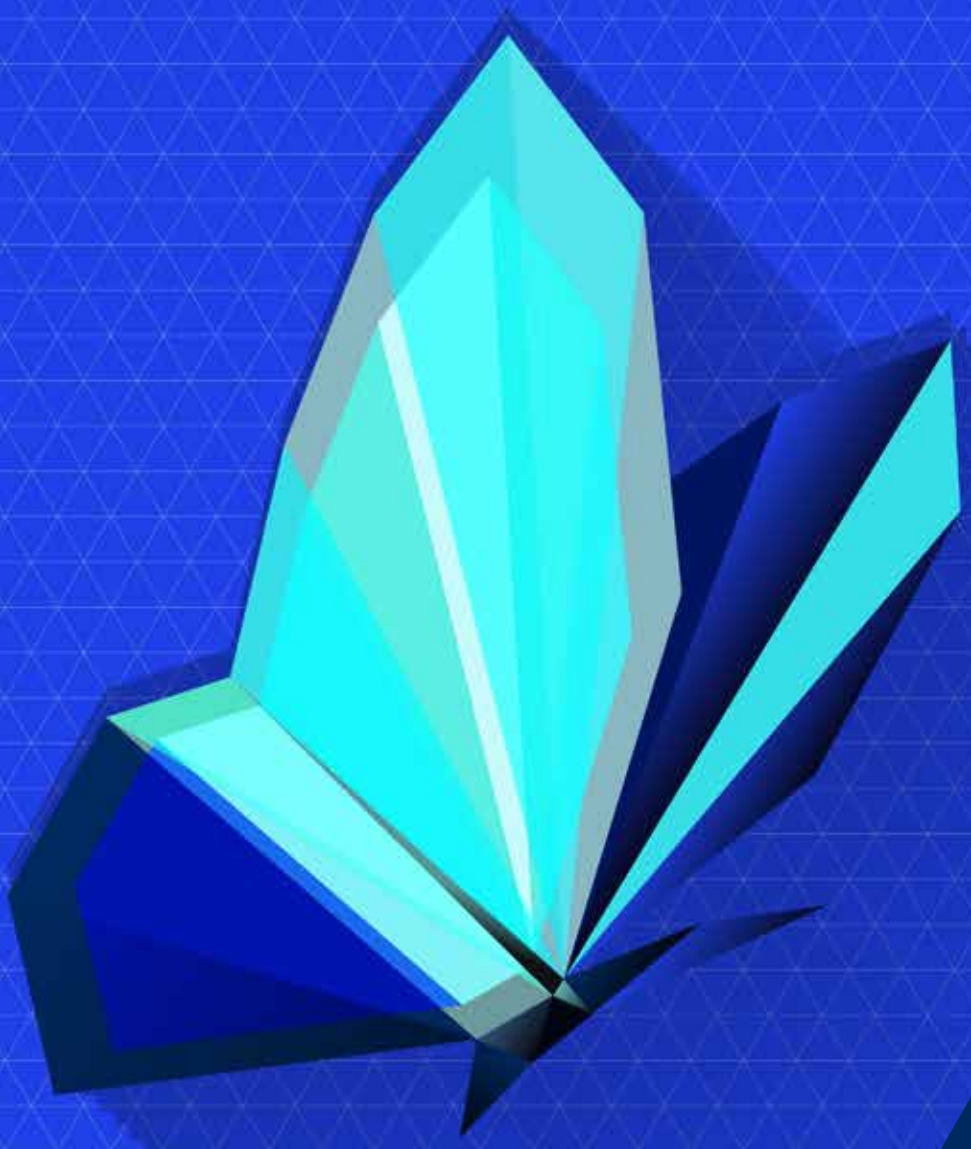
Digital Reinvention



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Introduction

"Disruption" might be a cliché, but it's hard to find a better word to describe the forces at work today. From the startup insurgency rattling the foundations of business to a stagnating global economy to the political upheavals that have challenged decades of accepted wisdom, corporate leaders are facing deep uncertainties.

This trend highlights a governing truth: the digital age rewards change and punishes stasis. But change comes in many flavors. Incremental adjustments or experiments at the periphery, for example, can provide real benefits and, in many cases, are a crucial first step for a digital transformation. But if these initiatives don't lead to more profound changes to the main business or avoid the real work of re-architecting how the business makes money, the benefits can be fleeting.

Companies must be open to radical reinvention, which is a rethinking of the business itself. It requires companies to reexamine, recalibrate and in many cases re-architect their core capabilities to find new, significant and sustainable sources of revenue. How successful companies will be in transforming their core could be the difference between victim and victor in the digital age.

We have compiled this collection of articles to help inform the conversations on digital transformations, and the journey we are all on. And we look forward to an eventful 2017.c.

Michael Bender

Paul Willmott

PART 1

Digital Transformation

From disrupted to disruptor: Reinventing your business by transforming the core

Peter Dahlström, Liz Ericson, Somesh Khanna, and Jürgen Meffert

Companies must be open to radical reinvention to find new, significant and sustainable sources of revenue.

When Madonna burst onto the scene in the early 1980s, there was little reason to suspect that she'd have more than her allotted 15 minutes of fame. But in the three decades since her debut album, she has managed to remain a media icon.

Her secret? "I think reinventing yourself is vital to your survival as an artist and a human being," Madonna once said. Fittingly, the name of her 2004 concert tour—her sixth—was "Reinvention."

Madonna may seem like an unlikely touchstone for modern businesses, but her ability to adapt to new trends and set some others offers a lesson for companies struggling with their own digital revolutions. That's because the digital age rewards change and punishes stasis. Companies must be open to radical reinvention to find new, significant and sustainable sources of revenue. Incremental adjustments or building something new outside of the core business can provide real benefits and, in many cases, are a crucial first step for a digital transformation. But if these

initiatives don't lead to more profound changes to the core business and avoid the real work of re-architecting how the business makes money, the benefits can be fleeting and too insignificant to avert a steady march to oblivion.

Simply taking an existing product line and putting it on an e-commerce site or digitizing a customer experience is not a digital reinvention. Reinvention is a rethinking of the business itself. Companies need to ask fundamental questions, such as, "Are we a manufacturer, or are we a company that enables customers to perform tasks with our equipment wherever and whenever they need to?" If it's the latter, then logistics and service operations may suddenly become more important than the factory line. Netflix's evolution from a company that rented DVDs to a company that streams entertainment for a monthly subscription to one that now creates its own content is a well-known example of continuous reinvention.

Reinvention, as the term implies, requires a significant commitment. From our Digital Quotient® research, we know that digital success requires not only that investment be aligned closely with strategy but also that it is at sufficient scale. And digital leaders have a high threshold for risk and are willing to make bold decisions.[1] But companies don't have to wait far in the future to realize those benefits. We've found that 60 to 80 percent of total improvement targets can be achieved within about three years while also laying the foundation for future growth.

For all the fundamental change that digital reinvention demands, it's worth emphasizing that it doesn't call for a "throw-it-all-out" approach. An engine parts company, for example, will still likely make engine parts after a digital reinvention, but may do it in a way that's much more agile and analytically-driven, or it may open up new lines of business by leveraging existing assets. Apple, with its move from computer manufacturer to music and lifestyle brand through its iPhone and iTunes ecosystem reinvented itself—even as it continued to build computers. John Deere created a whole series of online services for farmers even as it continued to sell tractors and farm equipment.

There are many elements of a transformation, from end-to-end journey redesign and embedding analytics into processes to open tech platforms. They require a myriad of capabilities, from artificial intelligence and agile operations to data lakes, cloud-based infrastructure, and new talent. Many of these elements have been written about extensively, and each can absorb a significant amount of executive time. What's often missing, however, is a comprehensive view of how an organization sets the right ambition, how to architect the right elements for the transformation, then how to systematically and holistically undertake the change journey.

What the core is and why it needs to change

"Think of your core muscles as the sturdy central link in a chain connecting your upper and lower body."[2] That was the guidance from Harvard Medical School on how to stay in shape. The authors defined the core as the central set of muscles that helps a body maintain its power, balance, and overall health.

1 Tanguy Catlin, Jay Scanlan, and Paul Willmott, "Raising your Digital Quotient," *McKinsey Quarterly*, June 2015, McKinsey.com.

2 "The real-world benefits of strengthening your core," *Harvard Health Publications*, Harvard Medical School, January 2012.

That's the essence of what we mean when we talk about changing the core of the business—the set of capabilities that allows the entire business to run effectively. A company's core is the value proposition of its business grounded in strategy as enabled by its people, processes, and technology. These elements are so intrinsic that any transformation that doesn't address them will ultimately underwhelm and fizzle because the legacy organization will inevitably exert a gravitational pull back to established practices.

Value proposition: Any digital reinvention must address the value the company provides to customers (whether existing or new) through its products and/or services. Inevitably this is based on a clear strategy that articulates where value is being created, shifted, or destroyed. Crucial to getting this right is identifying and evaluating existing assets that are most important and understanding what customers actually want or need. This can be surprisingly difficult to do in practice. The value that Amazon originally provided, for example, wasn't selling books online but rather providing convenience and unheard-of selection. Understanding the real source of its value allowed Amazon to expand exponentially beyond books.

People: Of course talent is important, but a reinvention needs to involve more than just hiring a CDO or a few designers. Talent priorities should be based on a clear understanding of the skills needed at all levels of the business. This requires investing in building relevant digital capabilities that fit with the strategy and keep pace with customers as they change the way they consider and make purchases. At the same time, targeted hiring should be tied to those capabilities that actually drive financial performance (for more on talent, please read "Raising your Digital Quotient"[3]).

Enabling that talent to thrive requires a digital culture—customer-centric and project-based, with a bias for speed and continuous learning. In fact, cultural and organizational issues can lead to the squandering of up to 85 percent of the value at stake. Making sure the new culture sticks requires re-building programs that reward and encourage new behaviors, such as performance management, promotion criteria, and incentive systems.

Processes: Rewiring the mechanisms for making decisions and getting things done is what enables the digital machine to run. Digitizing or automating supply chains and information-intensive processes as well as building new capabilities like robotic process automation or advanced analytics, for example, can rapidly increase the business' clock speed and cut costs by up to 90 percent.[4]

One temptation is to focus on simply digitizing existing processes rather than really rethinking them. Often, the most productive way to tackle this issue is to identify the customer journeys that matter most to the business and then map out the touchpoints, processes and capabilities required to deliver on them—without regard to what is already in place. Re-architecting processes

3 Tanguy Catlin, Jay Scanlan, and Paul Willmott, "Raising your Digital Quotient," *McKinsey Quarterly*, June 2015, McKinsey.com.

4 Shahar Markovitch and Paul Willmott, "Accelerating the digitization of business processes," May 2014, McKinsey.com.

requires establishing governance and decision rights to provide clarity and accountability, as well as embedding advanced analytics, automation and machine learning capabilities. (For more, please read "Accelerating the digitization of business processes").[5]

Technology: While digital reinvention is more than just a technology overhaul, technology is crucial. Leaders need to ensure that each IT investment responds to clear and robust business needs, and does not devolve into "tech for tech's sake." They also need to identify how best to work within an ecosystem of partners and vendors, and assess which legacy systems to keep, which to mothball and, critically, determine how to help legacy technology work in a digital world.

Reinvention requires a proven, systematic approach

Because of the complexity involved, most reinventions fall short of their original goals. In our experience, extracting the full value from digital requires a carefully coordinated approach across four "Ds": Discover what your digital ambition is (based on where the value is); Design programs that target profitable customer experience journeys; Deliver the change through an ecosystem of partners; and De-risk the process by thoughtfully sequencing steps (Exhibit 1).

While this approach may seem self-evident, we find that most companies fall short in the execution. There are myriad reasons for this, but the most common are that the business either underinvests in the capabilities needed or doesn't drive the transformation program sufficiently across all four of the "Ds." A company may invest tens of millions of dollars to "Discover" great

EXHIBIT 1

The 4Ds of a digital transformation

Discover: Shape digital ambition, strategy and business case based on insights

Design: Reinvent and prototype new capabilities and breakthrough journeys as part of a program

Deliver: Activate an ecosystem to rapidly deliver at scale

De-risk: Structure the change program, resources and commercial model to reduce operational and financial risk

Source: McKinsey analysis

5 Shahar Markovitch and Paul Willmott, "Accelerating the digitization of business processes," May 2014, McKinsey.com.

insights, for example, but if its “Deliver” strategy is inadequate, those insights are for naught.

1. Discover: Shape your digital ambition, strategy, and business case

In this phase, companies develop a clear view of where value is being created and destroyed as the basis for a clear business strategy. That requires an analysis of their business, sector, customer behavior trends, and the larger economy to identify and quantify both threats and opportunities. These kinds of digital opportunity scans should be sorted by short- and long-term pockets of value. (For more on this, please read “The economic essentials of digital strategy.”)

At the same time, companies need to engage in a sober analysis of their own digital capabilities and resources. Capabilities that build foundations for other key processes and activities (e.g. modular IT and agile technology platforms) are particularly important. And while leadership matters, our DQ™ research has shown that mid-level talent is the most critical element for a company’s digital success.

With this understanding in hand, companies then determine what their strategic ambition is, whether re-tooling the existing business or something more radical, such as plunging into a new market or innovating a business model. They develop a detailed roadmap for addressing capability gaps, and recruiting, developing, incentivizing and retaining the necessary talent. The goal is to develop a tight business case for change based on facts.

2. Design: Create and prototype breakthrough experiences

Actually acting on a digital ambition can be daunting. We have found that the most successful companies start by focusing on the most important customer journeys, then work back from there to design and build out breakthrough customer experiences. Using design thinking and skills, these companies define each journey, looking especially for the pain points and potential missed connections. The change team can then map out, screen-by-screen, models for a new interface. In this phase, the company must avoid getting caught in endless rounds of planning but instead rapidly build prototypes, translating concepts into minimum viable products (MVPs) to test and iterate in the market before scaling.

This phase also includes building out rapid delivery approaches and an IT infrastructure that blends the legacy systems with micro-services and modular plug-and-play elements). While agile IT has become standard, more digital businesses are embracing DevOps (integrated development and operations teams) and continuous delivery so that software can be developed, tested, and deployed quickly to consumers and end users.

On the organization side, the fluid nature of cross-functional collaboration, rapid decision making, and iterative development means that the business should focus on the enablers for this kind of teamwork. This includes effective metrics and scorecards to evaluate digital performance and incentive structures to drive the right behaviors, mindsets and outcomes. The CDO at one multinational pharma company addressed this issue by establishing a Digital Council, which was tasked specifically with breaking down organizational silos to enable transformational change

across all business lines. The initiative was credited with significantly contributing to a 12 percent increase in sales.

3. Deliver: Develop a network of partners who can rapidly scale your ambition

Getting the speed and scale necessary for a reinvention increasingly requires an ecosystem of external teams, partners, suppliers and customers. In practice, this means working with a mix of platform players, delivery specialists, and niche players. These are the relationships that companies can call on to provide specific skills and capabilities quickly.

This reality has made ecosystem management an important competency, especially understanding how to find and plug into the right mix of complementary capabilities. One national bookseller, for example, built out a digital offer by partnering with a telecoms company for its technology and with a range of retailers to build up a marketplace. This approach allowed it to rapidly hit the marketplace and increase revenue 78 percent in a year.

As companies push to scale their digital reinvention throughout the organization, the crucial role of seasoned change managers comes into focus. These leaders not only play "air traffic controller" to the many moving parts, but also have the business credibility and skill to solve real business problems. They must maintain an accelerated pace of change, and drive accountability across the business. The change leaders will look across the entire enterprise, examining organizational structure, data governance, talent recruitment, performance management, and IT systems for areas of opportunity, making decisions that balance efficiency and speed with outcome.

The "agility coach" is an example of this type of role. This person has strong communication and influencing skills, can create and roll out plans to support agile processes across the business, and can put in place KPIs and metrics to track progress.

4. De-risking: structuring the process to minimize risk

One of the most common reasons digital transformations fail is that the organization develops "change exhaustion" and funds start to dry up. To mitigate this risk, it's important to focus on quick wins that not only build momentum but also generate cost savings that can be re-invested in the next round of transformations. One global e-tailer, for example, focused on quick wins (such as increasing conversion rates) and was able to deliver $350 million in new revenue in just five months, which funded further changes and provided tangible results to further excite the business about the journey. This sequencing approach applies to tech as well. Many companies choose to invest first in "horizontal" components, such as business-process management (BPM) layers or central administration platforms that can be shared across many initiatives, while balancing them with more "visible" elements to provide the proof of concept.

Technology risks, especially cyber security, will also require increased attention as companies digitize more operations and processes. Organizations can mitigate these risks by automating tests on software, establishing systems in which failures can be rolled back in minutes, and establishing build environments in which fixes can be made without putting significant parts of the business at risk. Senior leaders in particular need to focus on the structural and organizational

issues—from building cybersecurity into all business functions to changing user behavior—that hamper the ability to manage cyber risk.

One risk senior leaders often overlook is losing ownership over sources of value. These might include the company's data, customer relationships, or other assets. Having a clear understanding of where the value is coming from allows businesses to navigate ecosystem relationships profitably. In evaluating which partners to work with, the book seller mentioned above, for example, declined to work with a storefront partner because it feared losing its most valuable asset: its direct relationship with its customers.

Digital reinvention will put new demands on leadership. Here are some crucial questions leaders should ask themselves:

- Where have our past transformations succeeded or broken down?
- What do our customers say about their experience with our company?
- Do we understand what the next sources of value are, and are we ready for them?
- Are we investing in the right places and at the right levels to reinvent ourselves?

▼ ▼ ▼

Companies can both rise and fall with astonishing speed as new customer needs are uncovered and new ways of meeting them are developed. We strongly believe that companies that are able to adapt, learn, and find new solutions quickly can do more than just retain market position; they can thrive, whatever disruptions come their way. As Madonna once said: "You have to reinvent to stay in the game." ▼

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Transformation with a capital *T*

Michael Bucy, Stephen Hall, and Doug Yakola

Companies must be prepared to tear themselves away from routine thinking and behavior.

Imagine. You lead a large basic-resources business. For the past decade, the global commodities supercycle has fueled volume growth and higher prices, shaping your company's processes and culture and defining its outlook. Most of the top team cannot remember a time when the business priorities were different. Then one day it dawns on you that the party is over.

Or imagine again. You run a retail bank with a solid strategy, a strong brand, a well-positioned branch network, and a loyal customer base. But a growing and fast-moving ecosystem of fintech players—microloan sites, peer-to-peer lenders, algorithm-based financial advisers—is starting to nibble at your franchise. The board feels anxious about what no longer seems to be a marginal threat. It worries that management has grown complacent.

In industry after industry, scenarios that once appeared improbable are becoming all too real, prompting boards and CEOs of flagging (or perhaps merely drifting) businesses to embrace the T-word: transformation.

Transformation is perhaps the most overused term in business. Often, companies apply it loosely—too loosely—to any form of change, however minor or routine. There are organizational transformations (otherwise known as org redesigns), when businesses redraw organizational

roles and accountabilities. Strategic transformations imply a change in the business model. The term transformation is also increasingly used for a digital reinvention: companies fundamentally reworking the way they're wired and, in particular, how they go to market.

What we're focused on here—and what businesses like the previously mentioned bank and basic-resource companies need—is something different: a transformation with a capital T, which we define as an intense, organization-wide program to enhance performance (an earnings improvement of 25 percent or more, for example) and to boost organizational health. When such transformations succeed, they radically improve the important business drivers, such as topline growth, capital productivity, cost efficiency, operational effectiveness, customer satisfaction, and sales excellence. Because such transformations instill the importance of internal alignment around a common vision and strategy, increase the capacity for renewal, and develop superior execution skills, they enable companies to go on improving their results in sustainable ways year after year. These sorts of transformations may well involve exploiting new digital opportunities or accompany a strategic rethink. But in essence, they are largely about delivering the full potential of what's already there.

The reported failure rate of large-scale change programs has hovered around 70 percent over many years. In 2010, conscious of the special challenges and disappointed expectations of many businesses embarking on transformations, McKinsey set up a group to focus exclusively on this sort of effort. In six years, our Recovery & Transformation Services (RTS) unit has worked with more than 100 companies, covering almost every geography and industry around the world. These cases—both the successes and the efforts that fell short—helped us distill a set of empirical insights about improving the odds of success. Combined with the right strategic choices, a transformation can turn a mediocre (or good) business into a world-class one.

Why transformations fail

Transformations as we define them take up a surprisingly large share of a leadership's and an organization's time and attention. They require enormous energy to realize the necessary degree of change. Herein lie the seeds of disappointment. Our most fundamental lesson from the past half-dozen years is that average companies rarely have the combination of skills, mind-sets, and ongoing commitment needed to pull off a large-scale transformation.

It's true that across the economy as a whole, "creative destruction" has been a constant, since at least 1942, when Joseph Schumpeter coined the term. But for individual organizations and their leaders, disruption is episodic and sufficiently infrequent that most CEOs and top-management teams are more accomplished at running businesses in stable environments than in changing ones. Odds are that their training and practical experience predominantly take place in times when extensive, deep-rooted, and rapid changes aren't necessary. For many organizations, this relatively placid experience leads to a "steady state" of stable structures, regular budgeting, incremental targets, quarterly reviews, and modest reward systems. All that makes leaders poorly prepared for the much faster-paced, more bruising work of a transformation. Intensive exposure to such efforts has taught us that many executives struggle to change gears and can be reluctant

to lead rather than delegate when they face external disruption, successive quarters of flagging performance, or just an opportunity to up a company's game.

Executives embarking on a transformation can resemble career commercial air pilots thrust into the cockpit of a fighter jet. They are still flying a plane, but they have been trained to prioritize safety, stability, and efficiency and therefore lack the tools and pattern-recognition experience to respond appropriately to the demands of combat. Yet because they are still behind the controls, they do not recognize the different threats and requirements the new situation presents. One manufacturing executive whose company learned that lesson the hard way told us, "I just put my head down and worked harder. But while this had got us out of tight spots in the past, extra effort, on its own, was not enough this time."

Tilt the odds toward success

The most important starting point of a transformation, and the best predictor of success, is a CEO who recognizes that only a new approach will dramatically improve the company's performance. No matter how powerful the aspirations, conviction, and sheer determination of the CEO, though, our experience suggests that companies must also get five other important dimensions right if they are to overcome organizational inertia, shed deeply ingrained steady-state habits, and create a new long-term upward momentum. They must identify the company's full potential; set a new pace through a transformation office (TO) that is empowered to make decisions; reinforce the executive team with a chief transformation officer (CTO); change employee and managerial mind-sets that are holding the organization back; and embed a new culture of execution throughout the business to sustain the transformation. The last is in some ways the most difficult task of all.

Stretch for the full potential

Targets in most corporations emerge from negotiations. Leaders and line managers go back and forth: the former invariably push for more, while the latter point out all the reasons why the proposed targets are unachievable. Inevitably, the same dynamic applies during transformation efforts, and this leads to compromises and incremental changes rather than radical improvements. When managers at one company in a highly competitive, asset-intense industry were shown strong external evidence that they could add £250 million in revenue above what they themselves had identified, for example, they immediately talked down the proposed targets. For them, targets meant accountability—and, when missed, adverse consequences for their own compensation. Their default reaction was "let's underpromise and overdeliver."

To counter this natural tendency, CEOs should demand a clear analysis of the company's full value-creation potential: specific revenue and cost goals backed up by well-grounded facts. We have found it helpful for the CEO and top team to assume the mind-set, independence, and tool kit of an activist investor or private-equity acquirer. To do so, they must step outside the self-imposed constraints and define what's truly achievable. The message: it's time to take a single self-confident leap rather than a series of incremental steps that don't lead very far. In our

experience, targets that are two to three times a company's initial estimates of its potential are routinely achievable—not the exception.

Change the cadence

Experience has taught us that it's essential to create a hub to oversee the transformation and to drive a cadence markedly different from the normal day-to-day one. We call this hub the transformation office.

What makes a TO work? One company with a program to boost EBITDA[1] by more than $1 billion set up an unusual but highly effective TO. For a start, it was located in a circular room that had no chairs—only standing room. Around the wall was what came to be known, throughout the business, as "the snake": a weekly tracker that marked progress toward the goal. By the end of the process, the snake had eaten its own tail as the company materially exceeded its financial target.

Each Tuesday, at the weekly TO meeting, work-stream leaders and their teams reviewed progress on the tasks they had committed themselves (the previous week) to complete and made measurable commitments for the next week in front of their peers. They used only handwritten whiteboard notes—no PowerPoint presentations—and had just 15 minutes apiece to make their points. Owners of individual initiatives within each work stream reviewed their specific initiatives on a rotating basis, so third- or fourth-level managers met the top leaders, further increasing ownership and accountability. Even the divisional CEO made a point of attending these TO meetings each time he visited the business, an experience that in hindsight convinced him that the TO process was more crucial than anything else to shifting the company's culture.

For senior leaders, distraction is the constant enemy. Most prefer talking about new customers, M&A opportunities, or fresh strategic choices—hence the temptation at the top to delegate responsibility to a steering committee or an old-style program-management office charged with providing periodic updates. When top management's attention is diverted elsewhere, line managers will emulate that behavior when they choose their own priorities.

Given these distractions, many initiatives move too slowly. Parkinson's law states that work expands to fill the time available, and business managers aren't immune: given a month to complete a project requiring a week's worth of effort, they will generally start working on it a week before the deadline. In successful transformations, a week means a week, and the transformation office constantly asks, "how can you move more swiftly?" and "what do you need to make things happen?" This faster clock speed is one of the most defining characteristics of successful transformations.

Collaborating with senior leaders across the entire business, the TO must have the grit, discipline, energy, and focus to drive forward perhaps five to eight major work streams. All of them are

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

further divided into perhaps hundreds (even the low thousands) of separate initiatives, each with a specific owner and a detailed, fully costed bottom-up plan. Above all, the TO must constantly push for decisions so that the organization is conscious of any foot dragging when progress stalls.

Bring on the CTO

Managing a complex enterprise-wide transformation is a full-time executive-level job. It should be filled by someone with the clear authority to push the organization to its full potential, as well as the skills, experience, and even personality of a seasoned fighter pilot, to use our earlier analogy.

The chief transformation officer's job is to question, push, praise, prod, cajole, and otherwise irritate an organization that needs to think and act differently. One CEO introduced a new CTO to his top team by saying, "Bill's job is to make you and me feel uncomfortable. If we aren't feeling uncomfortable, then he's not doing his job." Of course, the CTO shouldn't take the place of the CEO, who (on the contrary) must be front and center, continually reinforcing the idea that this is my transformation.

Many leaders of traditional program-management offices are strong on processes but unable or unwilling to push the CEO and top team. The right CTO can sometimes come from within the organization. But one of the biggest mistakes we see companies making in the early stages is to choose the CTO only from an internal slate of candidates. The CTO must be dynamic, respected, unafraid of confrontation, and willing to challenge corporate orthodoxies. These qualities are harder to find among people concerned about protecting their legacy, pursuing their next role, or tiptoeing around long-simmering internal political tensions.

What does a CTO actually do? Consider what happened at one company mounting a billion-dollar productivity program. The new CTO became exasperated as executives focused on individual technical problems rather than the worsening cost and schedule slippage. Although he lacked any background in the program's technical aspects, he called out the facts, warning the members of the operations team that they would lose their jobs—and the whole project would close—unless things got back on track within the next 30 days. The conversation then shifted, resources were reallocated, and the operations team planned and executed a new approach. Within two weeks, the project was indeed back on track. Without the CTO's independent perspective and candor, none of that would have happened.

Remove barriers, create incentives

Many companies perform under their full potential not because of structural disadvantages but rather through a combination of poor leadership, a deficient culture and capabilities, and misaligned incentives. In good or even average times, when businesses can get away with trundling along, these barriers may be manageable. But the transformation will reach full potential only if they are addressed early and explicitly. Common problematic mind-sets we encounter include prioritizing the "tribe" (local unit) over the "nation" (the business as a whole), being too proud to ask for help, and blaming the external world "because it is not under our control."

One public utility we know was paralyzed because its employees were passively "waiting to be told" rather than taking the initiative. Given its history, they had unconsciously decided that there was no advantage in taking action, because if they did and made a mistake, the results would make the front pages of newspapers. A bureaucratic culture had hidden the underlying cause of paralysis. To make progress, the company had to counter this very real and well-founded fear.

McKinsey's influence model, one proven tool for helping to change such mind-sets, emphasizes telling a compelling change story, role modeling by the senior team, building reinforcement mechanisms, and providing employees with the skills to change.[2] While all four of these interventions are important in a transformation, companies must address the change story and reinforcement mechanisms (particularly incentives) at the outset.

An engaging change story

Most companies underestimate the importance of communicating the "why" of a transformation; too often, they assume that a letter from the CEO and a corporate slide pack will secure organizational engagement. But it's not enough to say "we aren't making our budget plan" or "we must be more competitive." Engagement with employees and managers needs to have a context, a vision, and a call to action that will resonate with each person individually. This kind of personalization is what motivates a workforce.

At one agribusiness, for example, someone not known for speaking out stood up at the launch of its transformation program and talked about growing up on a family farm, suffering the consequences of worsening market conditions, and observing his father's struggle as he had to postpone retirement. The son's vision was to transform the company's performance out of a sense of obligation to those who had come before him and a desire to be a strong partner to farmers. The other workers rallied round his story much more than the financially based argument from the CEO.

Incentives. Incentives are especially important in changing behavior. In our experience, traditional incentive plans, with multiple variables and weightings—say, six to ten objectives with average weights of 10 to 15 percent each—are too complicated. In a transformation, the incentive plan should have no more than three objectives, with an outsized payout for outsized performance; the period of transformation, after all, is likely to be one of the most difficult and demanding of any professional career. The usual excuses (such as "our incentive program is already set" or "our people don't need special incentives to give their best") should not deter leaders from revisiting this critical reinforcement tool.

Nonmonetary incentives are also vital.[3] One CEO made a point, each week, of writing a short handwritten note to a different employee involved in the transformation effort. This cost nothing but had an almost magical effect on morale. In another company, an employee went far

2 Tessa Basford and Bill Schaninger, "The four building blocks of change," *McKinsey Quarterly*, April 2016, McKinsey.com.

3 Susie Cranston and Scott Keller, "Increasing the 'meaning quotient' of work," *McKinsey Quarterly*, January 2013, McKinsey.com.

beyond normal expectations to deliver a particularly challenging initiative. The CEO heard about this and gathered a group, including the employee's wife and two children, for a surprise party. Within 24 hours, the story of this celebration had spread throughout the company.

No going back

Transformations typically degrade rather than visibly fail. Leaders and their employees summon up a huge initial effort; corporate results improve, sometimes dramatically; and those involved pat themselves on the back and declare victory. Then, slowly but surely, the company slips back into its old ways. How many times have frontline managers told us things like "we have undergone three transformations in the last eight years, and each time we were back where we started 18 months later"?

The true test of a transformation, therefore, is what happens when the TO is disbanded and life reverts to a more normal rhythm. What's critical is that leaders try to bottle the lessons of the transformation as it moves along and to ingrain, within the organization, a repeatable process to deliver better and better results long after it formally ends. This often means, for example, applying the TO meetings' cadence and robust style to financial reviews, annual budget cycles, even daily performance meetings—the basic routines of the business. It's no good starting this effort near the end of the program. Embedding the processes and working approaches of the transformation into everyday activities should start much earlier to ensure that the momentum of performance continues to accelerate after the transformation is over.

Companies that create this sort of momentum stand out—so much that we've come to view the interlocking processes, skills, and attitudes needed to achieve it as a distinct source of power, one we call an "execution engine." Organizations with an effective execution engine conspicuously continue to challenge everything, using an independent perspective. They act like investors—all employees treat company money as if it were their own. They ensure that accountability remains in the line, not in a central team or external advisers. Their focus on execution remains relentless even as results improve, and they are always seeking new ways to motivate their employees to keep striving for more. By contrast, companies doomed to fail tend to revert to high-level targets assigned to the line, with a minimal focus on execution or on tapping the energy and ideas of employees. They often lose the talented people responsible for the initial achievements to headhunters or other internal jobs before the processes are ingrained. To avoid this, leaders must take care to retain the enthusiasm, commitment, and focus of these key employees until the execution engine is fully embedded.

Consider the experience of one company that had realized a $4 billion (40 percent) bottom-line improvement over several years. The impetus to "go back to the well" for a new round of improvements, far from being a top-leadership initiative, came out of a series of conversations at performance-review meetings where line leaders had become energized about new

opportunities previously considered out of reach. The result was an additional billion dollars of savings over the next year.

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Nothing about our approach to transformations is especially novel or complex. It is not a formula reserved for the most able people and companies, but we know from experience that it works only for the most willing. Our key insight is that to achieve a transformational improvement, companies need to raise their ambitions, develop different skills, challenge existing mind-sets, and commit fully to execution. Doing all this can produce extraordinary and sustainable results. ▼

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PART 2

Design and Customer Experience

The four pillars of distinctive customer journeys

Joao Dias, Oana Ionutiu, Xavier Lhuer, and Jasper van Ouwerkerk

New research reveals that focus, simplicity, digital first, and perceptions matter most.

In recent years, customer experience (CX) has emerged as a major differentiator for large companies, including financial-services providers. In a McKinsey survey of senior executives, 90 percent of respondents confirmed that CX is one of the CEO's top three priorities.

It's a priority because the stakes are so high. For financial institutions, for example, rising customer expectations are pressing organizations to come up with more functional improvements even as alternatives to traditional financial services are emerging. In this dynamic environment, financial institutions face a stiff challenge to differentiate their offerings while reducing cost and complexity for customers—and to do it at a profit.

Overcoming these challenges is critical not just to meet rising customer expectations and to compete with new digital attackers but also to generate significant business impact. Our research indicates that for every 10-percentage-point uptick in customer satisfaction, a company can increase revenues 2 percent to 3 percent.

At a time when the customer-satisfaction scores of top-quartile institutions can exceed those of bottom-quartile players by as much as 30 to 40 percentage points, the financial payoff from best-in-class CX can be significant indeed. These gains come from a variety of sources, including additional product purchases generated by cross-selling and upselling, such as when a borrower increases the value of a loan.

To understand what constitutes distinctive CX in financial services, we performed benchmarking research on five key customer journeys—the series of interactions a customer has with a brand to complete a task—in banking and insurance.[1] The survey findings in this article relate specifically to retail customer onboarding but apply generally to the other journeys we studied.

Reaching the top quartile of CX performers is no easy task. Cost, design, and value are emerging as key differentiators for customers, yet companies often lack guiding principles to shape those efforts. By analyzing and ranking correlations between customer satisfaction and operational factors (such as the reasons a customer chooses one company over others, cycle times, features offered, and the use of digital channels) in our survey, four pillars of great customer-experience performance stood out:

1. Focus on the few factors that move the needle for customers

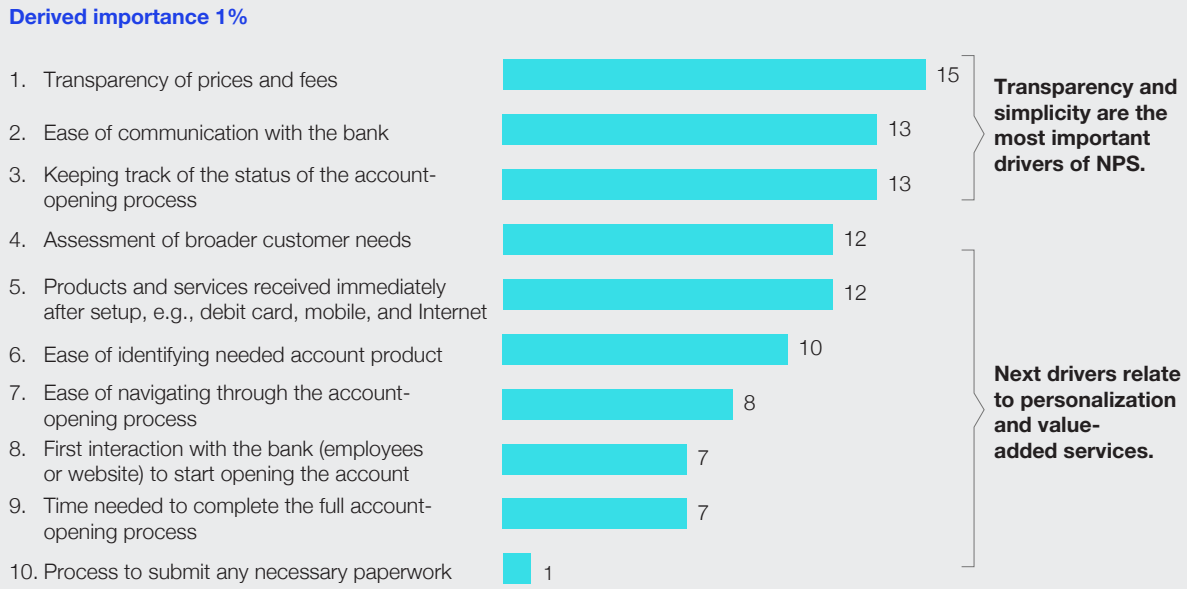
We asked customers to assess different characteristics of the end-to-end experience, including the first interaction with the institution, the ease of identifying the right products, and the knowledge and professionalism of staff. We found that only a small number of characteristics (typically three to five out of 15) had a material impact and accounted for the bulk of overall satisfaction (Exhibit 1).

For example, when analyzing the characteristics of the customer onboarding journey, we found that transparency of price and fees, ease of communication with the bank, and the ability to track the status of the onboarding process accounted for 42 percent of overall satisfaction. The next three highest-ranking characteristics—assessment of broader customer needs; products and services received immediately after account opening, such as debit cards and mobile and online banking access; and ease of identifying the needed product—account for an additional 34 percent. Conversely, characteristics such as the courtesy of staff, the timeliness of call-backs, and the clarity of documentation had limited impact on satisfaction. This finding strongly suggests that banks should concentrate mainly on those things that make the most difference to customer satisfaction.

1 We performed the research in five countries (France, Germany, Italy, the UK, and the US), conducting outside-in studies of five key customer journeys in banking and insurance. The journeys include retail customer onboarding, mortgage applications, car insurance claims, life insurance acquisition, and the onboarding of small and medium-sized enterprises (SMEs). In partnership with external research agencies we deployed an online questionnaire about these journeys, surveying customers of both top traditional players and purely digital players. We asked questions related to what led them to the company, metrics of the journey's steps, the companies' capabilities in place and customers' satisfaction with them, and customers' use of online channels.

EXHIBIT 1

Small number of journey capabilities (3 out of 15) account for over 40% of overall customer satisfaction.



Note: Johnson Relative Weighting was used based on overall account opening satisfaction.
Source: McKinsey customer journey benchmark

2. Ease and simplicity: The payoff trade-off

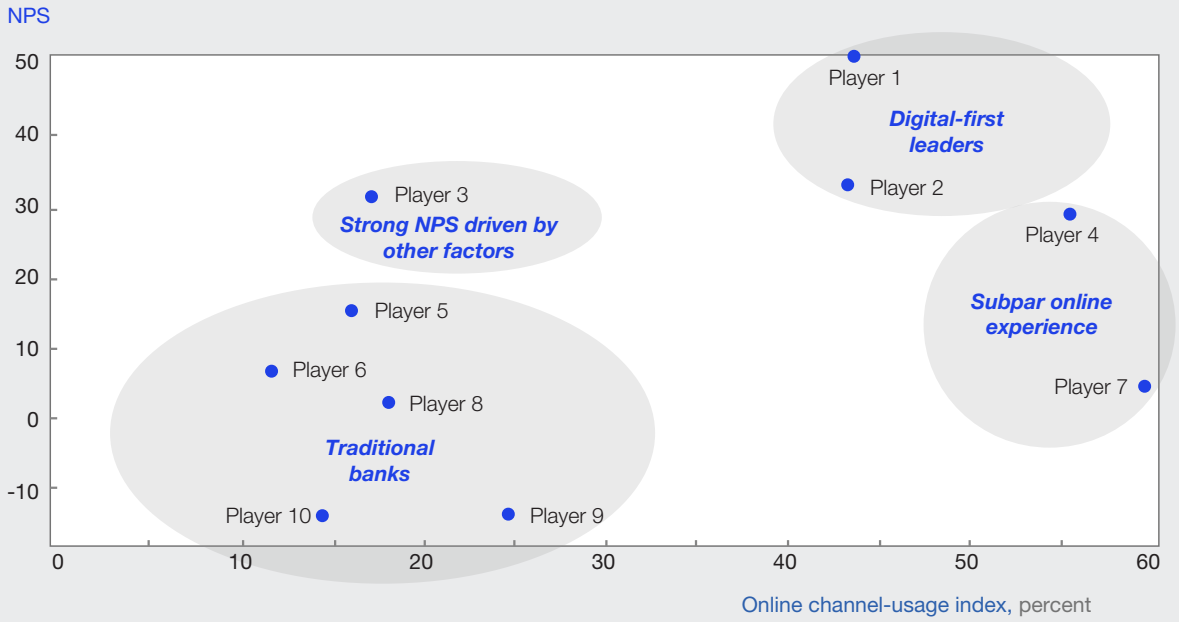
Today's harried customer values convenience. Cutting down the time it takes to complete an individual journey, such as applying for an account, by making it easier and simpler has a deep effect on customer satisfaction.

For example, in France, customer satisfaction drops by up to 30 percentage pointswhen the time to open an account exceeds 45 minutes. That 45-minute point marks the "satisfaction cliff." But what's really important to note is that there is a diminishing payoff in reducing the time it takes a customer to complete a journey. In France, again, the impact on customer satisfaction when taking between 15 and 45 minutes to open an account is relatively minor (the "satisfaction plateau"). Cut that process to below 15 minutes and satisfaction increases by up to ten percentage points. Companies need to work out the trade-off, then, between the investment in improving the ease and simplicity of a process and the resulting improvement in customer satisfaction and new value created.

As more processes are digitized, journey times will be cut back. But low cycle times alone don't equate to superior CX. Rather, our research indicates that customers respond most positively to the ease of a transaction or process.

EXHIBIT 2

Digital-first players generate higher customer satisfaction.



Source: McKinsey customer journey benchmark

3. Master the digital-first journey, but don't stop there

We analyzed different types of customer journeys: those that are completely online, those that start online and finish in a branch, those that start in a branch and finish online, and those that take place fully in a branch. We found that digital-first journeys led to higher customer-satisfaction scores (Exhibit 2) and generated 10 to 20 percentage points more satisfaction than traditional journeys.

For all the advantages of digital-first journeys, those journeys that are the most digitized across all the interactions lead to the greatest customer satisfaction. Nevertheless, many financial services do not provide fully digital services even when they exist, such as digital identification and verification. This finding indicates that financial-services providers can still significantly improve CX by digitizing complete journeys.

4. Brands and perceptions matter

It may not be surprising that companies whose advertising inspires their customers with the power and appeal of their brand or generates word of mouth deliver 30 to 40 percentage points more satisfaction than their peers. But how advertising or word of mouth affects perceptions is crucial. Two banks in the US, for example, performed nearly identically across a set of customer journeys. However, customers viewed one bank as delivering a much better overall experience than its rival, because the higher-ranked institution's advertising promoted its user-friendliness.

That perception had an important effect on identifying promotions that were effective for attracting new customers but, on average, had a nearly neutral impact on satisfaction. The average, however, is misleading. Promotions are slightly negative for traditional banks but positive for purely online players. In the same vein, physical proximity to a financial-services provider tends to have, on average, little discernible influence on customer satisfaction. Again, though, the value to customers of physical proximity can vary widely from institution to institution and from country to country, pointing to a need for financial institutions to understand their customers at a more granular level.

Despite the impact of word of mouth in shaping perceptions, our survey revealed that few customers recommend a financial-services provider on the strength of their existing relationship with it. An existing relationship alone does not turn a customer into an advocate. Institutions that do more to please their existing customers and help them tell their story to their peers might be able to mobilize a new group of influential advocates for their products and services.

It pays to customize

While the four hallmarks for outstanding customer experiences tend to be universal, experience designers should focus on a range of customer preferences based on country, product, and age group. For example, we observed that the ease of navigating through the account-opening process had a larger impact on satisfaction in Italy than in France. Conversely, the assessment of broader customer needs is more important in France than Italy.

When looking across products, we also found detailed differences, such as the satisfaction factors for current accounts and mortgages. When working with current accounts, customers derive the greatest satisfaction from transparency on prices and fees; when they're applying for a mortgage, by contrast, they most value the ease of filling in the application form.

Finally, there are also differences among customer groups. The ease of communicating with the bank is more important to customers 55 years and older than to 18-to-24-year-olds. Conversely, the ability to identify the right products is more important to 18-to-24-year-olds than to those 55 and older. This suggests that processes and value offerings need to be modular with their emphasis varying with what matters most to each customer segment.

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Knowing what to do is the right place to start. But a company's success in building out great customer journeys requires agile capabilities that excel at rapid iteration and testing and learning. Reacting to live feedback from real customers is often the difference between a good and a great customer experience. ▼

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Putting behavioral psychology to work to improve customer experience

Dilip Bhattacharjee, Keith Gilson, and Hyo Yeon

Applying the principles of behavioral psychology can improve the quality of customer interactions and build brand recognition as a customer-centric organization.

It's an all-too-familiar story. As a leader at your company, you've made enhancing your customers' experience a priority. You've invested in products, in people, and in the service-delivery processes to put your customers first. Yet when you tally customer-satisfaction survey results and other metrics of customer experience, your spirits drop. You see that customer-satisfaction scores are not improving in line with the changes that you know customers can see each day in the services you are delivering. They're not even moving as much as your minimum estimates.

Executives at far too many companies share this disappointment. Naturally, you'd like to receive credit for the effort of improving your customers' experience. But you also know that there are significant economic benefits in going beyond simply improving products and services by paying equal attention to customer expectations and how customers perceive their treatment at individual

touchpoints and throughout the full customer journey. It is possible, for example, to share the same level of operational performance with competitors yet secure higher brand recognition as a customer-centric organization. In a wide range of industries, it is also possible to reduce churn, improve cross-selling, and boost customer referrals.

Leading players in improving customer experience understand this. One tool they find increasingly effective is to apply the principles of behavioral psychology to smartly design products and services to improve the quality of customer interactions. Behavioral scientists tell us that these interactions are influenced powerfully by considerations such as the sequence in which customers encounter painful and pleasurable experiences. By focusing on these principles and

EXHIBIT 1

The CHOICES framework of behavioral drivers created by McKinsey's Behavioral Insight Lab helps determine relevant interventions.

CHOICES[1]	Drivers of behavior	Examples of interventions
Context	People gauge information relative to other, mostly implicit benchmarks	**Prime:** Playing German music in a wine store significantly increases sales of German wine
Habit	People often act and judge without deliberation, following habits or mental shortcuts	**Expect errors:** To reduce the risk of customers losing cards, ATMs usually return the card first, then dispense cash
Other people	People are influenced by what other people do, say, or think	**Tell about others:** Tax fraud is reduced by ~15% when taxpayers are informed that most people actually do not commit fraud
Incentives	People respond to "objectively" better offers	**Give immediate gratification:** Little treats for good deeds today (eg, cash for going to the gym) can help fight procrastination
Congruence	People act to preserve a positive and consistent self-image	**Activate commitments:** Public commitments work better than promises to oneself (e.g., to quit smoking)
Emotions	People are influenced by emotions and the physical state of their bodies	**Create "yes" emotions:** A photo of a happy/attractive person had the same demand effect for a bank as a mortgage-rate cut of 100 basis points
Salience	People take in messages that are easier to process and remember	**Show consequences:** Regular information on energy usage and price increases drives energy consumption down more than twice as effectively as yearly updates

1 McKinsey's Behavioral Insight Lab developed the CHOICES framework based on the work of Dan Ariely, Uri Gneezy, Daniel Kahneman, John List, George Loewenstein, and Richard Thaler.

Source: McKinsey analysis

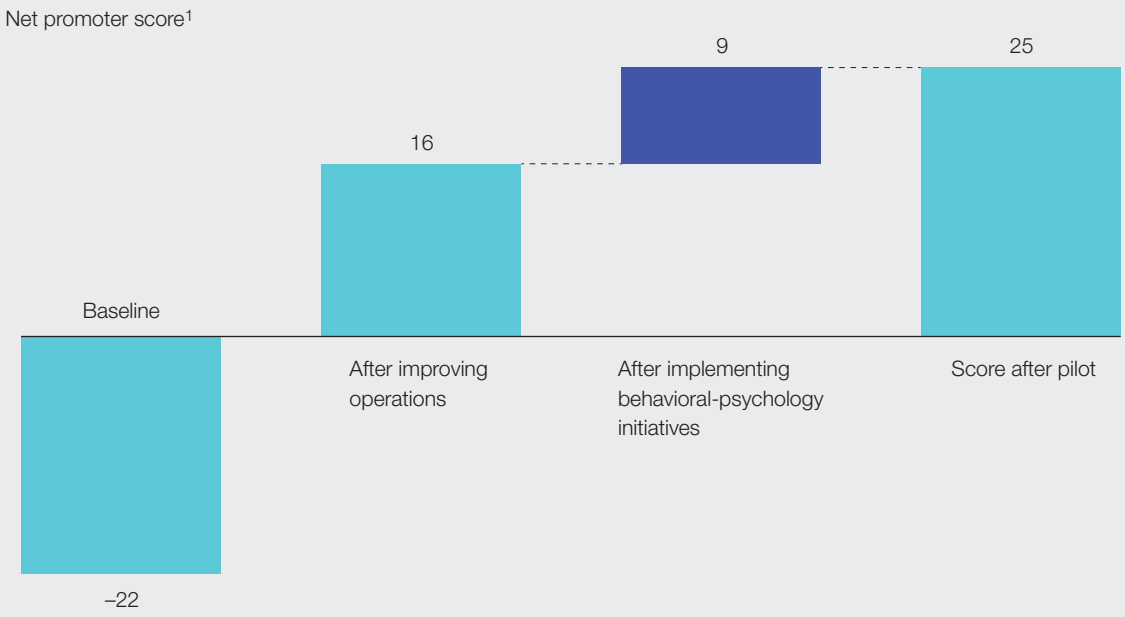
implementing them masterfully, companies can design and manage service encounters to maximize customer satisfaction. They can also improve the chances that customers will give them recognition and credit for all their investments in the experience offered.

Behaving well, and badly

A vast body of research within the field of behavioral psychology offers valuable insights into how customers experience service interactions and form their opinions and memories of those encounters. Research undertaken by Nobel laureate Daniel Kahneman and George Loewenstein forms the foundation upon which the practical principles have been developed. In addition, work by pioneers such as Dan Ariely, Uri Gneezy, John List, and Richard Thaler has also had a significant impact on how individuals make decisions. Based on this work, McKinsey has developed a framework for categorizing common actions that attempt to spur particular behaviors from individuals in consumer and other settings. The framework is called CHOICES, which is an acronym for context, habit, other people, incentives, congruence, emotions, and salience (Exhibit 1).

EXHIBIT 2

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



1 Before n = 58, after n = 28.
Source: McKinsey analysis

In work specific to customer experience, one pilot study at a consumer-services firm found that improvements in net promoter scores accrued from behavioral-psychology initiatives rather than from improvements in operations (Exhibit 2).

Customer interactions are influenced powerfully by considerations such as the sequence in which customers encounter painful and pleasurable experiences.

In other work, leading researchers Richard Chase and Sriram Dasu identified three major factors that occur during customer-journey experiences and drive customer perceptions and levels of satisfaction.[1] These principles can often be applied at little additional cost and help to ensure that companies receive credit for the experience they deliver:

- **Sequence.** Days, weeks, and months after using a product or service, customers tend to disproportionately recall the high and low points of their customer journeys and not all the individual aspects of it. Moreover, how a company sequences high points in relation to low points can materially change the perception of the service received: in particular, unpleasant endings have a strong negative impact. Recognizing this bias in human perception, hotel chains, for example, have largely eliminated the need for business travelers to wait in line for checkout in the morning by collecting their payment information at the beginning of the overnight-stay journey. They also offer their loyal customers complimentary breakfasts as the last touchpoint. By replacing a low point at the end of the stay with a high point and time savings before departure, hotels create a positive bump in their stay experience.

- **Segments.** The frequency of high and low points of interaction also affects how services are perceived. Companies have noticed that when customers encounter all negative experiences during one touchpoint and the company deliberately splits pleasant experiences into multiple touchpoints, it can improve the perception of service. At Disney parks, design engineers intersperse lines for popular attractions with multiple pleasurable experiences to reduce the negative impact of the long wait time. For example, the popular attraction The Twilight Zone Tower of Terror has three different themed waiting areas, a staging video shown while customers queue in a room that looks like a 1920s hotel lobby, costumed cast members interacting with guests, and cooling fans and mist. Similarly, many large trade shows combine all payment and registration requirements up front, ideally before the event, and disperse the distribution of popular events, speakers, and samples throughout the show.

1 Richard Chase and Sriram Dasu, *The Customer Service Solution*, Columbus, OH: McGraw-Hill Education, 2013.

- **Control.** Customers want to feel like they are in control of their journey as well as other immediate aspects of their life affected by the customer journey. The more empowered, engaged, and updated they are in the course of the journey, the less likely they are to assign blame to the company when things go wrong. A home-repair company knew from its consumer-satisfaction surveys that customers cared the most about the time it took for a repair worker to visit the home and fix the problems. However, when the company ran a pilot test, it was surprised to find that customer-satisfaction scores went up when customers were offered options for scheduling, even if each option offered meant the customer would wait longer than the company's average wait time.

Rewiring customer touchpoints and journeys

Many companies take advantage of these principles to improve the customer perception of the services received. Airlines and movie theaters allow customers to select their seats, providing

EXHIBIT 3

Reworking touchpoints creates improved perceptions of service.

Business	Practice	Principle
Walt Disney World	Families select and pay for their meal plans and restaurant reservations before starting their vacation, avoiding the need to pay after each dining experience at the park	Get bad experience over with early
Amazon	1-click ordering reduces the pain of entering payment details each time while checking out, and the pleasure of shopping is repeated with each checkout	Segment pleasure, combine pain
Cathay Pacific	Flight attendants memorize the names of passengers in premium cabins in order to say good-bye by name as fliers deplane	Finish strong
Norwegian Cruise Lines	Pioneered "Freestyle Cruising," which gives customers choice over when they dine, where they dine, and when to see entertainment	Give customers choice
Pizza Hut	Provides detailed real-time updates on order status to customers	Create a sense of control by showing where the order is
Ritz-Carlton Hotels	Greets guests with a welcome email before arrival and personalized welcome letter in the room	Create a sense of control by sticking to habits

Source: McKinsey analysis

customers with a sense of control. Most online retailers understand the value of allowing customers a sense of control and strive to keep their website displays, placement of buttons, and other functions consistently in line with customer habits. That said, there are also multiple examples across the industry where companies lose the opportunity to take advantage of behavioral-psychology principles. Contrast the examples of these online retailers with some cable companies and banks that routinely change the interactive-voice-response menus for callers, thus frustrating customers. Most airlines spend substantial resources on aircraft interiors, check-in, and in-flight service, but some are only now starting to invest in the last step in the passenger's journey to avoid ending on a bad note. One airline devotes resources to helping fliers collect their baggage and find transportation. Another airline now prebooks a car service. Several others actively monitor the gate readiness of ground crews to avoid delays, all with the intent of providing a positive feeling to arriving passengers.

How can companies take advantage of these principles more systematically? The best practitioners we've observed work to rewire individual touchpoints as well as the most important customer journeys (Exhibit 3). In doing so, they establish a foundation for a customer-centric reputation that can serve as a powerful element of their enterprise brand.

Touchpoints

Companies looking to bring some of these approaches to their own customers' experience should start by taking a critical look at each touchpoint within their typical customer-experience journey, with an eye to incorporating approaches derived from the three principles. These are some common goals:

- Work through bad experiences early so that customers recollect the more positive, later elements of the interaction.
- Segment pleasure and combine pain for your customers so that the pleasant parts of the journey form a stronger part of customers' recollections.
- Finish on a strong, upbeat note, as the customer's final interactions will have a disproportionate impact on his or her memory of the service.
- Provide customers choice, giving them a sense of control.
- Stick to habits and prevent any surprises, again giving customers more peace of mind and thereby increasing their satisfaction with the services received.

Journeys

While winning at individual touchpoints is very important, it is not sufficient to have isolated wins in a few channels, devices, or applications. In addition to redesigning the discrete touchpoints that make up a customer journey, companies need to take a critical look at their most important customer journeys—which could last from several days to several weeks—in order to manage customer perceptions throughout the entire journey.

Redesigning the entire journey to incorporate the principles of behavioral psychology listed above has the potential to yield sustained improvements in customer satisfaction.

For example, a leading home-mortgage company has embedded many of these principles in the process of approving mortgage applications. It consolidated all the information it requires from prospective borrowers and asks for it up front. This serves to dispatch negative customer experiences early in the 90- to 120-day approval journey. Thereafter, the company schedules regular touchpoints where agents proactively provide positive news to customers as the process moves forward through various steps. This spreads the pleasure or good news over multiple touchpoints. The company also offers customers options for ways to interact with the company. Customers can go into an online system at any time and have full transparency into the status of their application, including the expected lead time before the application moves to the next step, thus preventing surprises and providing a sense of control. Finally, the lender works to finish the process on a strong positive note, as the loan approval is the very last interaction that customers experience during this journey.

Finish on a strong, upbeat note, as the customer's final interactions will have a disproportionate impact on his or her memory of the service.

Obstacles and remedies

The field of using behavioral-psychology principles in customer interactions by applying sequence, segments, and control is growing rapidly. Applying these often requires little additional investment and enables companies to earn credit for their improvements in service delivery.

One issue we commonly see emerge is that many initiatives to harness behavioral psychology in improving customer experience prove to be little more than disjointed trials. This is understandable. It is often difficult for companies to move to more systematic interventions at scale and to integrate them with broader transformations of their customer journeys. That's unfortunate, because when integrated with a broader program and underlying operational improvements, behavioral-psychology initiatives can help ensure customer-service investments have sustained impact. In this context they will have an amplifying effect on improvements made in service delivery.

Our work has explored the variety of ways that companies can break down some of these challenges into smaller bits. One critical issue is the inability to quantify the impact of customer-experience initiatives (see "Linking the customer experience to value," on mckinsey.com). It's

also a challenge when the existing operating model is not solid enough to integrate behavioral programs into, and when siloed functions represent a roadblock to more systematic improvement efforts (see “Leading and governing the customer-centric organization,” on mckinsey.com). Finally, company cultures that resist embracing rapid and systematic prototyping of new digital initiatives are likely to find it difficult to refine behavioral elements in their customer interactions to improve service (see “Using rapid process digitization to transform the customer experience,” on mckinsey.com). By breaking down these barriers, more companies can find it possible, with minimal investment, to capture the incremental value that lies in smartly applying behavioral principles. ▼

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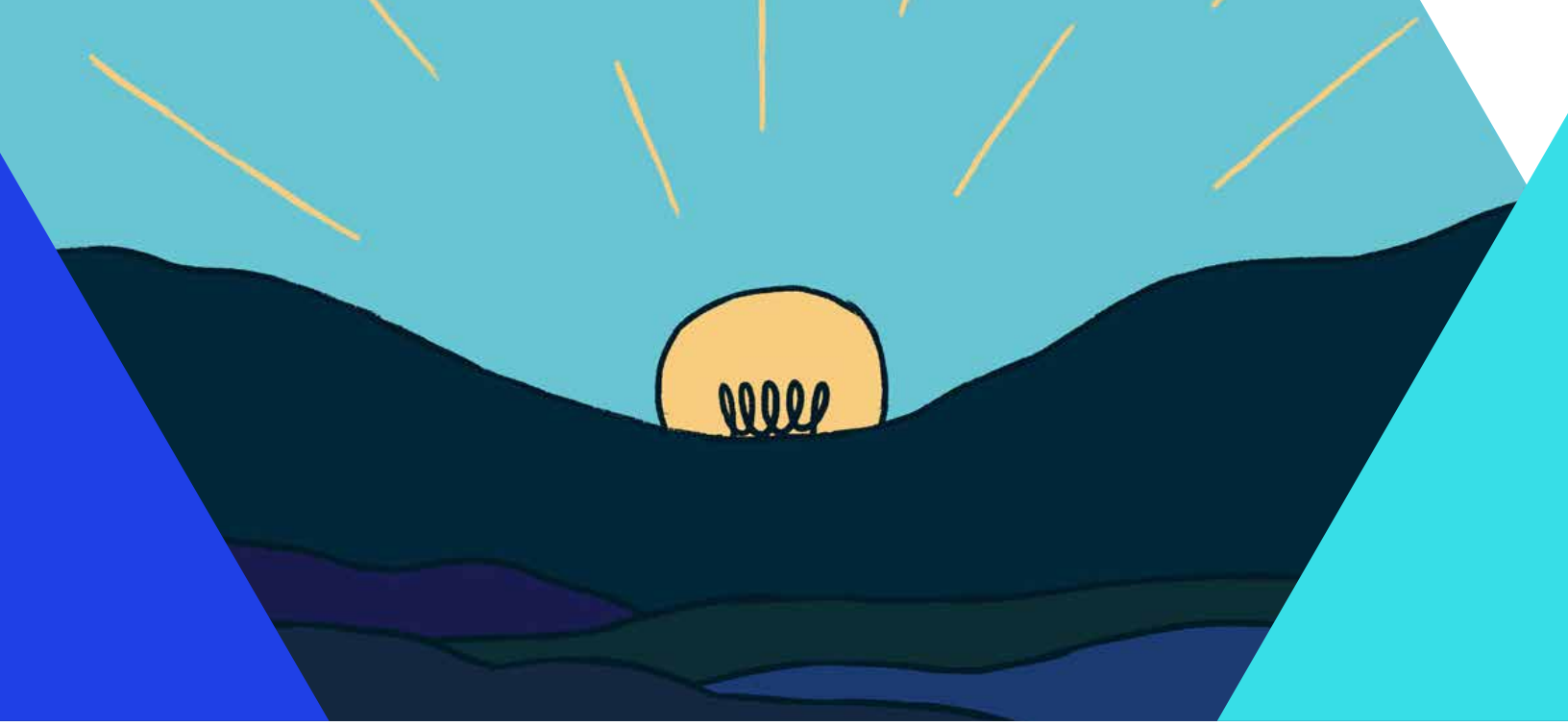
PART 3

Strategy & Innovation



What makes some Silicon Valley companies so successful

Heitor Martins, Yran Bartolomeu Dias, and Somesh Khanna

Everyone wants to know the secret sauce but most who investigate focus on the wrong lessons. Here's what we learned in our travels.

Executives and entrepreneurs from all over the world have traveled to Silicon Valley to learn the secrets of its success. But in our conversations with executives about what they've learned, we've seen a tendency to focus on superficial elements rather than on the root causes of companies' success. Sure, speed and boldness are important, but what is it about the culture of these companies that cultivates them? We decided to do a little digging ourselves.

Over a week in Silicon Valley, we met with more than 50 people deliberately chosen to give us a broad cross-section of insights. We spent time with established digital players, midsize companies (including Box and Palantir), and startups, particularly those focused on FinTech and technology services. We met with leaders at private equity funds, venture capitalists, and incubators, including Andreessen Horowitz and Playground. And we made the rounds of the thought leaders in the Valley, from the dean of Stanford to the founder of Lunar to a member of Tesla's board.

These conversations highlighted some attitudes and values that seemed to go a long way toward explaining Silicon Valley's innovation identity. Here are the ones that struck us most:

Lace audacity with grit. The kind of innovation that creates new markets always goes against the grain. But boldness by itself is a dime-store commodity. What stood out for us in these companies is the day-to-day determination to see something through despite near constant failure. We found people at all levels to be especially levelheaded about failure and comfortable with the inherent messiness of experimentation. The magic for them is not something's initial lightbulb moment but the commitment to assessing, refining, and reintroducing the systems that will make the thing work.

Use strong leadership to enable true collaboration. In the Valley, the leaders who are shaking things up combine a palpable vision with tenacity and the ability to build an organization that attracts other top thinkers. They have a pugnacious, single-minded determination to make their vision happen.

Yet while that kind of leadership is crucial, it's the ability to tap the collective minds of the organization that drives the business. "Collaboration" is a term that's been in vogue recently, but the best Valley companies make it happen by investing in an environment that fosters collaboration. It's more than open office plans and Ping-Pong tables — it's a culture where teams self-organize; people from various functions come together to work on specific projects by habit, not by exception; and good ideas gain momentum organically by attracting talent from around the business. As projects advance and coalesce, new teams form to gather the skills and priorities needed. Managers act more as enablers and connectors, providing regular feedback and tracking progress.

Give employees (and their dogs) a long leash. The strongest founder-led organizations recognize what really motivates their people. Mission-driven employees naturally expect competitive compensation, but more important is the opportunity to shape the path of innovation, to play a meaningful role in growing the business, and to develop their own leadership chops. The more autonomy employees have to be resourceful and make decisions, the more likely they will be to stick around. Artificial constraints, such as formal organizational hierarchies and belabored consensus-building processes, create waste and dampen motivation. The most innovative companies set clear expectations around goals and investment risk but let employees define the best way to meet them. If that means being open to flexible work schedules and letting people bring their dogs or bikes to the office, so be it.

Build platforms, not products. In the old economy, the math was simple: The more products you sell, the more money you make. Silicon Valley doesn't think in terms of "products," instead embracing the unbounded economics of the platform, where connecting users and interactions is the new coin of the realm. Unlike a static product, a platform's value is defined by the users who populate and use it; a platform can morph to adapt to their needs and continually unspool new services and innovations. Valley companies think in terms of ecosystems, networks, and sharable services — elements that are crucial to scaling very quickly. Any business needs to make

money eventually, but the power of rapid scaling is a huge competitive advantage that those in the Valley understand keenly.

Think like engineers *and* customers. While "user-centered design" has become an increasingly popular term, Silicon Valley lives and breathes it in a way that senior executives elsewhere can't imagine. In Valley companies all levels of the business, from the CEO to coders to cross-functional teams, are hardwired to look at problems from the perspective of the user in order to figure out what sets of processes would create the smoothest, richest experience. They obsess about the customer; everyone is expected to solve customer and user problems whenever and wherever they find them.

Know that money only gets you so far. Gone are the days when the venture capitalists on Sand Hill Road were merely an elite cash dispensary. Innovation can have a short shelf life, so entrepreneurs with great ideas but little business experience need coaching and infrastructure as much as cash. VCs have evolved from being financing arms and proxy boards to providing entrepreneurs with everything from lab space and equipment to a small army of programmers and coders.

Startups need money, too, of course. But in the same way that they focus on building platforms that scale by connecting people and businesses, the best startups look for VCs that can plug them into broader ecosystems to provide additional leverage and extend their vision. That "vision" part is crucial: Not all networks are created equal, and understanding how the nodes of a network align with the startup's vision can be the difference between a good idea and a good idea that scales in the marketplace.

Get acquisitions right. Large companies looking for new talent and capabilities have long used acquisitions, but doing them well is tricky. Too many incumbents are flat-footed in their approach; more than just finding great talent, timing is what really counts. The time to move is not in the early stages, when startups are small and need freedom, nor in the late stages, when startups have established a reputation, but rather in the middle, when the startup has a proven concept and is ready to scale. What this means for companies looking to acquire is that they need to develop a detailed market analysis that demonstrates where value is already being created (i.e., the business is proven and not relying too much on fanciful projections) but also identifies the growth that's possible when the technology or business is scaled.

Large companies can also be too controlling after acquiring a startup, layering on rules and practices that don't jibe with the unstructured gestalt of the recently hatched business. That's often because incumbents look at how best to use assets rather than focusing on culture. Established players need to know when to lead and when to let their young partners set the pace. This point bears emphasizing given how crucial culture change is for companies that are

transforming their organizations. In many cases elements of the acquired business' culture can become a model for the acquiring company.

As these lessons show, for all the technological advances in Silicon Valley, it is the region's longstanding leadership in business model innovation that offers the deepest and most transformational insights. ▼

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The economic essentials of digital strategy

Angus Dawson, Martin Hirt, and Jay Scanlan

A supply-and-demand guide to digital disruption.

In July 2015, during the championship round of the World Surf League's J-Bay Open, in South Africa, a great white shark attacked Australian surfing star Mick Fanning. Right before the attack, Fanning said later, he had the eerie feeling that "something was behind me." Then he turned and saw the fin.

Thankfully, Fanning was unharmed. But the incident reverberated in the surfing world, whose denizens face not only the danger of loss of limb or life from sharks—surfers account for nearly half of all shark victims—but also the uncomfortable, even terrifying feeling that can accompany unseen perils.

Just two years earlier, off the coast of Nazarre, Portugal, Brazilian surfer Carlos Burle rode what, unofficially, at least, ranks as the largest wave in history. He is a member of a small group of people who, backed by board shapers and other support personnel, tackle the planet's biggest, most fearsome, and most impressive waves. Working in small teams, they are totally committed to riding them, testing the limits of human performance that extreme conditions offer. Instead of a

threat of peril, they turn stormy seas into an opportunity for amazing human accomplishment.

These days, something of a mix of the fear of sharks and the thrill of big-wave surfing pervades the executive suites we visit, when the conversation turns to the threats and opportunities arising from digitization. The digitization of processes and interfaces is itself a source of worry. But the feeling of not knowing when, or from which direction, an effective attack on a business might come creates a whole different level of concern. News-making digital attackers now successfully disrupt existing business models—often far beyond the attackers' national boundaries:

- Simple (later bought by BBVA) took on big-cap banks without opening a single branch.
- A DIY investment tool from Acorns shook up the financial-advisory business.
- Snapchat got a jump on mainstream media by distributing content on a platform-as-a-service infrastructure.
- Web and mobile-based map applications broke GPS companies' hold on the personal navigation market.

No wonder many business leaders live in a heightened state of alert. Thanks to outsourced cloud infrastructure, mix-and-match technology components, and a steady flood of venture money, start-ups and established attackers can bite before their victims even see the fin. At the same time, the opportunities presented by digital disruption excite and allure. Forward-leaning companies are immersing themselves deeply in the world of the attackers, seeking to harness new technologies, and rethinking their business models—the better to catch and ride a disruptive wave of their own. But they are increasingly concerned that dealing with the shark they can see is not enough—others may lurk below the surface.

Deeper forces

Consider an insurance company in which the CEO and her top team have reconvened following a recent trip to Silicon Valley, where they went to observe the forces reshaping, and potentially upending, their business. The team has seen how technology companies are exploiting data, virtualizing infrastructure, reimagining customer experiences, and seemingly injecting social features into everything. Now it is buzzing with new insights, new possibilities, and new threats.

The team's members take stock of what they've seen and who might disrupt their business. They make a list including not only many insurance start-ups but also, ominously, tech giants such as Google and Uber—companies whose driverless cars, command of data, and reimagined transportation alternatives could change the fundamentals of insurance. Soon the team has charted who needs to be monitored, what partnerships need to be pursued, and which digital initiatives need to be launched.

Just as the team's members begin to feel satisfied with their efforts, the CEO brings the proceedings to a halt. "Hang on," she says. "Are we sure we really understand the nature of the disruption we face? What about the next 50 start-ups and the next wave of innovations? How can we monitor them all? Don't we need to focus more on the nature of the disruption we expect to occur in our industry rather than on who the disruptors are today? I'm pretty sure most of those on our list won't be around in a decade, yet by then we will have been fundamentally disrupted. And how do we get ahead of these trends so we can be the disruptors, too?"

This discussion resembles many we hear from management teams thoughtful about digital disruption, which is pushing them to develop a view of the deeper forces behind it. An understanding of those forces, combined with solid analysis, can help explain not so much *which companies* will disrupt a business as *why*—the nature of the transformation and disruption they face rather than just the specific parties that might initiate them.

In helping executives to answer this question, we have—paradoxically, perhaps, since digital "makes everything new"—returned to the fundamentals of supply, demand, and market dynamics to clarify the sources of digital disruption and the conditions in which it occurs. We explore supply and demand across a continuum: the extent to which their underlying elements change. This approach helps reveal the two primary sources of digital transformation and disruption. The first is the making of new markets, where supply and demand change less. But in the second, the dynamics of hyperscaling platforms, the shifts are more profound (exhibit). Of course, these opportunities and threats aren't mutually exclusive; new entrants, disruptive attackers, and aggressive incumbents typically exploit digital dislocations in combination.

We have been working with executives to sort through their companies' situations in the digital space, separating realities from fads and identifying the threats and opportunities and the biggest digital priorities. Think of our approach as a barometer to provide an early measure of your exposure to a threat or to a window of opportunity—a way of revealing the mechanisms of digital disruption at their most fundamental. It's designed to enable leaders to structure and focus their discussions by peeling back hard-to-understand effects into a series of discrete drivers or indicators they can track and to help indicate the level of urgency they should feel about the opportunities and threats.

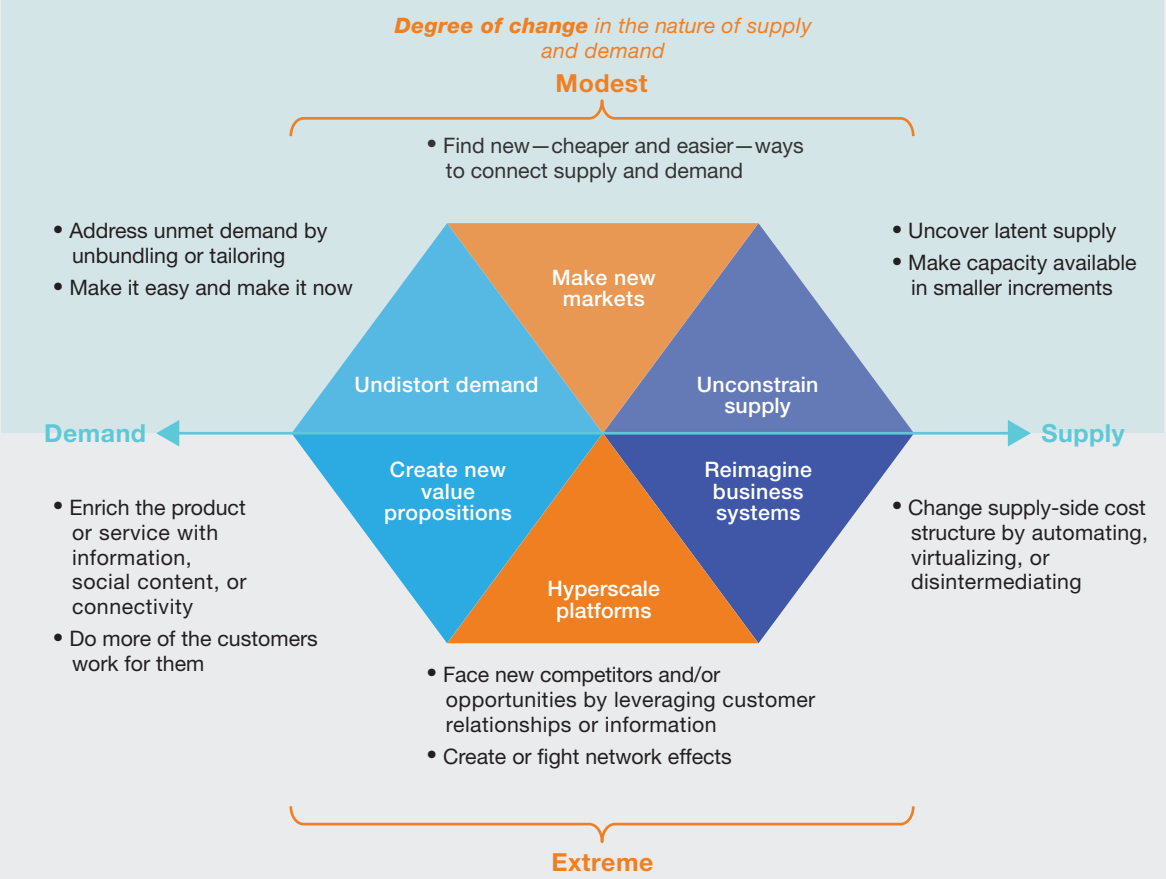
We've written this article from the perspective of large, established companies worried about being attacked. But those same companies can use this framework to spot opportunities to disrupt competitors—or themselves. Strategy in the digital age is often asymmetrical, but it isn't just newcomers that can tilt the playing field to their advantage.

Realigning markets

We usually start the discussion at the top of the framework (Exhibit). In the zone to the upper right, digital technology makes accessible, or "exposes," sources of supply that were previously impossible (or at least uneconomic) to provide. In the zone to the upper left, digitization removes distortions in demand, giving customers more complete information and unbundling (or, in

EXHIBIT

Digitization can disrupt industries when it changes the nature of supply, demand, or both.



Source: McKinsey analysis

some cases, rebundling) aspects of products and services formerly combined (or kept separate) by necessity or convenience or to increase profits.

The newly exposed supply, combined with newly undistorted demand, gives new market makers an opportunity to connect consumers and customers by lowering transaction costs while reducing information asymmetry. Airbnb has not constructed new buildings; it has brought people's spare bedrooms into the market. In the process, it uncovered consumer demand—which, as it turns out, always existed—for more variety in accommodation choices, prices, and lengths of stay. Uber, similarly, hasn't placed orders for new cars; it has brought onto the roads (and repurposed) cars that were underutilized previously, while increasing the ease of getting a ride. In both cases, though little has changed in the underlying supply-and-demand forces, equity-market value has shifted massively: At the time of their

2015 financing rounds, Airbnb was reported to be worth about $25 billion and Uber more than $60 billion.

Airbnb and Uber may be headline-making examples, but established organizations are also unlocking markets by reducing transaction costs and connecting supply with demand. Major League Baseball has deployed the dynamic pricing of tickets to better reflect (and connect) supply and demand in the primary market for tickets to individual games. StubHub and SeatGeek do the same thing in the secondary market for tickets to baseball games and other events.

Let's take a closer look at how this occurs.

Unmet demand and escalating expectations

Today's consumers are widely celebrated for their newly empowered behaviors. By embracing technology and connectivity, they use apps and information to find exactly what they want, as well as where and when they want it—often for the lowest price available. As they do, they start to fulfill their own previously unmet needs and wants. Music lovers might always have preferred to buy individual songs, but until the digital age they had to buy whole albums because that was the most valuable and cost-effective way for providers to distribute music. Now, of course, listeners pay Spotify a single subscription fee to listen to individual tracks to their hearts' content.

Similarly, with photos and images, consumers no longer have to get them developed and can instead process, print, and share their images instantly. They can book trips instantaneously online, thereby avoiding travel agents, and binge-watch television shows on Netflix or Amazon rather than wait a week for the next installment. In category after category, consumers are using digital technology to have their own way.

In each of these examples, that technology alters not only the products and services themselves but also the way customers prefer to use them. A "purification" of demand occurs as customers address their previously unmet needs and desires—and companies uncover underserved consumers. Customers don't have to buy the whole thing for the one bit they want or to cross-subsidize other customers who are less profitable to companies.

Skyrocketing customer expectations amplify the effect. Consumers have grown to expect best-in-class user experiences from all their online and mobile interactions, as well as many offline ones. Consumer experiences with any product or service—anywhere—now shape demand in the digital world. Customers no longer compare your offerings only with those of your direct rivals; their experiences with Apple or Amazon or ESPN are the new standard. These escalating expectations, which spill over from one product or service category to another, get paired with a related mind-set: amid a growing abundance of free offerings, customers are increasingly unwilling to pay, particularly for information-intensive propositions. (This dynamic is as visible in business-to-business markets as it is in consumer ones.) In short, people are growing accustomed to having their needs fulfilled at places of their own choosing, on their own schedules, and often gratis. Can't match that? There's a good chance another company will figure out how.

What, then, are the indicators of potential disruption in this upper-left zone, as demand becomes less distorted? Your business model may be vulnerable if any of these things are true:

- Your customers have to cross-subsidize other customers.
- Your customers have to buy the whole thing for the one bit they want.
- Your customers can't get what they want where and when they want it.
- Your customers get a user experience that doesn't match global best practice.

When these indicators are present, so are opportunities for digital transformation and disruption. The mechanisms include improved search and filter tools, streamlined and user-friendly order processes, smart recommendation engines, the custom bundling of products, digitally enhanced product offerings, and new business models that transfer economic value to consumers in exchange for a bigger piece of the remaining pie. (An example of the latter is TransferWise, a London-based unicorn using peer-to-peer technology to undercut the fees banks charge to exchange money from one currency into another.)

Exposing new supply

On the supply side, digitization allows new sources to enter product and labor markets in ways that were previously harder to make available. As "software eats the world"—even in industrial markets—companies can liberate supply anywhere underutilized assets exist. Airbnb unlocked the supply of lodging. P&G uses crowdsourcing to connect with formerly unreachable sources of innovation. Amazon Web Services provides on-the-fly scalable infrastructure that reduces the need for peak capacity resources. Number26, a digital bank, replaces human labor with digital processes. In these examples and others like them, new supply becomes accessible and gets utilized closer to its maximum rate.

What are the indicators of potential disruption in this upper-right zone as companies expose previously inaccessible sources of supply? You may be vulnerable if any of the following things are true:

- Customers use the product only partially.
- Production is inelastic to price.
- Supply is utilized in a variable or unpredictable way.
- Fixed or step costs are high.

These indicators let attackers disrupt by pooling redundant capacity virtually, by digitizing physical resources or labor, and by tapping into the sharing economy.

Making a market between them

Any time previously unused supply can be connected with latent demand, market makers have an opportunity to come in and make a match, cutting into the market share of incumbents, or taking them entirely out of the equation. In fact, without the market makers, unused supply and latent demand will stay outside of the market. Wikipedia famously unleashed latent supply that was willing and elastic, even if unorganized, and unbundled the product so that you no longer had to buy 24 volumes of an encyclopedia when all you were interested in was, say, the entry on poodles. Google's AdWords lowers search costs for customers and companies by providing free search for information seekers and keyword targeting for paying advertisers. And iFixit makes providers' costs more transparent by showing teardowns of popular electronics items.

To assess the vulnerability of a given market to new kinds of market makers, you must (among other things) analyze how difficult transactions are for customers. You may be vulnerable if you have any of these:

- high information asymmetries between customers and suppliers
- high search costs
- fees and layers from intermediaries
- long lead times to complete transactions

Attackers can address these indicators through the real-time and transparent exchange of information, disintermediation, and automated transaction processing, as well as new transparency through search and comparison tools, among other approaches.

Extreme shifts

The top half of our matrix portrays the market realignment that occurs as matchmakers connect sources of new supply with newly purified demand. The lower half of the matrix explains more extreme shifts—sometimes through new or significantly enhanced value propositions for customers, sometimes through reimagined business systems, and sometimes through hyperscale platforms at the center of entirely new value chains and ecosystems. Attacks may emerge from adjacent markets or from companies with business objectives completely different from your own, so that you become "collateral damage." The result can be not only the destruction of sizable profit pools but also the emergence of new control points for value.

Established companies relying on existing barriers to entry—such as high physical-infrastructure costs or regulatory protection—will find themselves vulnerable. User demand will change regulations, companies will find collaborative uses for expensive infrastructure, or other mechanisms of disruption will come into play.

Companies must understand a number of radical underlying shifts in the forces of supply and demand specific to each industry or ecosystem. The power of branding, for example, is being eroded by the social validation of a new entrant or by consumer scorn for an incumbent. Physical assets can be virtualized, driving the marginal cost of production toward zero. And information is being embedded in products and services, so that they themselves can be redefined.

Taken as a whole, these forces blur the boundaries and definitions of industries and make more extreme outcomes a part of the strategic calculus.

New and enhanced value propositions

As we saw in the top half of our framework, purifying supply and demand means giving customers what they always wanted but in new, more efficient ways. This isn't where the disruptive sequence ends, however. First, as markets evolve, the customers' expectations escalate. Second, companies meet those heightened expectations with new value propositions that give people what they didn't realize they wanted, and do so in ways that defy conventional wisdom about how industries make money.

Few people, for example, could have explicitly wished to have the Internet in their pockets until advanced smartphones presented that possibility. In similar ways, many digital companies have gone beyond improving existing offerings, to provide unprecedented functionality and experiences that customers soon wanted to have. Giving consumers the ability to choose their own songs and bundle their own music had the effect of undistorting demand; enabling people to share that music with everyone via social media was an enhanced proposition consumers never asked for but quickly grew to love once they had it.

Many of these new propositions, linking the digital and physical worlds, exploit ubiquitous connectivity and the abundance of data. In fact, many advances in B2B business models rely on things like remote monitoring and machine-to-machine communication to create new ways of delivering value. Philips gives consumers apps as a digital enrichment of its physical-world lighting solutions. Google's Nest improves home thermostats. FedEx gives real-time insights on the progress of deliveries. In this lower-left zone, customers get entirely new value propositions that augment the ones they already had.

What are the indicators of potential disruption in this position on the matrix, as companies offer enhanced value propositions to deepen and advance their customers' expectations? You may be vulnerable if any of the following is true:

- Information or social media could greatly enrich your product or service.
- You offer a physical product, such as thermostats, that's not yet "connected."

- There's significant lag time between the point when customers purchase your product or service and when they receive it.

- The customer has to go and get the product—for instance, rental cars and groceries.

These factors indicate opportunities for improving the connectivity of physical devices, layering social media on top of products and services, and extending those products and services through digital features, digital or automated distribution approaches, and new delivery and distribution models.

Reimagined business systems

Delivering these new value propositions in turn requires rethinking, or reimagining, the business systems underlying them. Incumbents that have long focused on perfecting their industry value chains are often stunned to find new entrants introducing completely different ways to make money. Over the decades, for example, hard-drive makers have labored to develop ever more efficient ways to build and sell storage. Then Amazon (among others) came along and transformed storage from a product into a service, Dropbox upped the ante by offering free online storage, and suddenly an entire industry is on shaky ground, with its value structure in upheaval.

The forces present in this zone of the framework change how value chains work, enable step-change reductions in both fixed and variable costs, and help turn products into services. These approaches often transform the scalability of cost structures—driving marginal costs toward zero and, in economic terms, flattening the supply curve and shifting it downward.

Some incumbents have kept pace effectively. Liberty Mutual developed a self-service mobile app that speeds transactions for customers while lowering its own service and support costs. The New York Times virtualized newspapers to monetize the demand curve for consumers, provide a compelling new user experience, and reduce distribution and production costs. And Walmart and Zara have digitally integrated supply chains that create cheaper but more effective operations.

Indicators of disruption in this zone include these:

- redundant value-chain activities, such as a high number of handovers or repetitive manual work

- well-entrenched physical distribution or retail networks

- overall industry margins that are higher than those of other industries

High margins invite entry by new participants, while value-chain redundancies set the stage for removing intermediaries and going direct to customers. Digital channels and virtualized services can substitute for or reshape physical and retail networks.

Hyperscaling platforms

Companies like Apple, Tencent, and Google are blurring traditional industry definitions by spanning product categories and customer segments. Owners of such hyperscale platforms enjoy massive operating leverage from process automation, algorithms, and network effects created by the interactions of hundreds of millions, billions, or more users, customers, and devices.[1] In specific product or service markets, platform owners often have goals that are distinct from those of traditional industry players.

Moreover, their operating leverage provides an opportunity to upsell and cross-sell products and services without human intervention, and that in turn provides considerable financial advantages. Amazon's objective in introducing the Kindle was primarily to sell books and Amazon Prime subscriptions, making it much more flexible in pricing than a rival like Sony, whose focus was e-reader revenues. When incumbents fail to plan for potential moves by players outside their own ecosystems, they open themselves up to the fate of camera makers, which became collateral damage in the smartphone revolution.

Hyperscale platforms also create new barriers to entry, such as the information barrier created by GE Healthcare's platform, Centricity 360, which allows patients and third parties to collaborate in the cloud. Like Zipcar's auto-sharing service, these platforms harness first-mover and network effects. And by redefining standards, as John Deere has done with agricultural data, a platform forces the rest of an industry to integrate into a new ecosystem built around the platform itself.

What are the indicators that hyperscale platforms, and the dynamics they create, could bring disruption to your door? Look for these situations:

- Existing business models charge customers for information.
- No single, unified, and integrated set of tools governs interactions between users and suppliers in an industry.
- The potential for network effects is high.

These factors invite platform providers to lock in users and suppliers, in part by offering free access to information.

Finding vulnerabilities and opportunities in your business

All of these forces and factors come together to provide a comprehensive road map for potential digital disruptions. Executives can use it to take into account everything at once—their own business, supply chain, subindustry, and broader industry, as well as the entire ecosystem and

1 Michael Chui and James Manyika, "Competition at the digital edge: 'Hyperscale' businesses," *McKinsey Quarterly*, March 2015, McKinsey.com.

how it interacts with other ecosystems. They can then identify the full spectrum of opportunities and threats, both easily visible and more hidden.

By starting with the supply-and-demand fundamentals, the insurance executives mentioned earlier ended up with a more profound understanding of the nature and magnitude of the digital opportunities and threats that faced them. Since they had recognized some time ago that the cross-subsidies their business depended on would erode as aggregators made prices more and more transparent, they had invested in direct, lower-cost distribution. Beyond those initial moves, the lower half of the framework had them thinking more fundamentally about how car ownership, driving, and customer expectations for insurance would evolve, as well as the types of competitors that would be relevant.

It seems natural that customers will expect to buy insurance only for the precise use and location of a car and no longer be content with just a discount for having it garaged. They'll expect a different rate depending on whether they're parking the car in a garage, in a secured parking station, or on a dimly lit street in an unsavory neighborhood. Rather than relying on crude demographics and a driver's history of accidents or offenses, companies will get instant feedback, through telematics, on the quality of driving.

In this world, which company has the best access to information about where a car is and how well it is driven, which could help underwrite insurance? An insurance company? A car company? Or Apple, which might know the driver's heart rate, how much sleep the driver had the previous night, and whether the driver is continually distracted by talking or texting while driving? If value accrues to superior information, car insurers will need to understand who, within and beyond the traditional insurance ecosystem, can gather and profit from the most relevant information. It's a point that can be generalized, of course. All companies, no matter in what industry, will need to look for threats—and opportunities—well beyond boundaries that once seemed secure.

▼ ▼ ▼

Digital disruption can be a frightening game, especially when some of the players are as yet out of view. By subjecting the sources of disruption to systematic analysis solidly based on the fundamentals of supply and demand, executives can better understand the threats they confront in the digital space—and search more proactively for their own opportunities. ▼

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Digital innovation in Asia: What the world can learn

Alan Lau, Gregor Theisen, and Cecilia Ma Zecha

Companies in the region are transforming their digital operations to great effect and building some of the world's most successful tech giants.

In Asia, a few factors make the impact of digital more pronounced than in other markets, including social penetration, consumers' openness to new technologies and the mobile Internet, and willingness by companies to innovate. In this transcript of a McKinsey Podcast, McKinsey senior partners Alan Lau and Gregor Theisen talk with Cecilia Ma Zecha about what makes Asia's technological advances different from the rest of the world and the lessons other regions can learn from Asia's innovations.

Cecilia Ma Zecha: Welcome to this edition of the McKinsey Podcast. I'm Cecilia Ma Zecha, an editor with McKinsey Publishing, based in Singapore. Today we're talking about digital trends in Asia, arguably the hottest region in the world for e-commerce, search, social networking, gaming, and ride sharing, just to name a few.

Asia has its own tech giants, such as China's Tencent, Alibaba, Baidu; Japan's Rakuten and SoftBank, among others. Here to tell us more about Asia's digital landscape and how companies in the region are transforming their digital operations are Alan Lau and Gregor Theisen, senior partners and coleaders of Digital McKinsey in Asia, based in Hong Kong. Alan and Gregor, welcome.

Alan Lau: Thank you.

Cecilia Ma Zecha: Can you start with some level setting on the similarities and the differences between the advance of digitization in Asia and the rest of the world?

Alan Lau: First, there is no one Asia. Economies are vastly different between Japan, Korea versus China, Indonesia, and India. One of the common myths is people think that developing Asia is behind in digital, and I think it's, in fact, the other way around.

The poor legacy in these developing Asian markets, whether it is IT or digital penetration, or the traditional retail and banking infrastructure, often means that digital is a great opportunity for the country to leapfrog. The most interesting digital market in Asia is actually not the likes of Korea and Japan, but is more China, Indonesia, and India. These are the markets that are really pushing the boundary and innovating the most.

Gregor Theisen: As a Western European, Asia is the most fascinating market I've seen so far, and that's for three major reasons. First of all, it's around innovation. That's not only China—we mentioned all those the companies already—but that's also happening in all the other markets like India or Indonesia.

The second thing is about how they leapfrog technologies. Most of these markets, even though e-commerce or Internet-banking penetration might be low, like in Thailand and Vietnam, social-network penetration is very, very high. It's much higher than in some of the developed markets. In these markets, you find unique business systems and ecosystems, which exploit these opportunities.

The third reason is that the people in these countries, they're open to new technology and mobile Internet. That makes it much easier for businesses to capture the opportunities.

Alan Lau: As Gregor said, these users do not have traditionally great services provided, whether it is in retail, banking, or telecom. When digital tech comes up with new business models, it's often new to these consumers. Therefore, they're more open-minded.

Cecilia Ma Zecha: India has a population of over 1.2 billion, but there's still a lot of potential for growth in broadband usage. There is a call for greater digital infrastructure. So there's still room for digitization to develop in India. Why do you think that that market is leading in innovation?

Alan Lau: If I try to compare India with China, as you said, the digital broadband penetration is still lower, which means that even at this lower level, if we already see this amount of innovation, we definitely can expect more. The other point is, with the attackers in India, they had the opportunity to try something that many Western peers didn't have the need to try before.

For example, look at e-commerce. You have leading companies like Flipkart and Snapdeal. The logistic challenge that they have to deal with is completely different than the UK, Germany, or the US. A lot of times the last-mile delivery is done by people going around on bike, and that really leverages the cheap labor in the country. That's also another reason why markets like India would have the chance to innovate, because they have to innovate. There isn't a lot that they can copy from.

Gregor Theisen: Let me add two points, Alan, regarding what you said about India. My first point is that India has most of the digital talent in the world. It's not only the home of the Internet service providers. These companies focused early on developing digital talent. I would argue we are talking about hundreds of thousands or even millions of talents in that market.

They are driving not only the innovation in India, but they are also the backbone for global innovation. My second point there is, and you touched upon it, yes, of course, there is significant room for improvement regarding the infrastructure side. Broadband Internet access, high-speed mobile phone, or even reliable mobile-phone networks. However, they are moving very fast at least in the key centers and major cities. These markets alone are significant.

A lot of people look at unicorns. Unicorns are defined as privately owned companies with valuations above $1 billion. If you look at the global unicorn landscape, 50–60 percent are based in the US.

The second market then, like Alan said before, is China. The third market is more or less India. You have innovative companies where people believe the valuation justifies their business system and what they are doing. India already has these kind of unicorns there. There are seven, eight, nine of them already, and much more emerging. So I would say, yes, e-commerce penetration is low, around 10 percent. However, Internet banking penetration, at least according to our surveys, is around 18 percent. If you multiply that with the population, it is already a significant market.

Cecilia Ma Zecha: Alan, you've spent a lot of time looking at China. Speaking of a very exceptional entrepreneurial class being an important factor in driving innovation, that certainly is one of the key points of success for the Chinese market. Can you talk more about that?

Alan Lau: The first thing to understand about China is that you don't have the same global names that you see everywhere else. Google, Facebook, Instagram, by and large, are still the leaders in many of the Asian markets. For example the number of Facebook users in Indonesia is larger than the number in the US.

But I think China is the exception. It's a very well-known fact that there is the great firewall, which means that many of these companies' servers are blocked in China. As a result, it has created the environment for the likes of Tencent, Baidu, and Alibaba to rise, starting from about ten years ago. A common myth is people think that these are quick copycat companies that looked to Silicon Valley to import their business model.

Indeed, it may have started that way, but if you look at the past, I would say six, seven years, the market has gone through, and these leaders have done a lot more than just copying. Take Tencent, for example. They have a very popular service called WeChat, which is very similar to a combination of WhatsApp and Facebook. Now they have 700 million users in China. In China, you've also got WhatsApp freely available. But it is WeChat that is, by far, the dominant player.

The Internet leaders in China, like Tencent and Alibaba have really innovated. Yes, they may have drawn the initial inspiration from outside about ten years ago, but certainly in the past couple of years, they've really developed a product and adapted it very much to the local market, to the extent that now a lot of people from outside have been looking to China for inspiration.

Cecilia Ma Zecha: Gregor, the retort is that government protection enables local Chinese firms to thrive, blocks out competition, therefore, Chinese firms don't have to innovate, but instead they copy business models in the West. Is that, like Alan is saying, not giving Chinese tech leaders enough credit?

Gregor Theisen: I fully agree with what Alan said. I'm intrigued by the degree of innovation that is happening in China. These are not only the leaders like Tencent, Baidu, and Alibaba, who have innovated around existing social networks. But it's much more about the businesses around them, for example like in the banking or financial services world.

There are offerings out there in China that are purely based on WeChat. I'm not aware of any other market where we have a WhatsApp bank that is entirely operating in that ecosystem. And that's not only limited to financial services. How people sell and interact via these social networks is also unique. Lastly, what I would love to add is, if they innovate, they innovate at scale. It is rapidly not only a small start-up, it is rapidly an entire business system, with real revenues, real impact, and real clients.

Cecilia Ma Zecha: How has WeChat been able to succeed the way that it has? Essentially turning one app into a full-scale mobile-payment service, whereas many people in the West, for instance, are used to using different apps for different things.

Alan Lau: First, we need to look at WeChat as not just one app. Of course it has a very sticky high-frequency service, which is messaging. But that is just a starting point. It is a super app because it is a portal to many other services that are being offered.

For example, on the main page, you would see the usual messaging interface. It's very similar to WhatsApp. But if you swipe right, then you see many other services that are offered. As Gregor

was saying, you can do your banking there. You can shop online. You can get a cab. You can do online payments.

The global discussion and narrative has been around app fatigue. That people have way too many apps on their smartphone. They don't want to be bounced off from one app or one website to another to complete a set of services. In China, it's the opposite. You can get a lot of stuff done on WeChat or Alipay.

Cecilia Ma Zecha: What about the other leaders from China such as Alibaba or Baidu? Anything that they could teach the rest of the world?

Alan Lau: It's also around the theme of ecosystems. Of course, Taobao and Tmall is the traffic driver. Everyone's shopped on it. In fact, the average number of transactions people had on Alibaba is 50 times a year, which means people buy something every week. On top of that, what really facilitates those transactions is Alipay, the payment platform. Alipay is the anchor for Alibaba. They've also developed a whole bunch of services. Very similar to WeChat, you can also shop online. You can get a cab. You can order other local services.

But they are also diversifying from that as well. One of the most fascinating services that I've seen recently is something called Sesame Credit. In China, most people don't have a credit history. What Alibaba has done with Sesame Credit is to say, "Based on your previous transaction history or borrowing history, I can automatically generate a score for you." If you had a high enough score, that allows you to do things in a more convenient way. So, for example, if you have a score that is above 700, you can book a hotel without making a deposit. If you have a score over 800, you can get a visa to go to Europe without producing income proof. I think if you have a score also around 800, you can get a priority listing on the most popular dating sites in China. They're creating all kinds of new cases, and other new ecosystems.

Gregor Theisen: I always learn when I look into the Chinese market. Every day, every second, there's some innovation happening. I want to step back, and say, yes, of course, these are leading innovators, and they're brilliant ecosystems. They also benefit from the Chinese consumer because they spend more time on the mobile Internet with their smartphone compared to many other markets. In some other markets like Indonesia, they spend even more time. But compared to Western Europe or North America, Chinese consumers spend more time, and they love conveniences like one-stop shopping. We talked about WeChat, Alibaba, all the ecosystems that drive that. But also, the willingness of the consumer. Of course we can learn a lot in the other markets around the ecosystems, what they are offering, and the integration, and the boldness of integrating new business systems.

However, one always has to take into consideration the consumer in the different markets: How will they react? And what will they do? Having said that, there's lots of room for improvement for many other markets and many other players in the other markets. Because even though the consumers don't behave like the Chinese one, they behave in a way that the demand is much higher than the current supply in these markets.

Alan Lau: I really like that point about the open-minded consumer, and I do think it is a key part to the success that we've seen in China. Let's take another service, as an example. Qzone is the equivalent of MySpace, I would say, or of Facebook.

They also have close to 700 million users. There was a lot of debate early on to say, "I just want people to post more photos. How do I do that?" One of the ideas within the company was to say, "I'm just going to auto load the photo and pull it from the photo album into the top of the app, so people can see it." They can just click, and then they can post.

I think many Western counterparts might also come up with the same idea, but it requires someone like a Chinese player to push the boundary. It also required consumers that are open-minded who said, "You're not intruding in my privacy," for that to take off.

Cecilia Ma Zecha: So Korea and Japan are the tech leaders in the minds of many. How are they doing in the advance of digitization in today's world?

Gregor Theisen: Korea and Japan, they have leading tech companies, both of them. Most of the innovation happening there is within the companies, especially on the tech side; they are leading innovators. However, they don't have this kind of start-up community ecosystem, vibrant community, where lots of innovations are happening.

That is happening much more in the boundaries of existing companies. However, if you look into these markets, they benefit a lot from great infrastructure. They benefit a lot from investments over a certain period of time, because both of these cultures, they are behind new ideas, and they go after these new ideas for multiple years. It's not that you get one year, if it doesn't work, we stop it.

Alan Lau: Korea and Japan are both very interesting markets. Very, very different when it comes to digital because Korea does have a lot of innovation, as Gregor said. Both in a traditional tech site, in hardware, leaders like Samsung and LG. But also in digital.

If you look at some of the global services that they've taken global, like Line, Kakao, these are messaging, but also gaming services that are popular not just in Korea but also outside. In fact, in many parts of Asia their e-commerce penetration is also very high. They just haven't got the same scale as China, as Gregor said. That makes it quite different. I think Japan is a completely different market, and one that I think many people still struggle to understand.

Cecilia Ma Zecha: How is it different?

Alan Lau: It does have major tech companies, admired companies that people have known for decades: Sony, Mitsubishi, Toshiba. But when it comes to digital and IT, and maybe Gregor can add to that, they have been very slow to move.

Legacy IT issues in Japan are probably one of the most challenging as we look across Asian markets. The idea that they need to be disrupting their own businesses and making a lot of changes to the legacy has been slow to catch on.

That doesn't mean that things would not happen. For example, when the iPhone was launched, people also said that it would never take off in Japan because they've got a different system. They've got Docomo. It's a completely different industry environment. But it did take off. When you have a fantastic service, and when you have an innovator that's really pushing a boundary, it will happen. It hasn't happened yet.

Gregor Theisen: And we have another industry, the gaming industry, and especially mobile, online gaming. I would argue that Japan is one of the leading players in that global industry. They are innovating a lot. You see that in certain subsegments of industries, they are able to innovate.

Cecilia Ma Zecha: Increasingly, companies around the world must experiment with digital technology, and, in some cases, reinvent themselves at the core to create new value. Talk about the transformational opportunities and challenges that organizations in Asia face.

Gregor Theisen: First of all, I would separate out emerging Asia from mature Asia because if you talk about the mature Asian markets and these corporations, at the end, they face exactly the same challenges as American or European companies. They have traditional legacy IT systems. They are in the business for 50 or hundreds of years. They have an existing customer base. They are used to a growth of 2–5 percent per year. These are all very stable environments.

To embark on a digital transformation requires top-down leadership. All functions need to be involved. IT architecture needs to be redesigned. Data architecture needs to be redesigned. But at the end, it is more or less the same as what you do to invest in Europe or in North America with these kind of companies.

If you move to emerging Asia or to conglomerates, which have only a recent history of significant growth, they have one key advantage. The key advantage is no legacy IT. That helps them significantly to leapfrog and embark on a digital transformation journey. The second key advantage most of these companies have is very strong top-down leadership. Some of them are privately owned. They have very visionary leaders. If you embark on an entire transformation of the entire corporation, a visionary leader is extremely helpful, because they inject the entrepreneurial mind-set, exactly what you need to have in order to be successful. So they have an advantage on the legacy IT side, and they have visionary leaders. The third point I would add: there is that you have digital talent available. Even though everybody is looking for digital talent out there, the educational systems, university graduates, they are more and more interested.

They are intrigued. And in my view, they are trained much better to be active and good contributors to a digital transformation than their peers in many other markets. So they have

access to a talent pool. They have visionary leaders, and in some markets or some corporations, they don't have legacy IT.

Alan Lau: That's right. There are more similarities than differences when it comes to a digital transformation between Asia and the rest of the world. You still need to recognize that digital is not just having a website or having a social-network account. But it's about digitizing the entire enterprise, as Gregor was saying.

It's digitizing the process, and the customer experience, modernizing your IT, injecting big data analytics and also AI into your core operations. All of that needs to happen. Having visionary leaders, as many Asian companies have, helps tremendously. Many of these are founder-owned companies. They're first-generation entrepreneurs, and they have the skills, and the commitment, to drive through digital transformation.

That's super important. The bottom-up involvement is also critical. Maybe that's where Asian companies are a little bit more different than their Western peers. Because there is still the traditional Asian culture, which is more hierarchical.

Which is, "This is my division. How do I work with them? And do I break the boundary?" One of the terms that we use is you need dragon slayers in the company. The visionary boss needs to empower the digital leader to say, "You need to go work across functions to do things in a different way and be empowered to do so." This may not always come naturally to Asian cultures. The top-down support would help. But you also need to create that bottom-up culture, and people feel empowered to make changes happen.

Cecilia Ma Zecha: Finally, given everything that we discussed, what would you tell CEOs who are listening to this conversation are the key takeaways when it comes to understanding the digital landscape in this region, and what's distinctive about some of the transformational journeys that are happening within organizations in Asia?

Gregor Theisen: I would say four points. My point number one is if you are a non-Asian CEO or leader, have a close look into Asia and really spend time on the ground. And not only in China. We discussed some other markets like Indonesia and so on, because lots of innovation at scale is happening here.

My second point is, the degree of change and the speed of change is significant. We talked about, we want to be paperless in three years. These are corporations who have 100,000-plus employees. We talked about, I want to reduce my cost base by 90 percent. Again, in three to four years, some significant players. The speed is significant. Learning how they do that, but also thinking about, we think, and I think, they will not only focus on Asia but they will be in Europe and in North America shortly with these kind of offerings.

My third point is how radical some of the players in Asia are. But also for Asian players. If you embark on a digital transformation, go all in. It is not, "Oh, I stop at a certain point in time." You either improve your customer satisfaction and the journeys or you don't. If you just embark on the journey and then stop, because you have traditional channels, sales channels, you have legacy IT, whatever might stop you, then you might be in a worse position.

It is a multiyear journey. It is a top-down journey. But if you embark on it with the entire organization, you will be successful. And the fourth point is, early on, think about the talent, cultural, and organizational implications. What are the new talents I want to integrate? Which ecosystem do I want to be part of? And what are the implications for my organization?

Cecilia Ma Zecha: Alan?

Alan Lau: Gregor covered it very well. I'll just add one point for CEOs, which is, think about your digital board. In a survey that McKinsey did, only about 15 percent of companies said that they actually had a digital-ready board. Only 5 percent of them said they have a technology board. In a rapidly changing environment and paradigm, it is very important to have challenges, to help management stay alert and be updated on what's happening.

That doesn't mean just bring in a token digital native ex-CEO to be on the board, because you wouldn't typically have 11, 15 board members, and just having 1 or 2 is not enough. By all means, bring people in with the relevant experience, but the rest of the board members also need to get upgraded and be aware of the challenges and the opportunity that digital brings. It's important to see Asia as a market where a lot of innovation is happening. People need to come see it. On top of that, don't treat the large Internet companies here, if I take China as an example, as just competitors. They are your partners.

Cecilia Ma Zecha: Well, thank you, Alan and Gregor, for your insights. And thank you for listening to this conversation. If you'd like to find out more about our research and knowledge, please head over to McKinsey.com. ▼

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PART 4

Organization & Operations

Adapting your board to the digital age

Hugo Sarrazin and Paul Willmott

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.

"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.

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.

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 (exhibit). 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.

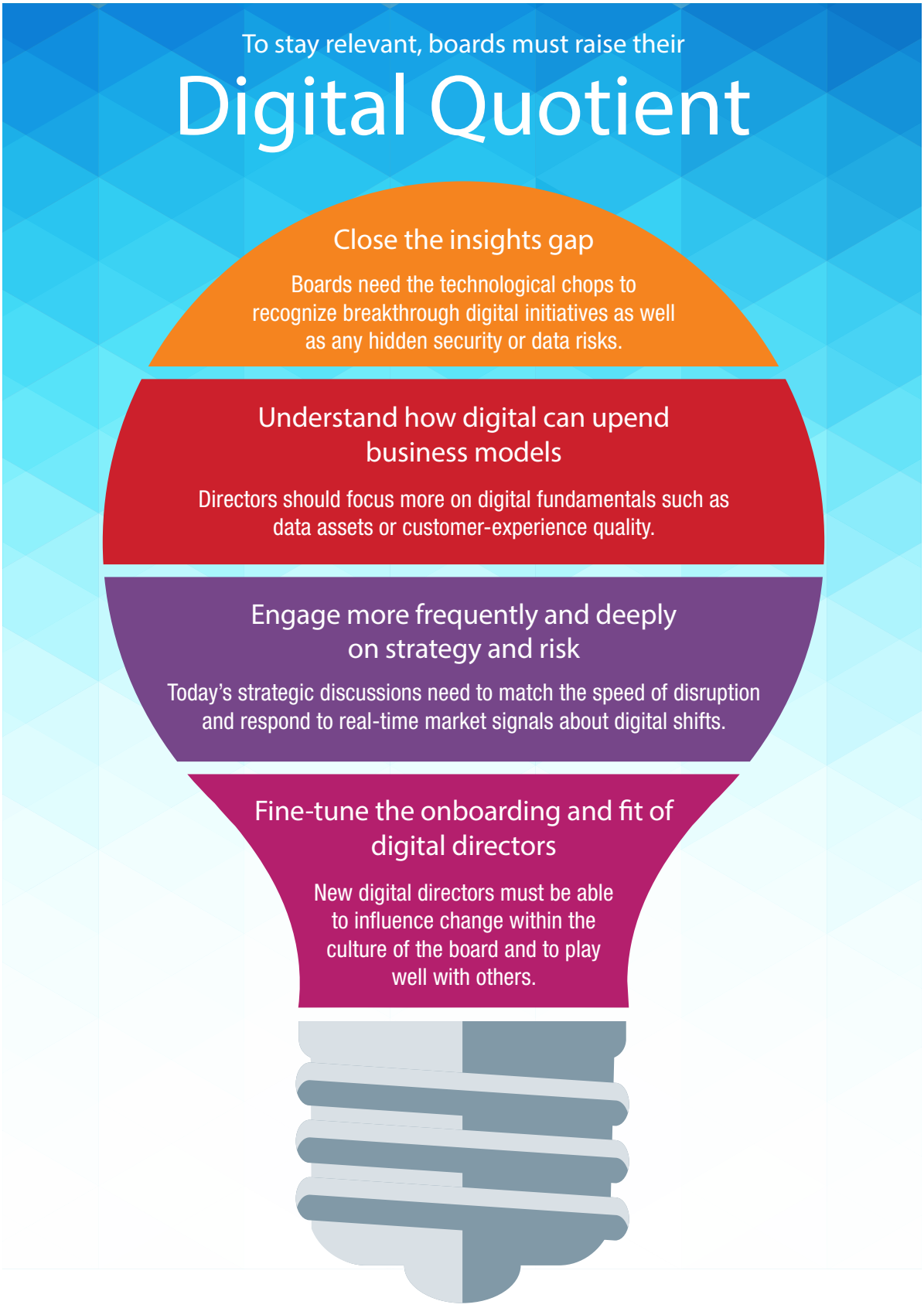
At the very least, top-management teams need their boards to serve as strong digital sparring partners when they consider difficult questions such as investments in experimental initiatives that could reshape markets, or even whether the company is in the right business for the digital age. Here are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

2 See Rhys Grossman, Tuck Rickards, and Nora Viskin, "2014 Digital board director study," Russell Reynolds Associates, 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.


To stay relevant, boards must raise their
Digital Quotient
Close the insights gap
Boards need the technological chops to recognize breakthrough digital initiatives as well as any hidden security or data risks.
Understand how digital can upend business models
Directors should focus more on digital fundamentals such as data assets or customer-experience quality.
Engage more frequently and deeply on strategy and risk
Today's strategic discussions need to match the speed of disruption and respond to real-time market signals about digital shifts.
Fine-tune the onboarding and fit of digital directors
New digital directors must be able to influence change within the culture of the board and to play well with others.

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.

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 under-appreciate 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]

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

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.

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 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 con- fronting 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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An operating model for company-wide agile development

Santiago Comella-Dorda, Swati Lohiya, and Gerard Speksnijder

Organizations are succeeding with agile software and product development in discrete projects and teams. To do so, they must rethink foundational processes, structures, and relationships.

Many digital companies are using agile development practices to deliver goods and services to customers more efficiently and with greater reliability. Using this software-development approach across all business units and product groups, digital giants have been able to design and build features quickly, test them with customers, and refine and refresh them in rapid iterations.

By contrast, few traditional companies—those with both online and offline presences—are using agile methodologies across the majority of their product- and application-development teams. Many banks, for instance, have established digital units to develop and release mobile apps or website features quickly. But those groups typically remain physically and strategically disconnected from the rest of the IT organization and the rest of the company.

Takeaways

Although traditional companies are experimenting with agile, their efforts lack the organization-wide reach necessary to capture the full potential of the approach.

We found that the companies making strides in their agile development practices have focused on four parts of their operating models: they've made organizational structures more product oriented, stepped up business–IT interactions, recast roles and responsibilities, and taken a new look at budgeting and planning.

Several methods, including big-bang redesigns and "wave and spike" models, can help companies transform to keep pace with new entrants, technologies, and customer expectations.

Research indicates that many traditional companies are experimenting with agile practices in discrete pilot projects and realizing modest benefits from them. But fewer than 20 percent consider themselves "mature adopters," with widespread acceptance and use of agile across business units.[1] Meanwhile, according to our own observations, the companies that *are* deploying agile at scale have accelerated their innovation by up to 80 percent.

There are many reasons traditional companies have not been able to successfully scale up their agile programs, but we believe a chief impediment is their existing operating models and organizational structures. In most of these companies, the process of software or product development remains fragmented and complex: a business request for a new website feature can kick-start a development process involving multiple teams, each tackling a series of tasks that feed into the original request. For instance, one team might work on the front-end application, another on updating associated servers and databases, and still another on reconciling the front-end application with legacy back-end systems. What's more, the supporting business processes (among them, budgeting, planning, and outsourcing) and existing roles and responsibilities in both the IT organization and business units continue to adhere closely to the legacy waterfall approach.[2]

For most companies, it will be difficult to incorporate agile practices from small-scale pilots into all business units and functions—regardless of the success of those pilots—without making significant structural changes.

We have helped many organizations adopt agile development practices in their IT and business groups. Building on that base, we recently studied in depth 13 large traditional organizations that are implementing agile methodologies across functions and business units (see sidebar, "Launching agile at scale: The research base"). To facilitate widespread adoption, these companies have made changes in one or more parts of their operating models, targeting the following four

1 *The 10th annual state of agile report*, VersionOne, 2016, versionone.com.

2 Waterfall product development is asynchronous; teams walk through multiple process steps, requiring sign-off on each task before they can start on the next one.

EXHIBIT 1

To deploy agile development at scale, companies will need to alter their operating models and organizational structures.

	Before	After
Organizational structure	**Application-oriented focus**, with ever-changing teams and pooled resources; siloed perspective	**Product-based focus**, with stable teams and dedicated resources; end-to-end perspective
Interactions between business and IT	Development process is managed by **proxy product owner** from IT, with input as needed from business	Development process is managed by **strong product owner** from business, who works closely with IT at all stages
Roles and responsibilities	Scrum teams comprise **developers and testers**; project-manager and line-manager roles remain unchanged from waterfall approach	**All roles are integrated** within self-organizing scrum teams; project-manager role is minimized and line managers focus on capability building
Budgeting and planning	Traditional **yearly budgeting**, with fixed budget allocated to projects	**Venture capital–style budgeting**, where minimally viable product is launched and future funding depends on product performance

Source: McKinsey analysis

areas: modifying their organizational structures to be more product oriented, improving interactions between the business and IT, redefining roles within business units and the IT organization, and reconsidering their budgeting and planning models (Exhibit 1).

The companies that have started on this path to change are realizing early benefits. One has switched from a project- to a product-oriented operating model. It has deployed talent and IT resources based on IT requirements for the entire customer-onboarding experience, for instance, rather than according to individual applications used during onboarding. As a result of this change in focus, it is now launching up to four website features a month instead of the typical four a year the company was able to release previously. This successful shift to agile was made more attainable when the company carefully considered when and how to phase in various modifications to its operating model.

Scaling agile practices

The benefits of agile are by now well known. Under agile development methodologies, IT organizations and product developers cocreate products and services with the business, rather than simply collecting feature specifications and throwing them back over the wall, as would

happen under the waterfall development model. Teams can experiment with minimally viable products, test and learn from those prototypes, and ultimately deliver new software features and products in days or weeks, not years. Based on our observations of leading-edge adopters, quick codevelopment of products and collaboration among highly skilled IT and business professionals can happen on a broader scale when companies take steps to remake their operating models and organizational structures, focusing in particular on these four principles:

1. Adopt a product-oriented organizational structure

Traditional companies tend to organize their IT resources according to applications and projects, creating the type of fragmented development experiences described earlier. Instead, they need to organize IT resources around products, gathering business-unit leaders, developers, and other members of the organization in stable end-to-end teams that are focused on delivering designated business outcomes. Such a structure would mean the end of projects as they are traditionally defined and of coordination bodies such as the project-management office.

In an agile-at-scale environment, products can't be defined solely as commercial offerings. They may actually be combinations of offerings (for instance, a payroll service), or the customer experience (say, all the features and tasks that make up the online purchasing journey), or an IT system shared by multiple product teams (such as pricing software that generates quotes on demand). So it's important for business and IT leaders to redefine the units of delivery. And once products have been recategorized, the company must designate an agile team, or clusters of agile teams, that will be responsible for the development and maintenance tasks associated with those products. These teams typically will include developers, testers, product owners, and others. They can draw additional support from a centralized group of experts—specialists in security issues, user-experience researchers, or enterprise IT architects, for instance.

Launching agile at scale: The research base

To better understand the impediments to deploying agile software development at scale, we conducted an in-depth study of 13 organizations that are in the process of extending their agile capabilities. These included companies in financial services, healthcare, telecommunications, and several other industries. The bulk of the companies represented in our research are in North America (six), but we did study companies in Europe (three), Latin America (two), and Africa and Asia (two). All were at different points in their adoption of agile at scale, with some of the most advanced organizations having deployed agile across 60 percent or more of their innovation activities. Through our research, we learned that without making significant shifts in organizational structures, roles and responsibilities, and other underlying elements of the operating model, it can be quite difficult for companies to extend agile practices beyond pilot teams.

A large medical-device manufacturer significantly shortened its time to market by refining its organizational structure. Under its traditional structure, there could be as many as 20 handoffs when a business unit shared its specifications and requirements with the technology organization for a new piece of software or an additional feature in existing software. Because of the interdependencies among its products, leadership knew it wouldn't be enough to deploy agile within one business unit or within certain product-management teams in the technology organization. In 2015, the company tweaked its product-ownership model so that software requirements were directly transmitted from dedicated product owners in the business units to the agile teams, rather than passing through multiple parties. With this change, the company was able to reduce the amount of time it took to release products in the market. The structural changes also facilitated the rise of several communities of practice. These role-based or topic-based groups (sometimes called guilds) are critical in agile-at-scale environments. They can encourage the transfer of knowledge among team members, promote coordination between teams and functions, and become the catalyst for continuous performance improvement.

2. Improve interactions between the business and IT

To create an agile-at-scale environment, companies will need to break down silos between and within the business units and the IT organization. It's a perennial issue in most companies. But closer collaboration can be achieved by designating strong product owners from the business units to work with IT—individuals who understand the company's products well and who have the technical knowledge and authority to prioritize feature changes in products.
In most traditional companies, product owners from the business side are involved in software development sporadically, providing input only as needed. To compensate for this lack of engagement, IT organizations often appoint a proxy product owner from IT. This arrangement can be useful in the near term but impede long-term product or project success. The proxy product owner typically has limited access to customers due to organizational barriers and possesses no mandate or the authority to make decisions. Because direction, priorities, and accountability are lacking, agile development is stalled. Teams face a significant amount of rework and waste.

By contrast, a strong product owner has an in-depth understanding of the product in question, connections to and an understanding of customers, and full authority to make quick decisions. Such accelerated decision making helps to reduce bottlenecks in development and increase productivity.

A provider of software-as-a-service solutions was struggling to get products to market in a timely fashion. There were marked lags in decision making and unclear lines of communication between IT and the business. In 2014, the company implemented a three-tiered product-owner structure, with a chief product owner leading a product domain, a senior product owner leading a product line, and product owners working with the scrum teams. Under this revised structure, interactions between IT and the business units improved. The lines of communication were clearer. The company was able to make decisions much more quickly while maintaining consistency and coordination within and across product-development groups. In part because of this structural change, the company was able to bring new software products to market quarterly—and in some instances monthly—rather than only once or twice a year.

3. Redefine managerial roles and responsibilities

About half the companies we studied have redefined managers' roles and responsibilities to account for the distinct capabilities associated with agile versus waterfall development. Consider the differences: the project manager working under a waterfall approach typically needs to coordinate a range of tasks occurring across application-development teams, database teams, and so on. Under an agile approach, however, the number of tasks (and therefore the need for coordination) is minimized. The tasks that remain are handled by a strong product owner or the agile team itself. Similarly, the process-management tasks that were traditionally done by line managers—for instance, identifying and addressing dependencies and assigning tasks to individuals—are handled by self-organizing, product-focused agile teams.

A large bank in Africa redefined certain roles, shifting the lines of communication and responsibilities, to accommodate the bank's desire to deploy agile practices more widely. Previously, software-development teams worked with various technology leads to translate architects' requirements into technical specifications. Under an agile approach, however, this translation step was no longer needed. The bank eliminated the tech-lead role within agile teams. Developers are now empowered to talk directly to architects and product owners, so they gain a better understanding of customers' needs and can develop software to accommodate those needs. Line managers will, of course, continue to play central roles—providing career-development support, serving as subject-matter experts within agile teams, and formally transferring their knowledge to others. But their responsibilities were redrawn, and this was communicated widely so that team members knew what to expect and whom to contact in particular situations.

Indeed, the companies we've seen that have effectively implemented agile at scale are resolutely transparent—they provide clear guidelines about which decisions should be made within the team and which require external input. The boundaries are clearly defined; team members are empowered enough to be accountable but not so much that they could create major risks with rogue or carte-blanche actions.

4. Reconsider budgeting and planning models

IT organizations typically adhere to annual budgeting and planning cycles—which can involve painful rebalancing exercises across an entire portfolio of technology initiatives, as well as a sizable amount of rework and waste. This approach is anathema to companies that are seeking to deploy agile at scale. Some businesses in our research base are taking a different approach. Overall budgeting is still done yearly, but road maps and plans are revisited quarterly or monthly, and projects are reprioritized continually.

A large European insurance provider restructured its budgeting processes so that each product domain is assigned a share of the annual budget, to be utilized by chief product owners. (Part of the budget is also reserved for requisite maintenance costs.) Budget responsibilities have been divided into three categories: a development council consisting of business and IT managers meets monthly to make go/no-go decisions on initiatives. Chief product owners are charged with the tactical allocation of funds—making quick decisions in the case of a new business opportunity,

for instance—and they meet continually to rebalance allocations. Meanwhile, product owners are responsible for ensuring execution of software-development tasks within 40-hour work windows and for managing maintenance tasks and backlogs; these, too, are reviewed on a rolling basis. As a result of this shift in approach, the company has increased its budgeting flexibility and significantly improved market response times.

A handful of companies are even exploring a venture capital–style budgeting model. Initial funding is provided for minimally viable products (MVPs), which can be released quickly, refined according to customer feedback, and relaunched in the marketplace—the hallmarks of agile development. And subsequent funding is based on how those MVPs perform in the market. Under this model, companies can reduce the risk that a project will fail, since MVPs are continually monitored and development tasks reprioritized. Typically there is less waste and more transparency among portfolio and product managers, and it becomes easier for the company to scrap low-potential projects early.

Choosing the right approach

Revamping an operating model is a large undertaking. There will be significant risks to address and short-term disruptions as new ways of working take hold. As with any large change-management initiative, such a transformation will require long-term commitments from employees at all levels, in all functions and business units. The companies we've studied have used a number of approaches to alter elements of their operating models.

At one extreme, some have used the "lab approach," in which an agile operating model is set up apart from the rest of the organization to serve as a testing ground before capabilities and processes are rolled out to the entire IT organization. This approach makes most sense when the company has only limited support from senior management for larger changes and needs to prove the business case quickly. For the most part, however, the separate organizations created under the lab approach tend to remain separate rather than influencing change across the organization.

At the other extreme, a handful of companies have embarked on a "big-bang redesign," in which they move all functions and business units toward new organizational structures and roles, self-contained agile cells, and faster processes—all in one go. For this to work, senior leadership must be all in from day one, which is likely to be the case in only a small subset of companies.

Somewhere in the middle is the "wave and spike" approach to deploying agile at scale. Under this model, individual teams are reconfigured as agile teams in waves, while elements of a new operating model are deployed in spikes. A large technology-solutions provider, for instance, needed to ramp up its digital capabilities fast. The company's IT organization was struggling to get products to market given the increasing size, complexity, and sheer number of projects. The company transitioned product-development teams to agile practices in waves; 5 were included in the first training and deployment cycle, while close to 20 were part of the second. As each

successive wave of teams was indoctrinated to agile, feedback was collected and training materials were developed or revised for the next set of teams. Agile coaches were also installed to guide teams.

Six months into its agile transformation, the company adopted a product-oriented organizational structure, gathering business-unit leaders, developers, engineers, and members of the IT organization into "tribes." Many months after that, the company focused on a different spike—interaction between IT and the business. It adjusted its operating model so the product-development group could collaborate more closely with the IT operations group (in a true DevOps model). As a result of these changes, time to market accelerated dramatically; because teams were cocreating products, the number of defects and the rework required decreased.

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Companies that are finding small-scale success with agile development practices may be loath to mess with a good thing, figuring it best to avoid the risks that widespread adoption might present. One of the chief risks in a digital business world, however, is standing still. To keep pace with new market entrants, emerging technologies, and changing customer expectations, companies will need to find ways to extend their capabilities in agile software development to all functions and business units. They must be willing to adapt the very fabric of their organizations and give agile methodologies the space and support they need to thrive. ▼

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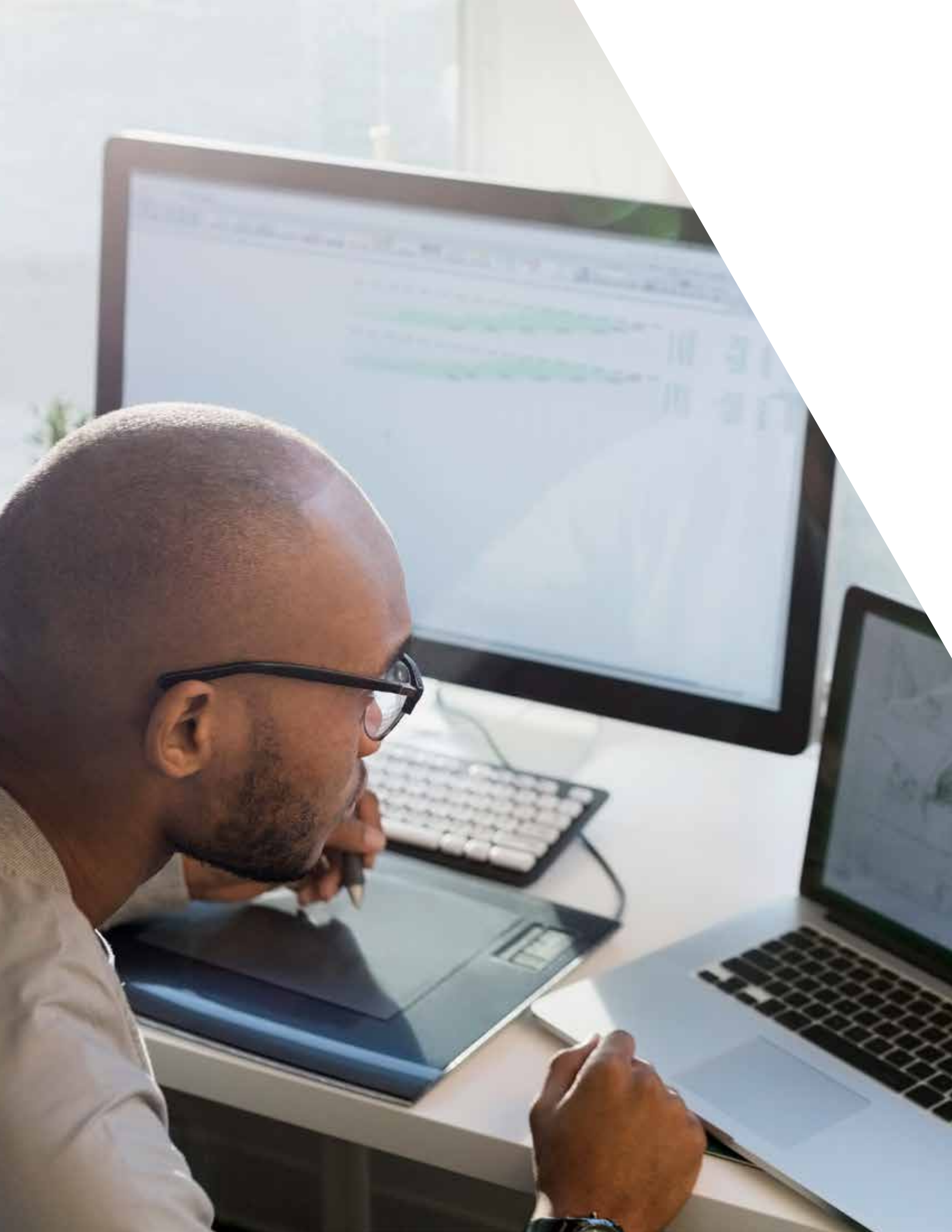


PART 5

Tech

Modernizing IT for a digital era

Driek Desmet, Markus Löffler, and Allen Weinberg

As digital disruptions impose greater demands on IT systems and organizations, companies must consider an end-to-end approach for upgrading and managing business technologies.

Most companies face critical IT modernization issues, whether that means digitizing the customer purchasing experience, managing or moving away from aging software and hardware solutions, or shifting to newer technologies such as cloud-based computing, serverless computing, and microservices for delivering software.

Historically, companies have favored an incremental approach to modernizing IT—that is, addressing the most immediate points of pain and then subsequent issues as they occur. However, the threat of digital disruption is creating an urgent need for companies to modernize IT systems end to end, with the big picture in mind.

End-to-end modernization, or a holistic approach to tackling system upgrades, completely redefines how a company thinks about IT. Under this approach, the technology organization is no longer just a shared service; IT becomes a critical part of the company's DNA, and IT leaders become trusted partners, not just service providers.

Certainly, the long-favored incremental approach to modernization may entail fewer risks: if something goes awry on a small software-development project, the harm from bugs or faulty processes can be contained and resolved before widespread issues occur. Incrementalism can also offer short-term improvements faster: through small service- or product-line changes, companies may be able to realize quick benefits in, say, customer interfaces or tasks associated with systems maintenance.

But incrementalism can also limit companies' growth and competitiveness in some important ways. Under this approach, technology teams in different parts of the IT organization may independently address discrete systems questions involving their own areas of competence or internal business clients. They may create islands of solutions, which in turn may breed more complexity, while redundant systems and processes remain. And when companies inevitably pursue digital initiatives, weaknesses in their traditional product-development processes and IT management systems can be exposed. Customers may experience this as missing data links, slow processing speeds, and disconnected products and services.

Takeaways

The threat of digital disruption is creating an urgent need for companies to modernize their IT systems. End-to-end modernization, a holistic approach to tackling system upgrades, redefines the technology organization so that IT becomes a critical part of the company's DNA.

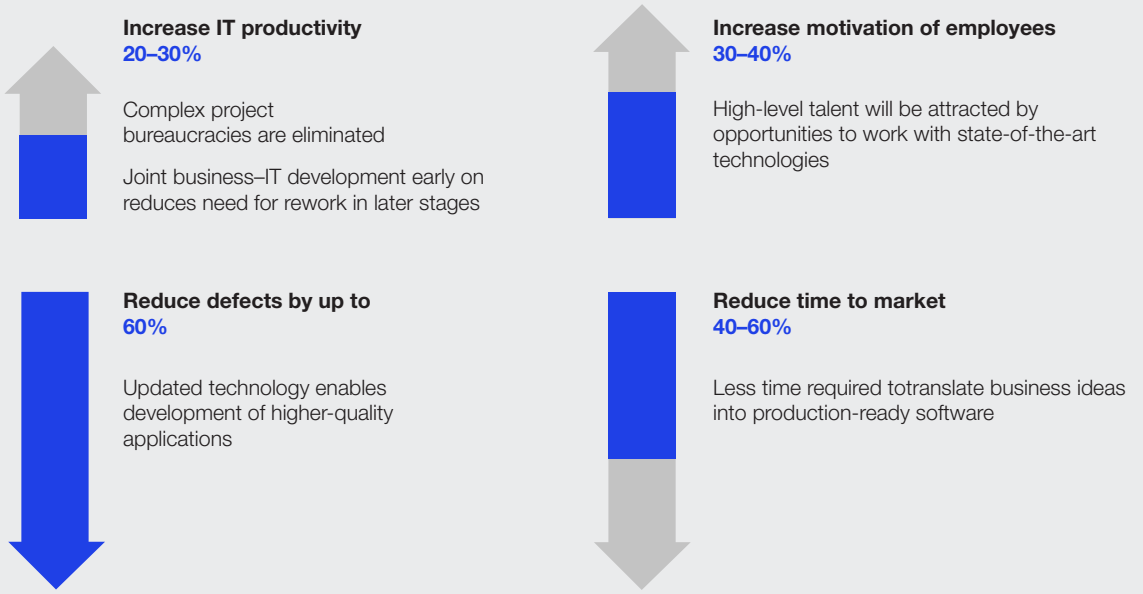
With end-to-end modernization, business and IT leaders define the target state of IT—not just for discrete business units or projects but for the entire organization. They ask questions to help guide them: for example, which technology-driven projects will generate the most value for the company, in reduced cost and greater efficiency?

Leaders will need to consider issues such as technical interdependencies to outline the sequence and scope of modernization. CIOs must help CEOs and board directors understand that the IT project budget may need to be devoted to modernization efforts over a two- to three-year period.

The end-to-end approach to modernizing IT is more effective for creating and supporting viable digital businesses (Exhibit 1). To pursue this approach, executives must break down the change process into three critical steps: defining the target state for their IT architectures, deciding which elements of the IT landscape (systems, people, and processes) need to change, and determining the sequence and scope of change. We've seen some companies tackle each of these steps in isolation, often in the context of a business-unit request for a new technology-enabled feature. But relatively few companies are considering these three steps in systematic fashion, across all business units and functions, and with input from both IT professionals and business leaders.

EXHIBIT 1

End-to-end IT modernization can have significant positive effects on operations and productivity.



Source: McKinsey analysis

Compared with incrementalism, the end-to-end path toward a modern IT landscape can be more risky, and potentially more expensive. In most cases, however, avoiding duplicate work leads to lower costs. It may pave the way for seamless adoption of microservices, two-speed IT,[1] and other emerging approaches for managing and enhancing IT architecture. And, ultimately, end-to-end modernization may ensure that companies have the right IT capabilities for decades rather than just the next few years.

Pursuing end-to-end IT modernization

Nowadays, the technologies that support digital business activities span the entire IT landscape; companies can no longer define bright lines between front- and back-end information-systems management. The sheer volume of technologies, processes, and decisions required to build and maintain digital applications and operations means companies can't afford to work in the same

1 See Oliver Bossert, Chris Ip, and Irina Starikova, "Beyond agile: Reorganizing IT for faster software delivery," September 2015, McKinsey.com; Oliver Bossert, Martin Harrysson, and Roger Roberts, "Organizing for digital acceleration: Making a two-speed IT operating model work," October 2015, McKinsey.com; and Oliver Bossert, Chris Ip, and Jürgen Laartz, "A two-speed IT architecture for the digital enterprise," December 2014, McKinsey.com.

old ways. Business executives and technology professionals seeking to change their approach to modernizing IT architectures may want to focus on three core tasks:

1. Define the target IT state

In end-to-end modernization, business and IT leaders come together to define the target state of IT—not just for discrete business units or projects but for the entire organization. They set realistic priorities for modernization, for example, asking which technology-driven projects will generate the most value for the company, in reduced cost and greater efficiency, and which would just be nice to have.

They define categories of business capabilities where processes, products, and actions can be digitized or otherwise improved through the use of technology. The overarching goals and vision at one bank, for instance, were centered on the tools and processes relating to the user experience and how to ensure that customers and potential customers could find the information they needed through the bank's new digital channels. For an insurance firm, the highest-priority tasks and tools included those related to ensuring compliance with emerging regulations. And for a retailer, the target end state was better customer segmentation, which required moving toward a centralized database and advanced-analytics capabilities.

What's most important is that the IT organization partners with the business on this step. According to recent McKinsey research, IT organizations that actively collaborate with the rest of the business to shape an overall business strategy that effectively employs technology tend to perform better on a number of dimensions, including provision of core services and the creation of a healthy organizational culture.[2] Conversations should include the CIO and top IT leadership, business-unit or business-domain leaders, and product-group owners.

1. Decide which changes to make: Systems, people, and processes

With information about the desired target state in hand, IT leaders can consider how and whether to make specific changes to elements of the IT architecture—for instance, front-end applications, middleware technologies, or back-end servers—to help the business attain its goals. This is less daunting than it sounds. Typically, there are just a few critical systems that must be fully redesigned; effective use of application programming interfaces and middleware can mitigate the need for significant changes to back-end systems.

As a first step, the IT team should take inventory of existing applications and other technologies and identify those that can be improved, consolidated with other applications or technologies, or decommissioned. The team should come to the table ready to ask questions such as these: How much real-time data do we need to support a digital customer experience? How quickly do we need to launch new features to meet customers' needs? How will service response times need to change? Will workload grow or shrink among groups within IT? A large telecommunications company, for instance, had to work out which elements of its IT architecture to modernize so it

2 "Partnering to shape the future—IT's new imperative," May 2016, McKinsey.com.

could launch a digital “e-care” feature for its 100 million–plus customers. The e-care feature was designed to allow users with prepaid smartphones to buy more SMS, data, and roaming services in just a few clicks. The telco realized such a digital program would mean giving users 24/7 access to data stored in back-end servers—hence, data storage and maintenance became an immediate target area for IT modernization.

Once IT team members have explored core technology questions, they must discuss the organizational- and operating-model changes that may be required to support business efforts long term—for instance, what new team structures or skills might be required? IT leaders, business-unit heads, and critical stake-holders from adjacent business units must consider each core business capability and determine which processes, products, and activities would most benefit from modernization.

3. Determine the sequencing and scope of change

IT and business-unit leaders can create a clear road map for modernization efforts by having two- and three-year sequences of updates in mind and identifying measurable outcomes. Indeed, a joint IT and business team will need to be clear on business priorities and how those will affect the scope and urgency of priority IT projects. The team will need to identify technical interdependencies among various business initiatives and quantify the cost and effort associated with each incidence of systems change. The team must also have an estimate in mind of the potential business value to be gained from modernization efforts. The team can use any number of metrics to guide these discussions, such as current IT investments (cross-unit and within particular divisions), the amount of revenue being generated by certain product lines, or the potential productivity increases from digitizing certain internal processes.

Business and IT leaders can use these insights to outline the potential sequencing and scope for modernization. In some instances, it might make sense to modernize according to lines of business; in other cases, by geographic location. Either way, the modernization team can devise a timetable indicating the people and capital investments required, the agreed-upon business and IT outcomes, and budget expectations. It is critical to get CEOs’ and executive-committee members’ input on this financial aspect of IT modernization; they will, after all, be the ones overseeing the IT modernization team. CIOs must help CEOs and board directors understand that the majority of the IT project budget may need to be devoted to modernization efforts over a two- to three-year period. The level of that commitment cannot be overstated. For end-to-end modernization efforts to succeed, top management must be clear about the spending required, and they must sign off on those budget requirements before any real work can start.

Realizing end-to-end improvement: Case study

Most companies have a sense of what they want their modern IT architecture to look like. And all are familiar with the core building blocks they can use to achieve that goal. Still, an end-to-end IT modernization program will look different in different industry and company contexts.

For a regional bank, the primary objective for modernizing IT was to introduce digital processes in the company. Its secondary objective was to cut costs; margins had been slipping the past five years. After considering the technology and management landscapes, as well as issues with timing and scope, a team of IT leaders and business executives at the bank developed and executed a series of staged initiatives designed to produce both quick wins and a blueprint for further modernization over the next three years.

As a first step, the team considered its current IT capabilities and its target state of IT operations—looking not just at discrete technologies but also considering potential business needs over the next two to five years. Then it made a series of decisions to try to close the gap between the two.

The bank had been using an incremental approach to upgrades that left it with an aging, fragmented IT architecture, with multiple point-to-point connections between front-end applications and back-end transaction systems. Because there were so many interfaces and redundant gateways, customers' banking experiences varied wildly. And because the IT architecture was so fragmented, it had been hard for the bank to design and build new software and services and launch them quickly. Software development was done using the traditional waterfall method; agile and DevOps approaches to development were used in only one pilot project. The bank's data were stored in disparate systems, so there was no easy, single view of the customer, and, as a result, the bank was not able to mount effective marketing campaigns. What's more, it was difficult, and time intensive, to respond to regulatory inquiries because risk officers at the bank had a hard time finding the information they needed.

The team's assessment of the technology landscape revealed the fragmentation issues, and as a result, the bank consolidated its front-end applications and built a cleaner integration layer. Specifically, the bank mapped application redundancies and identified all point-to-point interfaces. It documented its desired capabilities and design principles—for instance, the ability to write code once and use it everywhere, and minimal interdependencies among interfaces—and used that as a guide to determine which parts of the existing system could be reengineered, discontinued, or rebuilt from scratch. The bank built a multichannel management module, and the most advanced branch was reengineered so that all channels could use its components. Those components that shared similar functionality were grouped together under one module. To avoid writing these modules from the ground up, the most advanced and comprehensive elements were reused and reengineered (if needed). Old components were decommissioned and new ones set up and tested in a relatively short period. Front-end integration layers were migrated to the cloud and managed using agile methodologies.

In response to the team's review of business and IT capabilities and operations, the bank introduced agile development practices across the organization (not just in a pilot). This move had a second-order benefit of attracting new talent; developers were lured in by the promise of getting modern and challenging assignments, as well as the chance to be creative, rather than simply taking requirements from the business and making them happen in a mainframe

environment. The bank also established a data repository and built a platform for master data management and analytics. This change allowed the bank to target customers more accurately with products and services. It also made it easier for risk officers to find information required to fulfill regulatory requests. By creating a single hub for collecting, processing, accessing, and delivering data, the bank has been able to continually update its analytics programs and methodologies, ensuring that it will be able to adapt as the market and customer needs change.

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An incremental approach to systems upgrades may continue to be optimal for companies that believe they will be bought out or that are in industries that aren't anticipating substantial technology changes. For most companies, however, this will not be the case. Technologies and processes are only becoming more sophisticated as companies explore digital business opportunities. Therefore, IT organizations can no longer continue to implement system changes piecemeal, always backtracking and reengineering to correct for uncoordinated modernization efforts. They must join with the business units to think systematically about how to phase in digital technologies and faster processes while still supporting business day to day. The companies that don't do this risk falling behind competitors and further impeding any ability they may have to catch up in the long term. ▼

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The need to lead in data and analytics

McKinsey Global Survey results

Executives say senior-leader involvement and the right organizational structure are critical factors in how successful a company's analytics efforts are—even more important than its technical capabilities or tools.

Executives have high hopes for their data and analytics programs. Large majorities of respondents to McKinsey's recent survey on the topic expect their analytics activities to have a positive impact on company revenues, margins, and organizational efficiency in the coming years.[1] To date, though, respondents report mixed success in meeting their analytics objectives. For those lagging behind, a lack of strategy or tools isn't necessarily to blame. Rather, the results suggest that the biggest hurdles to an effective analytics program are a lack of leadership support and communication, ill-fitting organizational structures, and troubles finding (and retaining) the right people for the job.

1 The online survey was conductd in the field from September 15–25, 2015, and garnered responses from 519 executives representing the full range of regions, industries, and company sizes. To adjust for differences in response rates, the data are weighted by the contribution of each respondent's nation to global GDP.

Leadership and organization matter

Respondents say their organizations pursue data and analytics activities for a range of reasons, most often to build competitive advantage or improve the customer experience. Whatever the motivation, companies have found mixed success: 86 percent of executives say their organizations have been at best only somewhat effective at meeting the primary objective of their data and analytics programs, including more than one-quarter who say they've been ineffective.

High performers attribute their data and analytics success to involved leaders, while low performers say their biggest challenge is designing the right organizational structure for analytics activities.

However, a select group of executives report greater effectiveness and more developed analytics capabilities relative to their peers.[2] Compared with their lower-performing peers, these high performers say their analytics activities have had a greater impact on company revenue in the past three years.[3] And some of the biggest qualitative differences between high- and low-performing companies, according to respondents, relate to the leadership and organization of analytics activities. High-performer executives most often rank senior-management involvement as the factor that has contributed the most to their analytics success; the low-performer executives say their biggest challenge is designing the right organizational structure to support analytics (Exhibit 1).

On the whole, responses suggest that company leaders are less involved in analytics efforts than they are in digital activities. In McKinsey's latest survey on digitization,[4] 38 percent of respondents said their CEOs were leading the digital agenda for their companies; in this survey, just one-quarter say their CEOs lead the data and analytics agenda. But even when analytics are top of mind for company leaders, many of them don't seem to be communicating a clear vision throughout their organizations. Thirty-eight percent of CEOs say they lead their companies' analytics agendas, but only 9 percent of all other C-suite executives agree (Exhibit 2). These

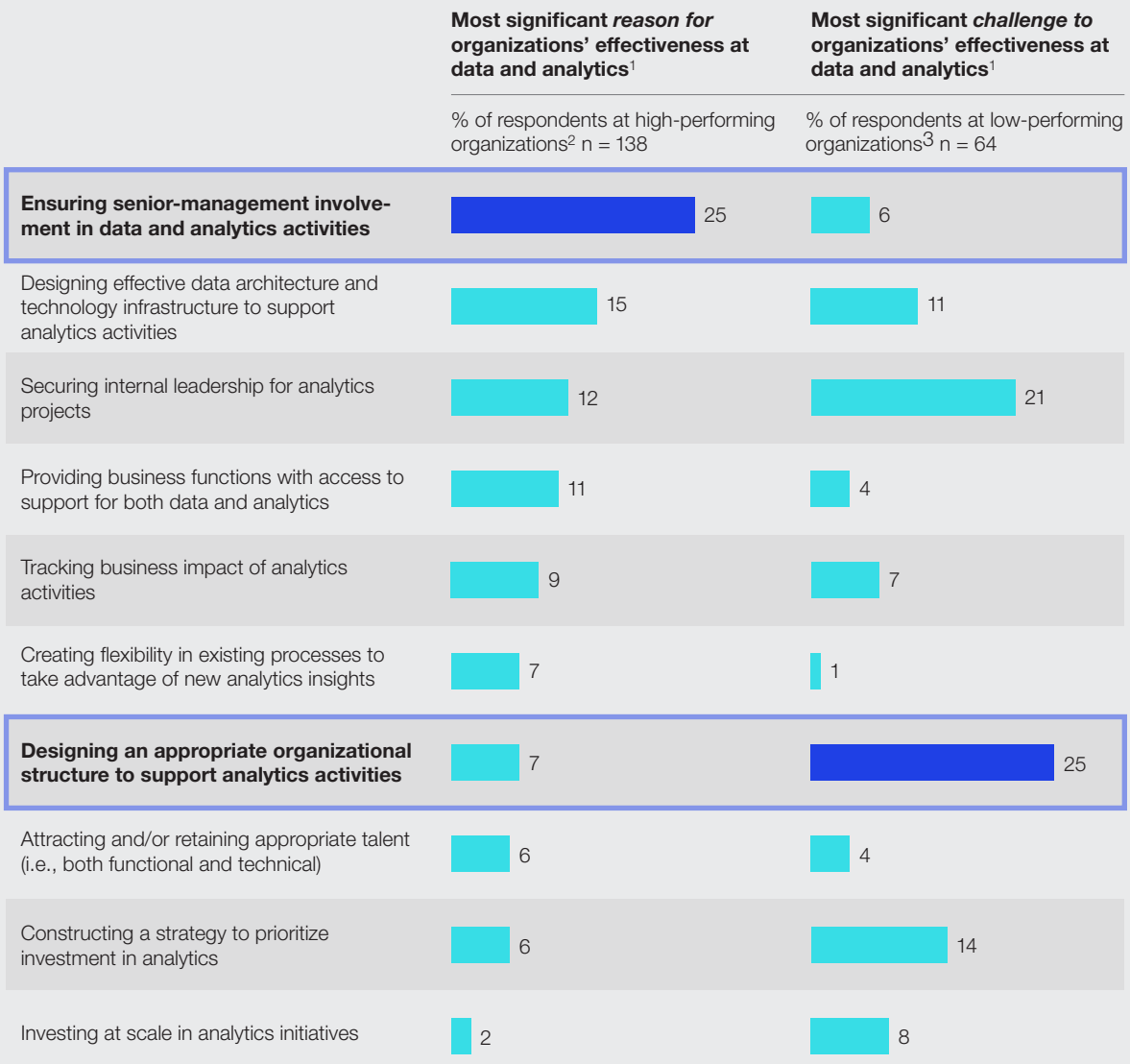
2 We define an outperforming company (or a high performer) as one that, according to respondents, has been somewhat or very effective at reaching the objective of its data and analytics activities, and has somewhat or significantly more developed analytics capabilities compared with industry competitors. We define an underperforming company (or a low performer) as one that, according to respondents, has been somewhat or very ineffective at reaching the objective of its data and analytics activities, and has somewhat or significantly less developed analytics capabilities compared with industry competitors.

3 Forty-two percent of respondents at high-performer companies say their analytics activities have had at least a 3 percent impact on total revenues, compared with 1 percent who say the same at low-performer companies.

4 Jacques Bughin, Andy Holley, and Anette Mellbye, "Cracking the digital code," September 2015, mckinsey.com.

EXHIBIT 1

Senior-leader involvement and organizational structure play a critical role in how effective (or not) a company's analytics efforts are.



1 Respondents who answered "other" or "don't know" are not shown.
2 Respondents who say their organizations have been effective at reaching the main objective of their data and analytics activities, and have more developed analytics capabilities than industry competitors. This question was asked only of respondents who said their organizations have met their analytics objectives effectively.
3 Respondents who say their organizations have been ineffective at reaching the main objective of their data and analytics activities, and have less developed analytics capabilities than industry competitors. This question was asked only of respondents who said their organizations have not met their analytics objectives effectively.

Source: McKinsey analysis

respondents are much more likely to cite chief information officers or business-unit heads as leaders of the analytics agenda.

Sponsorship is another area where company leaders can do more, and where the high and low performers differ notably. Respondents at high performers in analytics are nearly three times likelier than their low-performer peers to say their CEOs directly sponsor their analytics initiatives (Exhibit 3).

Just as companies pursue varied objectives with their analytics activities, they also differ in how they organize around this work. There is no consensus on a single structure—centralized, decentralized, or a hybrid model—that most companies use. But the executives who report using a hybrid structure—a central analytics organization that coordinates with employees who are embedded in individual business units—say analytics has a greater impact on both cost and revenue than other respondents do. Relative to others, these executives also report a broader range of analytics capabilities (including more sophisticated tools and advanced modeling techniques) and a greater number of business functions pursuing analytics activities.

Talent troubles

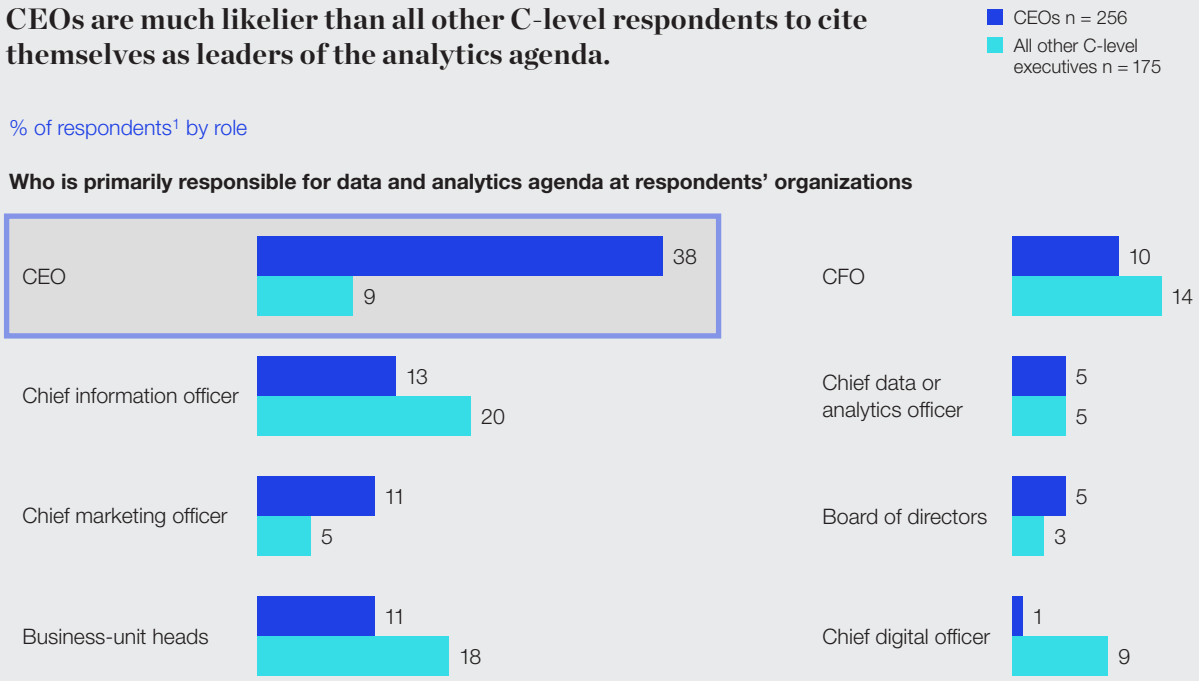
For many companies—especially the low performers—the results indicate that attracting and retaining talent are more difficult for data and analytics than for other parts of the business. In particular, executives say it's challenging both to find and to retain business users with analytical skills, even more than data scientists and engineers (Exhibit 4). Within the C-suite, the CEOs' direct reports are more likely than CEOs themselves to cite difficulty attracting executive leaders for analytics—roles that are critical, given the correlation between leadership involvement and overall analytics success.

The most significant talent challenges that companies face, according to respondents, are a lack of structured career paths (especially at larger companies) and the inability to compete effectively on salary and benefits. These two challenges are even more acute for companies where analytics work is decentralized (that is, when analytics employees are embedded in individual business units and act independently), reflecting the difficulty of creating a distinct analytics culture without a central team and leader. And while executives at low-performing companies report the same challenges as others, they overwhelmingly cite a lack of leadership support as the primary challenge to both attracting and retaining talent—once again underscoring the importance of leaders' involvement in advancing the goals of data and analytics efforts.

Compounding the talent challenge is that traditional recruiting methods seem to be falling short. Only 16 percent of respondents say their organizations have successfully found data and analytics talent through recruitment agencies and search firms. Other approaches, though, have worked better. Respondents most often cite retraining current employees as an effective method, which eliminates the need to find new hires and attract them away from other opportunities. At high-performing companies, respondents have also found success by developing a unique recruiting team for analytics employees.

EXHIBIT 2

CEOs are much likelier than all other C-level respondents to cite themselves as leaders of the analytics agenda.



1 Respondents who answered "other" or "don't know" are not shown.

Source: McKinsey analysis

EXHIBIT 3

High-performer respondents report a much higher rate of CEO sponsorship for analytics than their low-performing peers.

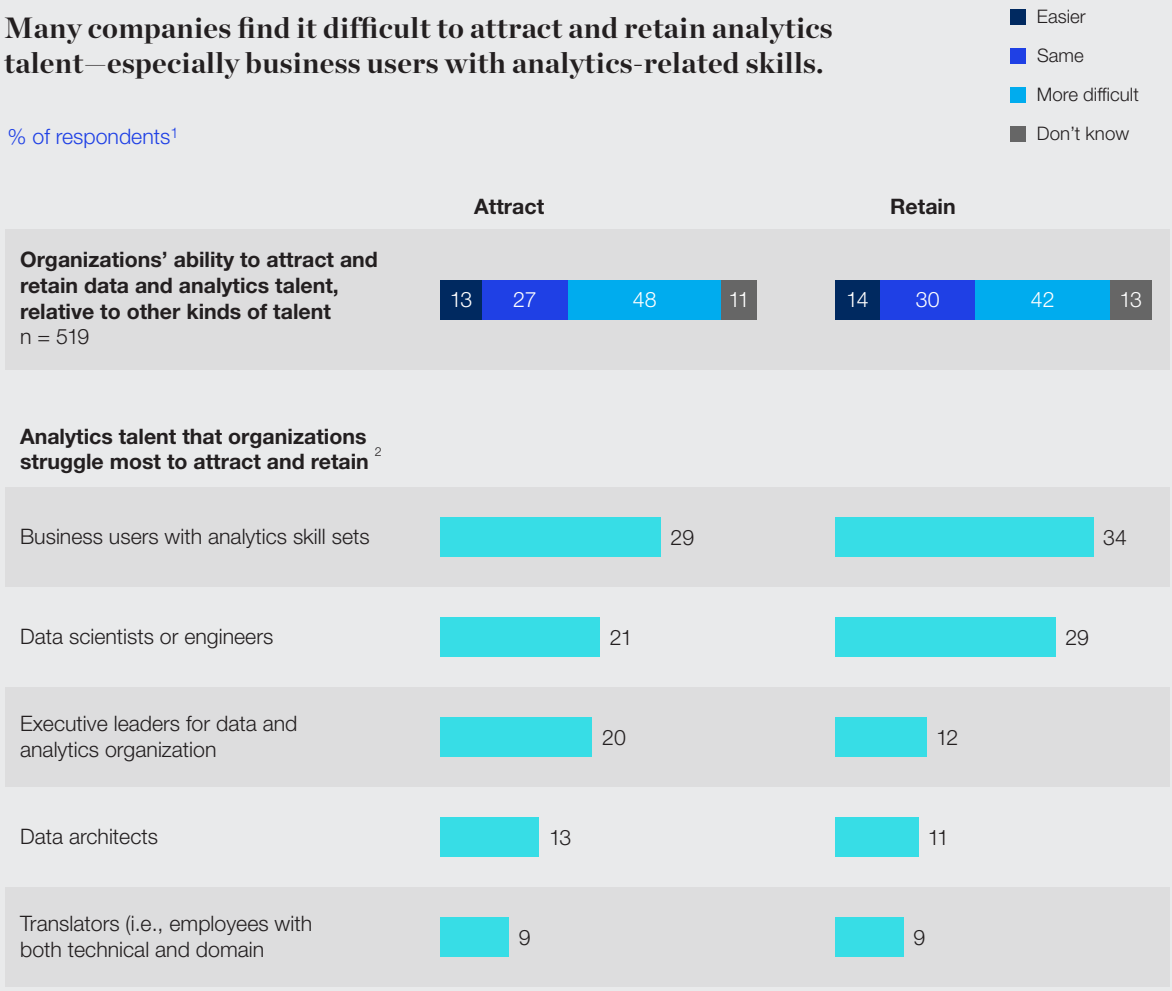
1 Respondents who answered "don't know/not applicable" are not shown.
2 Respondents who say their organizations have been effective at reaching the main objective of their data and analytics activities, and have more developed analytics capabilities than industry competitors.
3 Respondents who say their organizations have been ineffective at reaching the main objective of their data and analytics activities, and have less developed analytics capabilities than industry competitors.

Source: McKinsey analysis

EXHIBIT 4

Many companies find it difficult to attract and retain analytics talent—especially business users with analytics-related skills.

% of respondents[1]



1 Figures do not sum to 100%, because of rounding.
2 Respondents were asked this question only if they said it was more difficult or much more difficult to attract and/or retain data and analytics talent compared with talent for other parts of their organizations. For the "attract" question, n = 249; for the "retain" question, n = 223. Those who answered "other" and "don't know/not applicable" are not shown.

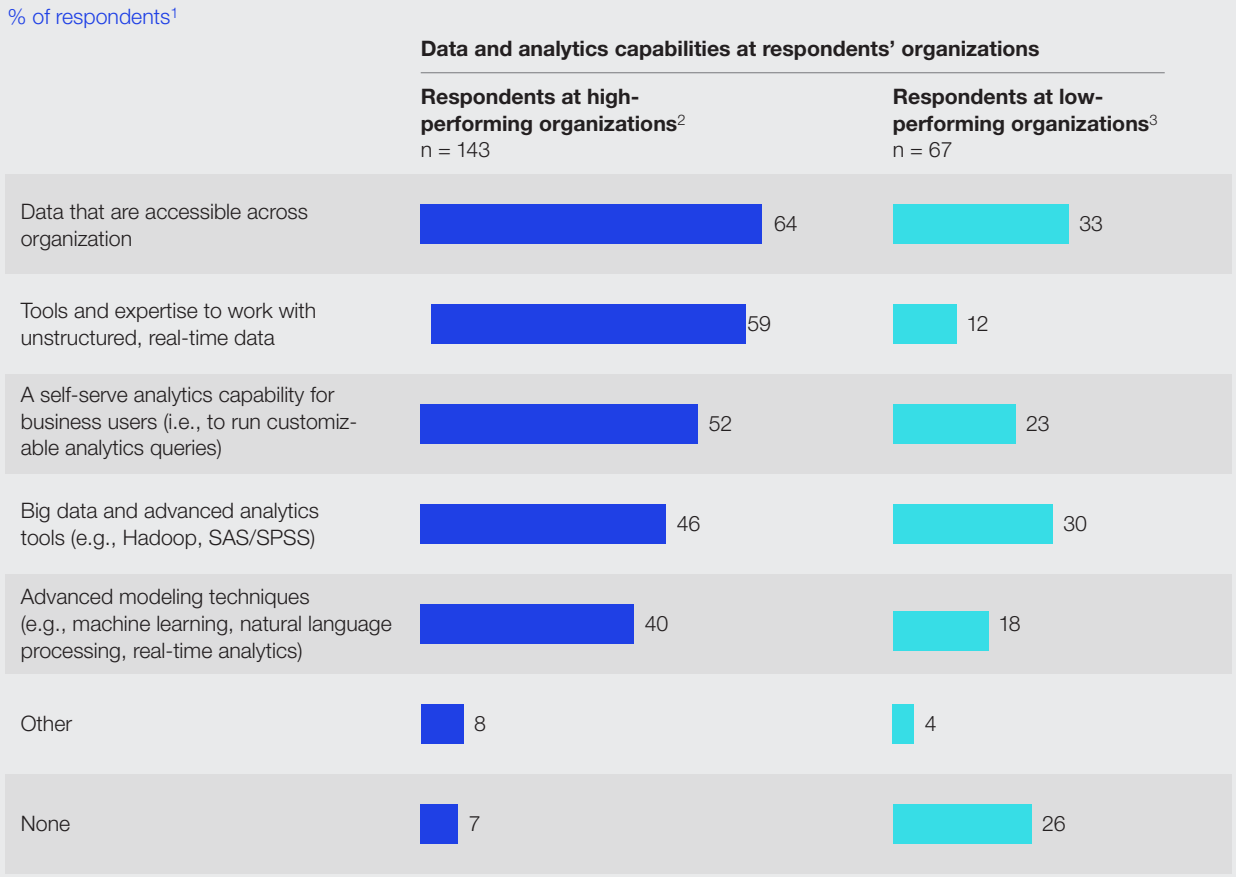
Source: McKinsey analysis

How companies are getting it right

Beyond better talent practices and more active CEO involvement, executives at high-performing companies report other practices that differentiate their analytics activities. Most executives—including three-quarters of those at low-performing companies—say their organizations have established some analytics capabilities. However, the high performers report significantly more advanced capabilities across the board (Exhibit 5). They are, for example, nearly five times likelier than their low-performing peers to say they have tools and expertise to work with unstructured and real-time data. And they are nearly twice as likely to say they make data accessible across their organizations.

EXHIBIT 5

At high-performing organizations, respondents report much more advanced data and analytics capabilities than their peers.



1 Respondents who answered "don't know" are not shown.
2 Respondents who say their organizations have been effective at reaching the main objective of their data and analytics activities, and have more developed analytics capabilities than industry competitors.
3 Respondents who say their organizations have been ineffective at reaching the main objective of their data and analytics activities, and have less developed analytics capabilities than industry competitors.

Source: McKinsey analysis

High performers are also more diligent than others when it comes to measuring results, and more likely than their peers to track most of the nine analytics-related metrics we asked about.[5] Fifty-four percent of high performers, for example, say their companies track the impact of their analytics activities on top-line revenues. By contrast, only 19 percent of respondents at low performers say they measure the impact on revenue.

5 The nine metrics are organizational efficiency (for example, fewer resources required), customer behavior (for example, purchasing behavior, churn, and loyalty), operating costs, top-line revenues, profits, return on invested capital, gross margin on goods and/or services sold, average sales price, and required capital.

Finally, high performers extend their data and analytics activities more broadly across the organization. Fifty-nine percent of these executives say their R&D functions use analytics, compared with just one-fifth of low-performing respondents. What's more, the high performers are more likely than low performers to say their primary purpose with analytics is building competitive advantage—and less likely to say they are simply trying to cut costs.

Looking ahead

- **Communicate from the top.** The results indicate that even if CEOs are aware of their analytics activities—and their importance to the business—many are failing to communicate their vision and strategy across the organization. This lack of communication can confuse the groups responsible for implementing analytics and can hinder collaboration among functional teams. Senior-leader involvement also goes a long way toward creating a culture that values this work, a critical factor in an organization's ability to recruit data and analytics talent and to capture value from their efforts. Company leaders must continually articulate the importance of analytics by hosting town-hall meetings, monitoring results on company dashboards, and incentivizing senior managers to focus on these initiatives.

- **Organize for success.** While there is still debate over which operating model works best for analytics, the survey results suggest that companies using a hybrid approach often see greater impact from analytics than companies with either a strictly centralized or decentralized model. However they decide to organize, though, companies must ensure that they have the right balance of technical and domain expertise, that resources are being used efficiently, and that all analytics resources align closely with the goals and targets of the business units they support.

- **Find new ways to attract talent.** Most respondents say it's difficult to attract and retain the best data and analytics talent through traditional recruiting means. To attract good people, companies will need to develop a distinct culture, career paths, and recruiting strategy for data and analytics talent; ensure that analytics employees have a close connection with company leaders; and articulate the unique contributions that data and analytics talent can make. They must also identify and tap into new or alternative sources of talent—retraining existing employees, for example, or forming innovative external partnerships. ▼

Contributors to the development and analysis of this survey include **Brad Brown**, a director in McKinsey's New York office, and **Josh Gottlieb**, a specialist in the Atlanta office.

The new tech talent you need to succeed in digital

Satty Bhens, Ling Lau, and Hugo Sarrazin

In today's rapidly changing digital landscape, companies that understand their talent needs and know how to meet them have a competitive edge. Here's how they do it.

While few would debate the importance of technology talent, its importance in successfully executing a digital transformation is often underappreciated. Over the next five years, large companies will invest, on average, hundreds of millions of dollars—and some more than a billion dollars—to transform their business to digital. And given that top engineering talent can, for example, be anywhere from three to ten times more productive than average engineers, acquiring top talent can yield double-digit investment savings by accelerating the transformation process by even 20 to 30 percent.[1] Of course, such talent is hard to find. In the next five years, we expect the demand for talent to deliver on new capabilities to significantly outstrip supply[2]: for agile

1 Steven McConnell, "The origins of 10X—How valid is the underlying research?" January 9, 2011, Construx.com.

2 Brad Brown, Michael Chiu, and James Manyika, "Are you ready for the era of 'big data'?," *McKinsey Quarterly*, October 2011, McKinsey.com.

skills, demand could be four times supply; for big-data talent, it could be 50 to 60 percent greater than projected supply.[3]

The new capabilities you need

Understanding what talent is necessary starts with understanding what capabilities digital businesses need. While those will vary by market and geography, successful digital businesses share some common traits: they're focused on the customer, operate quickly, are responsive and agile, and can create proprietary insights. And given the rapid pace of change, companies will increasingly need to be able to engage with broader ecosystems encompassing a range of businesses and technologies as well as position themselves to take advantage of emerging artificial intelligence (AI) and the Internet of Things.

That requires IT systems that can process massive amounts of data, continuously deliver new infrastructure environments in minutes, be flexible enough to integrate with outside platforms and technologies, and deliver exceptional customer experiences—all while maintaining core legacy IT systems. This way of working is much more dependent on the collective skills and strengths of a multidisciplinary agile team rather than on the heroics or talents of any one individual. In short, this reality means people not only need to have strong technical skills but also to be able to function well in teams. Poor team dynamics can crush even the most talented individuals.

While there is a broad range of skills needed, this set should be part of any company's tech-talent list:

Experienced designers and engineers. As customer experience becomes increasingly important, companies will need to invest in the tech talent to deliver those experiences. These roles often straddle IT and other functions, with experience designers in particular focused on getting at the heart of the customer through ethnographic research, human-centered design, and rapid test-and-learn cycles with customers.

Partnering with experience designers are in-place front-end and mobile engineers who can rapidly translate exceptional designs and digital experiences into working software that can be tested and iterated. This approach to rapid prototyping places a premium on user input and flexible software that can respond quickly to user needs.

Experience designers tend to wear multiple hats, from driving insights through customer research to running rapid test-and-learn programs in the field. They should have considerable experience creating and iterating products or services based on real customer interactions (i.e., not just data) and translating customer research, insights and ideas into solutions using design tools such as personas, empathy maps, and customer journeys (to name just a few).

3 Christopher Goldsbury, "Demand for agile skills outstripping supply," *InfoQ*, December 26, 2012, InfoQ.com.

Front-end and mobile engineers are typically software engineers with three to five years' experience building high-performing, scalable, and elegant web and mobile user interfaces. They bring deep expertise in front-end web and mobile technologies that include browser-based HTML, CSS, and modern JavaScript frameworks (e.g., ReactJS, Angular.js, et cetera) and native mobile platforms on either iOS and/or Android. They should be comfortable creating "imperfect" code for the purpose of testing and have a clear understanding of how something will be used in the real world.

In our experience, what separates a good from a great experience designer is the ability not only to focus on producing a sexy user interface but to be an advocate for the customer in solving customer-experience and design problems. This is someone who is motivated by customer empathy and can collaborate effectively with both product and engineering teams.

Scrum masters and agility coaches. "Agile development"—where software is rapidly developed in iterative cycles—is a core capability that drives the technology engine. Making the agile approach work relies on having "scrum masters" to manage teams during the development process. Scrum masters need great leadership and enabling skills, but also a deep understanding of technology and an ability to rapidly solve problems. As important as the scrum master is at the team level, to scale the agile culture across the broader organization, you need agility coaches. Think of them as Olympic trainers for the organization. They have strong communication and influencing skills, can create and roll out plans to support agile processes across the business, and put in place measurable key performance indicators (KPIs) and metrics to track progress.

While it's desirable for scrum masters to be certified, it's more important that they understand the values and principles of agile (e.g., value-focused delivery, adapting to change, continuous improvement, et cetera) and have at least two to three years' experience training, coaching and working to build high-performing agile teams. They are people leaders with the ability to deal with conflict, influence ideas, and have empathy. It is helpful for them to have baseline knowledge of software engineering best practices to appreciate what goes into building high-quality software.

Strong agility coaches have deep experience working as change agents to transform how an organization thinks and works. To be successful, they need to be comfortable coaching people across different functions and levels of the organization, including senior executives. They are focused on impact and build organizational muscle around measuring progress.

In our experience, what separates a good from a great scrum master is the ability to be a great people leader. A good scrum master protects the team from distractions, but a great one finds the root cause of distractions and eliminates them. For an agility coach, it's building capabilities to help an organization create sustainable change.

Product owners. This role is often referred to as the mini-CEO of a digital product. Product owners clearly define the vision of a product or service, are fully empowered to make decisions that deliver high business value, and are laser focused on KPIs to track progress. The product

owners work directly with developers, engineers, experience designers, and other stakeholders in the business on a daily basis. They need to understand technology and user-experience issues in order to make the right tradeoffs in deciding on the product or service features to develop.

Product owners are not just proxies for the business-unit leader to manage the project. They need to be empowered to make product decisions. Product owner can often be the hardest job on an agile team, and those who do it typically require four key skills to be successful:

- **Vision:** they can establish strategic vision for a product and align the organization around a clear view of what's required to achieve business success.
- **Value focus:** they possess a mini-CEO mind-set with a focus on delivering measurable business value, delighting the customer, and optimizing ROI.
- **Decisiveness:** they are natural problem solvers who make decisions and prioritize initiatives using data and facts rather than intuition and feeling.
- **Product management:** they typically have three to five years of strong product-management experience and a good sense for the intersection of business, user-experience design, and technology.

In our experience, what separates a good from a great product owner is someone who has a strong sense of the complete product or service vision (and doesn't get lost in the details of its parts), the ability to inspire and influence people to deliver on the overall vision (not just his/her piece of the project), and is focused on enabling the team by, for example, helping it make the hard product decisions.

Full-stack architects. These roles are particularly important in a more complex and rapidly changing technology landscape. The full-stack architect needs to be fluent across all technology components that include the web/mobile user interface, middleware microservices, and back-end databases, and have a "spike" (i.e., bring deep expertise) in one or more areas. As businesses increasingly engage with external ecosystems of technologies, full-stack architects can provide expertise in third-party packaged software, fluency in multiple best-of-breed technologies, and experience with multiple-technology integration strategies.

Full-stack architects are generally hands-on developers with at least eight to ten years of software engineering experience and deep expertise with one to two core programming languages (e.g., Java, .NET, Node.js, et cetera). They also need to be knowledgeable and fluent across the different "stacks" of a large-scale software system (e.g., front-end user interface, middleware integration services, databases, et cetera). They are effective at linking the architectural vision with the business vision and building solutions that focus on business value, not just technical excellence. They have a deep understanding of how an architecture will need to evolve to meet changing business goals and like to produce working software as one of the best ways to illustrate a concept. In our experience, what separates a good from a great full-stack architect is not

just the ability to provide technical excellence but also to embrace flexibility over building "bulletproof" systems. They are passionate learners who keep up with evolving technologies and techniques and are willing to experiment with them to test what would work for the business.

Next-gen machine-learning engineers. As companies move toward machine learning, they need a new breed of software engineer who knows how to use data, can program in scalable computing environments (e.g., Cloud, Hadoop, et cetera), and understands how to refine the algorithms in their software code. They are fluent in distributed computing techniques, have experience using different machine-learning algorithms and applying them effectively (e.g., choosing the right model, deciding on learning procedures to fit the data, understanding different parameters that affect the learning, et cetera) and understanding the trade-offs with different approaches.

They work closely with customer-data managers in particular, who use machine learning to collect and rationalize the massive amounts of data—from social media to purchase activities—to create comprehensive 3-D pictures of customers. They have a strong computer-science foundation to understand how to structure data and make efficient use of computing resources (e.g., memory, CPU, et cetera) when designing and implementing machine-learning algorithms. They also have a baseline knowledge of probability and statistics (e.g., regression, probability theory, et cetera) techniques as well as experience in data modeling and evaluating data sets for patterns, trends, and predictability. This capability is important since machine-learning algorithms rely on these data sets to learn and iterate.

What really makes a great machine-learning engineer is the ability to understand how an idea goes from concept to delivered insight. Throughout this process, a great machine-learning engineer not only focuses on the technical solution but is also effectively a thought partner to the business on shaping the problem to be solved, the insights generated, and the continuous learning required to improve the solution.

DevOps engineers. With the advancement of cloud computing and infrastructure as programmable software, infrastructure resources (e.g., networks, servers, storage, applications, and services) can now be rapidly provisioned, managed, and operated with minimal effort. To build and take advantage of these technology advancements, organizations need DevOps (the integration of development and operations) engineers who have the experience to navigate a rapidly changing development and cloud-infrastructure computing ecosystem. They can build out tools and automations that provide development teams with self-service and on-demand access and infrastructure resources at the click of a button (compared with today's traditional multiweek and months-long process to provision similar resources).

DevOps engineers are generally software engineers with a passion to apply the same craftsmanship to IT infrastructure and operations. They typically have five to eight years of software-engineering experience and have now ventured into infrastructure-automation technologies (e.g., Chef, Puppet, et cetera), cloud platforms (e.g., AWS, Azure, et cetera), and more advanced containerization technologies (e.g., Docker). Besides technical excellence,

DevOps engineers understand how technology serves business goals and are flexible in adapting approaches to changing business needs. What separates a good from a great DevOps engineer is the ability to role model the collaborative DevOps culture, think about infrastructure, and partner with the business to link solutions to real business problems.

Finding and hiring the talent

So now that you know what talent to look for, how do you find it? Any good talent strategy should focus on retaining and training existing talent, as well as on uncovering latent talent already in the business. But for the purposes of this article, we want to focus on how companies can acquire talent.

In most companies, IT recruiting typically is a slow process: the HR department creates and posts a job description for a candidate role. If they're lucky, they find a midlevel employee in six months (and it'll take another four weeks until s/he is productive). For an organization undergoing an aggressive digital transformation, that's too slow.

We believe companies need to rethink their IT talent-acquisition strategy in six ways:

1. Build a compelling vision

Money is important, of course, in attracting talent. But we've found that as long as the pay is competitive, an inspiring mission and value proposition is what motivates the best talent.

This issue is particularly stark for large incumbents, which typically don't have quite the "sex appeal" of a start-up. We're seeing many inspiring examples of large traditional companies actively advertising and communicating their commitment to reinventing their brand for the digital age, such as General Electric's aspirations to be a top-ten software company by 2020. We've even seen candidates and new hires take significant pay cuts to join organizations that communicate a cohesive story about their digital transformation and vision.

Companies need to make sure they can deliver on their promises. Large defections of people who find that the mission doesn't meet the reality will scuttle the best-intentioned hiring strategies. Effective strategies include creating ministart-ups within the business, with their own vision, reporting structures, career paths, and even cultures.

2. Make targeted 'anchor hires'

Like attracts like, and that's true of top talent too. Therefore, many organizations have invested in anchor hires who are leaders in a particular discipline or industry. These anchor hires help attract other exceptional talent to the organization either through their personal networks and industry reputation or by signaling to the market how important that talent is. Companies should evaluate the networks of top talent, invest extra time, and involve senior business leadership in pursuing them. Attracting anchor hires often requires offering them significant influence in shaping the unit the business is building.

One leading North American technology company looking to create a new innovation lab prioritized finding two to three key anchor hires for the design team. It focused on people from Google, Facebook, and noted design agencies to build up their design team from nearly zero to over 30 top people in less than 12 months. The anchor hires were leaders in these design organizations and quickly signaled to the market the company's commitment to design thinking and customer experience. It was able to triple the pace of hiring.

3. Reimagine recruiting

What makes hiring new kinds of IT talent more complex is that those with the right profiles may not have a traditional résumé or be searching for employment or posting to traditional careers sites. To engage with these technologists requires targeting international community discussions such as Hacker News, Github, Stackoverflow and Reddit. Recruiters can locate top software programmers by looking through the source-code repositories that programmers proudly open up for anyone to review and use.

To effectively engage with candidates in these new environments, companies often need to either retrain or acquire new recruiting capabilities to speak to candidates about relevant—and often very technical—topics in their industry, excite them about the opportunities in the organization, and assess whether the candidate would be a good fit. Top talent is often flooded with recruiter hits, and we have found it more effective and genuine to draft the best "athletes" (i.e., relevant tech stars) from within the organization to engage and recruit their peers or other technologists.

An international bank, looking to build digital talent in a new market for its digital factory, used nontraditional platforms such as Github, Aevy, and LinkedIn to build a heat map of the talent concentration, tech-community events, start-up spaces, and skill mix in the market. The bank also developed a recruiting team that contained traditional recruiters as well as digital talent that candidates would want to work with, such as agile coaches, full-stack engineers, and experience designers. In addition to combing through the online platforms, communities, and postings, the new recruiting team attended and contributed to communities through meet-ups, presented at conferences, and hosted hackathon events. The multifaceted approach paid off: The bank hired 50 top professionals in six months, a 50 percent improvement over an already aggressive aspiration.

4. Create a network of digital-labor platforms

Top talents know their value and have ready access to information about companies through online platforms such as Glassdoor, Hacker News, and StackOverflow, where employees share job satisfaction, company culture, and lifestyle information.

To connect with these people, leading companies are creating their own sourcing platforms. Some are hosting online competitions that allow users and prospective candidates to showcase their technical skills through digital platforms such as TopCoder, Kaggle, Codility and HirelQ.

Digital-talent platforms such as Good&Co and HackerRank are also helping companies more effectively assess a potential employee's match with the skill requirements and culture of the company.

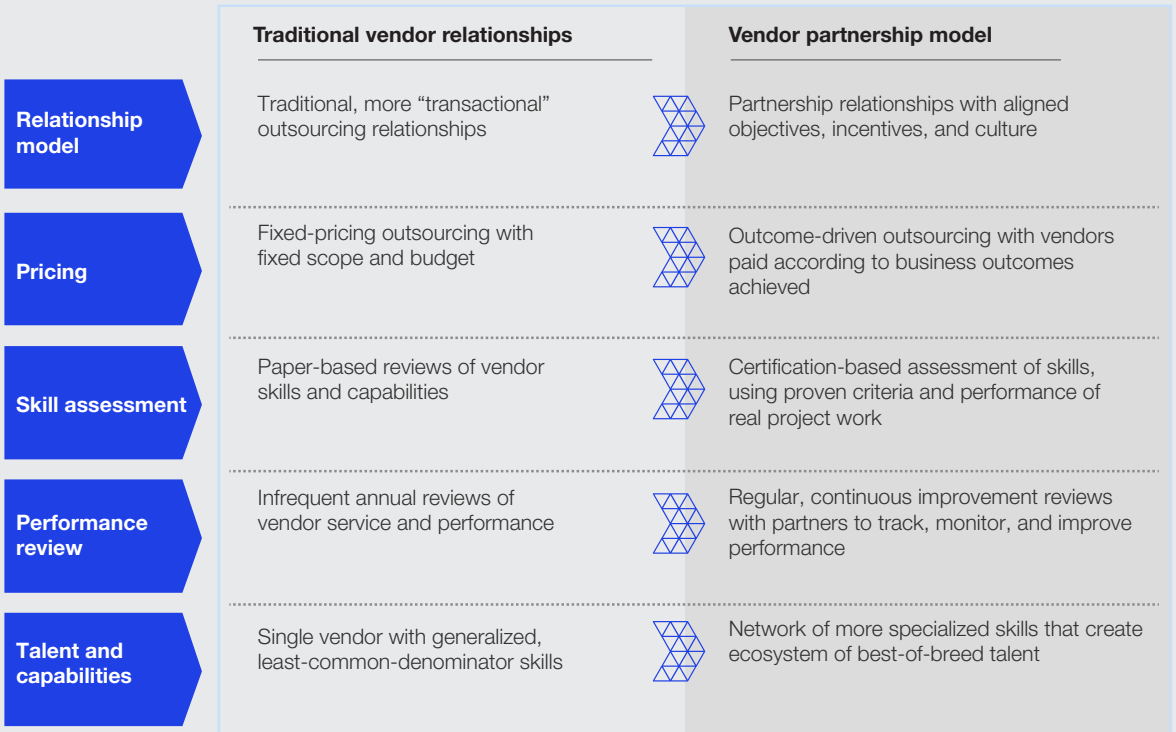
Recent McKinsey Global Institute research estimates that businesses deploying digital-talent platforms to their full potential could increase output by up to 9 percent, reduce employee-related costs by up to 7 percent, and add an average of 275 basis points to profit margins.[4]

5. Build an ecosystem of vendor partners

To effectively take advantage of the technology ecosystem, IT is shifting from having one or two primary vendors, as has traditionally been the case, to a broad array of external options that include traditional vendors, new partners, alliances, and crowd-sourcing. Engaging with a network of vendors also requires changes in skills certification and vendor-performance management. At the same time, the most productive relationships occur when these vendors are treated more like partnerships (Exhibit).

EXHIBIT

A new paradigm for vendor relationships



Source: McKinsey analysis

A leading international travel company, disrupted by start-ups in the market, decided it needed to build up and acquire new digital talent to drive its transformation. An important component of its strategy was to use specialized vendors to support different components of its ecosystem (for example, mobile, search engine, CRM, payments). The company updated its internal processes around procurement, legal, and billing, so that it could move more quickly and be more flexible in managing the variety of vendors.

The impact of this approach was significant. By tapping into the right talent at the right time, the company was able to experience 20 to 25 percent improvements in time to market without increasing its vendor cost base.

6. Acqui-hiring talent

To build up a talent set, it can make sense to acquire a start-up that has specific needed capabilities. Many companies have used this "acqui-hire" approach, but many end up having trouble meshing cultures. Isolating the start-up to preserve its culture can be a useful approach in the short term, but it only delays the inevitable.

To address this issue, many companies are embracing a "reverse takeover" mind-set: A rotating team from the acquiring company begins to integrate and work with the start-up in a "ring fenced" environment that's separated from the standard business processes. This allows the organization to begin taking advantage of the newly acquired talent while also "infecting" the broader organization with the start-up one small group of teams at a time.

One leading North American bank embraced the reverse-takeover approach for one of its start-up acquisitions. There was commitment from bank leadership to immediately begin cross-pollinating the start-up talent with those who were part of a new digital initiative already under way at the bank. The approach created an effective "digital lighthouse" for the bank and helped accelerate the first phase of the start-up's integration by three to six months.

▼ ▼ ▼

While technology isn't the only element of a successful digital transformation, it's one of the most important and complex. Getting it right means recognizing what sorts of new IT talent are necessary and changing the way the company goes about hiring it. ▼

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