solved and assigned to team members for implementation or elevated to more senior leaders for tackling in similar problem-solving sessions with other areas of the organization. Through these and several other standard practices that the bank

has implemented, it has been able to accelerate the velocity of innovation and continuous improvement to stay in front of competitors.

Strategists know that technological changes have made it easier for customers to shift their loyalties based on how satisfied they were with their buying experiences. But for companies looking to improve their performance, the personal interaction between customer and frontline employee may still be the most important link of all. 

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How new CEOs can boost their odds of success

The importance of acting quickly and of adopting an outsider's perspective are two messages from an analysis of the link between the strategic moves of new CEOs and the performance of their companies.

by Michael Birshan, Thomas Meakin, and Kurt Strovink

The success of CEOs is deeply linked to the success of the companies they lead, but the vast body of popular literature on the topic explores this relationship largely in qualitative terms. The dangers of these approaches are well known: it's easy to be misled by outliers or to conclude, mistakenly, that prominent actions which seem correlated with success were responsible for it.

We tried to sidestep some of these difficulties by systematically reviewing the major strategic moves (from management reshuffles to cost-reduction efforts to new-business launches to geographic expansion) that nearly 600 CEOs made during their first two years in office. Using annualized total returns to shareholders (TRS), we assessed their companies' performance over the CEOs' tenure in office. Finally, we analyzed how the moves they made—at least those visible to external observers¹—and the health of their

¹ There are, of course, a number of important factors (such as inspiring the top team and role-modeling a new culture) that play an important part in explaining a CEO's performance, even though these factors cannot always be observed externally. For a perspective on them, see Ian Davis, "Letter to a newly appointed CEO," *McKinsey Quarterly*, June 2010, McKinsey.com.

companies when they joined them influenced the performance of those companies.²

The results of this analysis, bolstered by nearly 250 case studies, show that the number and nature of the strategic moves made by CEOs who join well- and poorly performing companies are surprisingly similar. The efficacy of certain moves appears to vary significantly across different groups of companies, however. What's more, the sheer number of moves seems to make a difference, at least for CEOs who join poorly performing companies. Also, external hires appear to have a greater propensity to act.

These findings have important practical implications for new CEOs and the boards that hire them: focus early on a few bold moves well suited to the context of your company, and recognize the value of the outsider's perspective—whether or not you are one.

SURPRISING SIMILARITIES

The starting point for our analysis was a group of nearly 600 CEOs who left S&P 500 companies from 2004 to 2014 (identified in the annual *CEO Transitions* report produced by Spencer Stuart, the global executive-search and leadership-consulting firm).³ For each CEO's first two years, we gathered information—from a range of sources, including company reports, investor presentations, press searches, and McKinsey knowledge assets—on nine strategic moves that chief executives commonly make.

We expected that CEOs taking the helm at poorly performing companies, feeling compelled to do something to improve results, would have a greater propensity to make strategic moves than those who joined well-performing organizations. To learn whether this idea was true, we looked at how each company had been performing relative to its industry counterparts prior to the new CEO's arrival and then subdivided the results into three categories: well-performing, poorly performing, and stable companies.⁴ When we

² Total returns to shareholders (TRS) indicate the returns a company provides to its shareholders in share-price appreciation and dividends. We have annualized TRS over the course of a given CEO's tenure to provide for comparisons among companies and over time. In this article we use excess TRS, a company's returns normalized for the performance of its industry counterparts over the same period. Excess TRS is a more equitable measure than company TRS since it assesses a company's over- or underperformance relative to the market.

³ For the latest report, see *2015 CEO Transitions*, March 2016, spencerstuart.com. For a write-up by Spencer Stuart on CEO transitions from 2004 to 2008, see James M. Citrin and Dayton Ogden, "Succeeding at succession," *Harvard Business Review*, November 2010, Volume 8, Number 11, pp. 29–31, hbr.org.

⁴ We examined economic profit, a measure of the value a company creates over a sustained period of time. If a company's annualized EP growth in the five years before a CEO joined was, on average, more than 5 percent a year above that of its industry counterparts, it was classified as well performing; if it was more than 5 percent a year below that of those counterparts, it was classified as poorly performing; and if it was between these two figures, it was classified as stable.

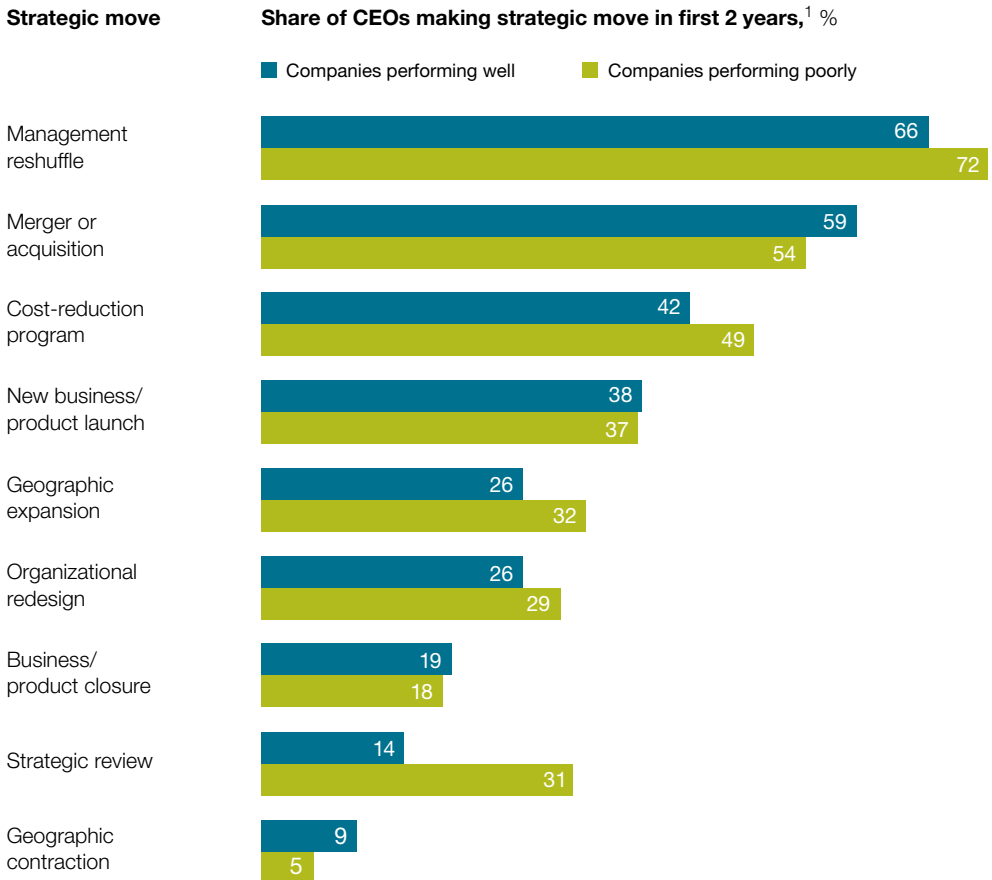
reviewed the moves by companies in each of these categories, we found that new CEOs act in similar ways, with a similar frequency, whether they had joined well- or poorly performing organizations. CEOs in different contexts made bold moves—such as M&A, changing the management team, and launching new businesses and products—at roughly the same rate (Exhibit 1).

CONTEXTUAL CONTRASTS

Although new CEOs transitioning into companies that have been performing well and CEOs transitioning into companies that have been performing poorly make similar moves with a similar frequency, that doesn't mean those moves are equally effective. We measured the performance of companies by excess TRS over a CEO's tenure. At companies where chief executives made strategic moves early on, we found striking contrasts between organizations

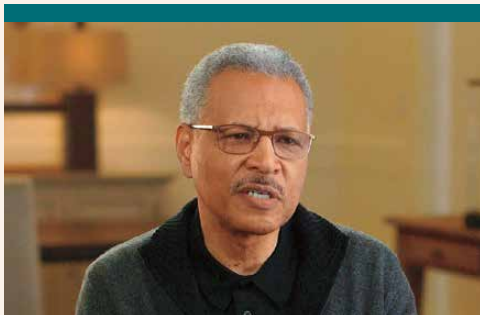
Exhibit 1

No matter the context, CEOs make strategic moves at roughly the same rate.



¹ Based on a sample of ~600 CEOs who left S&P 500 companies between 2004 and 2014.

AETNA'S RON WILLIAMS ON MAKING CRITICAL MOVES



Ron Williams was the CEO of Aetna from 2006 to 2010.

Moving at the right pace

Our pace of change always had to be rapid but measured. Our business is truly a technology business, and one of the things you learn is to never take apart anything you do not fully understand. Because when you snip the wires, you may never get them back together, and our customers will suffer. So we have to be in control of the inputs and outputs and customer-service levels. We often made very dramatic changes and important strategic moves, such as when we built our own pharmacy-benefits-management company up from nothing and later sold part of it, but we made sure it was extremely controlled so we didn't end up with a mess on our hands.

A decision I always look back on was the failure to pursue the strategic advantage when we had it. We had committed a lot of resources to develop an important,

innovative product that made us recognized as an industry leader. One of the mistakes we made was we let our competitors get into that space. If we had made acquisitions and taken other approaches, we would have had a very strong lock on a very important and growing product category. We had a lot of debate about it, and the notion was, "Well, we have the capability, why spend scarce capital on acquiring more?" Often, the fact that you keep a property out of another entity's hands is a poor rationale for an acquisition. In this case, it would have been a good rationale in retrospect.

Moving on values

I spent a lot of time on culture and values. Our senior team would go offsite and really talk about what kind of company we wanted to be. What was our vision? What kind of culture do we want? What kind of values? How did we align our strategy, our culture, our technology, our executional capabilities, and our financial aspirations to really set the standard in the industry? The CEO has to infuse the culture and the values into the organization, and that means you must select a leadership team that believes in, articulates, and lives by those values. The technical skills and competencies—you can find those in lots of people, but your team has to have leadership skills as well.

that had been performing well when the new CEO took charge and those that had been performing poorly:

- Organizational redesign was correlated with significant excess TRS (+1.9 percent) for well-performing companies, but not for low performers.

- Strategic reviews were correlated with significant excess TRS (+4.3 percent) for poorly performing companies but were less helpful for companies that had been performing well.
- Poorly performing companies enjoyed +0.8 percent TRS when they reshuffled their management teams. But when well-performing companies did so, they destroyed value.⁵

We recognize that excess TRS CAGR does not prove a causal link; too many other variables, some beyond a CEO's control, have an influence. (For more on the execution of strategy in different contexts, see the sidebar "Aetna's Ron Williams on making critical moves," which also has commentary on culture and values.) But we do find the differences that emerged quite plausible. It stands to reason that troubled companies would enjoy special benefits from major overhauls of management or strategy. Organizational redesigns are challenging for all companies and may, in some cases, be premature for organizations in significant flux.⁶ Also plausible was the finding that cost-reduction programs appear to improve a company's TRS relative to those of its counterparts for both well- and poorly performing organizations, though the effect is strongest for weak ones.

A final point on context is that the bar for top performance varies significantly by sector. In some, such as investment services and automotive, the TRS CAGRs of top-performing organizations with new CEOs are more than 16 percent above those of their industry counterparts. In other sectors, such as media and telecommunications, a CEO's company must outperform the market by only a few percentage points to be classed in the top quintile. The implication is that new CEOs seeking to calibrate their starting points and to prioritize strategic moves should look beyond top-level performance metrics to understand what it will really take to beat the market. For a personal perspective on this process, see sidebar, "Setting targets for Covidien: Jose Almeida reflects," on page 54.)

BOLD BOUNCEBACKS

We also sought to compare the number of major moves that new CEOs made in parallel at well- and poorly performing companies. Well-performing companies had no discernible pattern. But in poorly performing ones, CEOs who made four or more strategic moves at the same time during their first

⁵ We define a management reshuffle as a more than 50 percent turnover of a new CEO's direct reports within two years of taking office. Of course, even CEOs in high-performing companies need an effective, aligned top team, though this may not require shuffling more than half of it.

⁶ For a further discussion of the conditions necessary for a successful organizational redesign, see Steven Aronowitz, Aaron De Smet, and Deirdre McGinty, "Getting organizational redesign right," *McKinsey Quarterly*, June 2015, McKinsey.com.

SETTING TARGETS FOR COVIDIEN: JOSE ALMEIDA REFLECTS



Jose Almeida, currently the CEO of Baxter International, was the CEO of Covidien from 2011 to 2015. What follows are reflections on his early years at Covidien.

Targeting performance

We used to have roll-up strategies from the business units to corporate, and corporate would create a forecast for the business for the next three years. The forecast would then be negotiated down with the units and result in a growth objective for the next three years. We completely changed that; that was probably the biggest change we made. We started with the desire to become a top-quartile performer in total returns to shareholders. We deconstructed TRS to the point that we understood the gap between the current work the company was doing on a discount-cash-flow basis versus the desired discount-cash-flow basis, and we found the difference was a few billion dollars. So we went to work trying to fill the gap by changing the capital allocation into R&D projects, or through divestiture and acquisitions or other moves. Then we rolled down that strategy to the business units, which then developed specific plans. We knew what we had to do and how long we had to do it.

Targeting the right skills

Make sure your team has the right players for the moment, and make quick decisions to remove those who should not be at the

table. Then in recruiting people, we tend to undervalue some important leadership skills that sometimes don't show up in the skills matrix. Everybody values the drive for results, the quality of decision making, dealing with ambiguity, but there are some valuable skills that you don't see everywhere. One is learning on the fly. People who can learn fast will take charge of a situation and can be mobile between businesses and functions. Another one is managing innovation. To manage innovation, you have to have the ability to allow empowerment, entrepreneurship, and to let go of control. Those skills are not often found in traditional hierarchical companies, where people tend to become very process-driven. And process is a tremendous hindrance to creativity and innovation. So go find those gems, the people who have those skills that are undervalued in your company's leadership-skill inventory. Because those people will make you more successful as a CEO.

Targeting adaptability

Perhaps most important is adaptability. A great many companies today are matrix-organized. You can't manage in this very complex world without a matrix, but everyone inside wants to be a general manager. They want to be the P&L owner. They want to have that opportunity to manage a business. People need to understand that in a world where things are so complex, you can't really do that anymore. When you're launching a global product, you can't have the responsibility of selling that product in every country under your accountability. You have to work through others. You've got to be able to influence others without having the power. That adaptability is huge. Many people who do not possess it fail at their jobs because they can't understand emotionally how things work.

two years achieved an average of 3.6 percent excess annual TRS growth over their tenures. Their less bold counterparts in similarly bad situations could claim just 0.4 percent excess annual TRS growth.

These findings are in line with earlier McKinsey research⁷ showing how difficult it is to reach higher levels of economic profit without making substantial strategic or operational shifts. That has also been our own experience working with new CEOs on turnarounds.

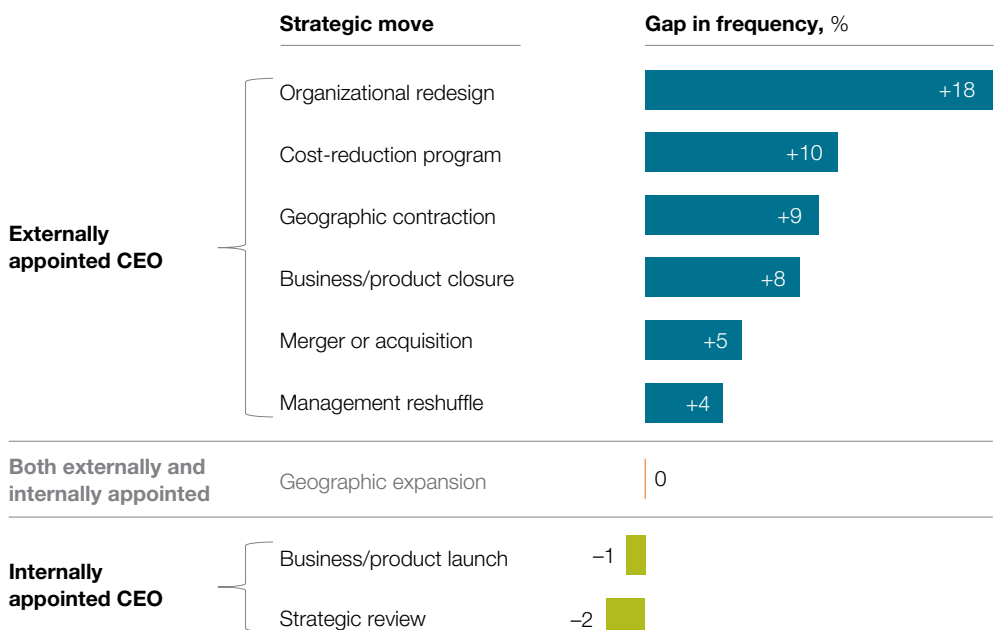
OUTSIDE VIEWS

When the time comes to appoint a new CEO, corporate boards face a difficult question: promote an executive from within or choose an outsider? We turned our own lens to this issue and found that the performance of outsiders and insiders differed significantly. Externally appointed CEOs have a greater propensity to act: they were more likely to make six out of the nine strategic moves we examined. The size of the gap in frequency—in other words, the chance an external CEO would make a particular move minus the chance an internal CEO would do the same thing—was much greater for the moves external CEOs opted to make (Exhibit 2).

⁷ See Stephen Hall, Dan Lovullo, and Reinier Musters, “How to put your money where your strategy is,” *McKinsey Quarterly*, March 2012, McKinsey.com.

Exhibit 2

CEOs who are appointed to companies from outside have a greater propensity to act than those promoted from within.



External CEOs almost certainly have a leg up when it comes to bold action. They are generally less encumbered by organizational politics or inertia than their internal counterparts. They may also be more likely to take an outside view of their companies. It's no coincidence, in our view, that the strategic moves that have the largest gaps in the propensity to act include some of the most far-reaching ones: organizational redesign, for example, or geographic contraction.

Poorly performing companies are more likely to appoint external CEOs, and corporate performance tends to revert to the mean. But the TRS edge of outside hires was substantial: over their tenure, they outperformed their internally promoted counterparts by a margin of more than five to one—on average, a 2.2 percent excess TRS CAGR, compared with 0.4 percent.

Clearly, this performance differential is the result of multiple factors, and it's important to note that new CEOs need not come from outside companies to cultivate an outsider's mind-set—or to be successful in their role.⁸

While our results are averages across multiple organizations and industries, they do suggest a few principles for new CEOs:


- *Adopt an outsider's mind-set.* On average, external hires appear to make more moves during their early years. This doesn't mean that insiders are the wrong choice for boards. But it does suggest that it's critical for insiders to resist legacies or relationships which might slow them down and that approaches which help insiders adopt an outsider's mind-set have great potential. Equally, there is value in having outsiders who can lean into the boldness that their status naturally encourages. Some executives have done so by creating new ways to assess a company's performance objectively—for example, by taking the view of a potential acquirer or activist investor⁹ looking for weak spots that require immediate attention. Others have reset expectations for the annual allocation of resources, changed the leadership model and executive compensation, established an innovation bank,

⁸ On average, the external CEOs in our database outperform their internal peers, but a majority of top-quintile CEOs are internal, indicating that many internal CEOs can make the bold moves necessary for success. This finding corresponds with those of a recent *Harvard Business Review* article, "The best-performing CEOs in the world," November 2015, Volume 93, Number 11, pp. 49–63, hbr.org. Our analysis also supports Joseph Bower's in "Solve the succession crisis by growing inside-outside leaders," *Harvard Business Review*, November 2007, Volume 85, Number 11, pp. 91–96, hbr.org.

⁹ For ideas on how activist investors think about business performance, see Joseph Cyriac, Ruth De Backer, and Justin Sanders, "Preparing for bigger, bolder shareholder activists," March 2014, McKinsey.com.

and looked for additional ways to bring an external perspective to the heart of the leadership approach.

- *Don't follow the herd.* On average, new CEOs make many of the same moves, regardless of starting point. They will do better, however, by carefully considering the context of their companies and leveraging more scientific ways to assess their starting points. For instance, some new CEOs take stock of the economic-profit performance of companies relative to that of their peers and, in light of the starting position, assess the odds that potential moves will pay off.¹⁰
- *When you're behind, look at the whole playbook.* On average, CEOs taking the helm at underperforming companies do better when they make more major strategic moves, not fewer. That doesn't mean they should try to do everything at once, but it does suggest a bias toward boldness and action. Plan a comprehensive set of moves that will significantly improve your company's performance, and make sure that you aim high enough.¹¹

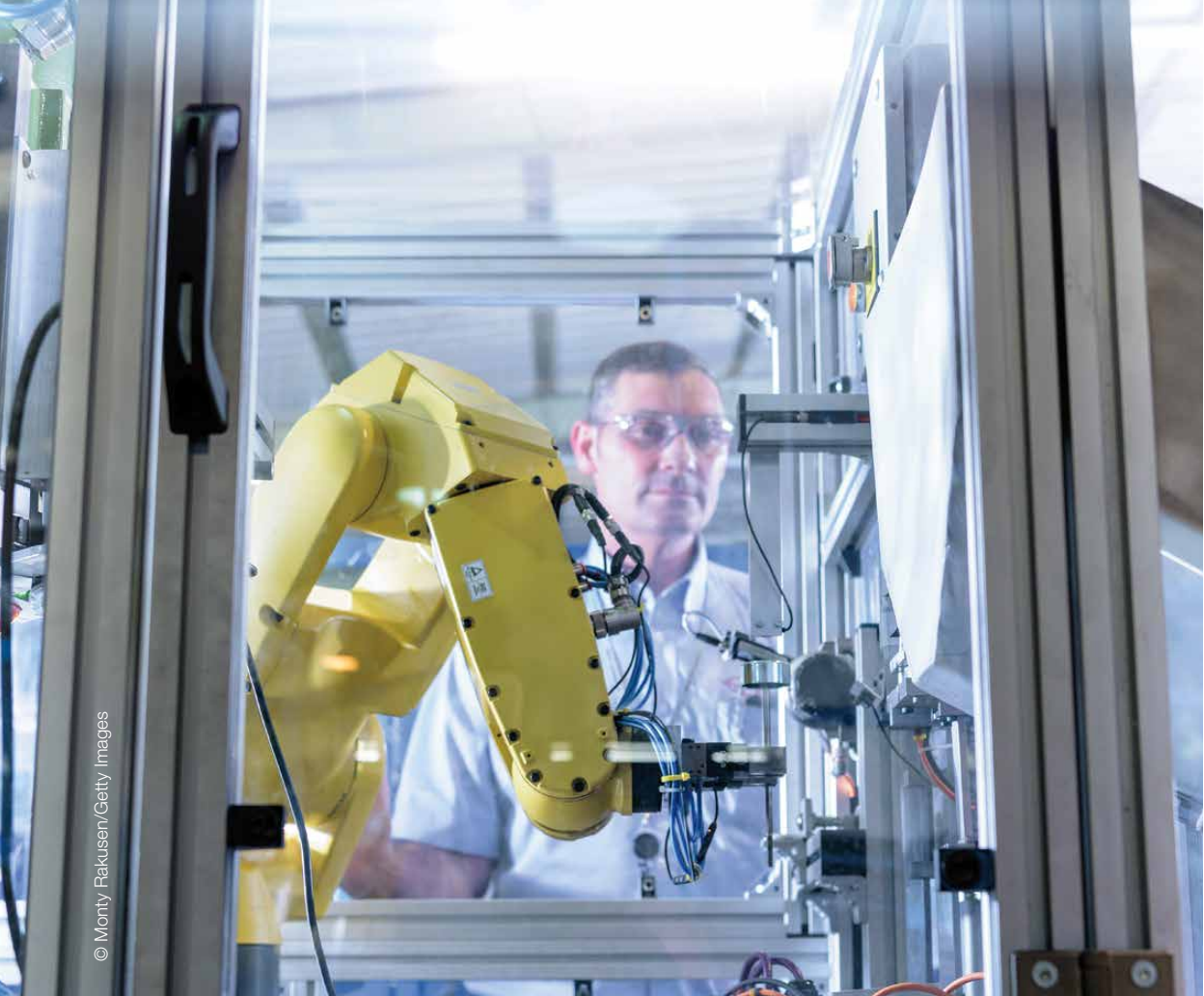
New CEOs take the helm with a singular opportunity to shape the companies they lead. The best ones artfully use their own transition into the CEO role to transform their companies. But this window of opportunity doesn't last long. On average, an inflection point arrives during year three of a CEO's tenure. At that point, a CEO whose company is underperforming is roughly twice as likely to depart as the CEO of an outperforming one—by far the highest level at any time in a chief executive's tenure. During this relatively short window, fortune favors the bold. 

¹⁰ See Chris Bradley, Angus Dawson, and Sven Smit, "The strategic yardstick you can't afford to ignore," *McKinsey Quarterly*, October 2013, McKinsey.com.

¹¹ For more on the highest-leverage internal actions a CEO can take to influence a significant shift in company performance, see Carolyn B. Aiken and Scott P. Keller, "The CEO's role in leading transformation," *McKinsey Quarterly*, February 2007, McKinsey.com. To determine whether your strategy is comprehensive and will position your company for success, see Chris Bradley, Martin Hirt, and Sven Smit, "Have you tested your strategy lately?," *McKinsey Quarterly*, January 2011, McKinsey.com. For tips on designing a transformation program for a company that's in trouble, see Doug Yakola, "Ten tips for leading companies out of crisis," March 2014, McKinsey.com.

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Where machines could replace humans—and where they can't (yet)

The technical potential for automation differs dramatically across sectors and activities.

by Michael Chui, James Manyika, and Mehdi Miremadi

As automation technologies such as machine learning and robotics play an increasingly great role in everyday life, their potential effect on the workplace has, unsurprisingly, become a major focus of research and public concern. The discussion tends toward a Manichean guessing game: which jobs will or won't be replaced by machines?

In fact, as our research has begun to show, the story is more nuanced. While automation will eliminate very few occupations entirely in the next decade,

it will affect portions of almost all jobs to a greater or lesser degree, depending on the type of work they entail. Automation, now going beyond routine manufacturing activities, has the potential, at least with regard to its technical feasibility, to transform sectors such as healthcare and finance, which involve a substantial share of knowledge work.

These conclusions rest on our detailed analysis of 2,000-plus work activities for more than 800 occupations. Using data from the US Bureau of Labor Statistics and O*Net, we've quantified both the amount of time spent on these activities across the economy of the United States and the technical feasibility of automating each of them. The full results, forthcoming in early 2017, will include several other countries,¹ but we released some initial findings late last year and are following up now with additional interim results.

Last year, we showed that currently demonstrated technologies could automate 45 percent of the activities people are paid to perform and that about 60 percent of all occupations could see 30 percent or more of their constituent activities automated, again with technologies available today. In this article, we examine the technical feasibility, using currently demonstrated technologies, of automating three groups of occupational activities: those that are highly susceptible, less susceptible, and least susceptible to automation. Within each category, we discuss the sectors and occupations where robots and other machines are most—and least—likely to serve as substitutes in activities humans currently perform. Toward the end of this article, we discuss how evolving technologies, such as natural-language generation, could change the outlook, as well as some implications for senior executives who lead increasingly automated enterprises.

UNDERSTANDING AUTOMATION POTENTIAL

In discussing automation, we refer to the potential that a given activity could be automated by adopting currently demonstrated technologies, that is to say, whether or not the automation of that activity is *technically feasible*.² Each whole occupation is made up of multiple types of activities, each with varying degrees of technical feasibility. Exhibit 1 lists seven top-level groupings of activities we have identified. Occupations in retailing, for example, involve activities such as collecting or processing data, interacting with customers, and setting up merchandise displays (which we classify as physical movement

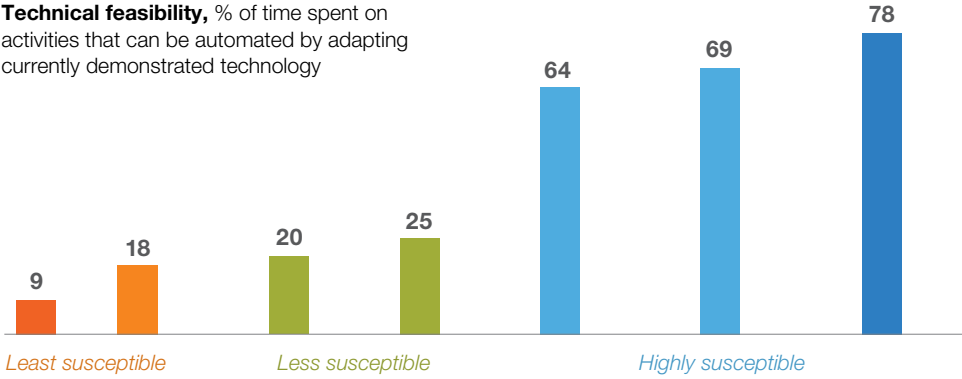
¹ For interim insights on our core findings, see Michael Chui, James Manyika, and Mehdi Miremadi, "Four fundamentals of workplace automation," *McKinsey Quarterly*, November 2015, McKinsey.com.

² We define "currently demonstrated technologies" as those that have already exhibited the level of performance and reliability needed to automate 1 or more of the 18 capabilities involved in carrying out work activities. In some cases, that level of performance has been demonstrated through commercially available products, in others through research projects.

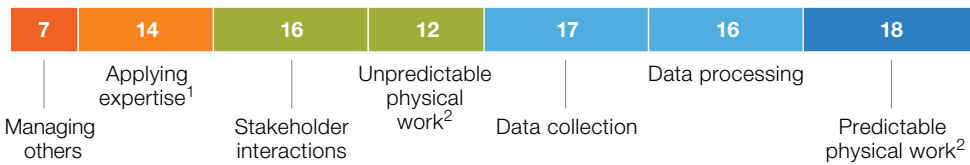
Exhibit 1

Analyzing work activities rather than occupations is the most accurate way to examine the technical feasibility of automation.

Technical feasibility, % of time spent on activities that can be automated by adapting currently demonstrated technology



Time spent in all US occupations, %



Note: In practice, automation will depend on more than just technical feasibility. Five factors are involved: technical feasibility; costs to automate; the relative scarcity, skills, and cost of workers who might otherwise do the activity; benefits (eg, superior performance) of automation beyond labor-cost substitution; and regulatory and social-acceptance considerations.

¹Applying expertise to decision making, planning, and creative tasks.

²Unpredictable physical work (physical activities and the operation of machinery) is performed in unpredictable environments, while in predictable physical work, the environments are predictable.

in a predictable environment). Since all of these constituent activities have a different automation potential, we arrive at an overall estimate for the sector by examining the time workers spend on each of them during the workweek.

Technical feasibility is a necessary precondition for automation, but not a complete predictor that an activity will be automated. A second factor to consider is the cost of developing and deploying both the hardware and the software for automation. The cost of labor and related supply-and-demand dynamics represent a third factor: if workers are in abundant supply and significantly less expensive than automation, this could be a decisive argument against it. A fourth factor to consider is the benefits beyond labor substitution, including higher levels of output, better quality, and fewer errors. These are often larger than those of reducing labor costs. Regulatory and social-acceptance issues, such as the degree to which machines are acceptable in any particular setting, must also be weighed. A robot may,

in theory, be able to replace some of the functions of a nurse, for example. But for now, the prospect that this might actually happen in a highly visible way could prove unpalatable for many patients, who expect human contact. The potential for automation to take hold in a sector or occupation reflects a subtle interplay between these factors and the trade-offs among them.

Even when machines do take over some human activities in an occupation, this does not necessarily spell the end of the jobs in that line of work. On the contrary, their number at times increases in occupations that have been partly automated, because overall demand for their remaining activities has continued to grow. For example, the large-scale deployment of bar code scanners and associated point-of-sale systems in the United States in the 1980s reduced labor costs per store by an estimated 4.5 percent and the cost of the groceries consumers bought by 1.4 percent.³ It also enabled a number of innovations, including increased promotions. But cashiers were still needed; in fact, their employment grew at an average rate of more than 2 percent between 1980 and 2013.

THE MOST AUTOMATABLE ACTIVITIES

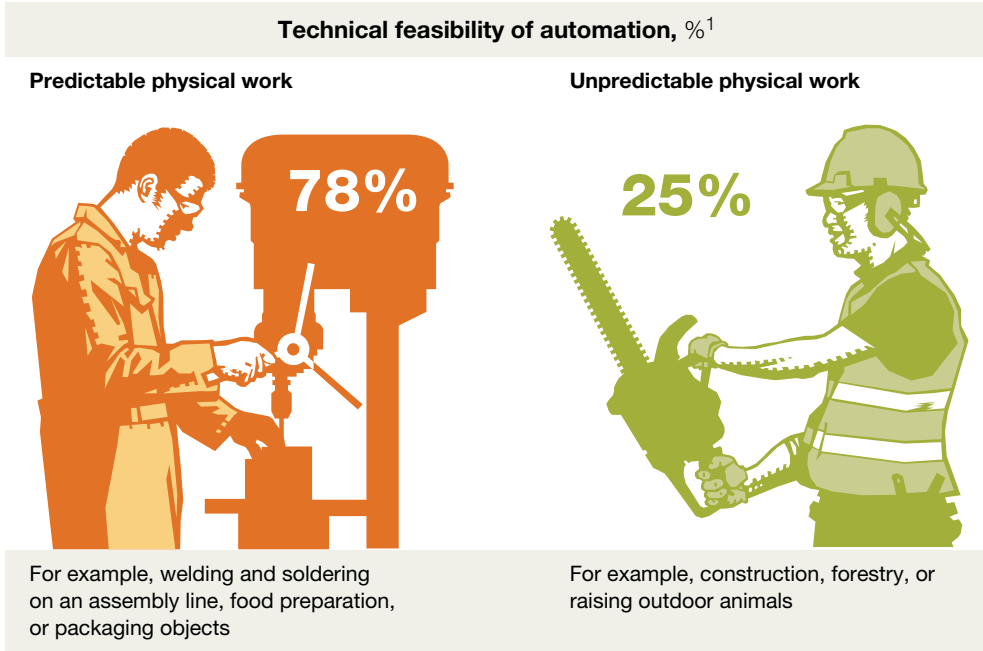
Almost one-fifth of the time spent in US workplaces involves performing physical activities or operating machinery in a predictable environment: workers carry out specific actions in well-known settings where changes are relatively easy to anticipate. Through the adaptation and adoption of currently available technologies, we estimate the technical feasibility of automating such activities at 78 percent, the highest of our seven top-level categories (Exhibit 2). Since predictable physical activities figure prominently in sectors such as manufacturing, food service and accommodations, and retailing, these are the most susceptible to automation based on technical considerations alone.

In manufacturing, for example, performing physical activities or operating machinery in a predictable environment represents one-third of the workers' overall time. The activities range from packaging products to loading materials on production equipment to welding to maintaining equipment. Because of the prevalence of such predictable physical work, some 59 percent of all manufacturing activities could be automated, given technical considerations. The overall technical feasibility, however, masks considerable variance. Within manufacturing, 90 percent of what welders, cutters, solderers, and brazers do, for example, has the technical potential for automation, but for

³ Emek Basker, "Change at the checkout: Tracing the impact of a process innovation," *The Journal of Industrial Economics*, June 2015, Volume 63, Number 2, pp. 339–70.

Exhibit 2

It's more technically feasible to automate predictable physical activities than unpredictable ones.



¹% of time spent on activities that can be automated by adapting currently demonstrated technology.

customer-service representatives that feasibility is below 30 percent. The potential varies among companies as well. Our work with manufacturers reveals a wide range of adoption levels—from companies with inconsistent or little use of automation all the way to quite sophisticated users.

Manufacturing, for all its technical potential, is only the second most readily automatable sector in the US economy. The top spot belongs to accommodations and food services, where almost half of all labor time involves predictable physical activities and the operation of machinery—including preparing, cooking, or serving food; cleaning food-preparation areas; preparing hot and cold beverages; and collecting dirty dishes. According to our analysis, 73 percent of the activities workers perform in food service and accommodations have the potential for automation, based on technical considerations.


Some of this potential is familiar. Automats, or automated cafeterias, for example, have long been in use. Now restaurants are testing new, more

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF KNOWLEDGE WORK



MARIA KLAWE

A lot of what's going on in AI is some mix of math, statistics, and theoretical computer science. It's basically probabilistic networks, with various strategies for how you design those networks in different layers. One of the things that has changed radically is the extent to which math and statistics and computer science talk to one another. And now economics is also talking, and

sociology is talking—there's much more social-science interaction. We're going to need people who can help develop algorithms in these application areas, not just people who can use the tools that somebody else develops. I'm not a labor economist, but I am worried that there's going to be an incredible demand for people who can work with new technologies. And for the people who can't, maybe there aren't nearly the same kind of opportunities to earn a living. We know that things are going to change radically, and we have really no idea exactly how they're going to change. 

Maria Klawe is a computer scientist and the president of Harvey Mudd College.

sophisticated concepts, like self-service ordering or even robotic servers. Solutions such as Momentum Machines' hamburger-cooking robot, which can reportedly assemble and cook 360 burgers an hour, could automate a number of cooking and food-preparation activities. But while the technical potential for automating them might be high, the business case must take into account both the benefits and the costs of automation, as well as the labor-supply dynamics discussed earlier. For some of these activities, current wage rates are among the lowest in the United States, reflecting both the skills required and the size of the available labor supply. Since restaurant employees who cook earn an average of about \$10 an hour, a business case based solely on reducing labor costs may be unconvincing.

Retailing is another sector with a high technical potential for automation. We estimate that 53 percent of its activities are automatable, though, as in manufacturing, much depends on the specific occupation within the sector. Retailers can take advantage of efficient, technology-driven stock management and logistics, for example. Packaging objects for shipping and

stocking merchandise are among the most frequent physical activities in retailing, and they have a high technical potential for automation. So do maintaining records of sales, gathering customer or product information, and other data-collection activities. But retailing also requires cognitive and social skills. Advising customers which cuts of meat or what color shoes to buy requires judgment and emotional intelligence. We calculate that 47 percent of a retail salesperson's activities have the technical potential to be automated—far less than the 86 percent possible for the sector's bookkeepers, accountants, and auditing clerks.

As we noted above, however, just because an activity can be automated doesn't mean that it will be—broader economic factors are at play. Bookkeepers, accountants, and auditing clerks, for example, require skills and training, so they are scarcer than basic cooks. But the activities they perform cost less to automate, requiring mostly software and a basic computer.

Considerations such as these have led to an observed tendency for higher rates of automation for activities common in some middle-skill jobs—for example, in data collection and data processing. As automation advances in capability, jobs involving higher skills will probably be automated at increasingly high rates.

The heat map in Exhibit 3 highlights the wide variation in how automation could play out, both in individual sectors and for different types of activities within them.⁴

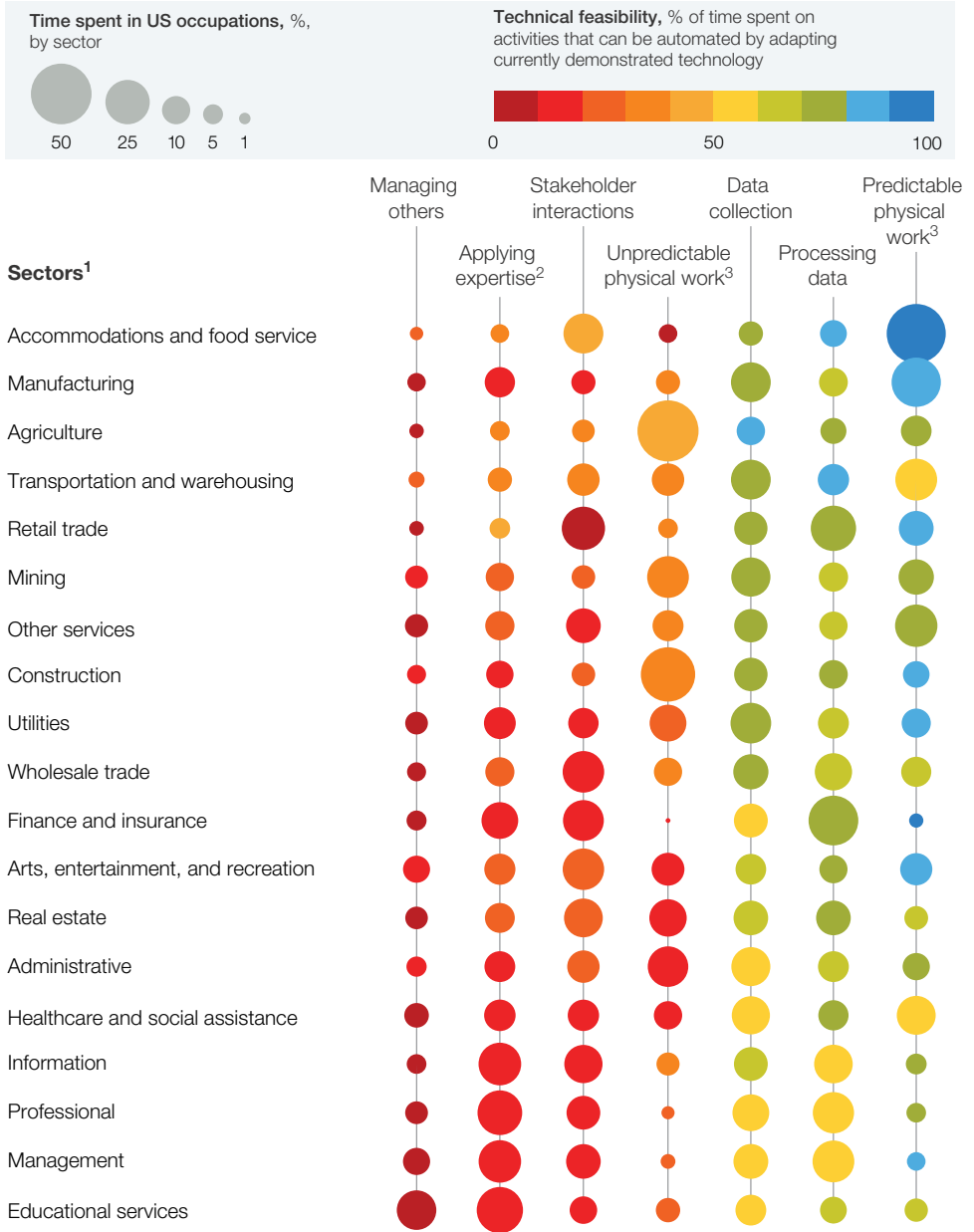
ACTIVITIES AND SECTORS IN THE MIDDLE RANGE FOR AUTOMATION

Across all occupations in the US economy, one-third of the time spent in the workplace involves collecting and processing data. Both activities have a technical potential for automation exceeding 60 percent. Long ago, many companies automated activities such as administering procurement, processing payrolls, calculating material-resource needs, generating invoices, and using bar codes to track flows of materials. But as technology progresses, computers are helping to increase the scale and quality of these activities. For example, a number of companies now offer solutions that automate entering paper and PDF invoices into computer systems or even processing loan applications. And it's not just entry-level workers or low-wage clerks who collect and process data; people whose annual incomes exceed \$200,000 spend some 31 percent of their time doing those things, as well.

⁴ For a deeper look across all sectors in the US economy, please see the data representations from McKinsey on automation and US jobs, on public.tableau.com.

Exhibit 3

Automation is technically feasible for many types of activities in industry sectors, but some activities can be more affected than others.



Note: In practice, automation will depend on more than just technical feasibility. Five factors are involved: technical feasibility; costs to automate; the relative scarcity, skills, and cost of workers who might otherwise do the activity; benefits (eg, superior performance) of automation beyond labor-cost substitution; and regulatory and social-acceptance considerations.

¹ *Agriculture* includes forestry, fishing, and hunting; *other services* excludes federal-, state-, and local-government services; *real estate* includes rental and leasing; *administrative* includes administrative support and government administration; *healthcare and social assistance* includes private, state-government, and local-government hospitals; *professional* includes scientific and technical services; *educational services* includes private, state-government, and local-government schools.

² Applying expertise to decision making, planning, and creative tasks.

³ Unpredictable physical work (physical activities and the operation of machinery) is performed in unpredictable environments, while in predictable physical work, the environments are predictable.

Financial services and insurance provide one example of this phenomenon. The world of finance relies on professional expertise: stock traders and investment bankers live off their wits. Yet about 50 percent of the overall time of the workforce in finance and insurance is devoted to collecting and processing data, where the technical potential for automation is high. Insurance sales agents gather customer or product information and underwriters verify the accuracy of records. Securities and financial sales agents prepare sales or other contracts. Bank tellers verify the accuracy of financial data.

As a result, the financial sector has the technical potential to automate activities taking up 43 percent of its workers' time. Once again, the potential is far higher for some occupations than for others. For example, we estimate that mortgage brokers spend as much as 90 percent of their time processing applications. Putting in place more sophisticated verification processes for documents and credit applications could reduce that proportion to just more than 60 percent. This would free up mortgage advisers to focus more of their time on advising clients rather than routine processing. Both the customer and the mortgage institution get greater value.

Other activities in the middle range of the technical potential for automation involve large amounts of physical activity or the operation of machinery in *unpredictable* environments. These types of activities make up a high proportion of the work in sectors such as farming, forestry, and construction and can be found in many other sectors as well.

Examples include operating a crane on a construction site, providing medical care as a first responder, collecting trash in public areas, setting up classroom materials and equipment, and making beds in hotel rooms. The latter two activities are unpredictable largely because the environment keeps changing. Schoolchildren leave bags, books, and coats in a seemingly random manner. Likewise, in a hotel room, different guests throw pillows in different places, may or may not leave clothing on their beds, and clutter up the floor space in different ways.

These activities, requiring greater flexibility than those in a predictable environment, are for now more difficult to automate with currently demonstrated technologies: their automation potential is 25 percent. Should technology advance to handle unpredictable environments with the same ease as predictable ones, the potential for automation would jump to 67 percent. Already, some activities in less predictable settings in farming and construction (such as evaluating the quality of crops, measuring materials, or translating blueprints into work requirements) are more susceptible to automation.

ACTIVITIES WITH LOW TECHNICAL POTENTIAL FOR AUTOMATION

The hardest activities to automate with currently available technologies are those that involve managing and developing people (9 percent automation potential) or that apply expertise to decision making, planning, or creative work (18 percent). These activities, often characterized as knowledge work, can be as varied as coding software, creating menus, or writing promotional materials. For now, computers do an excellent job with very well-defined activities, such as optimizing trucking routes, but humans still need to determine the proper goals, interpret results, or provide commonsense checks for solutions. The importance of human interaction is evident in two sectors that, so far, have a relatively low technical potential for automation: health-care and education.

Overall, healthcare has a technical potential for automation of about 36 percent, but the potential is lower for health professionals whose daily activities require expertise and direct contact with patients. For example, we estimate that less than 30 percent of a registered nurse's activities could be automated, based on technical considerations alone. For dental hygienists, that proportion drops to 13 percent.

Nonetheless, some healthcare activities, including preparing food in hospitals and administering non-intravenous medications, could be automated if currently demonstrated technologies were adapted. Data collection, which also accounts for a significant amount of working time in the sector, could become more automated as well. Nursing assistants, for example, spend about two-thirds of their time collecting health information. Even some of the more complex activities that doctors perform, such as administering anesthesia during simple procedures or reading radiological scans, have the technical potential for automation.

Of all the sectors we have examined, the technical feasibility of automation is lowest in education, at least for now. To be sure, digital technology is transforming the field, as can be seen from the myriad classes and learning vehicles available online. Yet the essence of teaching is deep expertise and complex interactions with other people. Together, those two categories—the least automatable of the seven identified in the first exhibit—account for about one-half of the activities in the education sector.

Even so, 27 percent of the activities in education—primarily those that happen outside the classroom or on the sidelines—have the potential to be automated with demonstrated technologies. Janitors and cleaners, for example, clean and monitor building premises. Cooks prepare and serve school food. Administrative assistants maintain inventory records and

personnel information. The automation of these data-collection and processing activities may help to reduce the growth of the administrative expenses of education and to lower its cost without affecting its quality.

LOOKING AHEAD

As technology develops, robotics and machine learning will make greater inroads into activities that today have only a low technical potential for automation. New techniques, for example, are enabling safer and more enhanced physical collaboration between robots and humans in what are now considered unpredictable environments. These developments could enable the automation of more activities in sectors such as construction. Artificial intelligence can be used to design components in engineer-heavy sectors.

One of the biggest technological breakthroughs would come if machines were to develop an understanding of natural language on par with median human performance—that is, if computers gained the ability to recognize the concepts in everyday communication between people. In retailing, such natural-language advances would increase the technical potential for automation from 53 percent of all labor time to 60 percent. In finance and insurance, the leap would be even greater, to 66 percent, from 43 percent. In healthcare, too, while we don't believe currently demonstrated technologies could accomplish all of the activities needed to diagnose and treat patients, technology will become more capable over time. Robots may not be cleaning your teeth or teaching your children quite yet, but that doesn't mean they won't in the future.

As stated at the outset, though, simply considering the technical potential for automation is not enough to assess how much of it will occur in particular activities. The actual level will reflect the interplay of the technical potential, the benefits and costs (or the business case), the supply-and-demand dynamics of labor, and various regulatory and social factors related to acceptability.


LEADING MORE AUTOMATED ENTERPRISES

Automation could transform the workplace for everyone, including senior management. The rapid evolution of technology can make harnessing its potential and avoiding its pitfalls especially complex. In some industries, such as retailing, automation is already changing the nature of competition. E-commerce players, for example, compete with traditional retailers by using both physical automation (such as robots in warehouses) and the automation of knowledge work (including algorithms that alert shoppers to items they may want to buy). In mining, autonomous haulage systems that

transport ore inside mines more safely and efficiently than human operators do could also deliver a step change in productivity.

Top executives will first and foremost need to identify where automation could transform their own organizations and then put a plan in place to migrate to new business processes enabled by automation. A heat map of potential automation activities within companies can help to guide, identify, and prioritize the potential processes and activities that could be transformed. As we have noted, the key question will be where and how to unlock value, given the cost of replacing human labor with machines. The majority of the benefits may come not from reducing labor costs but from raising productivity through fewer errors, higher output, and improved quality, safety, and speed.

It is never too early to prepare for the future. To get ready for automation's advances tomorrow, executives must challenge themselves to understand the data and automation technologies on the horizon today. But more than data and technological savvy are required to capture value from automation. The greater challenges are the workforce and organizational changes that leaders will have to put in place as automation upends entire business processes, as well as the culture of organizations, which must learn to view automation as a reliable productivity lever. Senior leaders, for their part, will need to “let go” in ways that run counter to a century of organizational development.⁵

Understanding the activities that are most susceptible to automation from a technical perspective could provide a unique opportunity to rethink how workers engage with their jobs and how digital labor platforms can better connect individuals, teams, and projects.⁶ It could also inspire top managers to think about how many of their own activities could be better and more efficiently executed by machines, freeing up executive time to focus on the core competencies that no robot or algorithm can replace—as yet. 

⁵ See Martin Dewhurst and Paul Willmott, “Manager and machine: The new leadership equation,” *McKinsey Quarterly*, September 2014, McKinsey.com.

⁶ See Aaron De Smet, Susan Lund, and William Schaninger, “Organizing for the future,” *McKinsey Quarterly*, January 2016, McKinsey.com.

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The authors wish to thank Rick Cavolo for his contributions to this article.



People analytics reveals three things HR may be getting wrong

More sophisticated analyses of big data are helping companies identify, recruit, and reward the best personnel. The results can run counter to common wisdom.

by Henri de Romrée, Bruce Fecheyr-Lippens, and Bill Schaninger

Bill James, the factory watchman turned baseball historian and statistician, once observed, “There will always be people who are ahead of the curve, and people who are behind the curve. But knowledge moves the curve.”¹ Some companies are discovering that if they employ the latest in data analytics, they can find, deploy, and advance more people on the right side of the curve—even if the results at first appear counterintuitive.

Over the past decade, big data analytics have been revolutionizing the way many companies do business. Chief marketing officers track detailed shopping patterns and preferences to predict and inform consumer behavior.

¹ Scott Gray, *The Mind of Bill James: How a Complete Outsider Changed Baseball*, New York, NY: Doubleday, 2006.

Chief financial officers use real-time, forward-looking, integrated analytics to better understand different business lines. And now chief human-resources officers are starting to deploy predictive talent models that can more effectively—and more rapidly—identify, recruit, develop, and retain the right people. Mapping HR data helps organizations identify current pain points and prioritize future analytics investments (exhibit). Surprisingly, however, the data do not always point in the direction that more seasoned HR officers might expect. Here are three examples.

1. CHOOSING WHERE TO CAST THE RECRUITING NET

A bank in Asia had a well-worn plan for hiring: recruit the best and the brightest from the highest-regarded universities. The process was one of many put to the test when the company, which employed more than 8,000 people across 30 branches, began a major organizational restructuring. As part of the effort, the bank turned to data analytics to identify high-potential employees, map new roles, and gain greater insight into key indicators of performance.

Thirty data points aligned with five categories—demographics, branch information, performance, professional history, and tenure—were collected for each employee, using existing sources. Analytics were then applied to identify commonalities among high (and low) performers. This information, in turn, helped create profiles for employees with a higher likelihood of succeeding in particular roles.

Further machine learning–based analysis revealed that branch and team structures were highly predictive of financial outcomes. It also highlighted how a few key roles had a particularly strong impact on the bank’s overall success. As a result, executives built new organizational structures around key teams and talent groups. In many instances, previous assumptions about how to find the right internal people for new roles were upended.

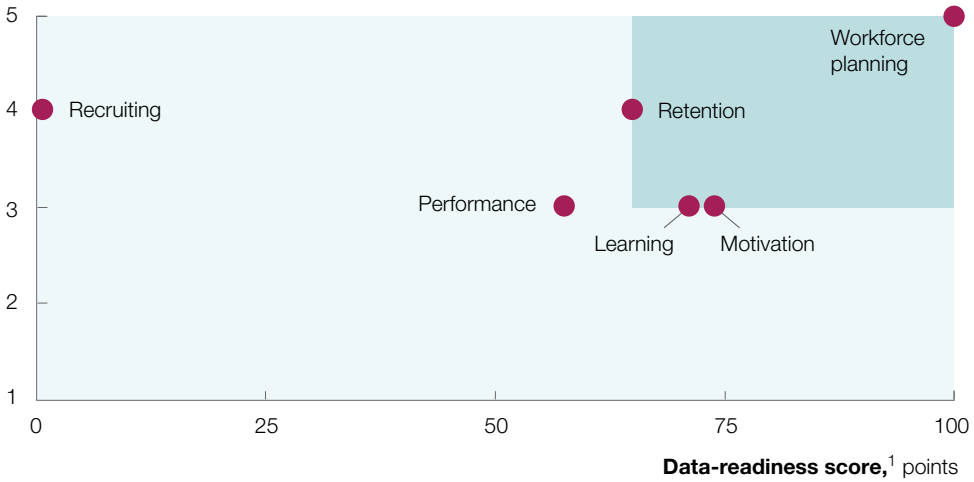
Whereas the bank had always thought top talent came from top academic programs, for example, hard analysis revealed that the most effective employees came from a wider variety of institutions, including five specific universities and an additional three certification programs. An observable correlation was evident between certain employees who were regarded as “top performers” and those who had worked in previous roles, indicating that specific positions could serve as feeders for future highfliers. Both of these findings have since been applied in how the bank recruits, measures performance, and matches people to roles. The results: a 26 percent increase in branch productivity (as measured by the number of full-time employees needed to support revenue) and a rate of conversion of new recruits 80 percent

Exhibit

Mapping data quality to critical needs helps HR organizations to prioritize future analytics investments.

Example of global pharmaceutical company:
Assessment of critical needs by company's top leadership
(1 = not important, 5 = top priority)

Focus first on high-priority, data-ready initiatives



¹ Determined by weighted scoring of the availability and quality of multiple data points.
Source: McKinsey People Analytics Readiness and Roadmap (PARR) diagnostic

higher than before the changes were put in place. During the same period, net income also rose by 14 percent.

2. CUTTING THROUGH THE HIRING NOISE AND BIAS


The democracy of numbers can also help organizations eliminate unconscious preferences and biases, which can surface even when those responsible have the best of intentions. For instance, a professional-services company had been nearly overwhelmed by the 250,000 job applications it received every year. By introducing more advanced automation, it sought to reduce the costs associated with the initial résumé-screening process, and to improve screening effectiveness. One complication was the aggressive goals the company had simultaneously set for hiring more women, prompting concern that a machine programmed to mine for education and work experience might undermine that effort.

The worries proved unwarranted. The algorithm adapted by HR took into account historical recruiting data, including past applicant résumés and, for those who were extended offers previously, their decisions on whether to accept. When linked to the company's hiring goals, the model successfully identified those candidates most likely to be hired and automatically passed

them on to the next stage of the recruiting process. Those least likely to be hired were automatically rejected. With a clearer field, expert recruiters were freer to focus on the remaining candidates to find the right fit. The savings associated with the automation of this step, which encompassed more than 55 percent of the résumés, delivered a 500 percent return on investment. What's more, the number of women who passed through automated screening—each one on merit—represented a 15 percent increase over the number who had passed through manual screening. The foundational assumption—that screening conducted by humans would increase gender diversity more effectively—was proved incorrect.

3. ADDRESSING ATTRITION BY IMPROVING MANAGEMENT

Too often, companies seek to win the talent war by throwing ever more money into the mix. One example was a major US insurer that had been facing high attrition rates; it first sought, with minimal success, to offer bonuses to managers and employees who opted to remain. Then the company got smarter. It gathered data to help create profiles of at-risk workers; the intelligence included a range of information such as demographic profile, professional and educational background, performance ratings, and, yes, levels of compensation. By applying sophisticated data analytics, a key finding rose to the fore: employees in smaller teams, with longer periods between promotions and with lower-performing managers, were more likely to leave.

Once these high-risk employees had been identified, more informed efforts were made to convince them to stay. Chiefly, these involved greater opportunities for learning development and more support from a stronger manager. Bonuses, on the other hand, proved to have little if any effect. As a result, funds that might have been allocated to ineffectual compensation increases were instead invested in learning development for employees and improved training for managers. Performance and retention both improved, with significant savings left over—showing yet again the value of digging into the data at hand. When well applied, people analytics is fairer, has greater impact, and is ultimately more time and cost-effective. It can move everyone up the knowledge curve—often times in counterintuitive ways. 

Henri de Romrée is a partner in McKinsey's Brussels office; **Bruce Fechey-Lippens** is an associate partner in McKinsey's Brussels office; and **Bill Schaninger** is a senior partner in the Philadelphia office.

The authors wish to thank Emily Caruso for her contribution to this article.

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DIGITAL DISRUPTION



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An incumbent's guide to digital disruption

Incumbents needn't be victims of disruption if they recognize the crucial thresholds in their lifecycle, and act in time.

by Chris Bradley and Clayton O'Toole

A decade ago, Norwegian media group Schibsted made a courageous decision: to offer classifieds—the main revenue source of its newspaper businesses—online for free. The company had already made significant Internet investments but realized that to establish a pan-European digital stronghold it had to raise the stakes. During a presentation to a prospective French partner, Schibsted executives pointed out that existing European classifieds sites had limited traffic. “The market is up for grabs,” they said, “and we intend to get it.”¹ Today, more than 80 percent of their earnings come from online classifieds.²

About that same time, the boards of other leading newspapers were also weighing the prospect of a digital future. No doubt, like Schibsted, they even developed and debated hypothetical scenarios in which Internet start-ups siphoned off the lucrative print classified ads the industry called its “rivers of gold.” Maybe these scenarios appeared insufficiently alarming—or maybe they were too dangerous to even entertain. But very few newspapers followed Schibsted's path.

¹ Raf Weverbergh, “8 lessons in how to disrupt yourself from Schibsted,” Whiteboard, whiteboardmag.com.

² Annual report, Schibsted, 2015, schibsted.com.

From the vantage point of 2016, when print media lie shattered by a tsunami of digital disruption, it's easy to talk about who made the "right" decision and who the "wrong." Things are far murkier when one is actually in the midst of disruption's uncertain, oft-hyped early stages. In the 1980s, steel giants famously underestimated the potential of mini-mills. In the 1980s and 1990s, the personal computer put a stop to Digital Equipment Corporation, Wang Laboratories, and other minicomputer makers. More recently, web retailers have disrupted physical ones, and Airbnb and Uber have disrupted lodging and car travel, respectively. The examples run the gamut from database software to boxed beef.

What they have in common is how often incumbents find themselves on the wrong side of a big trend. No matter how strong their ingoing balance sheets and market share—and sometimes because of those very factors—incumbents can't seem to hold back the tide. The champions of disruption are far more often the attackers than the established incumbent. The good news for incumbents is that many industries are still in the early days of digital disruption. Print media, travel, and lodging provide valuable illustrations of the path increasingly more will follow. For most, it's early enough to respond.

What's the secret of those incumbents that do survive—and sometimes even thrive? One aspect surely relates to the ability to recognize and overcome the typical pattern of response (or lack thereof) that characterizes companies in the incumbent's position. This most often requires acuity of foresight³ and a willingness to respond boldly before it's too late, which usually means acting before it is obvious you have to do so. As Reed Hastings, the CEO of Netflix, pointed out (right as his company was making the leap from DVDs to streaming), most successful organizations fail to look for new things their customers want because they're afraid to hurt their core businesses. Clayton Christensen called this phenomenon the innovator's dilemma. Hastings simply said, "Companies rarely die from moving too fast, and they frequently die from moving too slowly."⁴

We are all great strategists in hindsight. The question is what to do when you are in the middle of it all, under the real-world constraints and pressures of running a large, modern company. This article looks at the four stages of disruption from an incumbent's perspective, the barriers to overcome, and the choices and responses needed at each stage.

³ For McKinsey's analysis of the economic sources of digital disruption, see Angus Dawson, Martin Hirt, and Jay Scanlan, "The economic essentials of digital strategy," *McKinsey Quarterly*, March, 2016, McKinsey.com.

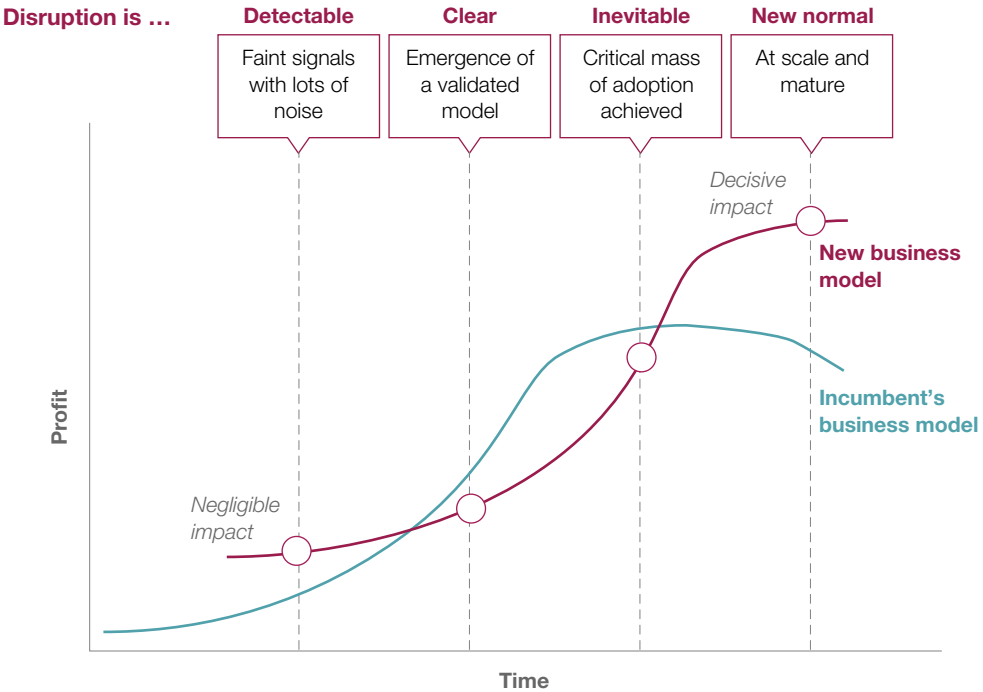
⁴ *Netflix Media Center*, "An explanation and some reflections," blog entry by Reed Hastings, September 18, 2011, media.netflix.com.

WHERE YOU ARE AND WHAT YOU NEED

It may help to view these stages on an S-curve (exhibit). At first, young companies struggle with uncertainty but are agile and willing to experiment. At this time, companies prize learning and optionality and work toward creating value based on the expectation of future earnings. The new model then needs to reach some critical mass to become a going concern. As they mature—that is, become incumbents—mind-sets and realities change. The established companies lock in routines and processes. They iron out and standardize variability amid growing organizational complexity. In the quest for efficiency, they weed out strategic options and reward executives for steady results. The measure of success is now delivery of consistent, growing cash flows in the here and now. The option-rich expectancy of future gain is replaced by the treadmill of continually escalating performance expectations.

Exhibit

Disruption introduces an incumbent to a new journey.



Incumbent's move	Acuity	Action	Acceleration	Adaptation
Common barrier	Myopia	Avoidance of pain	Inertia	Fit

In a disruption, the company heading toward the top of the old S-curve confronts a new business model at the bottom of a new S-curve. The circle of creative destruction is renewed, but this time the shoe is on the other foot. Two primary challenges emerge. The first is to recognize the new S-curve, which starts with a small slope, and often-unimpressive profitability, and at first does not demand attention. After all, most companies have shown they are very good at dealing with obvious emergencies, rapidly corralling resources and acting decisively. But they struggle to deal with the slow, quiet rise of an uncertain threat that does not announce itself. Second, the same factors that help companies operate strongly toward the top of an S-curve often hinder them at the bottom of a new one. Because different modes of operation are required, it's hard to do the right thing—even when you think you know what the right thing might be.

This simplified model, of a new S-curve crashing slow motion into an old one, gives us a way to look at the problem from the incumbent's perspective, and to appreciate the actual challenges each moment presents along the way. In the first stage, the new S-curve is not yet a curve at all. In the second, the new business model gets validated, but its impact is not forceful enough to fundamentally bend the performance trajectory of the incumbent. In the third stage, however, the new model gains a critical mass and its impact is clearly felt. In the fourth, the new model becomes the new normal as it reaches its own maturity.

Let's step through these stages in sequence and see what is going on.

STAGE ONE: SIGNALS AMIDST THE NOISE

In the late 1990s, PolyGram was one of the world's top record labels, with a roster boasting Bob Marley, U2, and top classical artists. But, in 1998, Cornelis Boonstra, CEO of PolyGram's Dutch parent, Koninklijke Philips, flew to New York, met with Goldman Sachs, and arranged to sell PolyGram to Seagram for \$10.6 billion. Why? Because Boonstra had come across research showing that consumers were using the new recordable CD-ROM technology (which Philips coinvented) largely for one purpose: to copy music. In hindsight, this is a good example of how, in the early stages of disruption, demand begins to “purify” and lose the distortions imposed on it by businesses.⁵

The MP3 format had barely been invented, Napster was a mere gleam in Sean Parker's eye, and PolyGram was riding at the top of its S-curve—but

⁵ Dawson, Hirt, and Scanlan, “The economic essentials of digital strategy.”

Boonstra detected the first signs of transformational change and decided to act swiftly and decisively. Within a decade, compact-disc and DVD sales in the United States dropped by more than 80 percent. Similarly, Telecom New Zealand foresaw the deteriorating economics of its Yellow Pages business and sold its directories business in 2007 for \$2.2 billion (a nine-time revenue multiple)⁶ while numerous other telecom companies held on until the businesses were nearly worthless.⁷

The newspaper industry had no shortage of similar signals. As early as 1964, media theorist Marshall McLuhan observed that the industry's reliance on classified ads and stock-market quotes made it vulnerable: "Should an alternative source of easy access to such diverse daily information be found, the press will fold." The rise of the Internet created just such a source, and start-ups such as eBay opened a new way for people to list goods for sale without the use of newspaper ads. Schibsted was one of the earliest media companies to both anticipate the threat and act on the opportunity. As early as 1999, the company became convinced that "The Internet is made for classifieds, and classifieds are made for the Internet."⁸

It's not surprising that most others publishers didn't react. At this early stage of disruption, incumbents feel barely any impact on their core businesses except in the distant periphery. In short, they don't "need" to act. It takes rare acuity to make a preemptive move, likely in the face of conflicting demands from stakeholders. What's more, it can be difficult to work out which trends to ignore and which to react to.

Gaining sharper insight, and escaping the myopia of this first stage, requires incumbents to challenge their own "story" and to disrupt long-standing (and sometimes implicit) beliefs about how to make money in a given industry. As our colleagues put it in a recent article, "These governing beliefs reflect widely shared notions about customer preferences, the role of technology, regulation, cost drivers, and the basis of competition and differentiation. They are often considered inviolable—until someone comes along to violate them."⁹

The process of reframing these governing beliefs involves identifying an industry's foremost notion about value creation and then turning it on its head to find new forms and mechanisms for creating value.

⁶ Annual report, Telecom New Zealand, 2006, investors.sparknz.co.nz.

⁷ "Telecom gets \$2 billion for Yellow Pages," *New Zealand Herald*, March 26, 2007, nzherald.co.nz.

⁸ Ken Doctor, "Schibsted's stunning classifieds and services business," Neiman Lab, February 14, 2012, neimanlab.org.

⁹ Marc de Jong and Menno van Dijk, "Disrupting beliefs: A new approach to business-model innovation," *McKinsey Quarterly*, July 2015, McKinsey.com.

STAGE TWO: CHANGE TAKES HOLD

The trend is now clear. The core technological and economic drivers have been validated. At this point, it's essential for established companies to commit to nurturing new initiatives so that they can establish footholds in the newsphere. More important, they need to ensure that new ventures have autonomy from the core business, even if the goals of the two operations conflict. The idea is to act before one has to.

But with disruption's impact still not big enough to dampen earnings momentum, motivation is often missing. Even as online classifieds for cars and real estate began to take off and Craigslist gained momentum, most newspaper publishers lacked a sense of urgency because their own market share remained largely unaffected. And it's not like the new players were making millions (yet). There was no performance envy.

But Schibsted did find the necessary motivation. "When the dot-com bubble burst, we continued to invest, in spite of the fact that we didn't know how we were going to make money online," recalls then-CEO Kjell Aamot. "We also allowed the new products to compete with the old products."¹⁰ Offering free online classifieds directly cannibalized its newspaper business, but Schibsted was willing to take the risk. The company didn't just act; it acted radically.

Now, let's openly acknowledge how hard it is for a company's leaders to commit to supporting experimental ventures when the business is climbing the S-curve. When Netflix disrupted itself in 2011 by shifting focus from DVDs to streaming, its share price dropped by 80 percent. Few boards and investors can handle that kind of pain when the near-term need is debatable. The vague longer-term threat just doesn't seem as dangerous as the immediate hardship. After all, incumbents have existing revenue streams to protect—start-ups only have upside to capture. Additionally, management teams are more comfortable developing strategies for businesses they know how to operate, and are naturally reluctant to enter a new game with rules they don't understand.

The upshot: most incumbents dabble, making small investments that won't flatten their current S-curve and guard against cannibalization. Usually, they focus too heavily on finding synergies (always looking for efficiency) rather than fostering radical experimentation. The illusion that this dabbling

¹⁰ See "CBS case competition 2009 case video. Schibsted classified media," February 25, 2009, youtube.com.

is getting you into the game is all too tempting to believe. Many newspapers built online add-ons to their classified businesses, but few were willing to risk cannibalizing the traditional revenue streams, which at this point were still far bigger and more profitable. And remember, at this time, Schibsted had not yet been rewarded for its early action: its results looked pretty similar to its peers.

In time, of course, bolder action becomes necessary, and executives must commit to nurturing potentially dilutive and small next-horizon businesses in a pipeline of initiatives. Managing such a portfolio requires high tolerance for ambiguity, and it requires executives to adapt to shifting conditions, both inside and outside the company, even as the aspiration to deliver favorable outcomes for shareholders remains constant.¹¹ The difficulty is the tendency to protect the core at the expense of the periphery. Not only are there strong, short-term financial incentives to protect the core, but it's also often painful to shift focus from core businesses in which one has, understandably enough, an emotional as well as a financial investment.

No small part of the challenge is to accept that the previous status quo is no longer the baseline. Grocery retailer Aldi has disrupted numerous incumbents globally with its low-price model. Aldi's future success was visible while Aldi was still nascent in the market. Yet many incumbent supermarkets chose to avoid the near-term pain of sharpening entry price points and improving their private-label brands. In hindsight, those moves would have been highly net-present-value positive with respect to avoided loss—as Aldi has continued its strong growth across three continents.

STAGE THREE: THE INEVITABLE TRANSFORMATION

By now, the future is pounding on the door. The new model has proved superior to the old, at least for some critical mass of adopters, and the industry is in motion toward it. At this stage of disruption, to accelerate its own transformation, the incumbent's challenge lies in aggressively shifting resources to the new self-competing ventures it nurtured in stage two. Think of it as treating new businesses like venture-capital investments that only pay off if they scale rapidly, while the old ones are subject to a private-equity-style workout.

Making this tough shift requires surmounting the inertia that can afflict companies even in the best of times.¹² In fact, our experience suggests

¹¹ Lowell L. Bryan, "Just-in-time strategy for a turbulent world," *McKinsey Quarterly*, June 2002, McKinsey.com.

¹² Stephen Hall, Dan Lovallo, and Reinier Musters, "How to put your money where your strategy is," *McKinsey Quarterly*, March, 2012, McKinsey.com.

stage three is the hardest one for incumbents to navigate. As company performance starts to suffer, tightening up budgets, established companies naturally tend to cut back even further on peripheral activities while focusing on the core. The top decision makers, who usually come from the biggest business centers, resist having their still-profitable (though more sluggishly growing) domains starved of resources in favor of unproven upstarts. As a result, leadership often under invests in new initiatives, even as it imposes high performance hurdles on them. Legacy businesses continue to receive the lion's share of resources instead. By this time, the very forces causing pressure in the core make the business even less willing and able to address those forces. The reflex to conserve resources kicks in just when you most need to aggressively reallocate and invest.

Boards play a significant role in this as well. Far too often, boards are unwilling (or unable) to change their view of baseline performance, further exacerbating the problem. Often a board's (understandable) reaction to reduced performance is to push management even harder to achieve ambitious goals within the current model, ignoring the need for a more fundamental change. This only worsens problems in the future.

Further complicating matters, incumbents with initially strong positions can take false comfort at this stage, because the weaker players in the industry get hit hardest first. The narrative "it is not happening to us" is a reassuring delusion. The key is to monitor closely the underlying drivers, not just the hindsight of financial outcomes. As the tale goes, "I don't have to outrun the bear . . . I just have to outrun you." Except when it comes to disruption, that strategy merely buys time. If the bear keeps running, it will get to you, too.

The typical traditional newspaper operator, likewise, wasn't blind to a shift taking place, but it rarely managed to mount a response that was sufficiently aggressive. One notable exception was former digital laggard Axel Springer. The German media company was "a mere Internet midget," according to *Financial Times Deutschland*, until it leapt into action in 2005. It went on a shopping spree, acquiring 67 digital properties and launching 90 initiatives of its own by 2013.¹³ Like Schibsted, it saw the value pools moving to online classifieds and made the leap. The lesson is that incumbents can win even with a late start, provided that they throw themselves in wholly. Today, digital media contributes 70 percent of Axel Springer's earnings before interest, taxes, depreciation, and amortization. The core has become the periphery.

¹³ Raf Weverbergh, "Strategy: How Axel Springer calculated and then bought its way to European digital dominance," Whiteboard, whiteboardmag.com.

To generate the acceleration needed at this stage of the game, incumbents must embark on a courageous and unremitting reallocation of resources from the old to the new model—and show a willingness to run new businesses differently (and often separately) from the old ones. Perhaps nothing underlines this point more than Axel Springer’s 2013 divestment of some of its strongest legacy print-media products, which accounted for about 15 percent of its sales, to Germany’s number-three print-media player, Funke Mediengruppe. These products, such as the *Berliner Morgenpost*, owned by Axel Springer since 1959, were previously a core part of the corporate DNA and emblems of its journalistic culture. But no more. They realized that the future value of the business was not just about the continuation of today’s earnings but rather relied on the creation of a new economic engine.

When incumbents lack the in-house capability to build new businesses, they must look to acquire them instead. Here the challenge is to time acquisitions somewhere between where the business model is proved but valuations have yet to become too high—all while making sure the incumbent is a “natural best owner” of the new businesses it acquires. Examples of this approach in the financial sector include BBVA’s acquisition of Simple and Capital One’s acquisition of the design firm Adaptive Path.

STAGE FOUR: ADAPTING TO THE NEW NORMAL

In this late stage, the disruption has reached a point when companies have no choice but to accept reality: the industry has fundamentally changed. For incumbents, their cost base isn’t in line with the new (likely much shallower) profit pools, their earnings are caving in, and they find themselves poorly positioned to take a strong market position.

This is where print media is now. The classifieds’ “rivers of gold” have dried up, making survival the first priority, and sustainability and growth the second. In 2013, the CEO of Australia media company Fairfax Media told the International News Media Association World Congress, “We know that at some time in the future, we will be predominantly digital or digital-only in our metropolitan markets.”¹⁴ True, some legacy mastheads have created powerful online news properties with high traffic, but display advertising and paywalls alone are for the most part not enough to generate a thriving revenue line, and social aggregation sites are continuing to drive unbundling. Typical media firms have had to undertake the multiple


¹⁴ Clive Mathieson, “Fairfax chief Greg Hywood sizes up the end of papers,” *The Australian*, May 1, 2013, theaustralian.com.au.

painful waves of restructuring and consolidation that may be needed while they seed growth and look for ways to monetize their brands.

For the incumbents who, like Axel Springer and Schibsted, have made the leap, the adaptation phase brings new challenges. Having become majority digital businesses, they're fully exposed to the volatility and pace that comes with the territory. That is, their adaptation response is less a one-time event than a process of continual self-disruption. Think of Facebook upending its business model to go "mobile first."¹⁵ You can't be satisfied with the first pivot—you have to be prepared to keep doing it.

In some cases, incumbents' capabilities are so highly tied to the old business model that rebirth through restructuring is unlikely to work, and an exit is the best way to preserve value. Eastman Kodak Company, for example, may have been better off leaving the photography business much faster, because its numerous strategies all failed to save it. When a business is built on a legacy technology that is categorically different from the new standard, even perfect foresight of the demise of film or CDs would not have solved the core problem that the digital replacement is fundamentally less profitable.

The simple fact is that new profit pools may not be as deep as prior ones (as many newspaper publishers have come to believe). The challenge is to adapt and structurally realign cost bases to the new reality of profit pools, and accept that the "new normal" likely includes far fewer "rivers of gold."

The reality is, most industries are still in stages one, two, and three. That's why the early experiences of media, music, and travel companies can prove so valuable. These first industries to transition to a digital reality highlight the social and human challenges that by their nature apply to companies in most every industry and geography. 

¹⁵ Jessica Guynn, "Facebook soars as 'mobile first' company," *USA Today*, January 28, 2015, usatoday.com.

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How a steel company embraced digital disruption

Gisbert Rühl, CEO of German metals company Klöckner, embedded himself in Berlin's start-up scene, creating two platforms to overhaul the organization's supply chain and make steel prices more transparent.

When you think about how incumbents are responding to digital disruption, steel companies may not immediately spring to mind. Yet German metals group Klöckner should. When the company's CEO, Gisbert Rühl, decided to build an innovation unit, he rented a coworking space in Berlin, brought along a couple of employees, and asked them to replace their ties with a willingness to learn how start-ups work. In this interview, Rühl tells McKinsey's Rik Kirkland how that endeavor ultimately changed Klöckner's supply chain, made the organization more efficient, and created platforms that make steel pricing more transparent for consumers.

DIGITIZING THE SUPPLY CHAIN

I pushed the company into digitization basically for two reasons. One reason is that steel is not only in a difficult cycle, I would say it's in a very difficult cycle. Because of oversupply, especially from China, there will not be a recovery, in my point of view, anytime soon. It will take years, maybe five years, maybe even ten years. That is one issue.

The other issue is our business model itself. The business model in steel distribution is very much based on earnings margins, also making margins through speculations. That was very much the case in the past, especially when steel prices went up. The more inventory you had, the more inefficient you were, the better your results were. That was especially the case between 2004 and 2008, and then again between 2010 and 2011. What we want to change is the supply chain, from the producer to the customer.

BUILDING AN INNOVATION UNIT

We found out that Berlin is a good environment for Klöckner because Silicon Valley is not really waiting for a company like Klöckner. But it's different in Berlin. We are also better known in Berlin. We started relatively pragmatic in a coworking space. I rented a desk in a coworking space for €1,000 per month, and I took two of my people there, and said, "Look, you start on Monday in Berlin. You don't need a tie, and you have two tasks. One task is to establish ourselves in this Berlin start-up scene. The second is to find out why start-ups are so much faster than incumbents."

And I said, "You don't have to start with a big operation. You can start small, for instance, in a coworking space." The second thing we learned was, it has to be a separate unit, especially when it's at least partially disrupted. This kind of innovation doesn't work from within. That works with sustainable innovations, but with innovations that are more disruptive, it doesn't work from inside. You need to establish a separate unit because you need separate people—in our case, digital natives. You also need separate processes, and maybe even a separate way to make profits.

MAKING STEEL PRICES MORE TRANSPARENT

The separate unit goes, in principle, in two directions. The first direction is that we want to build up, or that we're building a service platform, an Internet service platform, where we're integrating on the one side our suppliers—so, the big steel producers, for instance—and, on the other side, customers. That is the proprietary service platform. That is one direction.


Our target is that in 2019, 50 percent of all transactions should go through this platform. This is proprietary. We're also starting with a separate platform, with an independent platform, an industry platform. The reason is the following: in my point of view we will have platforms going forward, Internet platforms in every industry, like we have them already in B2C. Amazon is a platform, iTunes is a platform, and then others. An independent platform means that we have also onboard competitors on this platform.

We're doing both, by the way, because we don't know where it ends. Is it proprietary? OK, then we have our own platform. Is it more the independent model? Then we have the industry platform.

The price transparency will be much higher, and that is what a lot of our competitors fear. They say, more or less, "Are you dumb?" Because it was so nice in the past when nobody really knew how we made money. I said, "In the Internet world, with all this new technology, that will not work anyhow." If we don't do it, someone else will do it. Now we want to switch the way to make money. We want to get a service fee so that there is a clear basic price for the steel. Then we get a service fee on top, either for only supplying the steel, or for certain services for prefabrication. It's very transparent for the customer.

THE FUTURE OF DIGITAL PLATFORMS

Today we are more asset driven. Our resources are assets. Our know-how is steel know-how. Five years from now, our assets will be more the platform. It will be more intellectual property. Our people will be different to a certain extent. We will have much, much more digital people.

The processes will be different. Today we have the typical traditional formal and informal processes within the company. Also this will change because in the future all transactions will go through this platform. We will come to a point where we probably do business only online. The way we make profits, not this margin-arbitrage business, will be a real service business. 

Gisbert Rühl is the CEO of Klöckner. This interview was conducted by **Rik Kirkland**, the senior managing editor of McKinsey Publishing, who is based in McKinsey's New York office.

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Adapting your board to the digital age

Many directors are feeling outmatched by the ferocity of changing technology, emerging risks, and new competitors. Here are four ways to get boards in the game.

by Hugo Sarrazin and Paul Willmott

“Software is eating the world,” veteran digital entrepreneur Marc Andreessen quipped a few years back. Today’s boards are getting the message. They have seen how leading digital players are threatening incumbents, and among the directors we work with, roughly one in three say that their business model will be disrupted in the next five years.

In a 2015 McKinsey survey, though, only 17 percent of directors said their boards were sponsoring digital initiatives, and in earlier McKinsey research, just 16 percent said they fully understood how the industry dynamics of

their companies were changing.¹ In our experience, common responses from boards to the shifting environment include hiring a digital director or chief digital officer, making pilgrimages to Silicon Valley, and launching subcommittees on digital.

Valuable as such moves can be, they often are insufficient to bridge the literacy gap facing boards—which has real consequences. There’s a new class of problems, where seasoned directors’ experiences managing and monetizing traditional assets just doesn’t translate. It is a daunting task to keep up with the growth of new competitors (who are as likely to come from adjacent sectors as they are from one’s own industry), rapid-fire funding cycles in Silicon Valley and other technology hotbeds, the fluidity of technology, the digital experiences customers demand, and the rise of nontraditional risks. Many boards are left feeling outmatched and overwhelmed.

To serve as effective thought partners, boards must move beyond an arms-length relationship with digital issues. Board members need better knowledge about the technology environment, its potential impact on different parts of the company and its value chain, and thus about how digital can undermine existing strategies and stimulate the need for new ones. They also need faster, more effective ways to engage the organization and operate as a governing body and, critically, new means of attracting digital talent. Indeed, some CEOs and board members we know argue that the far-reaching nature of today’s digital disruptions—which can necessitate long-term business-model changes with large, short-term costs—means boards must view themselves as the ultimate catalysts for digital transformation efforts. Otherwise, CEOs may be tempted to pass on to their successors the tackling of digital challenges.

At the very least, top-management teams need their boards to serve as strong digital sparring partners when they consider difficult questions such as investments in experimental initiatives that could reshape markets, or even whether the company is in the right business for the digital age. Here are four guiding principles for boosting the odds that boards will provide the digital engagement companies so badly need.

CLOSE THE INSIGHTS GAP

Few boards have enough combined digital expertise to have meaningful digital conversations with senior management. Only 116 directors on the

¹ See “Cracking the digital code: McKinsey Global Survey results,” September 2015, McKinsey.com; and “Improving board governance: McKinsey Global Survey results,” August, 2013, McKinsey.com.

boards of the Global 300 are “digital directors.”² The solution isn’t simply to recruit one or two directors from an influential technology company. For one thing, there aren’t enough of them to go around. More to the point, digital is so far-reaching—think e-commerce, mobile, security, the Internet of Things (IoT), and big data—that the knowledge and experience needed goes beyond one or two tech-savvy people.

To address these challenges, the nominating committee of one board created a matrix of the customer, market, and digital skills it felt it required to guide its key businesses over the next five to ten years. Doing so prompted the committee to look beyond well-fished pools of talent like Internet pure plays and known digital leaders and instead to consider adjacent sectors and businesses that had undergone significant digital transformation. The identification of strong new board members was one result. What’s more, the process of reflecting quite specifically on the digital skills that were most relevant to individual business lines helped the board engage at a deeper level, raising its collective understanding of technology and generating more productive conversations with management.

Special subcommittees and advisory councils can also narrow the insights gap. Today, only about 5 percent of corporate boards in North America have technology committees.³ While that number is likely to grow considerably, tomorrow’s committees may well look different from today’s. For example, some boards have begun convening several subject-specific advisory councils on technology topics. At one consumer-products company, the board created what it called an advisory “ecosystem”—with councils focused on technology, finance, and customer categories—that has provided powerful, contextual learning for members. After brainstorming how IoT-connected systems could reshape the consumer experience, for example, the technology council landed on a radical notion: What would happen if the company organized the business around spaces such as the home, the car, and the office rather than product lines? While the board had no set plans to impose the structure on management, simply exploring the possibilities with board members opened up fresh avenues of discussion with the executive team on new business partners, as well as new apps and operating systems.

² See Rhys Grossman, Tuck Rickards, and Nora Viskin, *2014 Digital board director study*, January 2015, russellreynolds.com. Digital directors were defined as nonexecutive board members who play a significant operating role within a digital company, play a primarily digital operating role within a traditional company, or have two or more nonexecutive board roles at digital companies.

³ See Kim S. Nash, “Morgan Stanley board pushes emerging area of tech governance,” *Wall Street Journal*, March 26, 2015, wsj.com.

UNDERSTAND HOW DIGITAL CAN UPEND BUSINESS MODELS

Many boards are ill equipped to fully understand the sources of upheaval pressuring their business models. Consider, for example, the design of satisfying, human-centered experiences: it's fundamental to digital competition. Yet few board members spend enough time exploring how their companies are reshaping and monitoring those experiences, or reviewing management plans to improve them.

One way to find out is by kicking the tires. At one global consumer company, for instance, some board members put beta versions of new digital products and apps through the paces to gauge whether their features are compelling and the interface is smooth. Those board members gain hands-on insights and management gets well-informed feedback.

Board members also should push executives to explore and describe the organization's stock of digital assets—data that are accumulating across businesses, the level of data-analytics prowess, and how managers are using both to glean insights. Most companies underappreciate the potential of pattern analysis, machine learning, and sophisticated analytics that can churn through terabytes of text, sound, images, and other data to produce well-targeted insights on everything from disease diagnoses to how prolonged drought conditions might affect an investment portfolio. Companies that best capture, process, and apply those insights stand to gain an edge.⁴

Digitization, meanwhile, is changing business models by removing cost and waste and by stepping up the organization's pace. Cheap, scalable automation and new, lightweight IT architectures provide digital attackers the means to strip overhead expenses and operate at a fraction of incumbents' costs. Boards must challenge executives to respond since traditional players' high costs and low levels of agility encourage players from adjacent sectors to set up online marketplaces, disrupt established distributor networks, and sell directly to their customers.

The board of one electronic-parts manufacturer, for example, realized it was at risk of losing a significant share of the company's customer base to a fast-growing, online industrial distributor unless it moved quickly to beef up its own direct e-commerce sales capabilities. The competitor was offering similar parts at lower prices, as well as offering more customer-friendly features such as instant online quotes and automated purchasing

⁴ Our colleagues have described how boards also need to develop a shared language for evaluating IT performance. See Aditya Pande and Christoph Schrey, "Five questions boards should ask about IT in a digital world," *McKinsey Quarterly*, July 2016, McKinsey.com.

and inventory-management systems. That prompted the board to push the CEO, chief information officer, and others for metrics and reports that went beyond traditional peer comparisons. By looking closely at the cycle times and operating margins of digital leaders, boards can determine whether executives are aiming high enough and, if not, they can push back—for example, by not accepting run-of-the-mill cost cuts of 10 percent when their companies could capture new value of 50 percent or even more by meeting attackers head-on.

ENGAGE MORE FREQUENTLY AND DEEPLY ON STRATEGY AND RISK

Today's strategic discussions with executives require a different rhythm, one that matches the quickening pace of disruption. A major cyberattack can erase a third of a company's share value in a day, and a digital foe can pull the rug out from a thriving product category in six months. In this environment, meeting once or twice a year to review strategy no longer works. Regular check-ins are necessary to help senior company leaders negotiate the tension between short-term pressures from the financial markets and the longer-term imperative to launch sometimes costly digital initiatives.

One company fashioned what the board called a “tight-loose” structure, blending its normal sequence of formal meetings and management reporting with new, informal methods. Some directors now work in a tag team with a particular function and business leader, with whom they have a natural affinity in business background and interests. These relationships have helped directors to better understand events at ground level and to see how the culture and operating style is evolving with the company's digital strategy. Over time, such understanding has also generated greater board-level visibility into areas where digitization could yield new strategic value, while putting the board on more solid footing in communicating new direction and initiatives to shareholders and analysts.

Boardroom dialogue shifts considerably when corporate boards start asking management questions such as, “What are the handful of signals that tell you that an innovation is catching on with customers? And how will you ramp up customer adoption and decrease the cost of customer acquisition when that happens?” By encouraging such discussions, boards clarify their expectations about what kind of cultural change is required and reduce the hand-wringing that often stalls digital transformation in established businesses. Such dialogue also can instill a sense of urgency as managers seek to answer tough questions through rapid idea iteration and input gathering from customers, which board members with diverse experiences can help interpret. At a consumer-products company, one director engages with sales and

marketing executives monthly to check their progress against detailed key performance indicators (KPIs) that measure how fast a key customer's segments are shifting to the company's digital channels.

Risk discussions need rethinking, too. Disturbingly, in an era of continual cyberthreats, only about one in five directors in our experience feels confident that the necessary controls, metrics, and reporting are in place to address hacker incursions. One board subcommittee conducted an intensive daylong session with the company's IT leadership to define an acceptable risk appetite for the organization. Using survey data, it discovered that anything beyond two minutes of customer downtime each month would significantly erode customer confidence. The board charged IT with developing better resilience and response strategies to stay within the threshold.

Robust tech tools, meanwhile, can help some directors get a better read on how to confront mounting marketplace risks arising from digital players. At one global bank, the board uses a digital dashboard that provides ready access to ten key operational KPIs, showing, for example, the percentage of the bank's daily service transactions that are performed without human interaction. The dashboard provides important markers (beyond standard financial metrics) for directors to measure progress toward the digitized delivery of banking services often provided by emerging competitors.


FINE-TUNE THE ONBOARDING AND FIT OF DIGITAL DIRECTORS

In their push to enrich their ranks with tech talent, boards inevitably find that many digital directors are younger, have grown up in quite different organizational cultures, and may not have had much or even any board experience prior to their appointment. To ensure a good fit, searches must go beyond background and skills to encompass candidates' temperament and ability to commit time. The latter is critical when board members are increasingly devoting two to three days a month of work, plus extra hours for conference calls, retreats, and other check-ins.

We have seen instances where companies choose as a board member a successful CEO from a digitally native company who thrives on chaos and plays the role of provocateur. However, in a board meeting with ten other senior leaders, a strong suit in edginess rarely pays off. New digital directors have to be able to influence change within the culture of the board and play well with others. There are alternatives, though. If a promising candidate can't commit to a directorship or doesn't meet all the board's requirements, an advisory role can still provide the board with valuable access to specialized expertise.

Induction and onboarding processes need to bridge the digital–traditional gap, as well. One board was thrilled to lock in the appointment of a rising tech star who held senior-leadership positions at a number of prominent digital companies. The board created a special onboarding program for her that was slightly longer than the typical onboarding process and delved into some topics in greater depth, such as the legal and fiduciary requirements that come with serving on a public board. Now that the induction period is over, she and the board chairman still meet monthly so she can share her perspectives and knowledge as a voice of the customer, and he can offer his institutional insights. The welcoming, collaborative approach has made it possible for the new director to be an effective board participant from the start.

Organizations also need to think ahead about how the digital competencies of new and existing directors will fit emerging strategies. One company determined that amassing substantial big data assets would be critical to its strategy and acquired a Silicon Valley big data business. The company’s directors now attend sessions with the acquired company’s management team, allowing them to get a grounding in big data and analytics. These insights have proven valuable in board discussions on digital investments and acquisition targets.

Board members need to increase their digital quotient if they hope to govern in a way that gets executives thinking beyond today’s boundaries. Following the approaches we have outlined will no doubt put some new burdens on already stretched directors. However, the speed of digital progress confronting companies shows no sign of slowing, and the best boards will learn to engage executives more frequently, knowledgeably, and persuasively on the issues that matter most. 

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How a tech unicorn creates value

Delivery Hero CEO Niklas Östberg describes how his company disrupts the way we eat.

Niklas Östberg, an energetic 35-year-old Swede, is the CEO and cofounder of Delivery Hero. Based in Berlin and financed with venture-capital money, the company is built around an online platform that matches restaurants with hungry customers. Delivery Hero has grown to operate today in 33 markets across five continents, processing 14 million takeout orders each month and offering customers recommendations, as well as peer reviews of restaurants.

With a valuation of \$3 billion, Delivery Hero is also one of about 170 “unicorns”: start-ups with valuations above \$1 billion. Given the number of new companies that crashed when the turn-of-the-century tech bubble burst, many executives and investors have cast a skeptical eye on the unicorn

phenomenon. Östberg recently discussed with McKinsey’s Thomas Schumacher and Dennis Swinford the start-up landscape, the importance of innovation grounded in data, and his company’s role as a “disruptor of an inefficient restaurant industry.”

The Quarterly: Valuations of pre-IPO tech companies have come under scrutiny lately, particularly the emergence of so-called unicorns. What’s going on, in your perception?

Niklas Östberg: I’m sure a number of those unicorns shouldn’t be unicorns. As always, earlier-stage businesses come at a higher risk. But I am also sure that the next Google or Apple is among them—and if only one or two of the current pool of unicorns get to that level, it justifies their valuations, collectively, from an investor point of view.

But a lot has changed in the 15 years since the tech bubble of 2000. At that time, many valuations were based on what the future might look like, particularly in the Internet space, rather than on the returns a business could demonstrate. The supposition was that the world was changing and would probably change for the better as people went online. And although people did eventually go online, that happened much more slowly than predicted.

Today, there’s no doubt that online and Internet businesses are taking over. Some of the biggest businesses in the world, including Facebook, Amazon, Google, and Apple, are solidly grounded in the new world of technology. A lot of other companies also have large, tangible revenue growth and earnings. They don’t buy users or customers with the hope of making money when, maybe, those users eventually change their behavior. Delivery Hero, too, generates a lot of revenue—and earns a lot of profit in many markets. So valuations don’t depend on imaginary future earnings but on actual returns and EBITDA.¹

The Quarterly: How does your business model work?

Niklas Östberg: We’re a place where users and restaurants meet. The core of our business is an online platform that allows us to map users to the restaurants around them. Users are attracted to the platform and become very loyal to it because it helps them identify which restaurants are available and which ones are good. It’s also convenient because they can pay online, review past orders, and chart their savings.

¹ Earnings before interest, taxes, depreciation, and amortization.

It's a good model for restaurants, too. We channel more business to them and they increase their orders. And because the variable cost of food is pretty low, adding incremental customers is pretty lucrative. A restaurant that serves 100 orders a day might not make a lot of profit, for example, but if it boosts that to 110 orders a day, it would make good profits. Boost that to 200 orders a day, and it will make loads of money. So restaurants want to be on our platform, and we charge them a fee for transmitting orders. If they decide they no longer want to be on the platform, customers can order from other restaurants.

Everything is automated and online, so our gross profitability per order is around 90 percent. That also comes back to why we want to grow—because if you have 90 percent gross profitability and low variable costs, the closer you get, in theory, to 90 percent net profit. This compels us to build scale to add those incremental users and get closer to that 90 percent EBITDA margin. In some markets, we have already reached over 60 percent.

The Quarterly: Who are your competitors?

Niklas Östberg: The usual way of ordering food is to pick up the phone and call, so our biggest competitor is still the phone. And most people also still cook, though only some of them actually like doing it. So why shouldn't we get the many who don't like cooking? At a societal level, is it efficient for every little household to do its own cooking? For everyone to go to the supermarket and shop for groceries individually, versus buying groceries and preparing meals for 100 people at once? More and more, people don't cook as long as they can get the healthy food they want when they want it. That's our challenge, then—to improve the inefficiency of that industry, to make it more accessible and available.

NIKLAS ÖSTBERG



Education

MSc in industrial engineering and management, KTH Royal Institute of Technology and ETH Zurich

Career highlights

Delivery Hero Holding

(May 2011–present)

Cofounder and CEO

OnlinePizza

(November 2007–May 2011)

Cofounder and chairman

Fast facts

Provided capital and advice to several European start-ups as an angel investor, including Beekeeper, GetYourGuide, and Peakon

The Quarterly: You're talking about disrupting the entire social network of how people eat?

Niklas Östberg: I think we should, over the long term. Of course, you can't do that all at once, but if you look over ten years, why not? Our focus is first to attract those customers who order by phone and then to keep attracting new customers by making the service better. Every small, incremental improvement takes us one step closer. And at some point, maybe we'll have a service that's so good, why would anyone cook?

The Quarterly: So if home cooks and the telephone are your major competitors, who really worries you?

Niklas Östberg: We do also have competitors in our own space. Uber, for example, and Amazon and Yelp have similar efforts under way. It's a big space, so why wouldn't they try? Even Facebook could enable online food ordering via chat bots, which could completely change the industry yet again. And, indirectly, guys like Facebook could become our competitors because they could connect to someone else who provides restaurant info to their chat bots. And Google, continuously offering better access to information, is already offering restaurant data, including restaurant menus. So if we don't stay innovative and don't stay the best and don't offer access to the best and fastest food, then in the long term we are in trouble. That's why we can never relax.

The Quarterly: Do the restaurants get more value out of this than just reaching more customers?

Niklas Östberg: We try to give them as much value as we can, and it's part of our vision to do so. Besides attracting more customers, we reduce their operational costs, since they don't need to have someone answering the phone, for example. We also provide them with a point-of-sale system replacing the cash register and we compile useful statistics. That will not only save some thousands of euros per year but also help them provide better food and service to their customers.

And while we expect to do more in the next year or so, we're already able to tell restaurants which menu items are likely to work. We can say, for example, "it looks like there's no one in your area providing a bacon burger. Why don't you add a bacon burger to your menu?" We can say which dishes always bring customers back. Conversely, we can also tell which menu items draw customer complaints or have very low reorder rates. Customers order, but never return. Every time someone buys that dish, the restaurant loses a customer.

The Quarterly: Innovation is most successful when it disrupts what already exists. Who are you disrupting?

Niklas Östberg: I would say that we are a disruptor of an inefficient restaurant industry. We're disrupting bad service, inefficient manual processes. We're disrupting inefficiencies in how restaurants connect with customers—not every restaurant can build its own online food-ordering platform. We're disrupting inefficiencies in delivery. It makes no sense for every small restaurant to try to have its own delivery fleet with its own drivers, given the cost of maintaining a fleet and coordinating deliveries. After all, if a restaurant five kilometers away delivers to someone in one place and then goes five kilometers in another direction to deliver to someone else, it's expensive. It's bad for the environment. And it's bad for customers because it takes so long.

We're also disrupting the inefficiency of a system that doesn't serve the food customers want. If you were to ask people on the street, a lot of them would say, "I don't like delivery because I don't eat pizza" or "it's just bad quality and bad food." Combined, those inefficiencies raise costs and reduce quality.

The Quarterly: How are you using all the data you generate to improve your business?

Niklas Östberg: Big data should actually be big, meaning it should be available to the entire organization—especially at the front line of the business. That's where companies make tens of thousands of decisions every day, some of which can be handled automatically. These can be very small things, like "shall we do this kind of promotion for our users?" "Is that a good channel for our advertising?" "How do we improve our relationship with a specific customer?" If a restaurant has very bad delivery on Sunday evenings, we can downgrade it on Sunday evenings. If the system detects fraud, we can trigger people to stop ordering.

We also monitor our restaurants to maintain relationships. We know, for example, that a restaurant is likely to cancel its contract if it starts contacting us more frequently or gets negative feedback from customers. The data automatically trigger a pop-up to one of our sales agents—"call this restaurant, see what's wrong, and do what you can to help." This involves decisions that are made both automatically and independently by sales agents, as long as they have the right information, and saves a lot of money.

The Quarterly: Do data also help inform investment decisions?

Niklas Östberg: Data help us to be a little faster at managing our investments. Say you make an investment with a one-to-ten probability that you'll be right—but if you're right, you'll make a 100-to-1 return. That's a very good investment to try. The problem is that if you're wrong in nine out of ten cases, you need to have a very fast way of figuring that out. Then, when you do find the one investment with high returns, you can put a lot of money on it.

For example, while the main part of our offering is the online platform, we've also invested in separate businesses to handle delivery for independent restaurants. That is part of building up our logistics to enable a better service. Restaurants still do the cooking, naturally, but we track their orders. We offer quality assurance through metrics like user ratings and reorder rates. And we tell restaurants which dishes on their menus are good for delivery. We also make much more money on that—around €10 per order, less the cost of delivery.

For investments like that, we track the data and optimize performance, shutting them down quickly if it becomes clear they can't meet our expectations. We spent nine months on an earlier delivery-space investment, based on a different concept and setup, for example. We did as much as we could to improve its performance and invested close to €10 million in the project. But it wasn't meeting our expectations, so we shut it down. Now, maybe we could have realized that sooner and lost just €6 million, but other companies might have dragged out the investment and spent €100 million on it. The point is, if you're going to fail, you want to fail fast. You invest to validate or invalidate the concept and then shut it down if necessary.

The Quarterly: You appear to have a highly federated business model with a number of CEOs of individual delivery businesses. How does that work?

Niklas Östberg: Centralization is always more efficient, in a way, because you can do one thing and multiply it across units. On the other hand, giving people autonomy and authority and responsibility also has an amazing value. What rarely works is to be 100 percent one approach or the other. The trick is finding the right balance.


We give local CEOs autonomy and authority to encourage entrepreneurship—and they fight with blood and sweat to win in the market. But you have to set the rules of the game. And you have to set the culture of your company. That balance can be fragile. For example, if you set the wrong incentive scheme and you place autonomy at the local level, people are more likely

to optimize for their incentive schemes rather than for their businesses. And, suddenly, you're sitting there on a conference call wondering, "is this the right decision that he's suggesting or is this the right decision for him?" And you don't really know. That's why it's important to find people with an owner mentality rather than a manager whose personal interests are the top priority. Then give them an incentive scheme that reflects ownership as closely as possible.

Finally, we're a data-driven culture. Decisions based on data are the glue that holds us together. And if data are your starting point, then a CEO in Argentina, for example, can't just argue that "we should do it this way because every Argentinian's doing it this way." We might not agree, but we can do the A/B testing and see what the data tell us. CEOs get the final decision, but if they can't prove that their way is better and still do things their way, it's a question of judgment. You can be wrong many times as long as you address the issue.

The Quarterly: If we look back in our imaginations five years from now—say, after an IPO or acquisition—what would have to happen for Delivery Hero to fail? And what must happen for it to justify its considerable valuation today?

Niklas Östberg: We're in an economy that moves fast. It would be terribly dangerous to think that something can't go wrong or that we can't be disrupted. That could happen, especially if someone comes along with an innovation and we're not already there. So we are always—and I think you have to be—on the edge of innovating and on the edge of moving fast. That's what's required of companies at our stage.

In terms of revenue, we're in a good position. This is true even if I don't argue that we can grow over 50 percent five years in a row, though I think we could; even if I don't assume that we can improve our unit economics, though I think we will; and even if I don't assert that we can increase our pricing, though I think we can. Today's valuation is not built on some utopian assumption that the world will change and people will suddenly start ordering food in a certain way. People already order food online—and we have the data. We are the market leader in at least 25 markets. We have a business model that people like. And every second of every hour, we deliver 16 meals globally, hundreds of millions of orders a year. I think we've proved we can make a profit out of that. 

This interview was conducted by **Thomas Shumacher**, a partner in McKinsey's Dusseldorf office, and **Dennis Swinford**, a senior editor of McKinsey Publishing, who is based in the Seattle office.



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The ‘tech bubble’ puzzle

Public and private capital markets seem to value technology companies differently. Here’s why.

by David Cogman and Alan Lau

Aggressive valuations among technology companies are hardly a new phenomenon. The widespread concerns over high pre-IPO valuations today recall debates over the technology bubble at the turn of the century—which also extended to the media and telecommunications sectors. A sharp decline in the venture-capital funding for US-based companies in the first quarter of the year feeds into that debate,¹ though the number of “unicorns”—start-up companies valued at more than a billion dollars—over that same period continued to rise.

¹ Scott Martin, “Startup investors hit the brakes,” *Wall Street Journal*, April 14, 2016, wsj.com.

The existence of these unicorns is just one significant difference between 2000 and 2016. Until seven years ago, no venture capital–backed company had ever achieved a billion-dollar valuation before going public, let alone the \$10 billion valuation of 14 current “deca-corns.” Also noteworthy is the fact that high valuations predominate among private, pre-IPO companies, rather than public ones, as was the case at the turn of the millennium. And then there’s the global dimension: innovation and growth in the Chinese tech sector are much bigger forces today than they were in 2000.²

All of these factors suggest that when the curtain comes down on the current drama, the consequences are likely to look quite different from those of 16 years ago. Although the underlying economic changes taking place during this cycle are no less significant than the ones during the last cycle, valuations of public-market tech companies are, at this writing, mostly reasonable—perhaps even slightly low by historical standards. A slump in current private-sector valuations would be unlikely to have much impact on the broader public markets. And the market dynamics in China and the United States are far from similar. In this article, we’ll elaborate on the fundamentals at work, which extend beyond the strength of the current pipeline of pre-IPO tech companies, and on the funds that have washed over the venture-capital industry in recent years.

THE LESSONS OF HISTORY

The defining feature of the 2000 tech bubble was that it was a public-market bubble. At the start of 1998, valuations for tech companies were 40 percent higher than for the general market: at the peak of the bubble in early 2000, they were 165 percent higher. However, at that point the largest-ever venture-invested tech start-up we could find evidence of barely exceeded a \$6 billion valuation at IPO—a small number by today’s standards. Moreover, a considerable part of the run-up in valuation came not from Internet companies but from old-school telecom companies, which saw the sector’s total value grow by more than 250 percent between 1997 and 2000.

Equity markets seem to have learned from that episode. In aggregate, publicly held tech companies in 2015 showed little if any sign of excess valuations, despite the steadily escalating ticket size of the IPOs. Valuations of public tech companies in 2015 averaged 20 times earnings, only 10 percent above the general market, and they have been relatively stable at those levels since 2010.

² The lion’s share of the more than 160 pre-IPO unicorns is in the United States and China. See, for example, “The unicorn list: Current private companies valued at \$1B and above,” CB Insights, updated in real time, cbinsights.com.

By historical standards, that's relatively low: over the past two decades, tech companies on average commanded a 25 percent valuation premium, often much more. During the technology and telecommunications bubble of 2000, the global tech-sector valuation peaked at just under 80 times earnings, more than 3 times the valuation of nontech equities. And over the five years after the bubble burst in 2001, the tech sector enjoyed a valuation premium of, on average, 50 percent over the rest of the equity market (exhibit). Even with a focus limited to Internet companies—the sector most often suspected of runaway valuations—there is no obvious bubble among public companies at present.

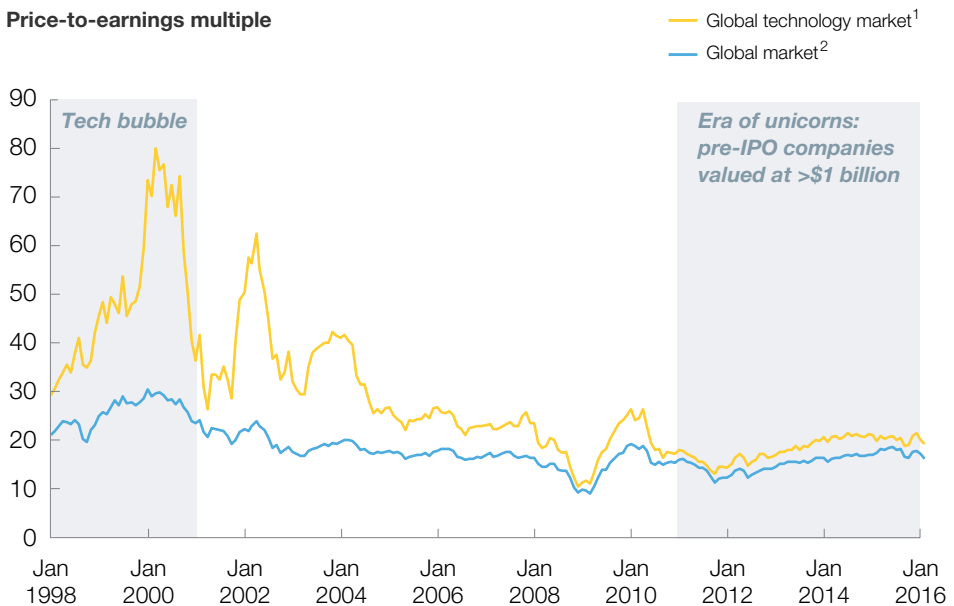
Nor do these companies' valuation premiums appear excessive to the general market when viewed in the light of their growth expectations. Higher multiples are in most cases explained by higher consensus forecasts for earnings growth and margins. The market could be wrong in these expectations, but at least it is consistent.

China is a notable exception, though equity valuations in China always need to be viewed with caution. Before 2008, Chinese tech companies were valued

Exhibit

Today's public tech valuations are roughly in line with the general market globally.

Price-to-earnings multiple



¹ Index of 392 publicly listed technology companies.

² Index of 7,115 publicly listed companies.

Source: Datastream

on average at a 50 to 60 percent premium over the general market. Since then, that premium has grown to around 190 percent. Why? In part because the Chinese online market is both larger and faster growing than the United States, and the government has ambitious plans to localize the higher-value parts of the hardware value chain over the next few years.³ The growth in China's nonstate-owned sector is another part of the story. Many of the new technology companies coming to the market in the past five years have been nonstate-owned, and nonstate-owned companies are consistently valued 50 percent to 100 percent higher than their state-owned peers in the same segments.

THIS TIME, IT'S DIFFERENT?

Where the picture today is most different from 2000 is in the private capital markets, and in how companies approach going public.

It wasn't until 2009 that a pre-IPO company reached a \$1 billion valuation. The majority of today's unicorn companies reached that valuation level in just the past 18 months. They move in a few distinct herds: roughly 35 percent of them are in the San Francisco Bay area, 20 percent are in China, and another 15 percent are on the US East Coast.

Notable shifts in funding and valuations have accompanied the rising number of these companies. The number of rounds of pre-IPO funding has increased, and the average size of venture investments more than doubled between 2013 and 2015, which saw both the highest average deal size and highest number of deals ever recorded. Increases in valuation between rounds of funding have also been dramatic: it's not unusual to see funding rounds for Chinese companies involving valuation increases of up to five times over a period of less than a year.

Whatever the quality of new business models emerging in the technology sector, what's unmistakable is that the venture-capital industry has built up an unprecedented supply of cash. The amount of uninvested but committed funds in the industry globally rose from just over \$100 billion in 2012 to nearly \$150 billion in 2015, the highest level ever. And where buyout, real-estate, and special-situations funds all have the luxury of looking across a range of deal sizes, industries, or even asset classes, venture capitalists have less flexibility. Many venture funds fish in the same pool of potential deals, and some only within their geographic backyard.

³ "China said to plan sweeping shift from foreign technology to own," *Bloomberg*, December 18, 2014, bloomberg.com.

The liquidity in the venture-capital industry has been augmented by the entry of a new set of investors, with limited partners in some funds looking for direct investment opportunities into venture-funded companies as they approach IPO. This allows companies to do much larger pre-IPO funding rounds, marketed directly to institutional investors and high-net-worth individuals. These investors dwarf the venture-capital industry in scale and can therefore extend the runway before IPO, though not indefinitely: their participation is contingent on the promise of an eventual exit via IPO or sale.

Thus valuations of individual pre-IPO start-ups need to be viewed cautiously, as the actual returns their venture-capital investors earn flow as much from protections built into the deal terms as by the valuation number itself. In a down round (when later-stage investors come in at a lower valuation than the previous round), these terms become critical in determining how the pie is divided among the different investors.

THE IPO HURDLE

Private-equity markets do not exist in isolation from public markets: with few exceptions, the companies venture capitalists invest in must eventually list on public exchanges, or be sold to a listed company. The current disconnect between valuations in these two markets will somehow be resolved, either gradually, through a long series of lower-priced IPOs, or suddenly, in a massive slump in pre-IPO valuations.

Several factors incline toward the former. Some late-stage investors, such as Fidelity and T. Rowe Price, have already marked down their investments in multiple unicorns, and it's increasingly common for start-up IPOs to raise less capital than their pre-IPO valuations. Given the still-lofty level of those valuations, this no longer attracts the extreme stigma that it did in 2000. Regardless of how the profits divide up, the company is still independent and now listed.

Tech companies also are staying private for, on average, three times longer.⁴ A much greater share of companies wait until they are making accounting profits before coming to market. From 2001 to 2008, fewer than 10 percent of tech IPOs were launched after the company had reached profitability: since 2010, almost 50 percent had reached at least the break-even point. The number of companies coming to market has remained relatively flat since the 1990s technology bubble. But the average capitalization at IPO time has

⁴ Jeremy Abelson and Ben Narasin, "Why are companies staying private longer?," *Barron's*, October 9, 2015, barrons.com.

more than doubled in the past five years, reflecting the fact that the companies making public offerings are larger and more mature.

What happens post-IPO? Over the past three years, 61 tech companies have gone public with a market cap of more than \$1 billion. The median company in this group is now trading just 3 percent above its listing price. The valuations of a number of former unicorns are lower still, including well-known companies like Twitter in the United States and Alibaba in China.

History paints a challenging picture for many of these recently listed companies. Between 1997 and 2000, there were 898 IPOs of technology companies in the United States, valued collectively at around \$171 billion. The attrition among this group was brutal. By 2005, only 303 of them remained public. By 2010, that number had declined to 128. In the decade from 2000 to 2010, the survivors among these millennials had an average share-price return of -3.7 percent a year. In the subsequent five years, they returned only -0.8 percent per annum—despite soaring equity markets.

THE GEOGRAPHIC DIMENSION

The current crop of pre-IPO companies is far more diverse than in 2000. It will be particularly interesting to see which of the two largest geographic groups—the US and the Chinese unicorns—weathers the shakeout best. Consider just Internet companies. The total market value of listed Internet companies today is around \$1.5 trillion. Of this, US companies represent nearly two-thirds, and Chinese companies—mostly listed in the United States—almost all of the remainder. The rest of the world put together amounts to less than 5 percent.

The differences between the unicorns in these regions are revealing. Of the more than 100 unicorns operating in the United States and China, only 14 have overlapping investors, and just two—the electronics company Xiaomi and the transportation-network company Didi Chuxing (formerly Didi Kuaidi)—account for two-thirds of the combined valuation of all of them. Three-quarters of the Chinese unicorns are primarily in the online space, compared with less than half of the US unicorns, and these serve separate user bases as a result of regulatory separation of the two countries' Internet markets.

It is not obvious which group holds the advantage. The local market to which Chinese Internet companies have access is substantial, with well over twice as many users as in the United States; the e-commerce market is significantly larger and growing almost three times as fast. Moreover, the three Chinese

Internet giants, Baidu, Alibaba, and Tencent, have invested in many of the Chinese unicorns, giving them easier access to a platform of hundreds of millions of users on which to operate.

The Chinese unicorns also have a much higher proportion of “intermediary” companies—start-ups that act primarily as channels or resellers of other companies’ services and take a cut of earnings. Around a third of the Chinese unicorns have business models of this kind, compared with only one in eight of their US counterparts. Finally, the US start-ups tend to adapt faster to a global audience. Although there are several established Chinese technology companies that have successfully made the leap to the global stage, such as Huawei, Lenovo, and ZTE, very few of the companies founded in the past five years have reached that point.

For all the differences between the tech start-up markets of today and those of 2000, both periods are marked by excitement at the potential for new technologies and businesses to stimulate meaningful economic change. To the extent that valuations are excessive, the private markets would appear to be more vulnerable. But perspective is important. The market capitalization of the US and Chinese equity markets declined by \$2.5 trillion in January alone. Any correction to the roughly half a trillion dollars in combined value of all the unicorns as of their last funding round is likely to seem milder than the correction of the last technology bubble. (Q)

David Cogman is a partner in McKinsey’s Hong Kong office, where **Alan Lau** is a senior partner.

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HOW BLOCKCHAINS COULD CHANGE THE WORLD

In commentary adapted from a recent interview, the coauthor of Blockchain Revolution explains why blockchains, the technology underpinning digital cryptocurrencies, have the potential to revolutionize the world economy.



Don Tapscott is CEO of the Tapscott Group and coauthor of *Blockchain Revolution*.

The blockchain is basically a distributed database. Think of a giant, global spreadsheet that runs on millions and millions of computers. It's distributed. It's open source, so anyone can change the underlying code, and they can see what's going on. It's truly peer to peer; it doesn't require powerful intermediaries to authenticate or to settle transactions.

It uses state-of-the-art cryptography, and it could record any structured information: Not just who paid whom but also who married whom, or who owns what land, or what light bought power from what power source, or a settlement system to settle trillions of real-time transactions in the case of the Internet of Things.

So this is an extraordinary thing. An immutable, unhackable, distributed database of digital assets. This is a platform for truth and it's a platform for trust. The implications are staggering, not just for the financial-services industry but also right across virtually every aspect of society. Most blockchains—and Bitcoin is the biggest—are what you call permission-less systems. We can do transactions and satisfy each other's economic needs without knowing who the other party is, and independent from central authorities.

These blockchains all have a digital currency of some kind associated with them, which is why everybody talks about Bitcoin in the same breath as the blockchain, because the Bitcoin blockchain is the biggest. There have been lots of problems with Bitcoin. You had big exchanges like Mt. Gox fail. You had the Silk Road, where Bitcoin was the payment system for all kinds of horrific, illegal activity. But don't be confused by that. To me, the blockchain, the underlying technology, is the biggest innovation in computer science—the idea of a distributed database where trust is established through mass collaboration and clever code rather than through a powerful institution that does the authentication and the settlement.



How the blockchain works

There's a huge community called miners, and they have a powerful computing resource. Some people have estimated that the entire computing power of Google would be 5 percent of the Bitcoin blockchain-computing power. That platform solves this big problem called the double-payment problem. If I send you an MP3 file and I send it to somebody else, it's a problem for the record industry. If I send you \$20, and I send the same file to somebody else, that's a massive problem called fraud: the economy stops if you have a monetary system based on that.

With a blockchain transaction, I send you the \$20, and these miners, to make a long story short, go about authenticating that the transaction occurred. Each miner is motivated to be the first one to find the truth, and once you find the truth, it's evident to everybody else. When you find the truth and you solve a complex mathematical problem, you get paid some money, some Bitcoin.


For me to hack that and try and send the same money to somebody else, or for me to come in and try and take your \$20 worth of Bitcoins, is not practically possible because I'd have to hack that block, and that block is linked to the previous block, and the previous block—ergo, chain: that's why it's called blockchain. This blockchain is running across countless numbers of computers. I would have to commit fraud in the light of the most powerful computing resource in the world, not just for that but for the entire history of commerce, on a distributed platform. This is not practically feasible.

Many people make the mistake of thinking, "Bitcoin? Well, that's an asset. Should I invest? Is it going to go up or down?" That's not of interest to me, just like speculating in gold is not of interest to me. Of serious interest is Bitcoin as a digital currency that enables us to do these kinds of transactions: a cryptocurrency that's not based on nation-states. The most important thing that we focus on in our work is the much bigger question, this underlying, distributed-database technology that enables us to have a truthful and immutable record of everything.

How disruption can occur

You pick any industry, and this technology holds huge potential to disrupt it. For example, in *Blockchain Revolution*, we identified eight different things that the financial-services industry does: it moves money, it stores money, it lends money, it trades money, it attests to money, it accounts for money, and so on. Every one of those can be challenged.

Sometimes disruption may create a more prosperous world where people get to participate in the value that they create. Maybe as a recording artist posting my music on a blockchain music platform, I'll say, "You listen to the music, it's free. You want to put it in your movie? It's going to cost you this much,



and here's how that works. You put it in the movie, the smart contract pays me." Or how about using it for a ringtone? Here's the smart contract for that.

This is not a pipe dream. Imogen Heap, who's a brilliant singer-songwriter in the United Kingdom and a best-selling recording artist, has been part of creating Mycelia, and they're working with an amazing company called Consensus Systems, that's all around the world: blockchain developers, using the Ethereum platform, which is one blockchain. She has already posted her first song onto the Internet. I fully expect that many big recording artists will be seriously investigating a whole new paradigm whereby the musicians get compensated for the value that they create.

What could go wrong?

We identified ten showstoppers and we went through them in detail in our research and in *Blockchain Revolution*. There are showstoppers such as the energy that's consumed to do this, which is massive. Another showstopper is that this technology is going to be the platform for a lot of smart agents that are going to displace a lot of humans from jobs. Maybe this whole new platform is the ultimate job-killer.


The biggest problems, though, have to do with governance. Any controversy that you read about today is going to revolve around these governance issues. This new community is in its infancy. Unlike the Internet, which has a sophisticated governance ecosystem, the whole world of blockchain and digital currencies is the Wild West.

It's a place of recklessness and chaos and calamity. This could kill it if we don't find the leadership to come together and to create the equivalent organizations that we have for governance of the Internet. We have the Internet Engineering Task Force, which creates standards for the Net. We have the Internet Governance Forum, which creates policies for governments. We have the W3C Consortium, which creates standards for the web. There's the Internet Society; that's an advocacy group. There's the Internet Corporation for Assigned Names and Numbers (ICANN), an operational network that delivers the domain names. There's a structure and a process to figure out things.

Right now, for example, there's a big debate about the block size. We need a bigger block size to be able to handle all of the transactions that will be arising. There are legitimate points of view and big differences between them. The problem is, there's no process to be able to come up with an optimal solution.

Imagine the possibilities

I'm not a futurist. I think the future's not something to be predicted—it's something to be achieved. What we're arguing is that this technology is




revolutionary and holds vast potential to change society. It feels a lot like the early '90s to me. You've got all the smartest venture capitalists, the smartest programmers, the smartest business executives, the smartest people in banking, the smartest government people, the smartest entrepreneurs all over this thing. That's always a sign that something big is going on. Is it an irrational exuberance? I don't know.

I'm hopeful, even optimistic, because I can see the power of the applications to disrupt things for the good. Rather than just redistributing wealth, maybe we could change the way wealth is distributed in the first place. Imagine a Kickstarter-like campaign to launch a company where you have 50 million investors and everybody puts in a couple of dollars, or very small amounts.

Imagine all those people who have a supercomputer in their pocket, who are connected to a network but don't have a bank account, because they only own a couple of pigs and a chicken. That's their bank account. Imagine if 2 billion people could be brought into the global financial system. What could that do?

Imagine a world where foreign aid didn't get consumed in the bureaucracy but went directly to the beneficiary under a smart contract. Rather than a car-service aggregation app, why couldn't we have a distributed app on the blockchain that manages all these vehicles and handles everything from reputation to payments? Or blockchain Airbnb? This is all about the value going to the creators of value rather than to powerful forces that capture it.

In the process, we can protect our privacy. Privacy is a basic human right, and people who say "It's dead—get over it" are deeply misinformed. It's the foundation of a free society. Imagine each of us having our own identity in a black box on the blockchain. When you go to do a transaction, it gives away a shred of information required to do that transaction, and it collects data. You get to keep your data and monetize it if you want, or not. This could be the foundation of a whole new era whereby our basic right to privacy is protected, because identity is the foundation of freedom and it needs to be managed responsibly.

We've been unable to do that, so far. I'm compelled most by the power of this opportunity. I've been writing about the digital age for 35 years, and I've never seen a technology that I thought had greater potential for humanity. 

This commentary was adapted from an interview conducted by **Rik Kirkland**, the senior managing editor of McKinsey Publishing, who is based in McKinsey's New York office.

NEW TALENT TENSIONS IN AN ERA OF LOWER INVESTMENT RETURNS

Employers can differentiate themselves by adjusting to the changing financial realities.



Richard Dobbs is a senior partner in McKinsey's London office.

The financial markets are poised to impose new pressures on top-management teams. We're not talking about hitting earnings targets, contending with share-price gyrations, or engaging with activist investors. Those imperatives will not go away. But in the coming decades, they're likely to be joined by something quieter yet perhaps more sweeping: an era of overall investment returns that are substantially lower than those of the past 30 years. The implications are significant for a wide range of stakeholders, and they will spill over to large employers in ways that extend beyond pension management to the heart of many companies' talent equations.



Susan Lund is a partner at the McKinsey Global Institute (MGI) and is based in the Washington, DC, office.


New realities

The starting point for understanding these new realities is the standard disclaimer on investment-fund communications: "Past performance is not necessarily indicative of future results." Over the past 30 years, US and Western European stocks and bonds delivered returns to investors that were considerably higher than the long-term average. Real total returns (including dividends and capital appreciation) on US and Western European equities were between 1.4 and 3.0 percentage points higher in the period from 1985 to 2014 than the 100-year average from 1914 to 2014. Total real bond returns in the United States in those 30 years were 3.3 percentage points above the 100-year average, while in Western Europe they were 4.2 percentage points higher. Returns in this period have shaped the expectations of most investors and executives.



Sree Ramaswamy is a senior fellow at MGI and is based in the Washington, DC, office.

We can link equities and fixed-income investment returns directly to real economic and business fundamentals. Our analysis suggests that the exceptional returns of the past 30 years were underpinned by a confluence of four highly beneficial conditions: lower inflation; falling interest rates; strong global GDP growth that was fueled by positive demographics, productivity gains, and rapid growth in



emerging markets, particularly China; and corporate-profit growth in excess of GDP, thanks to the expansion of global markets, lower borrowing costs, lower taxes, and efficiency gains from automation and global supply chains.

But now each of these four conditions has weakened or reversed. The steep decline in inflation and interest rates that contributed to capital gains, especially for bondholders, is largely over, as rates hover around zero. The employment growth that contributed to GDP growth in the past 30 years is waning because of demographic shifts. And after a period of exceptional profitability, the strongest since the late 1920s, US and Western European corporations face tough new margin pressures from emerging-market competitors, technology firms moving into new sectors, and smaller companies using digital platforms such as Alibaba and Amazon to turn themselves into “micromultinationals.”¹

As a result, our analysis suggests that total real US and Western European equity returns in the next 20 years could be between 1.5 and 4.0 percentage points lower than they were in the past 30 years. For fixed-income returns, the gap could be between 3.0 and 5.0 percentage points, and in some cases even larger (exhibit). In Western Europe, for example, our projections indicate that total real fixed-income returns could be near zero—or even negative for a few years.

New priorities

Before going further, let us pause to reiterate that these estimates are based on a long-term view of economic and business fundamentals. We are not investment managers or market prognosticators, and we cannot predict how these forces will interact to move markets in the short term. We also recognize that the economy and businesses have the potential to surprise us both positively and negatively—creating and destroying wealth and value in unforeseeable ways that could change the equation of future returns.

Nonetheless, the underlying shifts are real, and they suggest that, barring pleasant surprises such as a major surge in productivity growth, investment returns in the next two decades will be under significant pressure. An era of lower returns would prove challenging for many stakeholders. Municipal retirees, taxpayers, and bondholders, for example, will suffer if lower returns make it harder for already-strapped public pension funds to cover their obligations. (We estimate the deficit for US public-sector pensions could rise to as much as \$3 trillion.)

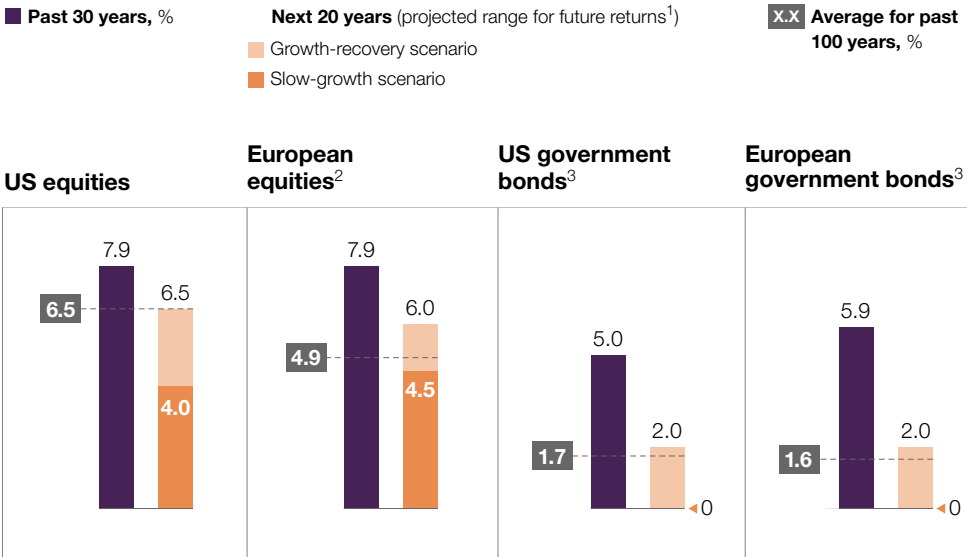
The exposure of corporations is less obvious. Many have already replaced defined-benefit pension plans with defined-contribution plans or have been

forced to take a more conservative view on the outlook for investment returns for their remaining defined-benefit liabilities.

That may remove immediate financial pressure from the books of employers, but it doesn't shield them from the impact of lower returns on their *employees*, who now bear investment-market risk as they save for their own retirement. Individuals will feel the impact directly in their investment portfolios and pensions. A two-percentage-point difference in average returns over an extended period means that in order to live as well in retirement as would have been possible with higher returns, a 30-year-old today would have to either work seven years longer or almost double her savings rate—and this does not factor in the effect of rising life expectancy. No matter how you slice it, the implications for employees of a lower-return world are significant, suggesting some new imperatives for employers seeking to attract, retain, and motivate talented workers:

Exhibit

After an era of stellar performance, investment returns may come back down to earth over the next 20 years.




¹ Numbers reflect the range between the low end of the slow-growth scenario and the high end of the growth-recovery scenario.

² Weighted average real returns based on each year's Geary-Khamis purchasing-power-parity GDP for 14 countries in Western Europe.

³ Bond duration for United States is primarily 10 years; for Europe, duration varies by country but is typically 20 years.

Source: McKinsey Global Institute analysis (For the full report, see "Why investors may need to lower their sights," on McKinsey.com)



Make the most of long careers. What will happen if large numbers of financially strapped employees seek to extend their careers? On the positive side of the ledger, longer working lives could mitigate the severity of the demographic and skills crunch that many have forecast as baby boomers retire. But those benefits could evaporate if organizations cannot figure out how to make sure their aging workforces remain productive, engaged, and cost effective as the business world changes, the skills they need evolve, and their compensation rises with tenure. What's more, older people extending their careers could create challenges for their younger coworkers. Many millennials are already glum about their growth prospects as they look up the corporate ladder. Incumbent companies will have to get creative to compete with start-ups with fewer aging workers.

Many companies are now experimenting with alternative solutions, although few would claim they have solved the problem. Two critical steps will be to create different opportunities for would-be retirees and to break the link between tenure and compensation. Numerous surveys have shown that while many retirement-age people would like to continue working, few want or would be effective in traditional full-time positions, particularly those demanding physical strength. Job opportunities that offer flexible hours, part-time schedules, and the ability to work from home are particularly attractive and can be paid on a different scale. Occupations that emphasize training, customer service, advice, and mentoring can put to use the life-time of institutional knowledge and company-specific skills that older workers have accumulated.

Promote smarter participation in retirement plans and rethink their design. To protect themselves from legal liability, companies have shied away from giving financial advice to employees investing in defined-contribution pension plans. But financial literacy should be a different story. Part of being a good corporate citizen in an era of diminishing returns is helping workers who are unaware of this looming change to plan for it. They need to make more realistic assumptions about their future assets and incomes, adjust their financial and savings behavior accordingly, minimize investment costs, and plan their career paths with new financial realities in mind. Companies that offer realistic financial education might be able to differentiate themselves as employers. In a world where individuals shoulder the risks of retirement, companies that help them think more intelligently about those risks are making a real contribution to their people and to society.


Beyond financial education for employees, behavioral economics has shown that a variety of “nudges” can shift people’s behavior.² Making enrollment and investment in defined-contribution retirement plans automatic, with an

In a world where individuals shoulder the risks of retirement, companies that help them think more intelligently about those risks are making a real contribution to their people and to society.

opt-out provision, rather than requiring employees to sign up for them, has been shown to boost participation dramatically. Similarly, the initial monthly deposit into such accounts can be set low and automatically escalate each year. The default investment option for these plans, moreover, should be a diversified portfolio of bonds and equities, not a money-market fund. Many companies have begun to offer target-date retirement portfolios to their employees to simplify their decisions. These plans typically adjust over time, shifting from more-volatile equities to more-stable fixed-income returns as people approach retirement age. The fact is, in a busy world with many competing demands, few people choose to use their limited time and mental energy to research retirement investment options or portfolio allocations.

Refocus compensation plans on long-term performance. Company stock plans and share-option schemes have become an important part of compensation packages—particularly for senior executives, as the compensation committees of boards have tried to link pay, in part, to their companies' stock prices. If stock-market performance lags behind the returns of the recent past, existing compensation packages that link executive and employee pay to stock-price performance won't deliver the results executives have come to expect. It also will be more difficult to meet shareholders' expectations, potentially intensifying the pressure on executives to deliver short-term financial performance. That pressure has been increasing since 2008, according to a recent McKinsey survey—which could make this an auspicious moment to reset incentive programs for executives and employees. Such programs could be altered to focus on long-term performance (five years is the time horizon urged by Fidelity Investments, the North America-based mutual-fund and financial-services

firm³), to reward stock performance relative to the market or to the company's sector, and to incorporate operating metrics beyond a company's share-price movements.

We recognize that these suggestions are longer on “what” than “how.” That's largely a reflection of where we are in the era of lower returns. As yet, there's little recognition of the new realities or of their implications for the value propositions companies are offering their employees. Simply putting priorities like those we've staked out here on the top-management agenda would be progress, and with any luck will stimulate creative responses. We're all in this together, and business leaders who think they are immune to these pressures could have a rude awakening. 

¹ See Richard Dobbs, Tim Koller, and Sree Ramaswamy, “The future and how to survive it,” *Harvard Business Review*, October 2015, hbr.org.

² See Cass R. Sunstein and Richard H. Thaler, *Nudge: Improving Decisions About Health, Wealth, and Happiness*, revised and expanded edition, New York, NY: Penguin Books, 2009.

³ “Appendix: Proxy voting guidelines,” fidelityinternational.com.

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Download the authors' full report, *Diminishing returns: Why investors may need to lower their expectations*, on [McKinsey.com](https://www.mckinsey.com).

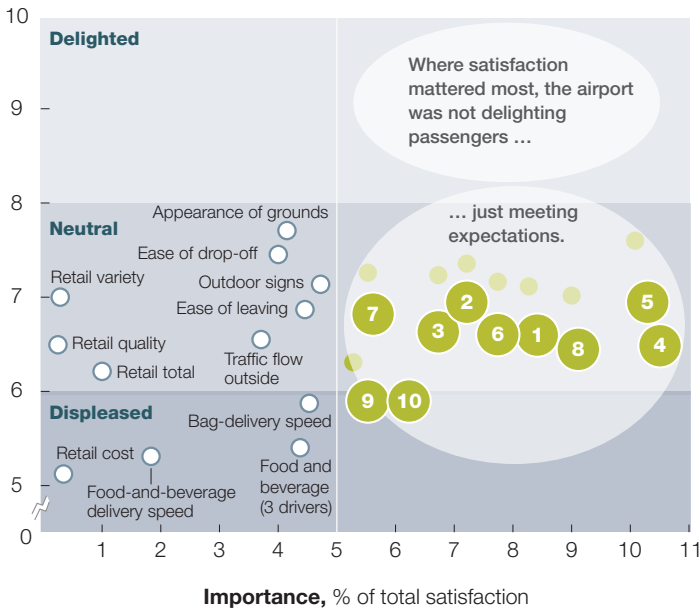
TRANSPORTS OF DELIGHT

by Brooke Boyarsky, Will Enger, and Ron Ritter

Almost every successful company recognizes that it's in the customer-experience business. On its own, though, that recognition is not enough to spur organizational change and drive distinctive performance. A vital first step is to define what matters most to customers, and whether there is a gap between their wants and needs and what they are getting at the moment.

Executives at one major airport recently discovered how powerful and counterintuitive the results of such an exercise can be. Combining data analysis, employee focus groups, and shop-floor observation, they developed a profile of what makes customers satisfied (or dissatisfied) with airports, as well as actionable insights that led directly to the design of a new customer-experience program.

Average customer-satisfaction score (on a scale of 1–10, where 10 = highest)



- 1 Restroom cleanliness and availability
- 2 Availability and quality of postsecurity seating
- 3 Relevant and timely journey information
- 4 Entertainment for long-stay passengers
- 5 Finding check-in and Transportation Security Administration (TSA)
- 6 Finding ground transportation
- 7 Check-in process
- 8 Perception of efficiency and courtesy of TSA
- 9 TSA checkpoint layout
- 10 Passenger processing through TSA

Brooke Boyarsky is a consultant in McKinsey's Dallas office, where **Will Enger** is an associate partner; **Ron Ritter** is a partner in the Miami office.

For more on creating exceptional customer experiences, see "The CEO guide to customer experience," on page 30.

Highlights

The CEO guide to customer experience

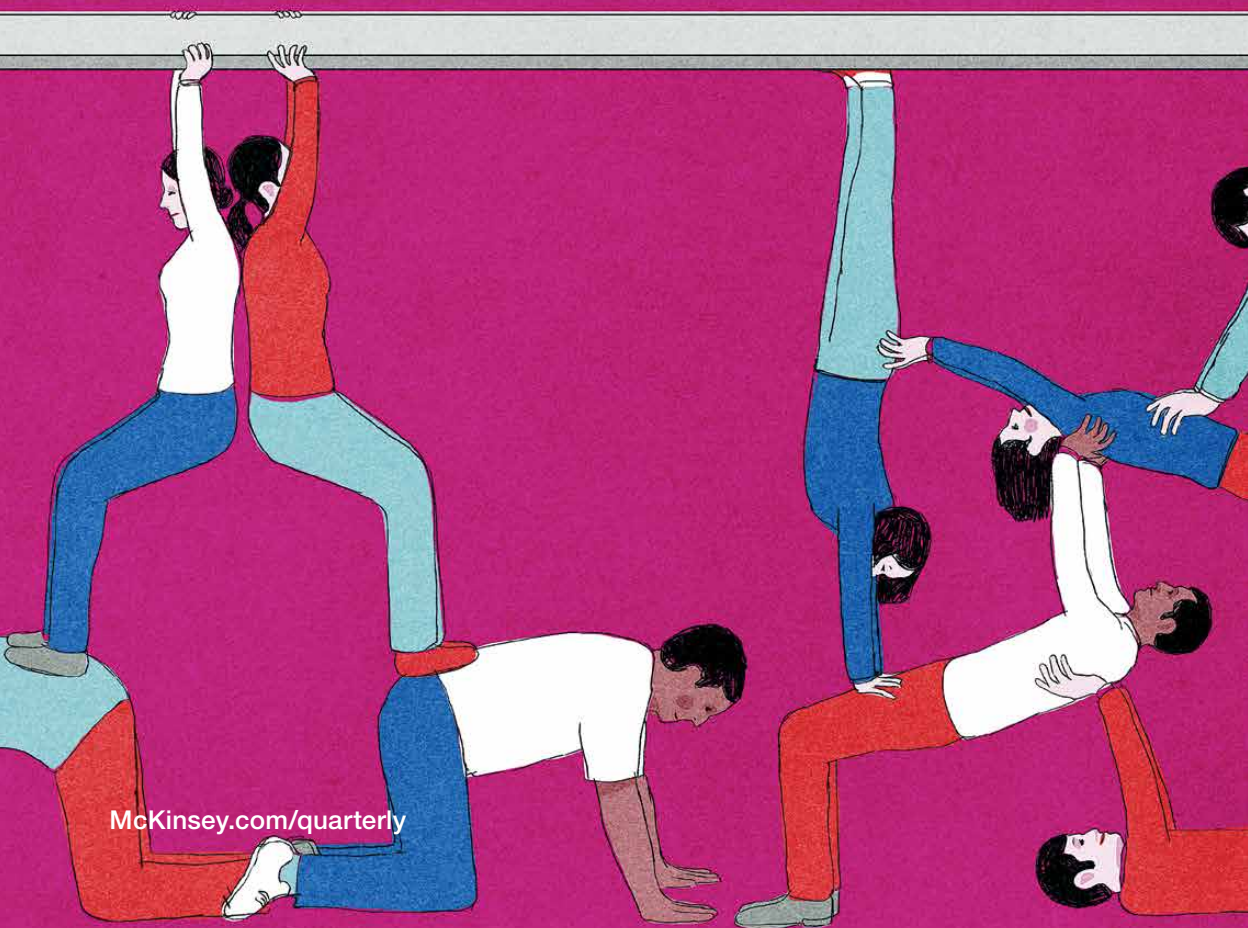
New insights on digital strategy—how tech unicorn Delivery Hero creates value, an incumbent's guide to digital disruption, and more

How new CEOs can boost their odds of success

Where machines could replace humans—and where they can't (yet)

Don Tapscott on how blockchains could change the world

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