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A Time For Courage

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Courage as Capability



“LEADERSHIP, AT ITS BEST, IS A MATTER OF THE HEART. COURAGE, which underpins every act of leadership, is also a matter of the heart.” So begins this issue’s cover story, by Kurt Strovink, Meagan Hill, and Mike Carson. “Courageous conversations: How to lead with heart” is an impassioned articulation of what it takes to ensure institutional strength in a moment like this. Uncertainty is the norm—from the global to the personal. Geopolitical differences seem to be hardening; organizations are navigating a generational technology shift; and fragile employees are short on trust. So don’t dismiss courage as some kind of timeless “nice to have.” It’s now the must-have quality that defines leadership and gives companies the best chance to push through chaos to the next great opportunities.

Courageous conversations are needed to address this range of disruptions. They are the way CEOs embed boldness into strategy, energize their organizations, and navigate uncertainty with both head and heart. And they are anything but easy. Pixar cofounder and former CEO Ed Catmull said, “Encouraging dissent is the best way to avoid being blindsided.” When leaders avoid courageous conversations, they stifle dissent: situations fester, misunderstandings deepen, and relationships fray. This issue’s cover package is a call to courage for company leaders, for new CEOs working with a raft of stakeholders (as Citi CEO Jane Fraser says in her revealing interview with McKinsey’s Eric Kutcher, “That was the biggest surprise I had as CEO—how much stakeholder management your job involves”), and for any executive trying to thrive as new technologies such as agentic AI redefine the workplace.

Managing technology is the one disruption that repeatedly, inexorably, demands courage. Take quantum. The promise is huge, but the technology isn’t far enough along for most companies to



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**‘Don’t dismiss
courage as a
timeless
“nice to have.”
It’s now
the must-have
quality that
defines
leadership.’**

create value today. Authors Henning Soller and Sven Smit have written a comprehensive guide for leaders on what they need to know about quantum computing. In “Quantum’s bold promise: What business leaders need to know,” they suggest that quantum represents a multibillion-dollar opportunity by 2035. As IBM CEO Arvind Krishna tells Kutcher in their discussion, “Quantum today is where AI was in 2015 or 2016.” So business leaders face a tough decision: advance cautiously or aggressively. The authors believe that most companies can adopt a two-phase approach—starting now and scaling later—to build a competitive edge.

Boards, too, play a role in the face of technological change. It’s a unique challenge given that many boards have limited knowledge or experience about AI. That’s a problem: A 2025 study from the Massachusetts Institute of Technology asserted that organizations with digitally and AI-savvy boards outperform their peers by 10.9 percentage points in return on equity. Authors Amer Baig, Ashka Dave, Celia Huber, and Hrishika Vuppala interviewed directors from 75 corporate boards to see what boards need to do besides become more tech-savvy. They identified two key priorities: aligning with management to define the company’s posture toward AI and tailoring the governance model to match that posture. “The AI reckoning: How boards can evolve” offers a road map for addressing those priorities and six governance actions that every board should consider.

AI, geopolitics, and an anxious workforce make it hard to define what really matters now and what reality will look like in the next decade. Max De Pree, the former CEO of Herman Miller and author of a series of books on leadership, once said, “The first responsibility of a leader is to define reality.” Having the courage to tackle that responsibility is what will make all the difference in the decade ahead.

It’s time to turn courage into a corporate capability. We hope this issue will be a valuable step on your own journey.

For 60 years, *McKinsey Quarterly* has aimed to help business leaders successfully guide their companies through their most difficult challenges. Besides enjoying the *Quarterly* in print, you can get *McKinsey Quarterly* in a digital edition (that has all the elegance of the print magazine) via a free membership that includes bonus stories we couldn’t accommodate in the print edition. It’s easy to sign up at McK.co/MQMMemberships, where you can learn about the other benefits of membership, including exclusive access to free downloads of McKinsey’s 100 most important reports. And we hope you’ll continue your learning on McKinsey.com, where you can go deeper on any subject we cover in the print *Quarterly*.



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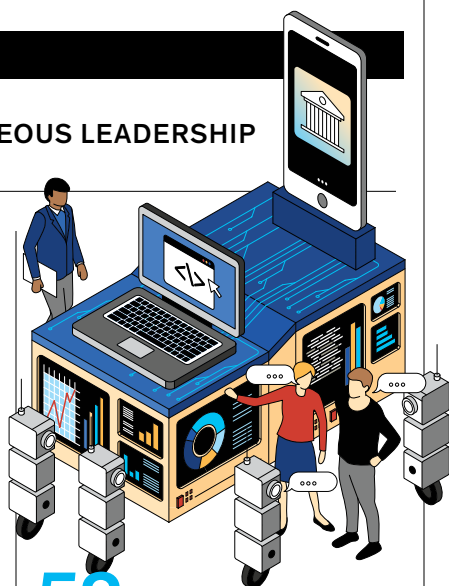
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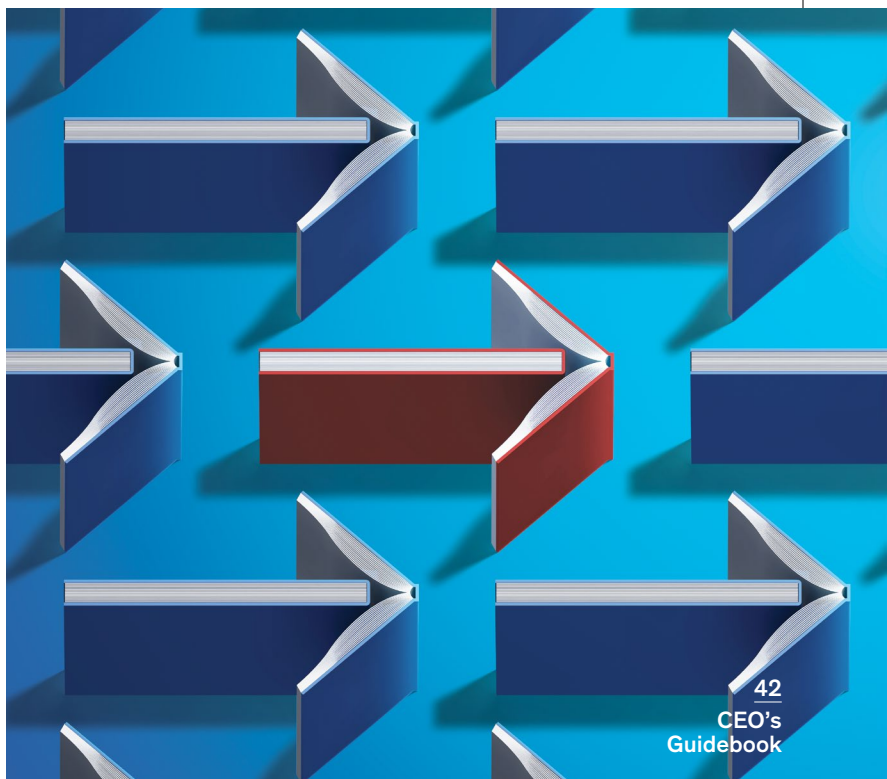
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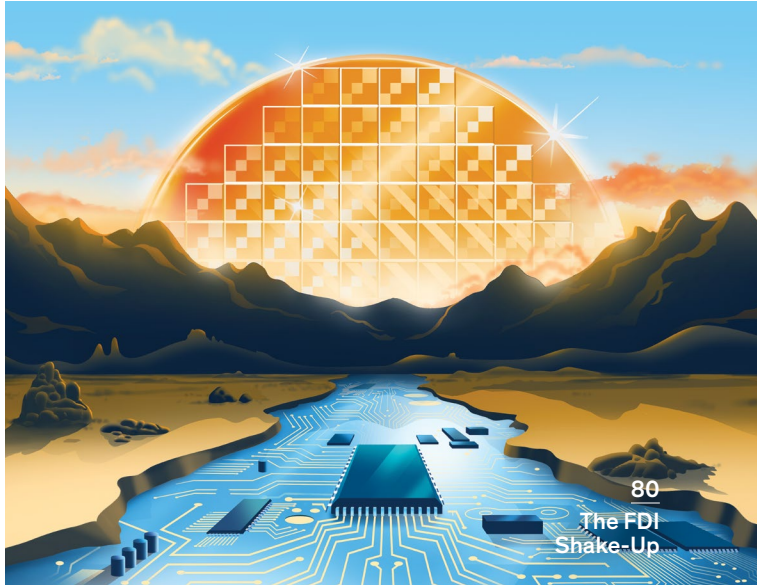
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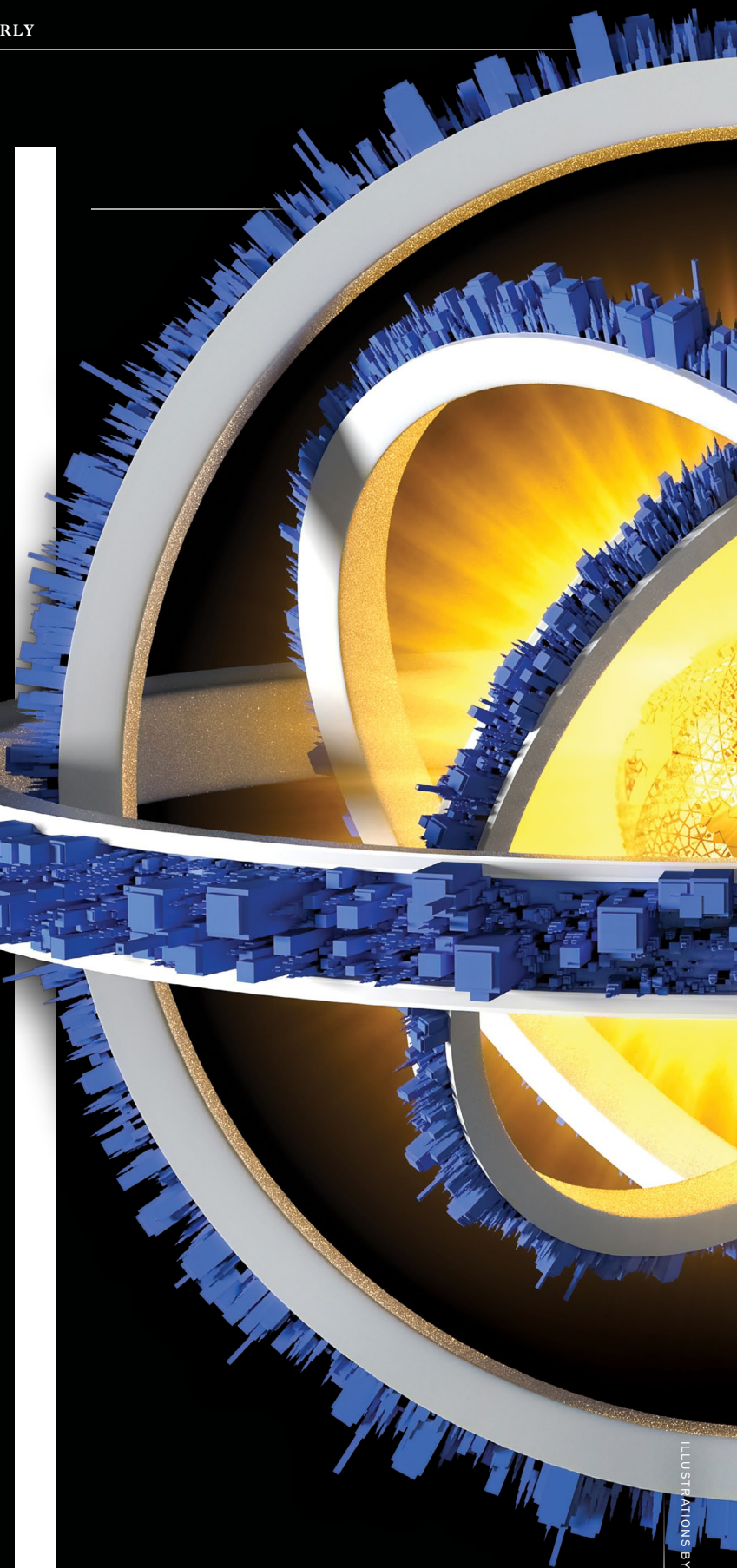
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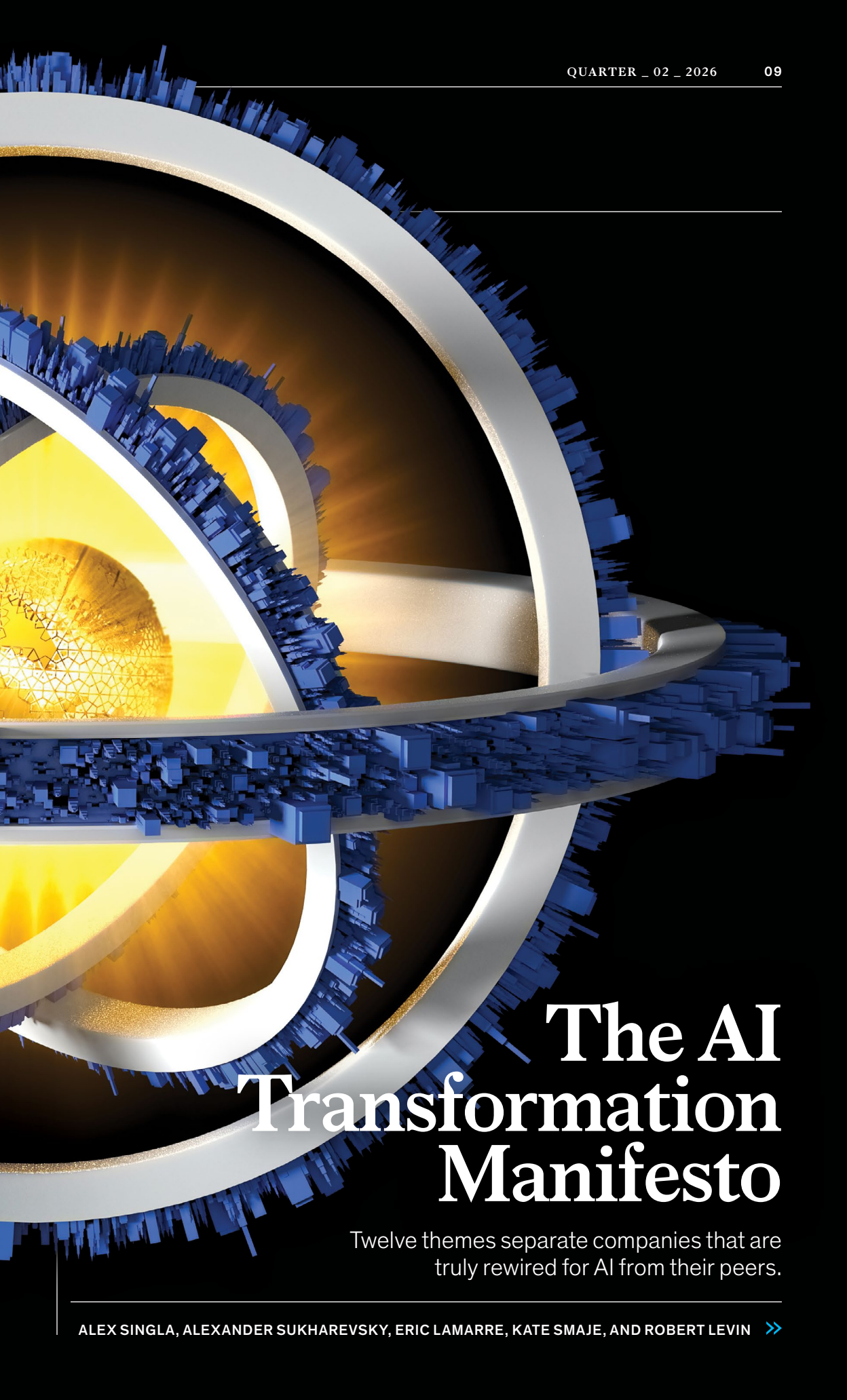
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Outlook

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The AI Transformation Manifesto

Twelve themes separate companies that are truly rewired for AI from their peers.

ALEX SINGLA, ALEXANDER SUKHAREVSKY, ERIC LAMARRE, KATE SMAJE, AND ROBERT LEVIN >>

T

he companies that are truly innovating with AI are doing something very different from their peers: They are conceptualizing and developing AI capabilities that

reshape their products, services, core business processes, and organizational systems.

These leading companies—many profiled in the second edition of our seminal book, *Rewired: How Leading Companies Win with Technology and AI*—are already realizing game-changing results and creating competitive advantage. Their advantage, however, does not come from the tech they use; those tools are broadly available. Their advantage comes from how—and how fast—they apply technology to solving real business problems at scale.

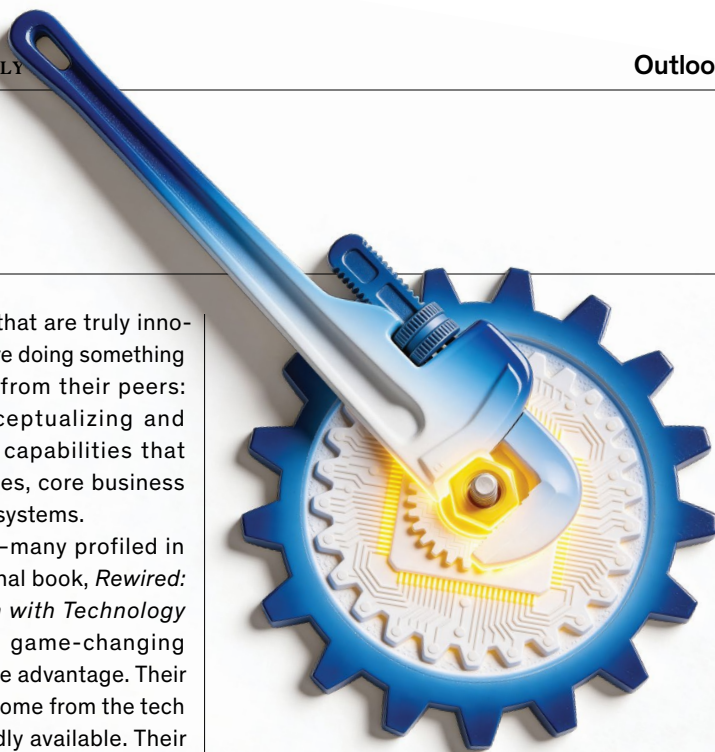
We summarize our perspective on *how they do it* in this AI transformation manifesto. This declaration captures the defining themes that separate the companies that are successfully transforming their business with tech and AI from those that are not. And while there's no question that agentic AI is pushing the boundaries of what's possible, the themes are enduring because they focus on what it takes to *harness technology* to drive business goals.

These themes are extracted from the six capabilities that are featured in *Rewired*: strategic road mapping, talent, operating model, tech, data, and adoption and scaling. In calling these themes out, we are highlighting what our work on hundreds of large-scale tech and AI transformations has shown really makes a difference. These themes should become a checklist for change and operate as guideposts along your transformation journey to value.

1. Technology alone doesn't create advantage; enduring capabilities do.

Who are the early winners at AI? The same companies that have been winning before by building capabilities that allow them to harness any technology effectively. We call them *Rewired* companies. When these new capabilities are built—and they take time to build—the company accelerates its business transformation with technology and outperforms its peers. The capabilities become the competitive advantage.

Are you building enduring capabilities for the journey, or merely delivering one-off solutions?



2. Economic leverage points are your best focal points.

Any business model has a few key economic leverage points that provide the biggest impact when improved with AI. In mining, for example, process yield and throughput is a key economic leverage point, and that's where Freeport-McMoRan achieved game-changing impact. In automotive, supply chain integration is a key leverage point, and that's where Toyota had its AI breakthrough. Most companies have long lists of use cases. Successful ones focus on achieving deep business transformation in the few areas that matter strategically. That's where they double down to build AI systems.

Have you disproportionately focused your AI efforts on your economic leverage points?

3. If the value you're creating doesn't move the business, you're getting it wrong.

We studied the impact achieved by 20 companies across industries that have proved themselves to be leaders in AI. On average, their technology- and AI-driven business transformations delivered a 20 percent EBITDA uplift, reached breakeven in one to two years, and generated \$3 of incremental EBITDA for every \$1 invested. These companies concentrated their efforts on one to three business domains, reinventing them with AI. That required creative problem-solving, coordinated use of tech and nontech levers, maniacal focus on the customers/users, and clear accountability for the business KPIs that mattered most. They made substantial, stage-gated investments and still continue to improve and stay ahead.

Will your business transformation plan result in game-changing value, or will the wins be incremental?

4. Building the tech and AI muscle of your senior business leaders should be a top priority.

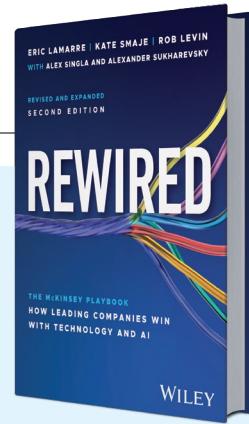
We don't have a single success story where senior business leaders were not in the driver's seat. IT leaders can support the transformation, of course, but it's business leaders who need to drive it. At leading companies, they actively own the tech agenda—from defining how the business will be reimagined with technology to steering solution development to ensuring value delivery. These leaders, usually one or three levels below the CEO, combine deep business domain expertise with technology, data, and AI know-how that makes them formidable business transformers. They are conceptualizing, building, and running AI systems that power key aspects of the business.

Are your senior business leaders tech- and AI-capable?



5. Every tech and AI transformation is a people transformation.

Leading companies increase their tech talent capability and density by following what we call the “30–70 shifts”: more than 70 percent of talent should be in-house, more than 70 percent of them should be “doer” engineers who build great software-based solutions, and more than 70 percent of them should perform at higher skill levels (that is, competent or expert). This produces small, highly skilled teams that outperform large armies of lower-skilled staff. On the business



The fully revised second edition of the bestselling ***Rewired*** is a practical playbook showing how companies can effectively apply AI to solve real business problems, at scale. It addresses the profound implications of AI-driven transformations for CEOs, executive teams, and boards. This story has been excerpted from *Rewired: How Leading Companies Win with Technology and AI*, by Eric Lamarre, Kate Smaje, and Robert Levin, with Alex Singla and Alexander Sukharevsky, with permission from the publisher, Wiley.

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side, leaders evolve into domain and solution owners, accountable for outcomes and leading cross-functional agile teams. Leading companies have largely completed this transition, which results in higher talent density and much tighter business ownership.

As AI agents take on more of the coordination, execution, and routine decision-making work, human roles shift up the value stack. Engineers spend less time on routine coding tasks and more time designing architecture, workflows, constraints, and quality controls. Business and solution leaders focus less on task management and more on setting objectives, defining success metrics, and making trade-offs. The result is fewer people doing higher-leverage work, with clearer accountability and faster learning loops.

Have you progressed enough on your people transformation?



6. Speed is the defining organizational advantage.

Businesses are in an innovation race with companies that have access to the same technologies. Companies win that race when their operating model redeploys resources more rapidly to important opportunities, empowers teams to act without excessive dependencies, and reduces the “latency” from insight to decision and decision to action. Speed requires embedding AI engineering and other functional talent directly in the business, maximizing technology and data reuse through platforms, and governing with clear business outcomes and sustained funding tied to results, not projects. This shortens cycle times dramatically. Without it, no company can truly innovate with technology and AI at scale; they will simply be too slow.

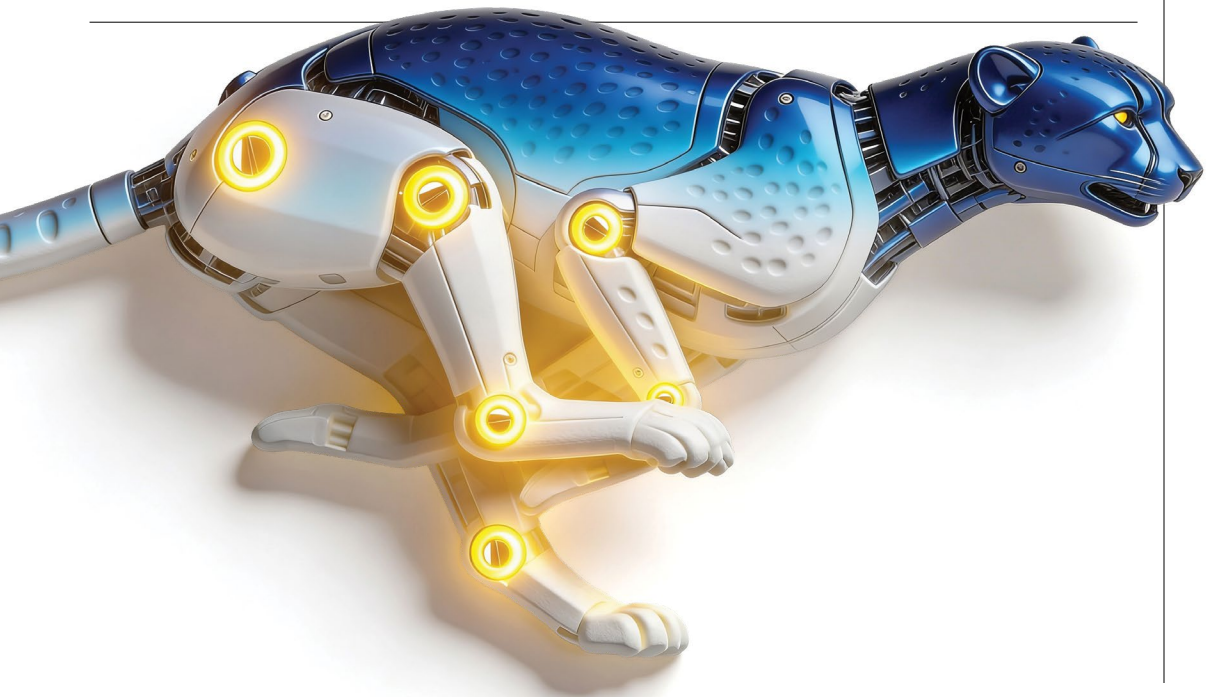
What are you doing to increase the metabolic rate of your organization?

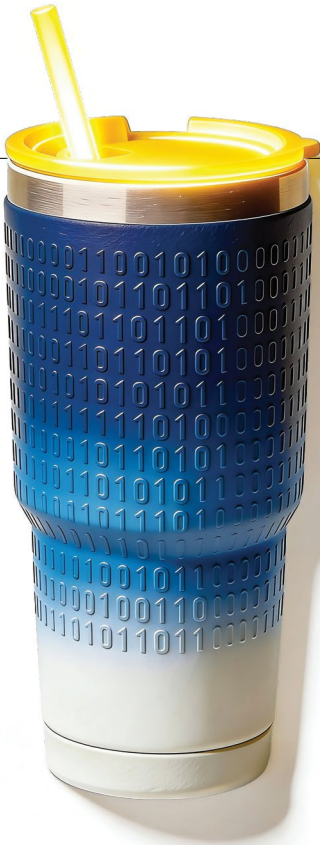
7. Tech platforms are strategic assets; invest in them that way.

Platforms determine a company’s execution speed, drive down its unit costs through reuse, get technology and data into the hands of the people who need them, and enable AI to scale responsibly. They provide standardized, safe, and shared tech and data capabilities that teams can access. Leading companies manage their platforms strategically with dedicated teams, road maps, budget, target service levels, and users whose needs shape how the platform evolves. As a senior executive, understanding your technical architecture, the latitude it gives you, and how it drives competitive differentiation is now as essential to leading a modern company as knowing your profit and loss.

Are platforms understood and discussed as strategic assets?

Speed requires embedding AI engineering and other functional talent directly in the business, maximizing technology.





8. Make data easy to consume—and enrich it for advantage.

As David Baker, winner of the 2024 Nobel Prize in Chemistry, observed when reflecting on recent breakthroughs: “AI needs masses of high-quality data to be useful.” Without good data, AI breakthroughs are impossible. Yet in most organizations, data often still acts as the constraining factor. Scaling AI therefore starts by productizing data—making it easy to discover, access, and consume across many AI-powered applications. That requires investments in building data products. Over time, the game shifts to data enrichment, deepening its quality, context, and uniqueness for sustained performance gains with AI. In *Rewired* organizations, data is a business-owned performance asset.

Can your teams easily consume your data, or are they still wrangling it?

9. Design for adoption and build for scale.

AI systems create value only when they are adopted and scaled. That may sound obvious, yet it remains one of the hardest challenges. Adoption often fails because adjacent upstream and downstream processes are left unchanged. An AI solution may predict equipment failures days in advance, but if maintenance still follows calendar-based scheduling, nothing happens.

Scaling is a different, but equally difficult, challenge. Expanding AI solutions quickly and economically across markets, factories, customer segments, or product lines requires modular solution architectures and a well-choreographed dance between central teams and the receiving units. These considerations—including required investments and run costs—must be addressed up front, not retrofitted later.

Can your organization repeatedly adopt and scale AI, or is it still relying on isolated heroics?

10. No trust, no right to deploy AI.

When AI systems fail, they challenge trust with customers, regulators, employees, partners, and society at large. Digital trust grows when stakeholders have confidence that your organization protects consumer data, enacts effective cybersecurity, offers trustworthy AI-powered products and services, and provides transparency around AI and data usage. The challenges are only increasing with the expansion of agentic technologies, requiring much more time for testing agentic systems and automating risk controls. It’s a fast-moving space, and the excitement for agentic AI may be getting ahead of companies’ ability to manage the more complex risks associated with the technology.

Would your AI deployments withstand public, regulatory, and customer scrutiny today?



**Scaling AI can make it easy
to discover, access, and consume many
AI-powered applications.**

11. Agentic engineering becomes the next capability to master.

Foundation models are now capable of sustained, autonomous work over long periods, making it possible to build complex agentic workflows. Nowhere is this more evident than in software development, where the productivity gains have been astonishing. Leading companies are moving quickly to master agentic engineering. They are ingesting unstructured data, extending their AI platforms with agentic capabilities, automating guardrails and controls, and rapidly experimenting to codify what works into a repeatable agentic playbook. *Rewired* leaders consistently absorb new technologies faster because they've built the underlying capabilities to do so. *Will agentic workflows be your next engineering advantage—or your next catch-up problem?*

12. (Re)learn like your business depends on it.

One reason we love working in this space is that it's constantly changing. The half-life of skills is shortening as innovation accelerates. The organizations that learn, unlearn, and relearn the fastest have the advantage. Taking the leadership team on learning journeys is the most important thing a CEO can do to accelerate business transformation with AI. These journeys are crucial for the top team to reach the *point of conviction* when both the strategic opportunity and transformation pathway become clear. At that point, every C-suite leader understands their role and the transformation truly accelerates. *Becoming the leader this era demands starts with committing to continuous learning; are you personally investing enough?*

Building the complete set of rewired capabilities is the cornerstone of every successful tech and AI transformation. Companies can accelerate their way through developing them, but they cannot skip the foundational work. This gets at the idea of compounding value as capabilities build off one another and competitive distance increases. That's how leading companies consistently outperform, again and again. 

» Alex Singla is a senior partner in McKinsey's Chicago office; Alexander Sukharevsky and Kate Smaje are senior partners in the London office; and Eric Lamarre is a senior partner emeritus and special adviser in the Boston office, where Robert Levin is a senior partner.

The AI Antidote



AI is changing the workplace and placing new demands on leaders. Meditation can help them maintain perspective and manage the disruption.

BY MANISH CHOPRA

↳ First thing in the morning, I'd check my email. After a shower and breakfast, I'd check it again and start tackling the many things on my to-do list. I multitasked all day: call clients, analyze information, catch up with texts and calls, meet a client, chisel out time with my family, and go to bed with a million things on my mind. It was a strain, it was a rush, and I thought I was the definition of productivity.

Then I ran out of steam. I felt I was at an inflection point in my life and in my leadership journey. Something was off. So in 2010, I decided to try what my wife had been urging me to do for five years: start meditating. Since then, nothing has been the same for me.

In the age of ascendant AI, nothing seems the same for many companies, leaders, and workers. Consider this incomplete list of what leaders must face: instant outputs from black boxes processing all kinds of data; accelerated and altered workflows; agents, robots, and people working together; a new mode of decision-making; a whole new race to create value before other organizations. Companies need new kinds of talent and new ecosystems and partners. And then there's the anxiety many people feel as they wonder what the workplace of the future will look like, whether they can keep up with the technology, and how to make themselves adaptable, if not indispensable.

Let's take a moment. Let's catch our breath. And let's consider how the practice that reset my life and work can lead to clear perspectives, resilience, and judgment. This article explores how and why a consistent meditation practice may provide leaders with a healthy foundation for grappling with the frenetic age of AI.



Meditation strengthens three essential foundations of wisdom: awareness, flexibility, and equanimity.





THE BENEFITS OF MEDITATION

Developing greater inner capacity requires focused and concentrated effort. It must be cultivated intentionally and consistently. I practice a form of meditation called Vipassana. I meditate in the morning and the evening. Once a year, I go on a silent meditation retreat, easily the hardest and yet most rewarding thing I do. Practices vary, of course, and other introspective practices such as journaling and reflective walks in nature can also help center the mind and heart. Many of the benefits that have enriched my life have enriched the lives of people with other kinds of inner practice.

Meditation offers so much that AI can't give us. It also offers so much that can help us grapple with AI's disruption and develop its potential. These benefits can include energy, internal and external clarity, a sense of purpose, a realistic and open-hearted perspective, wisdom, openness to new ideas, balance, and grounded ethical judgment.

difference between reacting on the fly to the sense of urgency created by the rapid current of data and seeing and acting on what really matters. Meditation can help you direct your attention where it is most meaningful, both professionally and personally. For instance, one CEO came back from a short meditation retreat understanding that he'd allowed his attention to be diverted from his wife for too long. His need to deal with everything at work had distanced him from his most important relationship. The adjustments he made to his personal working model helped him appreciate its deep, enduring value. The immersive meditation experience cleared his mind to steer attention to what truly mattered most.

Strengthening Cognitive Flexibility

To keep pace with the rapid change brought about by AI, leaders must continually learn and adapt. They face transformative questions: How should the company shift to make the most of AI? What is

If companies want a supportive environment for people to innovate with AI, they need an equanimous CEO.

These are all critical leadership capabilities that manifest in different settings.

From my experience, meditation strengthens three essential foundations of wisdom: awareness, flexibility, and equanimity, each giving rise to a dimension of personal growth from the inside out.

Reclaiming Attention

We live in an era of infinite inputs and finite focus. AI only exacerbates this. This is a great challenge for leaders, who must decide where to focus their attention at a moment when AI is scrambling expectations and furthering the sense of perpetual change.

Meditation helps me reclaim my attention. Small mindful habits, such as pausing between calls, taking a few intentional breaths before difficult conversations, and putting my phone away well before bedtime, anchor me in the present moment. It's the

the right operating model? What can a leader do to rally a workforce behind a technology that makes employees fear for their jobs?

As large language models develop, they are likely to present new opportunities and risks. But these are hard to predict. Meditation enhances working memory, mental agility, creativity, and open-mindedness to new possibilities. These capacities help leaders understand new tools and navigate shifting environments. This is the kind of flexibility that creates opportunity and sensibly dismantles risk.

Developing Equanimity

Meditation trains the mind to observe before reacting—to create space between stimulus and response. That ability helps me handle pressure and uncertainty with balance (*most* of the time). When I am able to act with equanimity, I can

remain evenhanded in the face of challenges, and I make better decisions. Equanimity is not passivity or ambivalence; it is poised action grounded in perspective and balanced judgment.

Leading people through change is as much an emotional ability as an operational one. The energy a leader embodies is central to the success of teams and organizations. An agitated leader creates agitated teams; a calm leader radiates calm through their teams. If companies want a supportive and entrepreneurial environment for people to grapple with and innovate with AI, they need an equanimous CEO.

Such leadership is critical in the age of AI. While generative and agentic AI have the potential to transform corporations, implementing them in a manner that is both opportunistic and secure is a delicate matter, requiring leaders to cut through the hype to determine which elements suit their business model and which do not. Meditation can help leaders center themselves, creating the inner calm that encourages the confidence needed to successfully navigate this rapidly developing technology and other future disruptions.

→ THE HUMAN ELEMENT

Our work on AI transformations has made it clear that humans can be a key differentiator in who will generate value from AI and who won't. In the agentic organizations of the future, people, robots, and agents will work together, performing tasks that are appropriate for each. People bring judgment, creativity, awareness, and other qualities that AI does not have. The next wave of upskilling will help people exploit these fundamental aspects of being human for new roles designed for the AI economy.

Meditation is no panacea. But it has long been a path for people seeking greater inner peace and discernment. (Meditation has been around for over two millennia, so AI is an infant by comparison.) The leaders I know who have made meditation a part of their daily routines say they have experienced powerful unlocks in their personal and professional lives. As we build smarter machines and integrate them into the way we work, the leaders who thrive will be those who also cultivate wiser minds. The most powerful leadership operating system isn't artificial. It's inherently internal. [Q](#)

» **Manish Chopra is a senior partner in McKinsey's New York office and is the author of two books on meditation.**



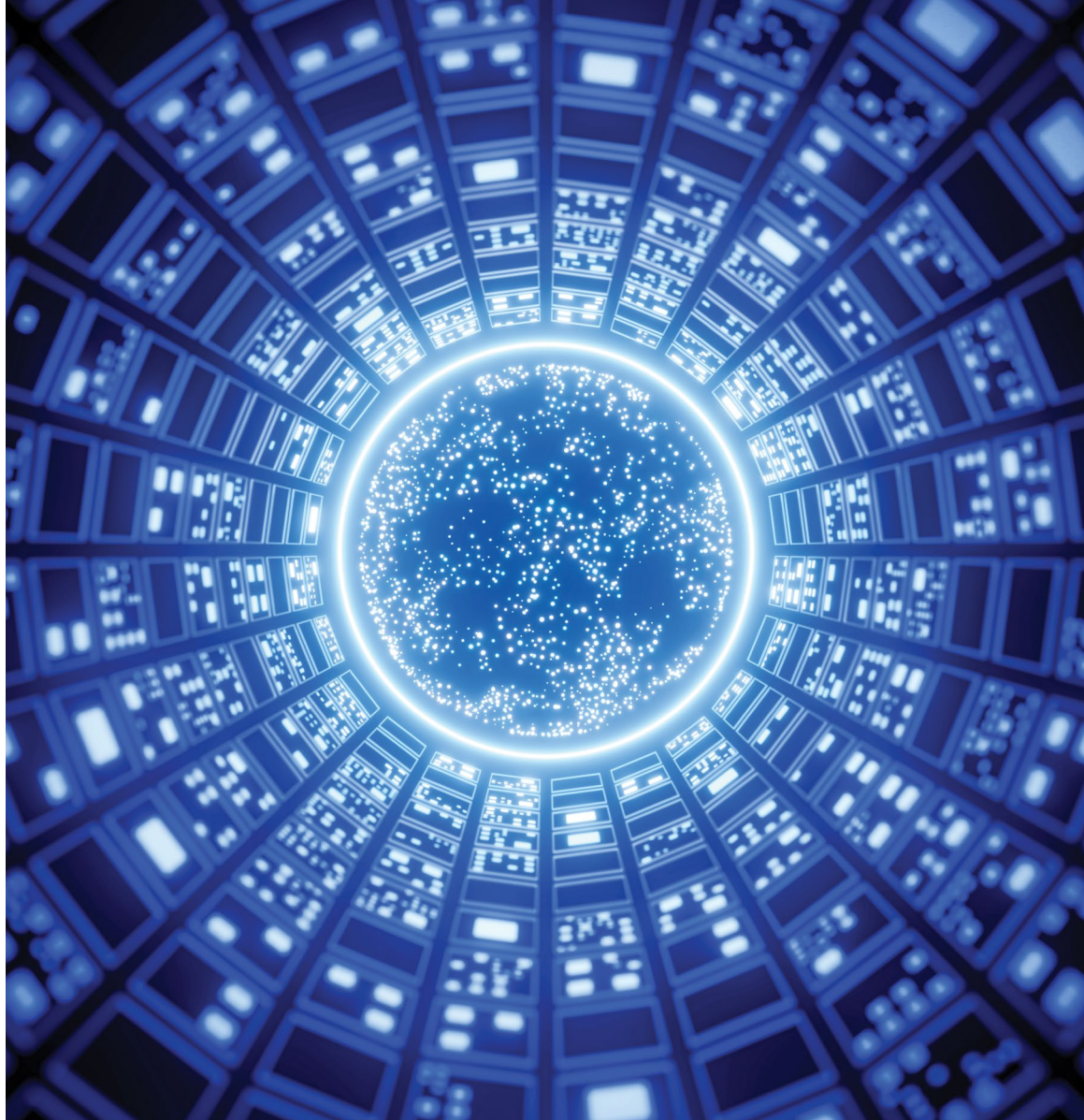
My Universe

Your AI Briefing: World models bring the physical to AI.

BY MICHAEL CHUI

↳ There are two defining features of the “a-word” (aka AI agents): First, they are based on AI technology (thanks, Mr. Obvious). Second, they somehow act in the world—that is, they have agency. But the world is a complicated place. Do AI agents, or even large language models (LLMs), *really* understand the world?

To be fair, language is a triumph of human intelligence, and it underpins a lot of what any company is able to do in business. Some of our previously published analyses estimated that activities accounting for 25 percent of global work hours required at least a median human level of understanding language. But that also means that 75 percent of global work hours do not require a median level of understanding human language. And you probably wouldn't expect that the foundation model controlling a robot or an autonomous vehicle would be an LLM. Language descriptions can help you understand the physical, 3D world, but there's a reason we talk about “book learning” versus



The process of scientific discovery requires

real-world knowledge, or why so many people watch YouTube videos to learn how to accomplish various tasks rather than just read written instructions. LLMs are trained from reading “books” (that is, lots of textual data), and it’s kind of amazing that they can appear to do reasoning about the physical world at all.

What kind of foundation models can better understand the physical world?

World models (thanks again, Mr. Obvious). The AI community is increasingly interested in building world models: Rather than predicting the next token in a sequence, as LLMs do, these models predict what will happen in a 3D world when a physical action is taken.

Noted AI researcher and Stanford professor Fei-Fei Li cofounded a start-up called World Labs. Its purpose is to create “large world models” to support “spatial intelligence.” Google DeepMind produces the Genie world models, which generate interactive environments that can be navigated in real time. Jensen Huang, CEO of NVIDIA, has popularized the term physical AI. And Yann LeCun, former chief AI scientist at Meta, has founded a start-up called Advanced Machine Intelligence, which will focus on world models. (LeCun, in a social media post on X, famously compared the intelligence of current AI systems unfavorably to that of house cats: “It will take years for [intelligent systems] to get as smart as cats, and more years to get as smart as humans, let alone smarter.”)

What are the applications of world models?

Companies that produce video content (for example, media, advertising, social networks) and interactive environments (for example, video games, 3D training) benefit from world models that can realistically predict how the physical world will react to actions and movement. Companies that build physical products that they want controlled by AI—for example, autonomous vehicles, industrial machines, and robots of various kinds—can also embed world models into their products. World models can also be useful for training other AI models that are meant to operate (that is, control machines) in the physical world.

How can world models be used for AI training?

There is a technique for training AI models called reinforcement learning: The model being trained is given a goal, and the actions it takes that result in progress toward that goal are “rewarded.” Models being trained could be set loose in the real world, but it’s much easier, faster, and safer to use a world model to simulate what might happen in the real world when a model in training takes an action. Would you want to train autonomous vehicles by just setting them loose on city streets? (Uh, never mind.)

The researcher often considered the father of

This brings up a pet peeve of mine about agents [RANT ON]:

I’ve seen a lot of descriptions of AI agents that assert they learn autonomously. But if they’re constructed with LLMs, this is not true. LLMs will react within their context windows based on the dialogue you are having with them (this is the “in-context learning” mentioned in the Dwarkesh Patel podcast with Andrej Karpathy noted earlier), but once you’re in another context window—that is, you’ve started a new conversation with an LLM—it’s as if you just restarted the model out of the box; it forgets everything from the previous dialogue. It hasn’t learned anything from your prior interactions (although developers of products such as Claude, ChatGPT, and Gemini have created hacks like adding connections to databases to try to create some kind of memory; results may vary). The strength of the connections, or “weights,” in a typical artificial neural network do not change after the initial training, unlike those in a real brain [/RANT OFF].

The process of scientific discovery also requires an understanding of the physical world. In fields such as life sciences and chemicals, companies are developing new products by using deep learning surrogate models that simulate aspects of the

an understanding of the physical world.

AI reinforcement learning, Richard Sutton, was recently interviewed by the prolific (and enjoyably geeky) AI podcaster Dwarkesh Patel. The conversation inspired a lot of commentary (which carried over into a follow-up podcast with AI researcher and Eureka Labs founder Andrej Karpathy), partly because it surfaced a fundamental limitation of classic transformer-based foundation models, including LLMs (which Sutton calls an AI “dead end”): They do not learn from their “experiences” in the way that human beings and animals are always continually learning. In other words, they have no long-term memory. To change an LLM’s behavior on a long-term basis, you have to take them “back to the AI garage” and retrain/fine-tune/modify the connection weights of their neural networks.

physical world and thus can be described as a type of world model. Our other research has shown that these and related AI techniques could help to double the pace of R&D in these and similar fields. The “AI for science” realm is buzzing, with start-ups and established AI leaders digging in.

World models are still early, imperfect, and evolving—but they point toward systems that can reason about cause and effect in the physical world. If that trajectory holds, we may look back on today’s language models as the prologue to a much more interesting story. [Q](#)

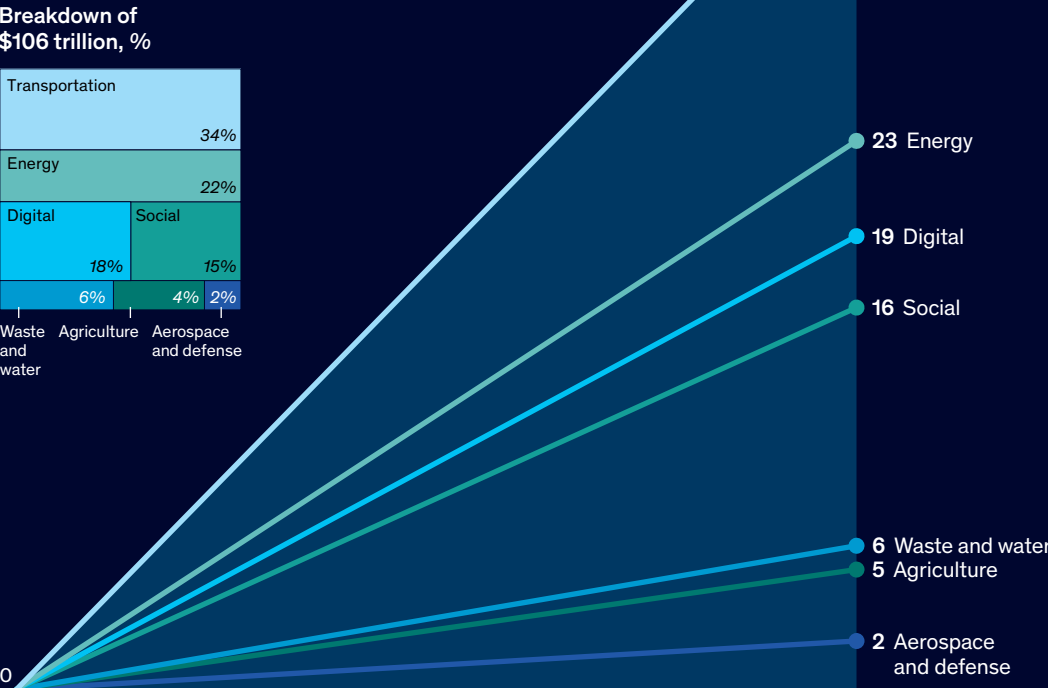
» Michael Chui is a senior fellow in McKinsey’s Bay Area office. This column is part of his *Quantum of Solis* series on AI.

Data View

Bridges and Bandwidth: The \$106 Trillion Infrastructure Moment

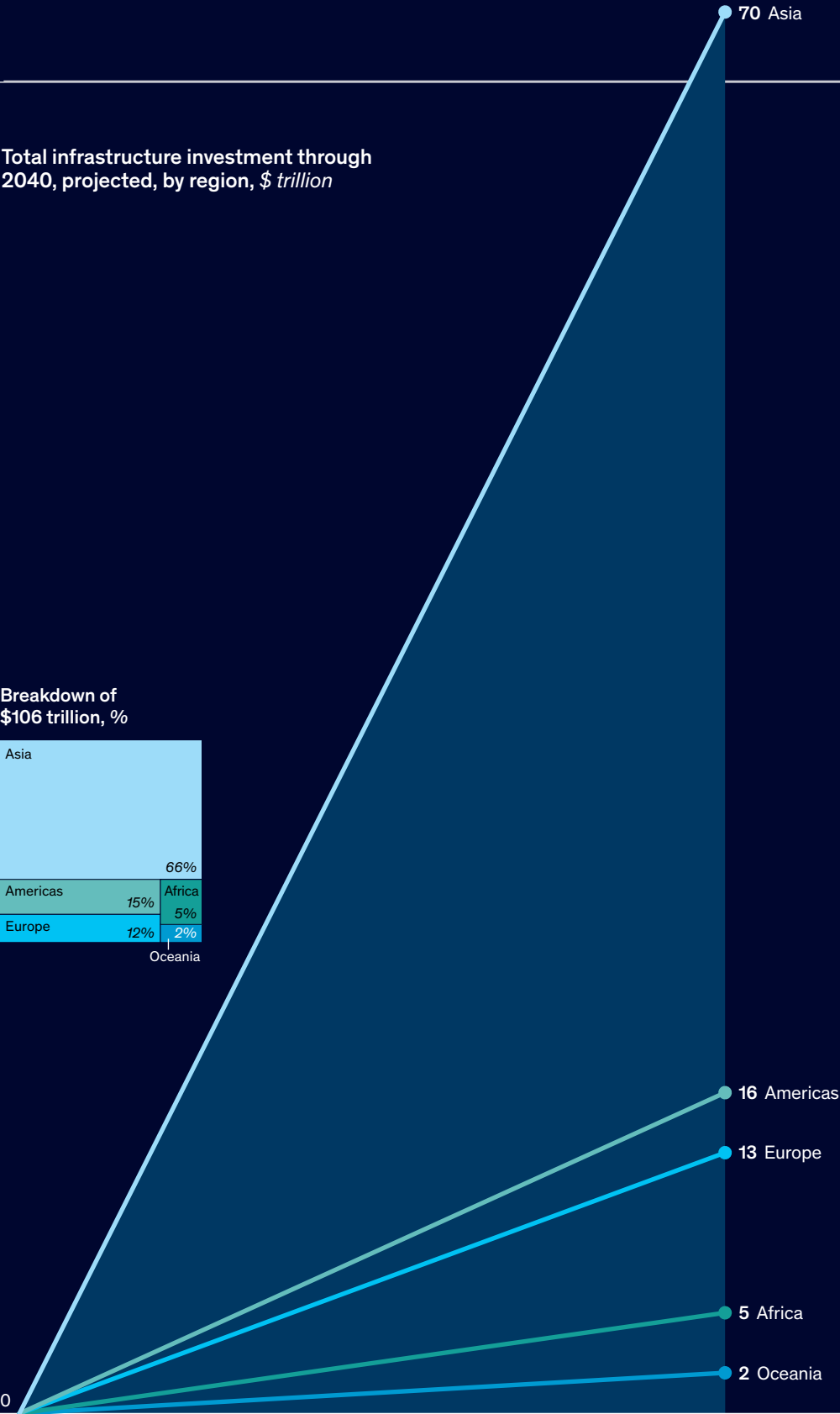
➔ Infrastructure underpins global prosperity and modern industry. A confluence of global forces is accelerating the need for infrastructure investment and changing the very definition of infrastructure. Traditional structures like roads and power grids now coexist with digital infrastructure such as fiber networks, data centers, and electric-vehicle charging stations—each requiring long-term investment. McKinsey projects that \$106 trillion in infrastructure investment will be needed through 2040, spanning seven sectors across five regions.

Total infrastructure investment through 2040, projected, by sector, \$ trillion



Note: For details, see *The infrastructure moment: Investing in the expanding foundations of modern society*, McKinsey, Sept 2025. Figures do not sum to totals, because of rounding.

Total infrastructure investment through 2040, projected, by region, \$ trillion



Source: Food and Agriculture Organization; Global Infrastructure Hub; International Energy Agency; International Monetary Fund; Organisation for Economic Co-operation and Development; Preqin; United Nations; World Bank; World Economic Forum; McKinsey analysis



Re:th!nk

The Business Case for Social Mobility

BY FERRY GRIJPINK

↳ From the earliest moments of my consulting career, I experienced firsthand the significant role that subtle class markers and unspoken cultural codes can play in determining professional success. At one of my first work dinners, a senior member of the team asked me about my tastes in wine and poetry. As the working-class son of two hairdressers—and the first in my family to attend college—my knowledge of fine vintages and literature was sparse, to say the least. My best attempts to deflect the unwanted attention with humor by citing a Dutch nursery rhyme went over well enough. But there was no denying that I stood out: I came from an entirely different social and economic background than

most of my new colleagues.

With the help of many mentors and peers, I was able to overcome such hurdles (which are often invisible to those who don't face them). But millions more aren't nearly as fortunate. This is increasingly the case in Europe, where long-standing progress in expanding socioeconomic mobility has stalled in recent years. Our research shows that more than a third of the continent's population now fares significantly worse on academic achievement, employment, and career progress than their counterparts from higher socioeconomic backgrounds (SEBs). The differences in outcomes are stark: Individuals from low SEBs are almost three times as likely to

work in low-skill positions as similarly educated individuals from high SEBs.

As damaging as it is for individuals on the losing end of the socioeconomic lottery, this lack of social mobility is an equally critical challenge for Europe's future. Economic growth is lagging, the population is aging, and industries can't find sufficiently skilled talent. Turning the tide on social mobility could fuel much-needed productivity growth, helping to boost consumer spending, improve skills matching and workforce participation, and lower healthcare costs and disparities. In the process, we estimate it could increase Europe's GDP by as much as 9 percent.

Our research suggests that "first-generation professionals" from lower SEBs make great employees. They tend to be very motivated and loyal, they've frequently been underutilized, and they're often ambitious. Our survey shows that employees from disadvantaged backgrounds are 20 percent more likely to aspire to leadership positions than their higher-SEB peers.

Previous research has also shown that diversity helps senior-leadership teams make better decisions. But socioeconomic diversity has been lacking in parts of corporate Europe. In France, half of the CEOs atop the 120 largest public companies are alumni of just four exclusive educational institutions. In the United Kingdom, a similar share of FTSE 350 CEOs attended prestigious "independent" schools.

If fixing this issue could improve outcomes on three fronts—for individuals, society, and employers—why hasn't more progress been made on it?

For starters, social mobility is difficult to measure. There is no single, perfect metric, and employers rarely collect varied socioeconomic data about their workers. Socioeconomic status can also be highly relative, at times invisible, and often a delicate or even taboo subject that most managers would rather not explore.

Most companies' current efforts to address social mobility tend to focus more on recruitment than on retention and advancement. Expanding

the use of paid internship programs and data analytics tools can help businesses connect with the vast reservoir of untapped, lower-SEB talent. And initiatives such as carefully crafted mentorship, sponsorship, and training programs, as well as inclusive, targeted career progression, can make an even greater difference in seizing the social-mobility opportunity.

Roughly half of lower-SEB employees say they would consider leaving their jobs for a workplace that is more socioeconomically inclusive. Organizations could benefit from bringing in employees with varied, valuable perspectives born of their more challenging backgrounds. Given my

‘Turning the tide on social mobility could fuel much-needed productivity growth, helping to boost consumer spending, improve workforce participation, and lower healthcare costs.’

upbringing, for instance, I feel that I do have a slightly greater appreciation and empathy for those who encounter obstacles, and a heightened ability to connect with outsiders or those from groups with lower representation. What's more, I have a sense of the on-the-ground realities of businesses and employees—instilled in me from an early age by my blue-collar parents—that can augment the view from the top that many executives are more accustomed to. Those kinds of skills, regardless of upbringing or education, can be hugely valuable additions to any workplace. [Q](#)

» Ferry Grijpink is a partner in McKinsey's Amsterdam office.



THE NEXT NORMAL

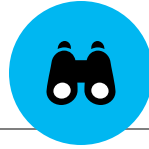
The Future of Airports

Airports have existed for more than a century. Revitalizing their infrastructure could lead to more seamless, automated, and personalized journeys for air travelers. Here's our **three-part look** at the tech innovations that are poised to transform the airport experience.



An artist's rendering of Singapore Changi Airport's T5 megaterminal, scheduled to open in the mid-2030s.

RENDERING COURTESY OF SINGAPORE CHANGI AIRPORT



1 _ GATE EXPECTATIONS

↳ For travelers, tomorrow's airport could feature less stress, shorter lines, and no more fumbling with tickets and passports. McKinsey experts recently examined how technology such as AI, biometrics, and even flying taxis could reshape how airports look, feel, and function in the decades to come. An edited transcript of their conversation follows.

SEAMLESS CHECK-IN

Kelly Ungerman > The airport today, I think we would all say, sometimes feels a little chaotic and crowded—full of friction from the time you pull up to the curb to the time you board at the gate. The airport of tomorrow will feel very different: frictionless, automated, touchless, and personalized.

Vik Krishnan > The airport of the future will fix the biggest problem of today, which is anxiety. Imagine walking into an airport and not waiting in line for anything. Your bags, to the extent that you have to check them, will be picked up by automated devices that can seamlessly deliver them to the aircraft or the baggage-handling system.

Kelly Ungerman > Security lines are the biggest bottleneck and one of the biggest friction points in the end-to-end airport journey. In the future, it may not be necessary to stop at all. Biometrics will mean that your face is your new ID. No more physical documents like boarding passes or passports.

PERSONALIZED TERMINALS

Kelly Ungerman > When you're in the terminals, the signage

will be completely personalized. The departure screen will know it's you. Signs that know exactly where you're going will point you in the right direction—whether to a restaurant, a club, or the gate. And this will help you navigate from the time you enter the airport until the time you board the flight. **Vik Krishnan** > You can see airports helping a ton with wayfinding. For instance, AI can be used to make digital signage in the language of choice of the individual traveler, as opposed to just in two languages: English plus whatever the local language is. AI can digitize and personalize that and deliver a very specific experience if, say, you want your journey to be entirely in Turkish or German.

Alastair Green > I would expect that in the years ahead, the best airports will say, "How can we tailor what is offered in the individual stores to the types of flights that are coming in?" They'll know the mix of passengers on board and let you preselect certain items. If you're landing at an airport in another country and you know you need a plug adapter or you're missing something from home, you shouldn't need to walk around the terminal looking for that item. You could prepurchase it on the flight so it's delivered to you when you land on the other side.

AUTOMATION 'BELOW THE WING'

Vik Krishnan > There's a lot of work that also happens in an airport "below the wing," which is the stuff that you don't see. It is about the belt loader showing up and helping take bags off the airplane. It is the tug that tows the airplane from the

ramp onto the gate. It is the service vehicles that help clean an aircraft. It is the catering truck that brings in drinks and food for passengers to enjoy on the airplane. Much of that will be digitized—and automated in some instances—and delivered in a way that allows for higher reliability and better on-time performance.

Kelly Ungerman > I think there's a real potential for AI to do better demand planning, so you know exactly where to staff workers, and they show up at the right place at the right time. Another really interesting technology in the context of the airport of the future is autonomous vehicles—to be able to shuttle passengers from one part of the airport to another, or from a large central terminal out to the airplane sitting on the runway. It gives you flexibility to be a lot more modular. I think robotics are interesting, as well. In everything from gate operations to baggage handling to food and beverage delivery, there is opportunity to be much more efficient.

Steve Saxon > We have self-driving taxis on the streets of San Francisco, but we still have somebody driving a jet bridge to attach to a plane. Lots of these things—like baggage loading, jet bridges, and passenger buses—will become autonomous.

I don't think we'll have long piers with lots of fingers and gates leading out to aircraft. Why do we want to build big buildings, and why do we want to make passengers walk? Instead, I think we'll have a fantastic, entertaining central area within the airport and then autonomous shuttles taking people out to board their aircraft just in time for their flight.



An online version of this feature (including video interviews) is available on

[McKinsey.com](https://www.mckinsey.com)

'From gate operations to baggage handling, there is opportunity for airports to be much more efficient.'



From left to right: At Amsterdam Airport Schiphol, bag drops and passport checkpoints are becoming more seamless and automated. AI and biometrics can help smooth passenger flows and eliminate bottlenecks.



Travelers move through Singapore Changi Airport's Jewel Rain Vortex and Shiseido Forest Valley.

AN AIRPORT FULL OF FLYING CARS?

Alastair Green > Today, many airport passengers choose economy off-site parking, sometimes waiting as long as half an hour for a shuttle bus to take them in. The dream for 2050 would be to have widely available eVTOLs [electric vertical takeoff and landing aircraft] or urban air mobility. This might seem like a pipe dream today, but if we can get the cost equation right, people will be able to show up at the airport in some form of autonomous helicopter, essentially.

Steve Saxon > If eVTOLs develop as we expect, airports will need to change, because they will need to manage the airspace for the long-haul traditional flights at the same time as managing a lower-altitude airspace for what are, in effect, helicopter-like vehicles. That requires innovation. We're still going to have airports, but we're going to have many more smaller flying vehicles going in and out of them, arriving autonomously, with passengers from the city and from

the surrounding area who will then be connected to a long-haul plane.

Vik Krishnan > In a world where people arrive at an airport in a flying car as opposed to in a train or a conventional vehicle, you can potentially process passengers through at a remote spot, so that when they get to the airport, they just walk onto the airplane. You could see a world where security processes are performed at a downtown location, where people get on a flying vehicle that doesn't require a runway to take off, and they are transported to the airport's air side—in other words, behind security.

Kelly Ungerman > In terms of a truly disruptive future, there is a scenario where you barely set foot in an airport at all. An eVTOL picks you up in your backyard or on a landing pad that's a block away from you, and it transports you to the airport, right next to the widebody jet that's leaving. You show up ten minutes before departure and never set foot in the airport. That's a pretty disruptive but potentially realistic future.

» Alastair Green is a senior partner in McKinsey's Washington, DC, office; Kelly Ungerman is a senior partner in the Dallas office; Steve Saxon is a partner in the London office; and Vik Krishnan is a senior partner in the Bay Area office.



2 – INDUSTRY INNOVATORS

Lim Ching Kiat

EXECUTIVE VICE
PRESIDENT OF AIR
HUB AND CARGO
DEVELOPMENT,
SINGAPORE CHANGI
AIRPORT

➔ Last year, for the 13th time, Singapore Changi Airport was named the world's best by the industry research group Skytrax. As Changi constructs a new terminal—adding capacity to the world's fourth-busiest airport—the airport's executive vice president of air hub and cargo development, Lim Ching Kiat, details efforts to attract new traffic while future-proofing airport infrastructure.

Capturing growth > Singapore's geography places us in the middle of some fast-growing economies. China, India, Indonesia, and the rest of Southeast Asia have a rising middle class and young populations. There are always new cities that are coming up—such as Visakhapatnam in India or Chongqing in China. Central Asia, particularly Mongolia, is an area that we want to grow our links to.

Harnessing new technologies > We have deployed trials for AI to be used in security screening for detection of prohibited items. Traditionally, at airports, this process is quite manual: You go to a scanner

or X-ray machine, and there's a person behind it screening the items. This is the perfect use case for video analytics and AI, and we have done trials that reduce screening times by up to 50 percent.

When the aircraft docks at the loading bridge, there are trucks refueling the aircraft, catering trucks, cleaning, cargo loading, baggage, and so forth. We have a pilot project in which we record all these activities and share data from the video analytics with all our partners in airport operations. Whenever some activities get out of step, every party handling the flight on the ground gets the information, and we can see how to remedy it.

Whenever there's lightning, it can lead to a stop work order on airside. So we are trialing robotics and autonomous vehicles to transport baggage even during challenging weather conditions to ensure continuous baggage flow.

Enabling seamless travel > At our auto-gate, your face is your passport. That has been very well received, and it will be deployed on a bigger scale. We are dreaming of other possibilities—for instance, using your face as your biometric token and then putting this token into a biometric wallet that can scale beyond just Singapore.

Creating an airport city > We don't just want to be a bus stop where people come and go. Imagine you could have an apartment at the airport. Or why can't offices be at the airport? For team events, you could just come in for half a day and then get out. There could be a use case for private bankers, or for medical clinics, that want to serve their regional clients. With the idea of an airport city, we could redefine some possibilities.





Robert Carsouw

CFO, ROYAL
SCHIPHOL GROUP

↳ The first flight to Amsterdam Airport Schiphol landed in 1916. Last year, Schiphol served 120 airlines flying to more than 300 direct destinations—making it among the best-connected airports in Europe. Schiphol CFO Robert Carsouw explains how to make an old airport new again.

Expanding infrastructure > We are the oldest airport in the world still operating at its original location. And we are the most crowded airport in Europe. We need to rebuild our infrastructure, expand it, renew it, and electrify it to become more sustainable, because our old infrastructure is reaching the end of its technical lifetime. We're investing more than a billion euros per year for the next decade and beyond. The airport will have a very different look and feel in the future compared to today.

Accommodating larger aircraft > We are expecting that the number of flights at Schiphol will stabilize at around 480,000 per year, but the number of passengers will grow

faster—from 70 million to 85 million in the coming years. We expect that to happen because of airlines' fleet renewal, which will bring in more passengers on larger planes. The expected "upgauging" of fleets to larger planes can create challenges: If the new airplanes are larger than the old airplanes, that means our gates will be too small, and our bridges won't fit anymore. So when it comes to developing new piers and new infrastructure, we take into account the increased size of the airplanes.

Smoothing aircraft and passenger flows > We have a camera system that analyzes 70 unique aircraft turnaround events within 30 turnaround processes, and we share that data with the airlines so they can improve on-time performance. Our image-based processing system can detect impending delays in advance and help us make informed decisions to act on them. We cannot afford to have planes stay longer at gates than planned. We're also monitoring passenger flows on an individual-passenger level so we can see, in real time, where passengers are—while respecting their privacy, obviously—and make sure that we direct flows to parts of the airport that can support passengers without overcrowding.

Automating operations > A lot of operations will be robotized and automated in the future. The concept of an autonomous airport that runs like a machine is something that we're moving toward. There are thousands and thousands of sensors and cameras in our buildings. That culminates in massive data pools that we're analyzing and using to steer the airport. We already have autonomous wheelchairs for passengers with reduced mobility, who can sit in the wheelchair and be autonomously driven through the airport.

'An autonomous airport that runs like a machine is something we're moving toward.'



Michael Swiatek

CHIEF STRATEGY
OFFICER AND CHIEF
ACCESSIBILITY
OFFICER, ABRA
GROUP



Air travel is particularly daunting for passengers with disabilities. Abra's chief strategy officer and chief accessibility officer, Michael Swiatek, a longtime aviation executive who is legally blind, outlines the societal, operational, and economic considerations involved with improving air travel for all.

Addressing air travel obstacles >

We looked at the touchpoints in a typical customer journey across four major categories of disability: auditory, cognitive, mobility, and visual. We found about 90 pain points—things as simple as getting off a plane and finding a restroom or other services if you are a blind/low-vision passenger, and as complicated as trying to fit a wheelchair on board a plane.

Wheelchairs probably pose the biggest challenge for the industry.

Wheelchair users can't take their own wheelchairs on board an aircraft, and the process for loading wheelchairs into the cargo hold of an aircraft varies depending on who made the chair, the manufacturer of the aircraft, the size of the cargo door, the size of the cargo hold, the training of the ramp agents, and so forth. Someone has to be thinking about how to load multiple wheelchairs on a plane so that the process doesn't create flight delays, damage to the plane, or damage to the chairs.

Upgrading hardware > We need to manage what I call the "hardware" of accessibility. A good example is an accessible lavatory, which airlines can buy as a unit from a supplier and install on their planes. The lavatory has expandable walls, which allow enough space for a wheelchair to be able to turn 360 degrees. This would allow wheelchair users to get in and out by themselves.

I recently noticed that the flush button on the plane I was on was outlined in LED lighting, and I was amazed because finding the flush button on most airplanes is very difficult for blind/low-vision people. Using LED lighting in this way, or using braille on seat numbers, is a great help. One more example of what I mean by hardware: Airports could offer autistic passengers a dedicated sensory room that would help them feel comfortable traveling, so the two hours spent in a terminal wouldn't be as stressful.

Measuring success > We want to reduce the number of complaints. We want to reduce the number of broken wheelchairs. One KPI we're developing involves circumstances in which stairs are used instead of a jet bridge to get passengers on and off the plane—that is, we want to ensure that the flights with more passengers with disabilities are the ones that get assigned to the jet bridges.

'We found about 90 pain points—things as simple as getting off a plane and finding a restroom.'

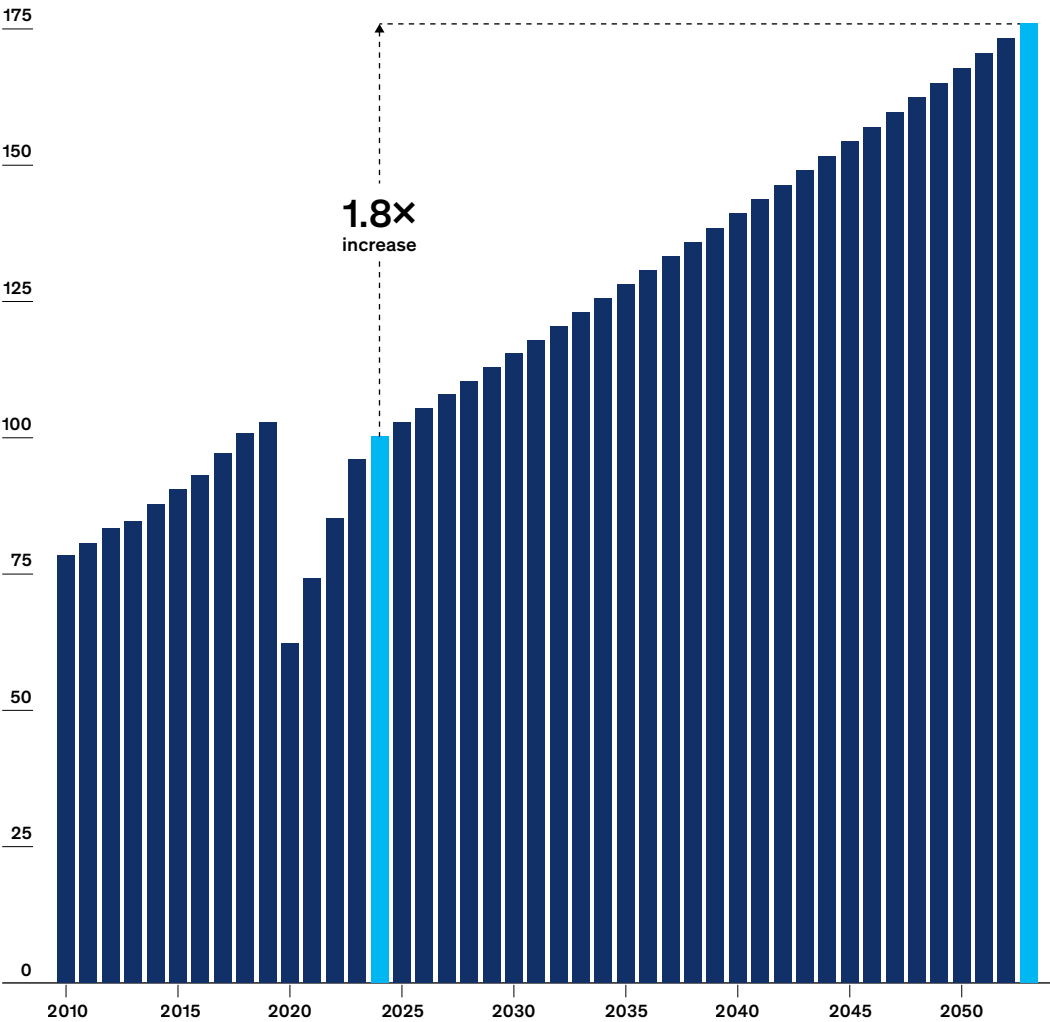


3 – CHARTING THE FUTURE

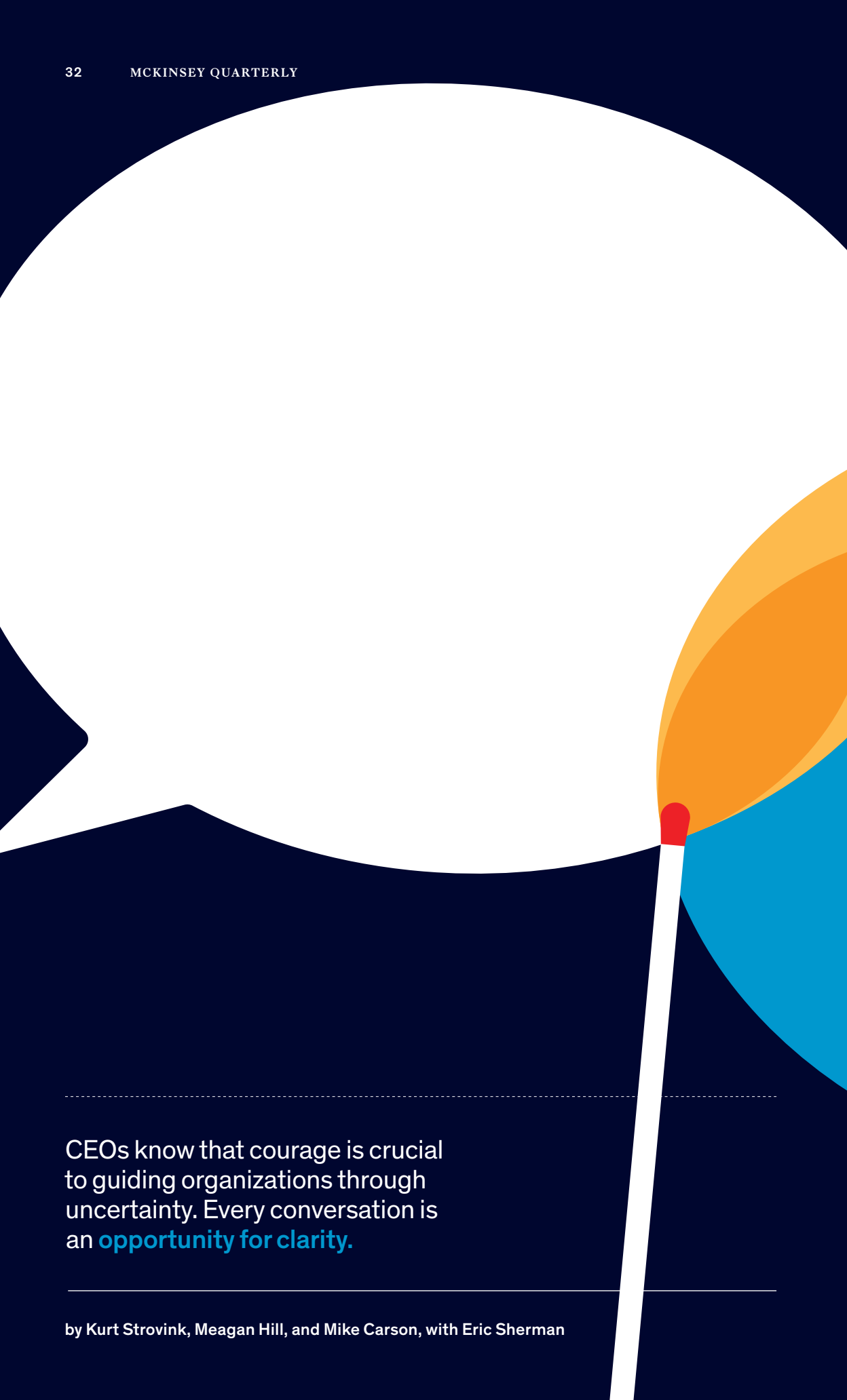
➔ After a dramatic dip during the pandemic, global aircraft traffic has steadily recovered. By 2053, annual aircraft movements (meaning takeoffs plus landings) are expected to reach nearly 176 million—about 1.8 times more than in 2024. That means busier airports are on the way. Today’s airport executives are planning for a future in which more planes will need to fit on runways and at gates, and more passengers—including many first-time air travelers—will need to pass through security, bag check, and boarding processes. [Q](#)

Global air traffic is projected to rise steadily for the next few decades.

Global annual aircraft movements, *million*



Source: Airports Council International



CEOs know that courage is crucial to guiding organizations through uncertainty. Every conversation is an **opportunity for clarity.**

by Kurt Strovink, Meagan Hill, and Mike Carson, with Eric Sherman

Courageous Conversations

HOW TO LEAD WITH HEART



ILLUSTRATIONS BY NOMA BAR

LEADERSHIP, AT ITS BEST, IS a matter of the heart. Courage, which underpins every act of leadership, is also a matter of the heart; it comes from the French word *cœur*—heart. As Winston Churchill observed, “Courage is rightly esteemed the first of human qualities, because . . . it is the quality which guarantees all others.” The point is simple: Courage is both moral and practical. It is not sentiment or bravado. It is the willingness to face what is real, invite challenge, and repair trust. The story of every great leader—from business to the arts, from education to government to sport—is written in these moments of choice: Do I accept the comfortable, or do I ask for and embrace the truth? Do I protect myself, or do I serve the enterprise?

sustained excellence. Good leaders have the courage to make difficult conversations easy.

Courageous conversations come in many forms, but four patterns recur in nearly every organization. Across the leadership cycle described in our recent book, *A CEO for All Seasons*, each phase of a leader’s tenure—spring, summer, fall, and winter—calls for its own expression of courage. In spring, as leaders step into new roles, they need transparency about what they don’t yet know. In summer, as they steer the company to new heights, courage means setting standards clearly and offering honest feedback while building trust. In fall, when there’s an imperative to set the organization on a new S-curve, courage lies in staying ahead—naming complacency, challenging entrenched thinking, and continuing to grow. In winter, courage becomes generosity—handing over power with grace and speaking truth to legacy. Courage, then, is not confined to crisis

Courage, then, is not confined to crisis moments; it is a daily practice.

Today’s world makes those choices more urgent. Employees are exhausted, trust in institutions is fragile, and volatility has become the norm. Among senior leaders, 53 percent report feeling burned out, and 84 percent feel underprepared for future disruptions. Meanwhile, 75 percent of employees say their boss is the most stressful part of their workday, and only 25 percent believe their leadership culture inspires them. In such an environment, courageous conversations are not a “nice to have”; they are the backbone of effective leadership. They are the way CEOs embed boldness into strategy, energize their organizations, and navigate uncertainty with both head and heart.

When courageous conversations are avoided, situations fester, misunderstandings deepen, and relationships fray. Left unattended, issues grow out of hand, and everyone suffers. Courage prevents that drift. It keeps relationships healthy and resilient, ensuring colleagues are capable of

moments; it is a daily practice, one that nurtures a leader’s inner conviction and shapes their outward posture. It is the very thread that enables integrity through every season of leadership, guiding leaders as conditions shift and stakes evolve.

In this story, we define four cases that demand courageous conversations: legitimizing professional dissent, clearing “withholds” with transparency, bringing performance truths to every interaction, and shaping a performance culture with honest feedback. These cases arise repeatedly, in patterns that test and strengthen a leader’s capability. Each demands a different kind of bravery: the courage to speak up, to be clear, to stay open, and to repair. Together, they form a practical playbook for leadership under pressure. Becoming adept at all four is one of the most reliable ways to deepen your leadership. The more you practice them, the more fluent you become in leading with both head and heart. We call them the four cases for courage.



→ PROFESSIONAL DISSENT: LEGITIMIZING THE MINORITY VIEW

Teams with high psychological safety are two to three times more likely to generate breakthrough ideas—yet dissent is often quietly suppressed through hierarchy, fear of reprisal, or simple inertia. Professional dissent is the courage to voice a contrarian view, even at personal risk. Yet fewer employees feel safe challenging a superior's view, and most leaders themselves admit to avoiding upward challenges. This silence damages performance. Research shows that transformations are 5.3 times more likely to succeed when leaders role model behavioral change, and cultures that encourage dissent consistently outperform those that don't. So professional dissent is not simply a behavioral norm; it is one of the most important forms of a courageous conversation in leadership. The CEO sets the tone for whether such conversations are welcomed, ignored, or quietly discouraged.

Examples abound. In sport, a Premier League manager told us his most important conversations were not with star players but with assistant coaches willing to challenge his tactics midseason. "That saved our campaign," he said. The CEO of a global manufacturing firm begins each executive meeting with the question: "What are we not seeing? What are we not saying?" Over time, this shifted the culture from guarded compliance to open contribution. During the pandemic, governments that encouraged scientific debate generally adapted faster than those that demanded consensus. In the arts, a young violinist questioned a conductor's interpretation; the conductor listened, adjusted, and the whole performance lifted.

For CEOs, the task is to legitimize dissent so it becomes routine rather than risky—shifting challenge from an exception to an expected part of how the team thinks and decides. Structured mechanisms can help embed this. Premortems, in which teams imagine a decision has failed and explore why, can create psychological safety, expose blind spots, and strengthen foresight. When CEOs consistently invite challenge—and respond with curiosity rather than defensiveness—they

transform dissent from a dicey act into a natural, courageous conversation that strengthens decision-making.

Designating one member of a meeting as a "chief challenger," responsible for testing assumptions, helps build the craft of dissent. And defining challenge capability as an executive skill both elevates and democratizes truth seeking. When constructive dissent is recognized and rewarded, it stops being a personality trait and becomes a discipline.

Leaders sometimes worry that encouraging dissent will slow decision-making or fragment execution. In practice, the opposite is often true. As Cyrus the Great observed, "Diversity in counsel, unity in command." The executive craft lies in drawing out diverse perspectives, testing assumptions rigorously, and then forging unified momentum from that input. Superior reasoning and open discussion sharpen the decision; decisive leadership then turns that clarity into action. The best CEOs keep their teams on the right side of the talk-to-do ratio: robust debate followed by disciplined execution.

Many CEOs apply a practical discipline when disagreements arise between senior executives. Rather than immediately rendering judgment, they give both leaders the opportunity and the obligation to resolve the issue together. The CEO makes it clear that if an agreement cannot be reached, they will decide—but deliberately holds back from doing so at first. This approach, which we have seen work well in several organizations, develops leadership maturity while reinforcing accountability for enterprise outcomes.

Leaders use other techniques to cultivate this capability. For example, some rotate a "learning observer" in meetings—a person tasked with noticing how dissent, challenge, and decision-making unfold and offering a brief reflection at the end. Others periodically convene short feedback sessions among executives, asking colleagues to share one observation about what is strengthening the team's decision quality and one suggestion for improvement. Practices such as these shift dissent from a moment of friction to a source of collective learning.



An online
version of this
article is
available on

[McKinsey.com](https://www.mckinsey.com)

McKinsey groups these practices under the principle of obligation to dissent, which frames challenge not as defiance but as duty.

How to Put Professional Dissent into Practice

- **Frame dissent as duty.** Help teams see challenge as service to the enterprise, not confrontation. Reframing it this way lowers emotional barriers and raises the collective standard of truth seeking.
- **Build dissent loops.** Set aside deliberate moments in meetings to invite missing or opposing perspectives. These structured pauses signal safety and turn disagreement into a productive muscle.
- **Protect the challenger.** Respond with curiosity rather than defensiveness. A leader's tone in these moments sets the cultural norm more

form of courageous conversation that protects trust and allows teams to move forward without hidden friction.

This pattern appears everywhere. A European CEO asked his team members to exchange one way they appreciated one another and one tension that wounded the relationship. At first awkward, the exercise soon built cohesion: "We're finally rowing in the same direction," says the CEO. In government, teams that surface tensions privately maintain focus; those that don't often spiral downward into leaks and infighting. In sport, unresolved resentments spill onto the pitch, while teams that clear issues early play with unity and flow.

For CEOs, the real courage lies in creating forums where withholds can be surfaced and resolved without blame, keeping relationships

A leader's tone sets the cultural norm. Publicly thanking challengers reinforces the sense that courage is valued.

than any slide deck. Publicly thanking challengers reinforces the sense that courage is valued.

- **Close the loop.** Follow through visibly—show what changed or explain why it didn't. When people see their input shaping outcomes, dissent becomes energizing.
- **Measure breadth.** Track where dissent comes from across levels and functions. Healthy dissent is system-wide, not limited to the confident few.

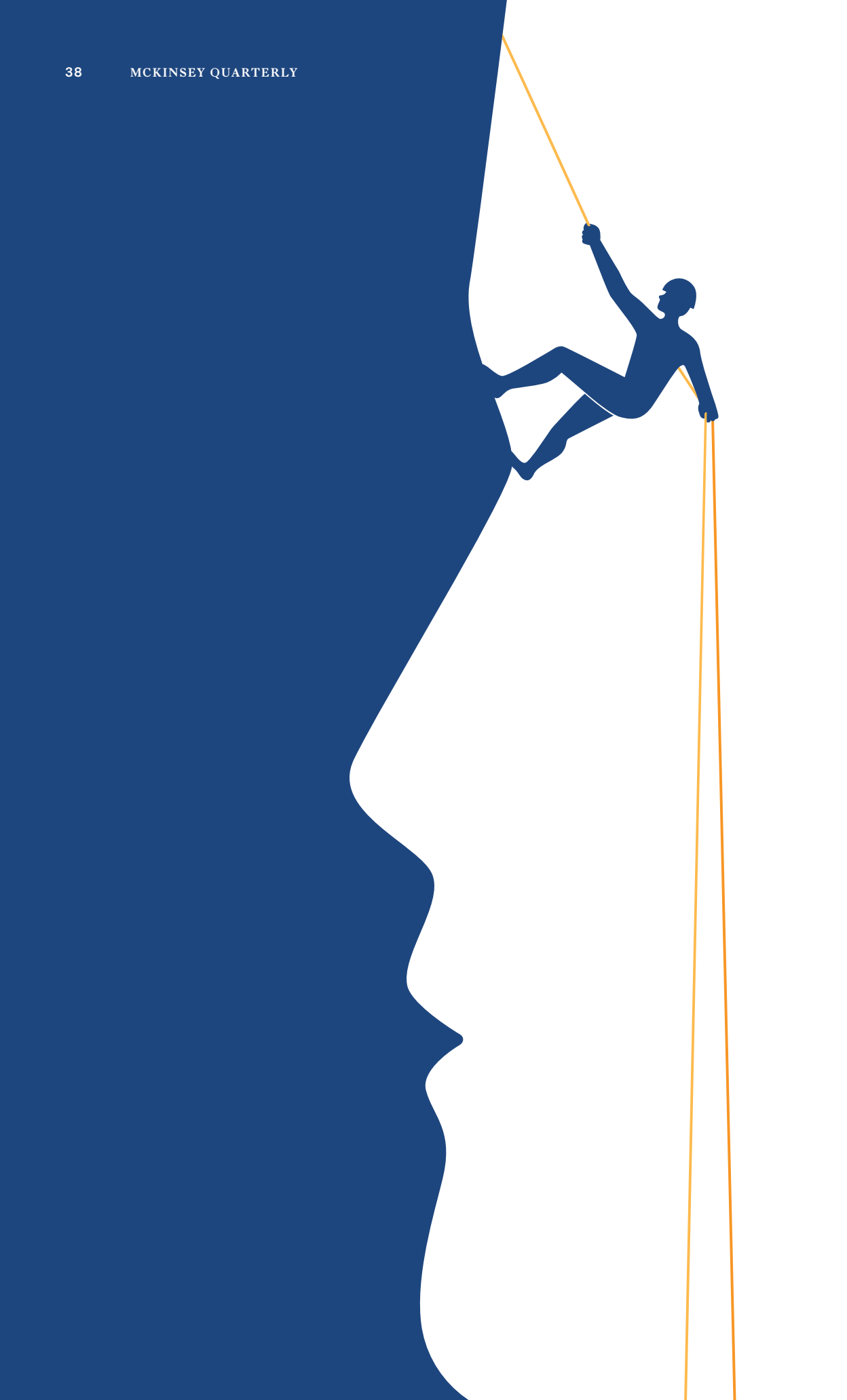
→ TRANSPARENT INTERACTION: RESOLVING WITHHOLDS

Withholds are unaired truths—resentments, disappointments, broken agreements, even withheld appreciation—that corrode trust. Left unresolved, they slow execution and fracture teams. Research shows that unresolved tensions can reduce collaborative performance by 30 percent, while teams with high relational trust outperform peers by 50 percent over time. Clearing withholds is a

intact even as difficult truths emerge. It demands the humility to admit when trust has frayed and the resolve to repair it. As Robert Frost wrote: "Something we were withholding made us weak / Until we found out that it was ourselves." When CEOs model these repairs themselves—naming tensions early and resolving them constructively—they signal that courageous conversations are not exceptional events but a normal discipline of leadership.

Healthy organizations deliver healthy results. Companies with strong cultural health achieve 2.5 times higher ROIC compared with their less healthy peers and are 2.4 times less likely to face financial distress. Teams that routinely clear tensions and exchange appreciation are not only happier—they recover faster and perform more strongly under pressure.

A healthcare leader in Egypt made this habitual. After a leadership workshop, he noticed some



tension between colleagues. When he sensed friction, he simply said: “You two need to have a real talk.” The pair would step aside for a brief, courageous conversation—often three minutes to surface and settle the issue, followed by 57 minutes of better collaboration.

Three minutes to clear the air; the next 57 to shape the future.

How to Put Transparent Interaction into Practice:

- **Run quarterly trust resets.** Create regular spaces where teams exchange both appreciation and tensions. When this becomes routine, honesty stops feeling risky and starts feeling normal.
- **Pair appreciation with critique.** Match every challenge with a positive reflection. Balance builds emotional safety and prevents difficult exchanges from becoming personal.

making trade-offs, calling priorities, running meetings, giving direction, and holding the line on standards. At every moment, leaders can risk slipping into judging people rather than diagnosing the work. Leaders crave clarity but fear demoralizing people; employees crave direction but fear judgment. This tension fuels what we call the performance courage gap: a gap not in capability, but in candor. Closing this gap requires courageous conversations about performance—conversations that clarify expectations while preserving dignity.

The most effective leaders resolve this tension by separating the “hardware” of performance (facts, KPIs, operating rhythms, decision rights, timelines, resource constraints) from the “software” (tone, timing, intention, relational context, humanity). This technique applies not just in

A simple truth emerges: Clarity is a kindness, and ambiguity is a burden.

- **Assign owners and dates for repair.** Ensure every tension has a clear follow-up and visible accountability. Making repairs actionable—not abstract—builds trust.
- **Make appreciation routine.** Don’t wait for milestones; frequent, specific appreciation strengthens relationships and creates the safety needed for hard truths later.
- **Track ‘time to repair.’** Fast closure of tensions is a strong indicator of cultural health and leadership maturity.

 **PERFORMANCE TRUTHS: SEPARATING
HARDWARE FROM SOFTWARE**

Companies with strong performance practices are over four times more likely to outperform peers—yet fewer than one in three employees believe reviews help them improve. A culture built around performance truths creates opportunities that are far greater than simply improving formal performance reviews. Every leadership interaction is a performance conversation: setting strategy, allocating capital,

formal reviews but in the daily act of running the business. When leaders clarify the hardware—“The decision criteria are X,” “The standard is Y,” “The timeline is Z”—the work becomes legible. When they adjust the software—“Here’s why this matters,” “Let’s slow down for a second,” “I want to help you succeed”—employees are receptive rather than wary. Separating performance into hardware and software allows leaders to deliver truth without wounding identity. In many ways, clarity itself becomes a form of care.

This approach applies widely. In high-performing organizations, the hardware and software lens shapes how CEOs run operating reviews, prioritize initiatives, and reset expectations. In education, great teachers distinguish between achievement and potential—a failed problem signals a need for a new approach, not a lack of capability. In the arts, conductors demand precision while fiercely protecting musicians’ dignity. In elite sport, coaches critique mechanics rather than identity—“Shift your line,” not “You’re not good enough.”

Across domains, a simple truth emerges: Clarity is a kindness, and ambiguity is a burden. In this sense, courageous conversations are also acts of teaching. When leaders clarify expectations, explain reasoning, and coach improvement, they demonstrate not only what success looks like but also how to pursue it. Over time, these moments accumulate into organizational learning—leaders learning about their people, and people learning what the enterprise truly values. When leaders apply hardware and software consciously to decisions, expectations, coaching, operating rhythms, and performance conversations, they build cultures where people know what great looks like, where they stand, and what is required. Performance truths, expressed with steadiness and respect, create the foundation for growth and close the performance courage gap.



HONEST FEEDBACK: GROWTH AT THE POINT OF WORK

Honest feedback is one of the greatest gifts a leader can give—yet many still shy away from it. Employees who receive regular, specific feedback are far more engaged than those who don't. The problem is not that people dislike feedback; it's that they dislike vague, delayed, or judgmental feedback. At its core, feedback is a courageous conversation that signals both respect for the individual and commitment to their growth.

The best leaders treat feedback as a dialogue, not a download. Done well, it becomes a moment of recognition—the kind of exchange where the recipient feels, “She sees me” or “He understands what I’m capable of.” Insightful feedback helps people feel known. It signals that the leader not only understands their current performance but

Courageous conversations with employees should translate into newfound energy and commitment.

How to Put Performance Truths into Practice:

- **Reframe reviews as alignment, not judgment.** Make the conversation about shared goals and next steps.
- **Separate hardware (facts, KPIs, commitments) from software (tone, timing, effort).** Keep the facts distinct from interpretation and emotion.
- **Critique actions, not character.** Focus on what can change. For example, telling a manager, “You’re just not a leader,” closes growth down. Saying “In that meeting, you didn’t bring the team with you—what could you try differently?” opens a path for improvement.
- **Maintain frequent check-ins.** Continuous coaching outperforms episodic critique.
- **Track whether employees leave performance interactions clearer and more motivated.** Courageous conversations with employees should translate into newfound energy and commitment.

also perceives their potential. In this sense, the best leaders give not only feedback but also “feed-forward”—focusing on who someone can become, not just what they did.

Examples across domains show the power of specificity. In the arts, a theater director offers a precise adjustment—“Pause half a beat before that line”—and the entire performance lifts. In business, an energy sector CEO sends short, personal voice notes to her top 50 leaders, acknowledging concrete contributions and inviting feedback on herself. Engagement rises sharply. In elite sport, coaches give real-time corrections—“Plant your foot earlier,” “Check your shoulder before receiving the ball”—accelerating learning in the moment. In the military, leaders conduct immediate “hot washes” after missions, rapidly reviewing what worked, what didn’t, and what must change—a disciplined feedback ritual that strengthens readiness and cohesion.

The best CEOs know that feedback sets the organization's culture. How they give it—and how they receive it—determines how the organization learns. When leaders welcome feedback on their own performance and close the loop by acting on it, they embed humility and truth seeking at the center of the culture.

Many leaders still believe feedback must be uncomfortable or confrontational. Great athletes, musicians, military units, and CEOs all share a simple truth: improvement requires input. The key is rhythm and proportion—feedback given too constantly becomes noise; feedback given regularly, specifically, and with care becomes fuel.

How to Put Honest Feedback into Practice:

- **Lead with gratitude before critique** so the recipient stays open rather than defensive.
- **Deliver feedback close to the moment**, when context is fresh and the insight is most actionable.
- **Make your developmental intention explicit:** “I’m sharing this because I want you to succeed.”
- **Ask for one piece of actionable feedback yourself**, and close the loop by acting on it.
- **Celebrate leaders who model great feedback**, reinforcing the behaviors you want to spread.

For CEOs, courageous conversations are not side work; they *are* the work. When leaders surface truths, set standards with dignity, teach what matters through their words and actions, give and receive feedback, and clear the air quickly, strategy becomes real, collaboration accelerates, and performance improves. Over time, these conversations do more than solve problems—they teach the organization how to think, decide, and grow.

We leave you with one final thought. Give yourself a weekly invitation: to ask for one dissenting view, to request one piece of feedback, or to clear one lingering repair. Courage, like most leadership qualities, grows stronger with practice. Model these moves consistently—for yourself and your organization—and courage becomes a system capability, shifting culture from declared to lived. [Q](#)

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Whatever metaphor you choose, being a CEO takes courage.

A CEO for All Seasons: Mastering the Cycles of Leadership, by McKinsey Senior Partners Carolyn Dewar, Scott Keller, Vik Malhotra, and Kurt Strovink, is an essential guide to a CEO's tenure. It features some of the world's most iconic leaders, including Dell Technologies' Michael Dell, Blackstone's Stephen Schwarzman, and Nasdaq's Adena Friedman, as well as insights from more than 30 other top 200 CEOs. The book covers everything from preparing for the role to leading with impact to sustaining momentum to fortifying a legacy. Courage is needed at every stage, especially in an era of disruption. *A CEO for All Seasons* is a playbook for maintaining forward progress and avoiding common blind spots.

NAIL YOUR FIRSTS

A New CEO's Guidebook to Stakeholder Impact

New and incoming CEOs are often unprepared for the intensity of internal and external stakeholder engagement. Here's how the right mindset, communication skills, and actions can make all the difference.

by Blair Epstein, Carolyn Dewar, and Richard Steele, with Eric Sherman and Kate Freeland



Dear New CEO,

First, congratulations on your new role. This is a true unfreezing moment for you and the organization at large. It's a personal achievement and—when done the right way—a public good. But the path ahead is unlike what many CEOs have faced before, and it will demand new levels of adaptability, resilience, and communication. New and incoming CEOs like you are being asked to take on the job at an increasingly accelerated pace, partly because of new time pressures: CEO tenure is now at an all-time low of 6.8 years. And there's real value at stake: Research shows that poorly managed C-suite transitions in the S&P 1500 wipe out nearly \$1 trillion in market value annually.

As Allianz CEO Oliver Bäte has said, "Nothing prepares you for becoming the face of a company.

on research from our newly released book *A CEO for All Seasons*, which features insights from more than 80 interviews, and from our *New York Times* best-selling book *CEO Excellence*. We also held targeted conversations with more than 20 CEOs, heads of marketing and communications, leaders at public relations agencies, and CEO counselors and conducted proprietary research on CEO readiness across Fortune 100 companies.

Here, we share our EDGE approach to stakeholder communications: an *expanded* view of the CEO as a bridge to the external world, a *distinctive* narrative that sees the CEO as storyteller in chief, a *growth-oriented* mindset that empowers a team of ambassadors to cascade the company's vision, and an *engaged* posture to strengthen stakeholder connections.



EXPANDED: SHIFT FROM PRIVATE- TO PUBLIC-FACING PLATFORMS

Developing strong relationships with stakeholders will be critical to your agenda, and we hope you are off to a running start. Our research for *A CEO for All Seasons* showed that 30 percent of CEO respondents felt more successful in the role if they

You'll shift from a private leader within the four

Nothing." New and incoming CEOs tell us that one of their most common hurdles is engaging a whole new range of stakeholders, including investors, regulators, media, employees, board members, and broader communities. You'll be shifting (seemingly overnight) from a private leader within the four walls of a company to a much more public profile. This shift, compounded by social media and a proliferation of new technologies and channels, can make for a steep learning curve, particularly given that only 1 percent of Fortune 100 CEOs have a formal background in communications or public affairs, according to McKinsey analysis.

That's why we've put this article together for you. Think of it as a handbook to help you proactively and sustainably engage your stakeholders. We drew

strengthened relationships with external stakeholders in the two years before becoming CEO.

As you step into the role, critically assess how to best engage stakeholders. Use your transition to recalibrate existing relationships and forge new ones, creating a through line from strategy to engagement using proactive communication. This is your chance to demonstrate your priorities.

Being public facing also means investing more heavily in building a coalition around your vision and new ideas, taking the time to see where your stakeholders are relative to your strategy. For example, one new CEO brought rigor to her engagement approach by categorizing stakeholder groups into archetypes—resisters, champions, allies, and mavericks—that were each treated

differently and reassessed regularly. She asked two questions about each group: How would a given decision affect them, and how could she best work with them? Resisters were engaged early to surface concerns, champions to build momentum, allies to expand influence, and mavericks to challenge assumptions. This exercise, originally intended to be internally focused, also helped her identify external ambassadors. This disciplined approach became a playbook to coalesce and mobilize teams around a common vision.

As you step into the role, the following techniques can help you identify your priorities early on: Ensure a smooth transition, take listening tours, conduct “stakeholder teardowns,” and access and convene newly available networks.

Ensure a Smooth Transition

To determine where to start, study how the former CEO approached stakeholder engagement. This can be a source of inspiration—or a lesson in what not to do. If possible, use the transition period to gain warm introductions and jointly survey the landscape.

It’s important to remember that there are two

it harder to challenge the status quo. The best internal appointees honor the past while signaling that “what got us here won’t get us there.” Some incoming CEOs have even partnered with their predecessors to reinforce this pivot—for example, running joint sessions to field employee questions and acknowledge what will remain (such as culture and talent) and where new emphasis is needed (for example, R&D and technology). Adopt an outsider’s lens by listening to dissenting voices, studying admired peers to uncover blind spots, and mining exit interviews for insights that reveal how experiences and perceptions differ across the organization.

For outsider CEOs, be a student of the organization. Visit the organization’s archives early, and honor the organization by drawing out themes from its past and using the insights you’ve gleaned to help drive toward an even brighter future. Further, maintain objectivity. This is one of your greatest gifts as an outsider and will enable you to set the pace early, make bold moves, and create a sustained performance edge.

Finally, transition periods have a need for speed. Given the pace of business today, new CEOs do

walls of a company to a much more public profile.

transitions happening concurrently: As you’re stepping into your new role as CEO, your predecessor is stepping out. Pass the baton smoothly, moving together with grace and humility to protect the institution and propel it forward.

Your transition is also an opportunity to disarm critics and potentially reset relationships. Meet with stakeholders who wouldn’t expect to be met with (such as critical investors and journalists) on their own terms, not necessarily with the intent of winning them over. Instead, express genuine interest in their concerns, collect feedback, and begin building bridges.

For insider CEOs, it’s important to think like an outsider. Internal appointments bring deep knowledge and continuity, but they can also make

not have a “honeymoon period.” People in other roles may have six months or even a year to find their footing, but as CEO, you will be expected to be ready from day one.

Take a Listening Tour with Key Stakeholders

A listening tour is your chance to deeply understand what’s on the minds of your most important stakeholders. Take the time to engage them one-on-one to hear their perspectives and find out where *they* envision the company going. These conversations can help you identify strengths and risks in your vision, understand what’s working and what needs to be fixed, and become open and adaptive. During these forums, it’s OK to say, “I don’t know.” This doesn’t take away from your core objective; it

ultimately enhances your approach by demonstrating your honesty and openness.

Conducting a listening tour early is important, because people are more willing to share things at the start of your tenure than after you've become established in your role. Craft your questions thoughtfully and invite stakeholders to share constructive, collaborative feedback. Listening tours also provide opportunities to test and refine your personal narrative (which can be similar to a stump speech in politics), which we explore in more detail below.

A "listening tour" involves more than just listening—it's about learning and, perhaps most important, signaling intent. Every question a CEO asks (or chooses not to ask) communicates priorities.

One CEO who was determined to spark a culture of innovation and renewal opened every meeting with the prompt: "Tell me one thing you're experimenting with." Over time, employees began shifting their behavior to ensure they had better answers, creating momentum for experimentation across the organization. Another CEO, intent on strengthening customer centricity, routinely asked, "What's the last thing you heard from a customer that changed how you're doing something?" In both cases, the questions themselves became powerful catalysts for change.

Conduct a 'Stakeholder Teardown'

A stakeholder teardown is a structured assessment designed to provide an outsider's perspective on a company's strategy and performance. These teardowns are a critical exercise, especially if you are stepping into the role from a different organization.

To conduct a teardown, work with your communications, investor relations, and marketing teams to collect and analyze relevant data that can help you understand where the organization stands regarding stakeholder interests, influence, and expectations. You can use generative AI to enable and accelerate this process. Use both internal and external lenses to holistically diagnose and solve issues and benchmark your performance against peers.

Ultimately, the goal is to understand your stakeholders and their motivations and reasoning, ensuring that your vision resonates with their short- and long-term expectations. Once the teardown is complete, you and your leadership teams will clearly understand what winning looks like.



Access and Convene New Networks

The CEO role can be lonely. Time and again in our conversations with CEOs, we hear about the importance of establishing strong peer networks. As a new CEO, consider actively engaging with your peer CEOs. Peers who are grappling with similar issues—or former CEOs who navigated parallel journeys—can be a valuable source of guidance. In fact, some new CEOs even think of this group as part of their "personal board."

→ DISTINCTIVE: DEVELOP NARRATIVES THAT CONNECT WITH STAKEHOLDERS

With many new demands competing for your attention, focus on what *only you* can do. Start building a "trust bank" and connecting with stakeholders with an authentic, personalized narrative. Think of it as a political candidate's "stump speech" that engages stakeholders and rallies them around your vision and strategy.

Master the Four W's

An effective narrative helps you articulate your key messages with conviction and elegance, and



The best CEOs don't just tell stories; they teach others how to tell them, too.

it can be adapted and enriched over time. Craft your narrative using the “four W’s” (who, why, what, and when) to capture and hold the imagination of stakeholders:

- **Who you are.** Provide insight into your identity, personality, and values. As Doug Parker, former CEO and chair of American Airlines, shares with us, “You need to figure out what you believe are the right things to do and show people that you are in charge. They want someone to follow, and they want to know who you are.”
- **Why you are here.** Reflect on your purpose, core mission, and beliefs. This is an opportunity to connect your personal mission to the organization, creating a clear link for stakeholders.
- **What you will achieve.** Lay out your agenda to convey a sense of ownership and accountability. You can do this by both showing and telling your plans. For example, David Ellison of Paramount wrote in his 2025 CEO letter that “sports serve as a powerful engine for deep audience engagement.” Less than a week after taking over, he secured a seven-year media rights agreement with the UFC for a record \$7.7 billion.
- **When you will execute plans.** Share what you plan to do right now for stakeholders and plant the seeds for future actions. For example, one financial-services CEO unveiled a new employee experience program by illustrating how it fit in with a broader redesign of the entire employee journey.

Build Storytelling Muscle

Storytelling may come more naturally to some than to others, but it is also a muscle that can be strengthened over time through repetition and refinement. Judy Marks, CEO of elevator and escalator manufacturer Otis, says she was neither comfortable in the public spotlight nor trained for it, but she actively cultivated this skill over time to become the company's "chief storyteller." Now, she says it's a central part of her job: "I can't tell the story enough."

A few best practices can fortify your storytelling abilities. We find that the best leaders do the following:

- **Balance the paradoxes of the role.** As CEO, you must constantly balance paradoxes such as delivering short-term results while investing for the long term, respecting the past while

everything from R&D to marketing campaigns—but remember that it takes work to achieve this level of profound simplicity. Take inspiration from Nike's mission to "bring inspiration and innovation to every athlete" or DBS Bank's goal to "make banking joyful."

- **Repeat and reinforce the message.** In the words of Procter & Gamble's former CEO A. G. Lafley, you'll need to endure "excruciating repetition" to spread your message. Our research shows growth leaders are 80 percent more likely to repeat their story internally and externally than their peers.
- **Put the story to the test.** Proactively bring in objective external voices to play "challenger" roles. One CEO brings in investigative journalists and reporters to critically dissect, break down, and ultimately rebuild her narrative

Your narrative must evolve continuously, shaped by stakeholder interactions and strategic priorities.

disrupting the future, and more. Recognize and embrace this dynamic, and understand that your narrative shouldn't be a fixed script. It must evolve continuously, shaped by stakeholder interactions, strategic priorities, and learnings.

- **Make the message stick with proprietary language and themes.** Figurative language can bring unlikely images together and unfreeze the mind to think about new possibilities. To that end, some CEOs embrace the power of analogies and metaphors. Stay curious and look for patterns using your unique perspective. For example, Microsoft CEO Satya Nadella coined the concept of a "learn it all," rather than a "know it all," to inspire a growth mindset and help make the message stick.
- **Focus on profound simplicity.** Less is more when it comes to powerful messages. Strive to make your statement in six words or fewer. Seemingly simple messages can provide clear purpose and strategic direction, affecting

ahead of crucial engagements with media, analysts, and customers.

- **Make your platform proprietary and fit for purpose.** You are leading a multigenerational workforce. The message and the method of distribution go hand in hand. We find that CEOs are increasingly investing in and building campaigns around their narratives, weaving together social media, public speaking, and media engagements programmatically to best serve the organization and its stakeholders.

When done successfully, this orchestration is both CEO-led and stakeholder-backed, creating points of intersection to meet audiences on their terms and in ways that facilitate two-way dialogue.

➔ GROWTH ORIENTED: EMPOWER MULTIPLE VOICES TO CARRY MESSAGING

In the previous section, we looked at what *only you* can do in the context of stakeholder communication and engagement, but you shouldn't act alone.

Set the tone early with your team regarding how you want them to engage stakeholders.

Take a balcony view to connect the dots between your leadership bench and the full spectrum of internal and external stakeholders you want to engage. We find the best CEOs take a systematic approach, enrolling (and reenrolling) the top team, scaling the reach of their message through ambassadors, and serving as both teachers and students of the craft of storytelling.

Enroll (and Reenroll) Your Top Team

The best CEOs can gain leverage through their top teams to activate stakeholder communications with greater speed, reach, and potential impact.

Proactively create space to bring communication and engagement to the forefront of your top team's mind. For example, at a two-day strategy off-site, a new CEO hosted a session entirely dedicated to narrative development. As a group, the top team refined their collective organizational narrative, resetting their vision and strategy for the future. Each team member then developed a personal narrative. They presented these narratives to one another, provided feedback, and ultimately built shared understanding and teamwide unity. Following the session, the top team kept communications and stakeholder engagement on the recurring agenda.

Another CEO added rigor to their approach by developing an executive dashboard that tracks both quantitative and qualitative KPIs to measure each leader's internal and external stakeholder engagement, such as share of voice, customer or employee feedback, town halls hosted, customer sessions attended, and participation on panels. These exercises demonstrate how leading CEOs treat the "soft stuff"—areas such as culture, talent, and communications—with the same level of rigor as the "hard stuff."

Reach Further into the Organization and Identify 'Ambassadors'

Deepen your bench of storytellers even further by identifying "ambassadors" who can authentically project and cascade key messages throughout your organization. Ambassadors can be found at all levels of the company but are typically rising or next-generation leaders embedded

at the second or third level of the organization who share three characteristics. First, they are unifiers who can bring together disparate viewpoints and mobilize a team around a shared vision. Second, they have a deep following across the organization among both people who report to them and those who don't. And third, they're the people who leaders call on to help solve the toughest issues.

Actively Teach and Continually Learn the Craft of Storytelling

The best CEOs don't just tell stories; they teach others how to tell them, too. They recognize the importance of proprietary language and themes in building shared understanding and conviction. These soft skills are critical differentiators in today's AI-powered world. As Matthew Prince, CEO of Cloudflare, puts it: "I have a BA in English literature, a minor in computer science, a JD, and an MBA. As CEO of Cloudflare, a fairly technical company, the most important has always been that English literature degree. To be able to write and communicate effectively, easily, and quickly is the job." Chief human resources officers also cite soft skills as the most important area for future leaders to develop.

By role modeling and actively teaching the craft of communication and stakeholder engagement, CEOs can unlock latent potential in their teams and build sustained capacity. This method enables CEOs to deepen their bench and accelerate the growth of next-generation leaders. Over time, this creates a virtuous cycle of individual and institutional development, creating a "leadership factory" filled with outstanding individuals who continually renew the institution and sustain impact across cycles.

One CEO recognized that he needed to give his team exposure to stakeholders they wouldn't otherwise meet, so he brought a designated "copilot" to the sessions he led. For example, his CFO would join him for relevant media interviews, and his chief administrative officer (often a functional role) would join him for customer sessions. Soon, this practice cascaded down and across the organization as the CEO's direct reports began bringing copilots (often previously identified ambassadors) to sessions they were leading. It allowed them to apprentice future leaders in



An online version,
with examples,
exercises,
and a checklist,
is available on

[McKinsey.com](https://www.mckinsey.com)

real time, broaden their worldview to see “the whole chessboard,” and improve cross-team collaboration.

Similarly, when Peter Orszag became CEO of Lazard, he launched a “salon” series, inviting critical stakeholders to the office or his home to discuss current events. He encouraged his leadership team to adopt this initiative, even converting a conference room into a fine-dining space for hosting leaders.



ENGAGED: ACTIVATE CAMPAIGNS WITH CONSISTENT, SUSTAINABLE RHYTHMS

Being a modern leader is an endurance sport. Too many of the best managers set out with the best intentions but end up suffering from burnout—more than 50 percent, in fact. Don't fall into this trap.

Ruthlessly prioritize who you could—and should— spend time with.

Think and perform like an elite athlete in your stakeholder engagements, maintaining a laser focus on how you manage your time and energy.

The following practices can help you engage your stakeholders: Manage your energy, not your calendar; invest in crisis readiness and response; and embed stakeholder engagement into your daily operating model.

Manage Your Energy, Not Your Calendar

As CEO, you are the primary ambassador of the organization, so it's essential to optimize your time—going beyond calendar maintenance and thinking more strategically about holistic energy expenditure.

The key is to establish a proactive, not reactive, mindset to ruthlessly prioritize who you could—and should—spend time with.

Constantly ask yourself, “Is this something I should lead myself, or would it be better to lead this through others?” In other words, are you better off as the protagonist or the architect of a particular engagement? This will help you delegate more effectively and triage incoming requests, while

also sending the signal that you're actively engaged.

At the same time, don't let the pendulum swing too far internally or externally. For example, research shows that in the first three months of a CEO transition, internal emails and meetings drop by about 20 percent, leading to organizational confusion and communication slowdown. Such communication typically rebounds around the six-month mark, but you can avoid this pitfall altogether by thoughtfully balancing internal and external stakeholders with proactive planning and sustained connection points with you and your top team.

Invest in Crisis Readiness and Response

Crisis readiness is inextricably linked with credible stakeholder engagement. During crises, leaders need to speak with clarity and conviction. Use time early in your tenure to rewrite your organization's crisis response playbook in partnership with your board, top team, communications team, and HR team, among others. Incorporate tabletop exercises into your leadership team's agenda to ensure that when disruption strikes, you're





prepared to mobilize and act with speed. The reality is that not all crises are created equal. Discern which issues are truly important to act on, and stay focused on the issues that are embedded in the organization's DNA. Let your performance do the talking as you stay focused on playing "big ball" (spending your time on the large issues that require your attention) with a dedicated team on the ground to manage issues smoothly and efficiently. Taken together, these approaches will ensure that today's small hiccup doesn't turn into tomorrow's front-page headline.

Embed Stakeholder Engagement into Your Daily Operating Model

On average, CEOs spend 30 percent of their time with external stakeholders, but every leader is different. For example, Gail Kelly of Australian bank Westpac was "rigorous and relentless" about fitting as many stakeholders as possible into her quarterly visits to different regions. By contrast, Richard Davis of American financial-services firm US Bancorp waited until he had the "right team in place" to increase the time spent with external stakeholders.

Any stakeholder rhythm you establish at the beginning of your tenure can evolve to best meet the changing landscape. If you can deliver on your promises early, you'll also be able to build trust and optimize your time as your tenure progresses. As former Best Buy CEO Hubert Joly explains, "If you do what you say you'll do, [stakeholders will] want to see less of you. They'll want you to spend time working on the business and delivering on your commitments."

The best CEOs keep a "tight but loose" schedule, leaving room for flexibility. As Marilyn Hewson of Lockheed Martin tells us, "Every September we look a year ahead and lay out what we'll do and when: investor calls, customer visits, air shows, conferences. If something new arises, I either can't do it, or something else has to come off my plate. It's not so strict that things can't be adjusted, but you know where your priorities are for the year." Flexibility—or, as one leader puts it, "structured serendipity"—is critical to provide you with the space to spotlight and celebrate the good news happening across the organization and amplify those messages.

Stakeholder engagement goes beyond day-to-day interactions—it's about cultivating trust-based, intentional relationships and leading yourself *and* through others.

As CEO, you are the organization's ultimate integrator, uniquely positioned to step onto the balcony, see the full landscape, and unite disparate—and often competing—perspectives. Taking a systematic approach now can help you galvanize stakeholders around a common vision to accelerate the company's trajectory.

We're excited as you embark on this next chapter of leadership.

Best,

Your friends at McKinsey 

- » Blair Epstein is a partner in McKinsey's Bay Area office, where Carolyn Dewar is a senior partner; Richard Steele is a partner in the New York office, where Eric Sherman is a senior knowledge expert and of which Kate Freeland is an alumna.
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The New Workflow

PEOPLE, AGENTS, AND ROBOTS

To move beyond minimal gains from AI, some companies are transforming the way they get things done. Here are four examples.

↳ Fewer than 40 percent of companies have seen measurable gains from AI—in spite of the fact the 90 percent say they have invested in the technology. While AI-powered automation could unlock \$2.9 trillion of economic value in the United States by 2030, realizing these gains requires more than automating individual tasks. The gap may reflect the fact that many projects are still in pilot or trial phases or that organizations are applying AI only to discrete tasks. Instead, companies should consider redesigning entire workflows so that people, agents, and robots can work together effectively.

Workflows—multistep processes involving collaboration, information exchange, and decision-making—form the backbone of how organizations operate. Most were designed for a pre-AI world, so applying AI to individual tasks within these legacy processes is unlikely to deliver

the productivity gains now possible. Redesigning entire workflows, however, may unlock far more. In banking, for example, this would be the difference between offering employees access to a chatbot for ad hoc use and deploying custom agents alongside people in a reimagined process to approve, process, and manage loans more efficiently, with better customer service. Unlocking larger productivity gains from AI will require reimagining workflows along the lines of the latter, rather than taking a task-based approach.

We analyzed 190 business processes across the US economy to identify where the greatest opportunities may lie. About 60 percent of potential productivity gains are concentrated in workflows related to sector-specific domains—activities at the core of each industry. In manufacturing, these include supply chain management; in healthcare, clinical diagnosis and patient care; and in finance,

by Anu Madgavkar, Sven Smit, Alexis Krivkovich, and Michael Chui,
with María Jesús Ramírez and Diego Castresana

regulatory compliance and risk management. Additional gains come from cross-cutting functions such as IT, finance, and administrative services that support every sector. In finance and insurance, for example, there are seven key workflows within the IT function. Every sector–function combination has its own set of workflows, which represent the critical unit for realizing gains from human–AI collaboration.

We identified 80 implementation cases—from pharmaceuticals to banking and sales—and looked closely at several to glean insights from their approaches. Managers and specialists are increasingly acting as orchestrators and validators rather than executors, while domain experts such as data analysts, underwriters, and engineers partner with agents that perform initial analysis or generate draft outputs. As a result, the most valuable human skills are fast becoming AI fluency, adaptability, and critical evaluation of outputs, enabling people to focus on higher-level work.

In this story, we look at four examples of how early movers have experimented with AI-embedded workflow redesign. The four offer early evidence of how these transformations look in practice. A technology firm uses AI agents to prioritize sales leads and manage outreach, freeing specialists to spend more time negotiating and building relationships. A pharmaceutical company applies AI to draft clinical reports, reducing errors and accelerating regulatory submissions. In customer service, agents now resolve most routine inquiries, while a regional bank uses them to speed up software modernization.

These deployments illustrate how increasingly specialized agents could reshape entire networks of business processes. They also show that people remain at the center of work because AI still depends on human guidance, interpretation, and quality control.

SALES CASE

AI-powered agents enabled specialists to redirect time from routine tasks to selling activities

→ A global technology company sought to expand its reach and deepen customer relationships while navigating growing complexity and customer volume. In its traditional model, human sales teams used inconsistent prioritization methods and had limited capacity to tailor outreach to thousands of smaller accounts. As a result, only top prospects received customized attention.

To overcome these limits, the company introduced several AI agents to automate the early stages of the sales process (Exhibit 1). A *prioritization agent* scores and ranks accounts based on public and proprietary data. An *outreach agent* contacts customers, while a *customer response agent* manages follow-ups and categorizes leads as interested, not interested, or uncertain. A *scheduling agent* sets up calls and reminders for high-potential leads. When a case requires human judgment, a *handoff agent* transfers the file to a specialist.

This process expanded outreach and improved conversion rates, delivering a projected annual revenue increase of 7 to 12 percent from new sales, cross-selling, and increased retention. Across sales roles, time saved ranged from 30 to 50 percent. Business development specialists were able to spend more time on strategic engagement—drafting proposals, negotiating partnerships, and building relationships.

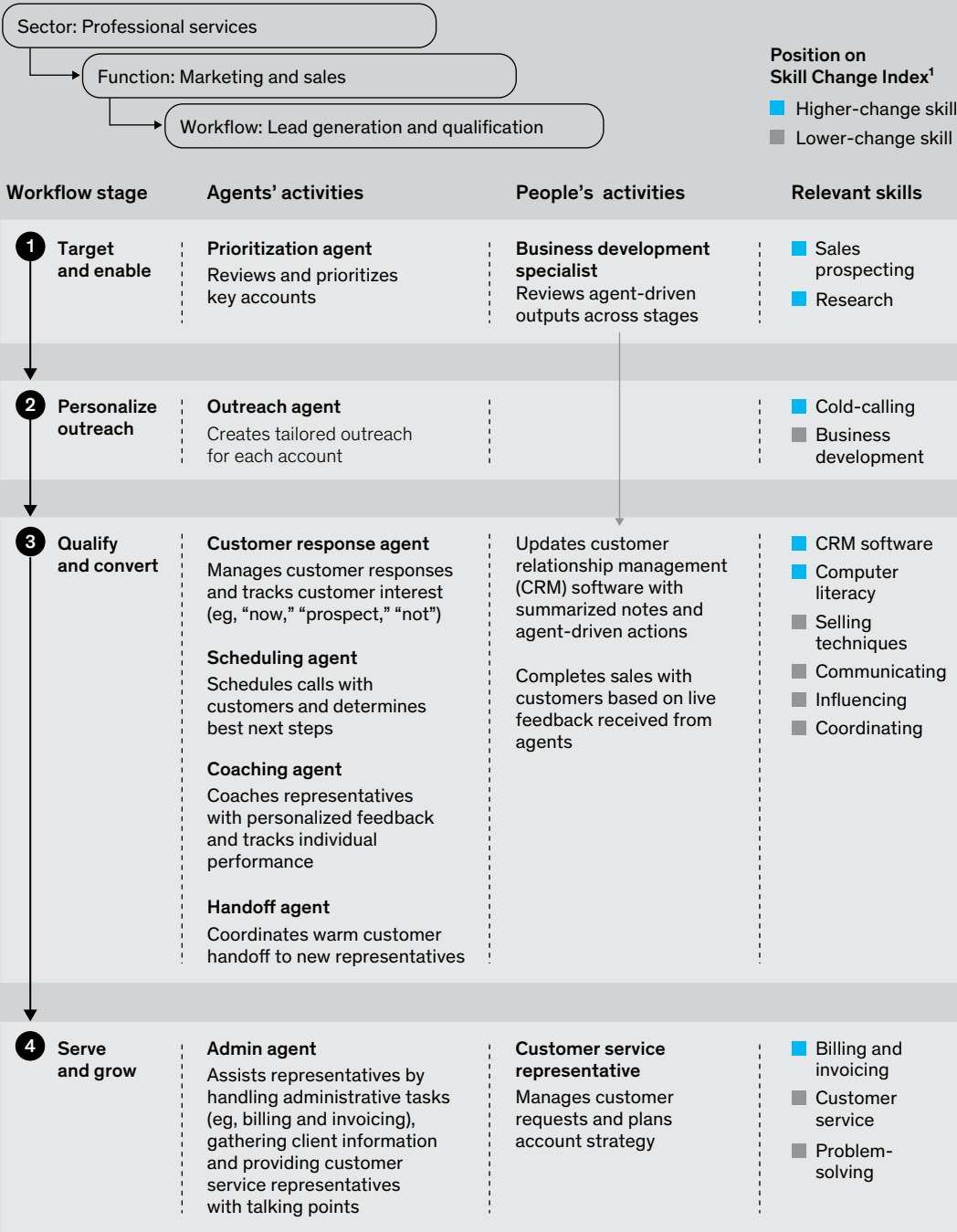
Looking forward, this model could be extended by introducing additional agents to support sales. A *coaching agent* could provide real-time feedback to sales teams, while an *admin agent* could act as an assistant, handling routine administrative tasks.

60% Estimated productivity gains concentrated in workflows related to sector-specific domains

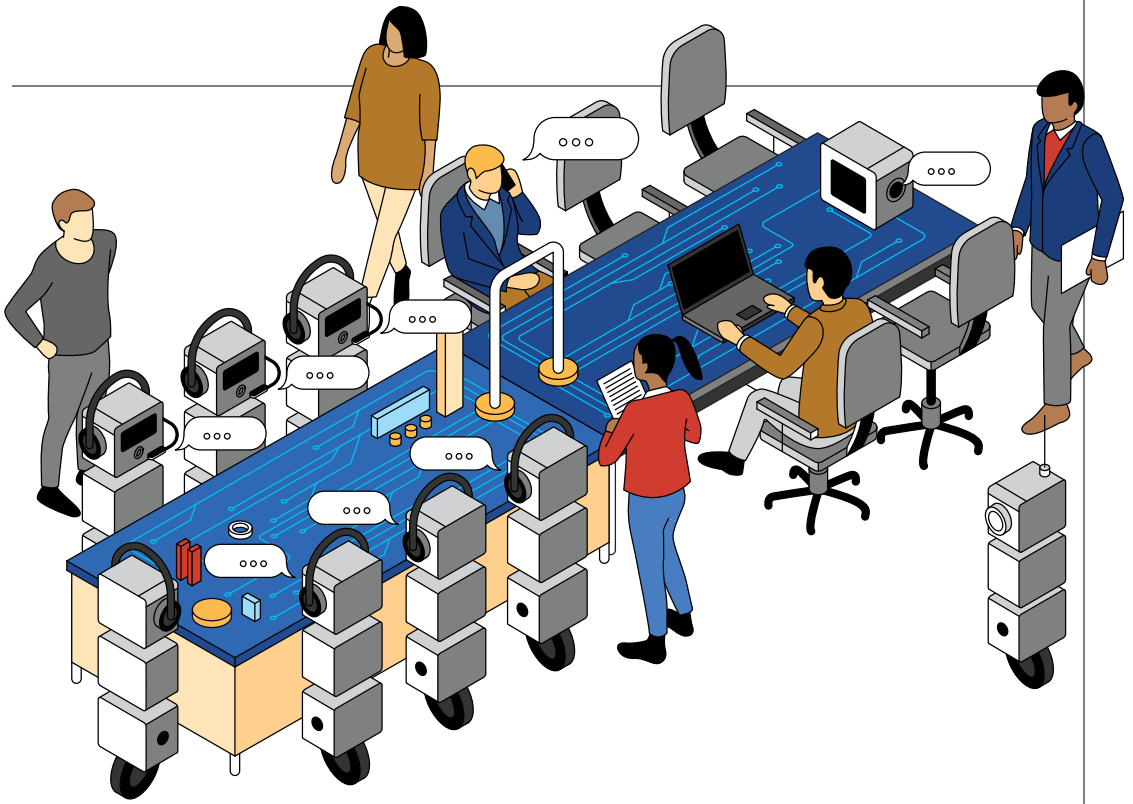
EXHIBIT 1

Redesigning commercial workflows with agents could help sellers reallocate time from routine tasks to selling activities.

Example: People-agent collaboration at a global B2B tech company



1. Based on the McKinsey Global Institute's (MGI's) Skill Change Index (SCI). Lower-change skills are in the 1st and 2nd quartiles of SCI, while higher-change skills are in the third and fourth quartiles. **Source:** McKinsey Global Institute analysis



CUSTOMER OPERATIONS CASE

AI agents improved customer experience and reduced cost per call

→ A large utility company handles more than seven million support calls each year, even with multiple self-service options available on its app and website. Its interactive voice response system had previously resolved only about 10 percent of inquiries, leaving the rest to human customer service representatives.

To improve efficiency and customer experience, the company deployed agentic conversational AI across its entire customer base (Exhibit 2). The system includes several agents: an *inbound-call agent* that authenticates customers, an *intent identification agent* that determines the purpose of the call, a *call-scheduling agent* that manages appointments, and a *self-service agent* that integrates with back-end systems. Together, these agents now handle roughly 40 percent of all calls, resolving more than 80 percent without human involvement. When escalation is needed, customers are transferred with verified account details and conversation history, ensuring a seamless handoff.

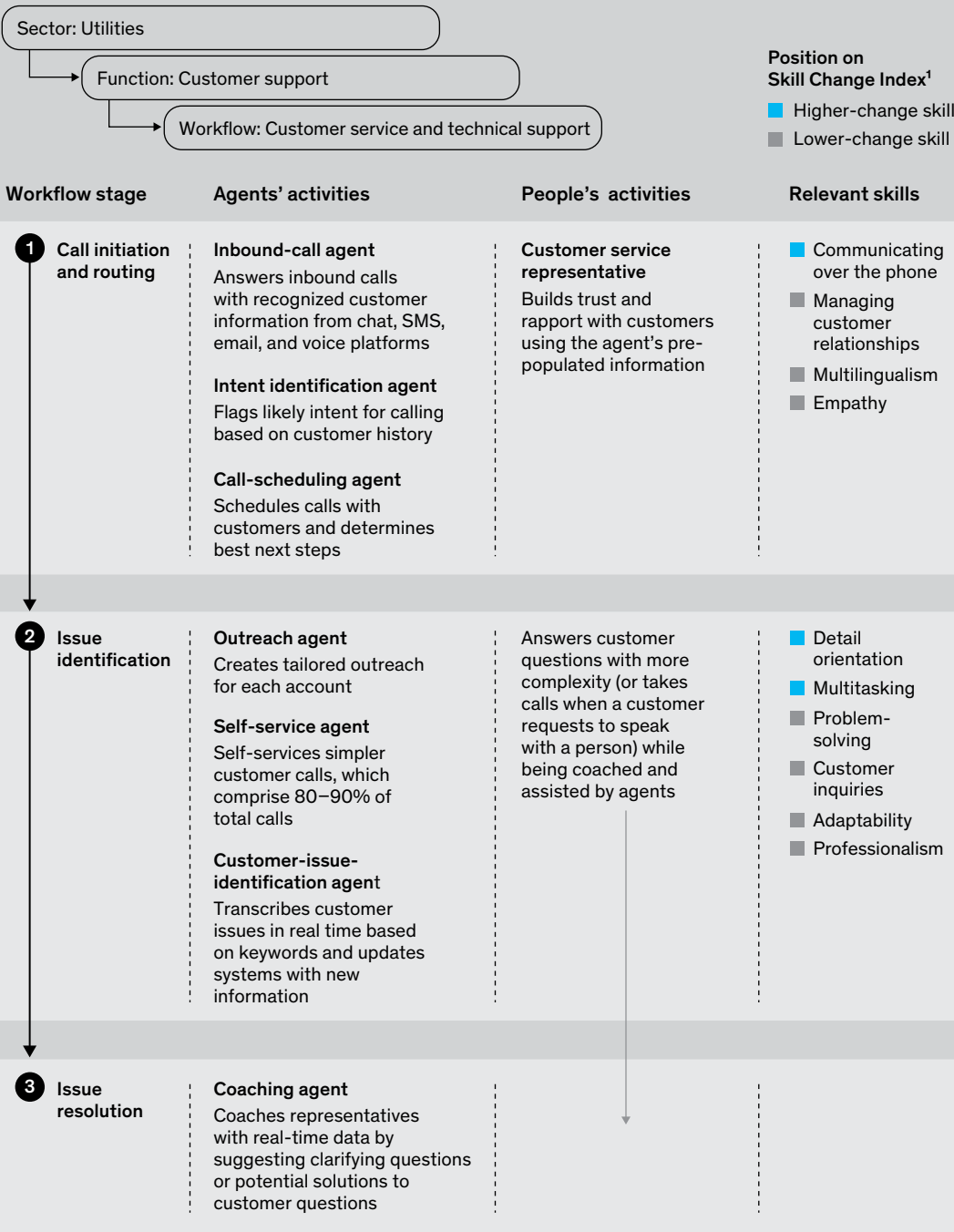
The new process has cut the average cost per call by about 50 percent and increased customer satisfaction scores by six percentage points, driven by shorter waiting times, more consistent handling, and faster resolution. Human representatives now manage more complex, emotionally sensitive, and higher-value issues, improving both the quality and the impact of service.

Future applications could go further. A *customer-issue-identification agent* could monitor systems to detect service interruptions and contact customers proactively, while a *coaching agent* could provide real-time guidance to human representatives during live calls. In such models, AI would handle most of the routine inquiries while people would concentrate on complex or relationship-based issues, supported by continuous insights and automated follow-up. Advanced AI agents could eventually handle 80 to 90 percent of customer inquiries, documenting each interaction and initiating follow-up to ensure continuity and consistency.

EXHIBIT 2

Reimagining service workflows with agents could improve customer experience in issue resolution.

Example: People-agent collaboration at a leading utilities firm



1. Based on the McKinsey Global Institute's (MGI's) Skill Change Index (SCI). Lower-change skills are in the first and second quartiles of SCI, while higher-change skills are in the third and fourth quartiles. Source: McKinsey Global Institute analysis



MEDICAL-WRITING CASE

Gen AI platform accelerated report drafting and improved accuracy

➔ A global biopharmaceutical company sought to improve its process for drafting clinical-study reports, which document safety and efficacy data for new drugs. In the traditional model, medical writers manually compiled study data, drafted lengthy reports, and coordinated multiple review cycles. Limited capacity and long turnaround times constrained the ability to meet growing submission demands.

To improve the speed and quality of clinical-study reports, the company developed an AI platform that reconfigures workflows for report writing (Exhibit 3). This AI companion synthesizes structured and unstructured study data, generates comprehensive drafts in minutes, applies company style and compliance templates, and self-reviews for errors. These tools shift the medical writers' role from manual drafting to collaborating with AI systems and applying clinical judgment. Writers can regenerate and edit sections of text, review potential issues, and validate data against source materials to ensure accuracy and regulatory compliance.

Early data indicate substantial efficiency gains. Touch time for

human-reviewed first drafts dropped by nearly 60 percent, and errors declined by roughly 50 percent. Go-to-market efforts accelerated by weeks when combined with other related processes and technology changes, and further improvements are expected as writers build AI skills and additional agents are introduced. The company reports that scaling these efforts can be challenging, and a combination of technology and people skills, including resilient data engineering, prompt-engineering upskilling, and bold organizational leadership, is key.

Looking ahead, life sciences companies could leverage agents to support key stages of clinical research, from planning studies through to submission. A *clinical-study planning agent* could help assemble trial protocols, a *data-mapping agent* could analyze and synthesize data, and a *report-drafting agent* could produce full drafts of reports on a study's findings. A *validation agent* could then check for compliance, and a *reviewing agent* could scan for errors. Finally, a *submission draft agent* could help generate regulator-ready documents. Applied across the research cycle, these tools could shorten timelines by several months.



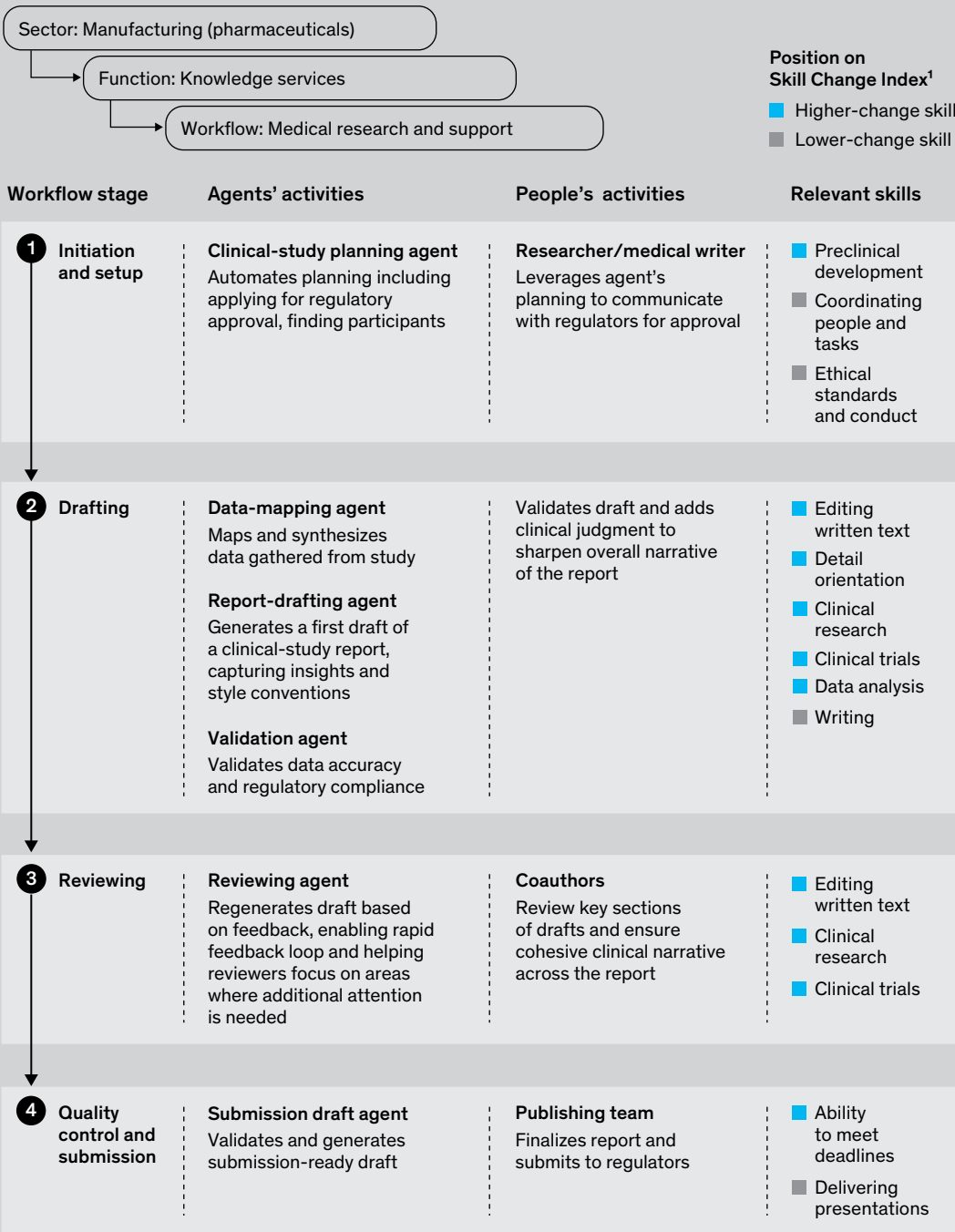
An expanded version of this article is available on

McKinsey.com

EXHIBIT 3

Streamlining workflows for clinical-study reports could enhance collaboration between people and agents.

Example: People-agent collaboration at a global pharmaceutical company

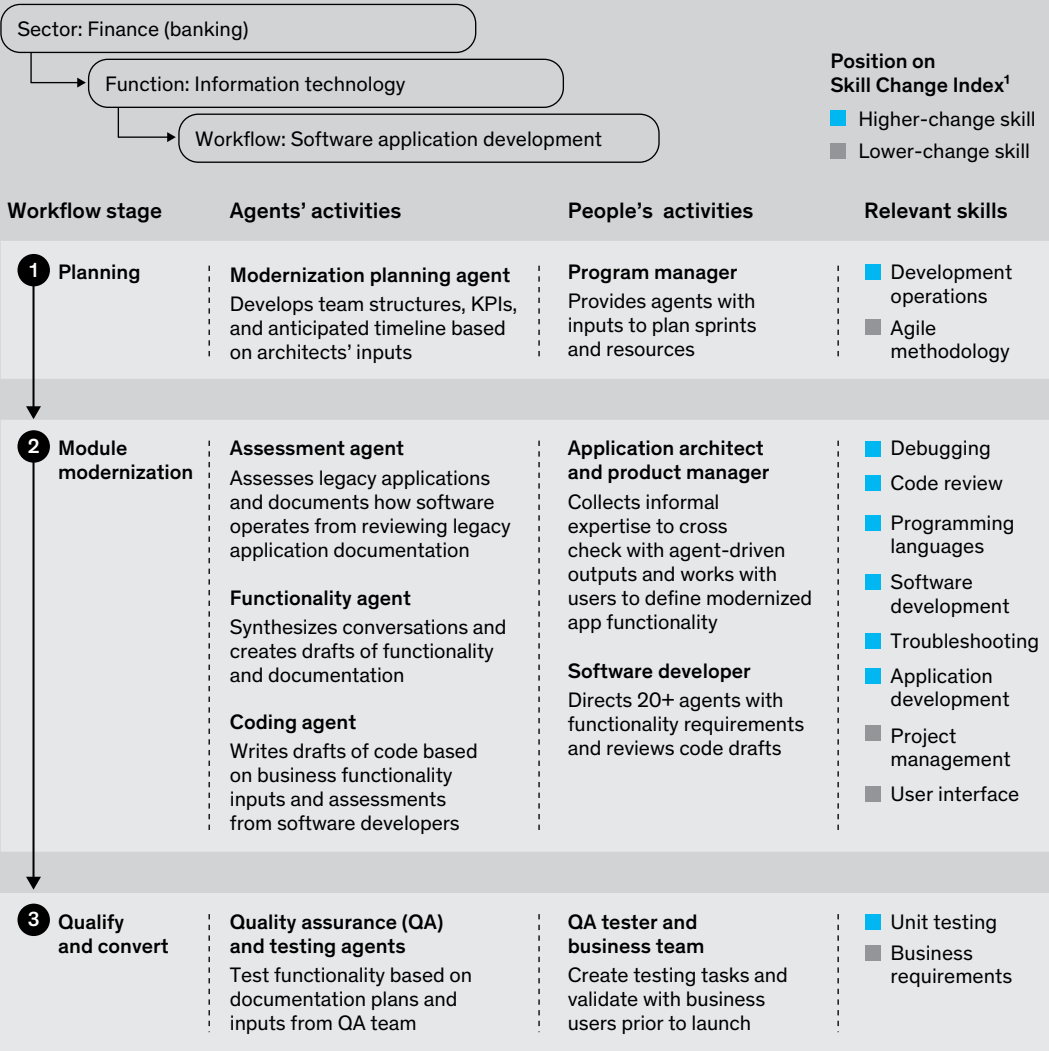


1. Based on the McKinsey Global Institute's (MGI's) Skill Change Index (SCI). Lower-change skills are in the first and second quartiles of SCI, while higher-change skills are in the third and fourth quartiles. Source: McKinsey Global Institute analysis

EXHIBIT 4

Automating IT modernization workflows could elevate related roles to focus more on orchestration.

Example: People–agent collaboration at a regional bank



1. Based on the McKinsey Global Institute's (MGI's) Skill Change Index (SCI). Lower-change skills are in the first and second quartiles of SCI, while higher-change skills are in the third and fourth quartiles. Source: McKinsey Global Institute analysis

As AI agents took on repetitive execution, human work shifted toward planning, orchestration, and testing.



IT MODERNIZATION CASE

AI agents streamlined code migration and shifted human roles to orchestration

➔ A regional lender used AI agents to modernize its banking application for small and medium-size enterprises. The aim was to update various programming languages to speed up internal development. The project would previously have required months of work, large budgets, and extensive engineering capacity for manual documentation, code refactoring, and testing of millions of lines of code.

To accelerate the process, the bank launched a pilot using AI agents for multiple modernization tasks (Exhibit 4). An *assessment agent* scans legacy code bases and identifies dependencies, while a *functionality agent* generates the target-state architecture. A *coding agent* migrates code to new frameworks and performs automated tests. Developers collaborated with 15 to 20 agents each, verifying and refining outputs to ensure architectural integrity, compliance, and functional accuracy. The modernization also shifted applications from desktop to mobile, on premises to cloud, and monolithic to microservice architectures.

As AI agents took on most of the repetitive execution, the focus of human work shifted toward planning, orchestration, and testing. Early results show up to 70 percent code accuracy.

Following the pilot module, the bank now plans to extend the use of agents to the entire modernization effort. It estimates that this could reduce required human hours by up to 50 percent. A *modernization planning agent* could coordinate the process, supported by *quality assurance agents* and *testing agents*. [Q](#)

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Citi moves \$2 quadrillion a year for 6,000 multinationals. No wonder its CEO has a provocative global perspective.

‘Having a
human bank
is very
important.’

A CONVERSATION WITH
CITI CEO JANE FRASER





A

FTER BECOMING

CEO in March 2021, Jane Fraser launched a multi-year strategy to transform, simplify, and modernize Citigroup for the digital age. That's an enormous challenge for a bank with a presence in 180 countries. The result is a trim company on a single platform that has left certain legacy businesses and entered new ones. In this conversation with McKinsey's Eric Kutcher, Fraser talks about the transformation, the role of AI and blockchain technologies, and the state of the global economy. What follows is an edited transcript of their conversation.

Eric Kutcher: As I often say, we live in interesting times. Given you are probably one of the most global CEOs in the world, and certainly in the banking industry, as you travel the world, what are the trends you're seeing?

Jane Fraser: Something that has really been reinforced for me this year is the mindset that different countries and companies have—and who's on the front foot and who's not. You could almost divide the world into the countries and companies that are building what they need with a view to the future, and those that are more focused on protecting what they already have. Broadly, I think of Europe as being in quite a "protect what we have" mindset, whereas the US, China, and the Middle East are very much in a "build what we need for the future" mindset.



Citi CEO Jane Fraser addresses a company town hall in Singapore.

Another difference I see is regarding whether growth is a team sport or a tug-of-war. If you go, say, to the Middle East—I find this exciting in Saudi Arabia or Abu Dhabi—there is this sense that the whole of the team is playing each of their individual sports, but they're driving the same agenda. Whereas in other countries, it's either a tug-of-war or the entire team is standing in front of the goal, playing defense.

And then you've got all these shifting geopolitics, which are changing flows of technology,

'You could almost divide the world into countries and companies building with a view to the future, and those focused on protecting what they have.'



finance, energy, and the like. Economics is favoring the scale players, so there is also this race for scale. It's a fascinating time, but at the end of the day, it's important to make sure you're relevant for what the world is going to be in a few years' time.

EK: You would also have one of the greatest views of how economies feel across the world. How do you see overall economic movement, and what keeps you up at night?

JF: The world has been remarkably resilient. Between COVID, conflicts, and then the policy changes, the speed of adaptation has been remarkable. A lot of large companies have been able to navigate this incredibly well without it being highly detrimental because they've got diversity. I think the ones who've paid a heavier price have been the smaller companies—the fourth-tier suppliers or smaller retailers—who don't have the diversity or adaptability.

One of the things we're keeping an eye on is the fiscal situation of many countries. You've got almost "emerging-market-like" risks being applied to developed markets. In an emerging market, there are

more constraints, whereas in a developed market, things can become systemic and problematic for everyone—quickly. Fiscal dominance and the intertwining of monetary and fiscal policy is one of the big long-term economic watch items. Affordability's another one you've got to keep an eye on. It's a lot more expensive today—for a lot more people—to have a good quality of life. That can come through in housing, dissatisfaction with standards of living, and ultimately in how people vote. I think affordability will bite different countries at different points.

Otherwise, in the shorter term, there's probably another shoe to drop in tariffs; the labor market has held up well, but it's showing some signs of softening; asset prices are high at the moment, and there's a lot of money flowing around in some concentrated opportunities. As a bank, one is always mindful of cyber and geopolitical threats disrupting the payments network, security network, infrastructure, or other elements. We've got a lot of heightened risks there. We can work our way through them, but they're certainly not fun when they happen. So overall, it's seat belts on for 2026.

EK: Can you give us a sense of the magnitude of change you've been driving at Citi in your time as CEO? What have you been doing—strategically, around where you compete, and operationally, around how you compete?

JF: We were all things to all people everywhere, and that's not a viable business model for where the modern world and economies are heading. We decided we would focus on where we felt we had a distinctive competitive advantage and eliminate where we didn't. We're a bank that does business in 180 countries, operating as a local bank in almost 100—and have done so for a century in many of these markets. That is our source of differentiation, and our people are unique in their global mindset. For me, the clarity was that we really had to drive toward modern excellence as the preeminent partner for clients who had cross-border needs—to tap into global investment markets, global capital markets, global supply chains, and so on—and that we would be the bank that provides the modern infrastructure to support those clients.

The heart of the strategy revolves around what we call our services business, which is really supporting the working capital of clients. We move \$2 quadrillion a year, with 6,000 multinationals around the world. We do that in a digitized, now

operate on global platforms. That enabled us to radically simplify the entire organization's structure. We took out four layers of the company. We took out the local complexity from how we manage businesses; because they're now run on global platforms, we don't need to do a country plan every single year for every geography. We standardized everything onto a single platform, with single processes everywhere around the world. Now we can run the bank almost on a grid, looking at the same data across and down the bank.

That's what we've spent the last five years doing, and now we've got a bank that is very much on the front foot and clear about the strategy and direction: We help clients operate globally, help them grow, help them with the financing, the structuring, and the other elements around it. Instead of being all things to all people, we're all things that are needed for a multinational company to grow and prosper, and we provide the same for the individuals behind those organizations.

EK: You mentioned blockchain. Can you give an example of where you're using this as part of the digitization strategy?

JF: When I think about the future of the payments network, I get very excited about tokenization.

'Now we've got a bank that is on the front

increasingly blockchain, multidimensional network. So that's quite a remarkable capability; it's the leading one in the world, and we're constantly innovating. Linked to this are our trading businesses, which support these clients. If you think of multinational companies, they have to hedge foreign exchange, interest rates, commodities; they need to do capital raising in different countries across all those dimensions, and that's the banking business. Then we help entrepreneurs—the world's progress makers and changemakers—we're the wealth manager of these entrepreneurs, business leaders, and owners.

It's a singular client base, and we sold all our local businesses and focused on those that could

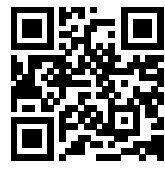
With coin, you have tax, you have accounting, you have AML [anti-money laundering], you have all these other complexities to deal with, let alone the on-off ramp, which is a 7 percent transaction cost. And with coin, it's very hard for a country to control its capital account because of FX [foreign exchange] controls.

I think tokenization of markets is the future. We've just linked our 24/7 clearing to our tokenized capabilities. So now we can move money from your bank account with us in New York to London, and then to your HSBC account in London or your Lloyds Bank account in London, all instantly. That's really the use case—multimarket, multicur-

rency, always on, instantaneous. You want it to be safe, and you don't want any complexity. This is where tokenization in the chain is very valuable, because we can do this within the existing banking system. So that's tokenization; it'll be coming to equity markets, it'll be coming to oil, it'll be coming to multiple different areas, and it's nice and secure.

EK: There seems to be a prevailing incongruence where many CEOs I speak to insist that the layoffs we are starting to see have nothing to do with AI, while others might suggest otherwise. What are you seeing, and what is your expectation of the way AI will change the labor market?

JF: What we've seen so far is the enormous build-out of AI infrastructure, and that has certainly been helping boost economic growth. But when we look at AI itself, it hasn't really come through yet. We're only in year three of this huge AI shift, so I don't think we should be falling off our chairs that the big productivity benefits haven't come through yet. What we're seeing with AI right now is more



An online
version of this
interview,
featuring audio
of the
conversation,
is available on

McKinsey.com

thinking about how to better automate the manual process. And that is starting to deliver some staggering productivity numbers, particularly with agentic AI. Our coders today are 9 percent more productive in their entirety—that's 30,000 coders—than they were at the beginning of the year. So I know the agentic piece, where you're getting agents to act and work together, will be a game changer for some business models. You can see this happening, and you can also see new jobs and the shifting of roles. But what will the timing of this be? Will they happen together? I think we're in for a bit of a bumpy ride on the productivity operational side.

The other element is the risks. We all talk about what AI means from the operational side, what it's doing for customer service or coding and so on. From a cyber perspective, as a bank, we have many billions of attacks on us a day—authentication, fraud, money laundering, cyber. It's a scary combo that keeps me awake at night. So while there are new elements and new threats, there are new jobs there too. It's going to be a very different world.

foot and clear about the strategy and direction.'

bottom up, task oriented. At Citi, we've given our employees a lot of different AI tools, and they're augmenting productivity. Our AI usage is high, at about 70 percent, but that's helping people do their jobs and removing some of the drudgery elements. The productivity benefits come from scaled use cases applied top down.

We're systematically going through all our major processes. I use a dishwasher analogy: How you wash a dish by hand and how a dishwasher washes a dish are completely different. How the two processes work has almost nothing to do with each other. We're looking at AI and applying it to our processes like a dishwasher, as opposed to only

EK: People talk about your willingness to bring in external talent, which, in my experience, is something few CEOs do, at least with great success. How do you think about doing that?

JF: We have fantastic talent inside the bank, and sometimes it's hard bringing external talent into your management team in a company that's as old as ours. But to my mind, it was an imperative, so we just went about finding the best talent. If you're trying to build something new, you can often get people who are the best in the world at something, because they're starting to get bored where they are—they want to build again and demonstrate that they can shape more than one legacy. We were able

to bring a couple of fantastic leaders from competitors that were much bigger and say, “OK, you are now going to build the leading franchise again, but you’re going to do it in a modern way, fitting with our assets, for the next generation.” It’s surprisingly easy to bring great teams and talent together when you’re building something. It’s sometimes harder to retain talent when you’re at the pinnacle; people don’t really want to just tweak things that are already optimized. People like growing and building things, so tap into that.

EK: You’re now well through this window of transformation, and you have a lot of opportunity ahead. How do you balance thinking about the short term with the long term? And as CEO, how do you manage all those different people coming at you from all sides?

JF: I have what I call my quarterly intent: What is it this quarter that I need to do? And how does this year fit into what’s coming up? I’m about to sit down with my board and lay out 2026. We want to deliver certain financial targets, so I call that a “waypoint” year, but it’s also the foundational year for the firm’s next chapter, and we’ll talk about the different foundations we want to lay down. As

long as you can keep that big picture view—with enough flexibility to pivot when the world turns out very differently from what you expected—you will still know your core intent for that year, and your core intent for that quarter. And you make sure you are achieving as much 80/20 on it as possible. I think then, when people understand that is the direction and they know what they’ve got to do, it’s easier to manage the stakeholders.

That was the biggest surprise I had as CEO—how much stakeholder management your job involves. There’s a real shock factor to just how many of them only you as CEO can deal with, at least until you’ve got the team established. It’s a lot of work. I think empathy is important. It’s by far the most effective way to win business with a client—it’s not about what you want to sell them; it’s about what they need and how you meet that need. Often, it’s not the way you are thinking about dealing with stakeholders, but when you do put yourself in their shoes, you’ll come at things very differently. My coach taught me, “You’ve got to deal with them with empathy. What is it they’re fearful of? What are they concerned about?” So I think empathy helps you understand how to get to a win-win, and it can save you quite a bit of agony.



A Citibank location in Clarendon, Virginia.



From left to right: Jane Fraser addresses an economic forum in Asia and performs community service with Citi colleagues in Dallas, Texas.

EK: If you could wind the clock back to when you took the role as CEO, what do you wish you had known then that you know now? What key thing would you call out to others as they head into roles like this?

JF: The job is extraordinary, but it's relentless. Everything is coming at you the entire time, and it just doesn't stop. So you do need to have incredible emotional resilience. You stick with the plan, and if you need to adapt the plan, you need to do so with real grit and determination. You can't let the media, the chitchat, the noise around you get in the way of getting your job done. One of my board members told me, "You need two things as a CEO: big ears and thick skin." And you have to really build those listening skills, because people will often tell you what they think you want to hear. So you need better sources of truth and other elements of input. You also need courage, physical strength, and good health because, again, it's always on. But I think that emotional resiliency was something I had really underestimated, and I don't think there's a good enough job done in helping leaders build that.

EK: How do you think about what kind of legacy you want to leave Citi?

JF: As we've gone through all this lift, I've always said I can't wait to run the bank that we're building. I would hope the legacy is having success with both the way the bank operates and the capabilities we've got, as well as in the talent pyramid and the culture. That is a human bank. I think the bank with a brain is table stakes, but having a human bank is very important. It's a great gift you have as a CEO—this ability to make people feel good and celebrate them when they've had success. The relationships, the human dimensions, are to be nurtured and invested in.

The other thing, obviously, is global dominance. [Q](#)

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» Comments and opinions expressed by interviewees are their own and do not represent or reflect the opinions, policies, or positions of McKinsey & Company or have its endorsement.

'The job is extraordinary, but it's relentless. Everything is coming at you the entire time, and it just doesn't stop.'

Strategy's Biggest Blind Spot

EROSION OF COMPETITIVE ADVANTAGE

by Andy West and Matt Banholzer, with Laura LaBerge

Misperceptions about the reach and durability of competitive advantage are hurting many companies' profits. Five rules can help organizations maximize their edge over peers.



D

DO YOU KNOW WHAT YOUR competitive advantage is? Are you sure?

Competitive advantage is the most critical yet misunderstood facet of strategy. It's more than a company's strengths—it's the reason customers choose its offerings over its peers' or why its products can command a price premium. Competitive advantage comprises unique, hard-to-replicate assets and operating models that enable a company to build sustained value and superior returns over time.

That foundation is shaky for many businesses today, our analysis shows. To identify shifts in competitive advantage, we looked for changes in market position using a metric we call the "shuffle rate"—an industry-level marker that measures the speed of change in the positions of market leaders and laggards. We found that the shuffle rate has accelerated for more than 60 percent of industries in the past decade, with an 11 percent increase in

shuffle rate could find opportunities to attract customers previously locked in by their competitors.

Yet despite the importance of acting on these shifts, recent research shows that most companies aren't monitoring how their industry positions and competitive advantages may be changing (Exhibit 2). Despite this, most respondents report being confident that they understand what drives customer and investor choice—a confidence that may be misplaced as change accelerates. The result is a troubling reality: While the majority of respondents recognize that their advantage is not durable, their organizations are not monitoring signals that would alert them to changes in the competitive landscape.

The dynamics eroding incumbents' competitive advantages in some industries illustrate why the shuffle rate is accelerating. For example, in entertainment, streaming services have matured, in-theater viewing has suffered a potentially permanent decline, and creator-driven content on video-streaming platforms is competing with traditional media companies. This realignment has been accompanied by significant M&A activity, including Netflix's intended \$83 billion acquisition of Warner Bros. Discovery and Paramount's merger with Skydance. The footwear industry has likewise seen substantial change. Challenger brands have rapidly gained market share from incumbents, and distribution has shifted from

Competitive advantage is the most critical yet misunderstood facet of strategy.

median rates (Exhibit 1). This pattern suggests that the defining elements of competitive advantage are in flux, the degree of differentiation between market players is narrowing (causing more frequent positional changes), or both.

The result is an increasing erosion of competitive advantage for some companies and a critical opportunity to capture greater market share for others. Businesses in a sector with a decelerating shuffle rate may find themselves stuck in lagging positions as the industry's top performers deepen competitive moats around their leadership. Conversely, those in an industry with an accelerating

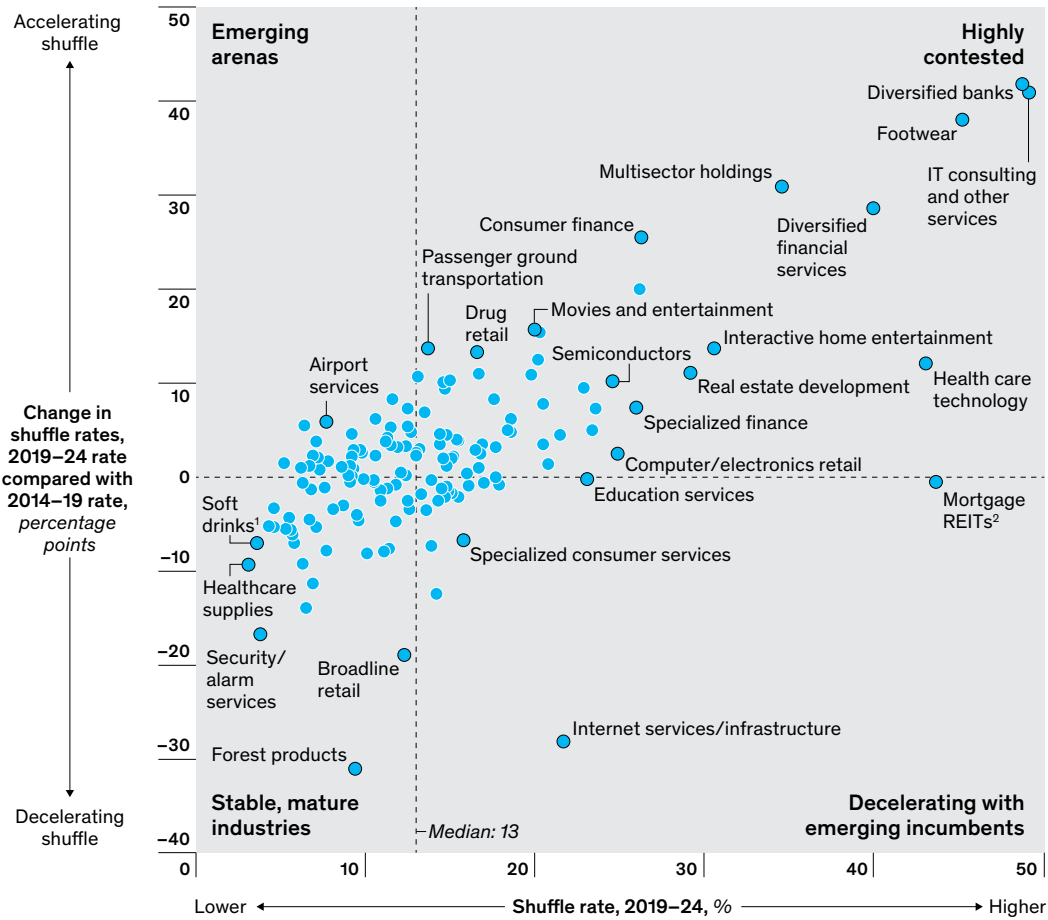
wholesale-dominated to direct-to-consumer models, requiring significant supply chain restructuring and changing the competitive advantages needed to win.

While understanding the stability of the organization's competitive advantage is critical, so is having a shared view of what that advantage is. When business leaders have different assumptions about their organizations' advantage, aligning on what to invest in and in which markets is challenging. And since competitive advantages are context specific, they can be hard to recognize and assess. An additional complication is that an organization's competitive advantage is dependent on the capabilities of its competitors, and

EXHIBIT 1

The ‘shuffle rate’ indicates how the stability of companies’ competitive advantage varies by industry.

5-year shuffle rate and its rate of change compared with prior 5-year period, by industry



1. And nonalcoholic beverages. 2. Real estate investment trusts.

those players constantly change—both in who they are and how they choose to compete.

Not surprisingly, organizations that track their competitive advantage in each of their markets and use it to guide their growth strategies and investment choices outperform their peers. In a McKinsey Global Survey, respondents from companies in the top quintile of annual growth and EBIT in their sectors were more than 2.5 times as likely as others to say that their organizations are fully aligned on what their competitive advantages are and are two-thirds more likely to be tracking that advantage at the market level.

→ FIVE RULES OF MAXIMIZING YOUR COMPETITIVE ADVANTAGE

With competitive advantage under pressure, business leaders need to actively protect their edge over peers. They can do so by following five rules:

- Develop a granular view of competitive advantage.
- Tailor the advantage to each market.
- Don't overinvest in areas that won't improve competitive position.
- Boost the return on competitive advantage by embedding it into strategic decision-making.
- Track metrics that can signal changes in the competitive landscape.

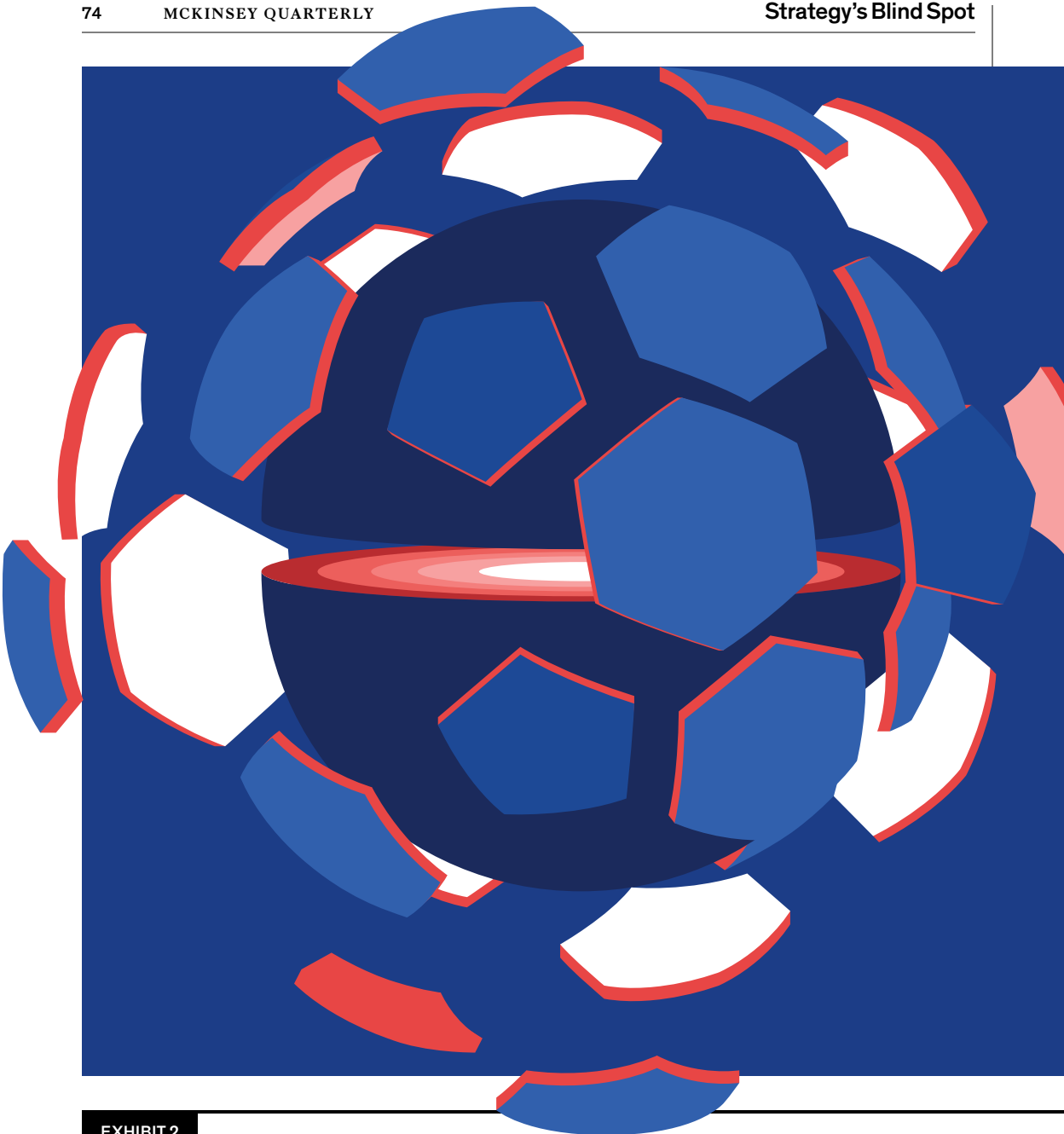


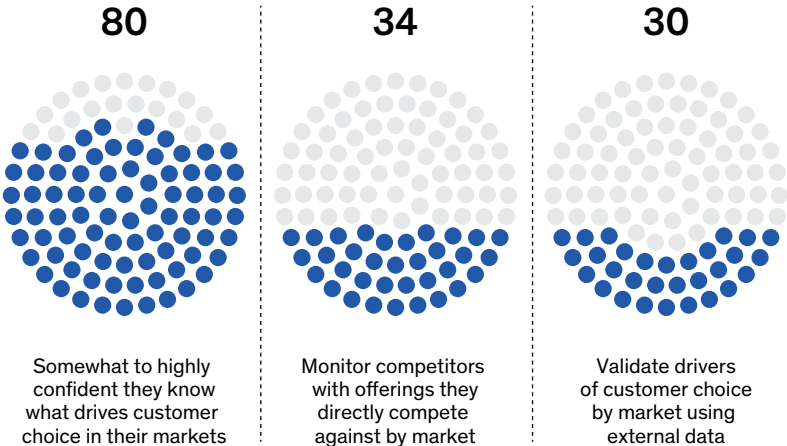
EXHIBIT 2

Companies are not closely tracking their competitive advantage despite evidence that it is eroding.

Share of respondents, %

Source: McKinsey Global Survey on innovation and competitive advantage, 1,257 participants, Oct 27–Nov 17, 2025

Knowledge of current competitive-advantage situation



1

Develop a Granular View of Your Competitive Advantage

→ Companies with numerous business lines and markets often struggle to pinpoint their competitive advantage because it may differ at the enterprise, product, and market levels. For example, financial resources, corporate brand, and some partnerships are enterprise-level advantages, while R&D and customer relationships can be specific to product categories or even individual markets.

When we analyzed the competitive advantages of the world's 5,000 largest companies by revenue, we found a wide variance in the unique attributes that constituted their advantages, even within the same industries. Those attributes ranged from broad elements, such as a strong global presence, to specific capabilities and assets, such as mineral rights in a particular country. We classified those attributes into seven categories: brand and external reputation, scale or financial strength, intellectual property or innovative offerings, go-to-market capabilities, partnerships or access to scarce resources, operational excellence, and talent or culture. Our analysis found that the source of advantage for most organizations is a complex and highly specific combination of several categories rather than a single element.

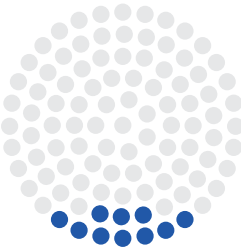
To effectively manage its sources of competitive

advantage, an organization needs a granular understanding of how the attributes comprising its competitive advantage combine to differentiate it in the market. Consider scale: In and of itself, it isn't always a competitive advantage, as the so-called conglomerate discount demonstrates. Yet scale of data and platform reach has enabled digital platforms such as Tencent to successfully enter multiple industries. Similarly, scale in R&D can be a competitive advantage if it fuels multiple business units, but usually not if the R&D expertise applies only to a single product category. Innovations in cancer treatments, for example, typically don't port to other pharmaceutical lines and thus don't give the overall organization a competitive advantage outside of oncology (a likely reason why many pharmaceutical companies are simplifying their portfolios).

Leading companies know which attributes affect customer choice, invest in strengthening them, embed them in their most important markets, and make them transferable so they can apply them at scale. These assets and capabilities can exist at many levels of the organization and are often combinations of attributes that are hard to replicate. Companies that operate across many markets may need to vary their competitive recipe across those markets.

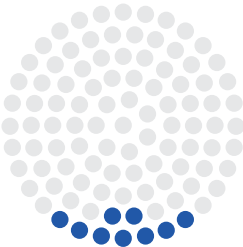
A lack of a granular view of competitive advantage often leads to disagreements among leadership teams and boards on how and where the company should compete. Creating that shared view provides a common fact base for the organization's decisions and helps it maximize returns on its investments.

10



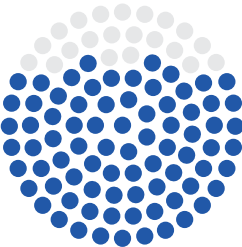
Track drivers of share gain and profitability at the market level

9



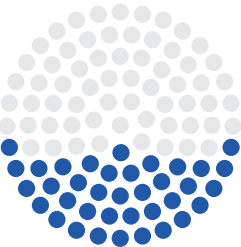
Have full alignment across the organization on what their competitive advantage is

79



Believe business model will require a moderate to complete overhaul over the next 5 years

37



Confident they can recognize new growth areas where they have a competitive advantage

Plans to address competitive advantage in the future

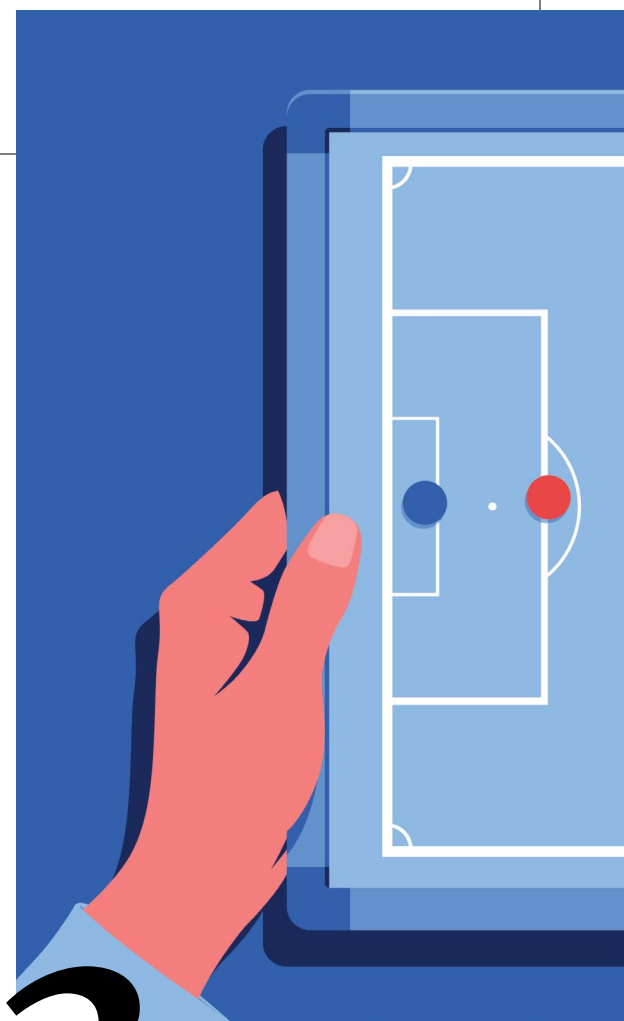
2

Tailor Your Competitive Advantage to Each Market

→ Once business leaders have a detailed understanding of their organization's advantage, they need to apply that understanding to how they position their offerings in each market. Competitive advantage occurs at the intersection of offering, geography, and customer—in other words, what you're selling, where you're selling, and to whom you're selling. As sector barriers erode, a company's biggest competitors may come from outside its industry. Those competitors, in turn, may set the bar that any attribute must meet to constitute a competitive advantage. In our survey, more than 40 percent of respondents cite disruptive trends and new entrants coming from outside their industries as the greatest threats to their competitive advantage. Such disruptions have a long history, from smartphones subsuming the traditional markets of camera and film manufacturers to software firms transforming the economics of industries as diverse as hospitality, transportation, and music.

Large companies that operate across numerous geographies face additional complications due to high variance in what matters for winning in a given market. Consider the evolution of quick-service meals. In Canada and the United States, food delivery apps changed the dynamics and shifted value pools in the fast-food and casual-dining industry; premade meals and meal kits have further eroded traditional players' market share. Yet these innovations haven't taken off in Latin America, China, and other markets.

As the variance in what determines customer choice increases, the attributes that create a competitive advantage also change. Consequently, business leaders need to be vigilant in ensuring that a competitive advantage their organization may have enjoyed for decades can be sustained as the market evolves. For example, the location of branches and ATMs used to be a significant competitive advantage for retail banks, often determining customers' choice of institution, but online banking has reduced the value of those physical assets.

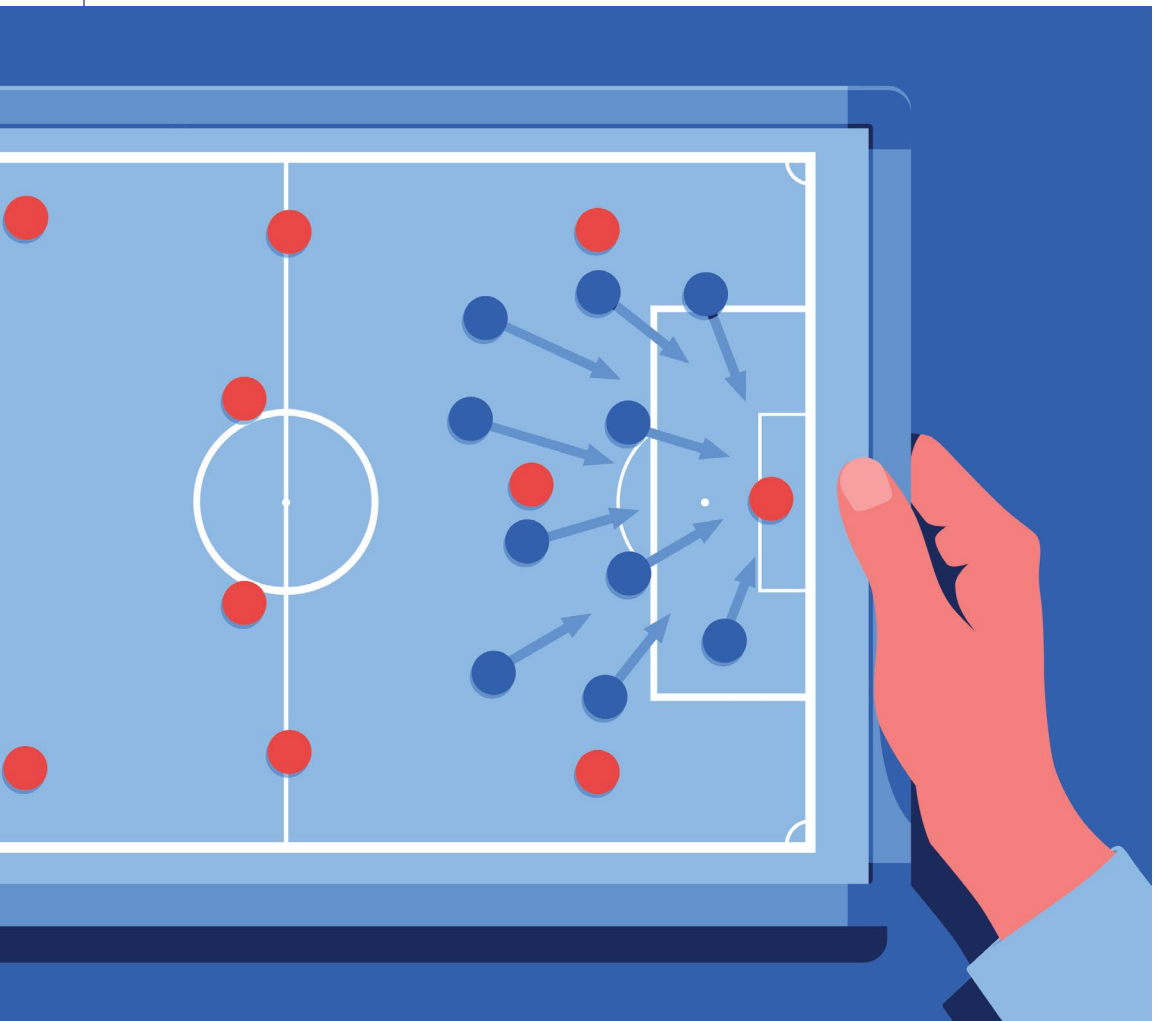


3

Don't Overinvest in What Doesn't Matter

→ In most scenarios, the ultimate authority on a company's competitive advantage is its customers (and people who *could* be its customers but instead buy from competitors). Yet organizations sometimes fall into the trap of believing that their capabilities or offerings are superior to their competitors' when customers don't see—or don't value—the difference. One home appliance manufacturer, for example, developed a product with sophisticated but complex features, only to discover that what customers valued most was ease of use as long as the product's features were "good enough." The lesson: Focus on the few factors that determine customers' choices (and on which investors place value) and don't overinvest in elements that won't differentiate offerings in customers' eyes.

A similar concept applies to addressing competition. Organizations sometimes focus too much

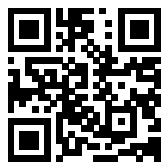


on replicating a competitor's source of advantage—efforts that rarely succeed. Instead, they should aim to be good enough in the competitor's capability while reinforcing their own sources of advantage. Why? Our research has yielded an important insight about the difference between winning and not losing. When we looked at the actions of pairs of competitors, we found a good-enough threshold—the market's expectations for basic value. Falling below this threshold due to a critical failure (a reputational crisis, for example, or a labor shortage that hampers production) can negate the benefits of investment in expanding competitive advantage. Conversely, investing more in elements that don't differentiate the offerings in customers' eyes will not yield returns. The key is to stay in the middle, except for the few areas that matter.

Talent can illustrate the concept of winning versus not losing on a

capability. In industries where expertise is the offering (such as professional services), where critical skills are scarce, or where top-decile companies far outperform the rest (such as niches of high-tech research where having the most-skilled workers disproportionately influences success), talent is an essential competitive advantage for being a market winner.

Not losing on talent is quite different. There's a large middle ground between not recruiting the very best talent (because it won't pay dividends to do so) and investing enough in people and culture to operate at the minimum expected threshold for the industry, then differentiating on other attributes such as ease of doing business, reliability, or cost. The distinction between how to win and how to not lose holds true across many attributes of a company's overall competitive advantage, including innovation, operations, and brand.



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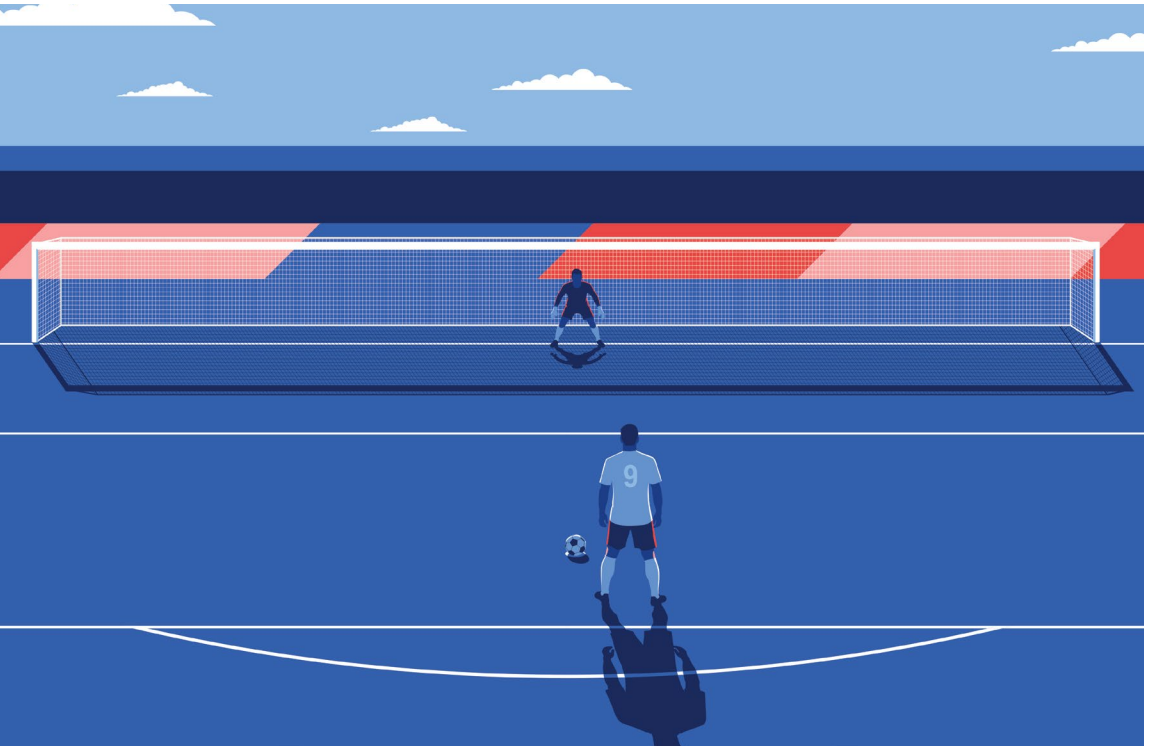
4

**Boost Your
Return on
Competitive
Advantage**

→ A genuine competitive advantage is sustainable over time. An event or trend can suddenly create a growth opportunity—as the pandemic did for videoconferencing apps—but a company needs a competitive advantage to maintain a market lead as new entrants emerge and competition evolves. Successful businesses regenerate their advantages over time and apply them broadly, especially to the most attractive market opportunities. For example,

investments in customer-relationship-management (CRM) systems targeted at capturing and feeding customer insights to R&D or a culture of internal collaboration can expand an organization's capabilities as competition evolves.

Sources of advantage that are transferable across markets provide an additional strategic edge. Having a deep technical capability in one type of manufacturing is quite different from having a culture of engineering and operations excellence. The former helps the organization win narrowly, while the latter can enable it to expand into growing markets. Investing in renewable and transferable forms of advantage creates the highest returns and is often what determines long-term value.



As the erosion of competitive advantage accelerates, organizations that identify and extend their advantages enjoy both outsize growth and lower risk.

5

You Can't Manage What You Can't See

→ Since the risk, complexity, and dynamism around a company's competitive advantage vary by market, business leaders need to monitor their competitive advantage at the market level. It's a complex task, but three markers can signal the potential erosion of advantage or opportunities to expand into new spaces:

- **Track the shuffle rate at market level.** Significant change in an industry's shuffle rate—either an increase in the rate itself or in the market share separating leaders and laggards—often signals the risk of erosion of a company's competitive advantage. It can also indicate shifts in the factors that determine customers' purchase decisions, which may present opportunities to move into new growth areas.
- **Follow the money.** Shifts in start-up, patent, and investment flow activity, among other indicators, can signal the arrival of new competitors (often with very different cost structures), capacity (which can hurt industry economics), value propositions, customer needs, or technological breakthroughs. These factors can reshape industry dynamics and potentially undermine an incumbent's advantage.
- **Watch acquisitions by players outside the industry.** Top performers are more than 50 percent more likely than peers to monitor noncompetitors' acquisitions of companies whose offerings they compete with, our survey shows. Such deals can be early signs of a sea change in an industry. AT&T's acquisition of a cloud-computing company at a time when cloud was still the domain of tech companies was an example of such a shift.

Aside from tracking market-related markers, organizations can monitor internal indicators to assess the strength of their advantage. These include acquisitions that do not pay off as intended, failed entries into new regions or market categories, or unexpected losses of market share or major contracts to companies not previously viewed as threats.

While the above markers don't cover all factors that could erode a competitive advantage, tracking



them can enable business leaders to objectively recognize change underway. AI tools can help managers rapidly scan for movement in their competitive sets, potential substitutes for their products, growing or declining segments, and market niches that could present new opportunities, as many trends emerge from unstructured data that traditional analyses may not capture.

When you focus on growth in areas where you're already strong, you can capture more customers than your peers, with a lower investment. As the erosion of competitive advantage accelerates in many markets, organizations that identify and extend their advantages enjoy both outsize growth and lower risk. Additionally, when investors can connect a move you're making with a strength you have, they're more likely to believe your growth projections. Even in stable market conditions, a company can miss the gradual decline in its competitive positions until it's too late. The response of character Mike Campbell in Ernest Hemingway's *The Sun Also Rises* to a question about how he went bankrupt is instructive: "Two ways. Gradually, and then suddenly." 

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The FDI

Foreign direct investment today

ILLUSTRATIONS BY SAM GREEN

Shake-Up

by Tiago Devesa,
Jeongmin Seong, Olivia
White, Nick Leung,
Michael Birshan, and Jan
Mischke, with Camillo
Lamanna and Masud Ally

may shape the industries of tomorrow.



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IL. COPPER. SEMICON-
ductors. Foreign direct
investment (FDI) has

seeded and transformed these and many other global industries.

Cross-border investments in the late 19th century forged the global oil industry as money and know-how flowed from the United States and Europe to Baku (present-day Azerbaijan) and Sumatra (modern-day Indonesia), followed by investment around the globe in the 20th century. Similarly, foreign investments shaped mineral-rich economies. For example, Chile's position as a world-leading copper exporter for most of the past 140 years was catalyzed by multinational firms that developed vast open-pit mines and transferred geological, engineering, and operational expertise.

Following World War II, FDI played a critical role in spurring global manufacturing. South Korea's semiconductor industry first emerged from successive waves of FDI, particularly from US and Japanese multinationals, starting in the 1970s. FDI fueled China's rise to become a leading manufacturing power as multinational enterprises built factories, transferred knowledge, and nurtured labor and supplier ecosystems.

2022 advanced economies announced more investment into one another—particularly into the United States—when compared with the five years before the pandemic. At the same time, advanced economies decreased their announced flows into China by nearly 70 percent. The geometry of global trade had already been shifting toward geopolitically closer partners, a pattern seen for nearly a decade. FDI may accelerate that trend, consistent with new tariffs, security concerns, and more muscular, domestically driven industrial policies.

Stakes are high and change is afoot. Megadeals over \$1 billion account for half the total investment pledges. New data centers, semiconductor fabrication facilities (fabs), and battery factories with high price tags have seen more megadeals than ever before. If successful, FDI projects announced since 2022 could more than quadruple current battery manufacturing capacity outside China, nearly double the global data center capacity that powers AI, and draw the United States into the circle of top leading-edge semiconductor-producing nations.

These shifts matter for companies of all kinds, not just tech giants and advanced manufacturers. As the aphorism goes, when others dig for gold, sell shovels. Announcements of major projects

FDI offers a window into the next era of global industry.

Today, FDI offers a window into the next era of global industry. Cross-border investments create fresh productive capacity—such as new mines, factories, and data centers—in new places. And recent FDI announcements promise to shape advanced manufacturing, AI infrastructure, and the resources that power them. Since 2022, three-quarters of cross-border announcements have gone to these industries—up from about half pre-2020.

Our analysis is based on almost 200,000 announced greenfield FDI projects from 2015 through May 2025—using data provided by fDi Markets, from the *Financial Times*. This data indicates that pledged investment has increasingly followed geopolitical lines. For example, since

signal opportunities for companies all along the value chain, while introducing new considerations for competitors across the world. FDI patterns can help decision-makers map a path that anticipates the shifting geometry of global trade and the future landscape of international business before it happens.



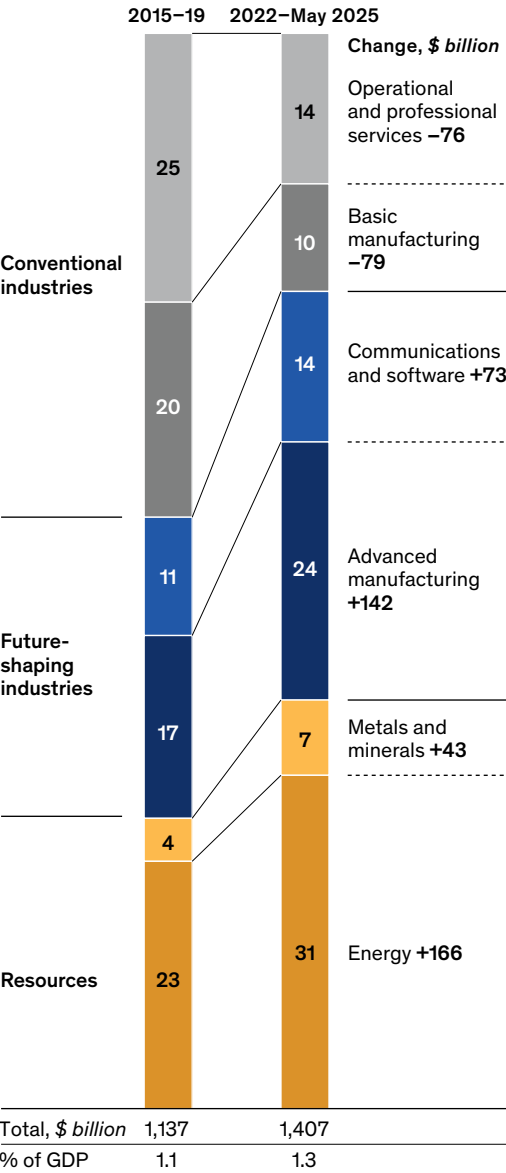
FDI HAS SHIFTED TOWARD THE INDUSTRIES OF THE FUTURE

Announced greenfield FDI flows increasingly target industries that will shape the global economy and the resources that power them. Future-shaping industries, as we call them, include semiconductor fabs; data centers powering AI; electric-vehicle (EV) and battery manufacturing

EXHIBIT 1

Greenfield FDI is increasingly targeting future-shaping industries and the resources that power them.

Greenfield foreign direct investment (FDI) announcements, by industry, annual average 2015–19 and 2022–May 2025, % of total



Note: For details, see Exhibit 2, “The FDI shake-up: How foreign direct investment today may shape industry and trade tomorrow,” McKinsey Global Institute, Sept 22, 2025. All \$ figures are in terms of 2024 US dollars. **Source:** Using data provided by fDi Markets; McKinsey Global Institute analysis

facilities; and a range of other advanced manufacturing, from pharmaceuticals to robots.

Cross-border investments in future-shaping industries could substantially expand their capacity and shift their global footprint into new locations. Together, the industries that make up advanced manufacturing as well as communications and software (AI infrastructure) accounted for an annualized average of roughly \$531 billion in announced greenfield FDI in the years since 2022. That is roughly 38 percent of announced FDI’s annual total of \$1.4 trillion (Exhibit 1). In inflation-adjusted, 2024-dollar terms, this annual average climbed ten percentage points from 28 percent during the period from 2015 to 2019—the pre-COVID-19 period we use as a baseline for comparison. Of course, not every potential project sees the light of day, but past studies have found that FDI announcements reliably predicted capacity creation on the ground, with realization rates between 60 and 80 percent.

Tracking the announcement trends, AI data centers, semiconductor fabs, and EV manufacturing are all receiving much more investment. From 2022 to May 2025, roughly \$115 billion per year was pledged to build new semiconductor fabs. Another \$110 billion per year went to assembly lines for EVs and gigafactories for batteries—which are primarily used in automotive manufacturing but increasingly relevant to broader applications in the realm of electrification. Amid the AI boom, data centers have received even larger pledges: equivalent to about \$170 billion per year since 2022.

This shift reflects the structure of these sectors: They are winner-takes-most, technologically advanced, and capital intensive, so only a handful of global firms have the capabilities to compete. At the same time, governments, eager to host them and reduce reliance on geopolitically distant partners, are deploying powerful carrots and sticks. The result is a surge of announced megadeals that drive most FDI growth and shape the global economy.

In parallel, as energy- and material-hungry industries expand, resource sectors also are attracting growing investment. They include projects to extract and refine minerals critical to advanced manufacturing—for example, copper, lithium, and nickel—as well as new steelmaking processes. Energy-related announcements also have risen. Here, announced investments in established renewable sources, like solar and

wind, as well as in nascent electrolytic hydrogen production are attracting roughly three-quarters of the growing total.

At the same time, uncertainty around international trade has been weighing on sectors that are not seen as strategically important for national resilience and competitiveness. Amid an even greater global focus on future-shaping industries at the aggregate level, the overall rate of FDI announcements leveled off in 2025, after tariff and trade uncertainty spiked. In particular, while the first quarter of 2025 saw higher-than-average announcements totals, the second and third quarters saw a reversal: They were both roughly 30 percent below the annualized average measured in the preceding three years. What played out was a bifurcation of investment patterns. Future-shaping industries

Until recently, production of leading-edge logic chips was heavily concentrated in Taiwan and South Korea. In 2022, these economies were home to about 65 percent and 25 percent, respectively, of global leading-edge capacity. But geographic concentration can create significant vulnerabilities, and companies and countries are taking note. For instance, export controls have recently been applied to semiconductor-related raw materials and manufacturing machinery, as well as the chips themselves, especially those at the leading edge. In fact, some researchers have found that export controls target the semiconductor value chain most.

Correspondingly, amid escalating geopolitical tension, semiconductor greenfield FDI announcements have been both increasing in value and flowing among more geopolitically aligned economies. Since 2022, FDI announcements into

Geographic concentration can create significant vulnerabilities, and companies and countries are taking note.

saw compounding growth. A wave of data center projects throughout the year continued to be propelled by the AI boom; and semiconductors saw a single deal in March exceeding a typical year's worth of announcements. But outside of these two industries, announcement values fell—by as much as 50 percent in the case of energy.

Below, we follow recent FDI announcement patterns in semiconductors, AI data centers, and the EV value chain to see where the shovels may be poised to dig next.



SEMICONDUCTORS: SHARE SHIFTING TO THE UNITED STATES

The future global economy will run on leading-edge semiconductors, the most advanced chips produced today. Potential applications range across generative AI, robotics, defense, and many other sectors. A large language model can require hundreds of thousands of these chips to train.

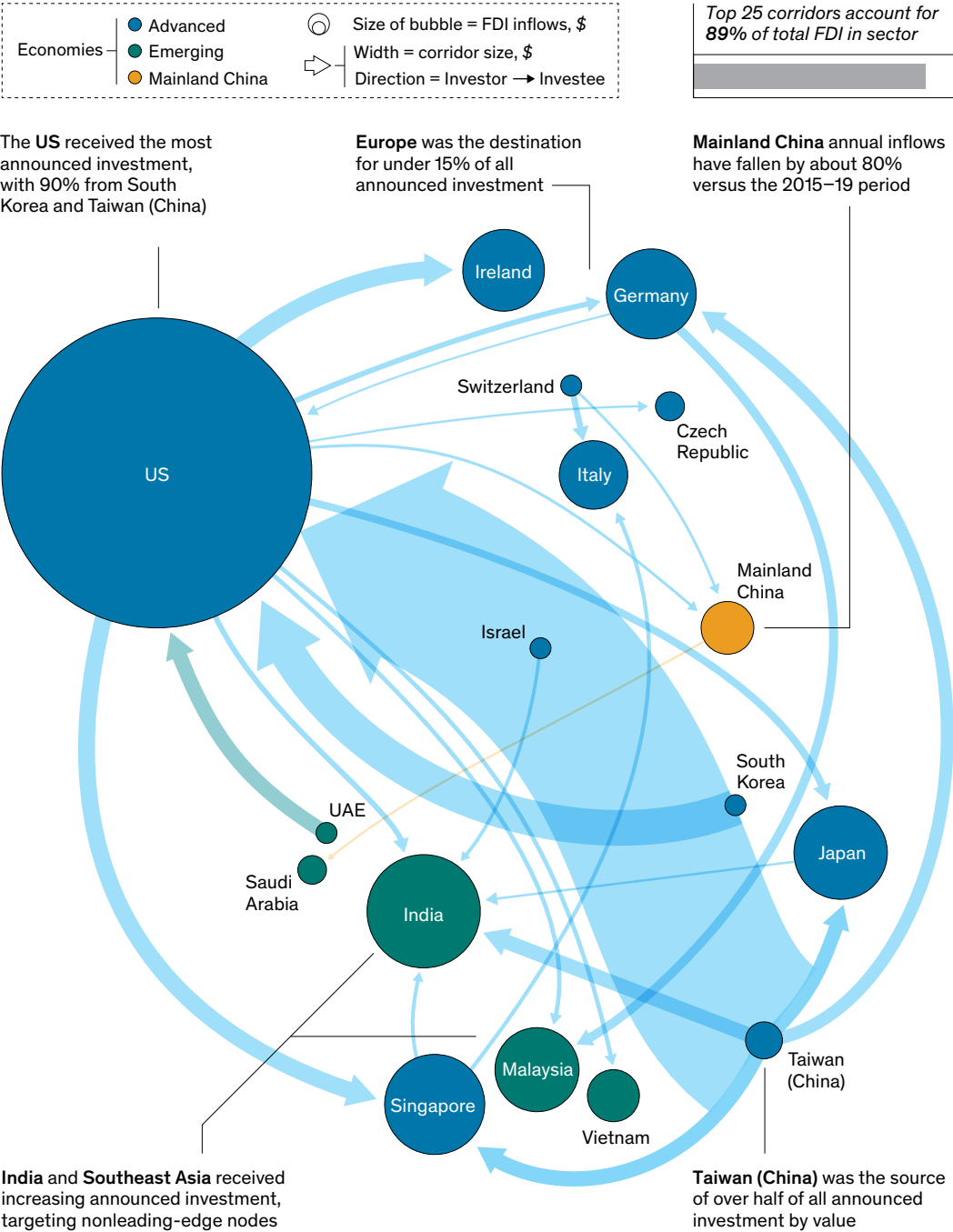
semiconductors have reached \$115 billion per year, a fivefold increase from the 2015-to-2019 period. Strikingly, half of this amount was focused on building new leading-edge facilities, which didn't feature in the previous round of foreign investments.

Against this backdrop, FDI has emerged as an engine that could transform capacity globally, particularly for the most advanced chips. By some estimates, the United States could become the second-largest producer of leading-edge chips by the early 2030s, home to more than 20 percent of global capacity, thanks primarily to investments from TSMC and Samsung, the leading players from Taiwan and South Korea, respectively (Exhibit 2). Early signs of FDI's impact in the United States are already visible. At TSMC's site in Arizona, one facility started producing leading-edge chips in high volumes in late 2024. As of January 2026, a second has completed its structural building phase and is scheduled to start production in 2027. A third is under construction.

EXHIBIT 2

FDI in semiconductors reconfigured sharply toward the United States.

Semiconductors: top 25 corridors by announced greenfield FDI,¹ 2022–25, \$ billion



Note: Adjusted for inflation based on World Bank US CPI, indexed at 2024. 1. Foreign direct investment. Source: Using data provided by fDi Markets; McKinsey Global Institute analysis

This additional capacity could reduce US reliance on foreign sources for leading-edge chips. However, some overseas dependencies will remain in place until the United States also boosts domestic capabilities for semiconductor-manufacturing equipment and other raw material and chemical inputs. The United States also retains some dependence on foreign capacity to assemble, package, and test semiconductors.

At a global level, if all announced leading-edge-fab FDI projects were realized, they could add five times the existing capacity outside Taiwan and South Korea. That would dramatically expand the footprint of the industry. Together with the United States, Europe's (primarily Ireland's) and Japan's shares would grow, too. That said, their shares will likely remain in the single digits, as only a few projects have been announced.

This is a massive change from the pre-COVID-19 years when China was the destination for most semiconductor-related FDI announcements. Announcement value has dropped about 80 percent during the period since 2022, compared with the 2015-to-2019 period. While China has more than commensurately ramped up domestic investment in the industry, it has so far trailed in leading-edge capabilities. The loss of FDI could lead to difficulty or delay in scaling leading-edge chip production. This is due in part to reduced inflows of know-how from leading global players combined with limited access to advanced semiconductor-manufacturing equipment.

Building capacity to produce leading-edge semiconductors at scale is, to put it mildly, neither easy nor cheap. A single fab can cost \$10 billion or more—they are incredibly complex and precise. Fewer than a handful of companies globally have the capabilities to develop them. Developing new and cost-competitive leading-edge manufacturing centers outside Taiwan and South Korea is a formidable endeavor, especially without their ecosystems of value chain partners and talent.

services and could unleash larger flows of data while enabling more localization of sensitive data. Additionally, data centers' massive power needs have prompted new energy projects nearby.

Today, China and the United States together account for more than half of global data center capacity. In these economies, domestic investment drives most of the capacity expansion.

But FDI could become the main engine of data center capacity everywhere else in the world. Announced projects could add about twice the capacity that existed outside of China and the United States in 2022, supporting more than half of total capacity growth out to 2030. Shifts are occurring since localizing data centers in the places they serve is often important for various commercial and regulatory reasons. All told, since 2022, FDI announcements dedicated to data centers have totaled more than \$170 billion annually, doubling the average level of investment announced in the 2015-to-2019 period, with about 90 percent of that total headed to economies other than the United States and China.

US firms, including hyperscalers such as Amazon Web Services and Microsoft, were the biggest sources of this announced FDI. In addition to ongoing large investments in Europe and other advanced economies, such firms have announced increased investment across emerging markets. Destinations included India and Southeast Asia, as well as Saudi Arabia. In addition, investors from Middle Eastern economies announced some of the largest data center projects ever in France and the United States in early 2025, contributing to the expanding geopolitical distances of recent FDI announcements (Exhibit 3).

The impact of recent FDI announcements could soon become apparent, as the majority of the 20 largest projects announced since 2022 are already under construction. Most of the remaining projects, often even larger, were announced in the first half of 2025. These could bring multigigawatt campuses online by 2030.

As these projects move toward execution, uncertainties remain. For example, rolling them out depends on ongoing growth in demand for enormous capacities. Execution also depends on supporting regulatory frameworks and agreements that facilitate transfer of intellectual property, chips, and data. These projects will also require massive amounts of power. At a global



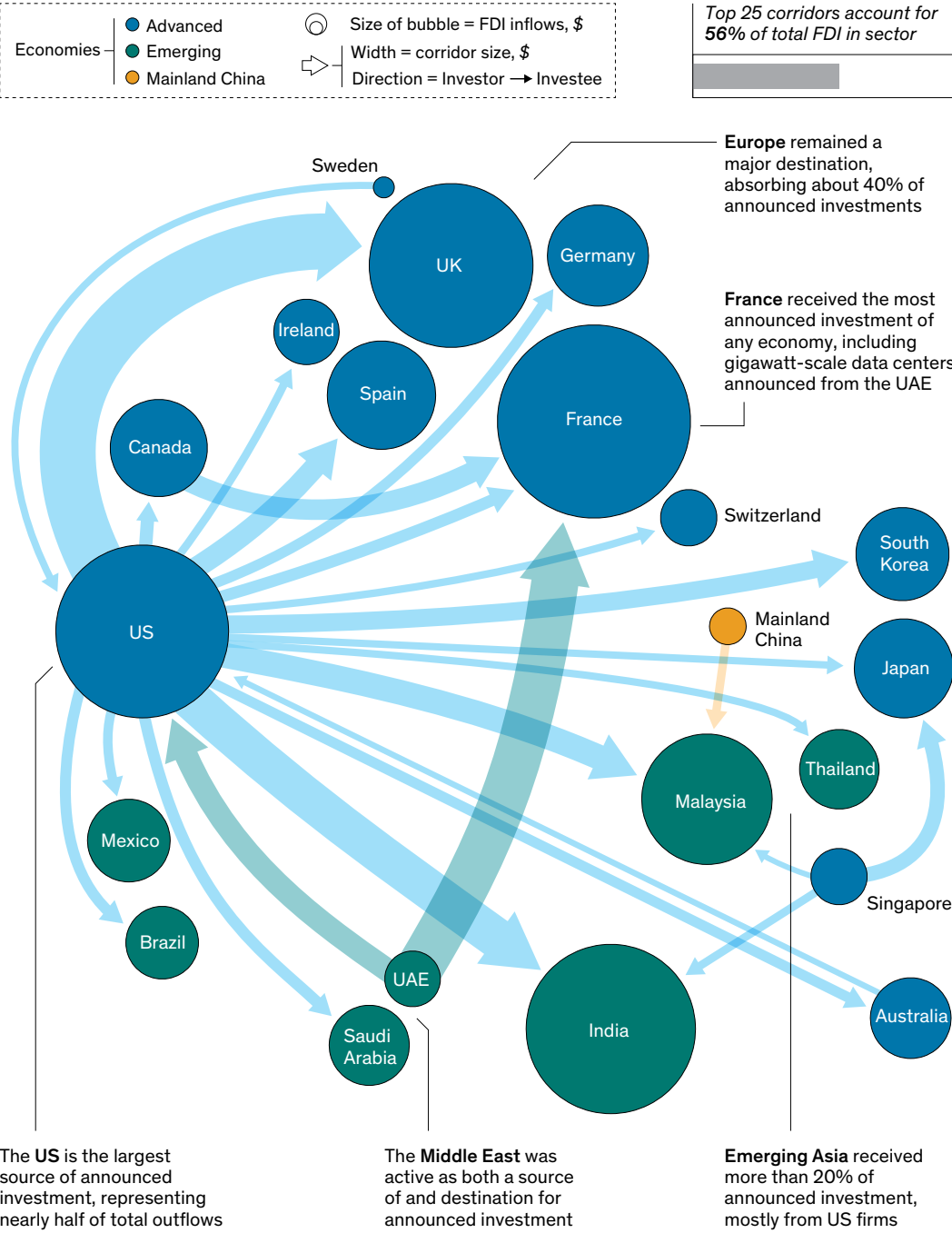
AI INFRASTRUCTURE: INVESTMENT SURGED GLOBALLY

Growing AI adoption and related workloads are fueling demand for data centers to host and process data across the world. And this build-out influences trade routes for chips and high-tech electronic components as well as affecting other sectors. FDI projects also could create new opportunities to offer digital

EXHIBIT 3

FDI in data centers was driven by US expansion into emerging economies and the United Arab Emirates into large projects.

Communications and software: top 25 corridors by announced greenfield FDI,¹ 2022–25, \$ billion



Note: Adjusted for inflation based on World Bank US CPI, indexed at 2024. 1. Foreign direct investment. **Source:** Using data provided by fDi Markets; McKinsey Global Institute analysis



level, data centers are a small but increasing power draw: By 2030, their electricity demand could represent up to roughly 5 percent of the global total, and higher in locations where data center build-out is most concentrated.

→ EV VALUE CHAIN: NEW HUBS IN THE WEST AND GLOBAL SOUTH

The EV value chain includes EV assembly plants as well as gigafactories to produce batteries. Batteries power not only EVs but also a growing number of consumer electronics, robotics, drones, and energy-storage devices for homes as well as for electric grids, making the industry increasingly critical for the global economy. China is, by far, the leading manufacturer of EVs and batteries today. It is home to more than 70 percent of global EV-assembly capacity; more than 80 percent of active

China and nearly double global capacity over 2022 levels. While many regions have homegrown businesses attempting to scale domestically, FDI-funded projects may provide important capabilities and could account for most of the capacity growth in these regions.

To a large extent, Chinese companies are shaping investment patterns in this industry. China pivoted from being the industry's top FDI recipient to becoming the leading FDI source, accounting for around one-quarter of industry announcement totals. At the same time, Chinese players continue to invest heavily at home. In fact, looking at announced investment totals in EVs and batteries, Chinese-owned capacity is expected to remain high as Chinese firms retain ownership of factories in new locations, expanding their global footprint rapidly.

Investments into the electric-vehicle value chain have been growing in value and reconfiguring.

material processing and global battery manufacturing capacity; and about 90 percent of lithium iron phosphate (LFP) cells—a newer, rapidly growing battery technology. Until recently, China was also the top destination for announced FDI into EVs and batteries, receiving 20 percent of the global total during the 2015-to-2019 period. That was almost 50 percent more than the United States, the next largest recipient.

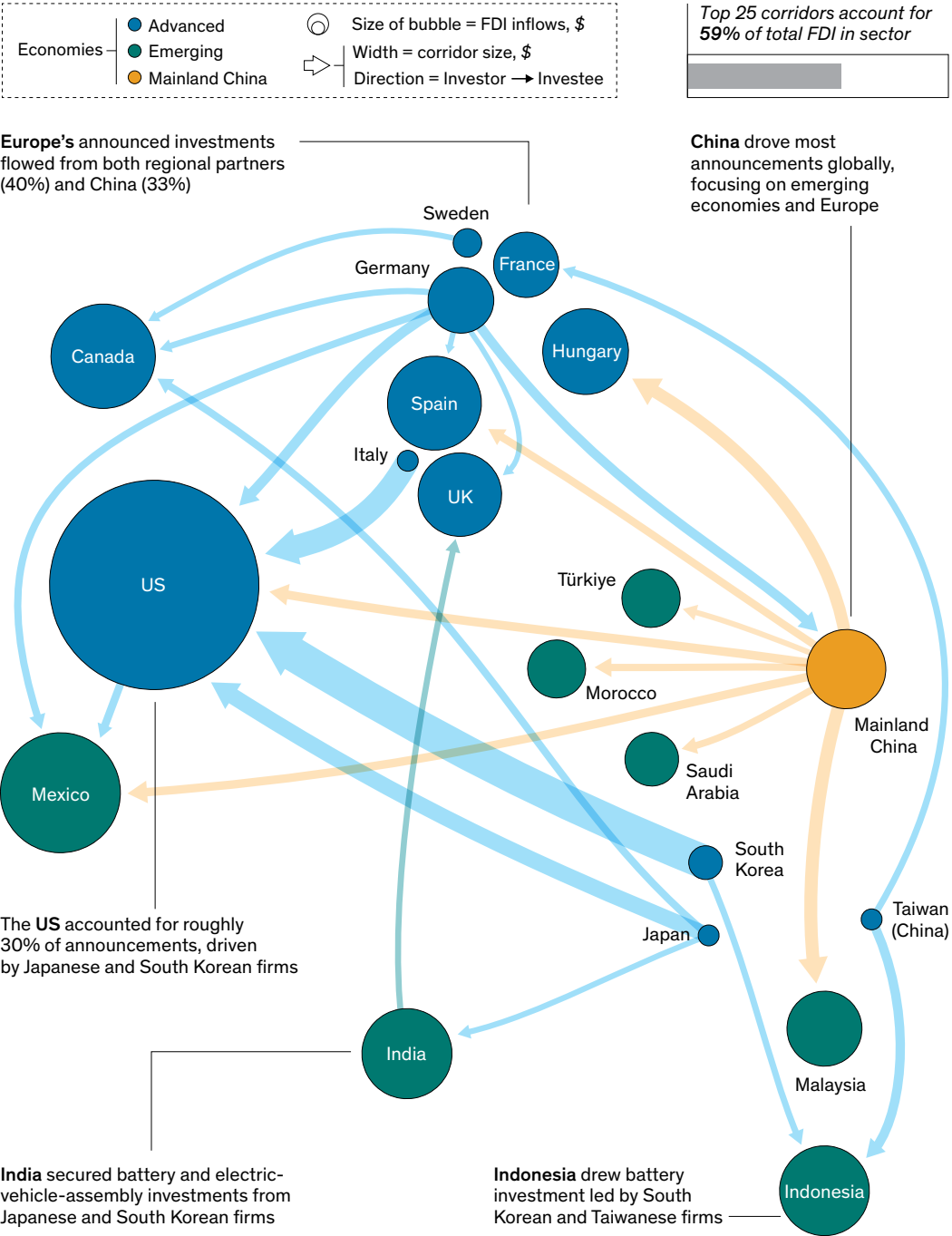
Since the pandemic, greenfield FDI announcements into the EV value chain have been growing in value and reconfiguring. In aggregate, we see a shift away from China and a seeding of new hubs (Exhibit 4). Annual announced greenfield FDI into EVs and battery production since 2022 has totaled about \$110 billion per year, roughly 40 percent higher than in the 2015-to-2019 period, and nearly all of it has flowed to economies outside China. If fully realized, these projects could more than quadruple battery capacity outside

Europe has been the largest destination of recent Chinese investment. While the continent historically relied on the strengths of its own automotive sector, it is growing increasingly reliant on FDI flows. Europe receives roughly \$28 billion in announced FDI annually. Of the \$16 billion yearly announcements coming from outside the European Union since 2022, Chinese firms accounted for approximately \$10 billion. Projects include some of the continent's largest planned gigafactories for LFP cells in Germany, Hungary, Portugal, and Spain, as well as new assembly lines in Slovakia. This expansion is substantial: A single Chinese manufacturer is currently developing gigafactories in Europe that could add 150 gigawatt-hours of capacity in 2026, roughly equal to Europe's total capacity back in 2022. At the same time, Europe has reinforced its intraregional links, too, with roughly \$12 billion in annual announcements coming from within the European Union.

EXHIBIT 4

FDI in electric vehicles and batteries reconfigured away from China and into a broad set of new hubs.

Batteries and auto OEM: top 25 corridors by announced greenfield FDI,¹ 2022–25, \$ billion



Note: Adjusted for inflation based on World Bank US CPI, indexed at 2024. 1. Foreign direct investment. **Source:** Using data provided by FDI Markets; McKinsey Global Institute analysis

China's investment footprint extends beyond Europe, too. In fact, Chinese players are set to become the biggest investors in emerging economies around the globe. In Morocco and Vietnam, they have announced battery projects. In Malaysia, Mexico, Saudi Arabia, and Türkiye, they have announced large EV-assembly projects. In total, emerging economies attracted about \$38 billion annually since 2022, of which China contributed the largest share at around 40 percent. Japanese and South Korean players collectively made up another 30 percent—geared primarily to emerging Asian economies, especially India and Indonesia.

Finally, the United States stands out both as the largest recipient of announced FDI and one drawing from more geopolitically aligned partners as it reduces its exposure to China. About \$35 billion have headed to North American shores, and about half of that has come from leading Japanese and South Korean players in EV assembly and batteries, with the remainder mostly coming from Europe. Leading Chinese companies made up less than 10 percent of the total.

While all of these projects are poised to change the geography of the industry, some FDI announcements face a bumpy road. Recent shifts in US trade and energy policy have affected planned investments in Mexico and Canada, placing several projects on hold. Furthermore, ongoing trade restrictions with China pose supply chain challenges for advanced Asian battery makers establishing US facilities, because Chinese suppliers provide key inputs. Elsewhere, questions remain about whether other countries can compete effectively with China's advantages in battery-production scale and cost efficiency.

→ THE FDI SHAKE-UP PROMISES TO MOLD FUTURE TRADE AND INDUSTRY

Announcements suggest that green-field FDI is emerging as an engine for future-shaping industries in many spots around the globe. These announcements have grown much faster than total capital investment, creating the potential to boost global capacity and to expand the worldwide footprint of these industries.

In the case of data centers and EV batteries, announced FDI projects could add roughly as much capacity as existed in 2022. For leading-edge semiconductors, FDI projects could add about 60 percent to 2022 global capacity (Exhibit 5).

The impact could be many times higher outside the core hubs where these industries are concentrated today. For data centers, leading-edge semiconductors, and EV batteries, FDI-driven projects could account for the majority of total capacity growth outside core hubs up to 2030.

It remains uncertain how many of these announced investments will be fully realized, but the direction of travel is clear. As of early 2026, the pipeline was progressing in a healthy way: More than 60 percent of the projects announced since 2022 in all of these industries were already live or well underway, and in particular some of the very largest semiconductor and gigafactories were already online.

→ NAVIGATING FDI SIGNALS AND SHIFTS IN A HIGH-STAKES ENVIRONMENT

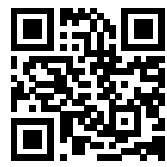
The stakes have rarely been higher for decision makers. Heightened geopolitical tensions, fast growth of a new set of future-shaping industries, and evolving industrial policies are fundamentally changing the environment for cross-border investment. Companies need to move fast enough to retain a stake in the industries of the future while maintaining flexibility, engage in ever-growing deal sizes without breaking the bank, and navigate a fresh set of incentives brought about by new “nonmarket” factors.

In this rapidly shifting environment, announced FDI can offer strategic foresight. In weighing their next moves, executives and policymakers can take

note of the clues that FDI yields—both cross-industry patterns and data at the granular deal level.

Anticipating and Cultivating the Ecosystem of New Projects

Where might industry demand for the proverbial shovels spike next? Consider semiconductor manufacturing. Announcements of major projects in locations like Arizona or Leixlip, Ireland, signal opportunities for adjacent companies such as toolmakers and chemical suppliers. It continues through the value



An expanded version of this report is available on

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chain, reaching the suppliers of suppliers, and so on. Indeed, the success of such megaprojects hinges on a broad ecosystem.

The impact of new hubs extends beyond sectoral boundaries, influencing infrastructure, logistics, and business services. This can be seen, for example, in the knock-on economic and employment effects of new data centers in the United States, which have been found to spur growth in a host of other industries. Companies can anticipate needs that include grid access, connections with shipping hubs, maintenance, and servicing support for the new facilities and their suppliers. Redrawn industrial footprints also increase demand for housing, hospitality, and food services. Of course, some of this may be part of preplanning in original deals, but opportunities will remain.

While FDI expands the frontier of new industries, history teaches that growth needs nurturing and cultivation. Targeted policies can help. Areas of attention include accelerating complementary domestic investment, upgrading infrastructure, enhancing workforce skills, and strengthening local industry ecosystems.

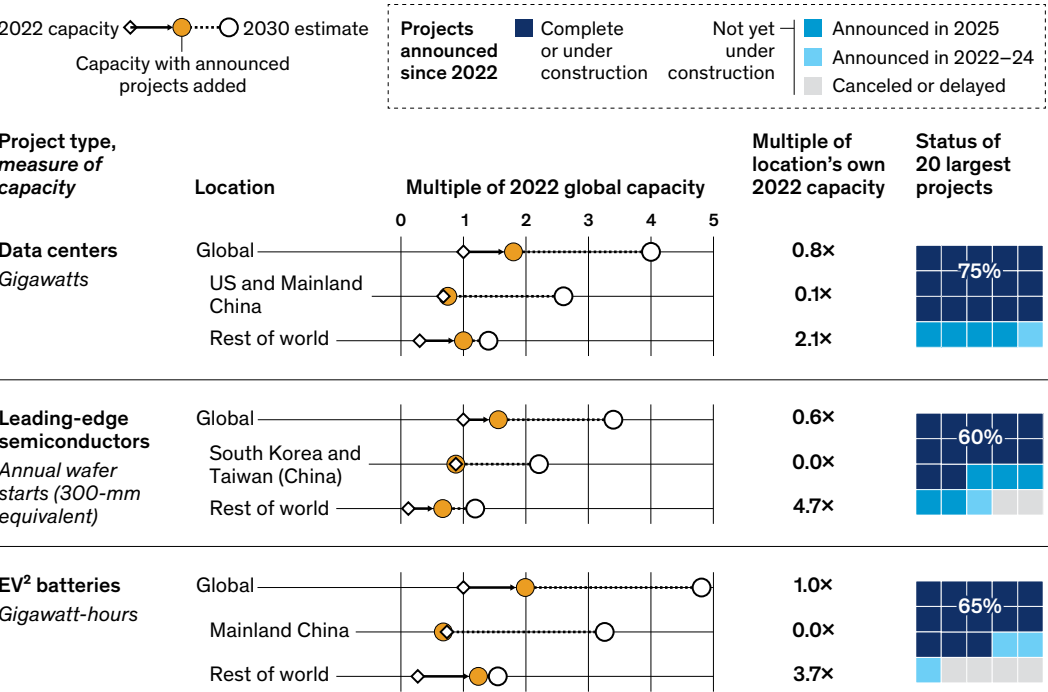
Responding to the
New Map of Competition

FDI announcements offer a detailed, strategic map of how and where different players plan to invest, allowing decision-makers to anticipate changes in the competitive landscape. FDI today can indicate where future capacity might outstrip future demand, depending on a company's beliefs about the latter. Even today, some industries such

EXHIBIT 5

FDI could drive growth in future-shaping industries, especially outside today's hubs.

Potential increase in production capacities from announced greenfield FDI¹ projects, *multiple*



Note: For details, see Exhibit 4, “The FDI shake-up: How foreign direct investment today may shape industry and trade tomorrow,” McKinsey Global Institute, Sept 22, 2025. 1. Foreign direct investment. 2. Electric vehicle. **Source:** Using data provided by fDi Markets; McKinsey Data Center Supply and Demand Model; McKinsey Semiconductor Supply and Demand Model; McKinsey Battery Insights, press search; McKinsey Global Institute analysis

as steel manufacturing are grappling with overcapacity, and some observers are warning of future EV manufacturing overcapacity.

Many companies already track their direct competitors. For example, think of incumbent automakers tracking manufacturing expansion plans of upstarts, or consider hyperscalers analyzing where competitors are expanding their data center footprint. But beyond gaining a competitive edge, this map is also important for potential partners. For instance, renewable-energy developers in emerging markets can identify global firms actively seeking local collaborations, while European automakers may spot battery manufacturers that haven't yet entered their region, representing possible joint-venture opportunities.

successfully realized, could fundamentally alter their economic prospects by serving as anchor projects for their economies. Of course, such success is not guaranteed, and FDI signals need to be calibrated with important preconditions to catalyze growth.

FDI can also signal change even in larger economies. For example, Saudi Arabia and Thailand have recently attracted projects across a diversified set of industries, from data centers to electronics and automotive. This inflow of FDI could spur significant new activity among local suppliers of components, tools, and materials. Similarly, economies drawing substantial power generation investments, such as Brazil or Morocco, could experience downstream competitiveness gains through cheaper and more reliable energy supplies.

A handful of large FDI projects could shape the fortunes of smaller economies.

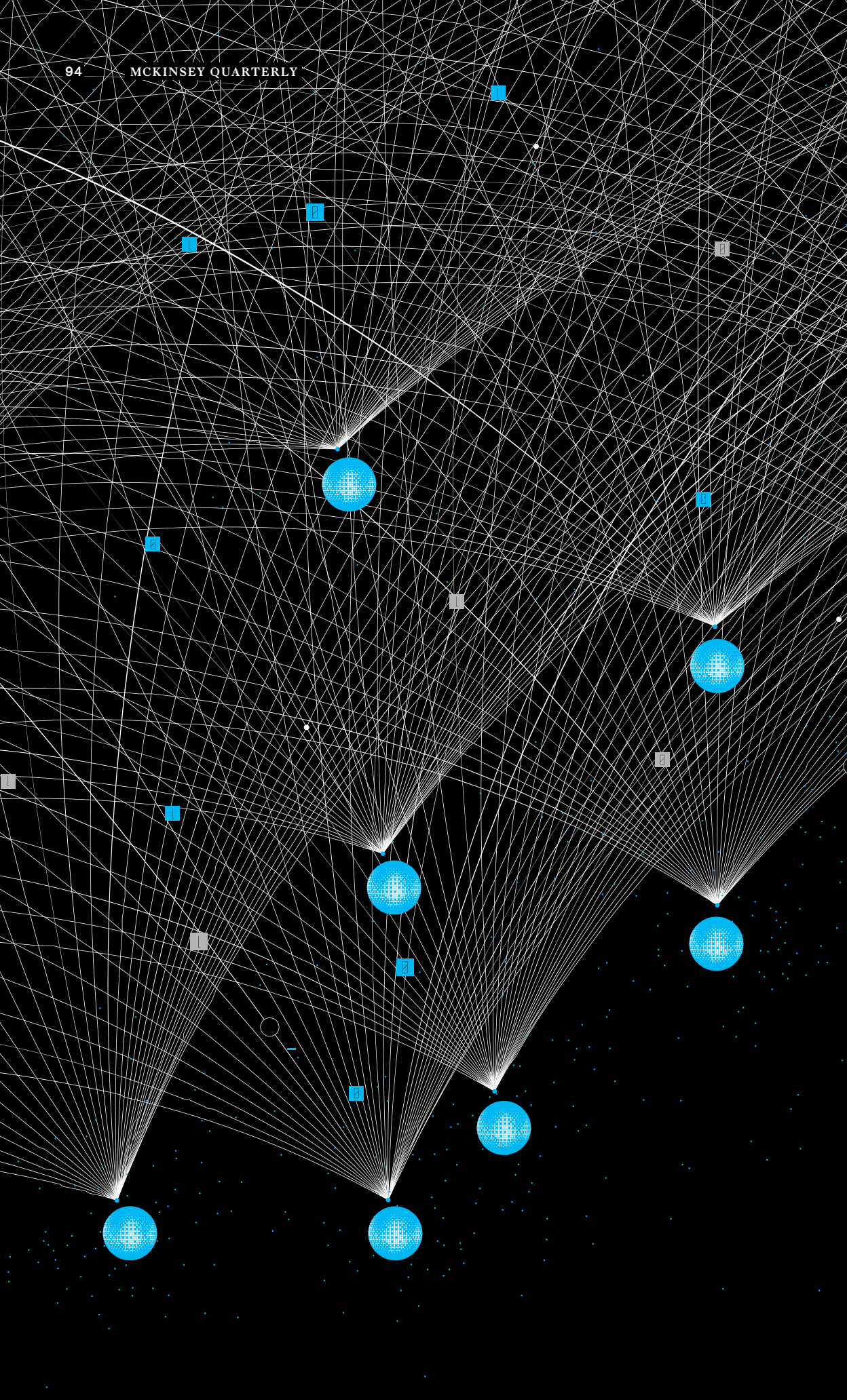
For financial-sector players, mapping which companies are investing and where may reveal a range of opportunities. Examples include new assets needing project finance and derisking, fresh prospects for banks and insurers, new sources for commodities traders, and even broader asset-class, boom-and-slowdown dynamics for principal investors. Finally, policymakers can also leverage these maps to pinpoint companies that may be scouting for a new location in their region, potentially leading to economic partnerships.

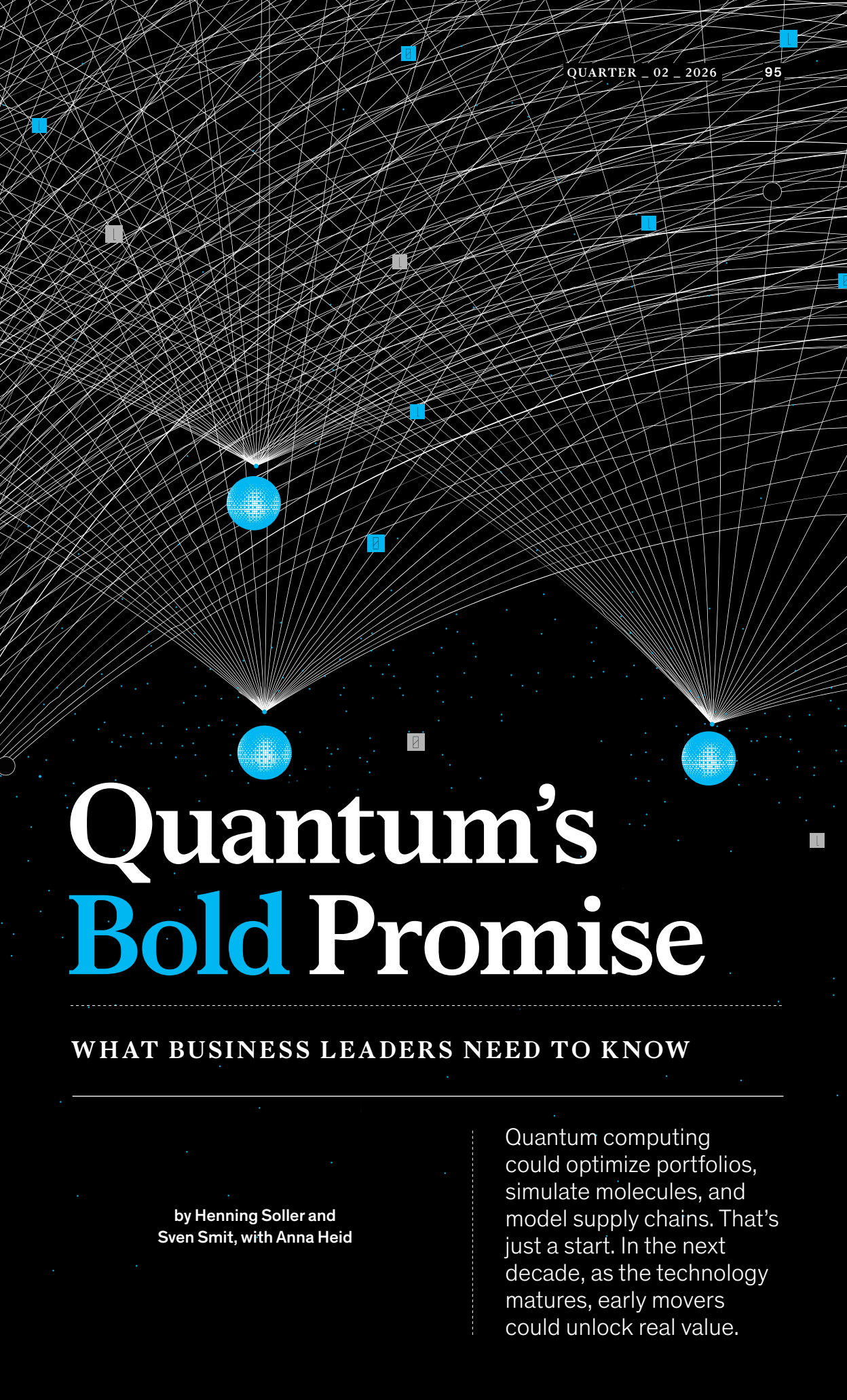
Anticipating Which Economies Will See New Waves of Growth

FDI announcements provide a powerful early signal about which economies may become more competitive directly from the investments themselves and indirectly via potential spillovers that stimulate upstream or downstream development. In the most pronounced examples, a handful of large FDI projects could shape the fortunes of smaller economies. For example, large energy deals in Guyana and Mauritania, if

Foreign direct investment has a long history of identifying, nurturing, and propelling leading-edge industries. The global firms of today are already responding to geopolitical changes and technological advancements, potentially shifting future trade patterns. Greenfield FDI announcements serve as a bellwether of where global economic ties may form or fray and how the geometry of global trade may evolve. Business leaders and policymakers can incorporate such insight to better navigate an uncertain time. [Q](#)

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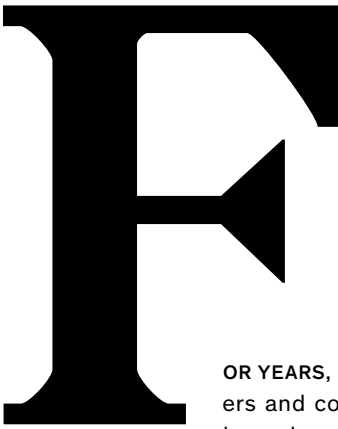


Quantum's Bold Promise

WHAT BUSINESS LEADERS NEED TO KNOW

by Henning Soller and
Sven Smit, with Anna Heid

Quantum computing could optimize portfolios, simulate molecules, and model supply chains. That's just a start. In the next decade, as the technology matures, early movers could unlock real value.



OR YEARS, BUSINESS LEADERS and corporate boards have viewed quantum computing (QC) as a threat—and for good reason: It has the potential to break today's strongest encryptions. That moment, commonly known as Q-Day, will occur when quantum computers succeed in factoring exceptionally large numbers, undermining the math that public-key cryptography depends on.

Though business leaders are keeping Q-Day top of mind, they are viewing QC through a new lens—less a threat and more an opportunity. Many are spurring their companies to experiment with QC now so that they will be ready to deploy it at scale once quantum computers become mainstream, which could happen within the next five years.

Though business leaders are keeping Q-Day top of mind, they are viewing QC through a new lens—less a threat and more an opportunity. Many are spurring their companies to experiment with QC now so that they will be ready to deploy it at scale once quantum computers become mainstream, which could happen within the next five years.

The potential benefits for early adopters are considerable. McKinsey research suggests that QC could create multibillions of dollars in enterprise value in the coming decade—and that's just for the industries we analyzed that are most likely to benefit (Exhibit 1). Providers of quantum computing have accelerated their engineering road maps and made algorithmic breakthroughs that suggest that scalable applications could arrive in a matter of years.

Unlike classical computers, which process information in a linear way, quantum computers leverage the principles of quantum mechanics to explore many potential solutions in parallel. While quantum computers themselves are extremely complex, they differ from classical computers in one fundamental way. Classical computers are built on units of information called bits, which can be represented by either a zero or a one. Quantum computers, on the other hand, are built on quantum bits, or qubits, which can represent any combination of zero, one, or both simultaneously. This form

of nonlinear processing allows quantum computers to solve complex tasks far faster than even today's most powerful supercomputers.

QC's greatest strength lies in its ability to solve problems that overwhelm classical computers, such as advanced simulation and probabilistic modeling. These capabilities make QC attractive for applications such as drug discovery, material simulation, supply chain optimization, and financial modeling—all areas where early QC applications are gaining traction. Already today, some organizations claim that QC outperforms classical computing by a wide margin (what's known as "quantum supremacy") and that the technology has matured to the point where companies are deriving incremental value from it.

QC has yet to hit the mainstream, however, because of two key challenges: Qubits are fragile and prone to errors, and QC hardware is expensive to build and operate. These constraints mean that for most companies today, QC is best suited to a small number of high-value use cases, rather than as a replacement for classical computing. However, advances in software are quickly helping to address these limitations. Algorithms that mitigate and correct errors could soon enable even imperfect quantum computers to deliver high-impact results. This algorithmic leap means that raw quantum hardware could become less important, making large-scale QC use happen sooner than hardware road maps alone suggest.

CEOs don't need to understand the intricacies of quantum computing to derive value from it. But they do need to know enough about the technology to understand where QC is headed and how it could affect their P&L. They also need to develop a clear view of the use cases that are relevant for their companies and partner with

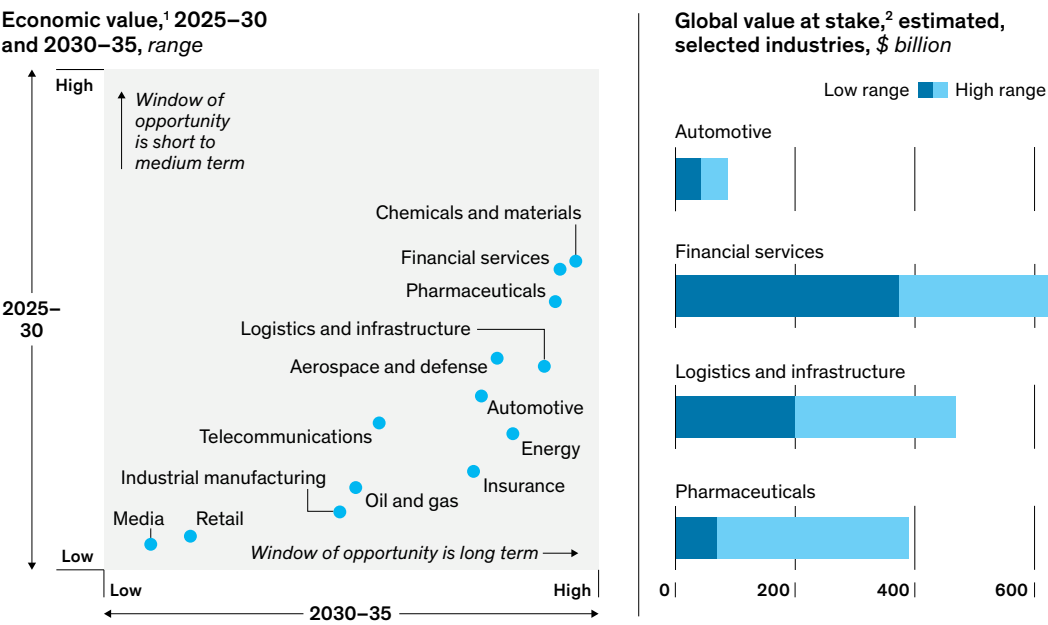


QC's greatest strength lies in its ability to solve problems that overwhelm traditional computers.

EXHIBIT 1

Quantum computing is poised to deliver immense economic value to companies worldwide by 2035.

Potential economic value from quantum computing by 2035



1. Economic value is defined as the additional revenue and saved costs that the application of quantum computing (QC) could unlock at organizations. 2. Our estimates are based on the additional economic value that QC-enabled use cases could deliver in each respective industry. We examined four industries in depth that are likely to realize value from QC in the next 10 years. Ranges illustrate conservative and optimistic scenarios and should be interpreted as approximate rather than definitive projections for business value.

technology teams to map QC rollouts to measurable business results, such as cost savings or productivity gains.

Over the next ten years, we expect QC to evolve in two stages. In the first stage, limited use cases will develop in a hybrid approach with classical computing. During the second stage, so-called fault-tolerant quantum computers could unleash new scalable use cases that deliver significant value. In this article, we map out the potential evolution of QC over the next decade, then outline key actions business leaders can take to capture value from the technology.

First movers recognize that quantum utility will precede quantum perfection. Motivated pioneers in financial services, telecommunications, automotive, pharmaceuticals, chemicals, and other industries are accelerating pilots today. Business leaders who wait for a “perfect” fault-tolerant quantum computer before they act may find themselves behind the

curve once such a machine does emerge. Their faster-moving competitors will have built intellectual property (IP) on top of today’s QC machines—often in a hybrid environment with classical computers—giving them a strong head start on solving some of tomorrow’s thorniest computing challenges (see sidebar, “Four problems quantum computing can solve”).

THE NEXT DECADE OF QUANTUM

The next ten years will bring significant technological gains that will advance the potential of quantum computing. Business leaders who understand the QC landscape will be better equipped than their peers to map corporate objectives against the industry’s evolution.

The Two-to-Five-Year Horizon:
Early Value from Hybrid Systems

In the short term, executives can seek to capture value by deploying hybrid systems that combine

QC applications with classical high-performance computing and AI. Practical use cases include simulating complex molecules and materials, which has gained traction in pharmaceuticals and chemicals; optimizing financial portfolios; and modeling complex supply chains or energy grid loads, where even small improvements can deliver significant value. Such QC pilots are most often deployed alongside classical computers. In these cases, classical computers process high-volume calculations, while QC machines solve the knottiest computations. Even a hybrid approach promises to dramatically boost computing speed, which our analysis shows could translate into billions of dollars in value for large organizations. QC companies claim that quantum computers can outperform classical computers; now they must prove that this performance can translate into measurable business value.

convergence between AI and QC and could be the breakthrough that propels the long-term value creation from QC that executives seek.



QUANTUM'S KEY STAKEHOLDERS

Our analysis identifies three main stakeholder groups—users, investors, and technology providers—that will be at the forefront of transforming QC from a theoretical promise to a foundational element of the next computational era.

Users

Our research shows that hundreds of organizations worldwide are already engaging with QC. Activity among sectors, however, remains uneven. We see an “urgency paradox” in quantum adoption. While sectors such as pharmaceuticals and chemicals have the most promising problem sets that could be solved by

Stakeholders will need to drive QC from a theoretical promise to a foundational element of the next computational era.

The Five-to-Ten-Year Horizon:

Full-scale Impact from Fault-Tolerant QC

Recent product road maps suggest that a new set of technological advances is likely to enable fault-tolerant quantum computing (FTQC) by 2030. This breakthrough will feature automatic error correction and stable qubits. Coupled with more advanced algorithms, FTQC machines will enable applications such as large-scale simulation for complex biology, climate, and materials modeling; deep integration of QC into mission-critical optimization and risk engines; and advanced AI that can spot patterns in high-dimensional data for yet-undiscovered applications. Pairing QC with AI will be critical. For example, quantum machine learning (QML) is already speeding up some of the heavy math and optimization steps that make AI model training so resource intensive today, while quantum circuits could allow smaller, lower-cost AI models to perform much more efficiently. These technological gains signal an upcoming

QC, other sectors are moving faster, such as defense, finance, and telecommunications (Exhibit 2). These industries are still operating from a risk perspective, where the cost of being second outweighs the technology's uncertainty. Nonetheless, today's early efforts can guide leaders just starting to explore how QC could affect their businesses, informing them on what's possible in the near to medium term.

Today, QC users predominantly include sectors that need to solve complex, high-value problems, such as pharmaceuticals. They are working with QC companies to pilot targeted use cases. For example, Amgen teamed up with Quantinuum to study peptide binding, and Biogen has worked with 1QBit to accelerate comparisons of molecules for neurological disorders such as Alzheimer's and Parkinson's diseases.

Financial institutions are using QC to enhance portfolio optimization and risk assessment. For example, several financial institutions, including BBVA and Crédit Agricole CIB, have partnered with

Multiverse Computing to improve capital allocation by combining tensor networks (a mathematical tool to manipulate highly complex multivariable systems) with quantum methods. HSBC has partnered with IBM to demonstrate the world's first-known quantum-enabled algorithmic trading platform.

Meanwhile, chemical companies are using QC to perform molecular simulations that can model complex molecules and reactions more accurately, speeding up the design of novel materials and high-performance catalysts. For instance, bp is working with ORCA Computing to apply hybrid quantum–classical machine learning to generative modeling of molecular conformations.

For some sectors, such as manufacturing, public services, and insurance, QC may seem like a distant technology with few immediate applications relevant to their core operations. But neglecting

to engage with QC at all today could be a mistake. That's because even if a company does not deploy QC directly, it will likely still be affected by it—especially when it comes to cybersecurity. (The looming Q-Day, when QC breaks today's encryption, will require companies to rapidly shift to new forms of security.)

Investors

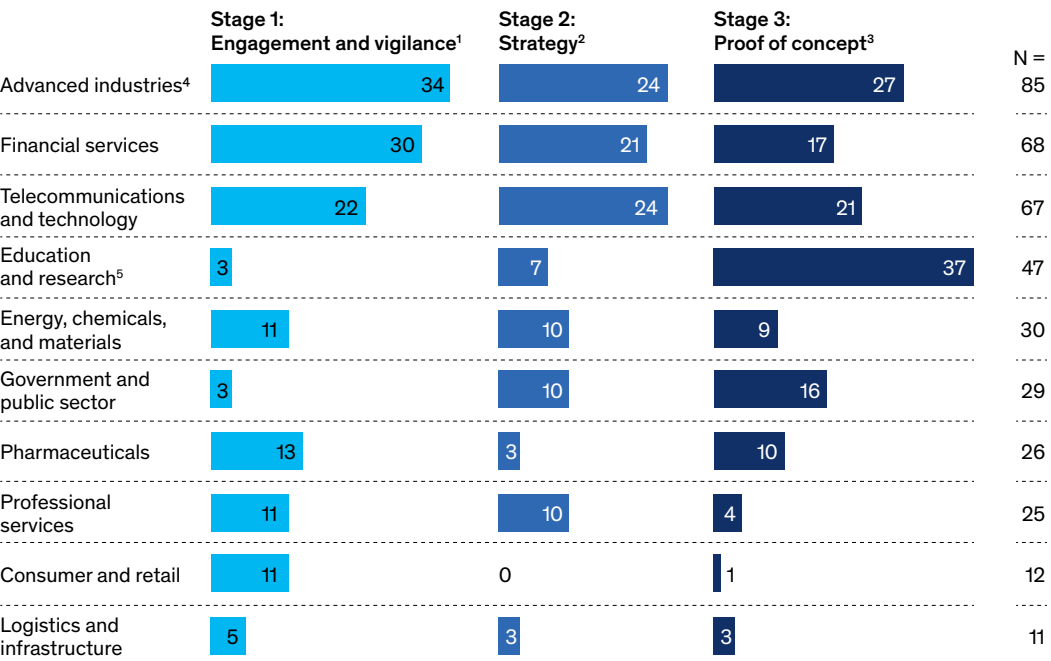
QC is a capital-intensive sector that will need billions of dollars in investment to scale. QC requires clean rooms, advanced manufacturing, and complex software. Investors span venture capital and private equity firms, corporations, and governments, each essential to the sector's development. Both public and private investors will need to accelerate their activity to move QC into the mainstream.

Global quantum investment is highly uneven. Europe and parts of Asia stand out for public

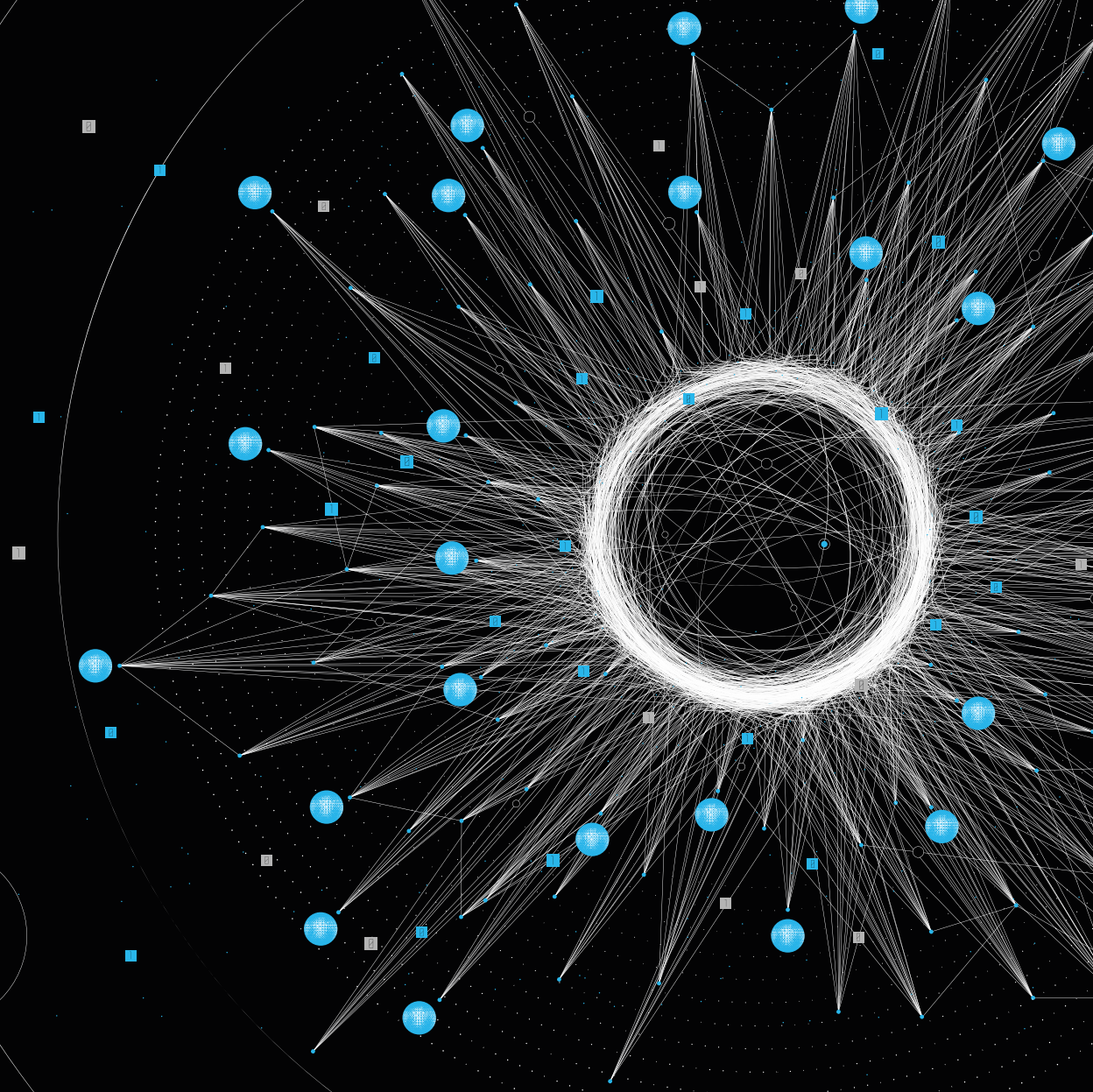
EXHIBIT 2

Among commercial sectors, advanced industries, finance, and telecom are the most actively engaged in quantum-computing projects.

Adoption of quantum computing across industries, by stage, *number of companies (n = 400)*



Note: For details, see Exhibit 2, "Quantum's bold promise: What business leaders need to know," McKinsey, May 2026. Data are from market research, including press announcements, LinkedIn posts, publications, job listings from 400 global companies, and client interviews. 1. Defined as active monitoring, announced research activity, discovery, and participation in conferences and discussions. 2. Defined as structured initiatives, use case exploration and analysis, and pilot planning. 3. Defined as demonstrated pilots or running experiments, business building, talent buildups, and deployed systems. 4. Encompasses the following subsectors: aerospace and defense, automotive, and industrial manufacturing. 5. Includes only a subset of prominent organizations.



funding, while the United States, and increasingly China and the United Kingdom, are attracting a disproportionate share of the private capital needed for late-stage scaling. Our analysis shows that as of 2024, QC companies in the United States have captured 57 percent of worldwide private quantum investment, while those in the European Union have attracted only 10 percent. This disparity belies the strong public support and large talent pool of quantum scientists in Europe.

Business leaders need to remain attuned to investment trends to strategically plan their organizations' future QC deployments and partnerships. Creating a robust quantum strategy means looking globally. For instance, leaders could look to the US ecosystem for commercial partnerships and to European innovation hubs to recruit scarce talent.

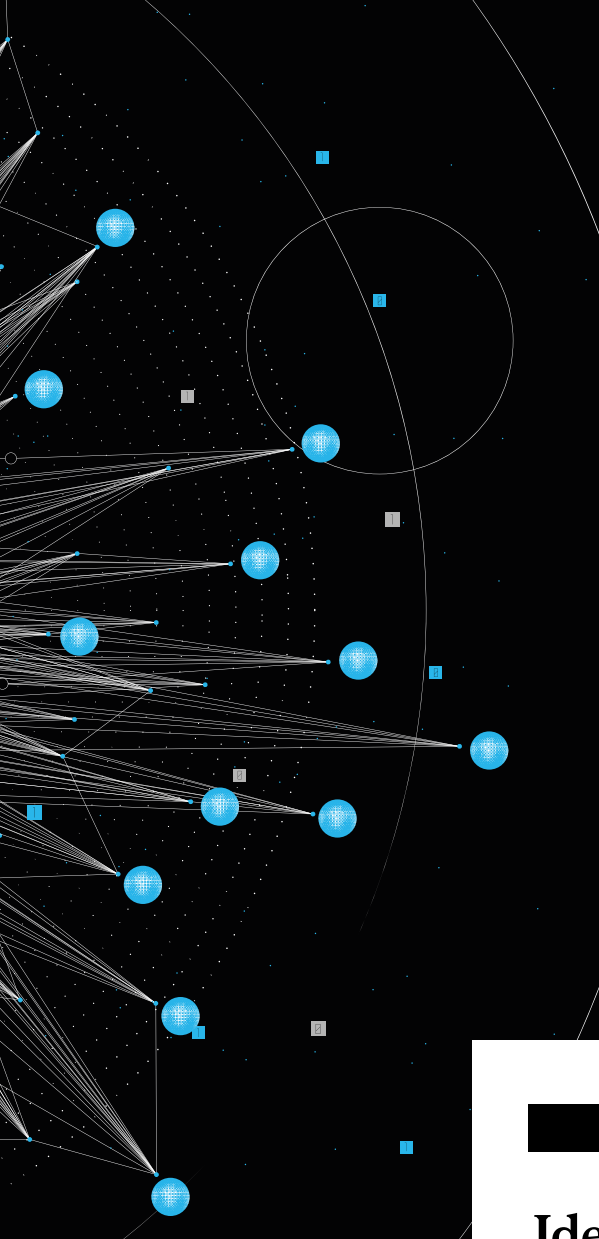
Technology Providers

Technology providers produce QC components, hardware, and software. They run the gamut

from start-ups spun out from academic research institutes to unicorn private companies such as PsiQuantum to large tech providers such as Google and IBM.

Two key sectors are on-premises QC machine sales—primarily to government and research organizations—and quantum-as-a-service (QaaS) platforms, which allow customers to access QC applications via cloud subscriptions and pay-per-use pricing. Providers of on-premises machines, which can cost millions to tens of millions of dollars apiece, include IBM, IonQ, IQM Quantum Computers, and Quantinuum. Some of the main QaaS providers today include Amazon Braket, IBM Quantum, and Microsoft Azure Quantum. These companies resell capacity from technology providers such as IonQ, Quantinuum, and Rigetti, which also sell their QC capacity directly to users.

In addition to these QaaS platforms, software providers are developing vertical applications that combine domain expertise with quantum



→ THREE STEPS FOR QC SUCCESS

Many companies will want to ready themselves for the maturation of quantum computing, given its potential to create value. For forward-thinking companies, that preparation can begin now. Our research shows that a strategic QC playbook balances prudence with risk-taking over three crucial steps.

Step 1: Map Exposure and Opportunity

Getting QC right requires both defense and offense. Business leaders can map a defensive strategy by examining how their companies' sensitive data and critical infrastructure could pose quantum-related security risks, especially when Q-Day arrives. This requires inventorying which data and products must remain secure and then migrating those assets to quantum-resistant cryptography and hybrid encryption schemes. In parallel, leaders should embed quantum risk into vendor strategies by updating procurement standards and ensuring that their vendors can rapidly adopt postquantum cryptography standards as they become available.

algorithms in areas such as molecular modeling for drug discovery or risk analysis for financial services. We expect some of these vertical QaaS applications to evolve into outcome-based business models where customers pay for tangible results delivered by QC. This customer-centric commercialization model could be especially prevalent in the pharmaceutical sector, where companies already pay for each viable drug candidate discovered using AI. Complementing QaaS offerings will be full-stack solutions that combine hardware sales, software licensing, and consulting services, in which QC technology providers cocreate tailored solutions for each customer.

Rather than betting that a single leading QC technology provider will emerge, executives can adopt a multivendor approach, selecting specific providers to solve specific business use cases.

Identify high-value use cases where the performance limits of classical computing hold back innovation.

Simultaneously, business leaders can outline an offensive strategy by mapping their companies' specific business problems to potential quantum solutions. They can start by identifying a few high-value use cases where the performance limits of classical computing are holding back innovation. These are the use cases where even an incremental quantum advantage could create material differentiation, such as developing R&D pipelines or conducting combinatorial optimization for scheduling, routing, or asset allocation. Once these use cases are identified, companies can invest in partnerships with



Four Problems Quantum Computing Can Solve

FOR BUSINESS LEADERS LOOKING to grasp the fundamentals of quantum computing (QC), we have identified four evolving QC capabilities that will emerge over the next three to ten years. All will be critical for solving complex computational problems.



Prime factorization

could dramatically accelerate the factoring of large integers compared with classical algorithms. This process uses a sequence of steps known as Shor's algorithm, which combines quantum interference with classical math routines to efficiently factor large integers and could break the math underpinning existing public-key cryptography.

Although demonstrated for small numbers on quantum devices containing only a few quantum bits (qubits), prime factorization at scale will require fault-tolerant quantum computing, as well as advances in error correction and qubit scaling. That may take at least ten years. From the mid-2030s onward, prime factorization could become commonplace, necessitating urgent attention from companies today to ensure they secure their systems for a postquantum cryptography world.



Quantum AI

promises to harness quantum processors to either speed up existing AI training or enable fundamentally new learning paradigms, such as quantum neural networks that could analyze data far more efficiently than today's AI systems. Full-scale deployments are still at least a

decade away, but quantum-machine-learning (QML) algorithms have been demonstrated in small-scale experiments. For example, researchers have developed a new liquid biopsy technique using QML that distinguishes between exosomes (microscopic particles released by cells) from cancer patients and those from healthy individuals by analyzing their electrical "fingerprints." This approach could offer a faster, less invasive, and more cost-effective way to detect cancer.

Quantum AI could also offer a synergistic feedback loop, as classical AI methods could improve quantum algorithms and hardware control, potentially accelerating the maturation of quantum systems.



Quantum optimization

addresses complex combinatorial and numerical problems by leveraging quantum algorithms that explore vast solution spaces more efficiently than classical methods. While concrete field-specific examples are still emerging, early use cases in logistics and finance are demonstrating promising quantum optimization. For example, financial-services companies could use QC for portfolio optimization, helping identify optimal asset allocations faster and more efficiently than classical computational techniques. This can allow a financial institution to determine the ideal investment mix within a portfolio and quickly alter its approach to respond to risks. In one example, Citi Innovation Labs has partnered with QC software company Classiq to explore opportunities for portfolio optimization.

Exploratory quantum hardware has also begun showing promise in accelerating heuristic algorithms to solve complex problems such as energy grid design or traffic flow management.

Broader commercial applications of heuristic optimization could emerge within five years, with large-scale deployments in the early 2030s. These applications will first leverage hybrid quantum-classical workflows before fully fault-tolerant machines become widely available.



Quantum simulation

can model complex systems, such as molecules and advanced materials, that are extremely challenging or impossible to simulate accurately on classical hardware because of the immense computational resources required. For example, simulating the quantum behavior of just 50 qubits requires tracking more than one quadrillion states simultaneously. Quantum computers, by directly exploiting quantum principles such as superposition and entanglement, naturally represent these states, enabling the efficient and accurate simulation of quantum phenomena beyond the reach of classical computers. Quantum-simulation applications for chemistry, materials science, and drug discovery are already being deployed in small numbers and should reach scale within three years. Large-scale deployments are expected by the late 2020s to the early 2030s. This is contingent on developing error-corrected systems containing tens of thousands to hundreds of thousands of qubits.

QC companies, pilot programs, and talent development. In particular, they can explore whether software solutions from companies such as Classiq, Horizon Quantum Computing, Kipu Quantum, Q-CTRL, and Strangeworks could address their use cases, or whether they want to engage in the deep hands-on work of building QC software themselves.

Beyond these defensive and offensive plays, leaders can benchmark their QC readiness against industry peers, many of which are already cementing early partnerships with technology providers. Mapping exposure in this way can help organizations quantify both the risk of disruption and the potential for value creation from QC.

Step 2: Secure Options on Technology and Talent

The companies that will win with QC tomorrow are building the necessary technology infrastructure today. To get that right, CEOs and their technology teams can establish strategic relationships with quantum hardware or cloud providers, ideally spanning different technological approaches, including on premises, cloud, and hybrid. They can also begin adapting their own technology architectures incrementally. This could include modernizing data pipelines, modularizing compute workflows, and ensuring their high-performance computing and AI environments can interoperate with emerging quantum run times. Of course, companies should be mindful not to alter their existing tech stacks too quickly or dramatically. They can instead build a flexible foundation that enables the integration of QC capabilities as they mature, given that the market is still early and the trajectory uncertain.

Forward-thinking CEOs are already securing the talent they will need to adopt QC in the next three to five years. The demand is high, and the talent pool is small, so moving fast will be essential. Hiring QC experts from research labs and universities is one proven avenue. CEOs can also build a small internal “translation” team of two to five people who will oversee the company’s gradual shift from classical computing to QC. This team should be closely tied to AI units and tasked with evaluating QC use cases, coordinating pilots, and connecting business, data, and quantum experts.



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Step 3: Run Targeted Experiments During the Readiness Window

Getting good at anything requires practice, and QC is no exception. This means that business and technology leaders can design a few high-value QC pilots now in areas such as molecular simulation, portfolio optimization, or logistics using the latest QC offerings or hybrid quantum–classical computing platforms. Developing early QC algorithms on small-scale machines can help ensure that a company owns the IP for this software when more powerful machines come online.

Companies can also get their data ready today for a quantum future.

Quantum algorithms require data to be structured differently than classical AI models, so cleaning and re-architecting enterprise data now is a prerequisite for future speed. In addition, technical teams can integrate QC considerations into their broader AI and cloud road maps.

Whichever pilots their companies deploy, CEOs should measure not just ROI but also the IP created, the talent developed, and the ecosystem relationships built. This approach can deliver maximum learning and secure long-term value.

Quantum computing is moving from scientific theory to strategic reality. Many technical hurdles remain, but the combination of advancing hardware, faster progress on software algorithms, and accelerating investment shows that QC will soon become mainstream. Clearly, most business leaders can no longer treat QC as a distant curiosity.

Leaders who act now to understand where quantum intersects with their core challenges, secure options on talent and technology, and run targeted pilots will have a crucial head start. They will be able to defend against the upcoming security transition and seize QC’s opportunities offensively. Over the next decade, their companies could be poised to capture a large share of economic value that QC may deliver. [Q](#)

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PHOTOGRAPH BY SCOTT MCDELMOTT

In five years, IBM CEO Arvind Krishna has revived the once-stagnant company. With AI and quantum, he sees lots of opportunity ahead.

‘This is not
about
tightening
the belt;
it’s reimagining
how work
is done.’

A CONVERSATION WITH
IBM CEO ARVIND KRISHNA

IN HIS 30 YEARS AT IBM, ARVIND Krishna has been driving innovation across core technologies, including AI, quantum, and cloud, to name a few. Since taking on the CEO role in 2020, the company's market value has tripled. That's a direct result of the changes he has introduced: doubling down on software, shedding big businesses that weren't aligned with his new strategy, pursuing innovation, embracing the potential of AI, and getting a 250,000-person company to move with alacrity.

Krishna recently sat down for a conversation with McKinsey Senior Partner Eric Kutcher about IBM's turnaround and the opportunities ahead, including his vision of the future of quantum computing. What follows is an edited transcript of their conversation.

Eric Kutcher: The phrase "interesting times" might be the understatement of the century. As a CEO, what are the forces at play today that you think about? How do you lead through those forces in a world where you have very little control over them?

Arvind Krishna: The word I would use is opportunity. Yes, the world is less predictable than it used to be, but when things are less predictable, by definition there's volatility. When there's volatility, that means that the current world order changes, and as it changes you have to ask, "What's the opportunity?" Let's take inflation as an example. A consequence of inflation is higher interest rates; when there are higher interest rates, people are looking for more productivity; as they look for more productivity, there's a greater appetite for technology solutions. So, absolutely, volatility brings all these headwinds. And you could hunker down and say, "Oh, my God. This is not what I was planning." Yes, it's not what you were planning, but your competition has the same headwinds. So, I would say whenever there's uncertainty, there's



IBM hybrid cloud servers.

opportunity, and it's our role as leaders to help guide our people through it and use it to take our clients to a better place.

EK: Even as they identify the opportunities that volatility can present, I sometimes find CEOs struggle with feeling too constrained to take them—because they still have to hit the earnings and keep the train on the tracks. How do you juggle that?

AK: One could go back and look at history. The pandemic came around, and everybody had uncertainty about what revenues and profits would be. The debates were rife, “How bad is the dip? Is it going to be three months or three years? Will it be a 3 percent dip or a 30 percent dip?” You could say, “Well, I’m just going to try to manage that.” Or you can say, “I’ve got five other tough things to do. Why don’t I just package them all up and take it all on?” In our case, it was: OK, let’s borrow cash so that we are good through the pandemic. We’ve got to spin out a third of our revenue. We’ve got to divest some things that don’t fit our long-term strategy. And hey, let’s set a new M&A strategy. We used the opportunity to take on all the bumps in one go. And then, to try to grow. Deferring pain is never a good idea.

EK: Let’s talk about one of the great opportunities: You are at the center of this moment around AI. What are some of the things you’re seeing in AI that are actually changing the way business works?

AK: This moment on AI is so interesting, because, in fact, the world has been using AI for about 30 years—there are many examples, but machine learning has long been used to make estimates in finance, in economics, and in sports. Then we had the era of AI that started with IBM winning *Jeopardy!* with a computer system called Watson. The problem with that era was that it was fragile and somewhat bespoke. You used a lot of data, and you used a lot of people to label the data; you constructed a model for a task, and if the task changed, or some of the data changed, you had to start again. What LLMs [large language models] now do is they put that on an industrial base. If more data comes along, you don’t need to start from scratch, you can just do more training—if the task changes only

slightly, you don’t have to change anything at all. So, the moment it’s on an industrial scale, you can begin to deploy it.

On the B2B side, I think the current generation of AI is going to help those who embrace it add about ten points to their bottom line while increasing revenue growth rates. Now, I’m not saying we would all add it to the bottom line. Rather, it frees up money for investment that you can plough back into innovation, R&D, sales. Take your pick depending on where you are on that journey. Where in the world have you seen an opportunity like that?

At IBM, we want to leverage AI to become the leanest, most nimble, and most productive company we can be. I looked at a cost base of about \$15 billion across what we would call third-party services, procurement, and G&A [general and administrative]. And I said, “We’ll take 20 percent out in the first two to three years, and then we’ll try to double that.” So, we set a bold target that we may not achieve, but if we get to 30 percent, I’ll claim victory. The idea is, this is not about tightening

‘We want to leverage AI to become the leanest, most nimble, and most productive company we can be.’

the belt and shaving 4 percent or 5 percent off; it’s reimagining how the work is done.

I think almost every back-office function can become 50 percent automated using AI. We’ve done a lot in our HR processes; we have something like 94 percent of our basic internal HR transactions handled by an AI bot.

We’ve also used AI at scale across about 8,000 of our 40,000 people who write code on products, and on that 8,000, we are getting 45 percent productivity increases. Many people react with, “Oh, my gosh. They’re taking 4,000 people out.” But no,

I'm adding 4,000 because if it's cheaper to build products, I can build more products that appeal to smaller and more niche audiences, whereas previously I might have said it was too expensive. In customer service and customer experience, anybody who says, "AI can't help me in half of that" is delusional. Right now, we're only at 5 percent there, but I think 70 to 80 percent is within reach. The opportunity to harness this generation of AI across all of this is here and now.

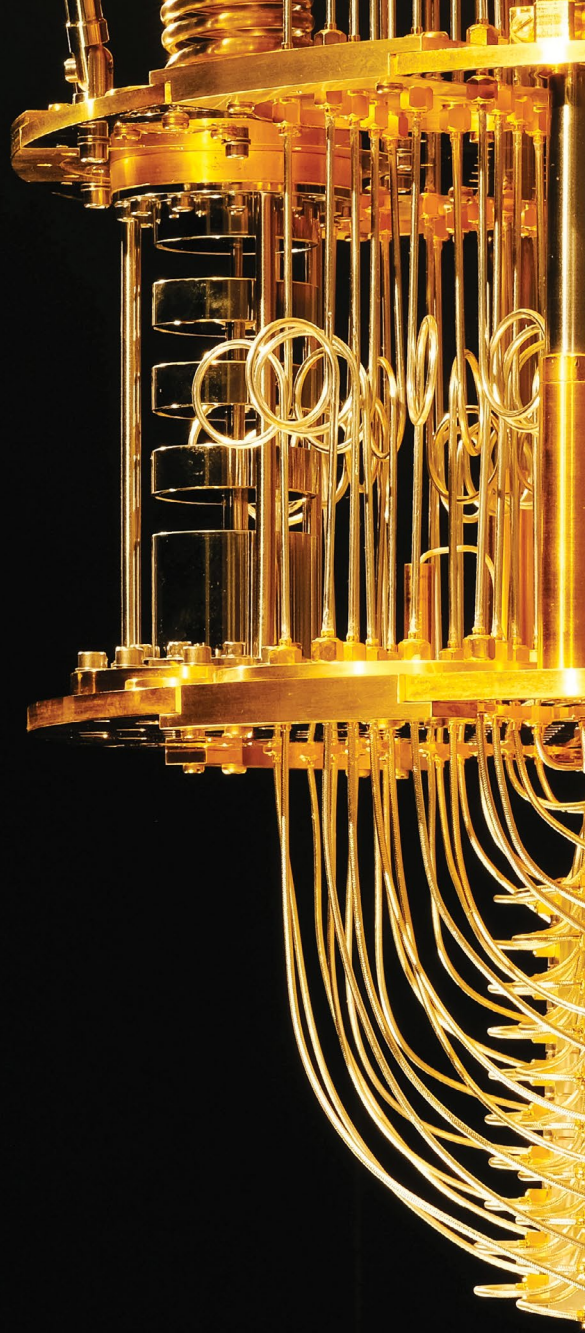
EK: You're also at the center of quantum. What happens from an AI point of view when you suddenly have quantum? And where are we right now in terms of quantum versus when we'll start to see it become more mainstream?

AK: If we define 2022 as the moment when AI went from being of interest to mainstream [use] and recognize that tech cycles move faster after each one, I'd say that quantum today is where AI was in 2015 or 2016. For the short to medium term, which I would define as the next ten or so years, quantum is additive to AI, meaning it's solving problems that AI can't solve very well. Think of AI as being great for large amounts of data, finding patterns that are in the data. Quantum is much more about deep compute—so, looking forward as opposed to looking backward on data. At some point as quantum gets better and more mature, it will replace some of the AI work. That intersection is longer term; we are maybe 15 years out from that.

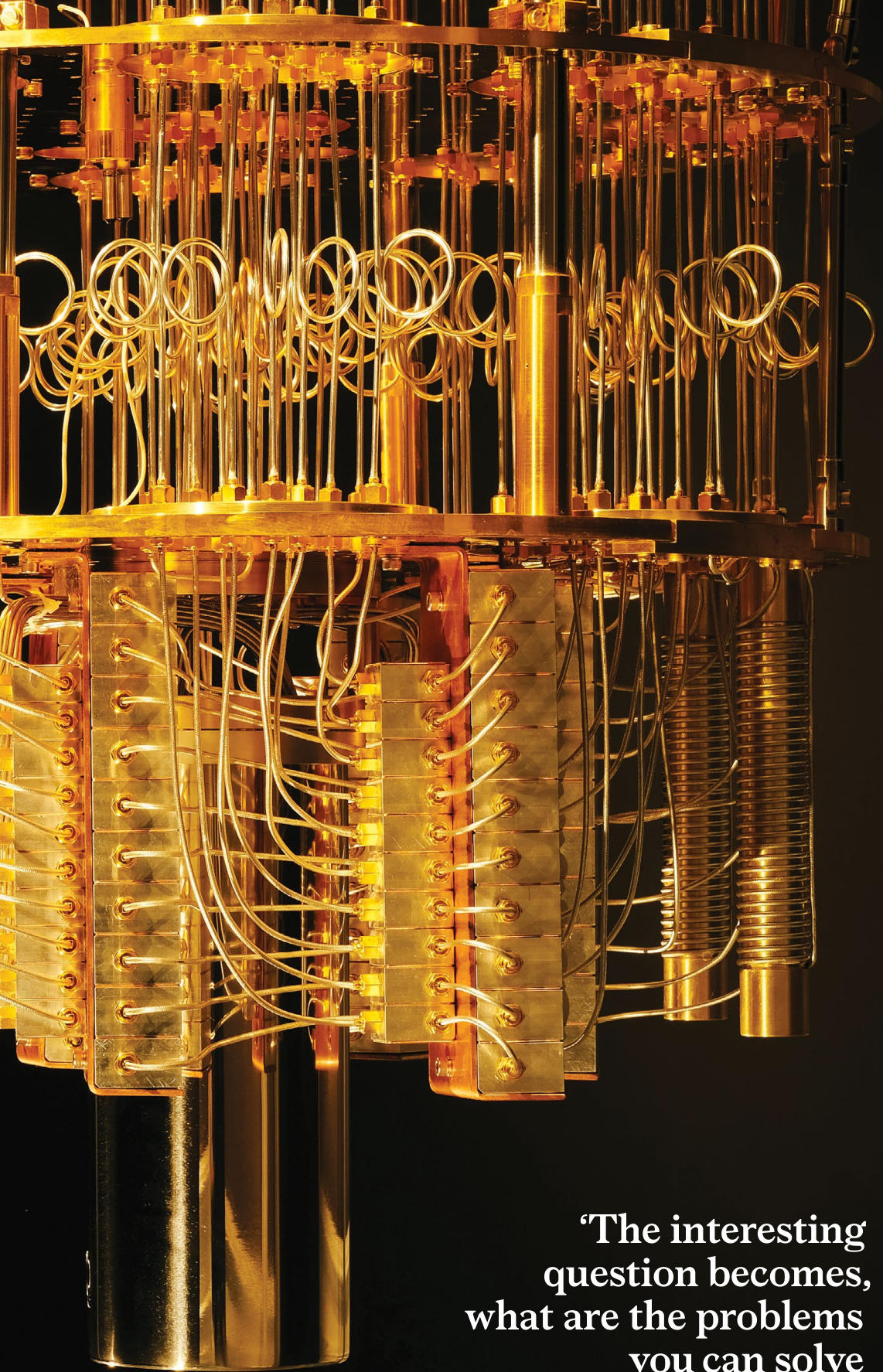
The interesting question becomes, what are the problems you can solve using quantum? We're already seeing this play out with our clients, where you can do better portfolio optimization using a quantum algorithm, or better bond pricing because quantum can find patterns hidden deep within the data. So, you can already start to look at new solutions with quantum, and that unlocks new markets.

EK: When you stepped into the role of CEO in 2020, the world was in a moment of great uncertainty, and IBM had been somewhat stagnant for a while. What was your thinking coming in, and how have you approached growth at IBM over the past five years?

AK: I had a very strong view that to be relevant in the market, you have to grow. And you can't just say, "I want to grow." Grow how, and where? When I came in, I said, "We have to be known for innovation." And this meant growing in areas that lean into



The inner workings of a quantum computer.



‘The interesting
question becomes,
what are the problems
you can solve
using quantum?’

‘When I came into this role, my order of priorities was strategy, talent, and then culture. Now, I would completely flip that order.’

innovation. I think the gap is that most people are not willing to take the hard actions necessary to do that. If we wanted to grow and be highly innovative, first we had to look at why we had low-margin, less innovative businesses inside the company that were also declining. We had to say, “Those do not belong; they’re not aligned to the long-term strategy,” and take them out. Most people get hung up on, “Oh, my God. I don’t want to upset people. Customers will get upset. Employees will get upset.” We took out a third of our employees and a third of our revenue. Is it really hard to do? It is. But it unlocks many opportunities.

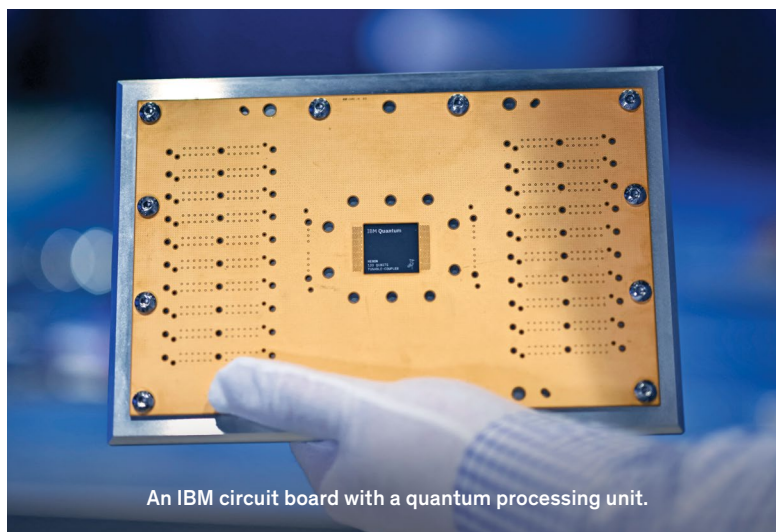
The second part of growth and innovation was being willing to invest in R&D—as well as M&A—that creates more innovation for your clients. Over the past five years, we’ve added over \$3 billion a year to our R&D budget. The third part I would say is that the world of tech is so big, you can’t really operate alone, you’ve got to form great

partnerships. And sometimes when you form those partnerships, you’ve got to say, “OK, I’m not going to operate in those areas, because that’s where the partner is really strong.” And so that was the third element of the unlock, and it was about pulling these three things together.

You were kind when you used the word stagnant; I think our CAGR was around –2 percent over some years leading up to that moment. We’ve now been at 5 percent, so that’s a 7 percent swaying already on revenue CAGR. My ambition is to make it more than that.

EK: You’ve made some big portfolio moves, and some would say you’ve sold in some areas that were high growth. Talk a little bit about how you thought about the reconfiguration of the portfolio, and this idea of organic versus inorganic growth.

AK: You’ve got to be willing to “do”: As opposed to getting disrupted by somebody else, disrupt



An IBM circuit board with a quantum processing unit.



An online version of this interview, featuring audio of the conversation, is available on

[McKinsey.com](https://www.mckinsey.com)



IBM CEO Arvind Krishna addresses a company event in Boston.

yourself while you still have the cash flow and clients who value your capabilities. Software is a great example. The value for clients, and consequently for investors, lies in software. When we began, the company was something like 22 percent software. Today, we are 45 percent software, with the software portfolio growing at about 10 percent. It's about half the company, and the company's growing at 5 percent. If we maintain that, that means software will soon cross over half, which is a big difference from where we were five years ago.

I don't think there is a clean division between inorganic and organic growth; I would never buy something unless it was going to help my organic growth rate go up. And I want the organic part to help increase the growth rate of the inorganic parts; these work together as a virtuous flywheel. I'll assert that with everything we have bought in the last six years, the growth rate has increased after we bought it, which most people think of as surprising because they think a big company will buy something and slow it down. It's been the other way around.

EK: IBM has historically been an organization where leadership has grown from within. You've made a lot of management changes. Can you talk about how you bring in talent today and make it work?

AK: At this point, about a third of my direct leadership team is people who didn't grow up inside IBM. About two-thirds are people who have grown up here, and we've pulled many people into the top layer from two, three layers down.

When you bring people in from the outside, you can do your hard checks IQ-wise and résumé-wise. What is hard to check is the interpersonal fit, and whether they align to how things are done, or what people call *culture*. I acknowledge that half of the outside hires will work, and half will not. It's very hard to prejudge that as it rolls out, but you can get great talent from the outside.

One thing to recognize is when something inside is not working; even if you get people from inside to fix it—and we do have a lot of great people to do that—it can take them longer to make big changes because that's how they're used to seeing it. So, you might get somebody from the outside, who brings a different perspective, to support them to succeed.

My "interview" focus is not all about what the person has done. Invariably it is, "Hey, if you were in this chair, how would you approach this?" So, they're coming in already aligned to, "I need to make all these changes." Whether from the inside or outside, part of it is about who is aligned to taking risk? Who is aligned to changing the way we do work? Who is aligned to growing in the areas we're going to grow, which right now is software, and then having a much more integrated company? People who are aligned toward those things and willing to take risks to get there are what we want in a team.

EK: We talked a bit about IBM having a period of stagnancy. You could argue that the speed of the organization has been slow. How do you get a

more-than-100-year-old organization of this size to move with greater speed?

AK: There are two reasons why speed is a challenge. One, as a large company, we operate in 190 countries across multiple lines of business. At 250,000 people, there is an element of just sheer scale that makes it slow. But I think there's a bigger challenge that causes slowness, and it comes back to the risk point. If people are risk averse, they'd rather get a check-in with somebody. If that somebody is risk averse, they would rather say no than yes, and you end up fighting through ten nos. To get people moving faster, you've got to say, "Hey, they're going to fail a third of the time. They may not succeed." You've got to begin to get to a culture where you say, "It's OK to be mostly, but not always, right."

How do you get people used to the fact that not everything they do will work? Or that if you are going a lot faster, then you actually more than make up for the total success in the speed? A team came to me about two years ago and said, "Hey, we can build this great tool, leveraging gen AI to help modernize the mainframe. We need 21 months." I said, "OK, great, but can you do it in six?" Their response was no way, so I asked them to go away and think about what they would need to do it in six. They came back about two weeks later and said, "One of the reasons we are going slower is that we know some gen AI, but if we had a couple more people who knew it well, it could help. And we need more resources. But it's still probably nine to 12 months away." I got them what they needed, and they did it in six. Now, that story gets around, and people start to see that's how they can and should do it.

I really do think that this is where senior leadership often falls down. We put people in a box and simply tell them to go and do it. You've got to



help them; it is a huge unlock to say, "What do you need?" as opposed to "Just do it."

EK: Given everything you know today, what do you wish you had known before you took on this role?

AK: When I came into this role, my order of priorities was strategy, talent, and then culture. Now that I have five and a half years under my belt,

'You've got to begin to get to a culture where you say, "It's OK to be mostly, but not always, right."'



Lab technicians inspect automation equipment at IBM's Albany, New York, research facility.

I would completely flip that order. In reality, all three are deeply intertwined and equally important. But I think many people coming into the role spend 50 percent of their time on strategy, and then a good 30 percent externally. That only leaves 20 percent total for talent and culture. I think it ought to be 50 percent on talent and culture and 50 percent for everything else.

EK: You're now in what we could call your third season as a CEO, and five years in is a real checkpoint. You've roughly tripled the share price—that's an amazing run. How do you get the energy and the vision to be able to take it toward another tripling?

AK: If I look upon my original intent—how do I get us to be perceived as much more innovative, and how do we get to much more growth—I tell myself I'm only halfway there. By the way, you never get all the way, and I actually think anyone in my position

should be able to step back and say, "If we are really slowing down on our rate of progress, then it's time to get somebody else who's got the energy, the fresh thinking." For me, that is the moment when you should go do something else and let somebody else take it. But as long as I believe we have a lot more to do, then I'm energized to keep pushing the organization forward to unlock that potential, and that is what keeps me jumping out of bed in the morning. [Q](#)

» Arvind Krishna is chairman and CEO of IBM. Eric Kutcher is a senior partner in McKinsey's Bay Area office and serves as McKinsey's chair of North America.

» Comments and opinions expressed by interviewees are their own and do not represent or reflect the opinions, policies, or positions of McKinsey & Company or have its endorsement.



The benefits of adaptation far outweigh its costs. Yet the world today spends just one-third of the amount needed to protect everyone exposed to hazards to developed-economy standards. What would it cost to adapt as the Earth warms, and how much will get spent?

Advancing Adaptation: Mapping Costs from Cooling to Coastal Defenses

↳ Humans have adapted to their local climates for millennia. Today, many proven, cost-effective solutions exist to address extreme weather that affects roughly 40 percent of the Earth's landmass.

Research by the McKinsey Global Institute finds that the world spends \$190 billion to deploy 20 tried-and-true adaptation measures ranging from fans and air conditioners to irrigation systems and sea dikes, which protect about one billion people exposed to heat, wildfire, drought, and flooding.

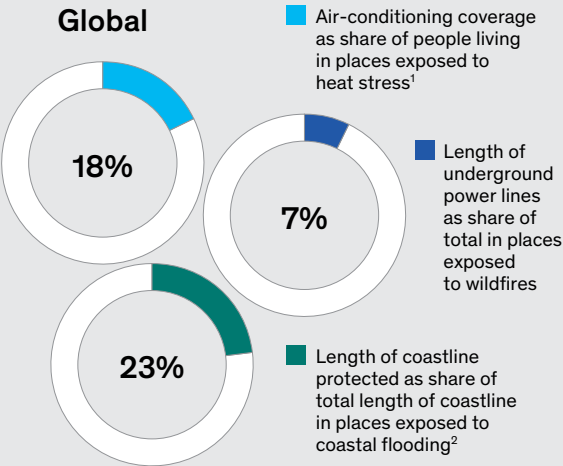
Yet despite the benefits of adaptation exceeding its costs, the world still has a resiliency gap, leaving three billion people with limited or no protection. Protecting these people at standards

established in developed economies would cost an additional \$350 billion a year, or roughly \$120 per person. And going forward, as the global temperature climbs, the pattern and occurrence of hazards will shift, changing adaptation needs.

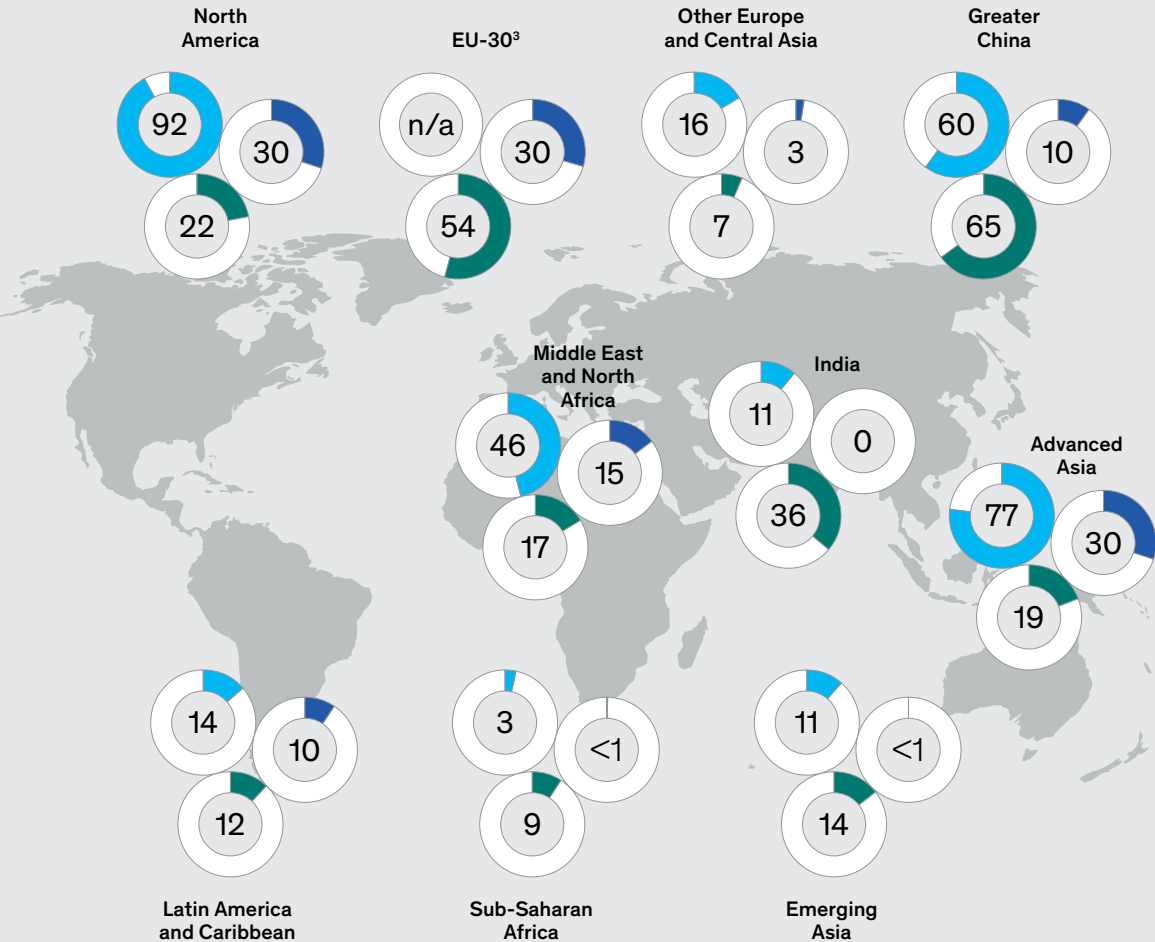
These findings are based on a first-of-its-kind comprehensive, pixel-level, geospatial assessment of adaptation today and through 2050, which is when current emissions trajectories suggest the world will have warmed to 2°C. The following selection of exhibits equips individuals, businesses, and policymakers with an understanding of adaptation needs, as well as the associated costs and benefits, enabling informed action on resilience now and over the long term.

Adoption of adaptation measures varies across regions and is lowest in emerging economies.

Today, adaptation measures are more widely deployed in advanced economies, while emerging economies experience larger resiliency gaps. Across all income levels, cities are typically better protected from climate hazards than rural areas, perhaps because their capacity to spend is greater and because each dollar invested protects more people, given their population density.



Regions' adaptation to extreme weather events today, select adaptation measures, %



Note: Observations of global temperatures indicate that Earth warmed by 1.1°C relative to preindustrial levels in the decade prior to 2020, which is when our analysis starts and what we refer to as "today." 1. Our estimate for air-conditioning coverage uses data from 2018, the closest year to 2020 with available data. Air-conditioning penetration in Greater China has risen sharply and is expected to have been higher in 2025. 2. Coastline is considered protected if coastal defenses can withstand a 1-in-100-year flood event with a height of at least 50 centimeters. 3. EU-30, which includes the 27 EU economies plus Norway, Switzerland, and UK, have had no population exposed to heat stress today by our definition. **Source:** Fathom Global Flood Map Fathom 3.0, 2021; McKinsey Global Institute analysis



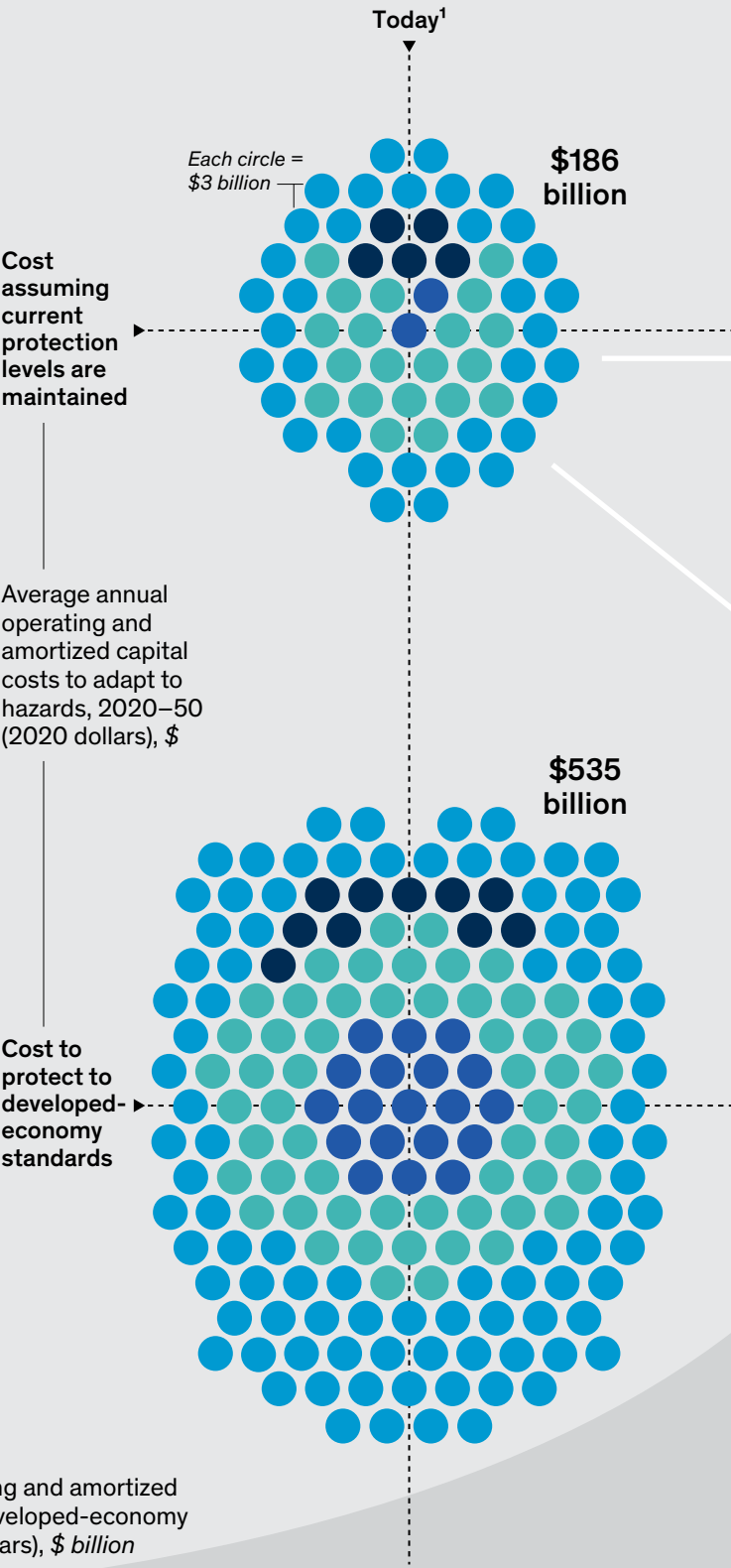
Protecting against hazards at 2°C to developed-economy standards would require \$1.2 trillion in adaptation spending annually by 2050.

As the Earth warms, hazards will become more widespread and sometimes more severe, increasing adaptation costs. Spending \$1.2 trillion annually would protect billions of people to developed-economy standards at 2°C of warming by 2050.

While adaptation is a good buy, spending is not a given and will need to scale going forward, even to maintain current protection levels. Factors such as capacity to pay, competing spending priorities, collective-action challenges, operational hurdles, and political will could complicate implementation.

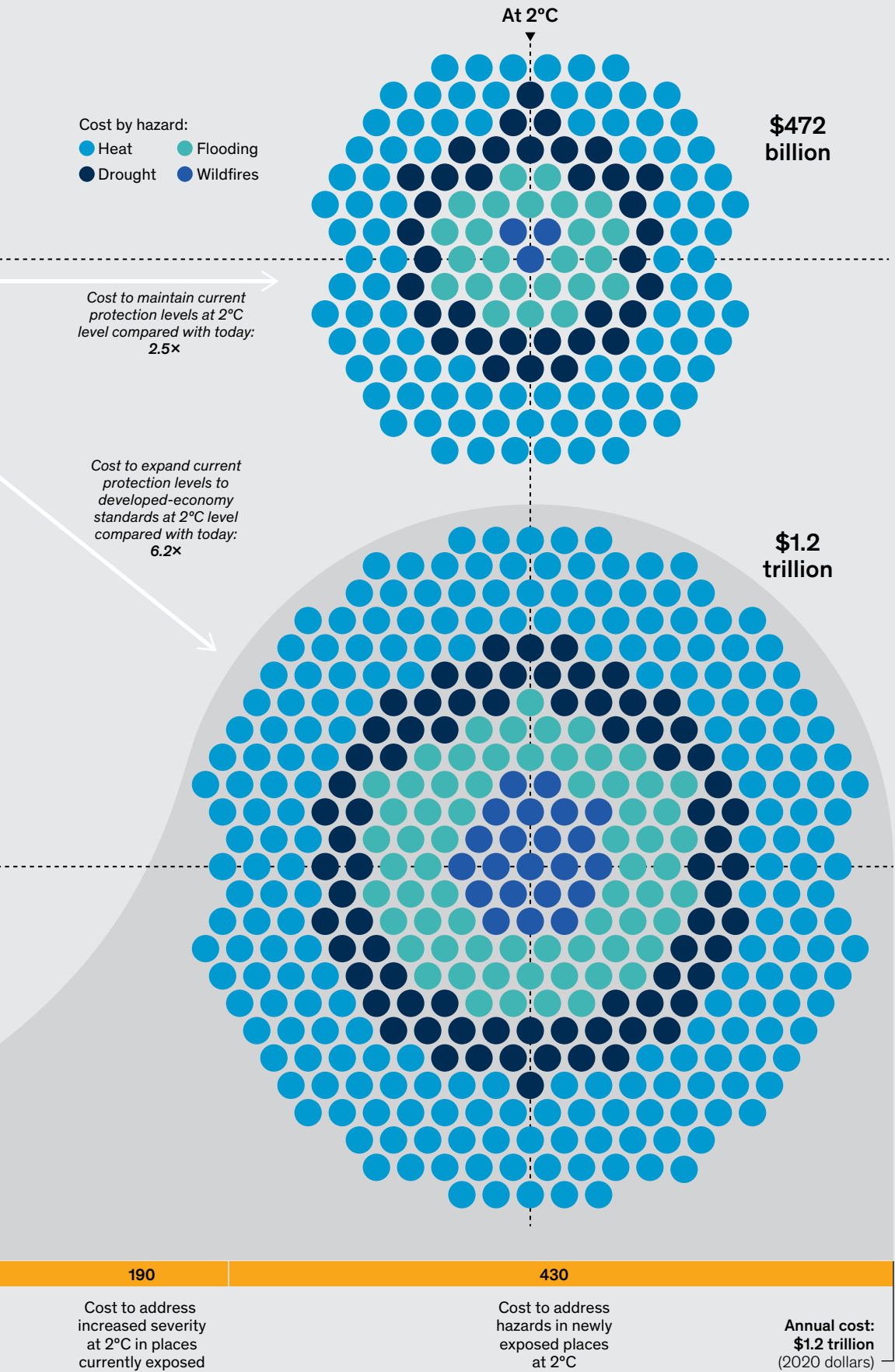
About 40 percent of the costs are capital expenditures, such as building infrastructure or purchasing durable goods. The remaining 60 percent would go toward operating costs, including infrastructure maintenance and electricity.

Distribution of average annual operating and amortized capital costs to adapt to hazards to developed-economy standards at 2°C, 2020–50 (2020 dollars), \$ billion



190	350	
Spending today¹	Cost to close today's resiliency gap	

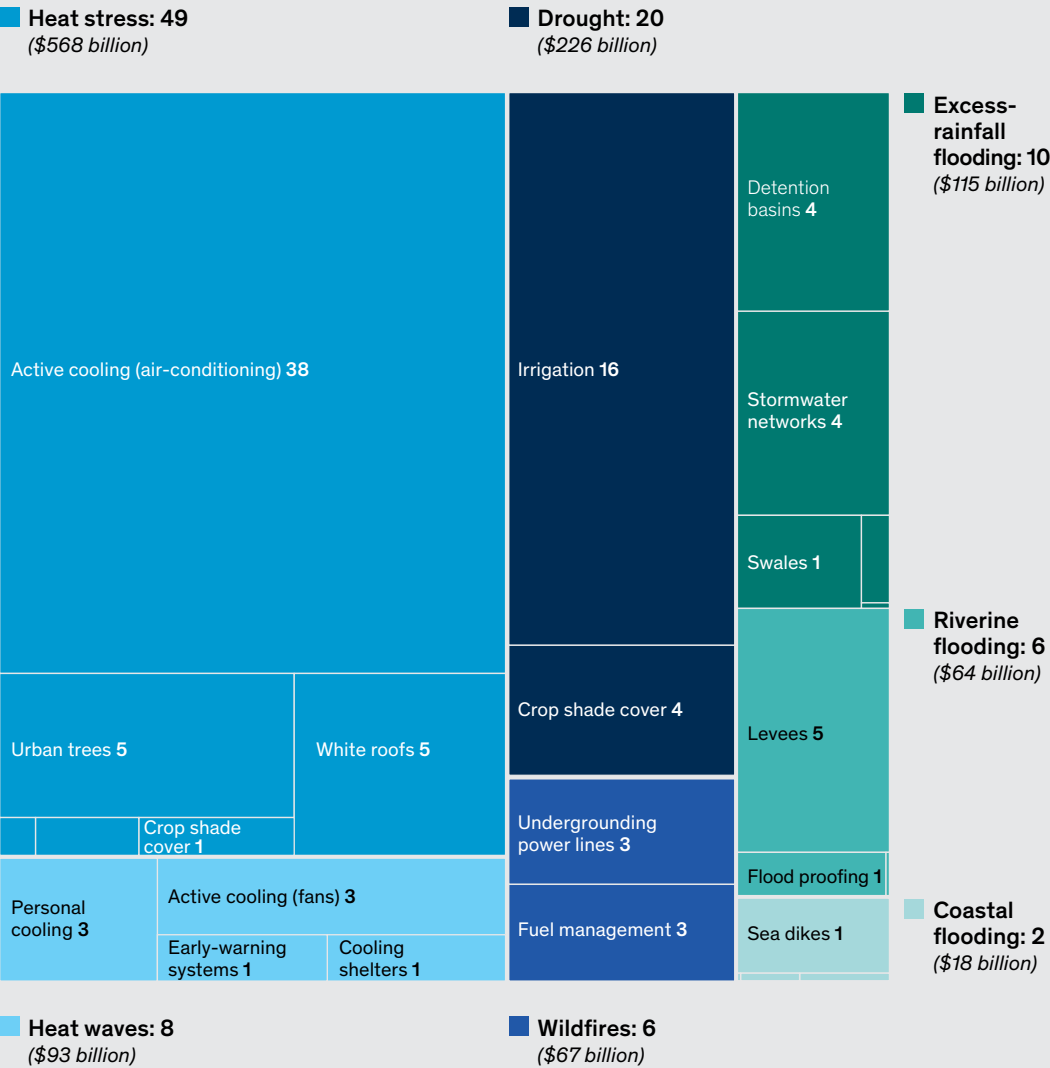
1. Observations of global temperatures indicate that Earth warmed by 1.1°C relative to preindustrial levels in the decade prior to 2020, which is when our analysis starts and what we refer to as "today." Source: Coupled Model Intercomparison Project (CMIP6), 2021; European Union Global Human Settlement Layer; Fathom Global Flood Map Fathom 3.0, 2021; Inter-Sectoral Impact Model Intercomparison Project Phase 2b (ISI-MIP2b), 2017; Kumm, Taka, and Guillaume, 2018; NASA NEX-GDDP, 2021; McKinsey Global Institute analysis



Air-conditioning and irrigation systems account for more than half of the adaptation spending to protect at 2°C to developed-economy standards.

Protection against heat and drought accounts for three-quarters of the adaptation costs at 2°C of warming, primarily for air-conditioning and irrigation. While this may seem surprising, more than 40 percent of the global population in 2050 would live in places exposed to heat stress, while less than 1 percent would live in areas exposed to coastal flooding.

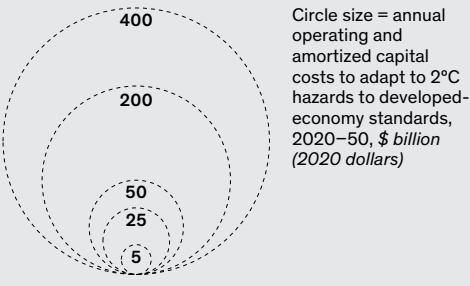
Distribution of annual average operating and amortized capital costs to adapt to 2°C hazards to developed-economy standards, 2020–50, %



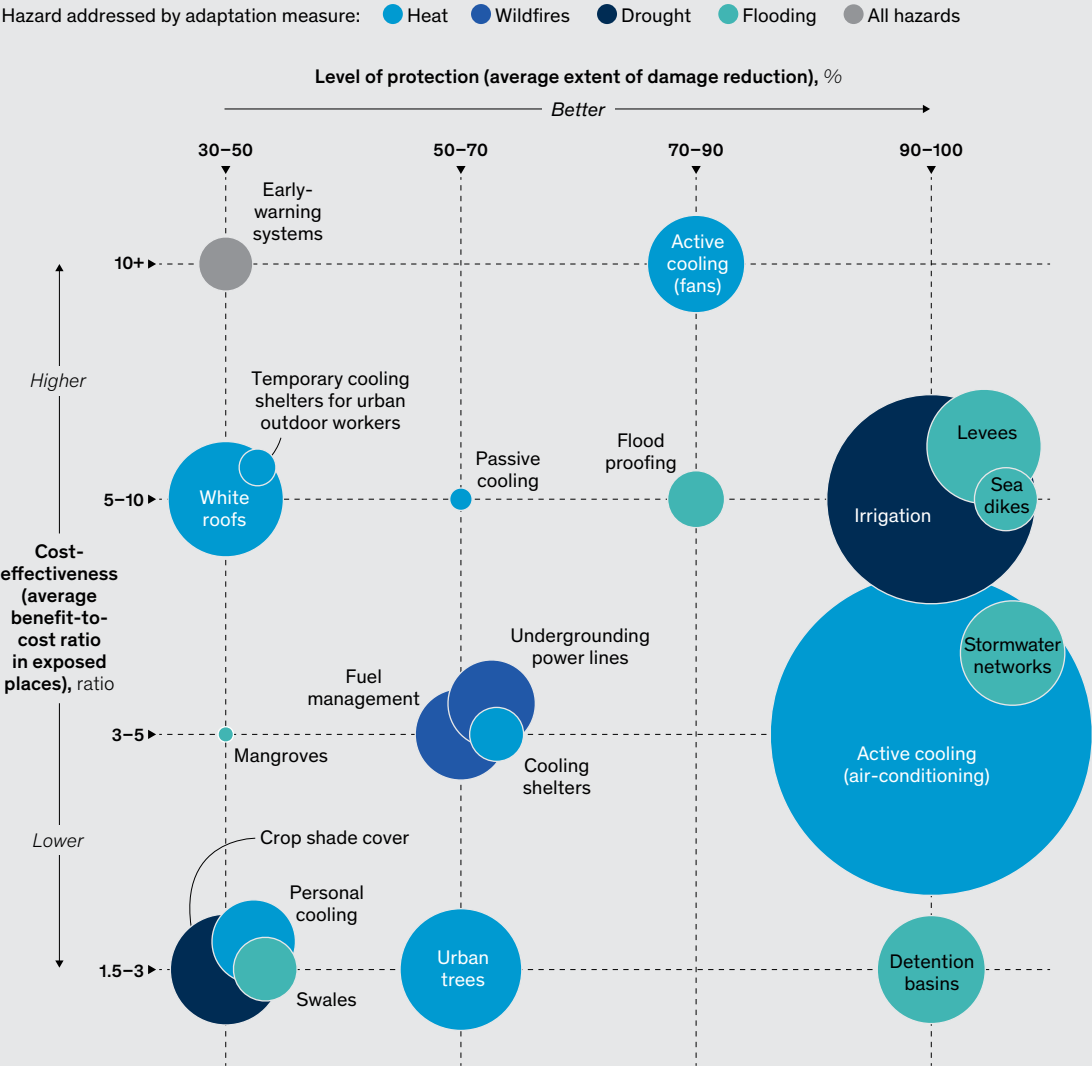
Note: This analysis is based on warming levels likely under current emissions trajectories, which project that the global temperature is likely to rise 2°C relative to preindustrial levels sometime in the next 3 decades (measured based on multidecadal average temperatures). It includes non-survivable heat, the costs of which are incorporated into the other heat-related hazards. Currency figures are in 2020 US dollars. Figures may not sum to 100%, because of rounding. Adaptation measures with <1% are not labeled on this exhibit. **Source:** Coupled Model Intercomparison Project (CMIP6), 2021; European Union Global Human Settlement Layer; Fathom Global Flood Map Fathom 3.0, 2021; Inter-Sectoral Impact Model Intercomparison Project Phase 2b (ISIMIP2b), 2017; Kummu, Taka, and Guillaume, 2018; NASA NEX-GDDP, 2021; McKinsey Global Institute analysis

Adaptation measures vary in their cost-effectiveness and level of protection.

Adaptation overall offers great bang for its buck. In aggregate, these measures, if fully deployed, would deliver benefits valued at more than three times their costs in today's climate. As hazards become more severe, the cost of adaptation measures goes up—but often more slowly than the damages avoided, pushing the benefit-to-cost ratio to seven at 2°C of warming. Of course, the 20 measures vary in costs, benefits, and level of protection, offering a spectrum of investment choices.



Cost-effectiveness and level of protection at 2°C for 20 adaptation measures examined



Source: Coupled Model Intercomparison Project (CMIP6), 2021; European Union Global Human Settlement Layer; Fathom Global Flood Map Fathom 3.0, 2021; Inter-Sectoral Impact Model Intercomparison Project Phase 2b (ISI-MIP2b), 2017; Kumm, Taka, and Guillaume, 2018; NASA NEX-GDDP, 2021; McKinsey Global Institute analysis



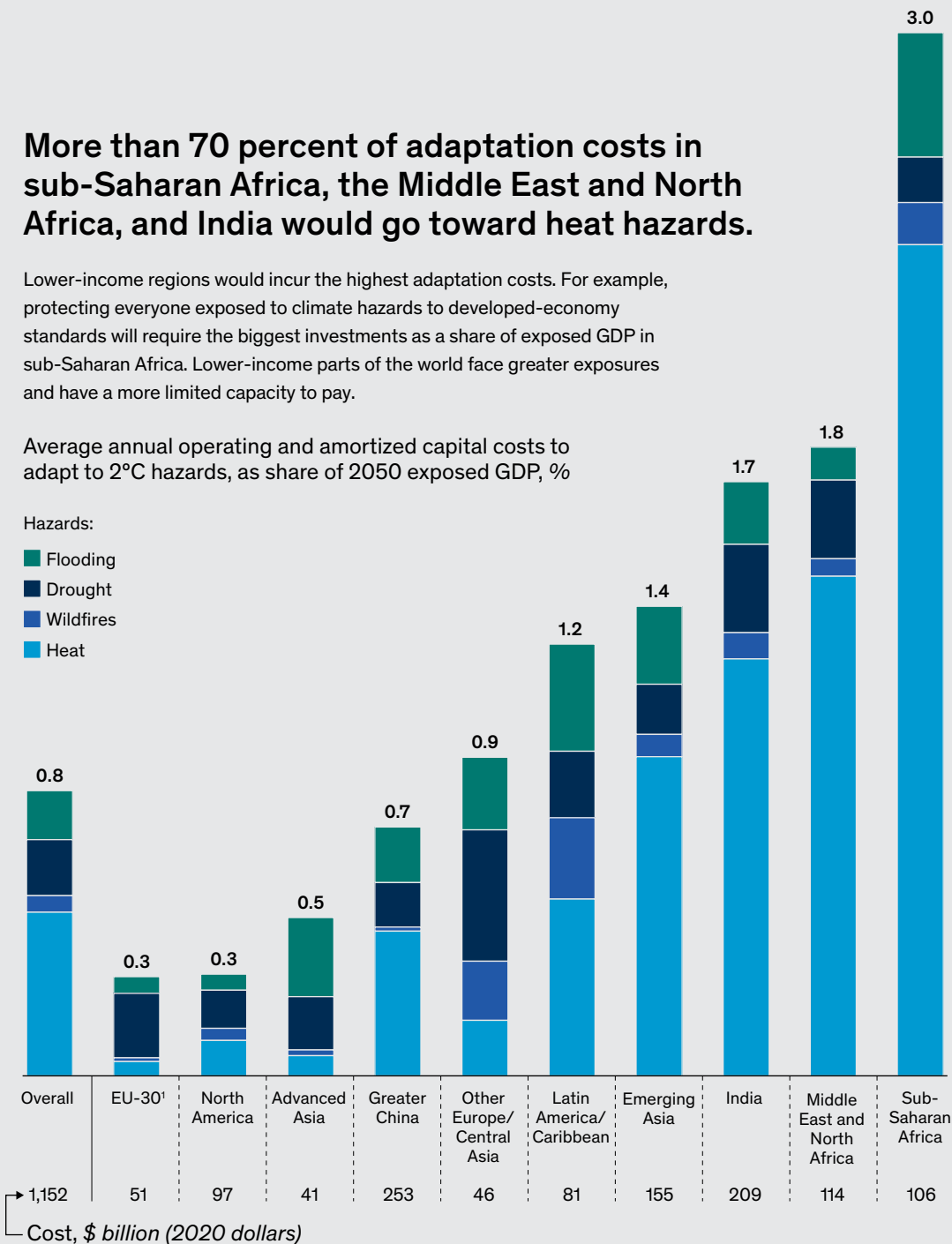
More than 70 percent of adaptation costs in sub-Saharan Africa, the Middle East and North Africa, and India would go toward heat hazards.

Lower-income regions would incur the highest adaptation costs. For example, protecting everyone exposed to climate hazards to developed-economy standards will require the biggest investments as a share of exposed GDP in sub-Saharan Africa. Lower-income parts of the world face greater exposures and have a more limited capacity to pay.

Average annual operating and amortized capital costs to adapt to 2°C hazards, as share of 2050 exposed GDP, %

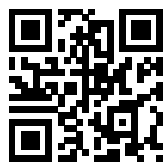
Hazards:

- Flooding
- Drought
- Wildfires
- Heat



Note: Costs are for 20 adaptation measures used to protect against 4 categories of hazards: heat, drought, wildfires, and flooding. Our climate analysis is based on warming levels likely under current emissions trajectories, which project that the global temperature could rise 2°C relative to preindustrial levels sometime in the next 3 decades, as measured based on multidecadal average temperatures. Figures may not sum to totals, because of rounding. 1. Includes the 27 EU economies plus Norway, Switzerland, and UK. **Source:** Coupled Model Intercomparison Project (CMIP6), 2021; Fathom Global Flood Map Fathom 3.0, 2021; Inter-Sectoral Impact Model Intercomparison Project Phase 2b (ISIMIP2b), 2017; NASA NEX-GDDP, 2021; McKinsey Global Institute analysis

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The AI Reckoning

HOW BOARDS CAN EVOLVE

by Aamer Baig, Ashka Dave, Celia Huber, and Hrishika Vuppala



ILLUSTRATIONS BY DAO





ARTIFICIAL INTELLIGENCE—including its many offspring, from machine learning models to AI agents—is much more than the latest wave

of technology. It is a general-purpose capability that is poised to touch almost every sector, function, and role, with the power to reshape how companies compete, operate, and grow. With trillions of dollars potentially at play and implications that could be existential to companies, AI is closer to a reckoning than a trend. And that is why AI is a board-level priority.

More than 88 percent of organizations report using AI in at least one business function; however, board governance has not matched that pace. While interest in AI seems to have spiked after the introduction of ChatGPT, as of 2024, only 39 percent of Fortune 100 companies disclosed any form of board oversight of AI—whether through a committee, a director with AI expertise, or an ethics board.

Even more telling, a global survey of directors found that 66 percent report their boards have “limited to no knowledge or experience” with AI, and nearly one in three say AI does not even appear on their agendas.

to become fluent in AI, not necessarily as a technology, but as a catalyst that affects the competitive dynamics of their sector. This might mean, for example, understanding how general-purpose AI systems can undermine a specific product line or service or how an AI-powered capability creates an opportunity to expand into a new market or adjacency.

AI-savvy boards will be able to help their companies navigate these risks and opportunities. According to a 2025 study from the Massachusetts Institute of Technology, organizations with digitally and AI-savvy boards outperform their peers by 10.9 percentage points in return on equity, while those without are 3.8 percent below their industry average.

What boards should do, however, is the bigger question—and the focus of this article. The intensity of the board’s role will depend on the extent to which AI is likely to affect the business and its competitive dynamics and the resulting risks and opportunities. Those competitive dynamics should shape the company’s AI posture and the board’s governance stance.

To better understand how boards can evolve to address AI, we conducted interviews with directors from 75 boards across various industries and geographies. We also analyzed the findings from the

AI-savvy boards outperform their peers by 10.9 percentage points in return on equity.

Having a low rate of AI adoption by boards might seem obvious at first, given the often-sizable investments many companies have already made in AI and the limited returns to date. AI adoption has not yet led to significantly improved performance for most businesses, with companies reporting modest levels of savings and new revenue.

In our experience, however, many of the issues plaguing AI programs—such as a lack of strategic coherence and unclear value dynamics—are precisely the ones that boards are best positioned to address. In other words, boards have an important role to play in redressing the disappointing outcomes.

That role is grounded in developing a strong understanding of how AI can change the business, both for better and for worse. Boards, therefore, need

McKinsey Global Survey on the state of AI and its data sets, which cover thousands of executives globally. This analysis highlights two priorities for boards:

- **Defining the company’s posture toward AI adoption.** Most organizations still lack a clear view of how AI fits into their strategy or transformation agenda. Without alignment between the board and management, oversight becomes either superficial or paralyzing.
- **Tailoring the governance model to match the company’s AI posture.** The board’s task is to calibrate its role around where to engage, what to oversee, and the cadence to use.

This article explores how boards can address these two priorities and also lays out six governance actions that every board should consider.

→ DEFINING THE BUSINESS'S AI POSTURE

A business's AI posture clarifies how AI fits into the company's strategic ambition and its priorities. Not every enterprise will approach AI the same way, nor should it. But having clarity about the potential impact of AI on the business provides boards and management with a foundation for making key strategic, governance, and investment decisions.

Two strategic dimensions determine a company's approach to AI, with where companies fall along the spectrum of each defining their posture:

- **Source of value.** Will AI help the company move beyond its core business model into new products, experiences, and revenue streams (expand strategically), or will its value primarily come from improving the existing model (optimize internally)?
- **Degree of adoption.** Will AI be embedded across the enterprise (holistic) or applied in targeted use cases (selective)?

A company's position along these dimensions determines its AI posture (exhibit). Determining which archetype a company wants to pursue is less about precision and more about aspiration. Companies are unlikely to fit neatly into one archetype and may straddle multiple ones—particularly at scale, where different business units or functions may pursue different approaches.

What matters is that the board aligns on the business's aspirational strategy using a clear view of the opportunities and risks so that it can tailor the governance approach. As the business gains greater experience with AI, the board can modify its posture. The four archetypes are as follows:

- **Business pioneers.** AI sits at the center of strategy, driving new offerings and redefining competition. Think of a medical-device company that could evolve from selling equipment to delivering AI systems that interpret scans and suggest appropriate treatments, thereby transforming from a manufacturer into a healthcare solutions provider.
- **Internal transformers.** AI becomes the backbone of operations, reshaping how an enterprise runs. An example of this archetype is a mining company deploying AI to guide exploration, automate extraction, and optimize refining—thereby transforming a labor- and asset-intensive model into a data-driven one. Similarly, a media studio could embed AI across its production pipeline, producing faster, cheaper content at scale.
- **Functional reinventors.** AI is used to enhance specific workflows with proven returns. Companies

treat AI as a disciplined, ROI-driven investment rather than a reinvention lever. As an illustrative example, a healthcare system might adopt different AI scheduling, transcription, and workforce tools. Or a logistics provider could use route optimization and predictive maintenance to cut costs.

- **Pragmatic adopters.** AI is adopted for targeted applications based on already proven market traction. This is essentially a fast-follower approach. For example, a consumer goods company may wait until off-the-shelf e-commerce recommendation tools have been proved before adopting them to expand to new segments. Similarly, a fashion retailer might start leveraging AI to offer clothing rentals and personalized styling only after others in the industry have proved its effectiveness.

→ TAILORING OVERSIGHT TO SUPPORT THE AI POSTURE

Once a company's AI posture is clear, the board's task is to calibrate its role to match the business's aspiration. What is essential for a pioneer moving into new markets will differ from what matters to a pragmatic implementer watching competitors.

EXHIBIT

To determine an approach to AI, companies should consider which archetype they fit into across two strategic dimensions.

AI posture archetype matrix

Degree of adoption Holistic Selective	Internal transformers The operating model is rewired with AI as the enterprise nervous system	Business pioneers AI is the engine of growth and reinvention
	Functional reinventors AI is used in disciplined, ROI-driven ways for targeted improvements	Pragmatic adopters AI tools are adopted carefully after they are proven in the market
Optimize internally		Optimize strategically
— Source of value —		



Business Pioneers

When AI is the engine of growth, the board's role is to ensure that executive leadership understands AI's value potential and how to capture it. This foundation enables the board to collaborate with and provide direction to management to make informed strategic investments and assess whether it possesses the necessary leadership, capabilities, talent, and capital to deliver.

Directors should focus on determining whether management has the entrepreneurial experience, technological know-how, and transformational leadership experience to run an AI-driven business. The board's role is particularly important in scrutinizing the sustainability of these ventures—including required skills, implications on the traditional business, and energy consumption—while having a clear view of the

- Do we have dedicated people who can manage the environmental, regulatory, legal, and reputational risks that come with being a business pioneer?
- How do we need to evolve our innovation pipeline to match the pace of technological change?

Internal Transformers

For companies with the ambition to embed AI across their operations, the board's role is to direct and oversee the rewiring of the operating model at scale. While all archetypes involve some operating-model changes, internal transformers stretch this across multiple functions in the enterprise—a uniquely complex challenge.

Boards play an important role in challenging management to certify that operational gains are structural rather than temporary and that they

The board's role is to direct and oversee the rewiring of the operating model at scale.

range of risks to address, such as data privacy, cybersecurity, the global regulatory environment, and intellectual property (IP).

This level of intervention will require a sufficient number of board members with product and broader AI experience, so they can act as thought partners and credible challengers to management.

Example: A global logistics company leveraged decades of trade data to develop a new AI-driven intelligence platform, transitioning from being a shipping provider to an information business. Support for the venture increased after the board validated defensible data moats, stable model performance under drift, and sustainable compute cost. Boardroom test questions include the following:

- Which competitive advantages does AI enhance or threaten?
- Does our AI business case target a large enough value pool to reshape our market?
- What key resources are needed to do that, and do we currently have them?

meaningfully improve the business's productivity. This focus requires detailed knowledge of systems and dependencies, as well as the technological foundations (particularly enterprise architecture) that enable cross-functional process modernization.

Boards will need to be particularly diligent in probing resilience, observability, and explainability to certify that systems are stable, trackable, and quickly corrected as needed. The board's task is to encourage management to balance ambition with adoption, making sure that the organization has a robust upskilling program and incentives aligned to the changes needed on the front line.

Example: One global manufacturer's board questioned management about whether AI-driven planning, supply chain, and maintenance systems were interoperable and stress-tested before approving new capital. This helped ensure that the AI initiatives were resilient and could scale. Boardroom test questions include the following:

- Is AI truly rewiring how this company operates or just automating isolated tasks?

- What evidence supports that the operational changes are both structural and sustainable?
- How confident is the management team that it can track and understand how AI is driving cross-functional processes?
- How should we shift our buy-versus-build approach to solidify our competitive advantage and our strategic flexibility?

Functional Reinventors

For companies embedding AI into selective workflows, the board's role is to focus on scaling for value, securing coherence across initiatives, and mitigating vendor-related risks. Board committees in specific areas, such as audit, risk, and talent, play a stronger role in driving AI workflow transformations within their respective domains.

Boards are focused less on the individual

transcription, and workforce tools. The board uses this review to challenge whether pilots are scaling effectively and whether weak pilots are being defunded quickly enough. Boardroom test questions include the following:

- Which high-value workflows can most benefit from AI?
- How does management set the parameters to manage the risk posed by AI programs in specific workflows?
- What are the advantages and risks of buying versus building core capabilities?
- What is the mechanism for tracking and scaling the most promising workflow programs?

Pragmatic Adopters

Boards of organizations that adopt a pragmatic approach toward AI should concentrate on strategic

Boards can play a critical role by probing management to explain how competitive advantage is being protected.

workflow modernization efforts and more on supporting management in allocating resources effectively, coordinating dependencies and governance issues across workflows, and determining which investments have the greatest application to a broad range of workflows (for example, developing data products that serve multiple workflows). Real-time dashboards can help boards track outcomes and progress.

Functional reinventors are more likely to buy than build, given the generally narrow focus on workflows. "Vendor lock-in" isn't a new concern, but boards can play a critical role by probing management to explain how competitive advantage is being protected and to what degree it is being ceded to vendors. Some vendor decisions have long-term implications, such as maintaining internal support capabilities, which management should clarify.

Example: One regional healthcare system's board now asks its CEO to present a consolidated map of all AI pilots each quarter, covering scheduling,

readiness and the risk of inaction. Board members can be most helpful by asking management to share and discuss market intelligence, including competitor moves, market shifts, and AI evolutions.

During these reviews, board members should be ready to constructively challenge management to clarify if and how these developments could threaten the business's long-term competitiveness and enhance any aspects of the current business model. Boards can establish clearly defined metrics and escalation procedures to track the maturity of the relevant AI capabilities deployed by any potential competitors, as well as conduct readiness assessments to ensure that the organization has sufficient foundations and capabilities to move quickly when an AI opportunity presents itself.

Example: One energy company's board devotes a portion of its annual strategy retreat to reviewing case studies of AI adoption from adjacent



industries. Directors ask management to map the elements, including vendor partnership, capital allocation, and workforce readiness, it would require to catch up quickly if needed. Boardroom test questions include the following:

- How are we tracking AI developments inside the industry, as well as with competitors, to determine what actions we should take?
- Do we have a credible plan to follow fast on a proven AI capability, and how do we assess our readiness to move?
- What are the risks associated with not pivoting in time in various business areas?



SIX ACTIONS TO TAKE

Our research highlights six actions that boards should consider taking, with the degree of pursuit varying per their AI posture:

example, risk frameworks and material vendor reviews), and which do not require significant board discussion (such as regular operational decisions). Without this specificity, ambiguity emerges and accountability breaks down or precious agenda time is wasted.

3. Codify a framework for AI governance policy.

Most companies draft principles or ethics statements, but fewer than 25 percent of companies have board-approved, structured AI policies. A credible governance framework designed to last should specify the following:

- scaling rules (when pilots earn capital to scale enterprise-wide)
- risk thresholds (where human sign-off is necessary and what guardrails should be in place)
- vendor or data guardrails (IP protections, third-party audit rights, security, and lineage standards)

Board members should become comfortable with AI by using it in their personal lives.

1. Align on AI posture and review it annually (at least). The very first order of business for directors is to align on what posture the organization should take with AI—without that clarity, none of the other actions matter. Boards should then regularly revisit their AI posture in response to changes in the competitive, regulatory, and technological environments. Proactive posture reviews are a useful way to make sure that the company's stance reflects today's realities rather than yesterday's assumptions. Of course, this annual review shouldn't replace more frequent engagement on the topic (see action number four).

2. Clarify ownership of AI oversight—within both the board and management. Oversight fails without clear accountability. Boards should explicitly define which topics should be reviewed and fully discussed in full-board sessions (for example, material investments to scale enterprise-wide AI), which belong in committees (for

- escalation triggers (what incidents reach the board and how fast)

4. Engage more broadly (and more frequently) with those doing the work.

It is not enough to engage only with CEOs or CFOs on AI developments across the organization. Board directors should be regularly exposed to and interact directly with the executives who are embedding AI into operations

(such as chief data and analytics officers and business and division leaders) to gain a deeper understanding of progress against goals and impact on competitive dynamics.

5. Tie AI investment to business value.

Boards should encourage management to not only identify but also quantify the potential opportunities and the possible risks associated with AI adoption. This view can help boards guide businesses through the short- and long-term trade-offs that balance opportunity and risk, using their AI posture. Effectively



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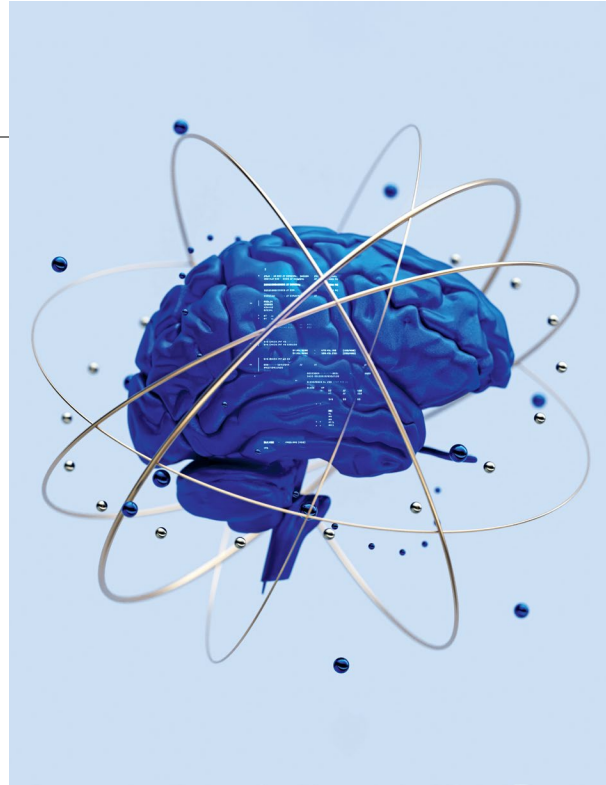
providing that guidance requires solid reporting, but only about 15 percent of boards currently receive AI-related metrics. Boards should have access to impact measures such as ROI by business unit, percentage of processes that are AI enabled, resilience indicators (such as override rates and backup drill results), workforce-reskilling progress, and regulatory alignment. This kind of valuable, goal-oriented detail helps reframe AI strategic direction and oversight in a similar way to capital allocation and risk reviews.

6. Build AI fluency. Directors do not need to be data scientists or deep-tech experts, but they do need to have a sufficient understanding of how AI works and its role in creating opportunities and risks for the business. Building up that base of knowledge happens through ongoing education, regular briefings, external trainings, advisory panels, and input from external experts on emerging technologies, regulations, and risks. Board members should become as comfortable as possible with AI by using it often in their personal lives, to prepare for meetings, to review publicly available information, and to run analyses on proprietary information only in ways approved by the general counsel.

As boards consider what steps to take, they might consider some of the operating practices for venture capital and private equity companies. Those companies typically have a clearer view and focus on the value opportunities with AI, stronger accountability measures, and a faster operating metabolism, such as with funding decisions.

The rules, risks, and expectations related to AI are evolving rapidly, and boards cannot assume today's practices are sufficient to meet the new challenges and opportunities. Boards will need to evolve to match the pace and scope of change that AI promises while maintaining their traditional focus of providing strategic direction and oversight to senior management to create value and mitigate risk. [Q](#)

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RELEVANT READING

CEOs trying to incorporate agentic AI across the organization navigate a world of uncertainty. Employees can be more focused on fears about the technology than on its potential. Investors expect companies to move fast, but most organizations haven't seen significant bottom-line impact. Scaling gen AI use cases has been tough.

'The change agent,' on McKinsey.com, focuses on the key decisions to be made and how CEOs can address them knowledgeably. A sample timeline suggests reasonable markers of progress over two or three years.

An agentic transformation is a leap into new ways of managing and organizing a company. For almost every CEO, the agentic organization is still uncharted territory. "The change agent" offers a road map.



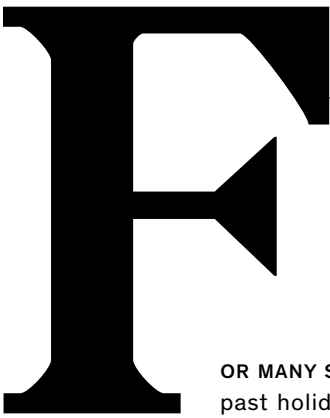
The Automation Curve

IN AGENTIC COMMERCE

by Deepa Mahajan, Hannah Mayer, Katharina Schumacher,
and Roger Roberts, with Katharina Giebel



Agentic AI is increasingly a part of shopping, but not all transactions will be automated in the same way. Here's what agents will handle—and the situations that will call for human involvement.



OR MANY SHOPPERS, THIS past holiday season may have felt different. Perhaps

an AI assistant suggested gifts your relatives might actually like while filtering for items that could arrive before the holidays. Maybe it helped you navigate the specs of three different noise-canceling headphones or scanned five retailers for a specific holiday outfit, assembled a ready-to-buy basket, and politely asked, “Should I go ahead?”

This is the year AI agents stopped being an experiment and became part of how people shop, not in headline-grabbing ways but in everyday moments—helping shoppers make sense of choices, assemble baskets, resolve trade-offs, and move toward action. Yet what looks like small convenience today is an early signal of a much larger shift in the way we shop. According to our research, even under moderate scenarios, AI agents could mediate \$3 trillion to \$5 trillion of global consumer commerce by 2030. Because agents navigate the same internet as humans—visiting websites, engaging with APIs, and interacting with loyalty programs—they can scale quickly. And as they do, they are reshaping how intent forms, how products are discovered, and where value pools can be found.

We introduced many of these themes in our report *The agentic commerce opportunity: How AI agents are ushering in a new era for consumers and merchants* last fall. This article builds on that foundation. Here, we explore what we call the “agentic commerce automation curve,” which illustrates how the shopper experience shifts at different levels of delegation, and outline how retailers can prepare for a world in which the customer is still human but AI agents increasingly mediate key decisions.



THE SIX-LEVEL AGENTIC COMMERCE AUTOMATION CURVE

The rise of agentic commerce reflects the collision of three forces. First, AI agents have reached decision-grade usefulness, allowing consumers to delegate not only inspiration but also

shortlisting, assembly, and even execution. Second, the ecosystem now has rails for real autonomy. Open-source protocols—such as MCP, A2A, AP2, ACP, and UCP—enable agents to read data, negotiate with other agents, and transact safely. The Linux Foundation recently established the Agentic AI Foundation—a partner-backed effort including Anthropic, Block, Google, Microsoft, OpenAI, and others—focused on the interoperability, identity, and payments building blocks needed to make autonomous commerce viable at scale. Third, intent is shifting upstream. Agents increasingly act when consumer goals surface—such as a conversation about an upcoming birthday party, a calendar reminder for a trip, or a low-supplies signal from a device. For retailers, the implications are stark: If your catalog, policies, and value proposition are not machine-readable, agents—and by extension, shoppers—simply will not find you, no matter how beloved your brand is.

That said, the rise of AI agents does not represent a single leap from human-driven shopping to full autonomy. Instead, agentic commerce is unfolding along a curve—one defined by how much of the commerce journey consumers are willing to delegate to machines. This automation curve is composed of six distinct levels of automation, each representing a different mode of delegation—from basic rules-based convenience to fully autonomous multiagent coordination. Importantly, these levels describe what agents are technically capable of doing, not what consumers will always choose to allow.

Further, adoption will not necessarily move uniformly “up” the curve. While agentic capabilities continue to advance, two forces are shaping consumer delegation. The first is time and trust: As consumers gain familiarity with agents and see them perform reliably, they become comfortable delegating larger portions of the journey. The second is category dynamics. Willingness to delegate varies sharply by ticket size, emotional salience, identity signaling, and regret risk.

Together, these forces determine a ceiling of delegation, in which autonomy naturally plateaus for a given category or moment. In some contexts, consumers may be comfortable delegating end-to-end execution. In others, they will deliberately stop short, retaining control not because agents are incapable but because human involvement is intrinsic to the value of the experience.

For these reasons, the model is best understood as a curve rather than a ladder. Higher levels of automation are not inherently better or more advanced, and the goal is not maximum autonomy but optimal delegation.

LEVEL 0: Program Convenience (‘Set and Forget’)

This level is the pre-agentic baseline: Recurring replenishment for things that run out—coffee pods, detergent, diapers, shampoo—is handled through subscriptions, scheduled refills, and recurring shipments. At this point on the curve, automation is rules-based: useful but brittle and largely blind to context. When needs change, it breaks, and the human steps back in.

Still, level 0 proves a foundational point at which consumers delegate when automation is reliable

options, weighs trade-offs, and decides what to do next.

In other words, level 1 replaces search and comparison but leaves assembly and execution entirely with the shopper.

Implications for retailers: Verifiable data beats marketing gloss. Agents require information they can parse and compare—structured attributes, clear eligibility rules, sizing and fit certainty, and claims that can be substantiated.

LEVEL 2: Assemble (‘The Personal Shopper’)

Level 2 marks a qualitative shift: Agents move from analysis to orchestration. Here, the shopper expresses an intent, and the agent returns a purchase-ready basket. “Build a cozy winter outfit under \$150.” “Stock a pantry for a vegan guest

AI agents could mediate \$3 trillion to \$5 trillion of global consumer commerce by 2030.

and reversible. For example, around 23 percent of US Amazon shoppers had at least one active Subscribe & Save order in 2024.

LEVEL 1: Assist (‘The Cognitive Sidekick’)

At level 1, agents help shoppers think and make decisions, but they do not execute. A shopper might ask, “Find four gifts under \$75 that can ship by Friday; prefer sustainable brands; and summarize trade-offs.” Or, in a more complex category, “Compare three noise-canceling headphones, and explain how they differ on sound quality, battery life, and comfort.” The agent’s role is analytical. It scans catalogs, parses reviews, compares features, and synthesizes options into short lists or recommendations. Crucially, it does not commit to a configuration or resolve operational constraints. There is no cart, no basket, and no readiness to transact. The human evaluates the

arriving tomorrow and staying for three days.” Or, more complex, “Put together a home office setup under \$2,000 that supports dual 4K monitors and quiet video calls and has next-day delivery.” Unlike level 1, the agent is tasked with resolving trade-offs and constraints rather than merely surfacing them. It selects specific items, ensures technical compatibility, and balances performance against price, availability against delivery speed, and promotions against eligibility. Taxes, shipping windows, loyalty benefits, and substitutions are handled by default. The output is not a list of options; it is a coherent configuration that is ready to check out. The shopper’s role shifts accordingly from comparing options to approving or adjusting a proposed solution.

Implications for retailers: Success at level 2 requires API-first merchandising. Inventory, pricing, shipping promises, promotions, and returns logic must be exposed cleanly so agents can assemble baskets with human-level fidelity.

LEVEL 3: Authorize (‘The Supervised Executor’)

At level 3, consumers delegate not only actions but also rules. Instead of approving each step, they authorize an agent to execute within clear boundaries. “If groceries are under \$120 and arrive Friday 6–8 p.m., place the order.” “If my preferred sneakers drop below \$80 from merchants I trust, buy them.” The agent then runs the workflow end to end, choosing among eligible options, swapping out-of-stock items for approved substitutes, applying loyalty benefits, and escalating to the shopper for approval only when something falls outside the rules.

Implications for retailers: To support shoppers at level 3, merchants must make it possible for an agent to pay and act on a customer’s behalf with

deeper integration—especially around loyalty, eligibility, substitutions, and service guarantees—so agents can reason about trade-offs and execute reliably. Put simply, it’s no longer enough to expose a catalog; retailers must expose the rules and policies that determine what “good” looks like.

LEVEL 5: Networked Autonomy (Multiagents)

This forward-looking level is still emerging and points to a world in which commerce becomes agent-to-agent by default. Personal agents won’t just interact with merchant websites; they will negotiate directly with a network of specialized agents that optimize pricing, logistics and delivery, payment authorization, and loyalty programs. Ultimately, this will result in multiagent

Shopping is not merely about outcomes; it is

safety and transparency. That means purchasing authorization that can be limited (by budget, time window, merchant, or category), activity that can be audited (what was bought and why), and actions that can be reversed (easy cancellations, refunds, and overrides when needed).

LEVEL 4: Autonomize (‘The Intent Steward’)

At level 4, agents operate against standing goals rather than one-off transactions. For example, “Keep household essentials under \$300 per month.” “Maintain my airline loyalty status at the lowest total cost over the course of 2026.” “Make sure we never run out of baby supplies.” The agent continuously monitors needs, anticipates replenishment, compares options across merchants, and optimizes for longer-term outcomes such as maintaining or achieving a certain loyalty status. The agent then handles the operational follow-through, including changes, returns, and replacements. The shopper becomes episodic, stepping in mainly for meaningful decisions or exceptions.

Implications for retailers: Competition at level 4 shifts from winning a single purchase to earning a place in the agent’s ongoing plan. Merchants need

marketplaces where intent can be brokered, trust is carried through reputation signals, and transactions are settled through shared protocols—enabling “procurement as a service” to run continuously in the background.

Implications for retailers: Level 5 will be shaped by those that are already proficient at level 4. Retailers that expose policies, guarantees, and loyalty logic in machine-readable ways will be positioned to influence how these ecosystems route demand. Those that don’t risk becoming interchangeable suppliers competing primarily on price in machine-negotiated flows.

→ HOW THE AUTOMATION CURVE BENDS

The automation curve describes what AI agents can do across the shopping experience. It also can help explain the way that delegation can play out in practice and why automation does not unfold evenly across categories, moments, or consumers.

In the real world, consumers do not climb the curve uniformly, nor do they aspire to full autonomy in every context across shopping categories. Instead, delegation accelerates where automation removes friction without sacrificing meaning.

It plateaus where human involvement is intrinsic to value, and it becomes selective amid trade-offs and uncertainty. Understanding these patterns is critical for retailers deciding where to invest, what to expose to agents, and how to compete in an agent-mediated world.

Where Delegation Accelerates:

Utility, Repetition, and Low-Regret Purchases

In categories where shopping is primarily a task rather than an experience, delegation tends to move quickly up the curve. Low-regret purchases such as groceries, household essentials, and basic consumables are natural candidates for higher autonomy. Here, the value of shopping lies in efficiency, reliability, and predictability rather than discovery or expression.

Where Delegation Plateaus:

Identity, Aspiration, and Regret Risk

In high-consideration categories, such as luxury goods or milestone purchases, delegation often plateaus lower on the curve. Here, shopping is not merely about outcomes; it is about identity, intent, and emotional assurance. Consumers may enthusiastically enlist agents to research, compare, and analyze but stop short of fully autonomous execution.

Consider a luxury-handbag purchase: A consumer may ask an agent to evaluate how different brands hold value over time, analyze resale markets, or assess how a particular style aligns with their personal aesthetic. The agent may surface alternatives, identify better price points in the resale market, or locate in-store availability. But the final decision and the transaction itself remain firmly human.

about identity, intent, and emotional assurance.

As agents prove capable of assembling baskets accurately, executing within guardrails, and handling substitutions or delivery changes gracefully, consumers become comfortable delegating execution entirely. Attention shifts from evaluating options to reviewing outcomes: Was the order on time? Did it stay within budget? Were substitutions reasonable? Over time, approval becomes implicit and intervention becomes the exception.

For retailers, this dynamic reshapes competition. Brand storytelling and front-end experience matter less than operational trust. Agents optimize for delivered value—factors such as price, availability, service reliability, and reversibility. Merchants that expose clean inventory data, predictable fulfillment performance, and transparent substitution and return policies become default suppliers, often without ever “winning” a traditional moment of consideration. In these categories, being agent-readable and dependable matters more than being distinctive.

In these moments, the agent functions less as an executor and more as an analyst and curator. The ceiling of delegation is set not by technical limitations but by emotional and identity-based considerations, such as the desire for a tactile experience, social signaling, or the avoidance of regret. Importantly, lower autonomy does not imply lower value. In many such categories, human involvement is itself a key component of the product.

For brands, this distinction is critical. Competing effectively does not require pushing consumers toward full automation. It requires enabling agents to support deliberation by exposing rich contextual attributes, provenance, craftsmanship, and long-term value signals while preserving human control at the point of commitment. In these categories, winning means shaping how decisions are informed, not how quickly they are executed.



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available on

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Where Delegation is Selective:

Complexity, Trade-Offs, and Context

Most categories sit between these two poles. In travel, consumer electronics,

home goods, and other complex purchases, delegation is selective and situational. Agents may autonomously handle research, comparison, monitoring, and assembly while escalating decisions that involve meaningful trade-offs. An AI travel agent, for example, might assemble an itinerary, optimize for loyalty benefits, and monitor for disruptions but still surface choices that require judgment—time versus comfort, cost versus flexibility. A home electronics agent may narrow options based on specifications and reviews but defer to the human when design, compatibility, or brand preference becomes decisive.

In these categories, trust is built not through perfect execution but through explainability and reversibility. As autonomy increases, consumers want to understand not just what the agent did but why it behaved in that manner. Why did

agent-mediated moment. Continuous commerce replaces episodic decisions. Loyalty becomes less about sentiment and more about policy.

As a result, value pools migrate. Advantage accrues to merchants that can reliably execute against agent constraints, not just those that attract human attention. Margins are shaped by service guarantees, fulfillment reliability, and clarity of policies. For some players, this will unlock efficiency and scale. For others, particularly those dependent on discovery-driven traffic, it introduces the risk of disintermediation.

Importantly, this does not imply a single end state. The automation curve does not prescribe where every category should end up. Instead, it describes the instances where delegation creates value and where it does not. Retailers that recognize these contours early can invest accordingly,

Margins are shaped by service guarantees, fulfillment reliability, and clarity of policies.

it choose a particular option? Why did it make a substitution? Why did it escalate an exception? Graceful handling of edge cases matters more than success on the happy path.

This is where metadata becomes strategy. Humans infer meaning intuitively, considering factors such as fit, feel, mood, and suitability for a particular occasion. AI agents, of course, do not. They rely on structured, contextual signals. Products that are emotionally legible to people but semantically opaque to machines risk becoming invisible in agent-mediated flows. This requires retailers to invest in rich, machine-readable attributes that enable agents to act with nuance—and to know when to pause and elevate questions to human shoppers.

pushing toward higher autonomy where it reduces friction and deliberately preserving human moments where they matter most.

The future of commerce is not about maximizing automation. It is about placing autonomy where it enhances experience, economics, and trust. The automation curve offers a practical lens for making those choices. Retailers that use it to guide capability investment, category strategy, and agent readiness will be best positioned to compete as AI agents become an increasingly central interface of commerce. [Q](#)

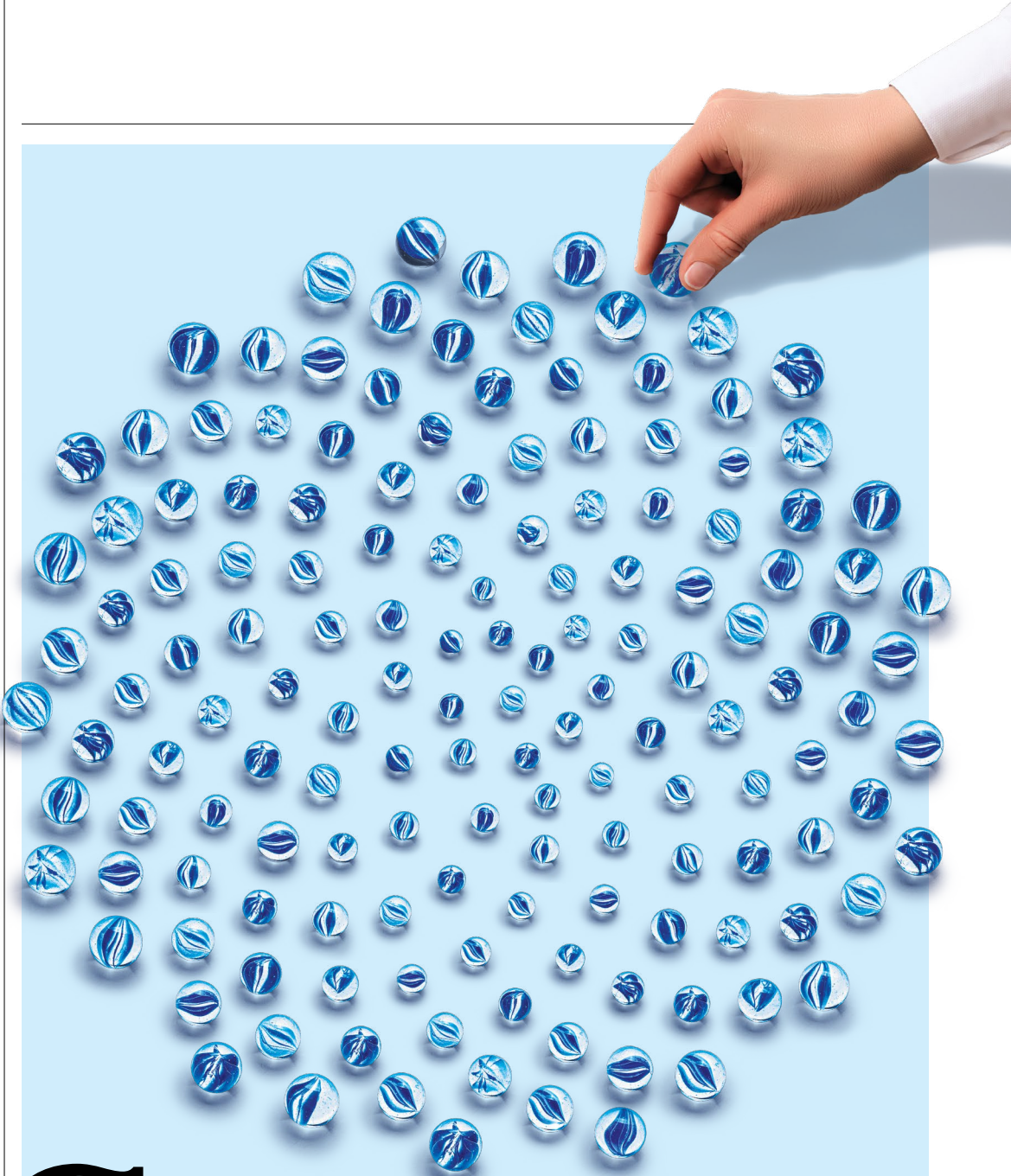


HOW VALUE POOLS SHIFT WHEN AGENTS MEDIATE COMMERCE

Across these patterns, one shift is consistent: the compression of the traditional funnel. Search, comparison, and consideration collapse into a single

» Deepa Mahajan, Hannah Mayer, and Roger Roberts are partners in McKinsey's Bay Area office, where Katharina Giebel is a consultant; and Katharina Schumacher is a partner in the Munich office.

» The authors wish to thank Eli Stein, Holger Harreis, Jack Trotter, Marcus Keutel, Philipp Kluge, Tara Balakrishnan, and Zamir Lalji for their contributions to this article.



Capstone



BOOKS, LEGACIES, AND A CROSSWORD



Author Talks

Go behind the bylines as the authors of books about workplace whimsy, accessible luxury, and online trust answer questions from McKinsey.



Why Play Isn't Just For Children

↳ In *Playful: How Play Shifts Our Thinking, Inspires Connection, and Sparks Creativity* (Avery/Penguin Random House, 2025), designer Cas Holman challenges conventional views on productivity by inviting adults to rediscover the power of play.

Q: You write that play is not the opposite of productivity. How can we achieve both?

Cas Holman: They can be the same thing. Playing is productive. Play also has benefits—for mental health, physical health, and our social well-being. Integrating a playful mindset into almost all forms of work can lead to unexpected outcomes, which is where innovation comes from.

Q: How can workplaces embrace and implement play?

Cas Holman: It depends on what they are hoping for. I've worked with organizations where teams did not align. Through play, the teams got to know each other differently and could understand each other's strengths and weaknesses beyond what was in a job description.

In a somewhat hierarchical workplace, it's often very hard to play. When I work in these environments, I set up ways that teams can really get into playing and collaborating with a new dynamic. One way involves playing so that participants can understand and communicate better. There can be room for bad ideas. A bad idea could mean many things. Sometimes if you can hang out with them or explore them, there's often something that can be useful.



Expanded versions of these interviews are available on

McKinsey.com





Luxury Within Reach

↳ In *Bag Man: The Story Behind the Improbable Rise of Coach* (Harvard Business Review Press, 2025), Coach chairman emeritus Lew Frankfort details how the fashion brand pioneered the accessible-luxury category.



Q: What's your advice to someone launching a consumer brand today?

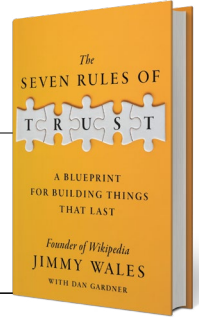
Lew Frankfort: When I advise entrepreneurs who are in the early stages

of contemplating a business or starting a business, the most important thing I say to them is, "Great ideas don't necessarily turn into great businesses."

The second thing I say is, "Know your customer and know your market. And understand the barriers to entry. Understand if the market is mature or growing." Understand whether you have a distinctive product or service that you can successfully insert into the market. And most important, have a clear path to profitability.

Last, be open to wise counsel. I've made the mistake of being attracted to brilliant, creative people who had ideas that I could only imagine, that I'd never build myself. And I did not lean in enough on their values or on their ability to grow. I often say, "Stay away from hardwired narcissists who are first-time CEOs."

Trust in the Digital Era



↳ In *The Seven Rules of Trust: A Blueprint for Building Things That Last* (Crown Currency/Penguin Random House, 2025), Wikipedia cofounder Jimmy Wales makes the case for accountability at scale.

Q: Why is it worth reminding the world about trust?

Jimmy Wales: People have seen a general decline in trust, not in every aspect and not in every country, but quite broadly. There is a decline in trust in journalism, politics, and institutions of all kinds. And we see the impact of that. People don't know what to believe.

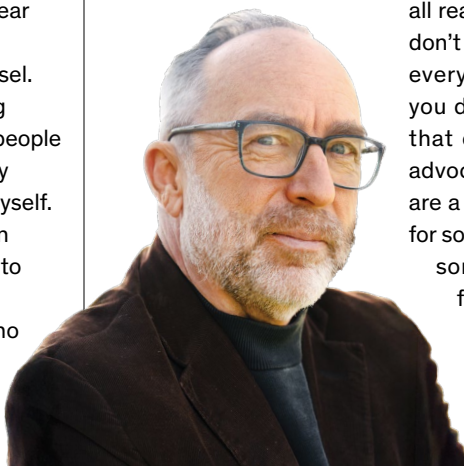
There's cynicism and a feeling that politicians cannot be trusted and that we can't expect them to be trustworthy because things have gotten so bad. It feels like it is worth reminding people, "We need people who behave in a trustworthy manner." We need to trust each other. For that to happen, we need to consider what are the things we can do to build trust, both trust one-on-one in an individual capacity, but also trust in our organization, in a business, and so forth.

Q: Does neutrality mean people can believe in two sets of truth?

Jimmy Wales: The way I think about it is that there is only one reality. There are a lot of different facts about reality, but they shouldn't contradict each other, because reality is reality. But there are a lot of different things that you could say about it and a lot of different perspectives.

'What are the things we can do to build trust?'

JIMMY WALES



On the other hand, for a lot of issues, both sides have something legitimate to say. The truth is probably somewhere in the middle or sometimes not. For a reader to make an informed decision, it's important that they're aware of all reasonable points of view. We don't necessarily have to include every single point of view. But you do need to be made aware that critics have said this and advocates have said that. There are a lot of cases where, at least for some period of time—and that some period of time may be forever, depending on what it is—the actual facts are somewhat murky. [Q](#)



Lives & Legacies

Remembering a corporate-turnaround master, a pioneering toy maker, an online-lending entrepreneur, and a fast-food luminary.

1942–2025

Louis V. Gerstner Jr.

MCKINSEY VETERAN SAVED IBM BY SWITCHING FOCUS TO SERVICES

When Gerstner arrived in 1993 as the first outsider to serve as CEO of IBM, his mission was clear: save America's most famous computer company from extinction. "The last thing IBM needs now is a vision," he declared. Instead, he concentrated on execution, cut costs, and shifted the focus to consulting and services. After leaving IBM in 2002, he wrote a book about his experience: *Who Says Elephants Can't Dance? Inside IBM's Historic Turnaround*. His career began at McKinsey, where he rose to partner at age 28 and led the finance practice. A demanding boss, he once told a colleague: "No one has ever met my expectations, with the exception of my wife." Raju Narisetti, partner and leader of McKinsey Global Publishing, covered Gerstner and IBM for *The Wall Street Journal*. In November 1997, Narisetti broke the story of Gerstner's commitment to serving a second term at IBM. As he recalls: "Gerstner said, 'The first [phase] was to get from survival to strength, and now we need to go from strength to leadership,' adding, 'I think that is going to take another five years . . . I would like to be part of that.'"

1924–2025

Lam Leung-tim

ENTREPRENEUR'S YELLOW DUCK
LAUNCHED A CHINESE TOY EMPIRE

Lam subsisted by eating tree bark in China during World War II. After the war, he sold newspapers on the streets of Hong Kong and happened to read about the growing use of plastics in toys. That sparked a business idea. His first products were yellow ducks, perfect for floating in bath water. His Hong Kong company expanded by making toys for Hallmark and Hasbro. In the late 1970s, Lam began moving much of his toy production onto the Chinese mainland and helped transform China into Santa's global workshop. He donated generously to educational causes and was awarded Hong Kong's Bronze Bauhinia Star for contributions to industry. "I started out lacking three things in life: money, business experience, and technical know-how," he said. "I built up the kingdom from nothing."

1970–2025

Doug Lebda

ENTREPRENEUR
CREATED LENDINGTREE
LOAN-SHOPPING WEBSITE

As a young man in the 1990s, Lebda was annoyed by the experience of shopping for a home mortgage and was sure there must be a better way. It was the dot-com era, so he created a loan-shopping website, now known as LendingTree. Unlike most dot-com start-ups, LendingTree survived. Acquired by IAC/InterActiveCorp in 2003, it was spun off five years later, with Lebda at the helm. As a boy in Lewisburg, Pennsylvania, he was an early entrepreneur who sold discarded golf balls for \$1 apiece. Lebda later bought a stake in the Pittsburgh Steelers football team.

1944–2025

Michael R. Quinlan

MCDONALD'S CEO EXPANDED GLOBAL REACH

Quinlan was the first member of his family to attend college. He arrived at McDonald's at age 19 only because the mother of his roommate at Loyola University worked for Ray Kroc, the company's founder. She arranged for him to work in the mail room while he continued his studies. Before age 30, he was on a fast track. His bosses made sure he learned all the basic restaurant skills, including how to clean toilets. As CEO from 1987 until 1998, Quinlan led a rapid and highly profitable expansion overseas. He also added more healthful options, including salads, but a lower-calorie burger—the McLean Deluxe—flopped in the 1990s. Quinlan donated \$10 million to Loyola's life sciences program and \$40 million to its business school—and said he had received far more from his alma mater than he gave. He was a life trustee of the Ronald McDonald House Charities.





Made With AI

BY PETER GORDON

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63					64						65			

NOTES

Each issue's crossword puzzle is developed around a business theme. The puzzle's headline serves as a hint to the three longest answers. For the solution, visit McKinsey.com/crossword.

ACROSS

- | | |
|--|---|
| 1 Understand | 34 Genetically altered pork cuts? |
| 6 Quadrathlon equipment | 39 Not neg. |
| 11 Letter addenda: Abbr. | 40 Snow structure |
| 14 Jean Smart TV series | 41 Name of one of the littlepeople in <i>Who Moved My Cheese?</i> |
| 15 Defeated person's concession | 42 Gradually substitute omelet ingredients? |
| 16 Create plot holes, say | 47 Long-range nuke |
| 17 Superlatively sore protuberance? | 48 Enjoy |
| 19 ____ de la Grande Jatte | 49 "I'm unimpressed" |
| 20 Rock subgenre | 52 Canopy for a Jewish marriage ceremony |
| 21 Teach through repetition | 55 Dancer Duncan |
| 23 Hue and cry | 57 Role in <i>Barbie</i> |
| 24 Subject of the 2022 documentary <i>The Princess</i> | 58 Sprite from Paris? |
| 26 Food for Fido | 60 Coffeehouse dispenser |
| 27 Least important Red Guard member? | 61 ____ mignon |
| 30 Reagan's "Star Wars" initials | 62 Lowest par, typically |
| 32 Little suckers? | 63 "Gangnam Style" rapper |
| 33 Baked dessert | 64 Seizes |
| | 65 Goes downhill fast? |

DOWN

- | | |
|--|---|
| 1 Neighbor of Burkina Faso | 28 XXIV × L |
| 2 Participated in a relay | 29 Hearth residue |
| 3 Blessing precursor | 30 Kissing couple, e.g. |
| 4 Uno card | 31 Fuzzball |
| 5 False start? | 35 Fore-and-____ |
| 6 Chocolate bar advertised with the slogan "Gimme a break" | 36 Calabria's place in Italy's boot |
| 7 Tiranë is its cap. | 37 Extinct giant deer |
| 8 "Way to go, dude!" | 38 Cries of surprise |
| 9 Tingling feeling triggered by certain sounds | 39 Make erect, as ears |
| 10 Hat in a Foreign Legion uniform | 43 Audio system component |
| 11 Ryan of <i>MacGruber</i> | 44 Throws out |
| 12 Self-centeredness | 45 "Holy cow!" |
| 13 Words in a cross-reference | 46 Skin transplants |
| 18 Fit of pique | 49 Shimmering pattern |
| 22 ____-tzu (Chinese philosopher) | 50 Made a goof |
| 25 Tennis player Jana who won Wimbledon in 1998 | 51 President before Garfield |
| 27 Sank one's teeth into | 53 Dismissive sound |
| | 54 Vehicle for the high C's? |
| | 56 Creator of Gloop, Salt, Bucket, and others |
| | 59 Maiden name indicator |

BY THE
NUMBERS



A Close Look at Women in the Workplace

54%

OF COMPANIES SAY WOMEN'S CAREER
ADVANCEMENT IS A HIGH PRIORITY

Women account for

49%
of
entry-level roles
but only

29%
of
C-suite roles

Women of color account for just 7% of C-suite roles

45%

VS

31%

OF
ENTRY-LEVEL
MEN HAVE
SPONSORS

OF
ENTRY-LEVEL
WOMEN HAVE
SPONSORS

WOMEN WITH
SPONSORS ARE
PROMOTED

15%

LESS FREQUENTLY
THAN MEN
WITH SPONSORS

21% of entry-
level women
are encouraged to
by their
managers to
use AI tools,
compared with
33% of entry-
level men

**BONUS
CONTENT**



Exclusive to subscribers of the Digital Edition





When IP Goes IRL: Standing Out With Location- Based Entertainment

The rise of smaller-scaled experiential attractions could help address consumers' growing desire for experiences—while enabling new strategies for brands and media properties.

BY ALEX GERSOVITZ, BO FINNEMAN, KABIR AHUJA, AND MATTHEW STRAUS

A

s the in-person experiences market continues to grow, many brands and intellectual property (IP) holders are looking for opportunities to engage with consumers in

more experiential ways. One option is to tap into the classic location-based entertainment industry, which has proven expertise in creating appealing experiences. But developing location-based attractions similar to those typically seen in major theme parks (where, for instance, an IP holding can become the basis of a roller coaster or large-scale interactive space) can involve big investments and long-term commitments that could stretch some brands' resources and risk tolerances.

An emerging trend suggests an alternative approach. More narrowly focused regional, seasonal, or pop-up experiences could provide various players—including those not historically active in the location-based entertainment space—with novel opportunities to create compelling attractions. This version of location-based entertainment could involve smaller investments, shorter commitments, more flexibility, and the potential for quick wins. Meanwhile, it could also help provide a solution for anyone looking to fill spaces in malls, city centers, or other areas that might be underutilized.

To be sure, smaller-format location-based entertainment projects often generate limited profit margins when compared with those found at major destination-based attractions. With their higher levels of repeat visitation and the operational benefits that come with large-scale investments, traditional theme parks can achieve EBITDA margins of roughly 30 to 40 percent. Family entertainment centers and arcades can reach EBITDA margins of roughly 25 to 30 percent. Meanwhile, smaller-scale, short-term location-based entertainment projects tend to operate at slimmer margins—though financial returns can vary significantly based on the type of experience offered.

Importantly, however, even if smaller-scale experiences are only incrementally profitable, they can still provide an avenue for brands and operators to deepen engagement with their most loyal and passionate customers. "Location-based experiences allow us to connect more deeply with our most engaged fans," says Ken Wee, chief strategy officer for Mattel, "and we know that those most engaged fans can be significantly more valuable than the average customer over time."

Beyond deepening engagement with core fans,

location-based entertainment is also a powerful tool for reaching broader audiences. Immersive, smaller-scale experiences can appeal to a different demographic: Recent McKinsey consumer research indicates that Gen Z is 1.5 times more likely than the general population to visit an immersive experience—and four times more likely than older generations.

Location-based entertainment experiences can be part of a healthy mix that includes marketing spend, loyalty programs, and other efforts that have a central goal of building deep relationships with lifelong fans and broadening exposure to new and harder-to-reach audiences.

→ THE GROWING BUSINESS CASE FOR EXPERIENCES

McKinsey research has found that 52 percent of Gen Zers say they splurge on experiences when traveling. These consumers will look to save money on almost anything else—including flights, local transportation, shopping, and food—before being willing to trim their spending on experiences. Meanwhile, US consumer spending data indicate that growth in discretionary spending on experiences has outpaced spending on goods.

Additionally, McKinsey research on consumer attention indicates that live entertainment is on the "efficient monetization frontier," meaning it maximizes the conversion of consumer attention into revenue. Amusement parks, in particular, generate among the highest dollars per hour consumed when compared with other entertainment media.

Major experience providers are taking note of the growing consumer interest and increasingly favorable economics associated with experiences. Universal Destinations & Experiences, in the midst of adding to its collection of Universal theme parks, has also launched new formats in new locations—including the recently opened Universal Horror Unleashed in Las Vegas and the forthcoming Universal Kids Resort in Frisco, Texas. On a 2025 earnings call, Disney CEO Bob Iger said, "We are building on our best-in-class parks and experiences businesses, with more expansions underway around the world than at any other time in our history."

→ ADVANTAGES OF SMALLER-SCALE AND TRANSITORY EXPERIENCES

Smaller-scale, location-based attractions can augment the traditional, high-capital-expenditure

destination experience approach, thereby broadening the portfolio of experiences on offer. Brands could derive several potential benefits from launching smaller-scale attractions or attractions that employ a short-term or pop-up approach:

- Much smaller initial investments reduce the general risks stemming from a project that fails to meet audience or revenue goals.
- The ability to close in one location and open in another makes projects less vulnerable to shifts in local economic conditions.
- Shorter development times and more nimble operational structures make it easier to time project launches to coincide with moments when the underlying concept (for instance, a piece of IP) will have maximum cultural relevance (for instance, when a new season of a hit TV show is released).

major studio franchises and global blockbusters with broad-based fan followings. This makes sense for attractions inside destination theme parks, given the significant up-front investments those models involve. But the short-term, lower-cost experience model is making it easier for less mainstream offerings—including niche TV shows, movies, and even books—to be adapted as location-based entertainment. For example, *The Queen's Ball: A Bridgerton Experience*, features immersive set recreations, live music, specialty drinks, and theatrical performances all based on the Netflix streaming series *Bridgerton*. It opened in 11 cities across three countries and saw more than 150,000 visitors across several of these locations within a few months of its launch. The romance book series *A Court of Thorns and Roses* has been the basis for small-scale, pop-up experiences that have gained attention largely through

Limited-duration attractions can create sca

- Limited-duration attractions can create scarcity and excitement, resulting in potential for increased social media sharing.
- Successful projects can quickly be scaled through expansion to new regions.
- As rising admission prices have become a concern at destination theme parks, smaller-scale experiences in regional locations could provide less expensive alternatives for local consumers who don't want to spend as much on travel or admission tickets.
- As further detailed below, lower ongoing costs and less onerous contractual commitments make it feasible to build attractions around concepts that target relatively niche audiences.

networks of like-minded book lovers who post on the social media platform TikTok.

Consumer Products and Food Items Can Provide the Basis for Attractions

The interactive experience *Monopoly Lifesized* (based on the classic Hasbro board game *Monopoly*) launched in London in 2021 and has since expanded to four cities in the United States, including Denver and Charlotte. The London and Denver destinations have collectively attracted nearly 500,000 visitors since their opening. The *Monopoly Lifesized* franchise partners with local production companies in each market. Signing short-term leases in underutilized spaces helps keep costs down.

ChainFEST—a recurring food festival that began as a pop-up event—has partnered with brands including Taco Bell, Pizza Hut, and McDonald's. In this case, beloved quick-service food items serve as the IP that forms the basis of an attraction, with gourmet chefs creating new takes on popular chain restaurant menus.

→ ENABLING NEWER TYPES OF EXPERIENCES

A smaller-scaled, more transitory approach to location-based entertainment is already spurring the creation of new types of experiential attractions.

IP Can Be Less Mainstream

IP-powered attractions have often centered on

Retail Stores Can Double as Attractions

The toy store Camp—with several US locations—bills itself as a “family experience company.” It regularly constructs in-store interactive experiences based on children’s media properties (such as the TV series *Bluey* or the *Trolls* films) that are accompanied by themed shopping opportunities.

Underused Real Estate Can Be Repurposed as an Attractions Space

Smaller and temporary attractions can create opportunities that benefit both real estate holders and IP owners. “Many real estate holders I speak with these days have underutilized space,” says Chris Holdren, former chief marketing officer at Caesars Entertainment. “One large movie theater group told me it has 10 percent too many screens and wants new ideas about what to do with those

a pop-up haunted maze in New York called “Jimmy Fallon Tonightmares.” In Las Vegas, the year-round, 100,000-square-foot Universal Horror Unleashed experience features multiple haunted house environments.

Lego has augmented its Legoland theme parks with smaller, indoor Legoland Discovery Centers in locations across Asia, Australia, Europe, and North America.

→ DEVELOPING A LOCATION-BASED EXPERIENCE FOR BRAND ACTIVATION

Stakeholders contemplating an investment in a location-based experience should consider important elements such as performance metrics, construction timelines, and the benefits of collecting and analyzing data to adjust approaches quickly. It’s vital to focus adequate attention on

rcity, excitement, and social media sharing.

spaces. Casinos and malls often have excess space. I think IP holders could consider moving quickly to make use of these available spaces.”

Bundling Attractions Together Can Create a Mini Theme Park

Both Netflix and Sony have experimented with combining a limited number of IP-based attractions under a single roof. Netflix launched a Netflix House concept in Pennsylvania and Texas, with each location offering a variety of experiences—based on streaming series such as *Squid Game* and *Stranger Things*—that are gathered within 100,000-square-foot venues. Sony created a Wonderverse in Chicago that was a 45,000-square-foot space featuring experiences based on movies such as *Ghostbusters* and *Jumanji*.

Theme Parks Can Expand to Satellite Locations

Universal Destinations & Experiences has previously offered “Halloween Horror Nights”—an evening presentation full of thrills and chills—to its theme park guests. But Universal has now expanded the initiative to other locations, including

creating distinctive experiences—while also protecting IP assets.

Align on the Measures of Success

It’s important to align on the core purpose of creating an attraction. Profitability is, of course, a plus. But if a well-received experience generates online buzz and deeper engagement with consumers, financial returns might be a secondary goal. Stakeholders should consider in advance what success would look like.

Coordinate on Realistic Timelines

A typical timeline for creating a smaller-scale, immersive experience—involving one attraction in an existing building—could stretch to roughly 15 months. That can include about 90 days for contract negotiations with execution partners, eight months for construction to build out the guest environment, and two weeks of closed beta testing to resolve any issues prior to opening to the public. If activations are planned in tandem with major launches or announcements, getting up-front alignment on the timeline is crucial.

Enhance Personalization Through Gen AI

Personalization has long been a key ingredient of experience design. As gen AI technology advances and its costs come down, it is now more feasible than ever to integrate personalized experiences into offerings. Creating ways to make each experience feel personal should be part of any planning.

The College Football Hall of Fame in Atlanta offers a personalized tour, where visitors are asked to pose for a photo and answer several questions upon arrival. Using AI, the photos and answers are incorporated into exhibits that make guests part of the attraction (for instance, by generating fake documentary videos that portray guests as successful college football coaches). The experience ends with guests being featured in videos imagining them being recruited to play for their favorite college football teams.

Make Tangible Memories Part of the Experience

Tangible products can help visitors remember an experience for years to come. These items can come in the form of ancillary merchandise that is sold or, if the primary goal is to drive affinity and loyalty, given to visitors as gifts. Themed menu items and specialty drinks can be tied into the overall design of an attraction and paired with take-home mementos to become integral parts of the experience. (The recent popularity of novelty popcorn buckets offered at movie theaters and theme parks helps illustrate this opportunity.) Given the high levels of consumer food and beverage spending in the attractions industry—which can be two or three times more per capita compared with consumer spending on other categories connected to attractions, such as retail sales and parking—it can be worthwhile for developers of attractions to focus efforts on both lifting the quality of food and beverage offerings and weaving them into the holistic experience.

Analyze Data to Adjust Consumer-Facing and Back-of-House Operations

Digitalization, robust data gathering, and the use of advanced analytics can help a short-term attraction (with limited time to get things right) quickly adjust to improve operational efficiency and identify unmet consumer needs as they emerge. Real-time insights can help with staffing decisions by ensuring workers are deployed to the right places at the right moments. Data-driven

analysis can help evolve best practices, creating standardized approaches that can be replicated if the attraction expands to other locations.

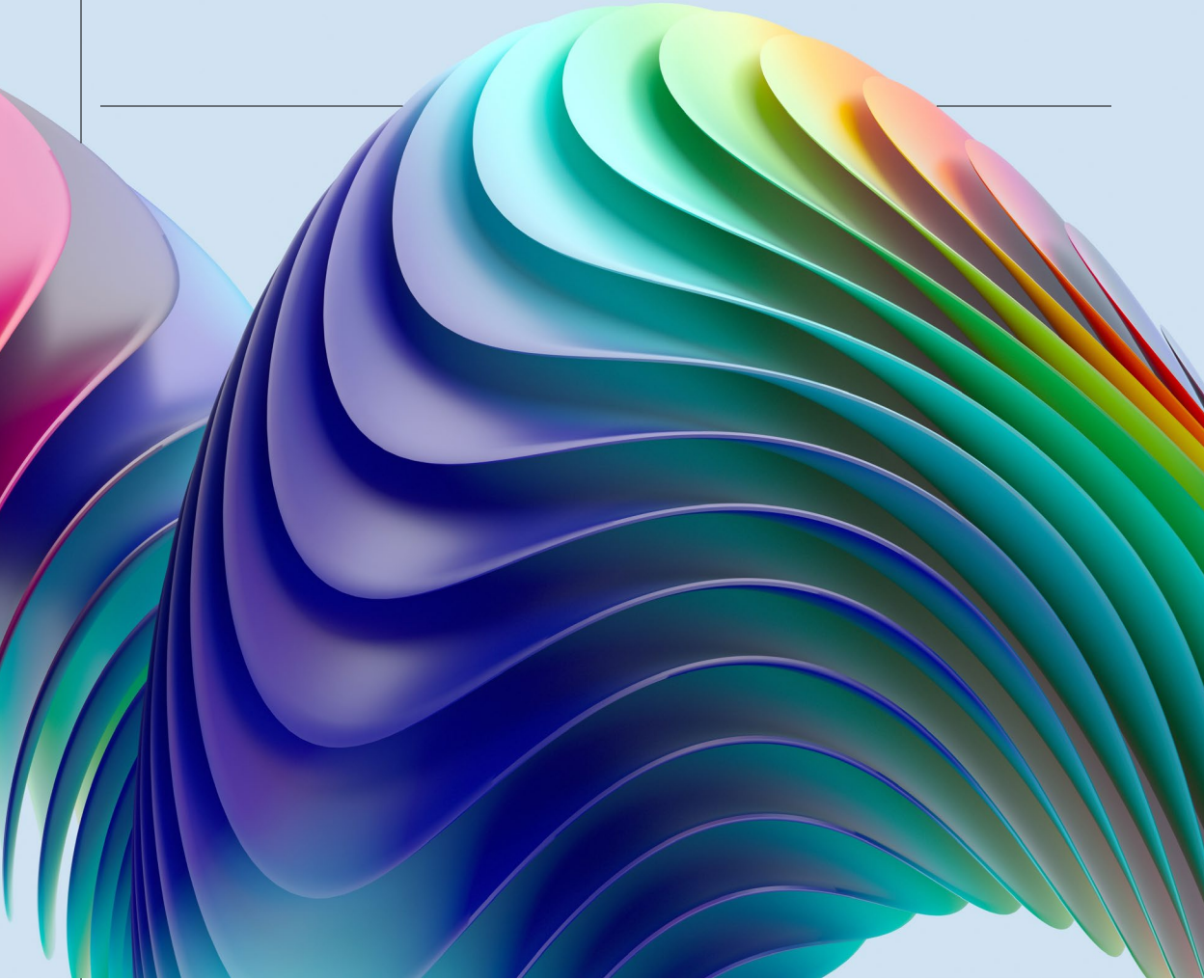
Develop Distinctive, Promotable Ideas

The family entertainment center Dave & Buster's hosted a rave-themed pop-up—collaborating with the electronic music collective Brownies & Lemonade to transform arcades into dance parties. Dave & Buster's Chief Strategy Officer Aldo Rosales says, "The goal was to create an experience that felt distinctly Dave & Buster's—grounded in what our audience already loves. It's about integrating with your guests' passion points and giving them a reason to show up. When you start there, the marketing comes naturally. Your partners, your influencers, and your storytelling all build around that shared energy."

Protect Assets

It's important to bear in mind the downside risk of a failed initiative. Proposals should be carefully evaluated, and potential collaborators





should be thoroughly vetted. A subpar idea for a new location-based experience—or even a great idea that’s poorly executed—can create lasting headaches for the owners of both the associated IP and the experience venue. “For real estate holders, you need to give serious consideration to whether the experience will actually bring in more revenue and foot traffic than a restaurant or retail store would,” says Caesars’ Holdren. “And if it’s your IP that’s being brought to life, it should be an experience that you take an active hand in developing—just as you did when you were creating the IP itself. A bad experience will be memorable in a disastrous way, and it can forever damage a customer relationship.”

Smaller-scale, transitory, and IP-driven location-based entertainment formats are poised to play an increasingly pivotal role for brands, media companies, and consumer-facing businesses that want to engage their audiences in immersive new ways. These flexible attractions offer considerable

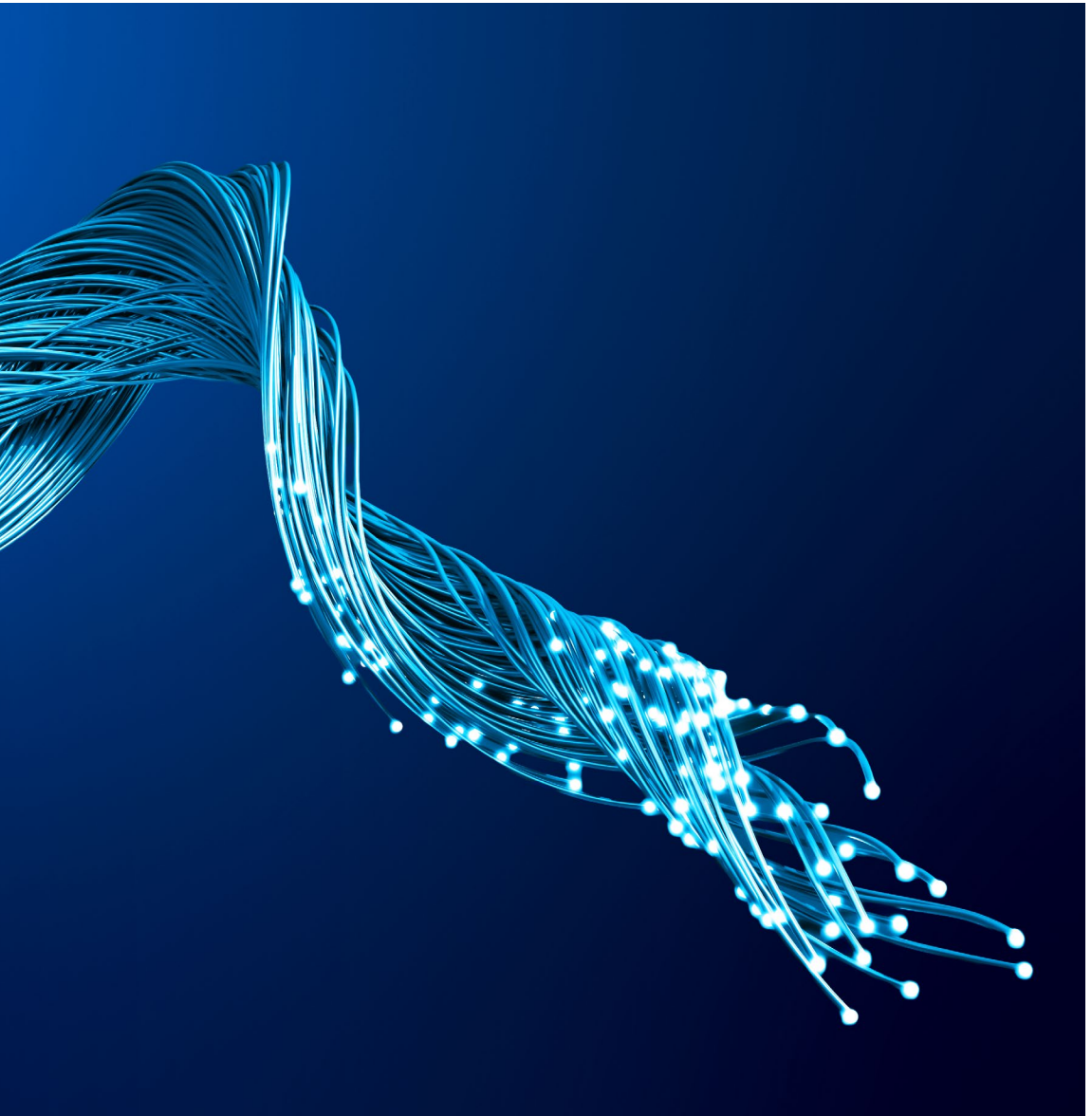
advantages—from lower investment requirements and faster time-to-market to more targeted, high-impact audience engagement—which can make involvement in immersive experiences more accessible and strategically attractive for many companies. Maximizing the potential of these initiatives requires thoughtful execution and operational discipline to mitigate risks and ensure each project delivers on its promise. With the right approach, however, these innovative location-based entertainment models can serve as a powerful growth lever, helping companies captivate fans and drive tangible value through unforgettable experiences. [Q](#)

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- » The authors wish to thank Filipa Douma and William Abbey for their contributions to this article.

The AI Revolution In Software Development

If gen AI has a killer application, it's software development—one of the most profound shifts in the history of programming.

BY CHARLOTTE RELYEA AND MARTIN HARRYSSON



It's 8 a.m., and the third floor of a bank in London comes alive as the day crew—three engineers shaking off the rain—steps into their office. Screens glow with activity. Logs scroll. The soft hum of their computers lingers in the air.

The AI agent teams—nearly a hundred of them—have just finished their shift, having spent the night refining a new cross-border payment system, testing failure paths, and shipping updates at a pace no human team could match.

The humans drop their bags and begin the daily ritual: a sprint review that now happens every morning, not every two weeks. Waiting for them is a neatly organized stream of AI-generated pull requests, test evidence, and risk flags—more progress in 12 hours than a traditional team might make in a month.

The job of the engineers isn't to code so much as to steer, apply judgment to, and adjust priorities for the AI agents working for them. The engineers' focus is much more on structuring agent tasks into precisely defined workflows, ensuring their activities are predictable and of high quality (for example, predefining the sequence of agent activities), and structuring templates for agentic output.

Sound like sci-fi? It's not.

An agent factory for a large global systemically important bank has successfully done this, including the new daily sprint cadence with humans. The

results are staggering: ten times the speed at half the cost. That's a revolution!

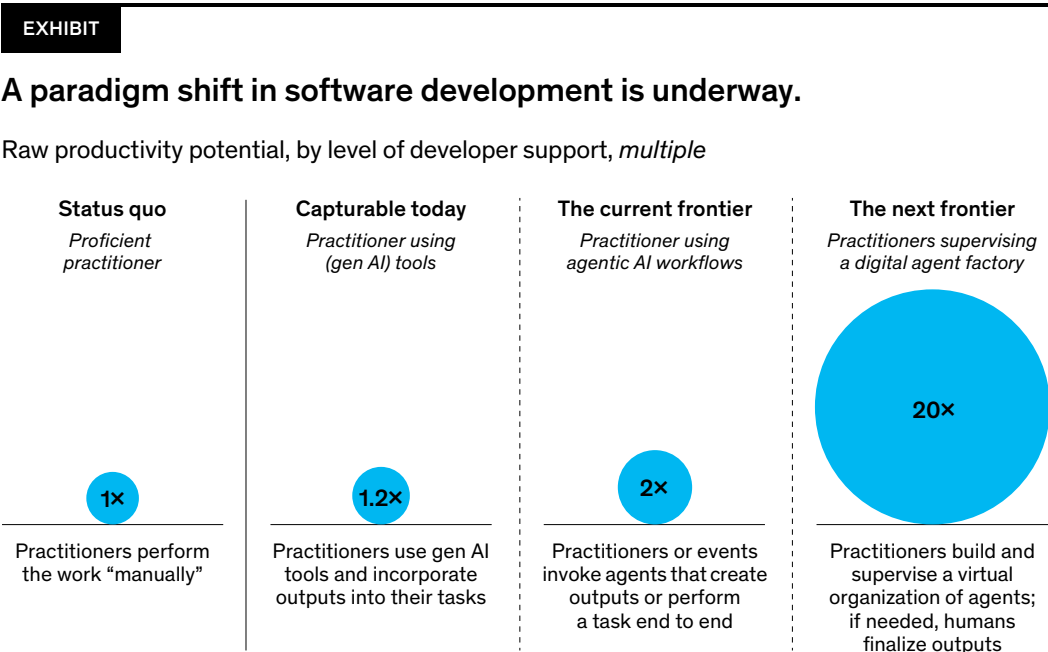
If gen AI has a killer application, it's software development. And its capabilities have grown exponentially over the past three years (exhibit).

It's hard to overestimate the shift that's happening in software development. In essence, AI agents are running increasingly complex tasks and workflows (such as creating evidence provenance, running legal and cyber checks, testing counterfactuals, and both suggesting and making decisions). The role of humans is to declare high-level intent and boundaries, evaluate outputs, and react to agentic decisions and suggestions. This change is leading to smaller teams, much lower unit costs for software development, and much faster idea-to-impact cycle times.

To better appreciate the implications of this shift, it's helpful to understand the progression of gen AI's abilities in software development because that leap is starting to happen, albeit not as quickly, in other areas like law, consulting, marketing, HR, and finance.

The progress can be broken down into four levels of developer support:

- **Level 1: Developing without gen AI.** The software developer writes all the code alone. Quality is solid, but speed is limited by how fast one person can work.
- **Level 2: Speeding up individual tasks.** The developer writes a few lines, and the AI suggests the



next ten, as though you had a super-fast pair programmer sitting beside you. AI provides a meaningful productivity boost.

- **Level 3: Automating entire steps in the workflow.** A developer describes a new feature to the AI agent in plain English. The AI generates the first version of the code, the tests, and the documentation automatically. The productivity boost is very substantial.
- **Level 4: Delivering entire applications.** A small team guides a coordinated system of AI agents that can deliver an entire application end to end—from design to code to testing to integration—raising only the decisions that truly require human judgment. The result is 20 times leverage: a few practitioners delivering what once required a large department.

Most companies are at Level 2 of this progression.

They deploy multiple AI development use cases spanning ideation, requirements, design, coding, testing, deployment, and operations, enabling continuous acceleration and compounding benefits.

These organizations also make their development model AI-native, evolving roles, practices, and workflows so that humans act as orchestrators of AI agents. Developers shift from writing every line of code to supervising generation, validating architecture, and managing quality; product managers and designers take on more system-level thinking and integration of AI into features and experiences. It's a fundamental change in how teams work.

Behind these shifts are three critical enablers that determine success. Top performers:

1. **Invest in serious upskilling**, using hands-on workshops, real sprint simulations, and coaching rather than passive training.

AI can transform software development for com

Level 3 is increasingly being adopted as large language models (LLMs) have evolved from simple inline completion tools to autonomously executing long-running multifile refactoring and modernization tasks. Level 4 is largely experimental as of the writing of this book, though with promising developments already emerging.



BEST PRACTICES FOR ADOPTING AI IN SOFTWARE DEVELOPMENT

McKinsey analyzed nearly 300 publicly traded companies to understand how AI is reshaping software development. We found that a small group of top performers—roughly the top quintile—are achieving 16 to 30 percent improvements in productivity, time to market, and customer experience, along with 31 to 45 percent gains in software quality.

The key insight here is that simply giving developers AI tools does not meaningfully move the needle. The companies that unlock real value are those that rearchitect how they build software and deeply embed AI across the entire development life cycle—not just for coding.

2. **Institutionalize tracking outcomes**—release frequency, defect rates, customer experience—not just simple adoption metrics.

3. **Reinforce change** through aligned incentives and performance management. In fact, about 80 percent of top performers link gen AI goals to the evaluations of product managers and developers. These enablers create accountability, accelerate learning, and help teams internalize new ways of working. Without them, organizations fall back into old habits, and AI's potential dissipates.

The implications are clear: AI can transform software development, but only for companies willing to rethink their operating model. Those that redesign workflows, roles, and governance around AI have the chance to create a true performance advantage.



A FACTORY OF AI AGENTS: HOW DOES THAT WORK?

AI agents make it possible to run software development like a two-shift digital factory. Humans take the day shift, setting direction and enforcing

quality. AI agents take the night shift, doing the heavy execution work—coding, testing, reviewing, documenting—inside a controlled, well-designed workflow. But reaching this point requires careful factory setup.

To begin with, the organization must prepare the environment in which agents will operate. Agents need structured requirements, clear user stories, and unambiguous acceptance criteria—they cannot infer business intent. They also need rich context about the system: domain knowledge, architecture diagrams, API contracts, data models, service boundaries, and nonfunctional expectations (such as performance and reliability). All of this is fed into the agent environment so the AI understands what it is building and why.

Once the factory is set up, the human team works the day shift. Their role is to decide what

declines, it invokes a performance-checking agent; if a policy is violated, it halts the workflow. By morning, the factory has produced a set of ready-for-review pull requests, each containing code, tests, logs, analysis results, and a natural language rationale.

The next day, the human team resumes the day shift by reviewing the output of the night. They examine the summaries, approve or refine code update requests, assess architectural fit, and give the AI new direction. They adjust priorities based on what the agents achieved overnight, tighten guardrails where needed, and mark more parts of the code base as “safe to automate” as confidence grows.

In this model, software development becomes a continuous, high-speed loop rather than a two-week sprint cycle. The humans guide the system;

panies willing to rethink their operating model.

matters and convert that intent into agent-ready tasks. They refine user stories, translate features into specifications, break the work into well-scoped tasks, and define what “good” looks like. They provide architectural direction—explaining which modules can be touched, which should not be altered, and why. They set priorities, tune guardrails, and update tests for areas where agents have made mistakes. In short, humans move from typing code to directing, decomposing, and quality-controlling the work.

As evening comes, the night shift of AI agents takes over. A coordinated fleet of them performs multistep workflows: Coding agents implement changes or refactor modules; test agents generate and run new test suites; QA agents identify regressions; security agents scan for vulnerabilities or leaked secrets; performance agents benchmark critical paths; and documentation agents rewrite and update API references and “what changed” summaries.

An orchestrator agent manages handoffs: If tests fail, it routes work back to a fix agent; if performance

the agents do the work; the engineering platform ensures safety and quality. The result is a factory that produces more, at higher quality, with humans focusing on the parts of the work that genuinely require expertise and judgment.

If you ask us, this is absolutely incredible. Success cases are still few and far between as of this writing, but breakthroughs are emerging. One large financial-services firm, for example, has stood up this exact AI agent factory to develop a greenfield payment system and is improving productivity by 40 to 70 percent. LATAM Airlines has also experimented with a version of this and is delivering 50 percent increases in productivity (with smaller teams).

What does it take to run an AI agent factory like the one described above?

- **Don’t skimp on the foundations.** Every successful implementation of AI agents has relied on strong foundations. LATAM highlights two in particular: a robust engineering platform that gives agents the tools and environments they need, and a product-oriented operating model

where cross-functional teams already understand modern software engineering.

- **Invest in knowledge graphs.** Knowledge graphs are essential because they unify all the information inputs—code repositories, documents, and more—into a single structured network that shows how concepts, facts, and assets are connected.
- **Learn to break work into agent-ready tasks.** Humans need to develop the skill of decomposing larger features into small, well-scoped tasks with clear inputs, outputs, and acceptance criteria. This is what allows multiagent workflows to run safely. Without discrete, agent-ready work items, agents either stall or drift.
- **Master spec-driven development and context engineering.** Teams need to get very good at defining clear specifications—what the system should do, how it should behave, and how it will be tested. AI can generate code, but only when its instructions are crisp, structured, and complete.
Equally important is giving agents the right context—architecture diagrams, data models, APIs, constraints, and business rules—so the AI can make correct decisions. Good AI output comes from good context, not clever wording.
- **Strengthen human judgment and review skills.** Humans become the editors in chief of the factory. They must review proposed updates, catch architectural drift, assess whether the agent's work matches intent, and decide when to tighten guardrails or adjust tests. This combination of product judgment, architectural understanding, and quality review remains fully human.
- **Revisit performance expectations.** Human-agent productivity changes how teams operate. LATAM found one of the biggest challenges to adopting agentic AI was redeploying people into additional tasks as agents freed up time. Some companies reduce team size; others raise the bar on what should be delivered in a quarter. Either way, operating models must shift.

- **Monitor token consumption closely.** In a world where teams can spin up agents, which then create additional prompts or spawn subagents, token consumption can grow exponentially and lead to significant cost overruns (tokens are essentially processing units for LLMs). To counter this issue, build up your financial operations (FinOps) management to track and direct agent activity.

Running an AI agent factory is not about swapping humans for automation; it is about creating the conditions where humans and AI agents can work together at high speed and with quality. The human capabilities that sit on top—decomposing work, exercising judgment, tuning the system, and managing cost—are what will turn an agent factory from an experiment into a durable advantage.

What would happen if progress in software development productivity moved from the current frontier of two-times improvement to the new frontier of 20-times improvement? How would this change the world of business?

We know the road there might be a bit bumpy—any one of us can point to issues companies have been having even making modest productivity improvements with AI agents. But this world is coming, and senior executives should be thinking through scenarios and implications. [Q](#)

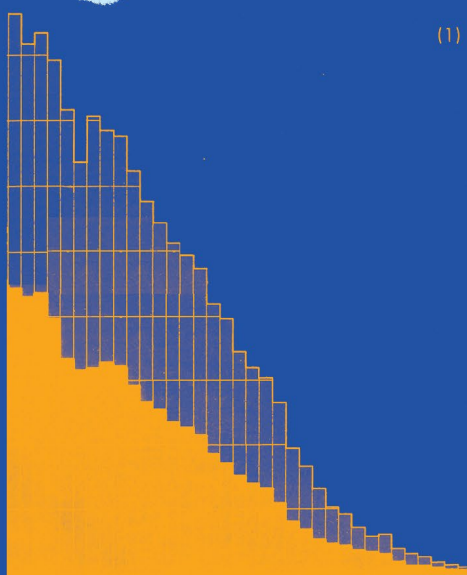
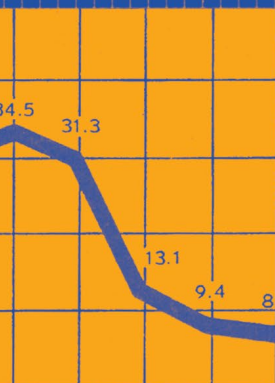
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**AI can generate code, but
only when its instructions are crisp,
structured, and complete.**



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