

# Managing Work and the Workforce in Health Care's New Reality

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# Preface

The pandemic put the health care sector on a roller coaster, and as the post-COVID new reality starts to take shape, the unpredictable ride is far from over. Hospitals and health systems continue to battle on the front lines, and stress and burnout (emotional and physical) are taking their toll. As employees grapple with unrelenting pressures, many are rethinking jobs, careers, and purpose. At the same time, hospitals are adapting and making changes to care delivery and business and operations that will outlast the immediate impact of the crisis. For industry executives, the macro issue of affordability has not gone away. Increases in labor and procurement costs exacerbate the problem.

While the near-term challenges are most acute for providers, they also have important implications for other players. For example, the need to build data, digital, and analytics capabilities, which was a necessity before COVID, has not ebbed. Indeed, it has become more pressing for organizations across the health care sector. But health care organizations also find themselves competing for technical talent with virtually every other industry, including the technology sector, which can pay more than all but the largest health care players. In addition, payers (as well as providers) are competing for talent not only with other health care incumbents but also with new, well-funded venture and private-equity-backed health care services companies.

Some of these changes were started, and others accelerated, by COVID, but all promise more twists and turns. Among the more significant are the following:

- Unprecedented levels of funding
- Alternative channels of care delivery
- Loosened policy and regulatory requirements
- New partnerships and collaborations
- The accelerated speed of experimentation
- More available data and better sharing of know-how and lessons learned

- An enhanced focus on social responsibility and protecting vulnerable populations

In addition, as patients' needs and the delivery of care become more differentiated, personalized, and virtualized, the industry is expected to respond with new solutions and to innovate more quickly. As health care executives think through how their organizations will work in the future, they must balance two priorities: managing the operational challenges of the near term and investing in innovative organization and talent models that can address patients' and employees' changing needs.

It's a lot for leaders to get their heads around. To help, we've selected a number of articles on the broad issue of work and the workplace that have relevance for the battery of challenges facing the health care sector. The first examines the new reality taking shape and the five big trends affecting players across the sector: providers, payers, pharmaceutical companies, and medtech suppliers. We then look at five aspects of organizational needs that will shape the future:

- **The Future of Work.** New working models to promote employee well-being and drive better outcomes for patients.
- **Smart Simplicity.** Combatting the increasing complexity of the provider delivery system.
- **The Bionic Organization.** How human skills and technological capabilities can work together to improve care and relieve labor pressures.
- **Skills and Talent.** The evolving needs of organizations and the degree to which supply and demand imbalances exist.
- **Resilience and Reinvention.** Catalyzing change in the industry—such as shifting sites of care, wider adoption of telemedicine, the growing use of digital solutions and artificial intelligence—for the benefit of patients and workers.



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*December 2021*

# Health Care's New Reality Is Dynamic, Digital— and Here to Stay

**By Szoa Geng, Nate Holobinko, Torben Danger, Sabrina Kristic, Sanjay Saxena, Ulrik Schulze, and Adam Farber**

**F**or the health care sector, COVID-19 delivered decades of change in a year and a half, highlighting the inertia that has been a significant barrier to widespread adoption of many available solutions. While many of the resulting changes were positive, the pandemic also laid bare the shortcomings of the health care infrastructure in many countries, revealed the tenuous state of health care staffing, underscored the disproportionately great health-related hurdles that patients from disadvantaged backgrounds face, and demonstrated the visible need for reliable, real-time data to spur fast action.

Many of the biggest changes are undoubtedly here to stay. Winners and losers across the sectors will be determined by how companies react to the shifts underway. Already, we see a divide opening in all four health care segments—providers, payers, biopharma, and medtech—between the players that are embracing the new reality and those that are trying to maintain or return to pre-pandemic business as usual. Those eager to adapt are experiencing a robust rebound in their core businesses and operations and discovering new opportunities to grow. Those holding out for a return to 2019 are enduring continued operational challenges and lower levels of productive activity. They are at risk of falling farther behind.

The new reality is not business as usual. Our latest research found that two-thirds or more of health care executives believe that their organization has significantly or moderately changed as a result of COVID-19. (See Exhibit 1.) Moreover, about three-quarters believe that the health care system (and their segment within it) will change more over the next three to five years. Here are five big challenges that successful organizations will need to tackle in this fast-evolving sector.

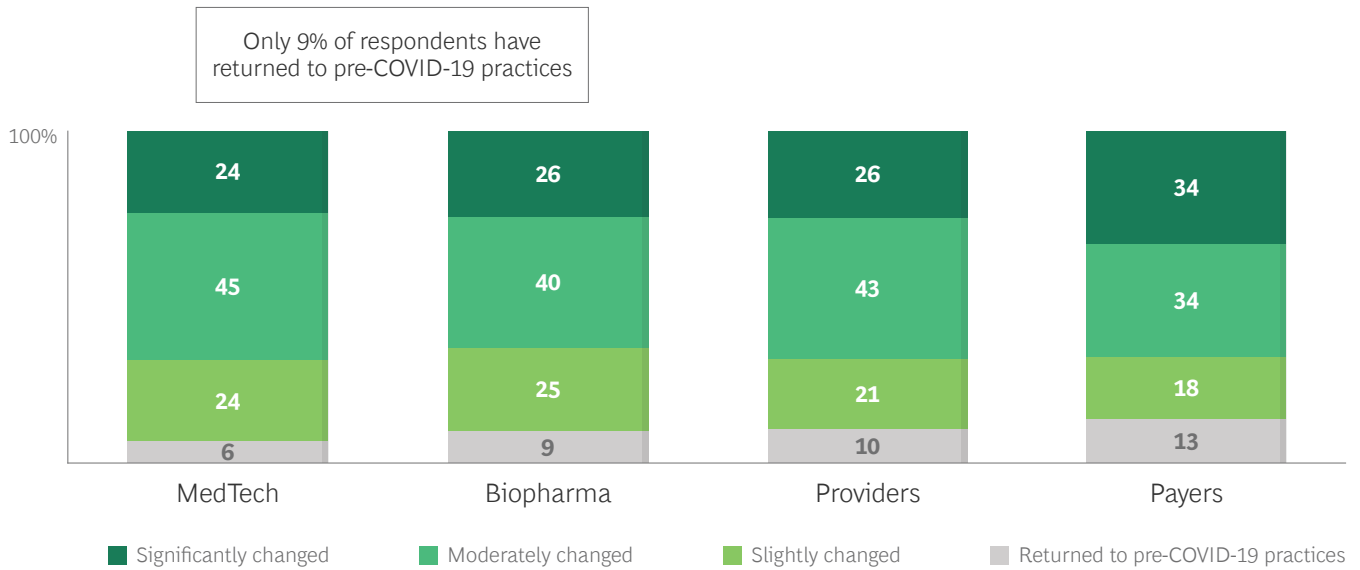
### Digital Engagement Is Now Imperative

Digital engagement is here to stay. Consumers, doctors, and health care executives all say so. Although telehealth usage has fallen slightly from its peak in 2020, it remains 11 times higher than it was before the pandemic began. Two-thirds of providers believe that use of virtual consultations will accelerate over the next one to three years. More than 30% of providers say that patients’ use of digital and diagnostic tools is common now, compared with only 17% that held this view before the pandemic.

More and more care journeys today start with digital interaction as the front door—and for certain specialties and treatments, virtual engagement will be a common option at most or all points of care. For example, according to our research, many providers believe that up to 60% of patient interactions for primary care will be conducted virtually in three to five years. (See Exhibit 2.) Some specialties will continue to require physical interactions, but companies that do not have the ability to engage digitally will lose patients, customers, and partners.

Still, while the benefits are clear, managing these new forms of engagement is hard. Expanding digital delivery requires providers to do more than just invest in digital platforms and technical infrastructure: it also mandates that they fundamentally change their operating model. Enhanced patient access, more flexible and on-demand scheduling, new clinician working and compensation models, and the ability to maintain quality and outcomes in the virtual environment are just a few of the shifts that providers must contemplate.

## Exhibit 1 - A Majority of Health Care Executives Say Their Organizations Have Changed Because of COVID-19



Source: BCG health care executive survey, August 2021.

Note: Because of rounding, not all bar chart totals add up to 100%.

## Exhibit 2 - Health Care Providers Can Do More Things Virtually, Especially with Respect to Long-Term and Continuing Care

What percentage of interactions with patients will be conducted virtually in 3–5 years? (%)

	First interaction/visit	Test results review	Pre-operation visits	Direct post-op follow-up	Long-term follow-up/continuing care	Overall average	
Cardiology	33	65	34	34	58	45	
General surgery	31	62	36	35	59	45	
Dermatology	46	63	46	48	60	53	■ 60%–69%
Oncology	27	53	30	30	48	37	■ 50%–59%
OB/GYN	28	60	31	37	53	42	■ 40%–49%
Primary care	53	69	48	51	67	58	■ 30%–39%
Overall average	36	62	37	39	57		■ 20%–29%

Source: BCG health care executive survey, August 2021.

### Patients Want Care in Their Community and Home

Patients are exhibiting a shift in preference away from hospitals and hospital-related sites of care. (See Exhibit 3.) Our most recent patient sentiment survey found that 60% of patients are willing to transition from hospital-level care, 52% are willing to transition from hospital-associated clinics, and 32% are willing to go to whatever site their physician recommends for care. Almost 30% of providers say that use of remote monitoring for patients is a common practice today, compared with only 12% who said it was common before the pandemic. Three-quarters of providers believe that use of remote monitoring will accelerate over the next two to three years.

Physicians, providers, and others must follow patients' shifting preferences toward various care settings that are closer to home and community, the next frontier in care delivery. More than 40% of executives expect to see an increase in procedures performed in outpatient ambulatory settings, and more than 60% expect to see more care delivered in nonclinical settings (such as the home). We project that as much as one-third of all hospital volume could move into ambulatory, home, and virtual-visit settings over the next ten years. Solutions are already expanding to cover more mobile patients and more points of care—including diagnostics, urgent care, primary care, specialty care, and post-acute care.

Further impetus for these shifts will come from policy momentum to maintain telehealth access and promote reimbursement parity. During the pandemic, the US Center of Medicare Services (CMS) increased the number of diagnosis codes eligible for telehealth reimbursement by 80%, and US private insurers eliminated co-pays for virtual care during the crisis. CMS recently added remote therapeutic monitoring codes to the 2022 Physician Fee Schedule, suggesting that the changes in reimbursement policy for digital health are likely to become permanent. Almost 30 states and the District of Columbia have passed parity laws for telemedicine.

That said, national and regional differences persist as legal, regulatory, and reimbursement frameworks have reached different stages of evolution around the world. The pace of telehealth adoption will probably be fastest in geographies such as the US, the UK, Australia, Denmark, Switzerland, and Spain, where digital consultations are an established part of the health systems. In contrast, data and privacy restrictions in markets such as Germany, Austria, France, and the Netherlands could hamper uptake in those countries.

# Exhibit 3 - Patient Preferences Show a Shift Away from Hospital and Related Sites of Care

Patients state a preference for care in lower-acuity settings

		New site of care preference (%)				
		Hospital	Off-hospital clinic/office associated with a hospital	Independent clinic/office	Wherever my doctor recommends	
Original site of care	Hospital	40	24	9	28	<b>= 60%</b> Willing to step down from hospital-level care
	Off-hospital clinic/office associated with a hospital	7	41	22	29	<b>= 52%</b> willing to step down from hospital-associated clinic
	Independent clinic/office	3	9	55	32	<b>= 32%</b> willing to return to wherever is recommended

Source: BCG patient sentiment survey, May 2020.

Note: Because of rounding, not all totals match the expected sum.

As the delivery of care shifts, providers must create delivery ecosystems that integrate both digital and in-person modalities. Providing a cohesive care experience across the patient journey will require providers to partner more seamlessly with other stakeholders. One big must-do for providers is to determine the right number and level of partnerships to establish with pharma, medtech, and insurance players to provide a cohesive patient experience and deliver the best outcomes while maintaining competitive advantage.

As patient care takes place in more diverse venues and becomes increasingly virtual, biopharma and medtech companies need to understand implications of these changes for [diagnosis, medication adherence, product design, R&D, and commercialization](#). In our most recent provider survey, three-quarters of physicians said that they would prefer to maintain or further increase the amount of virtual (versus face-to-face) engagements with pharma reps that they became accustomed to during the pandemic. They see virtual engagement with pharma companies as efficient and effective. Doctors are also looking for new models of cooperation with the pharma industry. Two of the four most effective communication channels for physi-

cians are now virtual: training webinars and virtual speaker programs. Physicians continue to have high levels of interest in medical information and scientific data, and more are interested in learning how biopharma companies can support patient care with digital tools and engagement.

Medtech companies have an opportunity to define their strategies and their role in the patient journey more clearly, and then optimize their production and distribution accordingly. Like biopharma firms, medtech companies will need to invest in culture, training, and technology to support new multichannel sales and marketing models, since they will have fewer opportunities for in-person sales. Early adopters of omnichannel sales approaches in medtech have enjoyed strong results. The main focus in medtech continues to be on developing innovative and differentiated products, services, and solutions for a wider variety of care settings. Many subsectors are experiencing a continuing shift from hardware innovation to digital and software features and ecosystems (such as remote access), as well as to service offerings. Some companies are actively positioning themselves as partners of choice for other players in a multisite, omnichannel care delivery model.



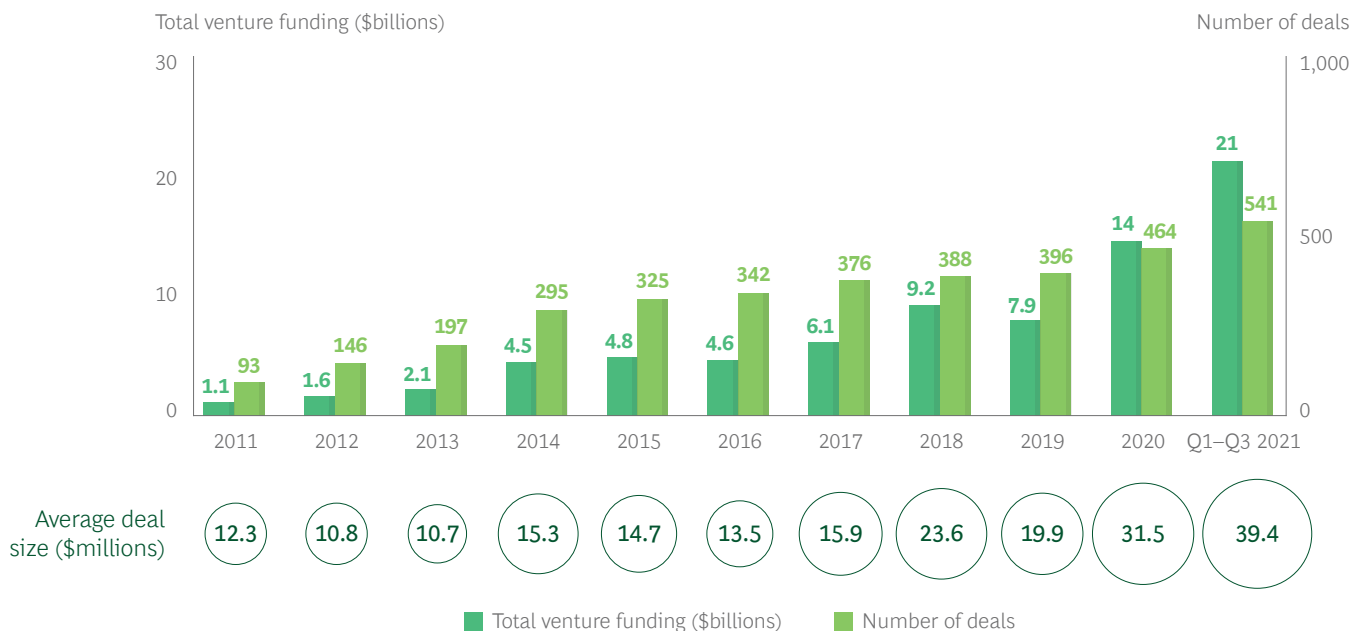
Payers have a critical role to play as enablers and facilitators of the shift in care settings. They can also play a role in facilitating more home and community care settings. Many companies are accelerating their adoption of digital technologies and altering benefit designs in ways that offer preferential cost sharing for—or even mandate the use of—telehealth as a first step. Two-thirds of insurance executives believe that COVID-19 has had a positive effect on virtual and telephonic engagements, and nine of ten expect members’ digital engagement to increase over the next one to three years. More payers are partnering with other organizations to share data and enable improved mobile and cloud experiences. As many payers integrate themselves with the delivery system, they increasingly become direct facilitators of in-home, remote, and ambulatory services, often via the creation of virtual platforms and ecosystems to link patient journeys.

## Science and Technology Accelerate

As the available therapeutic arsenal rapidly expands, players throughout the sector must adjust their practices to keep pace with the advances. New and advanced treatment technologies, such as RNA, CAR-T, and cell and gene therapy are gaining widespread traction. The successful development and delivery of two mRNA COVID-19 vaccines in less than a year will accelerate a wave of RNA innovation. We expect to see significant use of mRNA technology against other viruses, now that mRNA technology has been validated through the administration of hundreds of millions of doses. We also expect researchers to significantly accelerate the use of mRNA as a therapeutic modality in oncology and rare diseases and in other acute and chronic diseases.

In recent years we have seen strong growth in the funding of digital ventures, and the emergence of COVID-19 led to a marked acceleration in such funding. Venture funding in health care surpassed \$20 billion in September 2021, with three more months left in the year, and the average size of funding deals increased as well—to \$39 million in 2021, a 147% jump from \$15.9 million in 2017. (See Exhibit 4.)

## Exhibit 4 - Through September, Digital Health Funding for the Year 2021 Surpassed \$20 Billion



Source: Rock Health Digital Health Venture Funding Database, accessed October 4, 2021.

Note: Includes US deals of \$2 million or more; data through September 30, 2021.

As the speed of scientific innovation accelerates, everyone involved in the development, delivery, regulation, and reimbursement of care must become more agile. The pandemic represents an **inflection point** for the use of real-world evidence, both in R&D and in clinical trial design and deployment. One application garnering increased interest is the use of **real-world evidence** to serve as synthetic control arms (SCAs), dramatically changing the historical approach to clinical development testing. SCAs have the potential to reduce the number of patients required in traditional control arms, especially active-comparator or standard-of-care arms, thereby decreasing study costs, accelerating the speed to result, and boosting the overall attractiveness of clinical trial participation for prospective patients.

We also expect additional real-world data and evidence to deliver more informed engagement among providers and patients, payers, regulators, and pharmaceutical companies, yielding better outcomes at lower cost. Drivers include greater availability of real-world evidence, including data from electronic health records, social media platforms, and wearables; the availability of powerful computing tools and technologies to mine and analyze data in an iterative and self-improving fashion; and a growing number of partnerships and initiatives among regulators and private-sector players.

## Winning the Battle for Talent

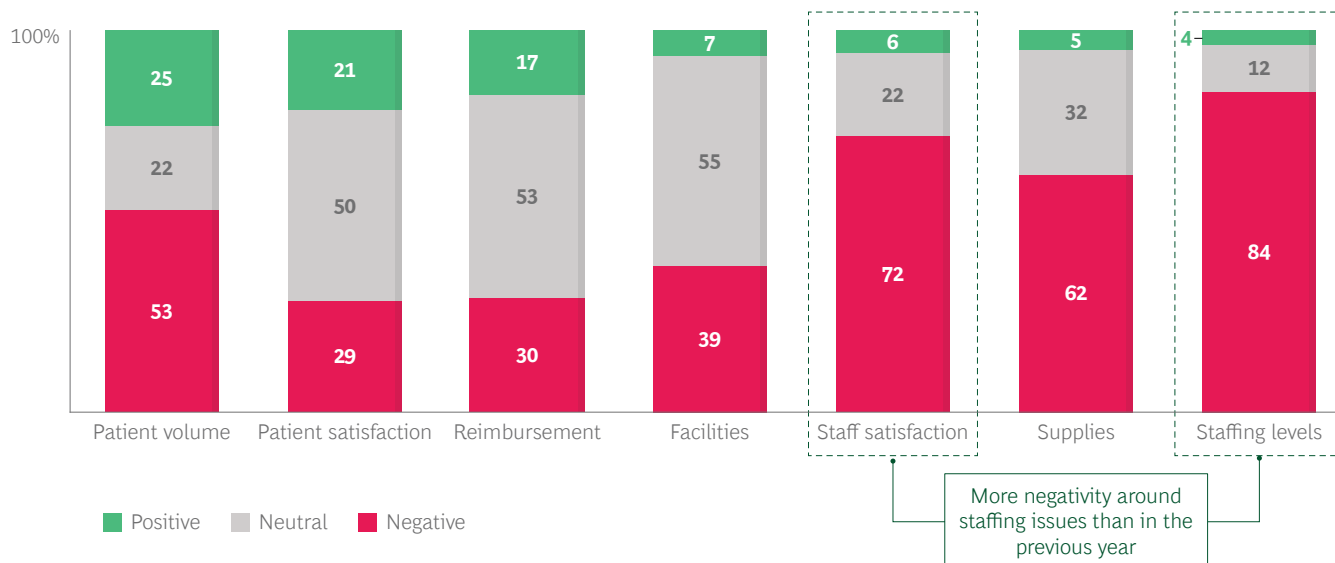
In the past year or two, a lot has changed in the ways people work and think about work. In response, organizations need to recast how they recruit, train, retain, and make themselves attractive to talent.

In a June 2021 survey by Future Forum of more than 10,000 knowledge workers from six countries, 21% of respondents said that they are likely to move to a new company in the next year, and 56% said that they are open to looking at new positions. Flexibility ranked second as a factor in job satisfaction, behind only compensation.

Hospitals and health systems have experienced particularly difficult staffing issues. Workforce challenges (such as burnout and labor cost inflation) are compounding the enormous burdens that providers face. Providers need to reimagine how care is delivered, make major digital investments, and address unrelenting pressures related to workforce affordability. Many of these issues were big concerns before COVID-19, and they are all the more acutely felt now. In our 2021 survey of health care executives, 72% of providers said that COVID-19 has had lingering negative effects on staff satisfaction, and 84% said that it has had lingering negative effects on staffing levels. (See Exhibit 5.) This isn't just a management issue. Staffing can have measurable impact on care quality: in 2020, hospital-associated infections increased significantly, after declining steadily for years.

## Exhibit 5 - Hospitals and Health Systems Have Experienced Particularly Onerous Challenges on Staffing Issues

Providers' responses on the lingering effects of COVID-19 on their organization, August 2021 (%)



Source: BCG health care executive survey, August 2021.

Note: Because of rounding, not all bar chart totals add up to 100%.

Digitization, more virtual care, and more varied care settings present staffing and organization challenges for pharma, medtech, and insurance companies, which must transition toward more bionic ways of working at time when talent—especially technical talent—is in short supply. The combination of a shifting skills mix, new ways of working, and new care delivery models for entirely new treatments will be a major test for most management teams and HR functions. For example, the design, manufacture, and delivery of cell therapies are likely to require advanced scientific and digital and analytics knowledge at every stage of the treatment chain. The right culture—one that breaks data silos, democratizes data, and centralizes its availability for use across the organization—is a prerequisite for success.

Aside from recruiting and training, part of the staffing solution lies in automating or eliminating low-value tasks (such as performing manual data entry or completing tasks that call for a lower-than-licensed level of skill) so that the available staff can focus on higher-value activities. Our research indicates that organizations in all segments should give due weight to the following principles as they rethink how they organize and do business:

- People can collaborate effectively from remote locations on an increasing number of activities.
- Even where remote work isn't possible, organizations should intentionally integrate digital tools and supporting automation to restore employees' "joy of work" and tighten their focus on value.
- It's not all about working remotely: flexibility is important, too, as is in-person connection with others.

## Prioritizing Health Equity

To achieve step-change improvements in health outcomes, organizations must put dollars and leadership energy toward health equity. The pandemic highlighted long-standing gaps in equitable access to health care. The COVID-19 death rate in the US among Black people is more than twice that of whites, and more than 85% of the difference is attributable to greater risk exposure and less access to testing.

These disparities present an additional threat: underserved populations may not be able to access and benefit from the new therapies. Addressing this challenge requires greater emphasis on the social determinants of health and the formulation of government policies to help protect vulnerable populations. As we wrote recently about [digital therapeutics](#), companies need to rethink their approach to product development, from idea and design to realization and commercialization. Doing so means taking into account how members of various demographic groups might use a particular product in their daily lives and testing potential solutions with individuals who are currently living with disease.

In recent months, major companies, such as Walmart, Target, CVS/Caremark, and UnitedHealth Group, and government agencies, such as the US Department of Health and Human Services and CMS, have announced major investments in initiatives to reduce inequities in health care access. US News & World Report, which publishes an annual ranking of US hospitals, announced in June 2021 that in the face of widespread and persistent health disparities, it is developing a portfolio of health equity measures that it will publish along with its rankings. Digital health and technology-based efforts that leverage artificial intelligence and machine learning are avoiding past mistakes by embedding health equity thinking into algorithm design from the start. These are necessary steps, but there is much more to do.

## Big Questions to Ponder

Taken together, it's a lot for both clinicians and health care executives to digest. The five challenges that we have identified signal that the foundation of scientific discovery, the channels of care delivery, and the modes of patient engagement are undergoing radical change at the same time. And they are doing so in an environment in which making real improvements in equitable access and patient outcomes is imperative. Organizations that fail to adapt rapidly are at risk of becoming obsolete—sooner rather than later.

In deciding how to move forward, industry leaders need to ask themselves some big questions. Here are a few to consider:

- As scientific and technological innovations accelerate, what diagnostics and therapeutics that don't exist today will become possible? What expensive or rare interventions will become commonplace? What will the patient journeys of the future look like?
- In increasingly crowded digital channels, how will organizations cut through the noise? What entities in the ecosystem will emerge as trusted voices? How can health equity be protected and advanced?
- What are the implications for hospitals and institutions of the shift in care into the home and community? How will the workforce adapt? How will patient-physician and patient-caregiver relationships evolve?
- As care sites, modalities, and channels proliferate, how will the health care system achieve integration and harmonization? Which organizations have the best opportunity to create new operating and talent models that will distinguish them from the rest?

The familiar adage that the more things change, the more they stay the same does not apply to health care. For the sector as a whole and for its individual segments, the changes are likely to be extensive, material, and permanent. The sooner companies in all segments begin planning for and implementing new operating, supply chain, and customer engagement models—with strong emphasis on digital interactions at all levels—the greater their advantage will be as the new reality takes hold.

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# The Future of Work



About six months into the pandemic, we wrote that business was already forever changed. Whether we were ready for it or not, COVID-19 had added rocket fuel to trends already underway, among them digitization, remote working, and virtualization. Now, one year after that, it is clear that many of the changes are here to stay.

An industry that has been historically slow to change, health care demonstrated that it could move fast when it needed to. One of the most fundamental adaptations was the recalibration of focus from volume to value and prioritizing the outcomes that matter to patients. But as we look to the future, big questions loom. Who will deliver care in the future? And how? Can the sector further tighten its focus on patient centricity? Can it empower the frontline, embracing virtual modes of engagement, and create smarter and safer environments? The advice we offered in November 2020 holds true: companies and health systems need to concentrate on four critical areas: how we work, how we lead, how we organize, and what we need.



*November 2021*

## Work Will Never Be the Same—Savvy Business Leaders Are Adapting to Change That’s Already Here

**By Bharat Khandelwal, Deborah Lovich, Joppe Bijlsma, Frank Breitling, and Penny Metchev**

There’s still time to capitalize on COVID-19’s once-in-a-lifetime effect on business. Although uncertainties born of the COVID-19 crisis continue to circulate throughout the world, one circumstance has become clear: business has forever changed. Whether we were ready for it or not, the pandemic has fueled trends that were already underway: digitization, remote working, and virtualization. There is progress in vaccine research, testing, and other non-pharmaceutical interventions (distancing, masks, and so on). Yet given supply chain and other constraints, any societal-level immunity will take months or even years. Several new, innovative work models are being created, and the best of these will be retained forever. The transformation of work is accelerating toward more flexible and customized models. This shift is here to stay. If companies don’t rapidly reinvent how they serve customers and support their employees, they will lose in the new reality.

Many companies responded to the crisis by focusing on immediate priorities: guaranteeing employee safety; deploying remote-working tools; evaluating real-estate savings. In emphasizing business continuity, however, many executives are not aggressively rethinking broader drivers of value, such as revenue, customer acquisition and retention, productivity, and talent—nor are they diligently quantifying the opportunity cost of inaction across these dimensions.

To help clients meet these extraordinary challenges and realize the opportunities they enable, BCG has developed an integrated approach to systematically assess each firm’s situation in order to create a customized strategy. When it comes to the future of work, there is no one-size-fits-all model. Instead, leaders need to design their own modus operandi intentionally and thoughtfully. For this purpose, we recommend examining four critical areas: how we work, how we lead, how we organize, and what we need. (See Exhibit 1.)

## Start with Your Customers

Here’s an underappreciated fact: companies exist because of their customers. As a result, any discussion of working models must begin with customer needs, especially as those needs evolve in the current environment. Specifically, leaders should ask themselves two questions upfront:

- What do our customers need, both today and in the near future?
- How do our customers want to engage with us?

Globally, over the past half-year—across both B2B and B2C sectors—customers have rapidly shifted away from in-person interactions and toward virtual and remote ones. That’s what a novel virus with no known cure does to the world.

## Exhibit 1 - Leaders Need to Take a Holistic and Intentional Approach When Designing the Future of Work

<b>HOW WE WORK</b> Embrace disruption	<b>HOW WE LEAD</b> Empower and inspire	<b>HOW WE ORGANIZE</b> Be responsive yet resilient	<b>WHAT WE NEED</b> Smart environments
<b>1.1   Reimagined Customer Relationships</b> Build virtual go-to-market methods Rethink personalized relationships Remove friction; create convenience	<b>2.1   Empowering Leadership</b> Promote adaptation and empathy Train leaders for remote management Empower the frontline	<b>3.1   Ways of Working</b> Embrace agile, iterative teaming Focus on alignment and autonomy Foster virtual collaboration Conduct shorter, effective meetings	<b>4.1   Space, Design, Location</b> Right-size real estate footprint Create safe and smart workspaces Design human-centered workplace
<b>1.2   Employee Work Models</b> Develop new work models Support remote readiness: asynchronous, location-agnostic Balance employee and team needs	<b>2.2   Cohesive Culture</b> Articulate and evolve culture Build affiliation and mentorship in virtual environments	<b>3.2   Adaptive Organization</b> Prioritize employee well-being and wellness Adopt flexible operating models Update governance and policies	<b>4.2   Tools and Technology</b> Implement virtual workspace design Adopt collaboration and remote tools Strengthen cybersecurity and data privacy
<b>1.3   Productivity and Value</b> Prioritize what matters; remove waste; return time to employees Automate; digitize; deploy AI Remodel SG&A/opex	<b>2.3   Societal Leadership</b> Reduce carbon footprint Create inclusion, access, and equality	<b>3.3   New Talent Models</b> Digitize the talent journey Access skills via new talent models Increase access to diverse talent Manage attrition of top talent	<b>4.3   Learning Organization</b> Promote digital learning and upskilling Meet future skills requirement Embrace remote apprenticeship

Source: BCG analysis.



Many businesses adapted to the situation in an ad hoc manner. As time goes on, though, many of these adaptations are likely to endure. Smart companies will see this constraint not as an obstacle but as an opportunity. Indeed, for companies with an opportunity-focused mindset, possibilities abound. Since customer interactions will have lower barriers to entry and exit, the potential for more frequent interaction points will grow. And since schedules will become more flexible, customers will expect deeper engagement.

Beyond direct customer interaction, the new workplace that the pandemic has thrust upon us has unlocked several societal benefits. One obvious and potentially permanent change is the dramatic reduction in travel. Less travel reduces climate impact and increases employee well-being—two key dimensions of sustainability. Other changes are more nuanced. For example, location-agnostic models enable companies to boost their employees’ geographic and cognitive diversity, thereby spurring increased innovation in problem solving.

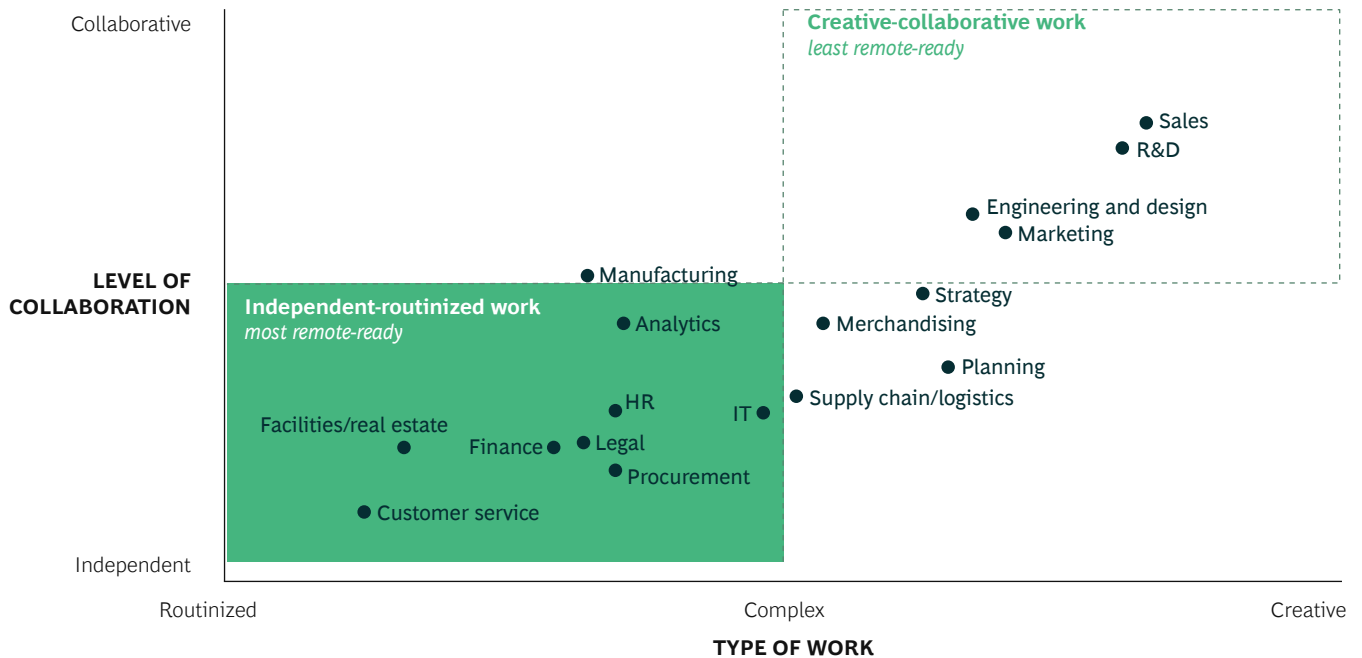
## Create De-averaged Work Models for Employees

We don’t believe in returning to the past, when work happened primarily with colleagues who were always located in the same place at the same time. Nor do we believe in the opposite extreme, where work is entirely remote. People may still need or want to meet physically in order to collaborate, co-create, and congregate.

Some jobs—such as factory production and lab R&D—require ongoing physical presence, and even employees who can do their work virtually need spaces and times for in-person interaction to unlock apprenticeship, team bonding, and learning and development. We believe that the best approach is to develop a range of flexible work models that conform to each individual and each role.

First, companies must look at all the work in their value chain through the lenses of changed consumer expectations and available technologies to address them, and then arrive at new work packages that will deliver business needs. After that, they must categorize the work along two dimensions: type of work, ranging from routinized to creative; and level of collaboration, ranging from independent to collaborative. (See Exhibit 2.)

## Exhibit 2 - Readiness for Remote Working



Source: BCG analysis.

After identifying the type of work that needs to be done in each case, planners should overlay the plot point with the given team (for example, procurement or marketing). To ensure coordination and collaboration, it is important to set expectations by specifying norms and guardrails. More specifically, planners should overlay the work activity data with individual preferences, team norms, and organizational guardrails. This is where the abstract meets the concrete, resulting in a set of personas for which the company can design models.

## Unlock Productivity

Finally, the company needs to gauge whether its new models are succeeding. Do they sustain morale, creativity, and productivity?

These elements are notoriously hard to measure. In operational and industrial work, a strong correlation exists between inputs and outputs. Carefully controlling the inputs generally ensures the quality and efficiency of the outputs. But in knowledge work, correlating outcomes to inputs is far more difficult. Productivity is less certain, and accurately assessing it necessitates using different lenses.

As we shift toward more creative and collaborative work, productivity is harder to unlock and measure. People are not necessarily more productive just because they are exchanging more emails and attending more meetings. A focus on outcomes and outputs rather than presence and inputs will serve companies better. They need to take a controlled and experimental approach to determine what drives productivity, and then they need to alter their inputs and measure the resulting outputs.

Other key ingredients that drive productivity are focus, engagement, and participation in larger and more diverse networks.

## Reset How You Lead

Most of today's leadership models were designed centuries ago, when managers and supervisors watched over their subordinates. Over the past 30 years, as a result of globalization, these models have seen incremental improvement. Nevertheless, most of the world's workforce still meets at the same place at the same time, and managers continue to expend most of their energy on managing tasks.

Today, the role of leadership is more concentrated. Leaders must quickly learn how to manage workforces that are fragmented across locations and time zones. Instead of focusing on supervising and overseeing, leaders must set objectives, modularize work, and enable teams.

Although new work models can address these challenges, they also create new ones. For example, building cohesion in teams and identifying and rectifying dysfunctional behaviors have become more difficult. Similarly, integrating new employees and building trust take more time. It is critical to anticipate and face these challenges directly.

## Promote a Cohesive Culture

Another critical short-term challenge involves responding to how people are wired. Humans are social creatures who need to connect in some form with others. It's not just that people tend to be happier in social settings; it's also that they gain a greater sense of purpose by collaborating with colleagues.

The pandemic has exerted great pressure on these needs. Indeed, many people will probably still be working remotely, to some extent, through the end of 2021. And in many instances, the shift to remote work will be permanent. Consequently, companies must create opportunities for employees to interact with one another through collaboration, apprenticeship, and training.

The larger—and often overlooked—issue is *culture*. Culture is transmitted and built when we observe and embrace behaviors, see decisions being made and learn from them, communicate ideas and knowledge, and adopt rhythms and routines that are important to organizations. Culture waits for no plans. How people interact and work together is an immediate and natural consequence of the workday. When everybody goes online, building and maintaining a cohesive culture become more difficult. This is a shame. Social cohesion builds trust and understanding, and they in turn foster more efficient and productive collaboration. According to BCG research, workers who are satisfied with their social connectivity are, on average, 2.5 times more likely to be at least as productive during the COVID-19 period as they were before.<sup>1</sup>

To achieve these results for their team, leaders must explicitly communicate their company's core values to their staff. They must use the pandemic to reflect on and document what it means to be a member of the company—not only as part of an orientation strategy for onboarding new hires, but also as a refresher for the entire company.

1. BCG COVID-19 Employee Sentiment Survey, May 21–June 13, 2020 (N = 12,662 in the US, Germany, and India), unweighted, representative within ±3% of census demographics.

## Take Advantage of the Opportunity to Leverage Talent Mobility

Yet another issue that COVID-19 has surfaced is the ease with which companies can lose top employees. When the world is in some form of lockdown, people can work anywhere—and many of them have made big changes in order to find the ideal environment.

Of course, the increased mobility of talent also presents an opportunity. Companies that embrace sourcing across geographies will benefit from higher-quality and more-diverse candidates. Companies that rethink their recruiting requirements and hiring process will gain access to a pool of human capital that otherwise would simply have been disqualified.

In working with BCG's clients, we've seen many C-suite hires during the pandemic. These executives have started work in a critical new role without having met anyone at the company in person. If remote hiring is possible at this level, it's certainly doable for more junior roles.

### NEW TALENT MODELS

Similarly, companies should invite discussions about alternative labor models, including leveraging the gig economy for shorter-term projects. The film industry has employed this model for decades: Studios rarely employ artists, actors, and musicians permanently. Instead, they assemble a crew with the right skills to complete a specific project.

### FOUR CONDITIONS

In order to flourish, a flexible model must satisfy the following four conditions:

- Managers must modularize roles with clear objectives, well-defined handoffs, and accountability.
- Managers must judge workers on performance rather than personality.
- New workers must be onboarded rapidly with well-documented team norms, organizational routines, and rhythms.
- Everyone must be adaptable; when things don't pan out, the whole team must be able to pivot.

In identifying these conditions, we are not recommending or forecasting a massively transient workforce. Rather, we believe that companies will benefit most by availing themselves of both a stable and long-term model and a need-based and flexible model. In either case, companies must create an atmosphere where talented people want to work and can be effective.

## Double Down on Learning and Development

Once a company has hired these people, how can it retain and develop them? Learning and development are essential. Most companies already have a vast ecosystem of technology and resources to help employees acquire new skills. In a world where the half-life of skills and expertise is ever shrinking, companies need to develop a structured approach to always-on learning for their employees—reinforcing ambition for learning, ensuring high levels of continued motivation, and creating a learning flywheel.

As you create a learning flywheel, it will be clear that simple training is not enough. To drive real learning, companies must create opportunities for apprenticeship, repetition and feedback, and peer-to-peer interactions. They may even consider letting employees shadow others within the company who work in different departments. A creative and flexible company can use this extraordinary time to allow its employees to gain all of the advantages of L&D without many of the disadvantages (for example, the friction of needing to transfer between offices or countries).

## Redesign the Physical Workplace to Create Smart Environments

Not surprisingly, the pandemic has revealed opportunities to rethink the workplace. For example, many companies are right-sizing real estate, enhancing collaborative spaces, and providing remote-work allowances.

However, getting the workplace right entails looking beyond the short term. Now is the time to fundamentally reset and retool the whole notion of work. The role of the office must evolve from a place to sit into a space to connect. For example, businesses with a distributed, activity-based work model can facilitate a culture of customer centricity, where empowered employees champion innovation, focus on net-new creation, and solve complex problems at speed. (See Exhibit 3.)

To realize these values, offices need a supportive ecosystem of technologies, including sensors, booking systems, and digital collaboration tools. As employees flex between telecommuting and a centralized office, digital tools will make interaction seamless across space and time.

# Exhibit 3 - Distributed Activity-Based Work Enables Empowered People and Rightsized Real Estate

A distributed activity-based workplace provides purpose-built zones to support employees as they move between tasks, work modes, and spaces throughout the day



- 1 Neighborhood work zone**  
Workstations and phone rooms available for individuals and team activities
- 2 Focus zone**  
Quiet areas to support and signal time needed for heads-down time
- 3 Collaboration zone**  
Well-equipped teaming areas for group work, digital connections, and formal meetings
- 4 Work cafe**  
Social spaces blended with productivity enablers to promote a casual work setting
- 5 Wellness zones**  
Rejuvenation zones to support healthy work cadence
- 6 Third place**  
Semisocial environment for “alone together” time
- 7 Home office**  
Ergonomically supportive home office with limited distractions

Source: BCG analysis.

## Follow These Five Lessons

Businesses today have a rare opportunity to start anew. Using their experience before, during, and after COVID-19, they can create a work model that promotes employee well-being while driving customer value. To these ends, leaders should focus on five lessons:

- **The shift is here to stay.** Many customer and employee behaviors that took root during the pandemic will become desirable—and even permanent—even after vaccines and herd immunity.
- **Be holistic to create competitive advantage.** Many companies are consumed by short-term thinking right now. Smart companies will be holistic in how they embrace the business model changes driven by the pandemic. They will take advantage of this time to expand their ambitions and create competitive advantage.
- **Start with the customer.** When designing new work models, companies should think like their customers and anticipate how the work will change.

- **Elevate the employee.** Companies need to purposely create culture and connection. They should build all employees’ capabilities to thrive today and in future work models, and they should balance the needs of the organization, teams, and employees.
- **Act now.** Companies that delay will find that their competitors have not stood still. The key is to embrace experimentation and then scale what works.

The COVID-19 crisis has generated a wave of human ingenuity and productivity. The next revolution is being built on technology that breaks the constraints of human capital. In short, the future of work has arrived. We are optimistic and pragmatic about the potential for companies, individuals, and society. It’s now up to each company to shape it. Or get shaped by it.

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*April 2021*

# The How-To of Hybrid Work

**By Nithya Vaduganathan, Allison Bailey, Sibley Lovett, Frank Breitling, Renee Laverdiere, and Deborah Lovich**

**H**ow can we preserve the benefits of remote or hybrid work as offices reopen without unintentionally institutionalizing the downsides of virtual models? That is the question facing many employers today.

Over the past 12 months, many organizations have found unexpected benefits in remote and hybrid work—more digitally enabled operating models, redesigned footprints to support innovation, enhanced means of collaboration—and they are eager to optimize these advantages. These employers recognize they are in a position to build a foundation for near- and longer-term change in the ways that work gets done. Employees too are interested in ongoing flexibility in where they work, when they work, or both. These aspirations will redefine ways of working.

But it's not as simple as just extending current remote work options postpandemic. In the forced transition to remote work, many leaders and organizations had to quickly adjust. While some leaders and companies figured out new ways to build the human connection remotely and to preserve creativity, many organizations struggled in this regard. Within months of the initial shift to remote working, employees who had high levels of social connectedness felt that they had maintained or improved individual productivity relative to their pre-COVID state. Yet even these socially connected employees found collaborative tasks quite challenging. Furthermore, while many were able to maintain close connections with immediate team members, most found that their weaker connections had deteriorated—putting creativity and innovation at risk. Now, after a year in the largely remote working mode, many employees are feeling real burnout and digital overload: meeting volumes have increased nearly 150%, and 40% of employees report feeling overworked, exhausted, or both.

Employers that seek to sustain remote or hybrid models must do so thoughtfully to capture the upsides of new ways of working while mitigating the risks. We've worked with organizations across sectors—in health care, education, finance, consumer goods, and more—and we've distilled the following methodology and emerging best practices for leaders to use when determining and implementing the right work models. While we are still early in this transition and will undoubtedly learn more over the coming months, these practices can serve as guideposts as companies begin the next phase in the future of work.

## Identifying the Right Work Models

Companies are currently experimenting with a wide range of potential work models. (See Exhibit 1.) Deciding which ones are best for a particular organization entails understanding the nature of the work being done, the teams involved, and the preferences of individuals. Here is a methodology for assessing these three factors to inform work model choices.

**Ground your assessment in the nature of the work being done and core business objectives.** Organizations must begin by assessing their remote readiness on the basis of the activities to be performed. They should consider the extent to which activities are relatively more independent or more collaborative, more complex or routinized, to determine their remote readiness. Relatively independent and routinized activities (as opposed to relatively collaborative and creative ones) tend to be more remote ready. (See Exhibit 2.) Leaders should contextualize this in the understanding that the nature of work for many functions was already shifting prepandemic and will likely evolve further (becoming more digitized, automated, or AI-enabled); these shifts may increase the proportion of work that is remote ready.

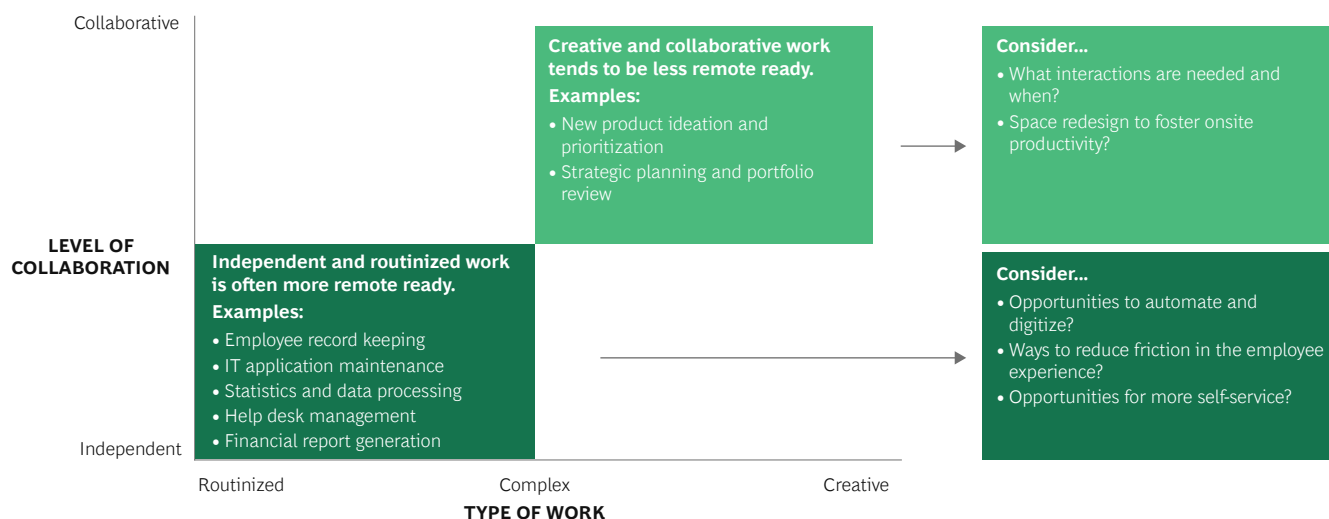
Organizations should then determine the key business objectives they are trying to optimize. An organization seeking to maximize employee choice and flexibility in order to win in a tight talent market may choose a different set of work models than one that is trying to achieve near-term cost-savings by reducing its real estate footprint.

## Exhibit 1 - A Wide Range of Potential Work Models

	Fully onsite	Partially remote	Primarily remote
Use this model if seeking to maximize...	Access to the worksite	Team collaboration and employee choice	Occasional collaboration with options to preserve employee choice and manage cyclical space needs
Custom options	<b>Always onsite</b> Fully onsite	<b>A/B</b> Onsite for rotating A/B teams	<b>Anchor and flex</b> Onsite "anchor" days with team; choice of onsite vs. offsite for "flex" days
		<b>Fixed in and out</b> Some fixed days onsite; others must be offsite	<b>Periodic</b> Majority remote, but onsite once per month or quarter
			<b>Seasonal</b> Onsite vs. offsite depending on season
			<b>Fully fluid</b> Working location left to employee
			<b>Never onsite</b> No option for onsite work

Source: BCG experience.

## Exhibit 2 - Assess the Remote Readiness of Activities, Then Seek to Optimize Them



Source: BCG experience.

Note: This illustrative assessment is most relevant for activities that do not require close proximity to physical assets.

**Orient at the team level.** Looking at the nature of the work that teams do is especially useful in determining the specific subset of work models that are most relevant to an organization. We recommend making work model choices on the basis of assessments at the team level, rather than the individual level, because the nature of work tends to vary more at the team level. We recognize that teams can be organized in multiple different ways including by department, function, or project, and some employees may be part of several teams simultaneously. As such, leaders may need to assess the nature of work being done from a variety of perspectives.

Some emerging practices can help make hybrid teams more effective. For example, encouraging members to align on when they are onsite versus offsite can ensure sufficient in-person collaboration time. Leaders can also conduct “sense checks” across the organization to ensure adequate overlap of the onsite work schedules of key stakeholders on teams that frequently work together.

**Be responsive to individual preferences.** After the best-fit model is selected for a team, leaders should try to accommodate differing employee needs and preferences. Doing so can help improve employee satisfaction, drive productivity, and increase retention. While some employees may perceive remote work as a benefit, others may regard it as a burden. Employers should try to be as equitable as possible in responding to employee preferences. For instance, they might consider providing commuting stipends for employees who work onsite to parallel work-from-home stipends for those who work mostly or entirely offsite.

### Putting New Work Models in Place

The transition to remote and hybrid work last year was abrupt and full of uncertainty. But lessons were learned and adjustments were made. Here are some emerging best practices that will help organizations transition to new work models.

**Experiment, test, and iterate.** The single most important success factor is to instill a mindset of test and learn as organizations navigate the transition. Although a few organizations (including Salesforce and Twitter) have publicly committed to permanent work model changes, many others are hesitant to make definitive changes in the face of an uncertain future. Even so, organizations can move quickly by piloting new models before rolling them out at scale. Where possible, teams should maintain the chosen model for three to six months in order to preserve predictability and allow time for teams to adapt and refine. During that time, team leaders should regularly gauge what is working and what is not in order to make rapid adjustments to balance and preserve productivity, innovation, and flexibility.

Establishing cross-unit learning forums to share lessons learned and create a living repository of best practices will also help organizations increase their long-term adaptability. Some cross-company learning ecosystems are already in place—for instance, the Flexwork coalition (led by Palo Alto Networks, Box, Splunk, Uber, and Zoom) and the Future Forum (convened by Slack, Fortune, BCG, Management Leadership for Tomorrow, and Herman Miller).



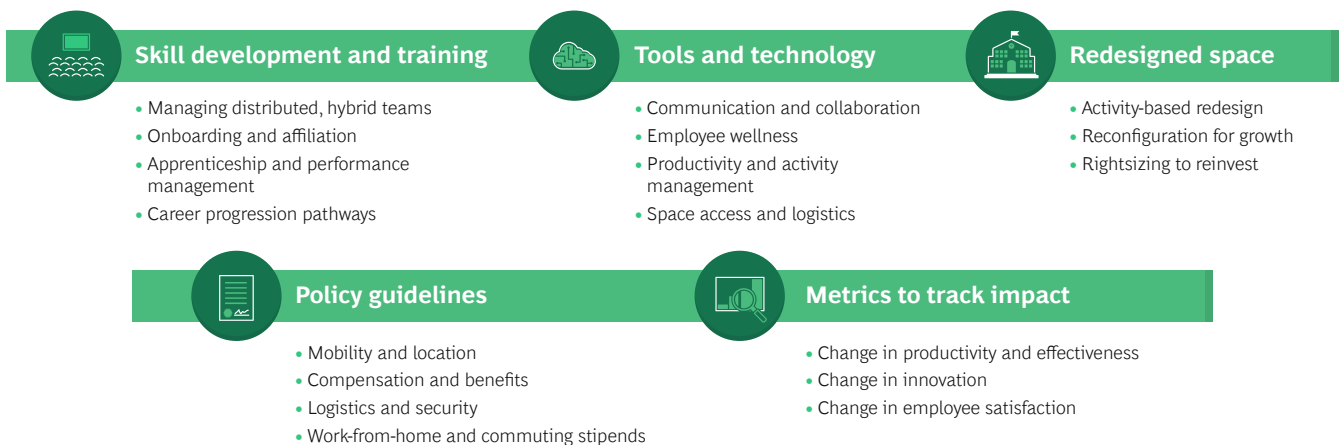
**Favor simplicity.** One critical emerging best practice is to narrow the set of hybrid work models to the two or three models that are most relevant to the way an organization operates, given its core business objectives and the nature of the work being done. Avoiding a profusion of work models helps to limit the complexity of managing across teams and to preserve productivity.

**Design for equity from the start.** Many leaders are concerned about designing models that are fair to both onsite and remote workers. When possible, we suggest arranging for meetings to be entirely onsite or entirely remote to prevent the inadvertent creation of in-groups and out-groups in the hybrid meeting context. Organizations should also consider balancing benefits between onsite and remote employees to mitigate the risks of inequity. Leaders can establish explicit approaches (such as pulse checks or town halls) to understand employees' experiences and to commit to transparently measuring and reporting on the ongoing impact of the transition on subpopulations.

**Don't forget enabling supports.** In addition to determining the work models themselves, organizations must consider the elements that will support implementation. (See Exhibit 3.) Five such elements are critical:

- **Skill development and training** will inevitably be needed as organizations roll out new policies, processes, and platforms. However, the single most important muscle to build is to help leaders to manage in a distributed environment, recognizing that coaching, developing, and motivating employees from a distance requires a whole new set of skills and habits. While this may come naturally to some leaders, to many it is a new muscle that needs to be developed. Organizations are already beginning to tackle this need: UBS created a Ways of Working training platform to upskill managers and employees on its workplace transition, with features to strengthen social connectivity and employee well-being.
- **Tools and technology** are critical to facilitate virtual collaboration, foster employee wellness, and increase productivity. Tools range from virtual whiteboards and shared project platforms to scheduling apps that show who is in or out of the office to task- and time-tracking programs. Knock, a virtual office platform, fosters spontaneous conversations and lets employees signal when they need focus time versus collaboration time by moving to different spaces in the digital office. We suggest that organizations help steer employees, at least at the team level, to a common set of platforms to help preserve productivity. Organizations can also help establish norms regarding meetings (number, length, gap between meetings), communications (expectations on time to respond on email, Slack, and so on), and the like to help further address digital overload.

## Exhibit 3 - Five Types of Enablers Are Essential to Support New Ways of Working



Source: BCG experience.

- **Redesigned space** may be necessary to accommodate new models. Many organizations are exchanging individual offices for open hoteling, with delineated collaboration and focus zones. Others are renegotiating leases and adjusting their overall real estate footprints. Google, for instance, decided to add more satellite offices rather than centralizing at its headquarters space. While changes to physical space may take time, they are key to ensuring that employees who return to the office are set up for the in-person collaborations that make in-office time uniquely valuable.
- **Policy guidelines** must be redesigned to accommodate changes to when and where employees can work, who hiring managers can recruit, and more. These changes impact everything from stipends to compensation and travel norms and must be thoughtfully developed and transparently rolled out. For example, VMware has announced that it is changing its compensation policy for predominantly remote employees to match the cost of living in their home geographies.
- **Metrics to track impact** help organizations gauge whether the new models are preserving employees' productivity, innovation, and satisfaction or whether a pivot is needed. By tying these results to specific work models, leaders can gain insights to guide adjustments to their approaches as they go.

Without such enabling supports, organizations may not fully realize the benefits of new work models. Many have found it helpful to establish a cross-functional team to design and deploy these enablers, in tandem with assessing remote readiness and aggregating learning experiences across the organization.

**Engage senior leaders in change management.** After a long year, uncertainty about the future pervades many workplaces. Vocal and visible senior leadership is essential in supporting employees in the upcoming transition. Leaders should also consider engaging employees from all ranks in designing models and clearly articulate the value proposition at both the enterprise level and the individual level. Throughout, leaders must commit to communicating transparently about what is known and what isn't and about what is working and what is not.

The opportunity presented by the postpandemic “return” to work is about more than just determining what types of hybrid and remote models will help to retain employees. Organizations rarely have the opportunity to boldly rethink how work gets done; factors such as near-term financial pressures and organizational resistance to change often get in the way. We encourage leaders to take advantage of this unique moment to experiment with new work models that can unleash new sources of productivity, innovation, and value.

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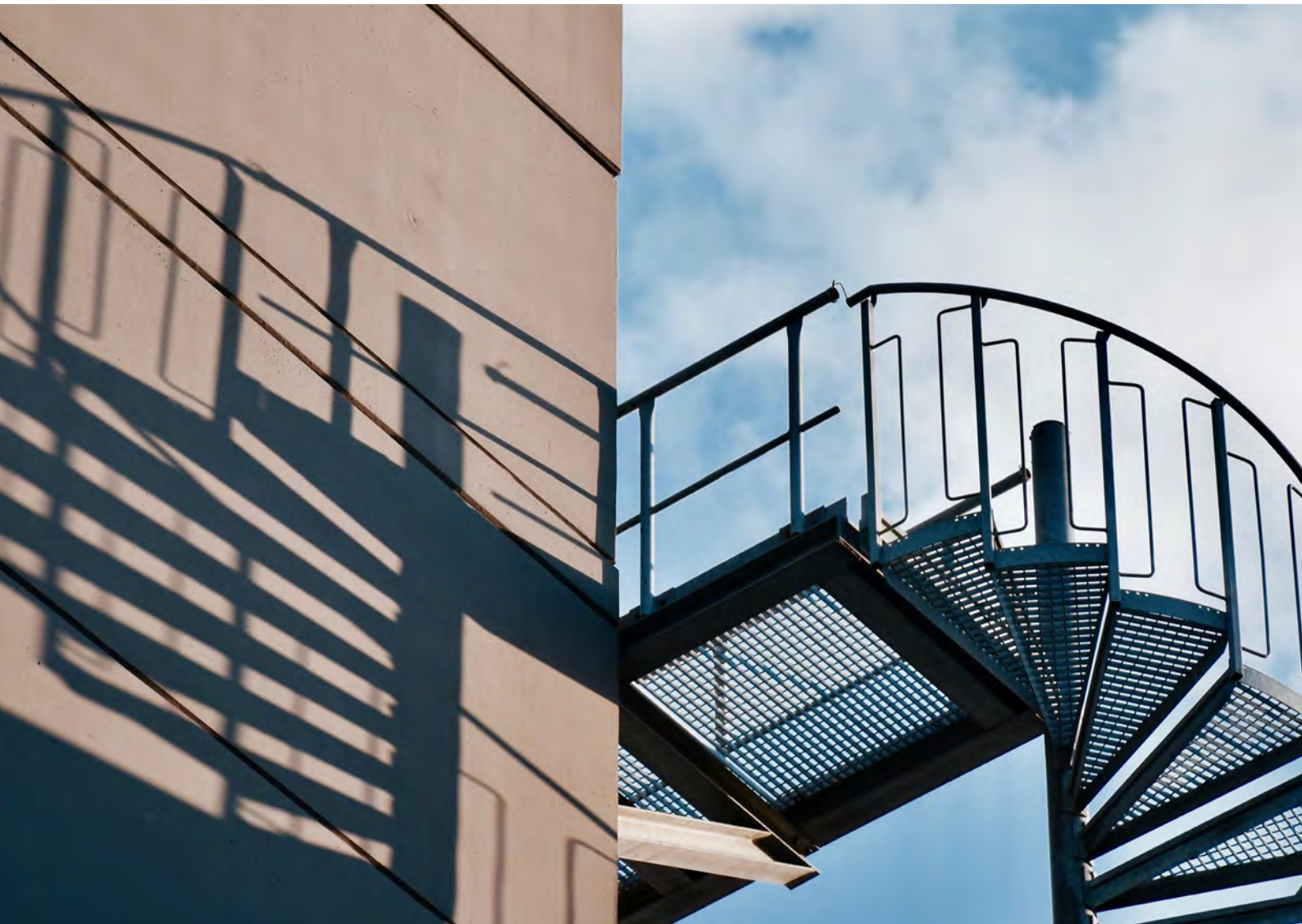
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# Smart Simplicity



Few sectors are as complicated as health care. The delivery of care itself can be highly technical and involve many partners working in close concert. The industry's many stakeholders, including providers, payers, drug makers, and medical device companies, are separate but interdependent members of an increasingly intricate ecosystem. So are other institutions, including university research labs, patient advocacy groups, and public-health organizations. Divergent priorities and interests mean that providers and their partners are often challenged to work together to take a truly integrated approach to patient health.

In recent decades, rapid scientific and technological advances have added to the complexity by producing a vast array of new tools used to diagnose and treat patients. These have led to increased specialization, more-complex clinical decision making, and a concomitant fragmentation of care. The heightened complicatedness of organizations threatens productivity, drives up the cost of care, and potentially undermines outcomes.

Health care's response to the pandemic showed that players can cut through complexity and focus on what's important when they are called to. The challenge now, as the first article below argues, is for organizations throughout the sector—for which “the lockdown unlocked real work”—to continue to build on newfound levels of productivity and performance as the immediate crisis recedes and the new reality sets in. In this context, the second article, a timeless capsule of BCG advice, reminds us that six rules of Smart Simplicity can help.



October 2020

# How the Lockdown Unlocked Real Work

By Yves Morieux and Peter Tollman

*The experience of work during a time of pandemic has revealed a hidden driver of organizational performance: relational productivity.*

Since the onset of the global coronavirus pandemic, the business world has been undergoing an extraordinary live experiment. Virtually overnight, millions of employees around the world left their offices and workplaces and have been working remotely from home.

By most accounts, the experiment has been a resounding success. Productivity at companies that have shifted to remote work is as good as or even better than before—increasing as **much as 15% to 40% in some organizations**. And according to a **recent BCG survey**, there has been a major shift in employee attitudes in favor of remote work. Some executives, however, worry that the changes aren't sustainable and that, over time, remote work will undermine cohesion, trust, and the kind of **serendipitous collaboration** that is often critical for innovation.

Executives can learn a lot from the current moment about how to make remote work work. Our focus here, however, is on another—far broader—lesson they can draw from their experience of working in this time of pandemic, one that is relevant to work in any situation, irrespective of where it takes place. Paradoxically, the challenges posed by the pandemic have revealed considerable untapped potential that can be captured by any organization to achieve major improvements in productivity and performance. Realizing that potential, however, depends on a fundamental change in how managers approach their relationships to and interactions with their people.

We like to put it this way: the lockdown has unlocked real work.

## Coronavirus, Complexity, and Complicatedness

Our perspective is informed by nearly 20 years' experience helping companies cope with rapidly growing business complexity.<sup>1</sup> Our research shows that over the past-half century, business complexity—the proliferation of multiple (and sometimes conflicting) performance requirements—has multiplied roughly sixfold.

To manage complexity, companies typically create new organizational structures, roles, processes, and systems; ever more elaborate matrix organizations; and new metrics, KPIs, and scorecards to track progress against these multiple objectives. The paradoxical result is an explosion in organizational complicatedness. During the same period that complexity was increasing by a factor of 6, organizational complicatedness in response to complexity was increasing by a factor of 35 times—or roughly the square of complexity.

Metastasizing complicatedness has taken a significant toll on organizations. It is a serious obstacle to real (genuinely value-adding) work, and as such is a major cause of stagnant productivity in many developed economies. Because managers must document information on more and more KPIs and scorecards, much of their time (we estimate about 40%) is tied up in writing reports. Because they must coordinate with more and more functions, they spend an additional 30% to 40% of their time in meetings. And because they are spending so much time managing complicatedness, they have little time to manage their teams, who often lose their sense of direction, purpose, and meaning. People disengage and, as a result, waste a significant portion of their time (between 40% and 80%, depending on the industry) on unproductive, non-value-adding activities.

Seen from this perspective, the most interesting impact of the pandemic has been the way it has so thoroughly disrupted this complexity-complicatedness dynamic. On the one hand, it is introducing additional dimensions of complexity to the business world. Organizations are being forced to respond to a new set of imperatives: keeping their employees and customers safe, managing the rapid transition to remote work, dealing with the severe economic fallout of global lockdown, and trying to understand and anticipate how COVID-19 will shift consumer preferences in the long term and otherwise transform their business. We are witnessing a new age of uncertainty and volatility and facing new demands for resilience, diversity, and redundancy in organizational networks, supply chains, stocks, and suppliers.

On the other hand, because the very suddenness and shock of the pandemic caught organizations completely off guard, they couldn't respond in the usual way by multiplying complicatedness. Few organizations had the time to develop a dedicated "coronavirus process" or appoint a formal "Chief COVID Officer" (CCVO?). Instead, almost despite themselves, they were forced to rely on something else: the intelligent adaptation of their people.

Millions of people around the world transitioned to remote working within days of the announcement of nationwide lockdowns. In many organizations, the six-hour face-to-face meeting (including travel) shrank to the one-hour online Zoom meeting. In this process of adjusting to a radically new situation, much of the complicatedness of the traditional work environment melted away, creating space for people to reset and refocus on the nuts and bolts of value-adding work. The lockdown unlocked real work.

## The Opportunities Within a Crisis

Why did this transition, which in many respects was completely disruptive to the normal way of doing things, happen so quickly and so smoothly? The short answer: because people's context changed and, therefore, they intelligently adjusted their behaviors to the new context. And when people's context changes, so do their attitudes, feelings, and values. In France, for example, about 40% of employers were skeptical of the potential of remote work before the pandemic; today, the percentage has dropped to 20%. So too with employees: 73% of French employees who have switched to remote work during the lockdown want to continue.

1. For more on the growth in business complexity and how organizations need to respond to it, see Yves Morieux and Peter Tollman, *Six Simple Rules: How to Manage Complexity without Getting Complicated* (Harvard Business Review Press, 2014).

It's worth pointing out that this kind of rapid adjustment is a common feature in periods of crisis (which, when you think about it, are periods of high complexity). In a crisis—for example, after a major accident such as a train derailment or a bridge collapse, or after natural disasters such as an earthquake—leadership emerges in the most unexpected places. People don't worry about process; rather, they exercise initiative and judgment to deal with these unforeseen circumstances. Everybody pitches in and works together. When we are cornered by complexity, we cannot escape—your success is my success; your failure is my failure. Typically, though, the new mindset lasts for only a few hours or days or weeks. Eventually, things return to normal. Complicatedness reasserts itself.

Some crises, however, are much longer-lasting: wars, technological revolutions, and—yes—pandemics. Such situations have the potential to catalyze something more than just brief periods of intense cooperation. They afford the extended time necessary to codify fundamental innovations. The world wars, for example, led to new industrial disciplines (for example, logistics), new technologies (radar), and new social roles for women and other previously disadvantaged groups.

Will the pandemic and its aftermath represent a pivot in which organizations fundamentally rethink how they organize and manage work? Perhaps—but only if executives draw the appropriate lessons from the experience.

## Discovering Relational Productivity

So what are some of the lessons we should be learning from work in a time of pandemic that can be applied to any work situation?

For one thing, in the traditional workplace, employee proximity often functions as a misleading proxy for working effectively together. One reason many managers are convinced of the benefits of physical presence and co-location is that they are often the only way to get anything done. They are the grease that makes the recalcitrant, squeaky wheel of the overcomplicated organization turn.

But without denying the real benefits of proximity, the essence of productive relationships depends on something more: connectedness, or the degree to which people interact effectively with each other and work together in the service of a collective task. (See the sidebar “Balancing Proximity and Connectedness.”) Paradoxically, the very asocial nature of remote work—for example, the isolation of working in one's personal bubble, the relative “thinness” of exclusively online and on-screen interactions, phenomena like “Zoom fatigue”—has revealed the degree to which productivity, performance, and work itself are relational, the result of behavioral interactions between distributed networks of people and groups.

The pandemic remote-work experiment has forced managers to focus directly on this relational dimension of work. Unable to rely on proximity, they must now invest in connectedness. In the process, they are discovering the central importance of what we call *relational productivity*.

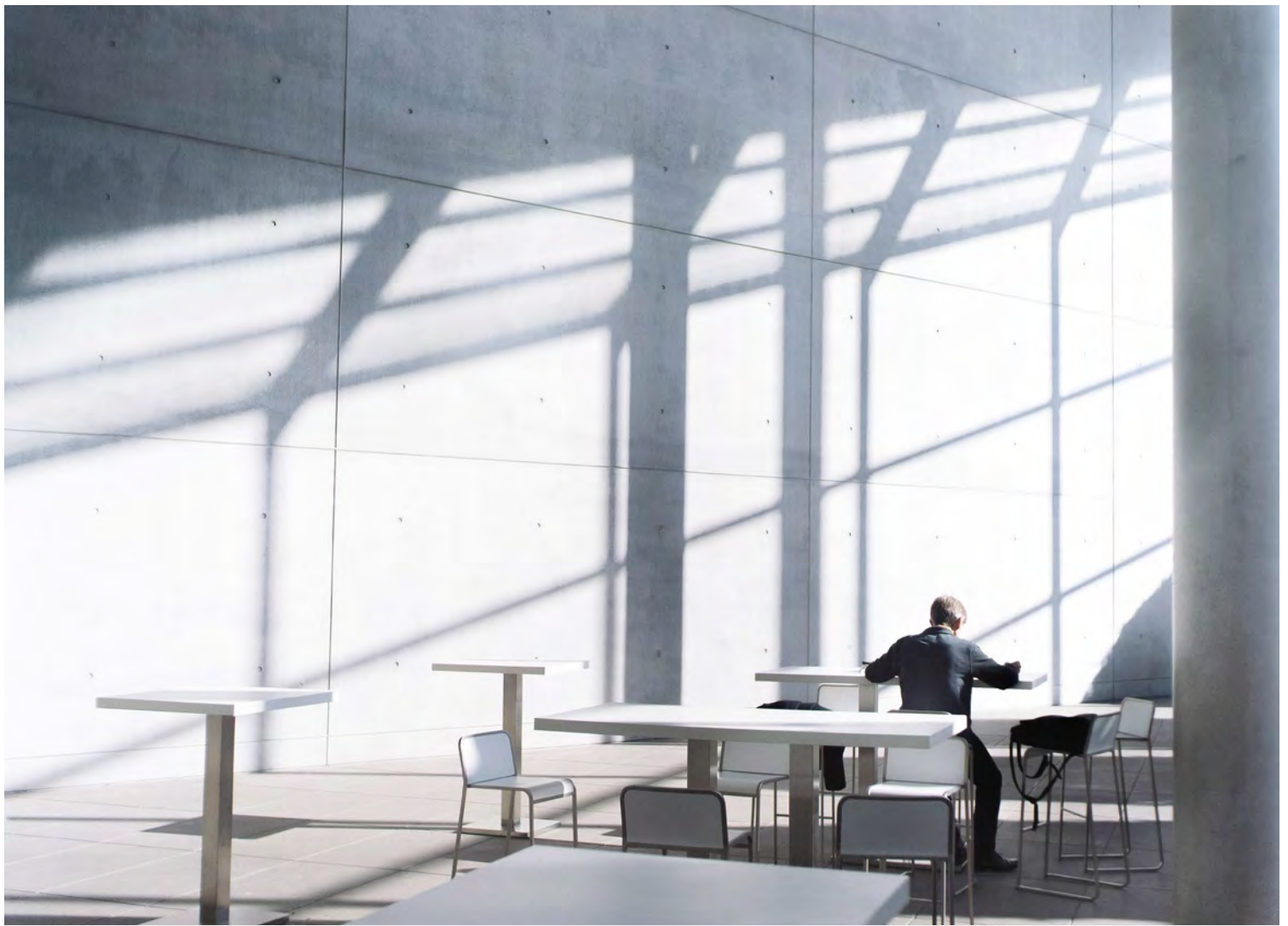
Relational productivity is the differential performance created by effective behavioral interactions in an organization. The relative quality of those interactions—whether they are value-adding or not—doesn't happen in a vacuum. Nor is it the automatic by-product of a given set of roles, structures, or processes. Rather, it is the product of a specific organizational context. Three types of relationships drive relational productivity in any organization: leadership, engagement, and cooperation.

**Leadership: How Managers Create Value.** Just because an individual has formal authority doesn't necessarily mean he or she is adding value. Rather, managers add value by exercising leadership—by getting people to do what they wouldn't do spontaneously in the absence of interaction with the leader.

We have been speaking with scores of CEOs and other senior executives about their experiences leading their organizations during the pandemic. What's been striking about these conversations is the degree to which executives have been pushed out their comfort zone, and how that experience has reshaped their ideas of what constitutes effective leadership. Put simply, the disruptions of the pandemic have forced them to lead.

Before COVID struck, many senior executives tended to rely on a set of typical control-oriented management practices that, in retrospect, were often obstacles to meaningful work. A classic example is the CEO's once-a-month daylong senior management meeting with direct reports. The routine rhythm of these meetings made it easy—too easy—to assume that everything was working like clockwork. The lockdown, however, has forced CEOs to engage directly with what it takes to keep the organization going without all those traditional controls, to keep people engaged, working together, focused on what matters. A few key principles and practices stand out.

First, many business leaders have greatly expanded the number of people they are interacting with across the organization. They have made it a habit to check in regularly with people one or two levels down from their direct reports. In the thinner remote-work environment, they feel an urgent need to be present in moments of truth, when their people are confronting tough issues or dealing with critical challenges in the business. For many, this direct exposure to the real work of the organization—what people really do—has been something of a revelation. “I've seen so many people rise to the occasion and exercise genuine leadership,” one CEO told us, “that I'm embarrassed I had never spotted them before.”



## Balancing Proximity and Connectedness

The shift to remote work during the pandemic has been so widespread that many executives forget how skeptical they were about it before the lockdown. The digital collaboration technologies have been around for years, yet many organizations had been pulling back from remote-work pilots and the technologies were not widely used. Even today, many executives are worried that remote work isn't sustainable over the long term. However, there are deeper trends underlying the remote-work phenomenon, and to understand them requires taking a broader perspective about the underlying dynamics of human productivity.

Productivity is largely a function of what economists call “complementarities.” There is complementarity between two factors of production when one increases the contribution of the other to the overall outcome. For example, a marketing department that provides the commercial team with the right customer targets at the right time can ensure that salespeople don't waste time on unlikely prospects. Such complementarities are a key reason why organizations exist. They make the whole worth more than the sum of its parts.



Ever since the industrial revolution, many of the complementarities fueling increased productivity have been the result of proximity, accruing directly from physical co-location. The scale economies made possible by the steam engine in the 19th century or the assembly line in the 20th required grouping people together. (Before the steam engine made the factory system possible, textile workers typically worked at home.) Indeed, the entire discipline of management grew up around the complementarity of physical proximity and the close control of work it made possible. It's even reflected in our language. We talk about "supervision" (literally, "seeing from above") in which the manager's authority benefits from the ability to "over-see" the team. It's easy for people to take these direct benefits of proximity for granted. After all, humans are social animals, energized and reassured by the physical presence of others. That helps explain why so many managers and employees anticipated that the shift to remote work would be disruptive—even traumatic.

But there is another kind of complementarity, what we might term "relational complementarity." This depends not on physical proximity but on a purposeful, coherent, and continuously maintained array of networked connections—irrespective of the physical proximity of the connected elements. What matters in relational complementarities is not so much the container of the relationships (where each node in the network is located in a shared workplace) but their synergistic content (how the actual behaviors of each node in the networked interaction increases the contribution of every other node).

Both proximity and relational complementarities are important. But because the former are far more visible (and, seemingly, natural), organizations risk overrelying on them at the expense of the latter. Often, organizations confuse the container with the content of relationships. Comfortable and convenient proximity, with its easy interpersonal encounters, all too often leads managers into a self-indulgent trap: "Why bother creating trust and explicit commitments? We are only down the hall from each other!" People assume that proximity will make up for any deficiencies in the productive content of relationships. Because the lockdown removed the container—and thus executives could no longer take for granted that productive relations were an automatic by-product of proximity—organizations were forced to focus on the actual content of relations. The lesson for the future: to get the full value of productivity as work organizations evolve into some hybrid combination of physically present and remote work, leaders need to thoughtfully balance the benefits of proximity with the benefits of relational productivity.

But it's not just that leaders are interacting with more people and doing so more regularly. Their ways of interacting have changed as well. Managers are communicating more directly and clearly. Instead of presiding at long, formal meetings where many participants can be passive, they are spending ten focused minutes on Zoom, one-to-one, asking specific questions: "What are your current priorities, the things you must accomplish, the battles you must win?" "What are you worried about?" "Do you feel like you know what you need to know?" "If not, do you know who to go to get what you need?" In other words, they are focusing on the essence of work.

This kind of clarity is precisely how managers should exercise leadership and add value in complex business environments. By engaging directly with their teams, they help them successfully navigate the often bewildering multiplicity of priorities, targets, milestones, and problems; make intelligent tradeoffs between them; and optimize performance across a complex set of objectives. That is the real work of management.

**Engagement: Going Beyond the Minimum.** Leadership of this sort nurtures another key dimension of relational productivity: engagement. By engagement, we mean the degree and intensity of individuals' connectedness to the organization and its goals, to the roles they occupy in the organization, and to the tasks they perform.

When people feel engaged, they go beyond the minimum. They get involved, take the initiative, and commit their intelligence and judgment to the completion of the task. They take personal risks and strive to fulfill the "spirit," not just the letter, of the rules. They put their energy and autonomy into adding value, rather than mechanically going through the motions or ticking boxes.

This is another place where the remote-work experience has been a revelation. Many leaders assumed that the way to engage employees was to provide them with an attractive work environment: beautiful offices, complete with full-service espresso bar and catered lunches; scheduled yoga and exercise classes; sports facilities; and the like. Yet when these environments were plunged into darkness overnight, people kept working and performing—often even better than before.

Why? Because they discovered the power of having a genuine purpose, and it turns out that having a sense of collective purpose is far more critical to eliciting engagement than even the most lavish onsite perks. It turns out that engagement doesn't happen in a workplace; it happens in people's heads.

Many of the CEOs we spoke to described how [the coronavirus pandemic has been an occasion](#) to rediscover (or, in some cases, articulate for the first time) the organization's core purpose, its reason for being. The human disruption and loss exacted by the pandemic took people back to first principles—what really matters and what really counts. By anchoring the organization's day-to-day activities to a higher goal, managers were able to unleash engagement. Or, as one CEO put it, "We have used purpose to move people beyond grief to action."

Cultivating a collective sense of purpose is a "macro" way to foster engagement. But many leaders we spoke to are also discovering a "micro" way. Early in the pandemic, many CEOs were worried that once people began to work from home, the demands of everyday life (keeping safe, taking care of children, etc.) would cause their attention to their work to suffer. In fact, precisely the opposite has been the case. The vast majority of employees have committed themselves even more deeply to their work.

It makes sense. Working together on a shared task with a shared sense of purpose, especially in a situation of crisis, can take on the quality of a compulsion. When we face a big task, when people are counting on us, we rise to the challenge.

Is it possible to cultivate this sense of compulsion—people's natural desire to do a good job—after the crisis has passed? Here, executives are finding that they can apply a lot of the lessons they are learning from agile—in particular, organizing work around time-limited and iterative sprints. This has the advantage of focusing people not on the uncertainties they can't control but on the immediate priorities that they can. It also unleashes engagement by leveraging people's sense of responsibility to complete what they have started for their team.

**Cooperation: Putting Individual Autonomy in the Service of the Collective.** This brings us to the third relationship critical to unleashing relational productivity: cooperation. No single individual or work group, no matter how engaged, will have all the answers.

By cooperation, we don't mean everybody getting along or enjoying social interaction at work. Rather, we mean the process by which people put their autonomy, initiative, and judgment in the service of a collective purpose or task—which sometimes means compromising their own goals or needs for the greater good. It's a process that can include as much conflict and tension as cozy fellow feeling.

Another common concern that many executives express to us is that cooperation, joint problem solving, creativity, and innovation will suffer if people cannot congregate in front of a whiteboard or serendipitously meet by the coffee machine or in the hall. But it's too easy to assume that proximity and frequent contact means that everybody understands where they fit into the whole and individuals and teams are working constructively together.

The challenge of remote work has forced many executives to review this assumption and focus on creating the right context for cooperation—for example, by explicitly building trust among far-flung team members, by giving everyone on the team enough air time (for example, by establishing a “right to speak” during Zoom calls). As a result, many organizations have experienced a lot of creative, collective problem solving during the pandemic.

How does a manager encourage cooperation? By focusing on key moments of truth rather than on process. By identifying the key interdependencies among people. And by asking them whether they are getting the help they need from others—and if not, how the manager can help make it happen.

The point is, cooperation doesn't happen by magic. You need to create a context for it to make sense to people, to be perceived as something that is in their interests and that will bring them benefit in the organizational system. And that is something managers can do whether people are co-located or not.

## No Return to Normal

Most executives we spoke to understand, on some level, that whatever the post-pandemic reality will look like, there will be no return to “normal.” Just as the act of consumption changes the consumer, the experience of work under lockdown has changed us, perhaps fundamentally.

Yet absent concrete steps to sustain the gains of the pandemic period, there is a strong risk that we will revert to old ways of behaving. In any organization, complicatedness has a way of reasserting itself over time. And the managerial assumptions that underly complicatedness have been more than a century in the making.

The solution: executives need to continue doing, proactively and consciously, what they have been forced to do during the pandemic. In other words, they need to start codifying the discoveries they have made about the importance of relational productivity and to translate them into sustainable innovations in the way they manage their people.

Here are seven steps that leaders can take to start nurturing the value-adding relationships of leadership, engagement, and cooperation.

- **Get to know what your people really do.** It's not enough to know how their roles are formally defined or how their teams are organized. Develop a deeper understanding of how—and how effectively—they interact on a day-to-day basis to tackle the tasks of the organization. What are the critical interdependencies? How effectively do people cooperate across those interdependencies? What are the key tradeoffs people face and how effectively are they optimizing across them?
- **Strive for clarity about what really matters.** While the long-term goals of the organization may be relatively stable, the priorities in a given situation or moment are likely to change. In a volatile environment, it's the leader's job to frame and reframe what matters in the moment and help people reorient their efforts accordingly.
- **Be present at moments of truth.** Paradoxically, in an era of remote work, managerial “presence” is more important than ever. By upping the tempo of your interactions, you will both develop a richer sense of where the relational roadblocks are and how you personally can help people overcome them.
- **Insist that your managers add value.** What positive difference are managers making in how their people create value? If they are not exercising leadership that unleashes engagement and cooperation and that helps their people navigate competing priorities and objectives, then they are not really adding value themselves. Which raises the question: is their role really necessary?
- **Connect with what people care about.** Articulating a corporate purpose is necessary, but unless it is translated into terms that are meaningful to people, it won't be effective. Find ways to creatively link the corporate purpose to people's individual objectives and goals, the resources available to them in their roles, and the constraints they face in the organization.
- **Demand cooperation and reward it.** No metric or KPI, no matter how well designed, can assess the effectiveness of cooperation in an organization. Such assessment is an exercise in judgment. A key responsibility of managers is to demand cooperation, be close enough to the work to know whether it is happening, reward those who cooperate well, and make sure that those who do not bear the consequences.

- **Accelerate digital transformation.** The millions of people who shifted to remote work did so in a situation that was far from optimal. They often had to share family computers and were plunged into remote work without any specific training. Imagine the productivity that could be unleashed by better leveraging the full array of digital technologies. In fact, there is a virtuous circle between relational productivity and digital transformation. To focus on relational productivity is to focus on the content of relationships, and digital is all about the content of work—data, analytics, networked connections. The more an organization focuses on relational productivity, the easier it is to accelerate digital transformation. And the more an organization accelerates digital transformation, the more important relational productivity becomes.

When business leaders take these steps and insist that their executive teams do so as well, they will find that their organizations can sustain heretofore unimaginable levels of productivity and performance—long after the crisis is over and no matter where their people happen to sit.

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# Bringing Managers Back to Work

By Yves Morieux

*Companies are revolutionizing how people work. Now they need to transform how managers manage.*

Sooner or later, every technological revolution gives rise to an organizational revolution. To realize the potential of new technologies, companies devise new ways of working; those that fail to adapt end up losing in the marketplace. The steam engine was fully exploited only with the development of the early factory system, the process technologies of the late 19th and early 20th centuries with the development of scientific management.

Now, business is in the midst of a wholesale digital transformation. Companies across the economy are using digital technologies and advanced analytics to unlock new sources of economic value and achieve step-function improvements in customer focus, productivity, flexibility, and speed. Parallel to this [digital transformation](#) is an organizational revolution-in-the-making, transforming not just what companies do but how they do it.

Take, for example, the recent popularity and rapid spread of agile. The term is shorthand for a variety of approaches to organizing work that emphasize small, self-managed, multidisciplinary teams with end-to-end control of product development, service delivery, and other business tasks; rapid cycles of activity known as sprints; and a test-and-iterate approach to performing work.

Agile started in software development, but as software and digital applications become more and more central to a broad array of industries—finance, retail, even industrial sectors being transformed by the Internet of Things—the approach has spread **far beyond the software industry**. And companies are increasingly applying the agile model to **nonsoftware activities** such as marketing, customer service, and other traditional business functions.

Agile is only the most recent example of work innovations emphasizing autonomous, self-managed teams. Other approaches that companies have been experimenting with in recent years go by a bewildering variety of names: **lean**, **holacracy**, the **polycratic organization**, and the **exponential organization**, to list a few.

But in this organizational revolution-in-the-making, a critical piece is missing. Companies lack a compelling model for the role of management.

Some agile champions seem to assume that the approach makes management irrelevant or even obsolete. “**Why Do Managers Hate Agile?**” reads the title of a commentary in *Forbes* by an agile consultant. His answer: because agile inevitably (and rightly) undermines their status, power, and control. In a world of self-organizing, autonomous teams, a lot of what passes for traditional management is no longer necessary. Or as the title of a webinar on the subject puts it, “**(In Agile) Where Do All the Managers Go?**”

Such perspectives circle around the right question: how do managers create value in the new work environment? But I think they have the answer exactly backwards. They embrace a traditional concept of management only to declare it irrelevant to the new way of working.

The challenge of the organizational revolution represented by agile and other new approaches is not that they make management somehow irrelevant or obsolete. Quite the opposite: they make management more important than ever before. But they also transform what managers—from the very top of the organization to the frontline of the business—have to do and how they need to work. In some cases, they even redefine who needs to be a manager.

Until organizations develop a management model that is equal to the challenges of the organizational revolution taking place today, that revolution **won't be successful**. Companies may implement the “letter” of agile or other new models, but they risk missing the “spirit,” including the invisible supports that actually make these innovations work.<sup>1</sup>

Developing the new managerial model will require a shift in how managers conceive of their role. Put simply, they need to stop thinking of themselves as the master designers of hardwired organizational structures, processes, rules, and procedures. Instead, they need to become the everyday orchestrators of a flexible and dynamic behavioral system, one that unleashes employees' autonomy and initiative, and puts it in the service of more effective cooperation to achieve the organization's goals.

I call this shift “bringing managers back to work.”

## How Managers Got Separated from Work

Wait a minute,” you may be thinking. “Aren't managers *already* working—coming to work earlier and staying later, their days consumed with meetings, conference calls, emails, and reports, their weekends spent trying to catch up?” It's true. Most managers are putting in more effort and more hours than ever before. But fewer and fewer are actually creating value.

To understand why, it pays to look back to the origins of professional management. Ever since Frederick Winslow Taylor introduced his theory of scientific management in the early 20<sup>th</sup> century, a key principle of modern management has been the radical separation of design and execution. Managers set strategy, plan, and define and allocate work tasks; they establish formal organizational structures, procedures, and incentive systems, and then monitor employees' performance against them. Employees execute according to the strategy and the plan, their actions governed by the organization's rules, procedures, and incentives.

This command-and-control model worked reasonably well in relatively stable environments. It also had the advantage of being easy to scale in the new era of mass markets served by mass production. It led to the specialization of functions and hierarchical management as we know it today.

1. In this essay, I focus on agile as an example of the broader phenomenon of work innovations. The lessons for management are equally applicable to other approaches.

## The Challenge of Business Complexity

Whatever its advantages, command-and-control management is singularly ineffective at addressing the distinguishing feature of today's business environment: the exponential increase in business complexity.<sup>2</sup> There are many dimensions of that growing complexity: the proliferation of (sometimes conflicting) performance requirements; the increase of customer segments, local markets, and competitors; the growth in the number of relevant stakeholders and business partners; the multiplication of categories of specialized knowledge and expertise; the faster pace of innovation and change; the higher levels of uncertainty and volatility.<sup>3</sup>

Business complexity may sound like a problem. In fact, it is an enormous opportunity—if organizations can take advantage of it. The more complex the business, the more ways to create value by breaking compromises among heretofore conflicting objectives or goals and by combining diverse skills and capabilities in unprecedented ways.

However, this is precisely where the command-and-control model becomes an obstacle. At the foundation of the separation of design and execution is the idea of rules, in the sense of formal procedures. The assumption is that if managers design the formal procedures carefully and employees follow them obediently, then people's work will predictably deliver the desired performance outcomes. In a relatively simple business environment, this assumption works well enough.

As complexity increases, however, the correspondence between the organization's formal procedures and its business outcomes begins to fall apart. It is in the nature of business complexity to impose competing performance requirements on the organization. Products need to be affordable but also of high quality. Manufacturing plants have to be efficient but also safe. Business processes require speed but also reliability. The challenge is to reconcile these requirements, so that achieving any one of them doesn't preclude achieving the others, and, ultimately, to discover solutions that exploit synergies across them all. But there is no "super-rule" that will tell people the best way to balance conflicting goals.

Even worse, in a futile attempt to control complexity, many organizations design more rules, processes, and guidelines for each new performance objective. The paradoxical result is an increase in organizational complicatedness—that is, the proliferation of contradictory rules and instructions—which causes people to lose their sense of direction and to escalate decisions to committees or to senior leaders, who have no direct knowledge of the issues at hand. The growing coordination burden means that more and more managers end up spending the lion's share of their time managing the complicatedness, not the work itself. In the process, they become ever further removed from the genuinely value-adding activities that constitute the work of the organization. (See the sidebar "How Complicatedness Erodes Productivity.")

## Complexity and the Digital Revolution

The digital revolution transforming business today is greatly accelerating the growth in business complexity, introducing new channels, new types of capabilities, new ways to create business value. It is also definitively exposing the dysfunctionality of the traditional separation of design and execution. Work innovations like agile are founded on the recognition that in a business environment characterized by competing performance requirements, more ways to create value, and continuous innovation, work tasks cannot really be "designed"—in the sense of programmed in advance according to a set of formal procedures. Nor, once designed, can they be "executed"—in the sense of performed according to an unchanging plan. Rather, work under conditions of complexity is all about *discovery*.

The key to effective performance in complex work environments is to unleash individual autonomy and initiative so as to maximize people's freedom to exercise judgment in the completion of a task. But since no single individual or work group will have all the answers, it also requires creating an environment where people have an interest in deploying their autonomy in the service of cooperation with others for the greater good of the organization.<sup>4</sup>

2. For more on the growth in business complexity and how organizations need to respond to it, see Yves Morieux and Peter Tollman, [Six Simple Rules: How to Manage Complexity without Getting Complicated](#) (Harvard Business Review Press, 2014).

3. According to research by the BCG Henderson Institute, since 1980 the volatility of business operating margins, largely static since the 1950s, has more than doubled (as has the size of the gap between those with the highest margins and those with the lowest); the percentage of companies falling out of the top three rankings in their industry increased from 2% in 1960 to 14% in 2008; and the probability that the market share leader is also the profitability leader declined from 34% in 1950 to just 7% in 2007. See "[Adaptability: The New Competitive Advantage](#)," BCG article, August 2011.

4. For more on the imperative of combining autonomy and cooperation in the modern organization, see "[Health Care's Value Problem—and How to Fix It](#)," BCG essay, October 2017.

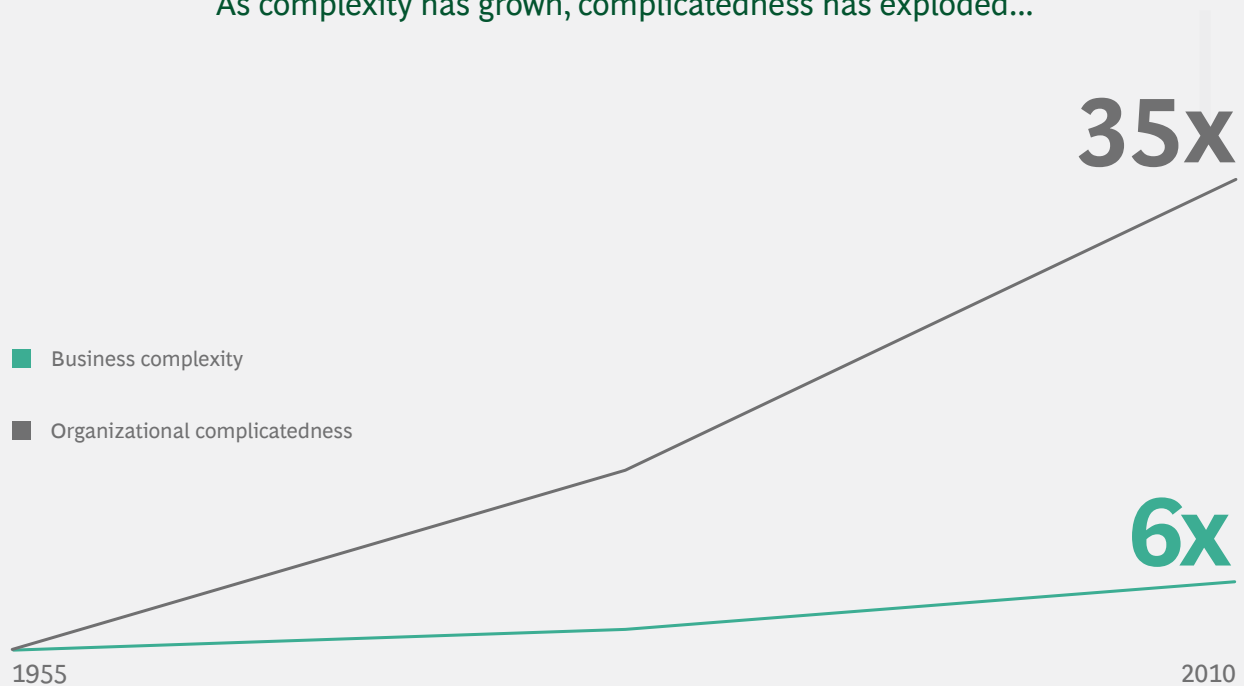
## How Complicatedness Erodes Productivity

One of the most puzzling paradoxes of the contemporary economy is the much-discussed slowdown in productivity growth—despite technological advances, notably in information and communication technologies.

Since 1980, median worldwide total factor productivity growth per year has averaged only one-sixth the level achieved from 1950 through 1970. This trend has been evident in both advanced and developing economies.

While there are many possible causes for this decline, a major—and often overlooked—factor is the explosion in organizational complicatedness. Consider the following data from research by the BCG Institute for Organization.

As complexity has grown, complicatedness has exploded...



...significantly eroding organizational performance and productivity

7

Number of approvals managers need to make a decision

40

Percentage of time managers spend writing reports

30–60

Percentage of time managers spend in meetings with peers

40–80

Percentage of time teams spend on non-value-adding activities

**Sources:** Andrew G. Haldane, “Productivity Puzzles,” London School of Economics, March 2017; Yves Morieux, “Smart Rules: Six Ways to Get People to Solve Problems Without You,” *Harvard Business Review*, September 2011; BCG analysis.

**Note:** Activity and time analysis is for the top quintile of most complicated organizations in a representative sample of more than 100 listed companies in the US and Europe.



This combination of autonomy and cooperation doesn't happen on its own. Rather, it requires a particular kind of management. Instead of focusing on formal procedures, managers must pay attention to the behavioral dynamics that shape organizational performance: why people do what they do; how they understand their individual goals, the resources available to them to achieve those goals, the constraints that stand in their way; and how individual behaviors combine (often in unanticipated ways) to produce the collective behavior underlying performance. What's more, because managers themselves are actors in the behavioral system, they need to know how to intervene in that system in order to foster more effective cooperation. (See the exhibit.) And to do that, they must get much closer to the actual work.

To guide their intervention in the behavioral system, managers need to cultivate a new skill set, consisting of three high-level tasks.

- 1 The first I call **framing through action**. It is the general principle of management in the new work environment.
- 2 I call the second **integrating around the task**. This is how that general principle plays itself out at the front-line of the organization.
- 3 Finally, I call the third **shaping the organizational context**. This is the role of senior managers in the new work environment.

Let's consider each task in turn.

## Two Contrasting Views of Management

	MAINTAINING COMMAND AND CONTROL	ORCHESTRATING A BEHAVIORAL SYSTEM
<b>Organizational Model</b>	The organization is a set of structures and procedures that determine hierarchical authority and the division of labor	The organization is a system of interdependent behaviors, each with its own contextual rationality
<b>Theory of Behavior</b>	Formal rules and procedures automatically determine people's behavior	People devise strategies to achieve their goals on the basis of the resources available to them and the constraints they face
<b>Role of Management</b>	Decide on the "what" and the "how" by determining the "one best way" to reach desired ends	Promote autonomy and cooperation through the creation of feedback loops that expose people to the consequences of their actions
<b>Source of Managerial Power</b>	Power is a function of position in the hierarchy, allocated to managers as a result of reporting lines	Power is the ability to influence the issues and stakes that matter to others
<b>General Principle of Managerial Action</b>	Separation of execution and design	Framing through action

Source: BCG analysis.

## Framing Through Action

In the new work environment, the separation of design and execution is replaced by the combination of framing and acting. Rather than design tasks, managers “frame” objectives and goals. That framing sets the context that allows employees not so much to execute but to “act”—that is, exercise initiative guided by strategic goals, not rigid processes and rules; operate more autonomously, making decisions in the moment in response to changing circumstances and unanticipated obstacles or opportunities; and work together to make the tradeoffs that will create the most value over time.

But managers don’t just need to frame; they too must act. Put another way, in a more dynamic and fluid business environment, the all-important framing that managers do must take place *through* action—that is, through their ongoing intervention in the organization’s behavioral system. Framing doesn’t happen once; it happens continually, in close interaction with employees, and in response to the constantly changing circumstances thrown up by the work people do and the challenges they face in the ongoing effort to create value.

## What Really Drives Behavior

Why is framing through action so essential in the new work environment? Partly it is a function of what drives behavior in organizations. As the decisions people make and the actions they take become ever more critical to performance, it’s important to understand that, despite the assumptions of the command-and-control model, people’s behavior doesn’t follow automatically from the organization’s formal structures, processes, and rules. Rather, their behavior depends on how they use those features to achieve their personal objectives and goals. In some cases, they may see the organization’s formal structures, processes, and rules as resources to achieve ends that are very different from what the organization intends. In other situations, they may view them as constraints to be worked around in pursuit of their own objectives. If managers hope to influence these complex behavioral dynamics, they need to be present, close to where work actually happens.

Take, for example, the concept of the agile sprint. People usually focus on the time dimension of sprints—rapid cycles of work of relatively short duration. To be sure, the time dimension is important. But just because a company organizes work cycles in sprints doesn’t necessarily mean that people will run their fastest. What makes a sprint a good sprint is not just the time allocated to it but what people achieve and the quality of their effort. If they don’t give their best, even the shortest sprint will be little more than another iteration of routine work. In other words, it is the team members who determine whether a sprint is really a sprint. It’s not enough for managers simply to design the new work processes—including agile or any other system for autonomous, self-managed teams. Rather, they need to create a context in which team members are motivated to put their best effort into the work of team.

Framing through action is also necessary because, as mentioned earlier, the more complex the business, the more difficult it is to make rules that will apply in any and every situation. Put simply, complexity “rules out rules” as an effective means for managing organizational tasks. Therefore, for managers to frame in a way that’s realistic and useful to the organization, they need to be involved in the action. The less framing through rules is effective, the more managers need to frame through action.

## The Paradox of Specialization

A third reason framing through action is essential is that increasingly complex tasks often require the integration of new kinds of specialized expertise and roles. My colleagues and I call this the paradox of specialization: the more complex work becomes, the greater the need for focused and deep content knowledge in a proliferating number of areas. The greater the number of highly specialized functions and units, however, the more the need for cooperation across those functions and units—and yet, the harder it is to get people to think, work, and interact beyond their own specialized functional mindsets.<sup>5</sup> It is impossible for any manager to grasp in advance the full range of knowledge and capabilities that needs to be brought to bear to create value. Therefore, they must be present in the moment, interacting with the organization’s cross-functional teams as they apply their diverse capabilities to perform a complex task.

5. For examples of how the paradox of specialization plays itself out in different industries and what to do about it, see [“Can R&D Be Fixed? Lessons from Biopharma Outliers,”](#) BCG Focus, September 2011, and [“Health Care’s Value Problem—and How to Fix It,”](#) BCG essay, October 2017.

Finally, framing through action is a requirement when creating value depends on more intricate forms of cooperation, as it does in any environment of high complexity. But the more cooperation is necessary, the less possible it is to isolate the contribution of any particular individual and, therefore, the harder it becomes to measure people's performance by means of individual KPIs. The fact is, cooperation often comes at the expense of individual performance—in which case, individual KPIs and the incentives associated with them end up functioning as disincentives to the more effective cooperation the organization needs.

Typically, organizations try to address this dilemma by evaluating people, in part, on a proxy for cooperation: the collective performance of their work group, team, or unit. But the problem of free-riding—when individuals don't pull their weight—will always be present, and no metric will capture it. Thus, the only way to evaluate people's performance is if managers exercise judgment based on their observations of the actual behavioral dynamics of the group—who cooperates effectively and who does not. To exercise that judgment effectively, they need to be close to the work.

All of the above explains why framing through action is the general principle of management in the new work environment. What that principle means concretely, however, depends on where a manager is located in the organization.

## Integrating Around the Task

At the frontline of any organization, value gets created by teams. People with diverse perspectives and capabilities pool their expertise and their efforts to come up with the best solutions for meeting customers' needs and achieving organizational goals. The role of management at the level of the frontline team is to integrate the work of various team members around the task at hand—that is, to make sure cooperation happens, people work together productively on the task, and they make the tradeoffs necessary to create value across multiple performance objectives.

Take, for example, the product owner of an agile team. Unlike traditional project managers, whose chief responsibility is to deliver a product on time and on budget, product owners orchestrate a complex process of discovery that eventually leads to a product or service that creates value for the customer and the company. Striking that balance requires navigating many tradeoffs. The head of product development at a leading internet company described this to me in terms of managing four types of risk:

- 1 The risk that the end user won't value the product
- 2 The risk that the user won't know how to use the product
- 3 The risk that the organization won't be able to build the product
- 4 The risk that selling the product won't help the organization meet its business goals

The various practices of agile—rapid prototyping, user testing, and the like—are designed to help teams manage these risks and balance the tradeoffs across competing performance requirements. In this respect, the agile product owner is on the frontline of management in the new work environment.

And yet, proponents of agile almost never talk about product owners as managers. After all, agile product owners don't have a formal reporting relationship with their team members. They aren't responsible for members' performance evaluations (although they sometimes provide input), nor do they determine a team member's career progression.

But to conclude that product owners aren't managers is to view the new way of working from the perspective of the old command-and-control model. It assumes that being a manager is a function of having a defined position in the hierarchy or being in charge of the structures, processes, and systems that, in theory, determine people's performance.

The problem with this perspective is that it completely misses the essential task of frontline management in the new work environment, which is less about "managing people" (in the sense of reporting relationships, career progression, performance evaluation, and the like) than it is about "managing behavior" (in the sense of creating an environment in which people find it desirable to devote their full effort to the task at hand, to exercise initiative, to cooperate constructively with their colleagues). And managing that behavioral context is precisely what an effective product owner must do.

It's an extremely challenging job. For one thing, the product owner can't simply order his team members to do whatever he thinks they ought to do. The product development head puts it this way:

**“The job of the product owner is not to make the right decisions; it's to make sure the right decisions get made by the team.”**

The product owner is what I call an *integrator*. He or she is responsible for managing effective cooperation—that is, for integrating all the diverse perspectives and capabilities of team members around the task.

What allows the agile product owner to be an effective integrator? The answer is power, but not the kind of power that comes from being someone’s supervisor or controlling his or her career progression. Rather, it is the power that comes from the capacity to make a difference in the goals or “stakes” that matter to individual team members. When a product owner has control (or, at a minimum, influence) over those key uncertainties, he or she has power in the behavioral system of the group and, therefore, is able to function as an effective integrator.

The product development head had an evocative way of describing this dynamic. Product owners, he said, “need to be able to tell a compelling story about the work.” For example, they must be able to convince team members that they are solving an important problem for users or that they are working on interesting technology or that the product, if successful, will have a significant impact on the company’s business. If product owners are unable to make the case persuasively, they are unlikely to attract the best people to the team or motivate them to do their best work. Telling a good story, creating a strong vision of the future, and tying that vision to business returns are how product owners frame through action and integrate the work of the team around the task.

One important source of power for agile product owners, reinforcing their ability to tell a compelling story about the work, is their role as a proxy for the customer (either the actual end customer or an internal customer such as the business owner). Product owners lead the “story mapping” exercise that defines the desired functionality of the product and the business value it is meant to deliver to the user. This user story frames the all-important question: What are we trying to accomplish? Product owners also are responsible for maintaining the product backlog, which sets the priorities that guide the team’s work in each sprint (What do we need to do next?). Finally, product owners also decide whether a particular feature meets the product’s acceptance criteria, thus determining when the feature is declared “done,” so the team can move on to the next items on the product backlog list. The control of these key uncertainties gives product owners the power to orchestrate cooperation among team members.

Agile practices like story mapping, scrums, and retrospectives; artifacts like user stories and product backlogs; even concepts like minimum viable products and sprints are all mechanisms for framing through action. They function as continuous feedback loops that make it easier to integrate the various contributions of team members around the task and, thus, are resources available to product owners in their role as integrator.

But such mechanisms don’t function automatically. For instance, even the most exciting or important project is going to have to navigate a variety of constraints in which not all necessary tasks will be equally exciting. In such situations, managers need to have sufficient power to induce people to accept adjustments to their individual goals (for example, their desire to work on the most interesting tasks or challenging technology) for the greater good of the team.

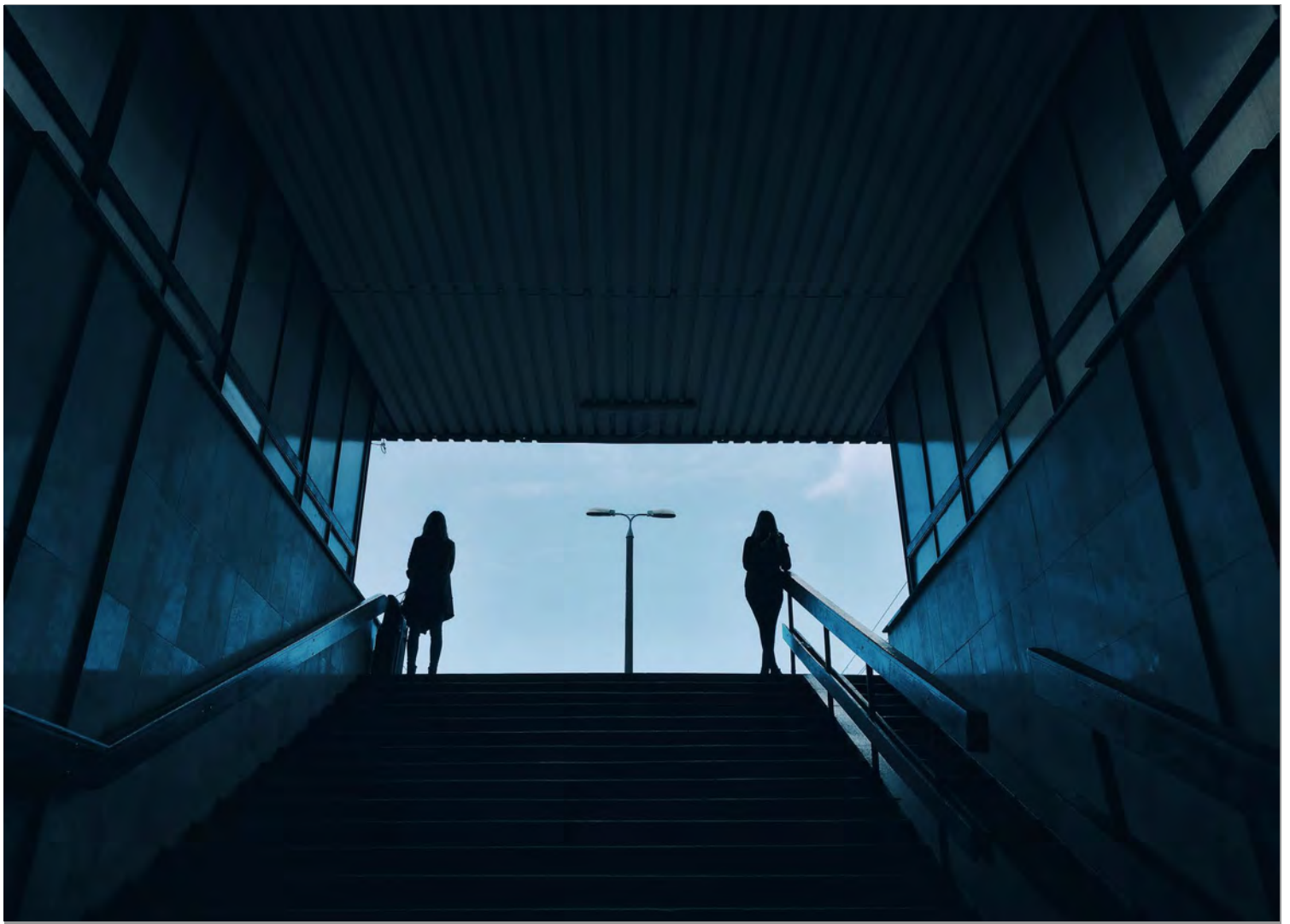
The problem with not conceiving the product owner role as explicitly managerial is that product owners can become disempowered. When that happens, they cannot be effective integrators and the work of the agile teams can become dysfunctional. (For an example, see the sidebar [“When Product Owners Lose Power: The Case of the Software Startup.”](#))

## Shaping the Organizational Context

Recently, I asked a senior manager at a company that was implementing agile teams how he saw his role in the process. “I set up the teams,” he told me, “and then just get out of the way.”

The statement contains an important element of truth. A key principle of agile is that those closest to the work are in the best position to make decisions about how to develop the product or service in question and how to prioritize tasks and objectives over time. Nothing is more certain to disrupt an agile implementation than senior managers who try to retain control over the process or otherwise direct how teams do their jobs.

And yet, the manager’s statement underestimates the complexity of the senior management role in the new work environment. Ceding control to self-managed teams doesn’t mean abandoning them. Senior executives, just like frontline managers, have a critical and ongoing “framing through action” role to play. When they get it wrong, the result can be the worst of both worlds—simultaneously too much control and too little enabling engagement and support—which can undermine the effectiveness of the new way of working.



## When Product Owners Lose Power

### The Case of the Software Startup

A rapidly growing internet startup organized the company around agile teams. The teams, which allowed the company to respond quickly to rapidly changing customer needs, helped the company establish a dominant position in its category. With rapid growth, however, the teams hit a speed bump. Senior management was hard-pressed to identify the reasons why.

The symptoms of the problem were clear enough: growing conflicts between product owners and team members and between the teams and the company's equivalent of functions. Even more disturbing was the sharp increase in job dissatisfaction, which led to high turnover among product owners. What had been an attractive and sought-after role had become a job that many of the best people in the

company were starting to avoid—so much so that the positions were hard to fill.

An analysis of the company's behavioral system suggested that the product owners were suffering from a significant erosion of their power. In the early years, the overwhelming business imperative was to get a mass audience to download and use the company's apps—what managers at the company called “reach.” Maximizing reach was essential to creating the network effects that drive value in most internet businesses.

The imperative of rapidly expanding reach was a key source of power for the product owners. They represented the customer on the agile teams; therefore, they were in a

position to have a decisive influence on what constituted an exciting and attractive app from the customer's perspective. This gave the product owners considerable power over the stakes that really mattered to team members: being involved in an exciting project, creating great applications that would drive growth, being a visible contributor on a project important to the company's future.

But with success came increasing complexity. As the business grew and product lines multiplied, the company had to develop new technological and business capabilities. Even more important, the critical business imperative began to shift from reach to monetization. It wasn't enough anymore to deliver great products to a rapidly expanding audience. Increasingly, the company had to do so in a way that leveraged its evolving technological infrastructure and platforms so they were economically and technologically sustainable.

These changes greatly increased the need for team members to adjust their individual goals in the interest of greater cooperation. Take the example of the dilemma that programmers call "tech debt"—the tradeoff between choosing the easy technical solution today to meet customers' needs (at the cost of rework later on) and taking the time to develop a more robust and standardized solution that can be used across multiple products and platforms. The monetization imperative required the software company to squarely face the tech debt issue. Doing so greatly complicated the work of the agile teams. Business owners weren't asking for a solution to tech debt; they just wanted an attractive product, even if its functionality wasn't particularly scalable across the organization's tech platforms. Team members weren't so excited about working on solutions to tech debt either; it was far less "sexy" than creating the next killer app.

All of a sudden, the job of the product owner was getting harder; these individuals no longer had enough power to effectively orchestrate cooperation in their teams. One product owner put the dilemma this way:

**"In the old days, it was easy to get everyone to pull together for the good of the business. Now, we are more dependent on our team members than they are on us."**

Senior managers at the company are still struggling with what has become a critical managerial challenge: how to give product owners the organizational resources they need to be effective integrators. Maybe, in addition to being the proxy for the customer, they need to be the proxy for the company's senior system architects so that their teams can make better tradeoffs between meeting customers' needs and addressing tech debt. Or maybe the solution is to increase cooperation among the company's business owners, so they are forced to meet their customers' needs in ways that are scalable across multiple platforms.

A third approach might be to make the business owners more dependent on the perspectives and needs of the system architects, so they start taking them into account—for example, by creating a career path in which some business owners eventually rotate into the system architect role and some system architects rotate into the business owner role.

Getting to the right answer will require senior executives at the software company first to acknowledge that the product owners are critical frontline managers in the behavioral system and, second, to manage that system more explicitly and consciously.

The role of the senior manager in an agile organization is not to determine the *content* of people's work. Rather, it is to provide the *context* for that work. That means helping employees understand how their immediate objectives relate to the organization's strategic and business goals. Senior managers need to articulate a robust strategic context that teams can use as a "North Star" that aligns their autonomy to those goals, guiding them as they exercise their initiative. In the absence of such a strategic context, just setting up agile teams is unlikely to create business value. (For an example, see the sidebar "A Failure of Strategic Framing: The Case of the Media Company.")

Of course, senior managers will never be as close to the work as frontline managers are. Nevertheless, framing through action at the senior level also involves bringing managers back to work. The first step is to realize that while senior managers' distance from the teams in which the work of the organization takes place may be a constraint (unless they make it their business to inform themselves, they often don't really know what is going on), it is also, potentially, a resource. After all, managers at the top of the organization have a broader perspective on business imperatives, the challenges the company faces in the external environment, and, therefore, the objectives it needs to achieve. And because they are not caught up in the granular details of the work, they often see things that others do not. You might say they have more "cognitive room for maneuver," which puts them in a position to supercharge team performance—for example, by asking the right questions, challenging matter-of-fact assumptions, or providing a broader context and new information.

The trick is to make their distance and the perspective it brings "present" to their people and their teams. Senior executives make distance present, first, by setting rich objectives. In complex environments where organizations are pursuing multiple goals, it's critical that performance targets reflect the complexity of those goals and acknowledge the tradeoffs necessary to achieve them. Rich objectives tend to increase the sense of reciprocity among actors—the mutual conviction that they have a shared interest in cooperation and that each actor's success depends on the success of others.

But setting rich objectives is not enough. Senior managers have to represent those objectives by regularly interacting with teams and being present as a sounding board and "thought partner." They need to be engaged enough with the work of teams to have at least a first-order understanding of the on-the-ground obstacles, to recognize potential missteps, and to help teams course-correct. What's more, they need to be open enough to learn from teams' experiences over time so that the organization's strategic vision is informed by the latest innovations from the frontline. For

example, at one large company undergoing an agile transformation, the CEO and his senior team dedicated a full day a week to these interactions in order to get the program up and running.

Clearly, effective senior management in an agile organization involves far more than simply "getting out of the way." It requires active and ongoing engagement and managerial presence. When the tasks of work are complex, there are no shortcuts. Senior managers need to spend the time necessary to shape an organizational context that will allow people to focus on value. And that requires bringing senior managers, as well, back to work. (For an example, see the sidebar "Framing Rich Objectives: The Case of the Luxury Goods Company.")

## Nurturing the Behavioral System

Bringing managers back to work has profound organizational implications. It will likely transform how companies select, develop, and promote managers.

Take, for example, the matter of career paths. In the old command-and-control environment, the typical managerial career path consisted of a progressive increase in an individual's span of control in a single domain or activity—R&D, say, or operations, or marketing. It was only at the very top of the organizational hierarchy that executives had to cope with the complexity that comes from managing across distinct silos.

In the new work environment, by contrast, career progression is likely to be characterized more by an expansion in responsibility for managing the organization as a behavioral system. An individual's advancement will depend on his or her capacity to manage behavior in organizational contexts of ever increasing complexity, defined by the number of competing requirements for creating value and by the diversity of the specialized profiles of the employees involved.

It will require considerable attention and effort for any organization, given its unique organizational context, to figure out the most effective practices for bringing managers back to work: to plan the experiences that will allow managers to develop the skills they will need, to establish pathways for career progression, and so on. The temptation, as always, will be to want to design everything in advance and then leave the new structures and processes to function on their own.



## A Failure of Strategic Framing

### The Case of the Media Company

A media company was struggling with the rapid digitization of its business. Translating its traditional nondigital content into new digital media and channels was wreaking havoc with the company's product development process. Precisely at the time when the company needed to speed up the development and release of new products, it faced delays and poor quality.

To address the problem, the company organized its growing staff of software and digital experts into agile teams and introduced the full range of agile roles and practices—product owners, sprints, and the like. And yet, despite the fact that the company was now “doing agile” (or, at least, so executives thought), the delays and poor quality persisted, leading to disagreements and infighting between the company's traditional product organization and its new technology organization.

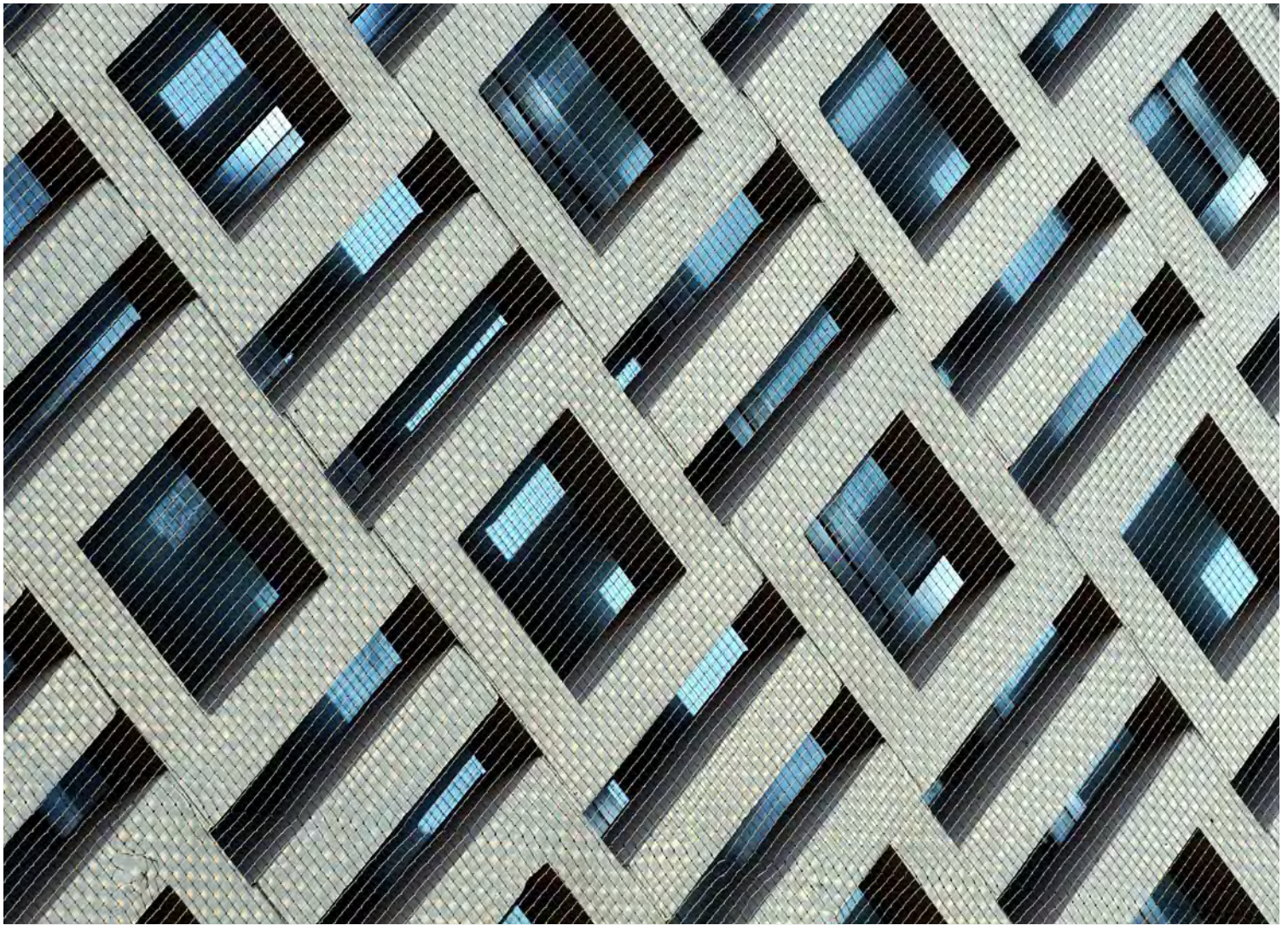
The problem was that senior managers fundamentally misunderstood the nature of the business challenge they faced. They thought they had a software design problem—digital product development was taking too long and the functionality of the resulting products wasn't good enough. Therefore, they conceived of agile primarily as a way to improve software development. They organized the new software talent in their technology organization into agile teams but neglected to include on the teams the all-important content experts from the company's product organization.



The real challenge facing the company, however, was not just to deliver better software—it was to use digitization to deliver better business value. And that required more seamless integration between the traditional product organization and the new technology organization. Senior management’s poor framing of the ultimate objective meant that the composition of the agile teams was radically incomplete. To deliver that value efficiently and effectively required creating the right context for cooperation between the product side and the technology side. But since content experts weren’t included on the teams, the teams were in no position to make that cooperation happen.

The failure of the senior managers at the media company wasn’t just a failure of framing; it was also a failure of acting. Because they were distant from the actual work of the new agile teams, they were unable to see that the delays and poor performance were merely symptoms of a much bigger problem (poor team design). Instead, they blamed the delays and poor quality on the teams, and so, whenever there was a conflict or disagreement between functional managers and the teams’ product owners, senior management tended to override the teams.

This put the product owners in an impossible situation. Because their teams didn’t include the content specialists, they didn’t have influence over the full range of skills and expertise necessary to meet customer needs. And because they were continually second-guessed by senior management, they didn’t have true autonomy. Team members remained beholden to their functional managers, who evaluated their performance and set their incentive compensation. As a result of all these factors, there was insufficient reciprocity among team members, a lack of necessary feedback loops inside the teams—and, therefore, ineffective cooperation. But the problem at the media company was not so much—or not only—a failure of the agile teams. It was a failure of senior management.



## Framing Rich Objectives

### The Case of the Luxury Goods Company

The senior executives of a major division at a luxury goods company were worried that their operations could not keep up with a rapidly changing competitive environment. Time to market for new product launches and critical global marketing campaigns was unacceptably slow. Even worse, senior executives felt like they were losing control over a key source of their competitive differentiation: the quality of their products.

The problems were partly a result of the growing complexity of the business. The luxury goods business was increasingly global, which meant a proliferation of new product categories, more (and more differentiated) local markets, faster product cycles, and many new locally based niche competitors. To deal with the complexity, the organization had put a lot of new managerial layers in place, but with two paradoxical results. First, cooperation plummeted; people in the division's functions reacted to the growth in business complexity and organizational

complicatedness by putting their heads down and focusing on optimizing their local objectives, not on the business as a whole. Second, new layers of management coordination had the effect of distancing senior executives from the division's work. By the time critical information got to them, it was often too late to do anything about it—which contributed to their sense of losing control.

As the division's executives considered agile as a way to organize work, they quickly realized that it wasn't enough just to introduce agile-like teams, practices, and principles. They needed to get their people to buy in to the goals of the agile effort. Otherwise, what motivation did they have to give their best and work together to help the new approach succeed? It was like the principle of unit cohesion in the military: soldiers will do the impossible for their comrades if they bond around a shared cause. The division head put it this way:

## “Let’s find a good reason to go to war.”

The division head and her team spent a great deal of time and effort framing the objectives of the agile effort and translating them into specific goals that were meaningful to the new agile teams. For years, the company had been talking about its brand in expansive and aspirational terms: to be the top luxury goods brand in the world and to empower customers by giving them control over their presentation of self, to help them feel good by looking good. But this aspiration, however noble, was too abstract, too disconnected from the work people did every day. What would it take for them to be really motivated to deliver on that aspiration?

The key, the senior team decided, was to frame the effort as a way for the company to reestablish its leadership in the industry. Doing so depended on winning back the company’s dominance in a product category that had long been a source of the company’s competitive advantage but in which its market position had slipped in recent years. That, already, was a more specific objective. But the management team pushed its framing even further: to become number one in the category required major changes in the company’s business in two key markets: China, where the company had not had a presence, and the US, where the company had suffered major declines in recent years.

This ever finer set of objectives helped identify the specific markets, product categories, and products that would be the focus of the agile effort. It also got people excited about the new approach to working together. They weren’t just solving operational problems; they were helping the company regain its status. But achieving that would require significant improvement in the efficiency and effectiveness of the organization’s product development and marketing. The agile effort was a means to that end, not the end itself.

The division head didn’t stop at framing these ambitious objectives. She enacted that framing through her interactions with the new agile teams. Once the teams were launched, the division head regularly engaged with them to convince people that their efforts would yield a big payoff. They weren’t just developing new products and marketing campaigns; they were creating the company’s future. Nor did she rely on second-hand reports to gauge the teams’ progress. She showed up for the weekly retrospectives to make sure that people knew she cared about their efforts and that she was sufficiently informed of the tough tradeoffs the teams faced to be able to give meaningful direction, early enough, on how best to resolve them. In effect, she created a virtuous cycle in which senior management engagement, empowered by the right information at the right moment, far from undermining team autonomy, supercharged it—and, in this way, added value to the work of the teams.

One sign of that added value: so far, the new agile teams have met every project milestone substantially faster than in the past. At the same time, people are more engaged and more committed to cooperating with one another to achieve objectives that none could achieve on their own. There is more and better information sharing. And the products and marketing campaigns the company is launching are of higher quality than those of their competitors and more differentiated in the marketplace.

But that would just repeat the mistakes of the old command-and-control model. As one CEO put it, “The perfect agile organization can’t be designed, but it can be developed.” Doing so requires the continuous fine-tuning of the organization as a behavioral system.

Elsewhere, my colleagues and I have written about six simple rules that managers can start following today to begin this fine-tuning.<sup>6</sup> These are light-touch interventions to improve people’s capacity for effective cooperation without falling into the trap of organizational complicatedness. They are directly relevant to how managers should think about implementing agile or any other work innovation. They are also critical to how managers themselves need to work in the new environment.

## Understand What Your People Really Do

To nurture an organization’s behavioral system, managers must first understand the behavioral dynamics that drive company performance—why people do what they do. For any performance-related problem or goal, managers should ask:

- Who are the people or organizational units critical to the key moments of truth in delivering on our strategy?
- What do these people do and how do their behaviors contribute, either individually or in combination with the behaviors of others, to produce the organization’s performance?
- Why do these people do what they do? What are the “good” (in the sense of individually rational) reasons for their behavior, even if that behavior is counterproductive to the goals of the organization?
- What changes to the organizational context will change behaviors in a way that improves performance?
- What kind of interventions or joint commitments are necessary—whether from colleagues, other functions, or senior management—to make these changes?
- How can I, as a manager, help bring about these interventions and joint commitments?

Increasingly, managers need to be evaluated on the quality of their answers to these questions. Why? Because the more executives at all levels routinely ask them, the more clearly they will understand the behavioral dynamics of the organization. And the more clearly they understand those dynamics, the more they will be in a position to intervene in the behavioral system to encourage more effective cooperation.

## Reinforce Integrators

One such intervention is to identify and reinforce the natural integrators in the organization. Integrators are individuals or work units that rely on cooperation to get work done. Their role is particularly critical in complex work environments. Reinforcing them means, first, recognizing the managerial nature of the role and, then, giving those who occupy it (for example, the product owners of agile teams) sufficient power to influence the behavior of others so they are willing to cooperate with one another.

## Increase the Total Quantity of Power

Power is often a dirty word in the new work environment because in the traditional organization, power is associated with hierarchy. I have a different way of thinking about it. Power is really only the capacity of one person to make a difference on issues that matter to someone else, and it is an inevitable feature of organizational life whether managers recognize it or not. What’s more, the way power is distributed in an organization is an important enabler of (or constraint on) effective performance. Sometimes, increasing the total quantity of power in the behavioral system can lead to more effective cooperation. It’s akin to increasing the number of cards in a deck. The greater the number of cards, the greater the variety of moves that each player can make. In the same way, expanding people’s behavioral options mobilizes them to find the best ways to satisfy the multiple requirements of a complex task.

6. The six rules are derived from fundamental concepts in the social sciences, in particular the field of game theory. For more on the scientific basis of the rules, see *Six Simple Rules*, pages 20 and 21.



**In the new work environment, there is no alternative to the continual exercise of managerial judgment.**

## Increase Reciprocity

Reciprocity is the mutual conviction among people in a behavioral system that they have a shared interest in cooperation and that each actor's success depends on the success of others. Another key intervention is to create mechanisms for making the necessary interdependencies among employees more visible. For example, setting rich performance objectives that go beyond purely individual objectives to include the impact of an individual's behavior on the performance of others is one way to increase the sense of reciprocity among actors in the behavioral system.

## Extend the Shadow of the Future

Another way managers can nurture the behavioral system is to create feedback loops that expose people directly to the consequences in the future of the decisions they make and the actions they take today. For example, managers can lengthen the amount of time a particular group of people have to work together so that they are “all in the same boat.” This is the basic principle behind the cross-functional agile team as a work unit. Or organizations can speed up the frequency of deadlines or targets—the basic idea behind a sprint. Another way to extend the shadow of the future is to force people to “walk in another's shoes”—for example, by designing career paths so that people know that they will experience in their next assignments the consequences of the decisions they make today.

## Reward Cooperation

The final rule is to factor cooperation more heavily into the rewards, both financial and nonfinancial, that the organization distributes to employees.

Earlier, I described how difficult it is to measure cooperation. At first glance, managers may view this difficulty as a limitation or constraint. In fact, it is a key resource for re-establishing the fundamental integrity of their role, because it means that in the new work environment, there is no alternative to the continual exercise of managerial judgment. No system, no metric, no rubric will be able to assess the effectiveness of cooperation among a group of people better than a human being exercising his or her judgment, and it is the responsibility of the manager to do so, rewarding those who cooperate well and ensuring that those who do not bear the consequences.

Of course, precisely because managerial judgment is so critical in the new, more fluid, more autonomous and self-managed work environment, it is also critical that that judgment be *informed*. It's no longer good enough for managers to make judgments from afar, on the basis of second-hand information and reports (let alone their own biases). To evaluate the quality of cooperation, they must experience up close how the organization and its people are working.

The growing importance of managerial judgment in work environments of increasing complexity is yet another reason for bringing managers back to work.

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# The Bionic Health Care Organization



Imagine this. You are at work and suddenly feel unwell. Rather than call your doctor, you use the health app on your phone to dictate your symptoms to an AI-powered “assistant” that analyzes the data received and connects you via video chat to a coordinator in your health system. Within hours, the coordinator consults with relevant specialists and delivers a prescription that is customized on the basis of your medical history and personal genomics. Your tailored treatment is “manufactured” at a nearby lab and delivered to your workplace (by drone)—all before you leave for the day.

Science fiction today, to be sure, but a version of this scenario will almost certainly become reality—and sooner than many think. Early indicators of the trend toward more advanced, more virtual, and more customized care are already evident. Two-thirds of providers believe virtual consultations will accelerate in use over the next one to three years. More than 30% say that patients’ use of digital and diagnostic tools is common now compared with only 17% before the pandemic. BCG’s most recent patient sentiment survey showed that 60% of patients are willing to step down from hospital-level care and 52% are willing to step down from hospital-associated clinics. Advanced treatment technologies, such as [RNA therapeutics](#), [CART-T](#), and [cell and gene therapy](#), many of which deliver customized treatments, are gaining widespread attention.

As the two articles below argue, these trends demand that health care organizations follow the lead of digital natives and become more bionic—intertwining new technologies, such as AI, with human capabilities to power growth, innovation, and resilience. As they consider the implications of new bionic business models, they cannot overlook the human implications, which are the hardest part of the transition. Digital and talent transformations need to be approached as an integrated whole.





*April 2021*

# Systems Thinking Powers Bionic Success

By Allison Bailey, Karalee Close, Marc Roman Franke, Michael Grebe, and Rich Hutchinson

Google has turned 23. Amazon is 27; Facebook, 17. Apple has produced 12 generations of the iPhone since 2007. How do digital natives grow from nothing to become the world's most valuable companies at such young ages while the largest legacy firms place massive bets on digital transformation and make only incremental progress? The question gains urgency as the pandemic pushes consumers and businesses toward more-digital engagement and business models.

The answer lies in the differing ways companies apply systems thinking—the concept is a norm for digital natives but mostly alien to legacy companies.

## Systems Thinking in Digital Versus Legacy Companies

Digital natives work very differently from legacy companies: they embed technology and data science into their organizations and processes from the day they are founded. So, all of the organization's systems function together easily. Digital natives grow up in a way that creates a coherent “digital + human,” or [bionic, operating model](#).

Legacy companies didn't start out with digital genes. They built themselves, for decades, on human-centric processes and teams known to drive business outcomes. Today, legacy companies, seeking to emulate the rapid success of digital natives, tend to copy or import what they consider to be the core success drivers, piece by piece. They rebuild the tech stack, for example, or assemble a data science team to introduce AI capabilities. But they fail to apply systems thinking to the digital transformation process. Addressing one element of the bionic operating model while others go largely unattended is akin to putting a new engine in an old car: the revitalized vehicle might go fast for a mile or two, but soon the transmission fails or a rusted axle cracks. In fact, multiple components of the entire vehicle need to be overhauled—and redesigned to work together—to achieve a new level of speed and handling.

It's a lot easier to renovate an old car than it is to redesign a global enterprise. Management teams that want to harness the power of digital capabilities need to think systematically about becoming bionic organizations—marrying the power of humans and machines to achieve superior performance throughout the organization and operating model

### How to Think Systematically

Many elements of bionic companies, such as agile teams and cloud-based technologies, are well known. But the formula for putting the elements together is neither immediately evident nor easily implemented. Once companies have a good understanding of the long (but manageable) list of elements required for systems thinking, though, rapid progress and value creation are possible.

First, all key business processes need to be redesigned, blending technological and human capabilities to radically improve business outcomes. Becoming a bionic company isn't a goal in and of itself—it's a means to radical performance improvement.

To build these bionic processes, companies must organize into new types of teams that build and manage the new technology that powers the processes. Staffing these teams requires new talent: data scientists and engineers, of course, but also product managers and experts on human-centric design.

To build and manage technology most effectively, ways of working must fundamentally change. Agile team processes drive increased adaptiveness and speed of execution. Redesigned organization structures replace the vertical business silos that worked well to manage human teams; instead, bionic companies use horizontal platform structures, which are better suited to the investment requirements of technology and data science.

The core technology stack must evolve—radically. To enable rapid product development, the organization has to move beyond infrastructure- and transaction-oriented technology (such as ERP) and invest more money and resources in data and smart-product technology layers. To avoid the endless delays and high costs imposed by legacy tech models, the tech stack must be rebuilt to match the modern, modular architecture common to agile organizations.

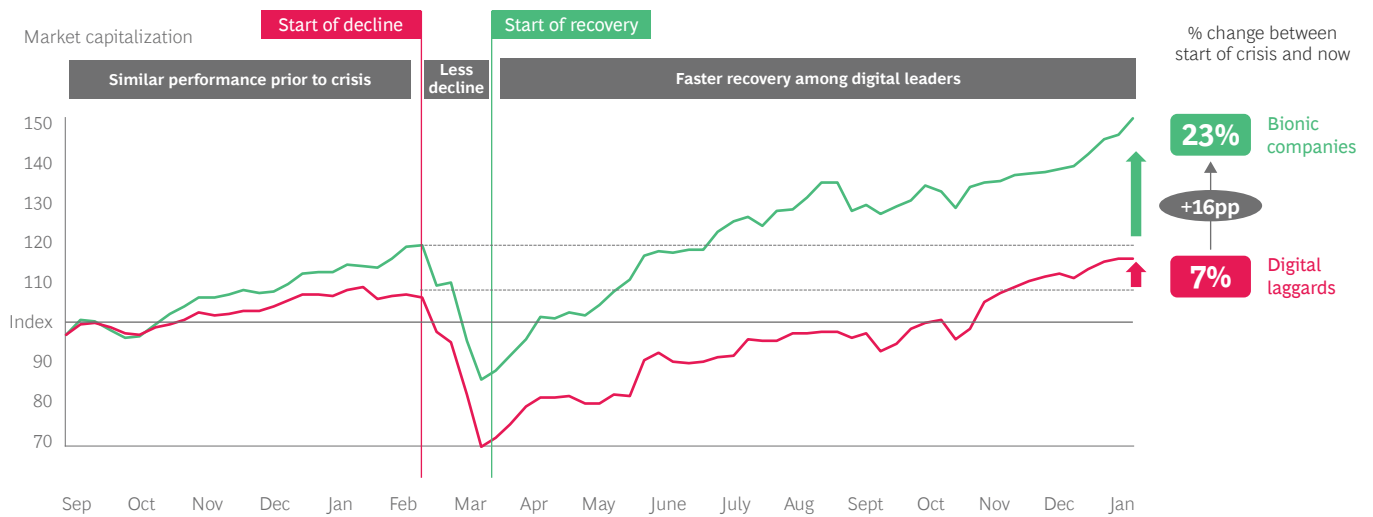
Even corporate strategy, advantage, and purpose must evolve. New sources of competitive advantage are often based on data or a company's position within a broader ecosystem.

To build and manage this new type of organization requires a new leadership model. The heads of legacy companies must master leading new types of talent, operating in an agile manner, and ensuring that their organizations build technology to drive outstanding results. Their job increasingly becomes designing and enabling the organization rather than managing it.

### The Bionic Model Pays Off

While the challenge of transforming is hard, the [benefits are enormous](#). Our most recent research shows that the bionic companies on BCG's Digital Acceleration Index (companies that score 67 or higher on a scale of 100 across 36 digital dimensions) increase EBITDA annually at almost twice the rate of digital laggards (companies that score 43 or lower), while their enterprise value rises more than twice as much each year. These digitally enabled companies have outperformed peers before, during, and coming out of the COVID-19 crisis. ([See the exhibit.](#))

# Digital Maturity Is Linked to Performance



Source: BCG Global Digital Acceleration Index (DAI) Database.

Note: This is a global sample based on 193 companies from 38 countries. “Bionic companies” refers to companies with a DAI of 67 or higher (out of 100), while “digital laggards” refers to companies with a DAI of 43 or lower (out of 100).

Legacy businesses that integrate people and machines are starting to show some eye-popping results.

One fashion retailer used AI to improve its ordering efficiency for the next season by 25%. When it combined its AI algorithms with human insights into real-time fashion trends, ordering efficiency jumped by 50%.

Insurance companies using bionic approaches have boosted customer satisfaction to 70%, compared with 48% for digital laggards, while reducing their expense ratios by an average of 5 percentage points, compared with 1 percentage point for laggards.

Digital success cannot be achieved with any single digital initiative. Indeed, the lack of one or more key ingredients (such as the right talent, tech stack, or organization structure) will fundamentally erode the return on all digital investments. [Developing and sequencing the digital change](#) agenda takes time, vision, smart investment, and persistence in implementation. It’s worth remembering that as young as they are, the digital stars did not achieve their current positions overnight. It took years of hard work. The focus of the work is what counts.

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*March 2021*

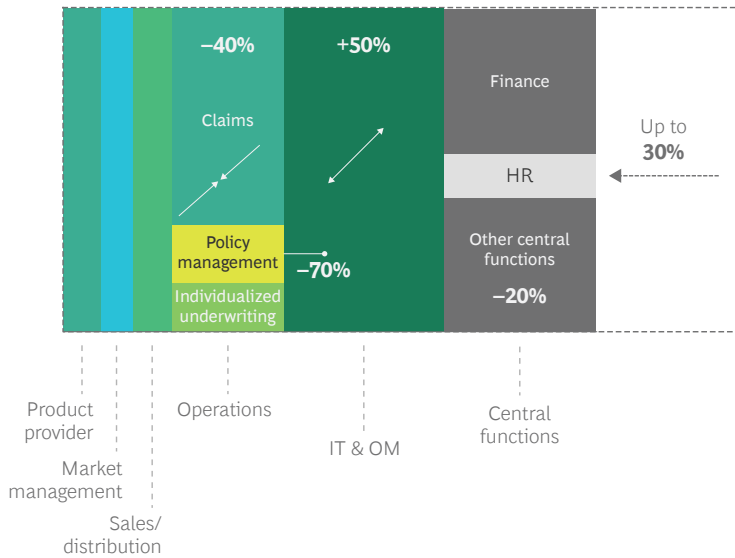
# Embracing the Human Side of the Bionic Insurer

By Christopher Freese, Deborah Lovich, Bodo von Hülsen, Laurent Richaud, and Michael Schachtner

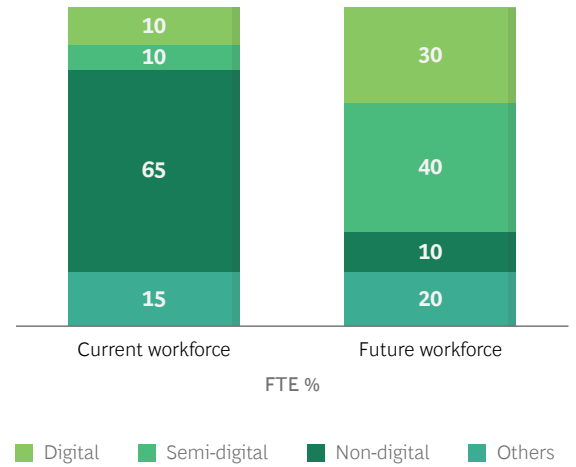
Insurance CEOs have a big strategic challenge: successful companies of the future will look very different than they do today. Overall headcount will shrink by as much as 30%, thanks to automation and new ways of working, although staffing will expand in some areas and contract in others. We expect that approximately 20% fewer people will be needed in claims and central functions such as HR and finance as much of that work becomes automated. At the same time, up to 50% more people will work in high-value human areas such as analytics. The balance of roles will evolve from being 20% digital today to being about 70% digital (including data scientists, software engineers, and analytics experts) over time. Even people in non-technical roles will need technical skills. Most managers and employees will require some form of new training or “upskilling” to stay with the company. (See [Exhibit 1.](#))

# Exhibit 1 - The Capabilities and Workforce Composition of Successful Insurance Companies Will Change

The size and makeup of the workforce will adapt to bionic processes...



...with roughly 70% of roles requiring digital upskilling



Source: BCG case experience.

When management teams consider the implications of new bionic business models that marry humans and technology more closely than ever before, they tend to focus on the delivery and technology aspects. Too often they overlook the human changes, which are the hardest part. According to a 2020 BCG survey of more than 5,000 employees and managers in the US, China, France, Germany, and the UK, training and recruitment of new skill profiles were the least successful elements of their company's digital transformation. This is a big failing. As our colleagues recently pointed out in *Harvard Business Review*, "a digital transformation requires a talent transformation. The two go hand in hand."

A bionic company needs a robust balance of technology and human enablers. (See Exhibit 2.) Here's a roadmap for insurers that want to build the human bionic capabilities they'll need. These six steps will help insurance CEOs organize the work, win the right talent, and manage their company's transformation.

## Focus on Customer Delivery

Bionic companies organize work differently than traditional businesses do. Rather than organize around products and services, they use agile principles and ways of working to focus the organization on the customer (whether inside or outside the company) and the customer's desired outcomes. They then use that focus to drive effectiveness and efficiency. One large US property and casualty insurer put improving its customer experience at the core of its growth strategy. The challenge was to move from an operating model anchored in product and segment to one built around the customer. The company was able to simplify and reimagine its customer engagement model and leverage its scale by aligning 3,000 people around serving customer journeys (such as customer acquisition, account servicing, and claims). For each journey, it reduced costs by 15% to 30% and improved net promoter score (NPS) satisfaction by 30 to 60 points.

## Exhibit 2 - The Insurer of the Future Is Bionic



Source: BCG analysis.

### Embrace Alignment and Autonomy

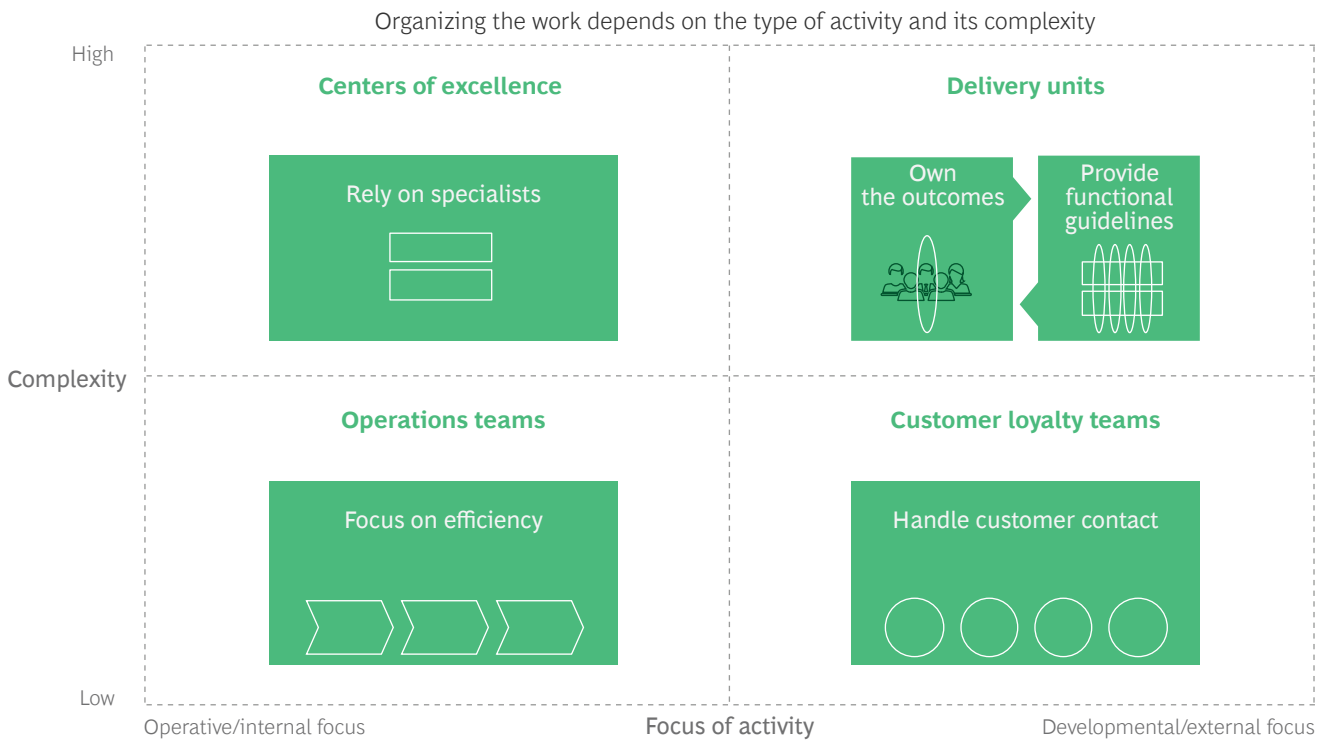
A key cornerstone of an agile organization is the principle of aligned autonomy, which pushes entrepreneurship down to the levels where the action is taking place and the work is getting done. A high degree of autonomy works only when there is also a high degree of alignment in and among teams. Leaders of bionic companies ensure this alignment around overall company purpose, strategy, and priorities. They communicate their intent, explaining both the why and the what, and then let go, releasing their teams to figure out how to address their specific assigned challenge.

Autonomy requires relying on trust while simultaneously fostering transparency about results. It demands a new corporate central nervous system with KPIs rooted in values, leadership formats, and ceremonies. Embracing alignment and autonomy changes the company's culture: the more alignment leaders are able to establish, the more autonomy they can afford to give.

### Adopt Agile Structures and Processes

One of the most important dimensions of unleashing aligned autonomy is the future organizational structure. Plenty of companies undertake an organizational change that they label as agile, but they don't make the kind of fundamental shifts in ways of working at scale across the organization (establishing cross-functional teams and institutionalizing a culture that regards failure as a learning experience, for example) that are the true markers of agility. A true agile-at-scale organization eliminates silos so it can focus more resources on value creation.

# Exhibit 3 - The Agile-at-Scale Matrix



Source: BCG analysis.

We employ what we call an agile-at-scale matrix to help management structure its thinking process for the transition to more-agile ways of working. Among other benefits, the matrix identifies scarce resources and illustrates how they can best be leveraged. (See Exhibit 3.) The matrix has four quadrants—centers of excellence, delivery units, operations teams, and customer loyalty teams—that are structured according to how complex the work is and whether it is internally or externally focused. Some current departments will move entirely into a single quadrant. Others that have activities in multiple quadrants will be split up, and the work will be organized according to the new parameters.

The matrix helps management scope out the transformation in waves. Structuring the organization into quadrants shows how each segment will be affected and sets a foundation for advanced strategic workforce planning. One European multiline insurer decided to focus its first wave of change on the delivery units quadrant of the matrix, which typically accounts for about 25% of staff. The company chose to leave the other quadrants untouched for the time being to avoid any disruption to running the business. In this way, the matrix can serve as the foundation for a detailed, per person-level migration to the target organization.

## Develop New Talent

Building human capabilities at scale and staffing the bionic insurer, with its dependence on the seamless interaction between people and technology, requires a combination of strategies. Digital skills are scarce and competition for them fierce. Like companies in other industries, insurers will need to rely on bionic enablement (a combination of retraining and upskilling) as well as outsourcing in order to meet their talent requirements.

Retraining and upskilling can take several forms. One that we have used successfully with more than 50 companies is BCG’s [Build-Operate-Transfer \(BOT\) model](#). Outside experts work together with internal staff and new hires to build skills while delivering digital priorities. Teams learn by doing while receiving shoulder-to-shoulder coaching. We worked with one health insurer in Europe to develop the talent it needed to harness the power of its customer data. A team of the company’s experts, our experts, and internal staff members with potential to learn worked side by side until the employees understood the intricacies of data management through a combination of coaching, reflection, and real experience.

Another approach is the digital academy and boot camp, a teaching program with two prongs. One is an academy designed to increase the productivity of existing software developers by giving them problem-solving experience, collaborative skills, depth of knowledge in modern technology stacks, speed, and creativity to meet the challenges of digital transformation. The other is a boot camp that enables new hires to excel quickly in their jobs. As with BOT, the priority of this approach is to turn over the upskilling efforts to client companies when the program is self-sustaining.

## Tailor the Approach to Meet Individualized Needs

Few organizations have the luxury of developing their transformation plans from scratch with no constraints. In reality, agility pilots or digital initiatives may be already underway, perhaps with subcritical mass, along with pressing business issues that require short-term delivery. Ambitions and competitive strategies vary. So there is really no one blueprint for direction, priorities, or path when it comes to bionic transformation. In our work with a Japanese life insurer, we started the process with an executive alignment related to strategic ambitions and competitive differentiators. We then helped management tailor a bionic roadmap to meet its specific goals.

Digital transformations take time, often three years or more, and companies have businesses to run and customers to keep happy while they make the transition to a new operating model. A well-defined transition process will speed things up and allow managers to keep one eye on running the business.

## Lead with One Team

The entire transformation process requires intensive [senior management involvement and adaptation](#), since ways of working must change significantly (more delegation, more workshops around product development, and iteration). Many executives have to [unlearn the very things that led to their personal and organizational success](#) in the first place. That is often the [toughest part of the agile transformation process](#) for leaders. We have worked with management teams to do four key things:

- Focus on the few agile behaviors that they see as most important for themselves and their organizations
- Commit to personally acting as role models of behavioral change
- Enable and empower themselves, each other, and their teams
- Champion and celebrate new behaviors

Leaders must prove from the start—and continue to demonstrate—that they have embraced the program and believe it can generate value in the form of premium growth, cost reduction, or rising customer satisfaction as well as adaptability and resilience. Nothing succeeds like success, which both builds momentum and funds the journey.

In the short term, digital technologies and ways of working offer productivity improvements and better customer experiences. In the medium term, digital opens up new growth opportunities and business model innovation. In the long term, successful transformations set companies up for sustained success by propelling them strategically toward a bionic future.

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# Skills and Talent



The ability to attract and train talent (including reskilling and upskilling) will be a defining attribute—and rising competitive advantage—for health care organizations. As we explore below, research by BCG and Faethm (a firm specializing in AI and analytics) into the future of jobs in three developed economies—the US, Germany, and Australia—found that health care practitioners rank among the five job categories that will suffer the biggest talent shortfalls in 2030. Compounding the problem, computer occupations and business operations specialists—two categories on which health care organizations will increasingly rely—are also among the top five talent shortfall groups in all three markets. Adding an additional challenge, as we also explore below, people’s priorities for what they look for in a job are shifting, in part because of COVID. For example, almost two-thirds of workers now would prefer to have flexible hours while only 36% want a traditional 9-to-5 job.

Health care organizations that do not have a people strategy geared to the labor market forces taking shape need to develop one fast. It must encompass more than just recruitment: leadership, culture, and reskilling are all vital components for (re)consideration. Providers, whose staff have experienced some of the most pronounced and prolonged COVID-related stress, must commit to employee support and emphasizing the physical, psychological, and emotional well-being of their staff. New clinician working models that reflect the need for flexibility and seamless transitions between virtual and in-person modalities will be a necessity, as will evolving compensation models to maintain quality and efficiency. And all employers will want to take steps to make themselves so attractive that employees will not want to leave.



March 2021

# Decoding Global Ways of Working

By Rainer Strack, Orsolya Kovács-Ondrejko, Jens Baier, Pierre Antebi, Kate Kavanagh, and Ana López Gobernado

*This is the second in a series about the pandemic's long-term impact on work.*

At times in the past year, it has seemed that “going to the office” was destined to become an antiquated activity, perhaps the subject of a future museum exhibit whose artifacts would include conference rooms, whiteboards, entry badges, and foosball tables. The belief that work has changed irrevocably has been especially pronounced if you work in certain industries, live in certain countries, and travel in certain professional circles. But the idea has occurred to almost everyone.

We're not there yet.

Although the pandemic has drawn attention to the upside of remote work, *fully* remote work—in which employees never set foot in an office—isn't a model that people are clamoring for as they look toward the end of the pandemic. Rather, remote work is among a set of workplace attributes—along with friendly colleagues, ethnic and racial diversity, and a commitment to environmentally sound practices—that many employees will be seeking.

These preferences come through in a survey of 209,000 people in 190 countries by Boston Consulting Group and The Network. (See Exhibits 1 and 2.) We conducted the survey in October and November of 2020 and are publishing our findings in a series of reports. **The first focused on people's lower willingness**, in a pandemic-altered era, to consider a job in a foreign country. After this second report on shifting work preferences, the series will continue with a look at evolving career expectations.

The survey was fielded when the second wave of COVID-19 cases was just beginning and many places weren't in lockdown. (See the sidebar, "Methodology.") The work-from-home percentages would almost certainly be higher if responses had been collected even a few weeks later. That said, the lower level of emergency that prevailed at the time of the survey may make the findings more reflective of the expectations people will have as the pandemic is increasingly brought under control.

## Clarifying the Prevalence of Distance Work

One topic explored in the survey relates to the biggest change for many people: the rise of remote working. Most people's sense of who has been working remotely, versus in a traditional physical setting, has been a projection based on their own experience. Our survey offers a more complete picture of what has been happening. Slightly more than half of all respondents globally were working remotely when the survey was conducted, either all the time or as part of a hybrid model with some days onsite. (See Exhibit 3.)

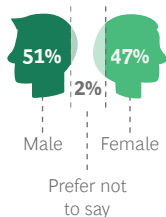
The type of job people hold is a major factor in their likelihood to be working remotely. An average of 70% of people in digital and knowledge-based jobs are now working remotely at least some of the time. Average work-from-home proportions are considerably lower (about 51%) for traditional office jobs, such as sales and purchasing. For jobs that require the handling of physical goods or contact with clients, the average is lower still. For example, only about 20% of people with manufacturing jobs said they are working remotely some or all of the time. (See Exhibit 4.)

And there are nuances within categories, too. An engineer designing automation software is in all likelihood working from home at the moment. A hardware engineer, or an engineer working on debugging a piece of equipment, may well be visiting a physical lab at least a few days a week.

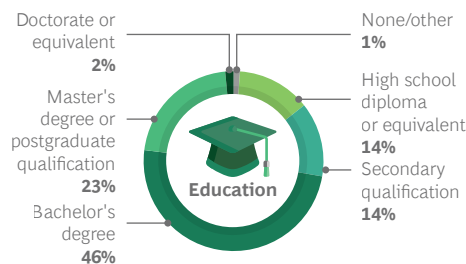
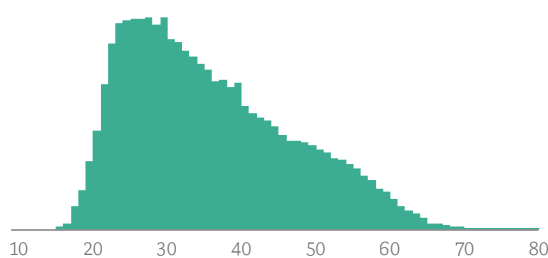
## Exhibit 1 - Demographics of Survey Respondents

**208,807**

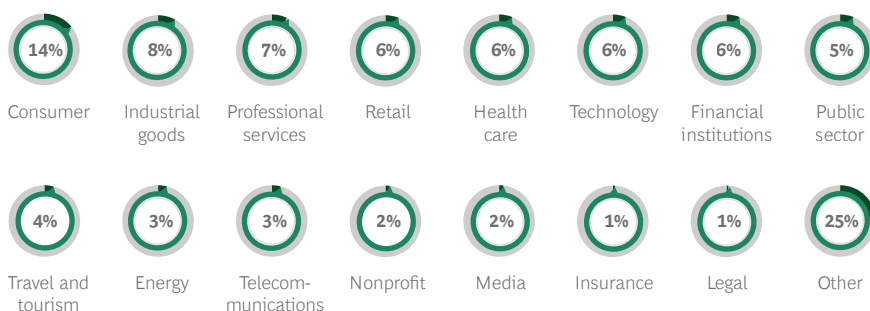
Workforce respondents



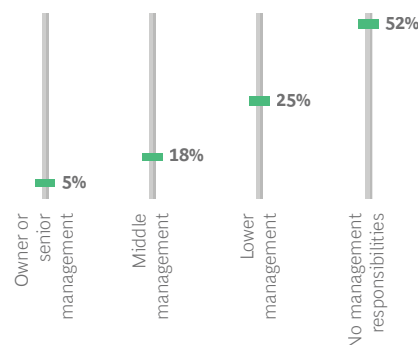
Age distribution



Industry



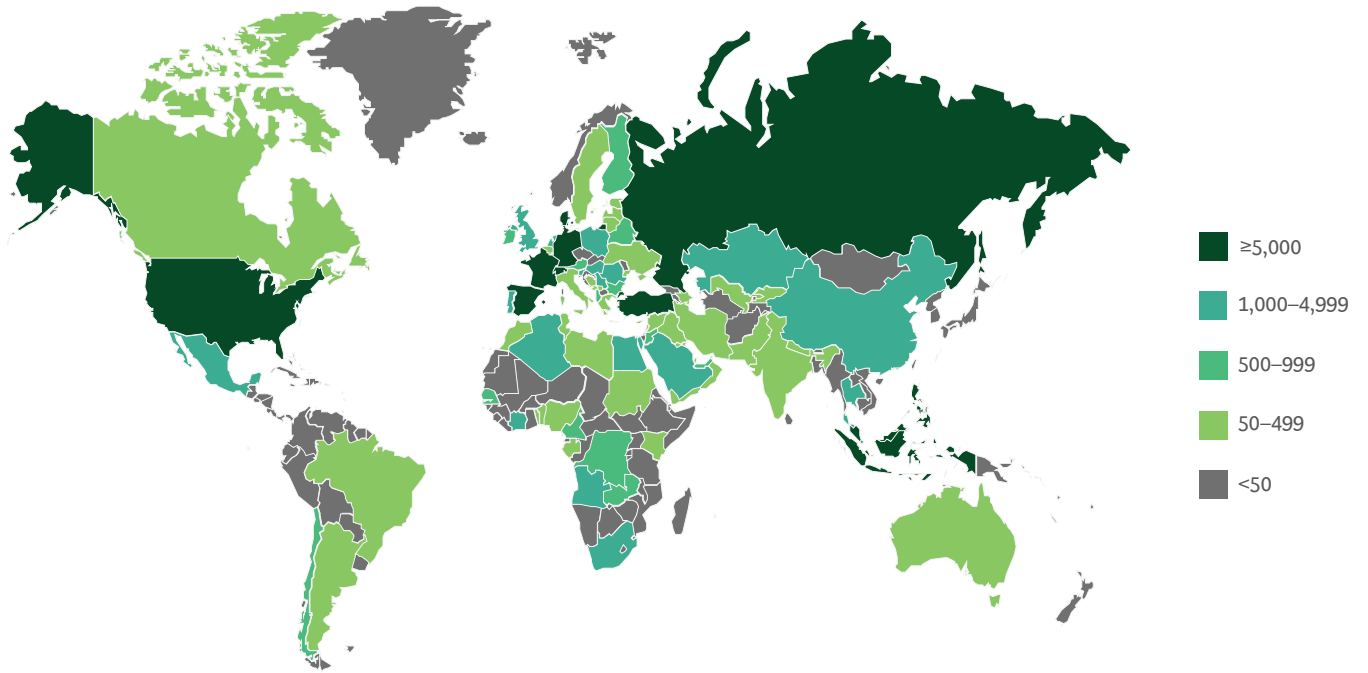
Position



Source: 2020 BCG/The Network proprietary web survey and analysis.

Note: Some percentages do not total 100 because of rounding.

# Exhibit 2 - A Survey of 208,807 Workforce Respondents in 190 Countries



	Americas	Middle East and Africa	Europe	Asia		
5,000 or more respondents	US		Turkey Russia Denmark France Germany	Spain Switzerland  Indonesia Philippines Singapore Malaysia		
1,000–4,999 respondents	Mexico	Angola Algeria Egypt	Ivory Coast Saudi Arabia South Africa	Hungary Kazakhstan Netherlands Poland Portugal	Romania Serbia Slovenia UK	China Thailand
500–999 respondents	Chile	Cameroon Democratic Republic of the Congo Jordan Senegal United Arab Emirates Zambia	Albania Austria Belarus Bulgaria	Finland Ireland Luxembourg		
50–499 respondents	Argentina Brazil Canada	Benin Gabon Iraq Iran Kenya Kuwait Lebanon Libya Morocco	Nigeria Oman Qatar Sudan Syria Togo Tunisia Yemen	Azerbaijan Belgium Bosnia and Herzegovina Cyprus Estonia Greece Italy Kosovo	Kyrgyzstan Latvia Lithuania Sweden Ukraine Uzbekistan	Australia India Nepal Pakistan
Fewer than 50 respondents	Other Americas	Other Middle East and Africa	Other Europe	Other Asia and Pacific		

Source: 2020 BCG/The Network proprietary web survey and analysis.



## Methodology

BCG and The Network (together with its affiliate organizations) conducted this survey between October and early December of 2020. All told, 208,807 people, in 190 countries, participated. The sample includes about an equal proportion of men and women, most of whom work in commercial industries. (The public sector and nonprofits are also represented.) The respondents are mostly early- and mid-career, and the majority are 20 to 40 years of age. Almost three-quarters of them have a bachelor's degree or above.

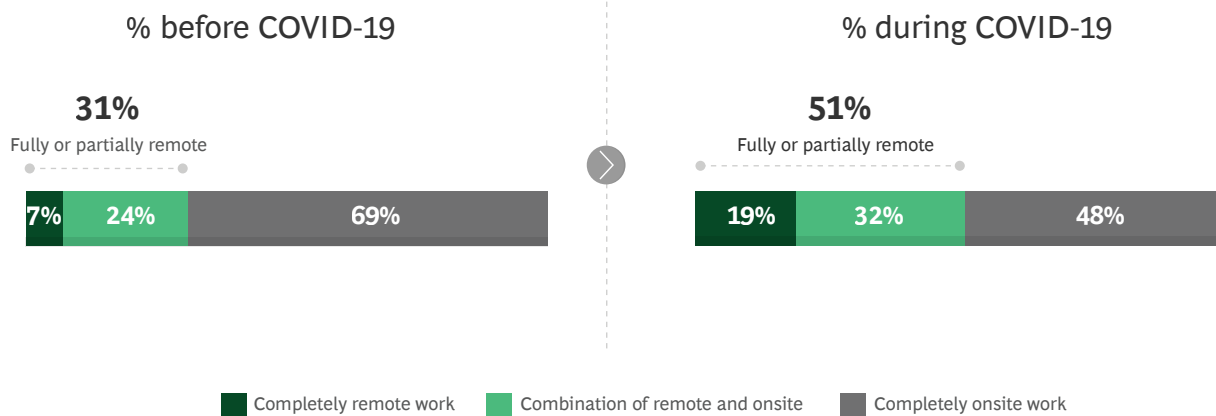
The 40-question survey elicited workers' attitudes regarding a variety of topics, including their willingness to work abroad, the countries (other than their own) that they would most like to work in, and the impact of COVID-19 on their work preferences, employment situation, and willingness to learn new skills.

The information gathered in the survey (which included people's nationalities and level of hierarchy in their organizations) made it possible to analyze workers' attitudes along a variety of parameters.

BCG also conducted follow-up Zoom interviews with select study participants around the world. Those interviews furnish the direct quotes that appear in this report.

# Exhibit 3 - Before and After: How COVID-19 Has Changed Work Models

Percentage of respondents who work from home, part- or full-time



Source: 2020 BCG/The Network proprietary web survey and analysis.

Matej Hrapko, a mechanical engineer at an Austrian automotive company, knows firsthand about the boost the pandemic has given to remote working. Before the pandemic, Hrapko never worked remotely. “Our company did not allow home office,” he explained. Amid shutdowns that kept many European workers out of the office, though, he and his colleagues gravitated to communication tools such as Skype and found new ways to collaborate. “COVID has brought some great progress in our ways of working that we would like to keep,” he said.

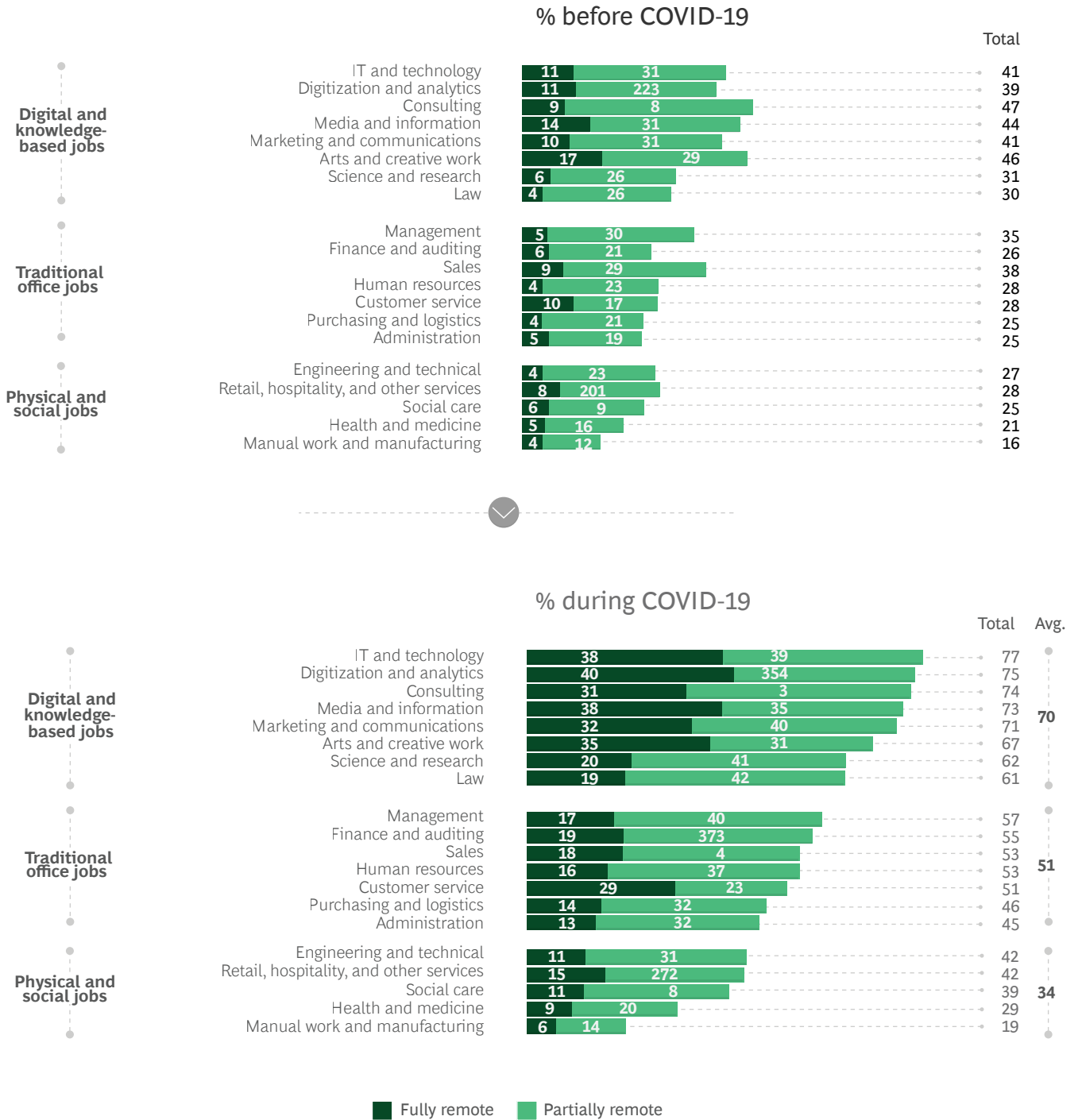
A closer look at the remote work trend shows that even within similar job categories, there are major differences by country of residence. (See Exhibit 5.) Remote work has most firmly taken root in Western Europe, especially in countries hit hard by COVID-19. The Netherlands and the UK lead all countries in the percentage of people who are working remotely, with Luxembourg and France also ranking high. More than 85% of these countries’ digital and knowledge-based workers said they were working from home at least periodically in October and November 2020, far above the global average. (We used a single job category to ensure that country-to-country comparisons would be meaningful, but the percentage differences hold across most job categories.)

The technical infrastructures and prior work practices in these countries—including an inclination to accommodate employees who need to work from home periodically—seem to have enabled a relatively seamless shift to remote work. These countries also have a clear motivation to support social-distancing protocols given their high COVID-19 numbers. (See Exhibit 6 for a correlation between COVID cases and remote work.)

In other countries, a sense that COVID has largely been vanquished is pushing work models in the other direction. This may explain why most Chinese and Saudi Arabian digital workers are once again back in a physical office. (Chinese digital workers are now the least likely to be working from home of any digital workers in the world.) There are also low remote work numbers in some countries where COVID cases were never high to begin with—Thailand, for example. Ivory Coast, Senegal, and Cameroon have likewise mostly avoided COVID-19—but the low work-from-home numbers in these sub-Saharan African nations may also have to do with their infrastructure limitations.

# Exhibit 4 - Digital and Knowledge Workers Have Been the Fastest to Embrace Remote Models

Different kinds of workers and the models they have used

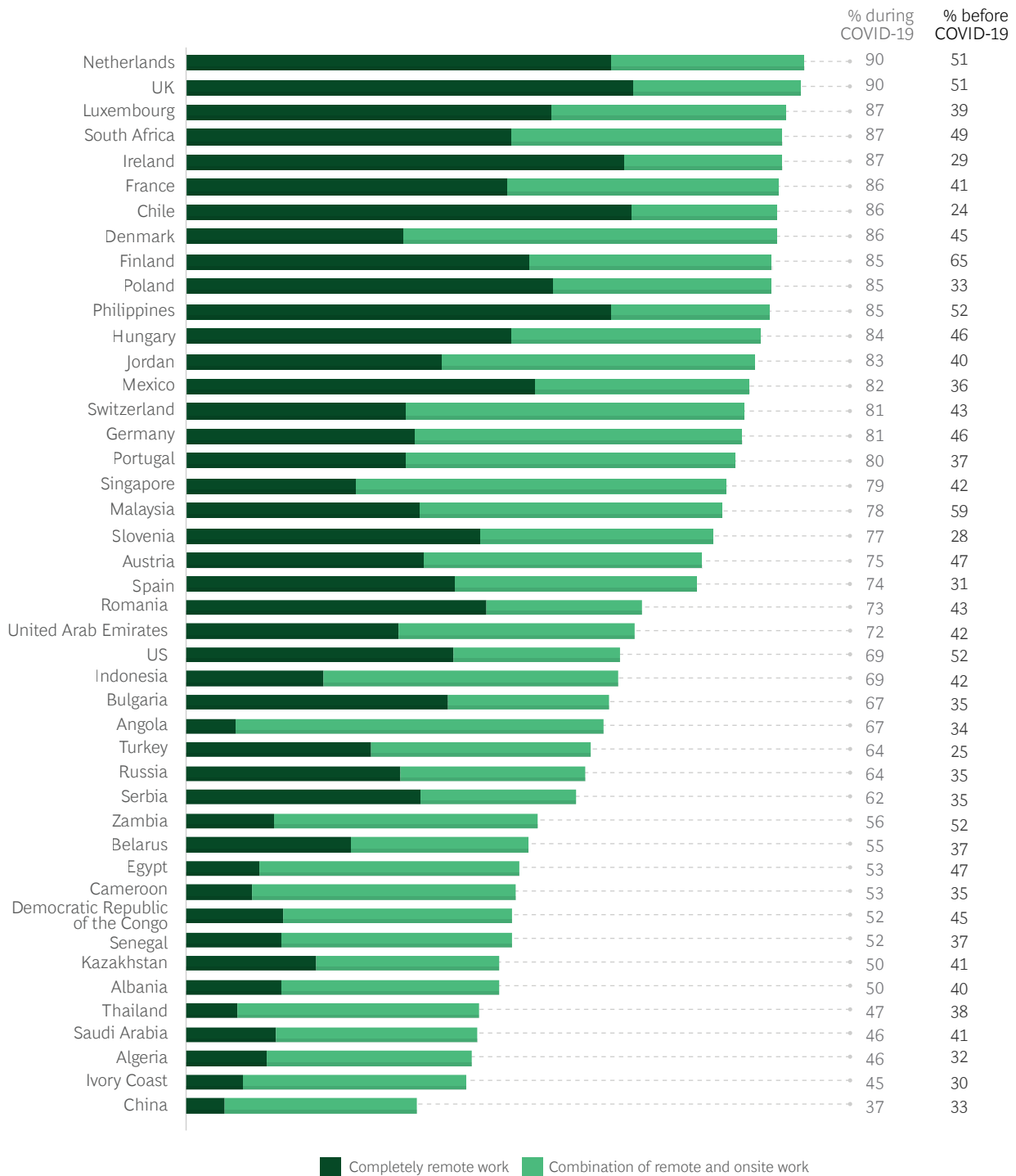


Source: 2020 BCG/The Network proprietary web survey and analysis.  
 Note: Percentages may be affected by rounding.



## Exhibit 5 - Europe Leads in Remote Work; Less Developed Regions Trail

Percentage of digital and knowledge-based workers in each country who have worked remotely

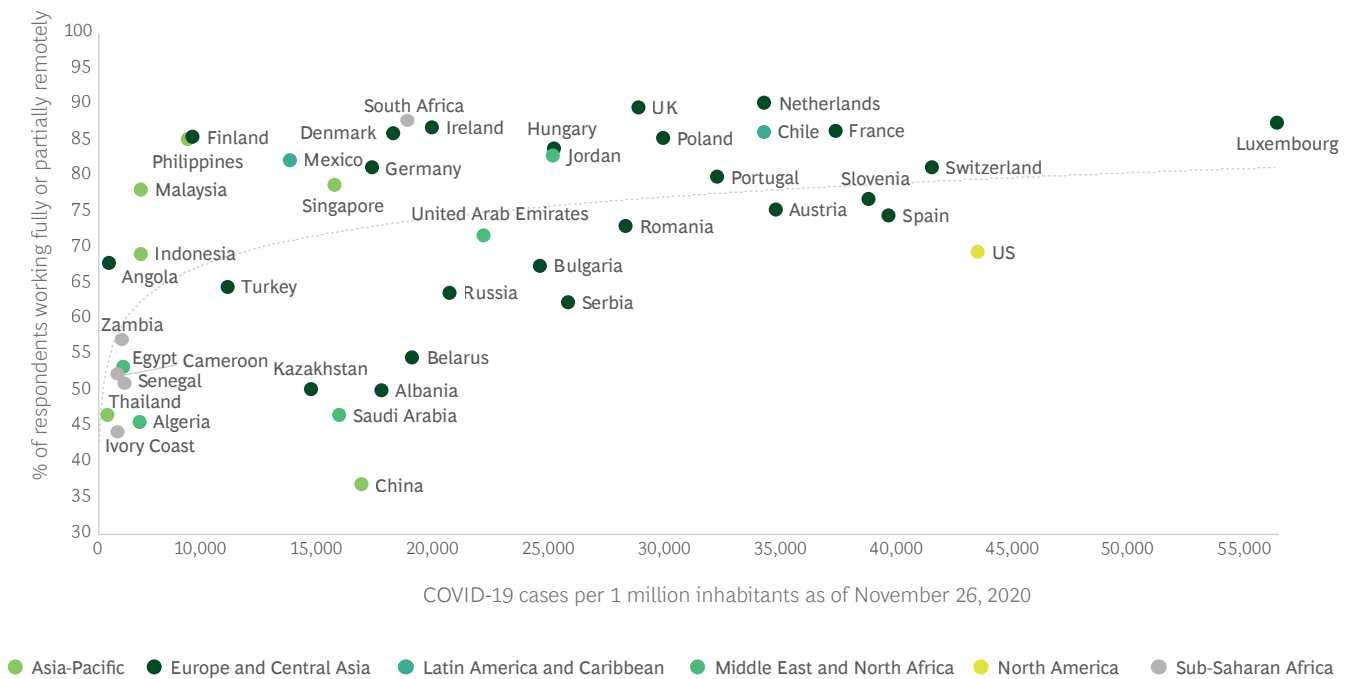


Source: 2020 BCG/The Network proprietary web survey and analysis.

Note: Percentages may be affected by rounding.

## Exhibit 6 - How Remote Work and Virus Response Are Correlated

Percentage of digital and knowledge-based workers in each country who have worked remotely



**Sources:** World Health Organization COVID-19 cases; 2020 BCG/The Network proprietary web survey and analysis.

**Note:** Countries shown had more than 500 respondents. Curved dotted line indicates regression for the countries displayed.

The two factors of preexisting digital work practices and virus aversion seem to explain most countries' proportion of remote working. There are, of course, many nuances. Finland, Denmark, and Ireland, for instance, have high levels of remote work despite low COVID-19 caseloads. These European countries have seen how quickly COVID cases have spiked elsewhere and likely want to avoid a similar outcome, along with the economic disruption that would ensue. The same is true of some of the high-percentage remote work countries in Asia, including Malaysia, Philippines, and Singapore, where the virus has been well controlled. All of these countries, it may be said, are doing what they can to keep the genie in the bottle.

The US is in the middle of all countries on the proportion of remote work, despite having a very high per capita incidence of COVID-19. Sixty-nine percent of US digital and IT workers have been doing some remote work during the pandemic, very close to the global average. While this is not a low proportion, it falls significantly below that of many countries that have done a better job of pandemic management.

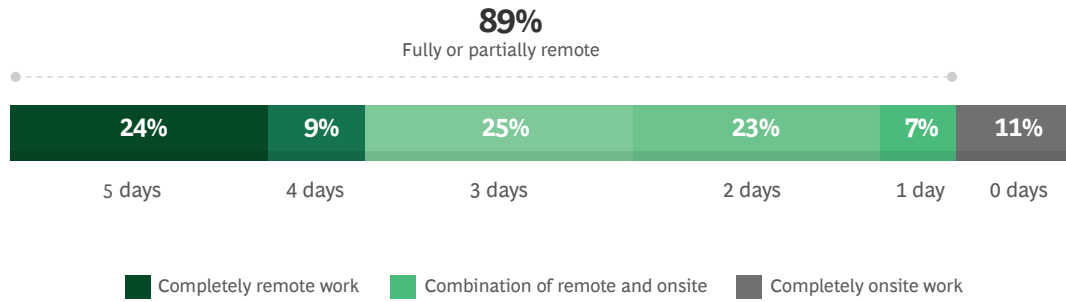
### Attitudes About Flexible Working After the Pandemic

Working from home isn't new. Before the pandemic, however, many companies were still treating it as an occasional practice allowed only for certain employees. COVID-19 has democratized distance work. The details vary, but it's clear that overall remote work awareness has created an expectation that will outlive the crisis.

This came through in a part of the survey where respondents were asked where they would prefer to work in the future. Nine out of ten said they want to work remotely at least some of the time, significantly higher than the 51% of people who were working remotely when the survey was conducted, some seven months into the pandemic. But only a relatively small proportion of workers—one in four—would switch to a completely remote model if they could. The rest like the idea of a combination of home days and office days. (See Exhibit 7.) And it is indeed flexibility that most people are interested in, not a 180-degree turn in the traditional model that would have everyone working from home all the time and never going to a physical work location.

# Exhibit 7 - The Future: How People Would Work If Given a Choice

How many days per week people would like to work from home, by percentage of respondents



Source: 2020 BCG/The Network proprietary web survey and analysis.

“An ideal model for me would be to work from home Mondays and Fridays and go to the office the rest of the week,” said Tomilola Abiodun, who works in marketing for a major US software manufacturer. While it took Abiodun a little while to get into the groove of remote work, she now has what she considers a professional home setup and said she has been much more productive.

This wish for flexibility is not limited to those with digital, knowledge, or office jobs. The preference for occasional home office days is evident even among people who have not worked from home at all during the pandemic and in sectors that haven’t historically had a way to do distance work, including social care, services, and manufacturing. In many of these seemingly less flexible industries, there’s a big gap between the desire for remote work and the incidence of it. For instance, only 29% of health and medical workers and 19% of manufacturing workers have been working remotely during the pandemic, despite 79% and 70% of them, respectively, wishing they could. (See Exhibit 8.) It may be that these respondents are unrealistic about what’s possible. Or the responses may be indicative of work model changes destined to transform even more industries.

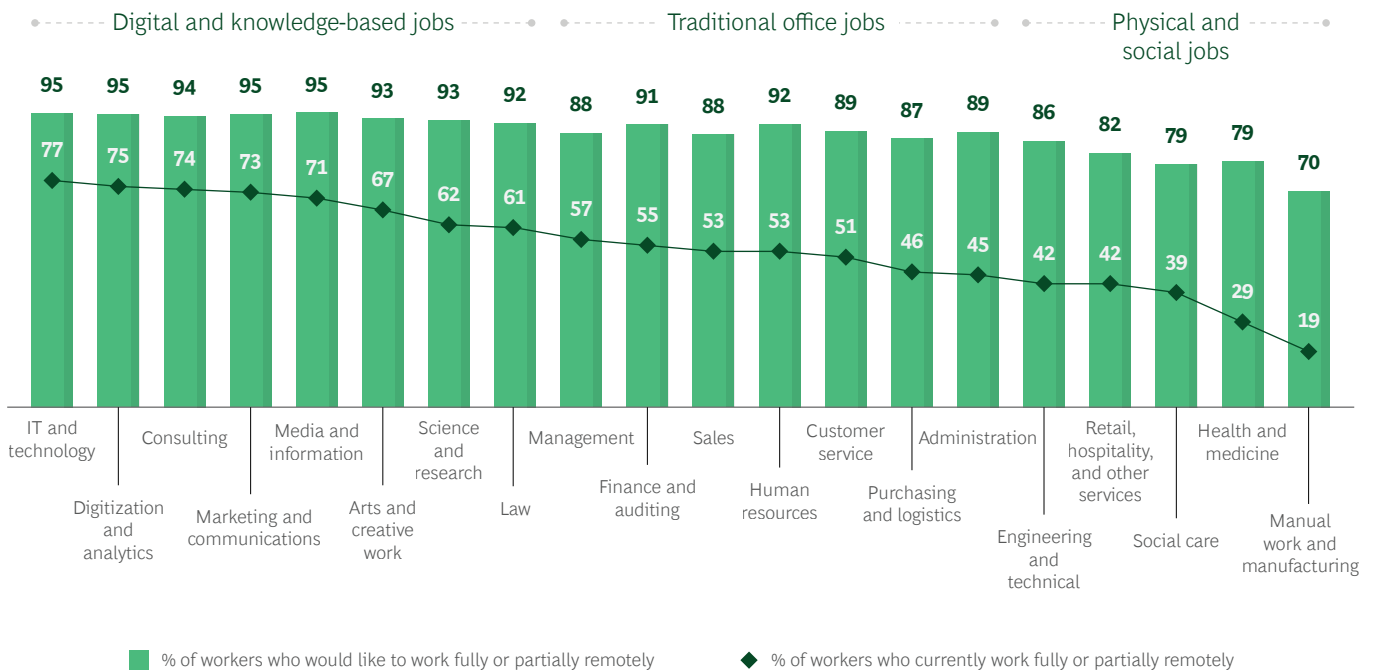
To the extent that there is an appetite for fully remote work, that appetite seems not to be in the most economically advanced countries. For instance, residents of the Netherlands, Luxembourg, France, Denmark, and Finland—who are among the most likely nationalities to be working from home now—are among the least likely to say they would be okay with never going to the office again. (See Exhibit 9.) China’s workers are similarly uneasy about a future that would have them not working together physically with their colleagues.

The enthusiasm for fully remote work is highest in developing countries, including parts of Africa. (In our first report in this series, we noted that African respondents were among those expressing the highest interest in remote international work, in which a person accepts a job with a foreign employer but performs the work in his or her own home country.) The different attitudes about fully remote work may reflect differences in transportation systems, including the time and effort needed to get to the office in one city or country versus another. Companies in highly developed countries may also invest more in their office spaces or to create workplace amenities, making their employees more eager to be on site.

In a bit of a surprise, Americans are near the top of all nationalities in their appetite for fully remote work, with 35% of US respondents saying they would be happy to work from home permanently. In part, this might reflect the huge cost-of-living differences between big US cities where many large businesses are located and the more affordable suburbs and towns where many Americans might live if they didn’t have to go to an office. The 35% makes the US the highest-ranked developed country for fully remote work and the tenth-ranked country on this measure overall.

# Exhibit 8 - Desired Work Model of Workers in 20 Job Roles

Remote work expectations in the future versus what's happening today



Source: 2020 BCG/The Network proprietary web survey and analysis.

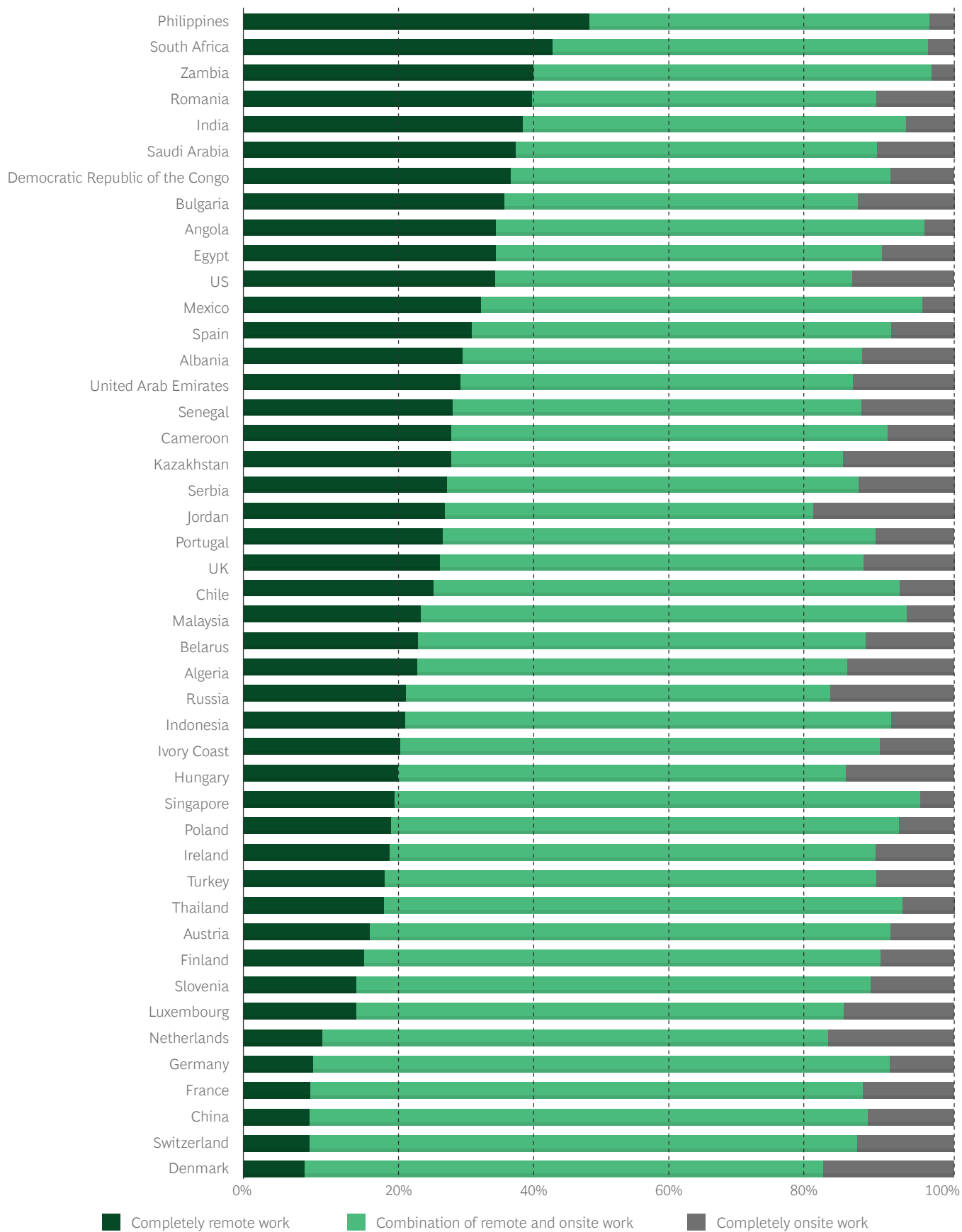
The desire for flexibility does not stop at location; it extends to work time as well. Only 36% of respondents globally say they want a traditional 9-to-5 job with fully fixed hours. The largest proportion (44%) would prefer a combination of fixed and flexible time, which could take the form of a daily window of a few hours when everyone is required to work and flexibility regarding the remaining required time. (Another 20% of respondents would like to have complete timing flexibility, with no fixed work hours at all.) Flexibility relating to when one is at one's desk is obviously helpful to the work-from-home model in that it allows for personal preferences and family commitments. Of course, the model also requires discipline on the part of the remote worker and a reverse sort of flexibility so that colleagues in other time zones aren't forever unable to engage the remote worker in real time.

## COVID-19's Impact on Workplace Culture and Effectiveness

The pandemic's impact on people's work experience goes well beyond the dimension of where and during which hours jobs get done. The way people collaborate, the tools they use, the effectiveness of their work, and their well-being have also been affected.

One big change is people's increasing facility with using digital tools for work. (See Exhibit 10.) Even industries that haven't traditionally thought of themselves as high tech have become heavy users of Zoom, Slack, file-sharing solutions, and virtual flip charts. "We were not used to working with digital tools before," said Anne Granelli, who manages a medical center in Sweden. "COVID-19 has shown us that anything is possible remotely, even medical consultations."

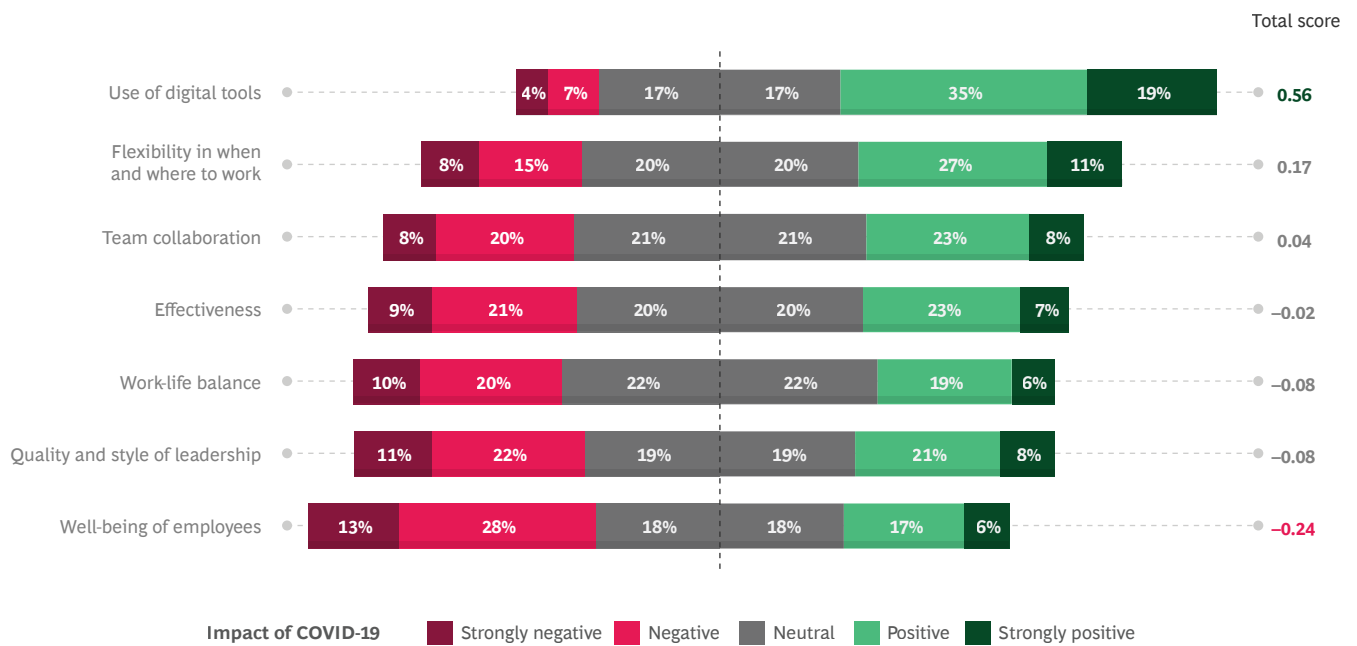
## Exhibit 9 - Different Levels of Enthusiasm for Fully Remote Work



Source: 2020 BCG/The Network proprietary web survey and analysis.

Note: Countries shown had at least 500 survey participants.

## Exhibit 10 - COVID-19's Impact on Different Areas of Work



Source: 2020 BCG/The Network proprietary web survey and analysis.

Note: Total score was calculated as the average of answers ranging from +2 (strongly positive) to -2 (strongly negative).

The improved use of digital tools during the pandemic was noted by people in every industry and every location. In terms of job roles, people who do digital and IT work are the most likely to say they have become better at using digital tools because of the pandemic, followed by people in consulting. Muriel Giroud-Villaine, an independent French consultant who works with companies in the mining, pharmaceutical, and technology fields, said she has learned to speak more slowly in Zoom calls than she does in person and to ask more questions. This is to compensate for “all the nonverbal cues that I don’t get anymore,” she said.

The other area where the pandemic has had an unmistakable impact is on employee well-being. Most people said they feel they are still getting the job done—the barely changed perceptions of team collaboration and organizational effectiveness underscore this—but that feeling has come at the cost of their well-being, to some degree. This was true of every respondent cohort, but lower well-being was especially pronounced among service-sector and manual workers. These are the workers who, during the pandemic, have had to travel to their jobs and who often work in physical teams. For some of these workers, the increased risk of contracting the virus and the discomfort of having to wear masks for hours at a time may have turned work into something to be dreaded.

(One thing that—surprisingly—didn’t show up in the data is a difference based on gender or family circumstances. People with families were no more likely to say that the pandemic lowered their well-being or work-life balance than were people without families. Nor was there an appreciable difference by gender in response to these questions.)

### Shifting Attitudes Toward What Matters on the Job

Apart from work location and work practices, the survey also identified some shifts in what people value at work.

In our last study, in 2018, people said that they expected their jobs to provide them with a mix of both short- and long-term benefits. Job seekers at the time wanted to be surrounded by people they liked, and they wanted their jobs to give them time for outside activities too. The 2018 survey respondents also expected to get some long-term benefits from work—specifically, a chance to develop new skills and advance their careers.



## The Desire for Flexible Hours

Sixty-four percent of workers would prefer to have flexible hours. Only 36% want a traditional 9-to-5 job.

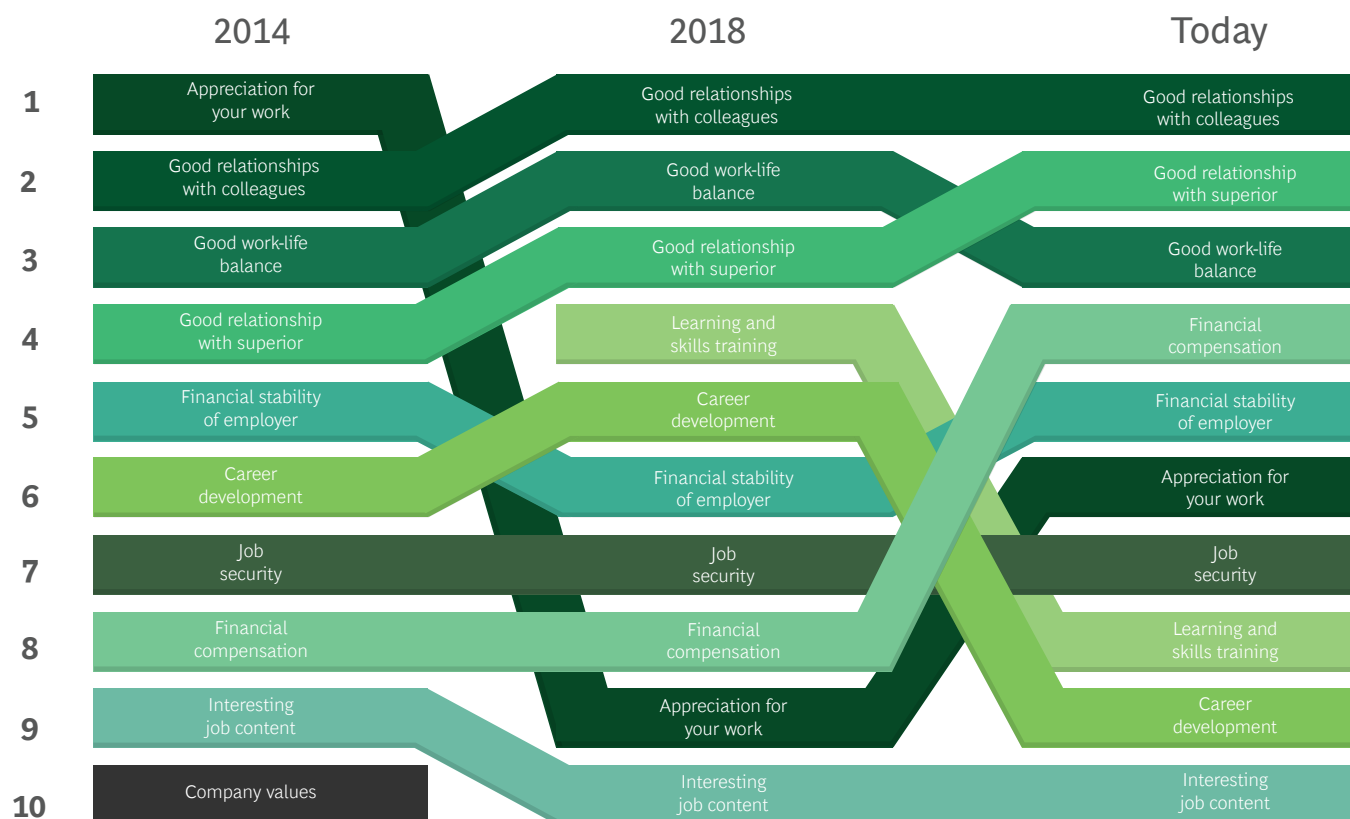
Today, these long-term attributes are much further down the list. It's all about the here and now—people care the most about the colleagues and manager they work with and a good work-life balance. Meanwhile, personal financial security has jumped in importance. (See Exhibit 11.) Indeed, it would be surprising if people *weren't* saying this, given the economic and existential crisis everyone has experienced.

There is some variation, by region, in what workers are focused on. For instance, financial attributes are central for workers in China, Russia, and Poland. Good relationships and a desire to be appreciated for the work one does remain the top priorities in Europe; they are also important in the US. European and US HR departments will have to figure out how to foster these feelings at a time when COVID-19 protocols are still keeping many employees and managers physically separated. And some African, Middle Eastern, and Latin American countries are exceptions to the lower importance of learning and career development. Those long-term goals remain near the top of the list in parts of these geographies. (See Exhibit 12.)

COVID-19 is not the only event in the past year that has changed people's expectations about work. The Black Lives Matter protests and the #MeToo movement have job seekers paying more attention to social values in the workplace. And a succession of climate catastrophes, including the Australian bushfires of 2019 and 2020, have prompted some job seekers to question prospective employers' environmental commitment.

## Exhibit 11 - The Most Basic Reward of All—Pay—Has Surged in Importance

How different attributes rank now versus in the past



Source: 2020 BCG/The Network proprietary web survey and analysis.



# Exhibit 12 - Top Workplace Attributes, by Respondents' Location

Latin America and Caribbean		Asia-Pacific				Middle East and North Africa			
Brazil	Mexico	China	India	Indonesia	Philippines	Algeria	Egypt	Saudi Arabia	United Arab Emirates
1	Good relationships with colleagues	Career development	Financial compensation	Good relationships with colleagues	Good relationships with colleagues	Job security	Learning and skills training	Good relationships with colleagues	Good relationships with colleagues
2	Learning and skills training	Learning and skills training	Good work-life balance	Good relationship with superior	Good relationship with superior	Good work-life balance	Good relationships with colleagues	Employer reputation	Career development
3	Good work-life balance	Financial stability of employer	Financial stability of employer	Opportunities to lead	Financial compensation	Good relationship with superior	Career development	Appreciation for your work	Job security
4	Good relationship with superior	Good work-life balance	Good relationship with superior	Good work-life balance	Career development	Good relationships with colleagues	Job security	Good relationship with superior	Appreciation for your work
5	Interesting job content	Job security	Good relationships with colleagues	Company values	Company values	Career development	Good work-life balance	Financial stability of employer	Good relationship with superior

Europe and Central Asia					Sub-Saharan Africa			North America	
France	Germany	Spain	Poland	Turkey	Russia	UK	Democratic Republic of the Congo	South African	US
1	Interesting job content	Appreciation for your work	Good relationships with colleagues	Financial compensation	Career development	Financial compensation	Good relationships with colleagues	Company values	Good work-life balance
2	Good relationship with superior	Good relationships with colleagues	Good work-life balance	Financial stability of employer	Good work-life balance	Financial stability of employer	Good work-life balance	Learning and skills training	Good relationships with colleagues
3	Good relationships with colleagues	Interesting job content	Job security	Good relationship with superior	Job security	Interesting job content	Good relationship with superior	Good relationship with superior	Appreciation for your work
4	Good work-life balance	Good relationship with superior	Career development	Good relationships with colleagues	Learning and skills training	Learning and skills training	Appreciation for your work	Company values	Good work-life balance
5	Learning and skills training	Good work-life balance	Financial stability of employer	Appreciation for your work	Good relationship with superior	Good relationships with colleagues	Interesting job content	Financial stability of employer	Learning and skills training

Source: 2020 BCG/The Network proprietary web survey and analysis.

Roughly seven in ten respondents said diversity and climate had become more important issues in the last year. (The younger the cohort, the higher the likelihood of the issue growing in importance.) And half of all workers said they would not accept a job with an employer whose policies in these areas didn't match their personal beliefs. (See Exhibit 13.)

Awareness of social issues has certainly risen for software marketer Tomilola Abiodun. "The BLM events really affected me," said Abiodun, a 29-year-old Black woman from Nigeria who has been in the US for four years. "I have always thought that inclusion and diversity were important, but 2020 showed me it could be a deal breaker for me if a company did not have these core values." Her employer has "responded very well to the BLM movement," she added, with colleagues calling her to see how she is doing.

## What the New Attitudes Mean for Employers

The preferences about future work that the survey found aren't all surprising. But the findings show how deeply rooted some new attitudes have become. The question for employers: How to respond?

**First, develop a thoughtful remote work strategy.** For all the publicity that has greeted a few high-profile staff-can-work-from-home-forever declarations, fully remote work is rarely the right answer—and for many companies it is not a possibility. Instead, the right remote work strategy will come to companies that do four things:

- Differentiate by job role.** Certain job roles, by their nature, are better suited to remote work than others. Companies should think in terms of personas—the activities performed as part of certain jobs, the experiences of the people who perform them, and how a shift to a remote work model would affect those people. For many companies, there will be jobs that could all be remote by design and other jobs where working from home can be no more than an occasional perk.
- Balance governance with flexibility.** Companies should introduce guidelines to help workers understand the choices they have. (The guidelines should leave some room for employees' personal preferences.) Those for whom remote work isn't a possibility should not be left feeling that nothing is being done for them. Consider offering such workers other benefits, such as additional days off.

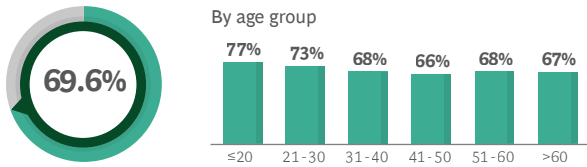
# Exhibit 13 - A Greater Focus on Environmental and Social Issues

Percentage of respondents who agree with the following statements

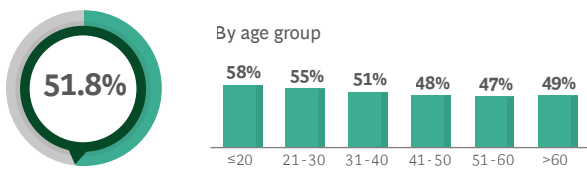


## Environment

The issue of environmental responsibility became more important to me over the last year

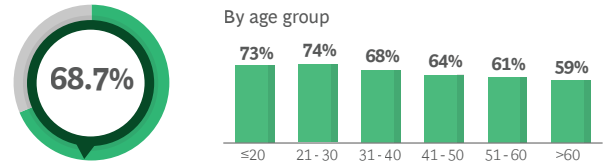


I would exclude companies that don't match my beliefs in environmental responsibility

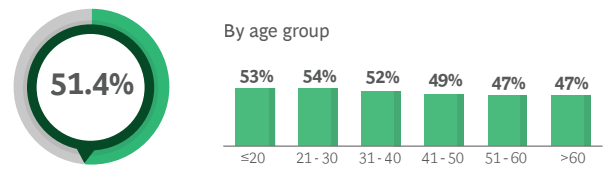


## Diversity and inclusion

The issue of diversity and inclusion became more important to me over the last year



I would exclude companies that don't match my beliefs in diversity and inclusion



Source: 2020 BCG/The Network proprietary web survey and analysis.

- **Provide the right enablers.** A year into the pandemic, many companies have already made sure that their workers have the infrastructure and tools they need to work effectively from home. For companies planning to support remote work on a more permanent basis, **the next step is to adapt their ways of collaborating.** Implementing agile work practices in virtual settings (through virtual daily standup meetings or online team rooms with digital whiteboards) can help teams replace the everyday, in-person meetings they used to stay in touch in more normal times.
- **Experiment, and monitor success.** Even with the head start on remote work that companies have gotten, there aren't many situations where the processes are already perfected and no further adjustments are needed. So, whatever models are chosen, companies should start with small pilots and ensure good data collection on employee experience and productivity. The insights from these pilots can then be used to design remote work models for other parts of the organization.

**Second, build a culture that emphasizes interpersonal relationships and societal values.** The higher ranking of pay and financial stability in this year's survey is notable. But these are also end goals that come with some inherent constraints—all the more reason why companies should focus on some of the softer attributes that may make a difference. Four steps will give organizations a shot at making this shift:

- **Prepare leaders for the world that's coming.** **Leadership models will be different postpandemic.** People in management and executive positions will need to be more multifaceted and adopt an attitude of trust rather than trying to monitor everything. The best leaders will also be technology champions, allowing them to support their organization's switch to remote work.
- **Use virtual tools to build personal connections with employees.** The informal communication that typically takes place in an office must be made more formal in a remote work dynamic, whether through the use of online buddy systems, virtual "water cooler chats," or Zoom team evenings. Managers should also seek to get regular feedback on how employees are feeling, given that their employees may be out of sight on many days. Quick pulse-check surveys (with only a few questions) and mobile apps can make it easier to stay connected.

- **Take a holistic approach to employee well-being.** Many companies are already paying attention to the physical health of workers by making their offices more “touchless,” their common areas more hygienic, and their workspaces more socially distanced. Postpandemic, companies may want to put **more emphasis on their mental health offerings as well**, by supporting stress relief through yoga classes, meditation sessions, and gym memberships. As part of this effort, managers could get training in how to handle employees’ personal and emotional challenges.
- **Get serious about making a positive impact.** Not every company is in a position to address the full gamut of the world’s social and environmental needs. But companies should figure out which issues they can realistically act on and what practices they want to follow to build an inclusive workplace. In those areas, **they should set targets and look at key performance indicators**. Employers should also take a more active stand on the topics that matter to them and encourage employees to contribute by giving them time off for social impact activities.

As headquarters and other physical offices reopen in the coming months, workers will inevitably be wondering how the organizations they’re returning to have changed. They’ll be grateful about the paycheck that came their way during the pandemic. But they’ll also return to their workplaces with new expectations—of reimagined remote work policies, of better on-the-job relationships, of organizations that share their social values. Organizations that step into this future now will have a huge advantage as the competition for talent resumes postpandemic.

*Next in the series: how the crisis has affected people’s career plans and prospects.*

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March 2021

# The Future of Jobs in the Era of AI

By Rainer Strack, Miguel Carrasco, Philipp Kolo, Nicholas Nouri, Michael Priddis, and Richard George

The increasing adoption of automation, artificial intelligence (AI), and other technologies suggests that the role of humans in the economy will shrink drastically, wiping out millions of jobs in the process. COVID-19 accelerated this effect in 2020 and will likely boost digitization, and perhaps establish it permanently, in some areas. However, the real picture is more nuanced: though these technologies will eliminate some jobs, they will create many others. Governments, companies, and individuals all need to understand these shifts when they plan for the future.

BCG recently collaborated with Faethm, a firm specializing in AI and analytics, to study the potential impact of various technologies on jobs in three countries: the US, Germany, and Australia. Using the underlying demographics in each country, we developed detailed scenarios that model the effects of new technologies and consider the impact of the pandemic on GDP growth. (See [Appendix A](#).)

One key finding is that the net number of jobs lost or gained is an artificially simple metric to gauge the impact of digitization. For example, eliminating 10 million jobs and creating 10 million new jobs would appear to have negligible impact. In fact, however, doing so would represent a huge economic disruption for the country—not to mention for the millions of people with their jobs at stake. Therefore, policymakers and countries that want to understand the implications of automation need to drill down and look at disaggregated effects. Understanding the future of jobs is a tall order, but the groundbreaking analysis we conducted helps governments, companies, and individuals take the critical first step to prepare for what is to come.

### Three Components of Workforce Imbalances

In general, computers perform well in tasks that humans find difficult or time-consuming to do, but they tend to work less effectively in tasks that humans find easy to do. Although new technologies will eliminate some occupations, in many areas they will improve the quality of work that humans do by allowing them to focus on more strategic, value-creating, and personally rewarding tasks.

To understand the potential impact of new technologies on future workforces, we looked at three components of imbalances in the US, Germany, and Australia:

- **Workforce Supply and Demand.** We analyzed all elements that affect a nation’s full-time equivalent (FTE) workforce, including the number of college graduates and the rates of retirement, mortality, and migration. And we used standardized job taxonomies on a very granular level for both supply and demand. The taxonomies were based on 22 common job family groups, and close to 100 job families, found in countries all around the world. The three countries we studied for our analysis, however, showed slight variations in the numbers of job families—93 for the US, 86 for Germany, and 82 for Australia—because of differences in their national taxonomies. (See Exhibit 1.)
- **Technology.** To model the impact of technology, we used analytics provided by a Faethm platform to develop three sets of circumstances with different tech adoption rates. The technologies under consideration included programmed intelligence (predefined technologies, such as process automation and robotics), narrow AI (reactive technologies, such as tools that use machine learning to recognize and organize data), broad AI (proactive technologies that can sense external stimuli and make decisions), and reinforced AI (self-improving technologies, such as fully autonomous robots or those that can solve unstructured, complex problems). (See Appendix B.) We considered the medium adoption rate to be the standard, but we also evaluated adoption rates that were 25% faster and 25% slower than the standard in our analysis.

## Exhibit 1 - Methodology to Project Workforce Supply and Demand in 2030

### Categorizing jobs

Job family groups encompass similar occupations and represent the first level of categorization. They include, for example:

- Production occupations
- Business and financial operations occupations

Job families represent the second level of categorization, such as:

- Metal and plastic workers
- Financial specialists

	Number of job family groups	Number of job families
US	22	93
Germany	22	86
Australia	22	82

### Workforce supply

Total available workforce split by job family and age

- Working population (including regular employees, self-employed people, and civil servants)
- Unemployed population

#### Entries into workforce

- + Graduates from education system
- + Net migration

#### Exits from workforce

- Retirement
- Mortality

### Workforce demand

Total workforce demand split by job family and year

- Working population (including regular employees, self-employed people, and civil servants)
- Open positions

#### Job creation

- + Additions due to technology
- + Nontech job gains due to economic growth

#### Job reductions

- Automation
- Augmentation-based efficiency increases

**Sources:** Faethm; BCG analysis.

**Note:** All national-level data drawn from federal statistics offices.

- **GDP Growth.** Given the continuing and dynamic evolution of the pandemic, we used two major COVID-19 projections to simulate future GDP growth: one is a baseline, while the other is more severe and has a longer recovery time. We leveraged data from Oxford Economics for both projections from 2018 up to 2025 and then used the baseline projections to extrapolate growth to 2030.

Looking at all of these factors gave us an aggregate impact of automation and economic growth on national workforces by 2030. Two economic forecasts, and three possible technology adoption rates, led to a total of six possible scenarios:

- **Baseline** COVID-19 projection: high, medium, or low rate of technology adoption
- **Severe** COVID-19 projection: high, medium, or low rate of technology adoption

Throughout this report, unless mentioned otherwise, we will refer to the midrange scenario, which comprises a baseline GDP forecast in response to the pandemic and a medium rate of technology adoption.

We find that the US will likely experience a labor shortfall in its workforce of 0.9% to 4.4% by 2030. Germany will also experience a shortfall, of 0.5% to 4.1%. And although Australia will experience a labor shortfall of up to 3.7% in the baseline scenario, it will experience a labor *surplus* of up to 4.0% if the pandemic causes a more severe impact on GDP growth. (See Exhibit 2.) These consolidated gaps are the difference between the total supply and the total demand in the future workforce for each country. This net number, however, is only an initial indication, and policymakers and business leaders need to look at the disaggregated perspective to see the full picture. Our research also reveals that automation will reduce the number of both unskilled jobs and white-collar positions.

The two additional sets of technology adoption circumstances that we considered would influence the labor curve accordingly. Faster adoption rates would lead to greater demand for people in specific occupations as well as greater surpluses in others that are more prone to automation. Slower adoption rates would lead to a less severe impact on the labor force. In total, the effect would be lower workforce demand.

## A Closer Look at Three Markets

Taking the qualifications of the workforce into account in the form of job family groups generates a much more detailed picture.

**United States.** Talent shortfalls in key occupations, such as computer and mathematics, for the midrange scenario is set to soar from 571,000 in 2020 to 6.1 million by 2030. (See Exhibit 3.) The deficit in supply of architecture and engineering workers is also set to rise sharply, from 60,000 in 2020 to 1.3 million in 2030. So even though the country's overall supply of labor is projected to rise, the US will face significant deficits in crucial fields. In fact, the sum of all job family groups with a shortfall is 17.6 million. Technology and automation will also drive people out of work in the US, particularly in office and administrative support, where the surplus of workers will rise from 1.4 million in 2020 to 3.0 million in 2030.

**Germany.** Germany is also projected to have a shortfall of talent in computer and mathematics by 2030: 1.1 million. (See Exhibit 4.) The next most severely affected job family groups are educational instruction and library occupations (346,000) as well as health care practitioners and technical occupations (254,000). Yet Germany's overall shortfall of talent does not preclude workforce surpluses: production occupations, for example, are expected to rise from 764,000 in 2020 to 801,000 by 2030. This is a very good example of the shift from jobs with repetitive tasks in production lines to those in the programming and maintenance of production technology—and thus the need for significant reskilling (teaching employees entirely new skills needed for a different job or sector) and upskilling (giving employees upgraded skills to stay relevant in a current occupation).

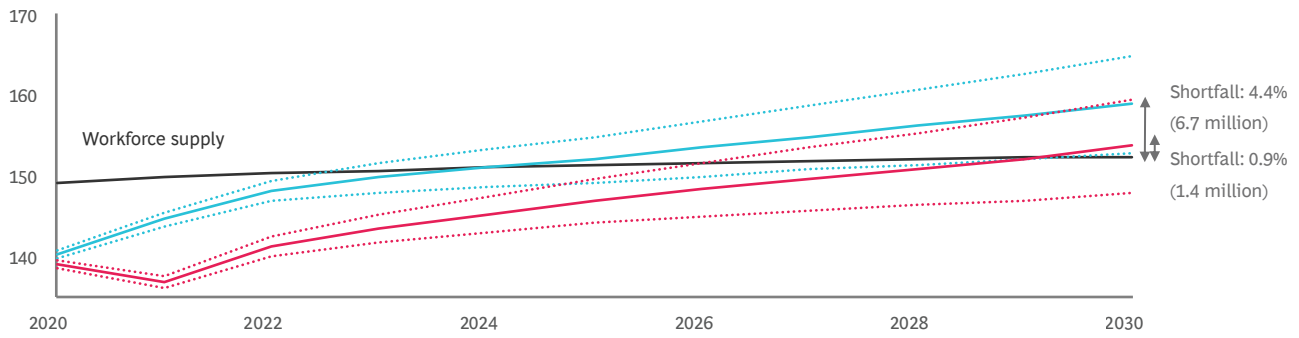
**Australia.** Australia will experience difficulties in filling jobs in certain sectors, although the overall workforce supply looks less stretched. The greatest shortfall by far exists again in computer and mathematics, where the figure will rise to 333,000 by 2030. (See Exhibit 5.) The three job family groups with the next most significant shortfalls are management; health care practitioners and technical support; and business and financial operations.

However, technology will exacerbate Australia's workforce surplus in certain sectors. For example, in production, the surplus will stay high, rising slightly—to 118,000—by 2030. And with technology taking over mundane, repetitive tasks, the surplus in office and administrative is expected to rise from 161,000 in 2020 to 180,000 by 2030. Nonetheless, the sum of all job family groups with a surplus is 0.6 million, while the sum of all job family groups with a shortfall is a cumulative 1.0 million jobs. Combining the two cumulative figures of shortfalls and surpluses gives the net workforce imbalances.

# Exhibit 2 - Differences in Workforce Supply and Demand in Focus Countries

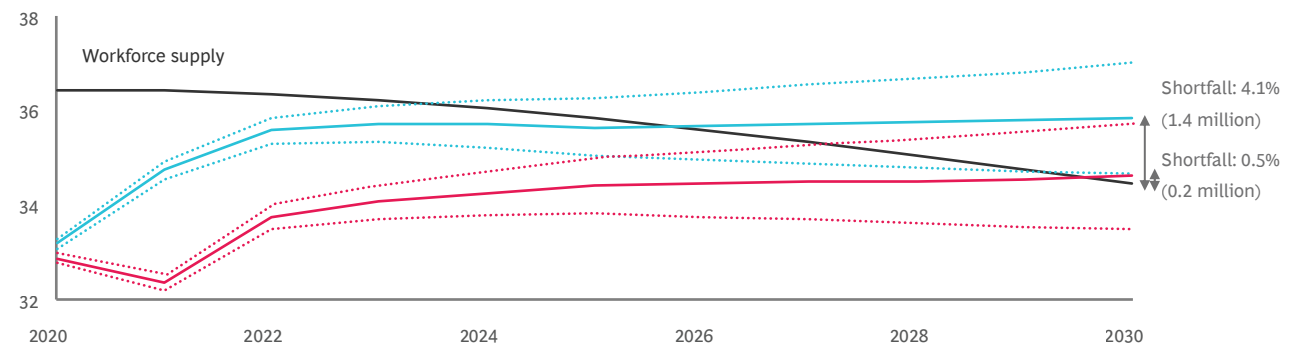
## United States

Workforce (millions of FTEs)



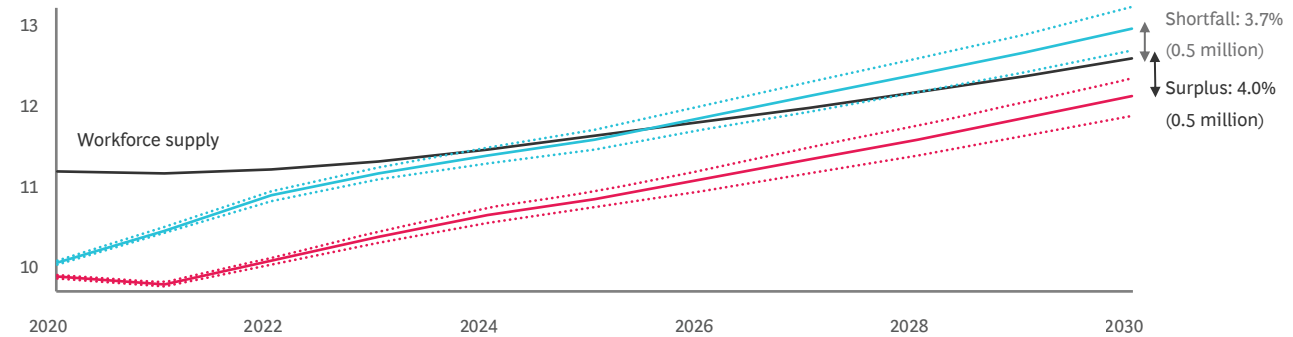
## Germany

Workforce (millions of FTEs)



## Australia

Workforce (millions of FTEs)



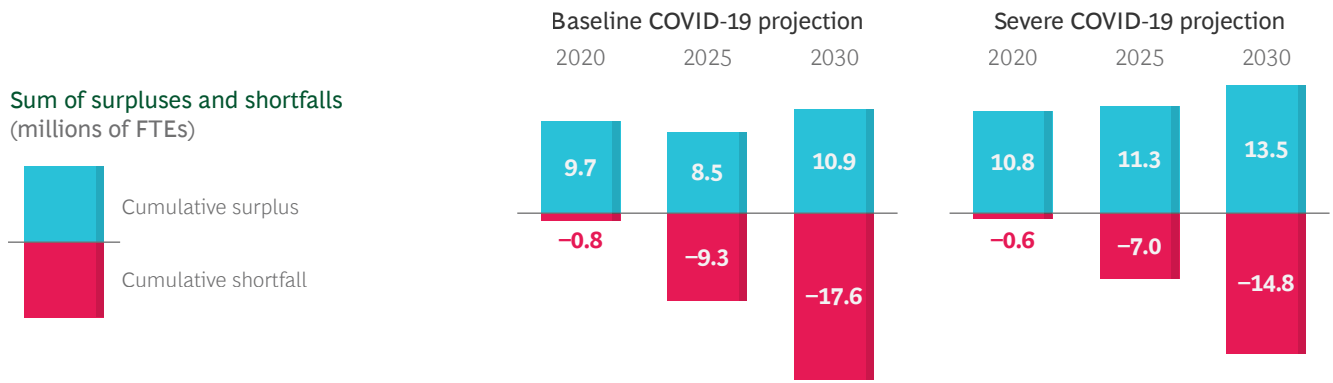
Workforce demand

- Baseline COVID-19 projection, medium rate of technology adoption  
⋯ Baseline COVID-19 projection, high and low rates of technology adoption
- Severe COVID-19 projection, medium rate of technology adoption  
⋯ Severe COVID-19 projection, high and low rates of technology adoption

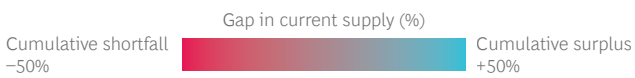
Sources: Faethm; BCG analysis.

Note: FTEs = full-time equivalents.

# Exhibit 3 - US Shortfalls and Excesses by 2030



## Gap between workforce supply and demand (thousands of FTEs)



## Job family groups

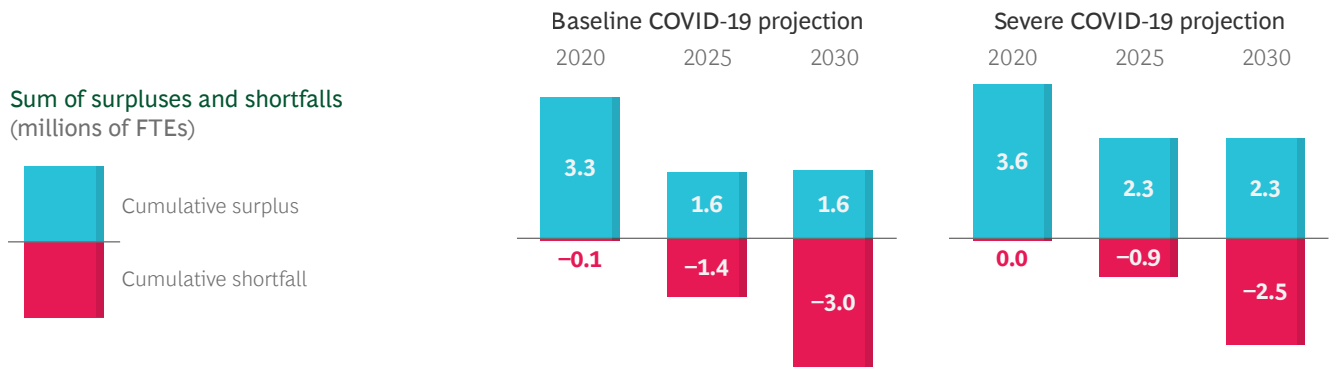
Job Family Group	2020	2025	2030	2020	2025	2030
Architecture and engineering	-60	-621	-1,258	-36	-520	-1,136
Arts, design, entertainment, sports, and media	104	-286	-594	129	-174	-471
Building and grounds cleaning and maintenance	566	351	476	613	538	657
Business and financial operations	-29	-972	-1,593	33	-714	-1,313
Community and social services	7	-349	-652	29	-254	-546
Computer and mathematics	-571	-3,387	-6,138	-527	-3,123	-5,779
Construction and extraction	721	680	760	780	793	874
Educational instruction and library	249	-490	-1,131	325	-132	-745
Farming, fishing, and forestry	50	3	36	58	33	66
Food preparation and service	2,000	2,100	2,458	2,063	2,395	2,760
Health care practitioners and technical support	-134	-1,021	-1,693	-55	-652	-1,295
Health care support	95	-148	-260	125	-9	-113
Installation, maintenance, and repair	318	185	210	354	325	349
Legal	-3	-19	-4	9	4	17
Life, physical, and social sciences	3	-83	-114	14	-45	-75
Management	231	-1,903	-3,919	360	-1,340	-3,306
Office and administrative support	1,369	1,885	3,019	1,520	2,459	3,557
Personal care and service	565	77	-261	608	270	-51
Production	927	1,086	1,417	998	1,372	1,690
Protective service	138	185	271	161	238	325
Sales and related fields	1,091	690	615	1,216	1,244	1,180
Transportation and material moving	1,312	1,292	1,683	1,389	1,609	1,985
<b>Total</b>	<b>8,949</b>	<b>-744</b>	<b>-6,673</b>	<b>10,169</b>	<b>4,315</b>	<b>-1,372</b>

Sources: Faethm; BCG analysis.

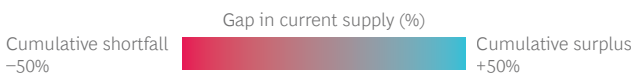
Note: Aggregate results calculated by summing all surpluses and shortfalls within the 22 job families. Because of rounding, not all numbers add up to the totals shown.



# Exhibit 4 - Shortfalls and Excesses in Germany by 2030



## Gap between workforce supply and demand (thousands of FTEs)



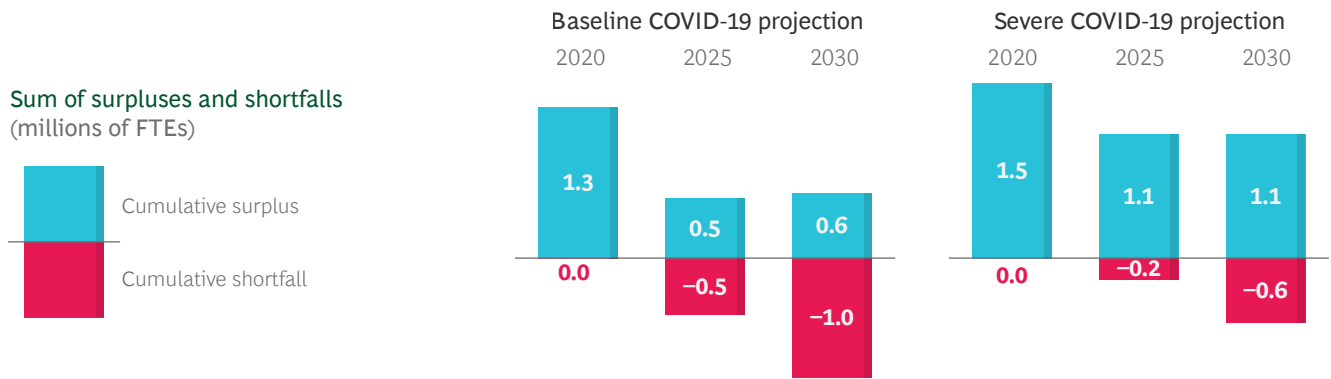
## Job family groups

Job family group	Baseline COVID-19 projection			Severe COVID-19 projection		
	2020	2025	2030	2020	2025	2030
Architecture and engineering	102	-49	-168	110	-3	-118
Arts, design, entertainment, sports, and media	55	-26	-69	61	-1	-43
Building and grounds cleaning and maintenance	165	71	83	108	112	121
Business and financial operations	105	-71	-175	116	-24	-126
Community and social services	15	-48	-93	18	-42	-87
Computer and mathematics	-57	-627	-1,109	-48	-572	-1,037
Construction and extraction	130	108	116	148	168	175
Educational instruction and library	39	-211	-346	52	-184	-317
Farming, fishing, and forestry	38	60	95	42	81	114
Food preparation and service	112	58	56	120	87	85
Health care practitioners and technical support	111	-88	-254	128	-52	-216
Health care support	45	14	9	50	25	19
Installation, maintenance, and repair	116	42	21	127	90	68
Legal	43	44	53	46	52	61
Life, physical, and social sciences	67	18	2	71	41	24
Management	394	-208	-632	431	-22	-438
Office and administrative support	287	246	276	317	332	357
Personal care and service	127	-32	-116	141	-7	-91
Production	764	692	801	802	911	1,006
Protective service	36	-7	-33	40	4	-22
Sales and related fields	318	83	-6	346	211	122
Transportation and material moving	244	123	93	263	219	184
<b>Total</b>	<b>3,256</b>	<b>192</b>	<b>-1,396</b>	<b>3,562</b>	<b>1,429</b>	<b>-158</b>

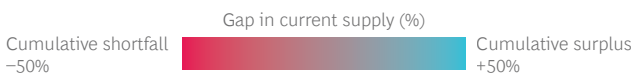
Sources: Faethm; BCG analysis.

Note: Aggregate results calculated by summing all surpluses and shortfalls within the 22 job families. Because of rounding, not all numbers add up to the totals shown.

## Exhibit 5 - Shortfalls and Excesses in Australia by 2030



### Gap between workforce supply and demand (thousands of FTEs)



### Job family groups

Job family group	2020	2025	2030	2020	2025	2030
Architecture and engineering	29	-20	-63	35	10	-27
Arts, design, entertainment, sports, and media	30	4	1	35	25	26
Building and grounds cleaning and maintenance	36	-9	-14	42	17	14
Business and financial operations	33	-35	-66	43	10	-14
Community and social services	2	-25	-47	5	-15	-34
Computer and mathematics	-2	-165	-333	7	-121	-273
Construction and extraction	87	47	4	98	90	55
Educational instruction and library	11	-22	-22	25	16	19
Farming, fishing, and forestry	37	-13	-27	42	3	-9
Food preparation and service	231	90	55	241	145	123
Health care practitioners and technical support	-2	-92	-168	11	-53	-121
Health care support	7	-11	-16	11	1	-2
Installation, maintenance, and repair	48	20	25	53	40	47
Legal	5	-5	-10	7	3	0
Life, physical, and social sciences	6	-10	-17	9	2	-4
Management	173	-66	-214	201	57	-70
Office and administrative support	161	116	180	188	220	288
Personal care and service	42	-22	-44	52	11	-6
Production	112	101	118	125	154	175
Protective service	-1	1	1	2	9	10
Sales and related fields	198	125	175	218	219	277
Transportation and material moving	74	15	9	83	53	49
<b>Total</b>	<b>1,318</b>	<b>24</b>	<b>-473</b>	<b>1,533</b>	<b>898</b>	<b>521</b>

Sources: Faethm; BCG analysis.

Note: Aggregate results calculated by summing all surpluses and shortfalls within the 22 job families. Because of rounding, not all numbers add up to the totals shown.

## Growing Demand for Technological and Soft Skills

For all three countries, the development of labor supply does not fully match the changes in demand, except for certain occupations. At the same time, in many sectors, severe shortages of skilled workers will mean that growth in demand for talent will be unmet. This is particularly true for computer-related occupations and jobs in science, technology, engineering, and math, since technology is fueling the rise of automation across all industries. This is why the computer and mathematics job family group is likely to suffer by far the greatest worker deficits in all three countries.

Meanwhile, in job family groups that involve little or no automation but that do require compassionate human interaction tailored to specific groups—such as health care, social services, and certain teaching occupations—the demand for human skills will increase as well. Germany and the United States, given their overall human resource deficits, will face the greatest pressure for talent in these occupations. For example, Germany will suffer a shortfall of 346,000 people in the educational instruction and library sector by 2030. The deficit for health care practitioners and technical support will rise to 254,000. In the United States, the deficits for those two groups will rise to 1.1 million and to nearly 1.7 million, respectively, by 2030. Even Australia will suffer a significant shortfall, in health care practitioners and technical support: 168,000.

## Sensitivity of Outcomes

**Exhibit 6** provides an overview of all six potential scenarios and gives an indication of the possible situations that may occur across them. For example, Australia will face a shortfall in the baseline COVID-19 projection of approximately 800,000 workers, assuming a low rate of technology adoption. At the other end of the spectrum—the severe COVID-19 projection, with a high rate of technology adoption—Australia will face a labor surplus of about 800,000.

Compared with the United States and Germany, Australia is projected to experience a substantial growth in labor supply. In 2002, the national government started offering cash subsidies to parents of newborns in an effort to lift the country's fertility rate. The increase resulted in a baby boom of people who will enter the job market over the next decade. At the same time, Australia has significantly cut immigration for the foreseeable future in response to the economic challenges of the pandemic—a short-term effect that will lead to increased labor supply when immigration resumes. Nevertheless, the projected skills mismatch is unlikely to be fully resolved. Therefore, we expect higher levels of unemployment in some areas and more acute skills shortages in others.

The shortfall is even more pronounced in Germany, where the analysis shows a talent shortfall in five of the six potential scenarios we identified. Only a severe impact by the pandemic on GDP, combined with high technology adoption, would generate a net surplus of approximately 1 million employees. Germany faces the dual challenge of a birth rate that has remained low, at an average of 1.6 children per woman, combined with aging baby boomers who will retire in the next decade. Exacerbating this is a demand for workers that we anticipate will either remain constant or increase.

Similarly, five of the six potential scenarios in the US show a shortfall (up to 12.5 million people), and only the severe COVID-19 trajectory, combined with a high adoption rate of technology, indicates a surplus (up to 4.5 million).

Although the adoption of technology is progressing at roughly the same pace in all three countries, demographic profiles suggest that they will face different challenges during the digital transition. However, they all share the need for a labor force that has the right composition of skills to meet the needs of the digital age, which will demand upskilling and reskilling on a large scale. In the baseline projection, all three countries will face a net workforce gap. In addition, a certain level of structural unemployment (defined as the difference between demand and supply) will prevail. Therefore, the challenge is more significant than the aggregate numbers suggest.

## Building an Adaptive Workforce

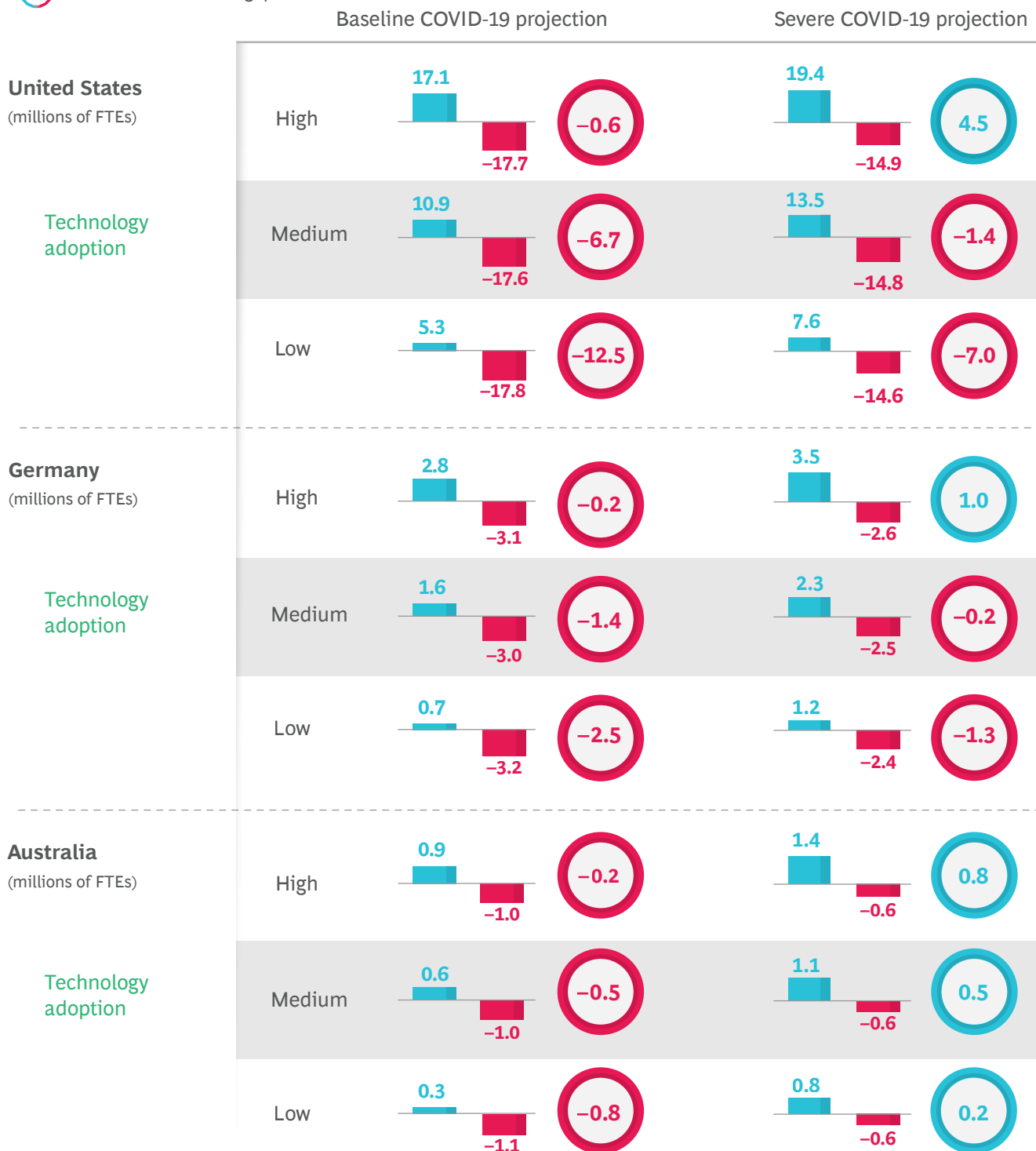
The stark predictions for labor deficits suggest that all three of the countries we studied should take deliberate action to build a workforce that is ready for the future. Governments and corporate leaders need to understand the specific demographic challenges they face, where the biggest impact of automation will be, and how they can help individuals remain employable by maintaining their skills. They then need to ensure that workers continue to learn over time as demand for different skills evolves. In short, countries must build an adaptive workforce.

Through a deeper dive into the analysis, we can identify the job families (which make up the job family groups discussed above) with the highest absolute surpluses and shortfalls in 2030 for the baseline projection. (See [Exhibit 7](#).) These job families reflect the areas with the highest need for action from all stakeholders. The US, Germany, and Australia share some similarities here. For example, all three show that information and record clerks constitute one of the occupations with the greatest overall surplus (1.9 million for the three countries)—an increase generated by the ability of new technology solutions to manage this task. Similarly, all three countries will see a steep shortage of business operations specialists (who analyze business operations and identify customer needs) as a direct result of the data made more widely available by technology.

# Exhibit 6 - The Findings Are Largely Consistent Despite the Impact of COVID-19



## COVID-19 GDP impact



Sources: Faethm; BCG analysis.

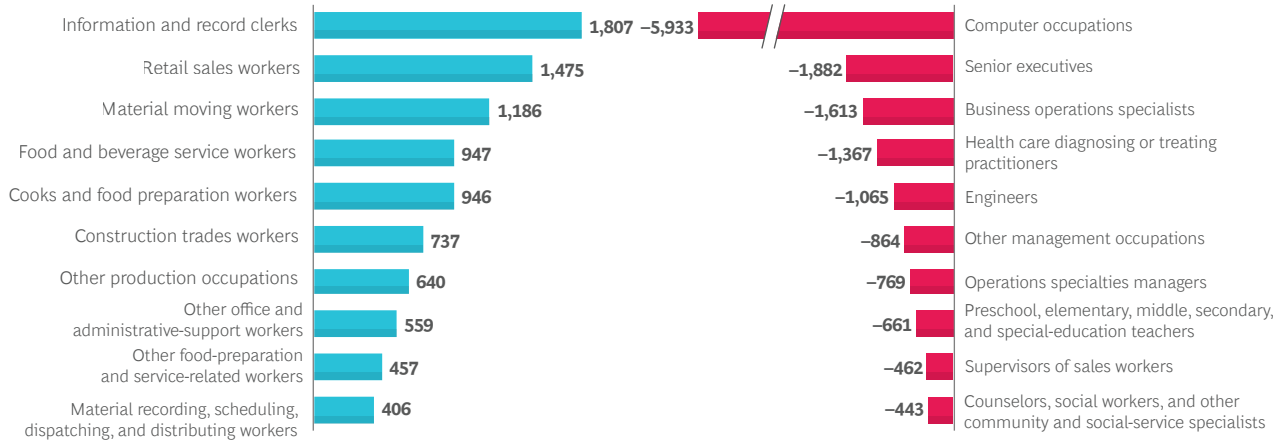
Note: Aggregate results calculated by summing all surpluses and shortfalls of the 22 job families so that each job family contributes either to the cumulative surplus or shortfall result. Because of rounding, not all numbers add up to the totals shown.

# Exhibit 7 - Biggest Job Family Surpluses and Shortfalls in 2030: Baseline COVID-19 Projection

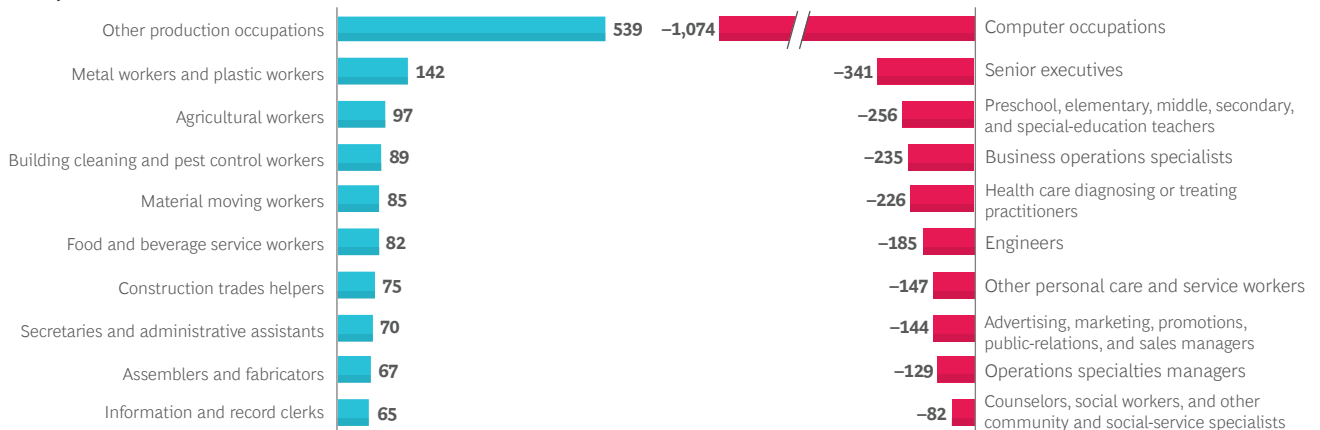
**Occupations with the biggest absolute surpluses**  
(thousands of FTEs)

**Occupations with the biggest absolute shortfalls**  
(thousands of FTEs)

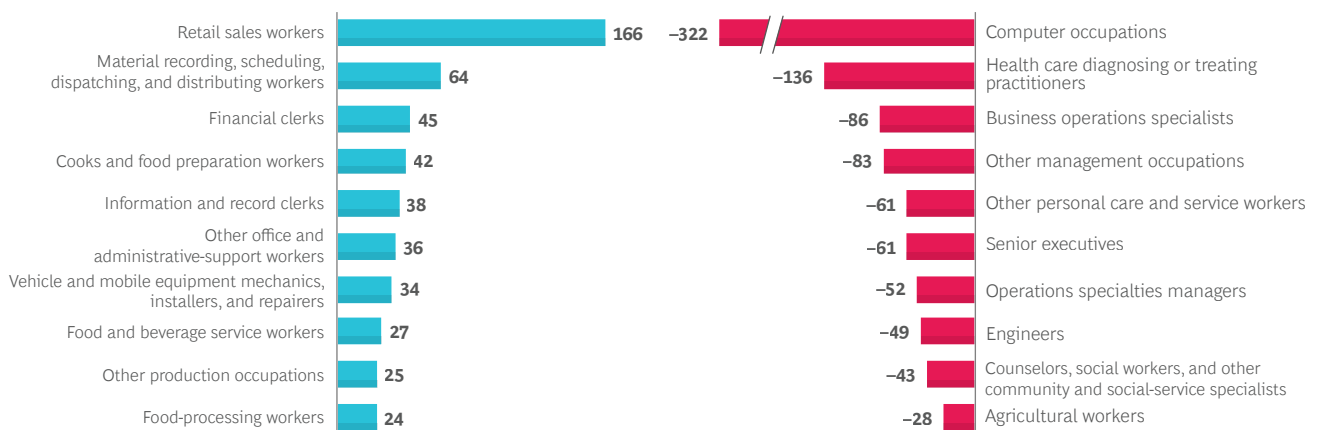
## United States



## Germany



## Australia



Sources: Faethm; BCG analysis.

Of course, although humans may no longer be needed for some tasks, they will nevertheless be necessary to help develop automation. Decisions must be made on the rules governing the use of new tools and how to implement and maintain the software or robots that are taking over those tasks. Despite eliminating the need for human employees for many routine and administrative tasks, technology can also create new jobs as the demand for software developers, data analysts, cybersecurity testers, and other digital specialists rises across all sectors. There may be a need to redeploy, upskill, or reskill people—and perhaps even to redefine any given job itself. Although these markets share characteristics in terms of technology adoption, significant differences emerge.

In the United States, for example, for every six jobs that are being automated or augmented by new technologies, one additional job will be needed in order to develop, implement, and run those new technologies. In the aggregate, those newly created roles will encompass 63 occupations, mostly in the fields of data science and software development.

Increased job automation will also create significant opportunities. Primarily, it will enable workers to undertake higher-value tasks. For example, the removal of mundane, repetitive tasks in legal, accounting, administrative, and similar professions opens the possibility for employees to take on more strategic roles. This also illustrates how automation will affect not only blue-collar jobs but white-collar occupations as well.

Meanwhile, core human abilities—such as empathy, imagination, creativity, and emotional intelligence, which cannot be replicated by technology—will become more valuable. The supply of talent for occupations that require these abilities—such as health care workers, teachers, and counselors—is currently limited, causing the high shortfalls we see in these job families. At the same time, crises such as the COVID-19 pandemic underscore the importance of these occupations in ensuring societal well-being.

## Recommendations for Governments

Countries need to take the following actions to get ahead of current and future work imbalances in their employment markets.

**Plan for the future workforce.** Governments should have a central workforce strategy and policy unit in place to understand the current trends in workforce supply and demand; identify the gaps that exist in certain jobs, sectors, and skills; and predict the measures that will be needed to close those gaps. Specific resources include advanced-analytics models to predict changes over time and sufficiently granular sources of data that can generate insights into various regions, sectors, and demographics. Furthermore, the findings should be translated into strategic directions that are then implemented in specific policies and programs across government departments, including education, welfare, labor, and economics.

**Rethink education, upskilling, and reskilling.** Guided by strategic workforce planning, governments should create adult upskilling and reskilling programs at scale. Success requires working closely with the private sector and academia to develop more creative solutions that match the shifting realities of the labor marketplace over time. Governments also need to refocus education systems to develop so-called metaskills, such as logical thinking, reasoning, curiosity, open-mindedness, collaboration, leadership, creativity, and systems thinking.

In addition, education systems must become more flexible, moving beyond degree programs that require several years to complete and, instead, facilitating intermittent periods of study. They should also help people to obtain microcredentials and certifications tailored to industry needs (ideally created in partnership with the private sector) and to upgrade their skills on a regular basis.

The right solution will require a much broader set of educational formats to convey these skills in a sound way. Current education funding models need to shift from large, one-time subsidies to smaller, incremental payments spread over a person's lifetime. This might mean, for example, creating lifelong learning accounts, such as those in a program offered by the Singapore government, which provide funding for a person's education over their lifetime and can be drawn upon whenever they need to upgrade existing skills or gain new ones. Traditional education systems will need to apprise prospective students of the fields of study and types of degrees that are most aligned with the needs of the workforce, so they can make informed decisions about which path to pursue. This is especially true for students who are transitioning to higher education. What's more, doing so would cut down on any future reskilling needs because citizens will have acquired the skill profiles demanded by the labor market right from the start.

**Build career and employment platforms.** To ensure that the labor market is working as efficiently as possible, some governments are creating comprehensive data and digital employment platforms so that workers can navigate to jobs and training opportunities more easily and quickly. A world-class platform helps citizens assess their skills, identify potential employment pathways, and close capability gaps through upskilling and reskilling opportunities. Critically, these platforms need to be continually updated and reinvented to ensure that they remain relevant and useful. In addition, governments need to establish their own employer brands in order to influence immigration patterns and attract employees with relevant skills from other countries.

**Update social safety nets.** Given the risk that automation poses for many jobs, policymakers need to focus on providing upskilling and reskilling opportunities for workers who are in transition, employed part-time, or unable or unwilling to adapt to the digital economy. Welfare policies need to adapt so the system can assist people who regularly enter and exit the workforce. Supporting those who do not profit directly from the positive effects of future technologies is critical to fuel a societal support for this major shift toward a more flexible and adaptive workforce. Funding all this will require governments to embrace automation in their own administrations as boldly as possible.

**Drive innovation and support small and midsize enterprises (SMEs).** SMEs may lack the funds to continually enhance their automation and thus will need support in the form of subsidized loans or investment tax breaks as they work to develop a digitally enabled workforce. Regulations for the use of advanced technologies should not overburden these SMEs, in order to avoid inhibiting their innovation. Supporting SMEs will help build the capabilities needed to drive innovation throughout the economy as well.

## Recommendations for Companies

To ensure that current and future work imbalances do not have an impact on their financial stability and ability to compete, companies need to take the following actions.

**Perform strategic workforce planning.** As at the country level, a company should regularly assess the current size, composition, and development of its workforce. It should also evaluate future demand on the basis of strategic direction and determine the gaps for certain jobs and specific skills. Furthermore, it should proactively design the measures needed to close those gaps. These strategic measures need to be closely connected to the company's overall planning for the medium term and need to be budgeted accordingly to ensure swift implementation.

**Upskill and reskill existing workforces.** Given the rapid shifts in skill requirements and the number of entirely new tasks and roles that are emerging, the labor market will be unable to supply sufficient new talent to fill available positions. Companies therefore need to supplement external hiring with internal development initiatives and on-the-job training.

**Create a lifelong learning culture.** Corporate training used to consist of certifications or intermittent training programs, but the digital economy will demand a constant upgrading of skills. Companies therefore need to build constant learning into their business models. Content and skill upgrades should be delivered in a variety of formats so that they can be integrated into the daily routine of every employee, ensuring a nimble and agile workforce.

**Rethink talent recruitment and retention strategies.** The combination of demand for digital skills and demographic shifts will put extreme pressure on the labor supply pipeline, creating fierce competition for talent. Thus, companies may need to shift the recruitment focus from hiring for skill to hiring for will: as some of the skills needed in the future (such as coding computer languages) will most likely be self-taught or come without an explicit certification, HR professionals will need to view candidate criteria with a more open mind and embrace diverse curricula. Companies will also need to find new ways of retaining their talent and equipping them with the skills that will enable them to stay relevant within the changing context in which the enterprise operates.

Companies may also opt to create an employee pool to which people with new skills can be added without yet knowing which field of operations they'd be best suited for. Companies could choose to assess intangible skills with trial periods as well. In a postpandemic era, the higher prevalence of remote working will allow companies to access international and more fluid talent pools that are outside the companies' main markets. For many organizations, this will be a completely new source of talent to explore and manage.

## Recommendations for Individuals

In order to ensure that they are prepared for the jobs of the future, individuals will have to take greater responsibility for their own professional development, whether that means through upskilling or reskilling. They should take the following actions.

**The removal of mundane, repetitive tasks in legal, accounting, administrative, and similar professions opens the possibility for employees to take on more strategic roles.**





**Make lifelong learning the new normal.** Whether through programs offered by employers or through private channels, continuous learning and the acquisition of new skills must become central to an individual's working life. Individuals should also invest not only in digital skills but also in metaskills, which will serve them well regardless of shifts in the market.

**Remain focused on upskilling and reskilling.** More and more sources of information about jobs and skills will become available in the coming years. Many governments are establishing overviews of jobs and skills that are currently in demand and creating forecasts for the future. Individuals need to pay attention to these sources of information and update their skills accordingly, either by searching out high-quality providers of education or by charting their own course amid the vast amount of online-learning offers.

**Become more flexible when developing a career path.** Frequent career changes and lateral moves into similar job positions will become increasingly necessary. Therefore, workers should remain flexible throughout their careers, looking for positions where their existing skill sets can be applied successfully as well as updating their skill sets according to where their own interests match the market's needs.

## The Way Forward

As countries prepare to meet the demands of the digital age, they must understand the challenges that lie ahead. This means making use of more sophisticated analytical models to predict supply and demand in the labor market and integrating them into the foundation of their workforce strategies. It also means focusing on managing the transition to a future workforce so that the economic and social friction associated with the mismatch of supply and demand is minimized.

To reduce the mismatch in skills, governments should update the education system. They should create more flexible institutions that can anticipate the future needs of companies and refocus on metaskills.

Companies need to invest in corporate academies, training partnerships, and constant upskilling and reskilling of their existing workforces. They should also transform their HR functions and processes to cater to the shift in approach needed to hire and retain talent with the new skills in demand. Companies that make these investments and significant changes in their own processes stand to gain a substantial competitive advantage over those that stick with their current approach.

Perhaps more important, given the speed of the digital transformation, it is urgent to make such investments today. Countries that leverage education to create attractive locations for companies will gain a competitive edge over their static neighbors. Companies that hesitate will find themselves unable to access the talent they need and will fail to capitalize on the opportunities that technology brings. Surviving and thriving in the digital age means understanding current shifts, predicting future transformations, and responding rapidly to build an adaptive, future-ready workforce that can support a strong and equitable economy.

## Appendix A

### METHODOLOGY

Our calculations for workforce supply were based on a country's total workforce, including both the working population and the unemployed. We adjusted the overall workforce in terms of head count, factoring in part-time employees via full-time equivalents for the simulations. The biggest factors that increase the national workforce supply are graduates and net migration. The biggest factors that decrease supply are retirements and general mortality.

To model these factors, we used national labor data to classify the workforce supply by age groups and job family groups. The number of graduates was calculated from official forecasts, adjusted by probabilities of entry into the labor force, and assigned to job families according to the current distribution. Migrant entries were determined by net migration projections for working-age people and allocated according to the current distribution of non-national workers. Retirements and mortality were drawn from official numbers by the government and pension bodies. We used a variety of sources to estimate these values, including working population and unemployment numbers from federal statistics offices, employment agencies, and other government entities.

For workforce demand, our model included both the total working population and currently open positions. To calculate future workforce demand at the detailed level of job families, we considered traditional nontechnology factors, such as GDP growth, as well as a variety of technology-specific factors. For demand reduction through labor productivity gains, we assumed that all labor productivity gains in the coming years will be driven by advancements in technology and thus would include one of the technologies in our analysis. All these factors were calculated for the industries, countries, and job families separately.

Because the pandemic is still so unpredictable, we modeled its potential economic impact by using two GDP growth projections. Both are from Oxford Economics and entail industry-specific GDP forecasts for the United States, Germany, and Australia. In the first projection, the peak of infections and lockdown measures is followed by a rapid return to economic growth, with only some lingering impact on global GDP growth. A second, more severe, projection assumes that another, longer-lasting infection wave will result in renewed strict lockdowns and persistent public-health concerns that reduce confidence, leading to a considerable impact on economic activity in the medium term.

To analyze the impact of technology on workforce demand, the Faethm predictive model created proprietary adoption rates for 17 automation and augmentation technologies, using 150 metrics (including, for example, a country's political and regulatory situation, business and innovation climate, and technical infrastructure). Methods used include neural networks, natural-language processing, support vector machines, boosted decision trees, and random forest modeling. Adoption was calculated at a task level, considering both the availability and uptake for each technology-task combination. A low rate of technology adoption (25% slower than the medium scenario) would lead to fewer jobs being automated and augmented and thus larger future workforce demand. A higher rate of technology adoption (25% faster than in medium scenario) would lead to lower future workforce demand.

The resulting surpluses and shortfalls were calculated by subtracting demand scenarios from supply and can be seen in all levels of the calculation. The more granular in terms of job family groups and job families, the more pronounced the gaps become. An overall slightly positive balance on a workforce level might still mean that there are steep surpluses and shortfalls in specific job families.

## Appendix B

### SEVENTEEN TECHNOLOGIES UNDER CONSIDERATION

Our analysis looked at a range of automation and AI technologies, which are listed here in order of increased sophistication and complexity.

### Programmed Intelligence

These technologies are known as predefined.

- **Process automation:** software code that is programmed to complete predefined, logical, and rule-based processing tasks
- **Fixed robotics:** stationary robots that handle and manipulate objects in a predefined way
- **Mobile robotics:** robots programmed to move between points in a controlled environment

### Narrow AI

These technologies are considered to be reactive.

- **Predictive analysis:** tools that reactively use machine learning to conduct narrow analysis and make predictions
- **Recognition vision:** tools that reactively use machine learning and sensors to recognize and classify data meaningfully
- **Voice response:** tools that use machine learning to reactively interpret queries and offer a predefined response
- **Suggestion provision:** tools that reactively use machine learning to prioritize data for the purpose of identifying relevant recommendations

## Broad AI

These technologies are considered to be proactive.

- **Sensory perception:** systems that use machine learning and sensors to detect and extract meaning from external stimuli
- **Decision generation:** systems that use machine learning to evaluate input data in order to determine the best course of action
- **Conversation exchange:** systems that use machine learning and sensors to interpret and engage in conversation
- **Dexterous robotics:** robots with flexible functions capable of adapting dynamically using sensors and machine learning

## Reinforced AI

These technologies are self-improving.

- **Navigation robotics:** robots using real learning and sensors to navigate autonomously in unstructured environments
- **Collaborative robotics:** robots using real learning and sensors to help generate shared meaning
- **Solution discovery:** agents using real learning and sensors to digest and solve unstructured, complex problems
- **Generative design:** agents using real learning and sensors to interpret creative data and generate concepts
- **Creative origination:** agents using real learning and sensors to invent new and original concepts beyond known data
- **Assistive robotics:** robots using real learning and sensors to physically interact with humans in an emotive manner

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# Resilience and Reinvention



The pandemic put the concept of resilience front and center in just about all sectors. Resilient businesses were the first to absorb the shock of shutdown and the quickest to bounce back. Resilient governments were the quickest to take action to combat the emerging threat. Resilient health care providers dealt with the sudden massive influx of very ill COVID patients while maintaining critical operations in other areas of care.

In the first article below, our colleagues at the BCG Henderson Institute identify three ways in which resilient organizations create value relative to their peers. They feel lower impact from the immediate crisis because they are better able to absorb the shock. They recover more quickly by rapidly adapting to new circumstances. And they extend their recoveries by reimagining their businesses to flourish in new circumstances.

As the second article argues, being part of a vibrant ecosystem makes organizations more resilient, but the potential of such ecosystems has been largely untapped in health care. This needs to change, and there are an increasing number of indicators that change is coming. Four in five health care leaders expect acceleration of the shift to virtual models, for example. More than 60% of provider executives expect acceleration toward value-based payments. More than 60% of health care executives expect more care to be delivered in nonclinical settings (such as the home).

The third article identifies six characteristics of resilient governments: prudence, modularity, redundancy, diversity, embeddedness, and adaptiveness. These attributes transcend sector. Health care payers, providers, systems, and services organizations need similar attributes if they are to build resilience and continue to innovate and, in the process, to become more equitable and more effective—and more prepared for the next pandemic.



July 2021

# Transform for Resilience: An Imperative for Good Times Too

By Martin Reeves, Lars Fæste, and Tom Deegan

During the COVID-19 crisis, resilience rose to the top of the **strategic agenda**, and many leaders also indicated a desire to extract lessons to increase preparedness for future crises. Our research indicates that resilience, although less emphasized in stable periods, **creates significant value and does so well beyond times of crisis**. Nearly two-thirds of long-run outperformers do better than peers in response to shocks.

Crises often precipitate or accentuate the need to transform because of the immediate pressure on performance. Crisis-driven transformations often aim to ameliorate performance pressure by increasing cost and asset efficiency. But what is their impact on resilience and long-term performance? And how can companies transform for not only efficiency but also resilience?

To better understand the impact of **large-scale change programs** on building resilience, we applied an evidence-based approach to study more than 1,200 corporate transformations over the past 25 years. The evidence indicates that roughly half of corporate transformations fail to improve resilience in response to future crises. The same dataset also offers valuable insights into how some companies successfully transform for resilience.

## Measuring the Impact of A Resilient Transformation

To study the success factors of a **resilient transformation**, we must first quantify the total value created by resilient companies in response to crises. Our past research has identified three stages during which resilience creates value relative to peers:

- First, the immediate impact can be lower than that on peers because they better absorb the shock.
- Second, they can have higher recovery speeds by rapidly adapting to new circumstances.
- Finally, they can have a greater recovery extent (in the 12-month period following a shock) by reimagining their business to flourish in new circumstances.

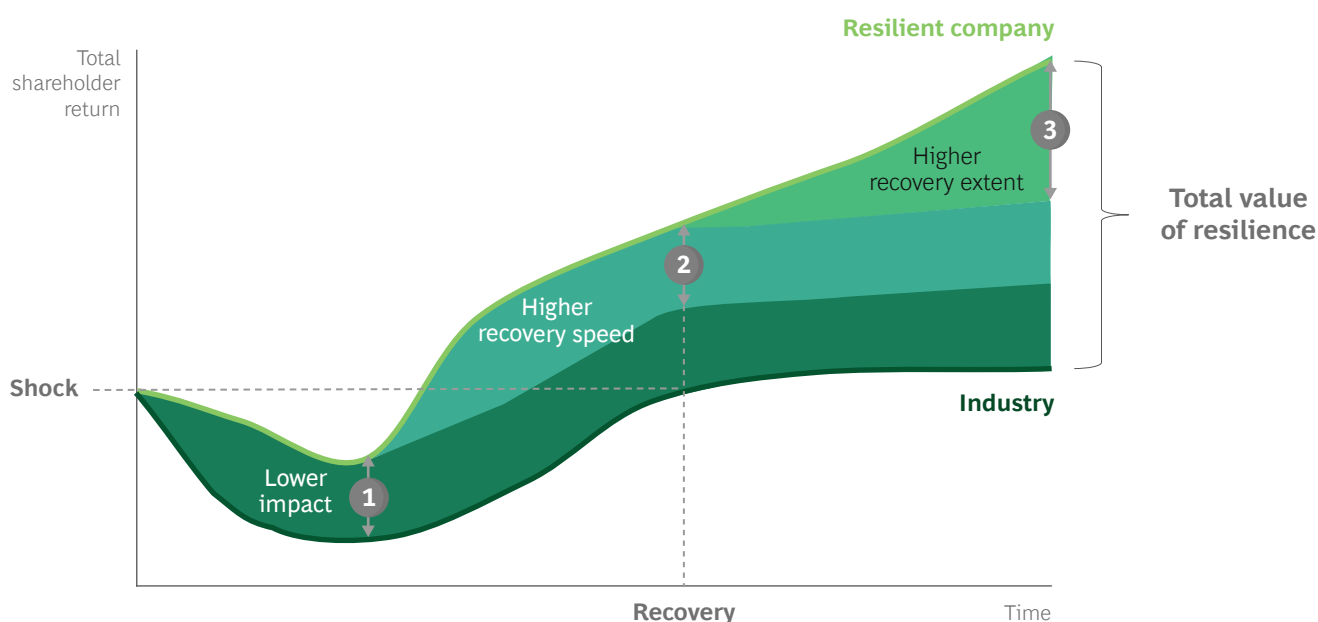
Cumulatively, the relative performance (TSR benchmarked to industry median) across all three stages is the total value of resilience displayed in response to a crisis. (See [Exhibit 1.](#))

To measure the impact of change programs on resilience, we have studied the difference in total resilience in response to industry shocks during the five-year period following a corporate transformation. While roughly half of transformations fail to improve resilience, a significant spread in outcomes exists. The top quartile of resilient transformations improved performance relative to industry by 25 percentage points (pp) in response to future crises, while the bottom quartile saw a decline of 20 pp.

What can we learn from the outperformers?

- **Growth acceleration is the main driver of a resilient transformation.** Whereas large-scale change programs, especially crisis-induced ones, typically target cost reduction, differential growth contributes most of the incremental value created by resilient transformations. Transformations that accelerate growth improve performance relative to industry during each stage of future crises (+6 pp total impact on average), while transformations that only reduce costs see future resilience decline.
- **Transformations that reduce debt and increase flexibility improve resilience.** Transformations that reduce debt loads improve the ability to cushion the initial impact of a future shock. Furthermore, transformations that reduce fixed asset intensity boost adaptivity and recovery speed by shifting costs toward variable expenses. Growth transformations that do both increase the odds of improving resilience from half to nearly two-thirds and yield an average change in TSR performance relative to industry of +10 pp in response to future crises.

## Exhibit 1 - Total Value of Resilience Realized Across Three Stages



Source: BCG Henderson Institute analysis.

- **Transformations are empirically less likely to build resilience when a crisis is no longer fresh.** If history is any guide, resilience now risks losing its spot on the corporate agenda as the performance of economies and companies recover. Immediately following a crisis, transformations are 19% more likely to be growth-oriented and 20% less likely to increase debt than those at least 12 months removed. However, our research shows that allowing resilience to fall off the change agenda would be a mistake. In today’s dynamic business environment, resilience has benefits across the whole economic cycle.

### Growth Drives Resilient Transformations

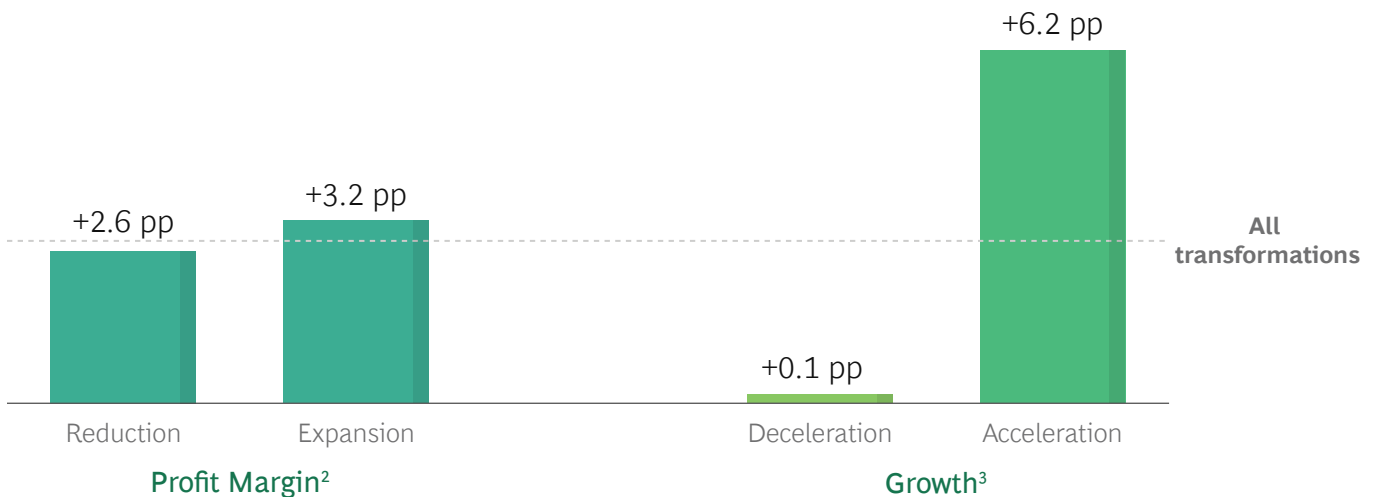
Our past research indicates that transformations often aim **primarily at reducing costs**. While this may improve performance in the short run, on average it does not lead to greater resilience in future crises. In contrast, transformations that accelerate growth, in aggregate, improve total resilience by 6 pp, while those that decelerate growth, on average, fail to improve resilience. (See Exhibit 2.)

While growth transformations succeed in improving performance relative to industry during each of the three stages of future crises, nearly half of the improvement manifests in the extent of future recovery. In this third stage, after the recovery has taken hold, companies begin to reimagine their products and business models to thrive in the altered circumstances resulting from the shock. Growth-oriented transformations create significant advantage in this period by building the capability to spot and capitalize on new growth opportunities. (See Exhibit 3.)

For example, Nvidia’s 2015 corporate transformation restructured operations toward strategic growth areas in deep learning, automated driving, and gaming. Following the transformation, Nvidia doubled its growth rate over the next 12 months to 26%. With the semiconductor industry recovering to prepandemic highs in June, Nvidia once again shifted its strategic focus to identifying new growth drivers. In June 2020, the organization announced a partnership with the Daimler AG unit Mercedes-Benz to build software-defined computing architecture for automated driving and in April 2021 unveiled the company’s first data center GPU. Having previously performed in line with peers during postrecovery periods, Nvidia has thus far outperformed industry peers by 11 pp in the COVID-19 recovery.

## Exhibit 2 - Growth Acceleration Improves Resilience

Mean change in industry-adjusted TSR in response to crises<sup>1</sup>



Sources: S&P Capital IQ; BCG Henderson Institute analysis.

<sup>1</sup>Crisis quarter is one in which peak decline in industry TSR exceeds 15 pp. Compares performance in response to industry shocks during five-year periods preceding and following corporate transformation.

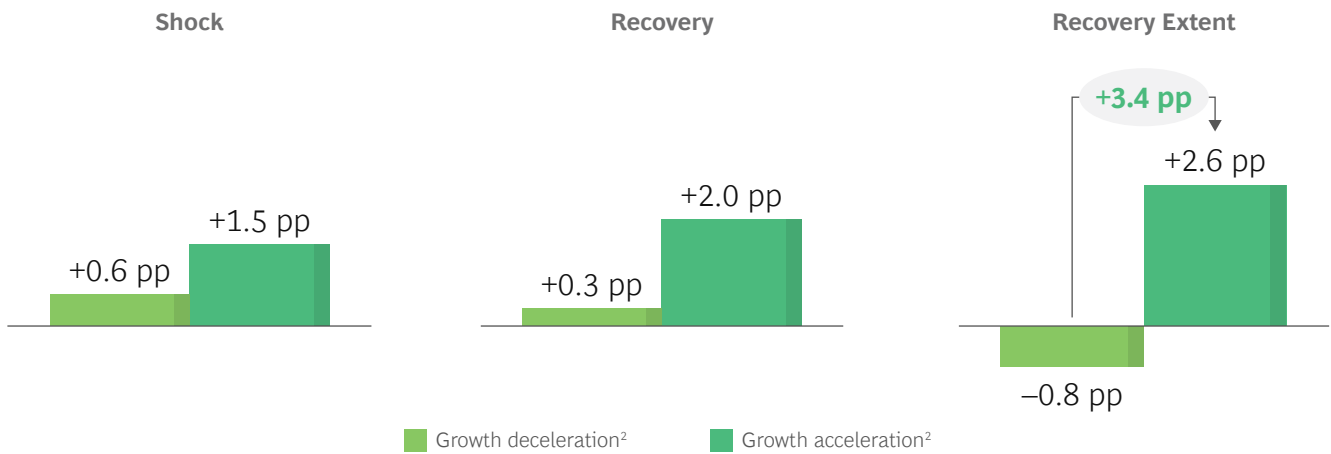
<sup>2</sup>Margin expansion if 12-month EBIT margin after transformation end is greater than 12-month EBIT margin before transformation start; otherwise, margin reduction.

<sup>3</sup>Growth acceleration if trailing 12-month growth in full year following end of transformation is greater than trailing 12-month growth at start of transformation; otherwise, growth deceleration.



# Exhibit 3 - Growth Transformations Especially Advantage Future Recovery Extent

Mean change in industry-adjusted TSR in response to crises<sup>1</sup>



Sources: S&P Capital IQ; BCG Henderson Institute analysis.

<sup>1</sup>Crisis quarter is one in which peak decline in industry TSR exceeds 15 pp. Compares performance in response to industry shocks during five-year periods preceding and following corporate transformation.

<sup>2</sup>Growth acceleration if trailing 12-month growth in full year following end of transformation is greater than trailing 12-month growth at start of transformation; otherwise, growth deceleration.

## Debt Reduction and Operational Flexibility Also Help

**Transformations that reduce debt loads help companies cushion future shocks.** Large-scale change efforts often require a significant financial commitment. In response, leaders may find it tempting—particularly in the low interest rate environment of the past decade—to fund change programs by increasing corporate debt. But doing so materially reduces resilience on average.

When a crisis hits, highly leveraged companies are more likely to struggle to sustain operations because servicing debt is a higher fixed cost. It also limits the ability of corporations to tap into corporate debt markets during a future crisis—either to sustain operations or to acquire distressed assets. Furthermore, amid the uncertainty of a crisis, investors often prefer the safety of corporations with lower debt levels, compounding the problem.

Our research finds that growth transformations that reduce debt burdens (lower debt-to-enterprise value) increase performance relative to industry during future market dips by 2.5 pp on average, while those that increase debt burdens see a decline of 0.3 pp during the initial shock.

Consider *The New York Times* and its corporate transformation effort throughout the 2010s. After its debt burden briefly surpassed 200% of enterprise value during the global financial crisis, the company began rebalancing its portfolio of businesses and restructuring operations. After selling off several noncore business segments and entering a sale-leaseback agreement on its headquarters to free up capital, the organization began dramatically reducing debt and investing heavily in its paid digital subscription model. By the end of 2019, the organization announced it was debt-free and had increased digital revenue to \$800 million.

Without the higher burden of servicing debt, the organization was afforded a cushioning advantage as advertising revenue contracted sharply at the beginning of the COVID-19 crisis. Having struggled in past market shocks, *The New York Times* outperformed industry peers by 26 pp during the first stage of the crisis.

**Transformations that increase operational flexibility boost adaptivity.** To succeed in crises—particularly during the recovery period, which can be unpredictable in timing and magnitude—companies need to adapt rapidly to the changing environment and scale up new models. Companies with greater operational flexibility (which we capture using the proxy of lower fixed asset intensity) can more easily adapt to outperform during the recovery stage.

Companies with lower levels of asset ownership tend to have a higher proportion of variable costs, affording them the flexibility to tie costs closely to revenue in a downturn. They also tend to be less reliant on legacy assets, which creates an advantage in adapting to technological advances and seizing new market opportunities during the recovery. Our research shows that growth transformations that reduce fixed asset intensity increase performance relative to industry during future market recoveries by 3 pp on average, while those that increase levels of fixed asset ownership see no change in performance during the recovery stage.

From 2004 to 2006, consumer conglomerate Cendant Corporation undertook a strategic realignment to exit noncore business segments with high levels of fixed assets. Over the two-year transformation, the organization initiated public offerings and spun off segments in tax services, real estate services, and fleet leasing—reducing fixed asset intensity from 35% to 9% in the process.

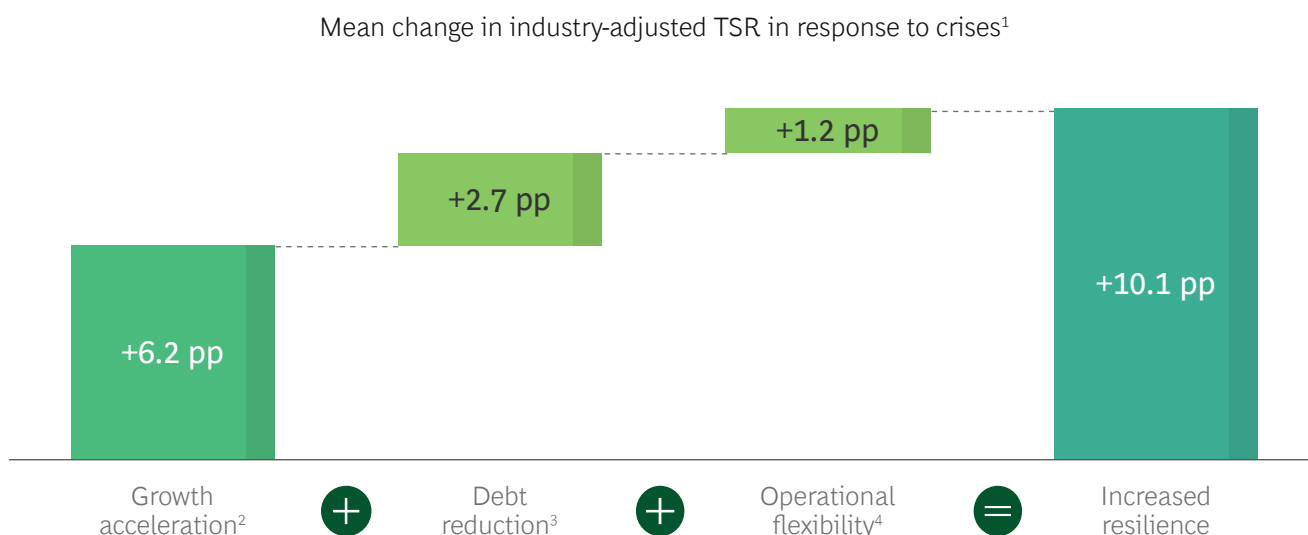
Renaming the firm Avis Budget Group, the organization refocused its efforts on its core vehicle rental operations. With vehicles acquired under repurchase agreements (which allow for return of vehicles to manufacturer at set monthly depreciated value), the company now benefits from a highly variable cost structure. With the ability to de-fleet quickly during a downturn—and scale up during recovery—Avis was well-positioned when the global financial crisis hit. One year past the initial shock from that crisis, Avis was 62 pp above pre-shock levels while industry peers had yet to fully recover.

Companies that transform on all three fronts (accelerating growth, reducing debt loads, and increasing operational flexibility) improve performance relative to industry peers by 10 pp in response to future crises. (See Exhibit 4.)

### Don't Overlook Resilience In Good Times

The playbook for resilient transformations differs in a few ways from those that primarily aim to increase efficiency and optimize short-run financial performance. Transforming for resilience requires a new mindset that unfortunately tends to fade as stability and prosperity return.

## Exhibit 4 - Debt Reduction and Operational Flexibility Further Improve Resilience



Sources: S&P Capital IQ; BCG Henderson Institute analysis.

<sup>1</sup>Crisis quarter is one in which peak decline in industry TSR exceeds 15 pp. Compares performance in response to industry shocks during five-year periods preceding and following corporate transformation.

<sup>2</sup>Growth acceleration if trailing 12-month growth in full year following end of transformation is greater than trailing 12-month growth at start of transformation; otherwise, growth deceleration.

<sup>3</sup>Debt reduction defined as lower debt:EV ratio following transformation.

<sup>4</sup>Increased operational flexibility defined as lower fixed asset intensity (net PPE/sales) following transformation.

Our research indicates that, when a crisis is fresh, leaders are more likely to adopt an approach to transformation that is consistent with building resilience. Immediately following a crisis, transformations are 19% more likely to be growth-oriented and 20% less likely to increase debt than those at least 12 months removed from a shock.

Put simply, as the crisis fades from memory leaders tend to neglect the importance of building resilience. Corporate change efforts tend to return to targeting cost reduction, stabilized corporate bond markets make debt financing more palatable, and the superior operational control afforded by asset ownership begins to look more attractive. Critically, however, the **value** of a resilient transformation remains the same—no matter the timing.

Future-oriented leaders recognize the long-term value of resilience and keep it on the change agenda in fair weather times. On the basis of our natural language processing analysis of SEC filings and annual reports, we find that transformations accompanied by a long-term strategic orientation are 10% more likely to accelerate growth, 30% more likely to reduce debt, and 24% more likely to reduce fixed asset ownership. For future-oriented leaders, keeping resilience on the transformation agenda pays off. Transformations that accelerate growth, reduce debt, and increase operational flexibility in more stable periods improve resilience by 7 pp over those that do not.

## The Resilient Transformation Agenda

The COVID-19 crisis has brought the value of corporate resilience into focus, and many leaders now seek to rebuild their organizations to be more resilient. While every transformation is unique, our findings point toward a pattern of moves that can improve the odds for a resilient transformation.

**1. Transform with an opportunity mindset.** Defensive, cost-cutting measures might produce short-term gains, but they fail to advance resilience in the long run. To build resilience—especially in the recovery stage of a crisis—corporate transformations must increase the organizational capacity for innovation and reinvention.

**Upstream of innovation lies imagination.** Transformations that prioritize growth are those that increase the organizational ability to think counterfactually, break existing mental models, and conceive of new ideas fit for new environments. Transformations that push organizations to **compete on imagination** will be best positioned to thrive in altered circumstances after the next crisis.

**2. Accelerate digital transformation.** Digital transformations, executed correctly, can improve resilience by increasing operational flexibility and positioning the firm to capture new growth opportunities. Operational flexibility and adaptivity are both critical capabilities in improving a company's future recovery speeds. Some asset-light companies take this approach even further by organizing in massive digital ecosystems, effectively reducing asset intensity, pooling resources, spreading risk, and accelerating the scaling of new models and offerings.

Companies that **build a digital technology advantage and strategically deploy it** can further benefit by extending the perceptive power of the organization to identify emergent opportunities. Digital transformations can also **free up human cognition to focus on higher-level activities**, such as imagination, to conceive of new ideas and identify fresh sources of growth. In doing so, they create significant advantage in the final stage of future crises as organizations reinvent themselves to succeed in new post-shock realities.

**3. Keep resilience on the transformation agenda in good times as well.** To capture the long-term competitive benefit of resilience in a very dynamic business environment, companies must transform with resilience in mind in stable times too.

Future crises are inevitable. Companies that recognize resilience as a long-term strategic imperative and make it a pillar of corporate change will be best positioned to outperform in future crises.

**A**s corporations ready themselves for reopening and growth, resilience is now at risk of losing the limelight. Change programs that prioritize growth over cost cutting, debt reduction over debt financing, and operational flexibility over direct control will realize the full value of resilience and build advantage for the next crisis.

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# The Untapped Potential of Ecosystems in Health Care

By Ulrich Pidun, Niklas Knust, Julian Kawohl, Evangelos Avramakis, and Andreas Klar

William Kissick, the father of the US Medicare program, once described the economics of health care systems as an iron triangle composed of three competing elements: access, quality, and cost containment. The core challenge: How do you make improvements to one of the elements without compromising the other two? Much of the focus has been on rising costs, which the traditional model of care delivery has tried to address with improvements in operational efficiency—delivering the same level of output with less effort and waste. However, this chase for efficiency has reached its limits. In recent decades, productivity improvement rates in health care in Europe and North America have lagged behind those of almost all other industries. It is time to pivot from a focus on efficiency to a focus on meaningful innovation, and business ecosystems in health care can play a major role in this paradigm shift.

First, they can provide fast access to a broad range of external capabilities that may be too expensive or time-consuming to build internally. This is particularly relevant for companies that want to reap the benefits of open innovation, an area where ecosystems outperform pipeline models. Second, ecosystems can scale much faster than pipeline models. Their modular setup, with clearly defined interfaces, makes it easy to add partners and expand the network. And finally, ecosystems offer a large degree of flexibility and resilience. They can quickly adapt to changing consumer needs or technological innovation, which makes them particularly advantageous in unpredictable environments and during times of high uncertainty.

In business ecosystems, a dynamic group of largely independent partners work together to deliver integrated products or services. While the health care system meets all requirements of a business ecosystem, it is rarely managed as one. By learning from other industries and harnessing the innovation potential of the ecosystem model, health care could substantially improve all three dimensions of the iron triangle. Like Alibaba for retail, or Airbnb for travel, health care ecosystems could facilitate and improve *access* at scale for patients and consumers. Like smart farming or smart mining platforms, health care ecosystems could enable new solutions and major improvements in *quality* by enhancing coordination and effectively using data across partners. Like cloud-computing platforms or e-commerce marketplaces, health care ecosystems could lower *cost* and tap the efficiency potential currently lost in the fragmented interplay of stakeholders, sectoral boundaries, and limited care coordination, which researchers estimate account for up to 25% of health care spending in Europe and the US. When **designed and managed properly**, business ecosystems allow health care organizations to break the painful tradeoff between access, quality, and cost.

## Why Are There So Few Successful Health Care Ecosystems?

The ecosystem approach is not new to health care. Traditional health care payers, providers, and suppliers, as well as big tech companies, have attempted to establish ecosystems in order to deliver integrated or value-based health care. Some success stories exist, particularly among health maintenance organizations (HMOs), such as Kaiser Permanente, but the broader health care sector has not yet embraced the ecosystem concept.

There are a few reasons for this. First, innovation in care delivery is hampered by structural roadblocks that discourage the most important precondition of an ecosystem: cooperation between partners. In most developed econo-

mies, strict legal boundaries between the different health care segments fragment care delivery, and fee-for-service payment structures incentivize single treatments rather than holistic care. Stakeholders lack common outcome measures and shared goals.

Second, the health care sector is resistant to change. While the overall health care system is under considerable pressure from rising costs, many individual actors don't feel this pressure because their business models are still intact, creating a strong status-quo bias. Many of these actors are well organized and equipped with veto-like powers in political processes, making policy change difficult. Health policy plays an important role in defining common goals, providing a framework for cooperation, and driving long-term improvements. For ecosystem solutions to work, proactive changes in regulation are needed.

**Finally, the strategic challenges of moving from a pipeline model to an ecosystem model are considerable, and few health care players have found the right approach.**

Research conducted by the BCG Henderson Institute found that **fewer than 15% of business ecosystems are sustainable in the long run**—and six out of seven failures can be attributed to weaknesses in ecosystem design. To make the transition, business ecosystems must be designed and managed carefully from the outset.

## Now Is the Time for Ecosystems in Health Care

Several trends are paving the way for a broader application of ecosystem models in health care. First, new competitors, many equipped with successful platforms and relevant experience in creating business ecosystems, are entering the market. Walmart has launched cost-efficient outpatient clinics, startups like mySugr and Omada Health are disrupting chronic care management, and tech players such as Google, Amazon, Microsoft, and Apple are offering health care solutions such as cloud services for health data and telemedicine. Second, patients are increasingly demanding levels of service and choice in health care that they are used to receiving in other areas of life—often delivered by ecosystems. Third, technology adoption has created new forms of access and interaction. Secure and cost-effective data-sharing solutions, for example, are increasingly available and enable new ecosystem applications. Fourth, we are starting to see momentum in regulatory changes. In Germany, for example, an enabling regulatory framework for telemedicine was recently instituted, digital therapeutics can now be prescribed by doctors, and systemwide electronic health records (EHRs) were launched in January 2021.

Finally, while the COVID-19 pandemic has exposed many structural weaknesses of existing health care systems, it has also demonstrated the potential of digital ecosystems. Companies responding to the COVID crisis were required to rethink many existing rules, regulations, and routines, which enabled them to innovate and collaborate like never before. Virtually overnight, a contactless health care system became a necessity, fostering a plethora of new digital applications, including advances in telehealth, innovative distribution of medical supplies (via drones, for example), and coordinated care across broad geographical regions.

Of course, **business ecosystems are not a panacea**; for many business opportunities and situations a hierarchical supply chain or an open-market model will perform better. But ecosystems are the optimal governance model when a high level of modularity (offerings of different players can be flexibly combined) meets a significant need for coordination in order to align stakeholder activities. And these are exactly the conditions that we typically find in the health care sector. The entire health care system can be considered a large ecosystem made up of providers (hospitals, doctors, therapists, and others), payers (health insurers), suppliers (pharmaceutical and medtech companies, pharmacies, and others), and regulators. All of these partners offer complementary modules that need to be coordinated in order to provide coherent diagnostic, therapeutic, or care solutions for patients.

## How to Put Ecosystems Into Practice

Health care companies that want to build or participate in a business ecosystem have much to gain, but they must first understand why some ecosystems work, and others do not. Based on our analysis of health care ecosystems around the world, we have found that the most successful, sustainable ecosystems embrace the following principles:

- 1. Focus on a big enough problem to solve.**
- 2. Ensure that all essential partners are on board.**
- 3. Select the right orchestrator.**
- 4. Achieve critical mass by first increasing scale, not scope.**
- 5. Create and harness data flywheel effects.**

### FOCUS ON A BIG ENOUGH PROBLEM TO SOLVE

Many health care ecosystems have failed because they did not address a large enough problem. Establishing an ecosystem requires a considerable upfront investment to build the platform and incentivize partners to join. These investments can only be justified if the ecosystem, once fully established, creates sufficient value by addressing and solving a sizable problem.

Consider HealthSpot, a US telemedicine provider that allowed patients to video chat with doctors via walk-in kiosks equipped with videoconferencing tools and a suite of interactive medical devices. Despite significant funding of \$44 million, and strong strategic partners, including Rite Aid (to pilot the kiosks at selected pharmacies) and Xerox (to provide IT infrastructure), HealthSpot, founded in 2010, shut down in 2016. A key reason for its demise was built right into its business model. In the US, access to care is broadly available, and an online doctor's visit does not remove a significant source of friction. Rather than creating value, HealthSpot just shifted value from one channel to another (offline to online), and from one doctor to another, in a zero-sum game.

But value propositions can be context dependent. In China, unlike the US, access to health care in rural areas is a major challenge, and this paved the way for integrated care offerings at scale, such as Ping An Good Doctor. Ping An reports that Good Doctor, which was founded in 2014, now facilitates more than 830,000 daily consultations and provides a network of 111,000 pharmacies, 1,800 in-house medical doctors, and approximately 10,000 external medical experts who can remotely diagnose more than 60% of common diseases.

### Remote access to health care became an enormous problem that needed to be solved during the COVID-19 pandemic.

In the US, online consultations increased from less than 0.01% of total ambulatory visits before the pandemic to nearly 70% in April 2020. By July 2020, the share of online visits dropped to 21%, according to analysis from Epic Health Research Network, and while it is unclear how big the share will be in the long run, many telehealth providers are profiting. In September 2020, Google-backed telehealth company Amwell raised \$742 million in its IPO, with its stock price rising 28% in its first day of trading. As of September 2020, Amwell had provided 5.6 million consultations since its 2006 launch, with half of those coming in the six months from April through September of last year. Teladoc, a direct competitor, saw its share price jump from \$84 in December 2019 to \$208 in December 2020, an increase of approximately 150%.

Similarly, Grand Rounds identified a substantial friction in the health care system and developed an ecosystem solution with a clearly defined value proposition. When his son was diagnosed with a rare disease, Dr. Lawrence Hofmann, a professor at Stanford University Medical Center, reached out to his personal network to ensure the best possible care for his son. Hofmann knew that most people do not have the benefit of such a specialized network, and building on this idea, he helped found Grand Rounds in 2011. Grand Rounds offers not only a telemedicine solution but AI-based algorithms to match people with trusted specialists and top-rated medical facilities in their network when a second opinion is needed. In this way, the ecosystem creates value not only for the affected patient but also reduces health care costs overall by preventing expensive mistakes and identifying the most efficient treatments. Grand Rounds has since grown to become a care coordinator for large employers, with corporate clients that include Walmart and Home Depot. The company was last valued at \$1.34 billion in a financing round in mid-2020 and recently announced a merger with the telehealth company Doctor on Demand.

For companies looking to remove existing frictions in health care with the help of an ecosystem model, we have identified four fundamental value propositions: optimize treatment of a disease, improve life with a disease, enhance processes in health care, and facilitate a healthy lifestyle. (See the sidebar, “The Four Fundamental Value Propositions of Health Care Ecosystems.”)

#### **ENSURE THAT ALL ESSENTIAL PARTNERS ARE ON BOARD**

Once you have found a big enough problem to solve, the next challenge is to identify all essential partners needed to make an ecosystem work—and convince them to join the ecosystem. Start by creating a blueprint of your ecosystem that outlines the various activities, actors, and responsibilities, along with a clear view of the ways that information, goods or services, and money will flow through the ecosystem.

A blueprint can also uncover technological risks. Bold value propositions frequently require multiple innovations from different partners, and if just one of the components is not ready, the entire ecosystem may fail. Consider the example of remote robotic surgery, which promised access to state-of-the-art surgery everywhere. The technical proof of concept was established in 2001 when a group of surgeons in New York City used telesurgery to remove the gall bladder of a patient in France. Twenty years later, telesurgery is still rare. Innovations addressing latency (the lag between the operator and the remote system), reliability, and security have not been fully addressed. As a result, telesurgery has not taken off. But there is an important lesson here: timing matters. With recent advances in 5G, encryption, authentication, and robotics, telesurgery may finally be poised to bring high-level care to underserved populations.

Even if the technological problems are solved, convincing all participants to join and commit to the ecosystem can be a critical roadblock and a key reason for ecosystem failure. In health care, misaligned incentives are a chronic problem and the source of many inefficiencies. The German health care system has long struggled with system-wide adoption of digital infrastructure (“telematic infrastructure”) because of low participation among health care providers. Neither positive incentives, such as investment subsidies, nor punitive measures, including fines of up to 2.5% of revenue, convinced a critical mass of providers to join, as many still perceived the net effects of adoption as negative.

**To understand which players are ready, willing, and able to participate and invest in an ecosystem, you must first understand their specific incentives.**

Partners are more likely to commit if the following conditions are in place: participants can expect meaningful net benefits; there is a high competitive risk associated with not participating; limited investment is required; the probability and/or cost of failure is low; participants can build on existing capabilities rather than having to develop new ones.

An ecosystem can only be sustained if all required partners benefit. Strong incentives can be built into its design—and not just monetary incentives, but access to services or information. Consider the example of HERE Technologies. The mapping and location-data company has established mutually beneficial partnerships with transport and logistics companies, automakers, and traffic management centers. In exchange for receiving traffic or location data, HERE provides data and services to its partners, so all participants in the ecosystem benefit from the collaboration. Additionally, some partners are also paid for data sharing. By aligning all of the partners’ goals, HERE has created a thriving business ecosystem.

It’s critical to convince health care providers and patients to participate in an ecosystem. Patients can be incentivized with free products, free services, or bonus programs. The situation is more complex for providers, who often face high investment costs and limited benefits, and orchestrators must think carefully about how to get them on board. The HMO Kaiser Permanente solved this dilemma by merging payer and provider, which has allowed it to ensure that providers participate and enabled the company to successfully implement EHRs at scale. More generally, health care players must find ways to encourage participation by establishing an aligned vision and generously sharing the benefits of the ecosystem.



## The Four Fundamental Value Propositions of Health Care Ecosystems

A clearly defined value proposition is vital to the success of a health care ecosystem. These value propositions will vary depending on the ecosystem's targeted disease scope (the number of indications and whether the focus will be on treatment, prevention, or both) and the targeted life area (health or beyond). (See exhibit below.) Based on this framework, there are four fundamental approaches for creating a health care ecosystem.

**Optimize treatment of a disease.** Ecosystem strategies can focus on the treatment and prevention of specific indications, such as heart disease or cancer. This can be done through traditional disease-management programs as well as emerging solutions, such as optimizing COVID-19 treatment in hospitals. For example, the [World Economic Forum launched the Atlanta Heart Failure Pilot in 2017](#). The pilot built an ecosystem of approximately 40 health care stakeholders and aimed to “make Atlanta a

national leader in the heart failure survival rate by 2022 while significantly improving quality of life and reducing the average cost per capita.”

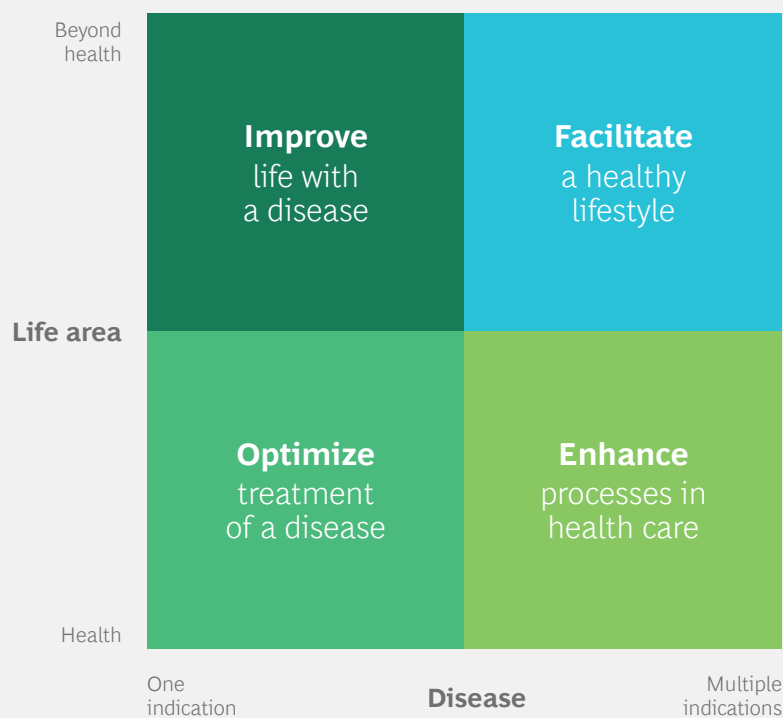
**Improve life with a disease.** Ecosystem strategies can also move beyond the narrow health care focus and include other life areas such as nutrition, housing, mobility, or wellness in order to improve the lives of patients with a specific indication. Payers, care-management organizations, and startups are well-positioned to offer this value proposition. For example, mySugr, the Austrian diabetes-management startup (acquired by Roche in 2017), built an open ecosystem that brings together diabetes-focused partners like Novo Nordisk, specialized physicians, coaching, and other services to improve the lives of patients with diabetes. The company crisply captures its mission in the tagline: “make diabetes suck less.”



**Enhance processes in health care.** Ecosystem strategies that can be leveraged to make health care processes more efficient and effective include EHRs and comprehensive telehealth offerings. Some solutions, like EHRs, need systemwide scale to be successful, while others focus on specific segments or services. Chicago-based primary-care provider Oak Street Health, for example, offers population health management for care-intensive seniors, dramatically improving patient outcomes by using advanced data analytics to gain deep customer insights and constantly expand its offerings.

**Facilitate a healthy lifestyle.** The broadest value proposition of a health care ecosystem is to span different life areas such as mobility or education to promote a healthy lifestyle—with or without a disease—including prevention and general health. Some traditional health care players have started to expand their offerings to address social determinants of health (SDH). RWJBarnabas Health, a US-based integrated-care provider, recently launched a tech-enabled SDH platform that includes assistance on housing, safety, nutrition, and access to transportation.

## Four Approaches for Creating a Health Care Ecosystem



Source: BCG Henderson Institute analysis.

## SELECT THE RIGHT ORCHESTRATOR

In business ecosystems, an “orchestrator” offers a platform, defines the basic **ecosystem governance**, and encourages others to join (think of Google in its smart-home ecosystem). “Realizers” contribute complementary products or services (such as manufacturers of lighting, security, or entertainment devices in the smart-home ecosystem). “Enablers” supply more generic products or services to the ecosystem participants (such as manufacturers of sensors or displays).

The orchestrator bears the bulk of responsibility for the ecosystem’s success and will shoulder the significant investments required to make it work. In return, the orchestrator typically claims the residual income of the ecosystem, which can be very high (as in the case of Amazon or Apple), though it may take years to achieve profitability (as in the case of Uber or Airbnb).

Some health care ecosystems have failed because they had the wrong orchestrator. Two massive efforts to create EHRs offer a clear example of this. In 2007, Microsoft launched HealthVault, a web-based personal health record system. In 2008, Google launched Google Health, which was originally an attempt to create a repository of health records and data. Neither company managed to build a sustainable EHR ecosystem: Google Health was shut down in 2012, and Microsoft closed HealthVault in 2019. These big tech companies were not accepted as the orchestrator of an EHR ecosystem by providers and patients. Accordingly, many providers started to implement their own in-house EHRs, limited to their respective organizations, forgoing the full potential of the ecosystem model.

A successful orchestrator needs to meet four requirements. It must:

- Serve as an essential member of the ecosystem and contribute key resources, such as access to users or a strong brand
- Occupy a central position in the ecosystem network, with strong connections to many other players, allowing for close coordination
- Stand to gain significantly from the ecosystem and thus have the incentive and ability to take on the required large up-front investments
- Be perceived as a fair or neutral partner by the other ecosystem members, not as a competitive threat

The challenge in health care is that the natural orchestrator is not always obvious. That said, in some scenarios a particular organization is in a privileged position to take the orchestrator role, depending on the ecosystem’s value proposition and the player’s capabilities. For example, in ecosystems that focus on optimizing treatment of a disease or improving life with a disease, the point of care and medical expertise is critical; therefore, providers are in a good position to orchestrate these types of ecosystems. As geographic scope expands, larger health care players are often best positioned to become orchestrators, as we’ve seen with Novo Nordisk and its nationwide diabetes ecosystem in China.

If the ecosystem aims at improving processes in health care, it’s more important for orchestrators to have a broad operational scope, putting health insurers and governments in a central position. In Europe, most systemwide EHR solutions are orchestrated by the government (as in Denmark and Estonia) or by payers (as in Germany). For more local applications, providers can take a central role, as we’ve seen with the integrated-care ecosystems of Kaiser Permanente and Mayo Clinic.

In ecosystems that aim to facilitate a healthy lifestyle, digital capabilities are frequently at the core of the value proposition, which means tech players are in a good position to take on the orchestrator role. In China, tech companies such as Tencent, Alibaba, and Baidu are demonstrating their ability to manage extensive health care ecosystems (both in terms of scale and scope).

**Because they play such a crucial role in health care ecosystems, it’s critical for orchestrators to be aware of and actively manage their potential shortcomings.**

For example, a tech company with limited experience in health care, or a health insurer with a track record of ruthless cost cutting at the expense of providers will first need to build trust with partners in order to be accepted as a fair ecosystem orchestrator.

Increasing scale requires focus.  
A common failure is to broaden  
the scope of the ecosystem before  
achieving critical mass



However, it's not just the orchestrators that benefit from an ecosystem. In many cases, serving as a realizer or enabler can be highly attractive, because they typically have lower investment requirements and can select the most attractive ecosystem to join—or they can even hedge their bets by participating in more than one competing ecosystem. In particular, if they provide important components in an area that can become a bottleneck in the ecosystem, they are in a good position to claim a substantial share of the profits. Microsoft followed this path after the failure of its HealthVault platform by pivoting to an enabler role in digital health. In 2020 the company launched a health care cloud solution that combines Microsoft's existing services, like chatbots (which enabled more than 1,500 COVID-related bots), Teams (enabling provider-to-patient virtual visits), and Azure IoT (enabling remote health monitoring).

#### ACHIEVE CRITICAL MASS BY FIRST INCREASING SCALE, NOT SCOPE

A key challenge during the launch phase is to achieve critical mass so the ecosystem can take off. To this end, the ecosystem must quickly increase its scale to achieve network effects, whereby additional partners and users make the ecosystem more valuable for existing participants, which in turn attracts further partners and users.

Increasing scale requires focus. A common failure is to broaden the scope of the ecosystem beyond its core value proposition before achieving critical mass. A number of health care ecosystems have fallen into this trap by adding too many services and products, only to find that they have diluted their value proposition, added complexity, and struggled to grow.

Consider Driver, a platform designed to match cancer patients with clinical trials. Instead of focusing on its core value proposition, Driver quickly broadened its scope. The company not only collected patients' medical records and tumor samples to be sequenced, but also opened two pathology labs (one in China, one in the US) and ran multiple apps for doctors and patients. Driver failed in 2018, just months after its launch, despite funding of \$80 million. In an interview with *MedCity News*, co-founder William Polkinghorn concluded: "One of the biggest things we got wrong is we tried to do too much."

The scale and size of an ecosystem should not be measured by vanity metrics, such as the number of registered patients, but by the number of interactions or transactions, because this is how the ecosystem creates value for its participants. In many cases, it is not just about the quantity of members but about attracting the right members (just as an online booking platform like OpenTable must work with the most in-demand restaurants) in the right proportions (just as a ride-hailing ecosystem like Uber must balance the number of drivers and riders). Moreover, network effects are often local, so network density may be more important than network size.

In health care, ecosystems that are built on physical supplier networks, such as accountable care organizations or patient booking platforms, require local density. They can learn from the launch strategies of mobility and food-delivery platforms that built their network clusters country by country or even city by city. Other health care ecosystems, such as those focused on EHRs, can only demonstrate their strength when they operate across sectors and geographies and thus require supraregional or even system-wide density to take off. For more specialized health care ecosystems, such as the online patient network PatientsLikeMe, which connects patients with peers facing the same rare disease to share their experiences, relevant scale is defined as high penetration of the global population of patients with a specific indication.

#### Once the ecosystem has achieved critical mass, the scope can be broadened in a series of staged expansions.

For example, LinkedIn was launched as a social network, allowing users to connect with other professionals based on simple profiles. Only after having achieved a leading market position did the company begin to add further services, such as a marketplace for online recruiting and a content-publishing platform.

Doctolib, an online and mobile booking platform, followed this path of strategic expansion to become one of the few health care unicorns in Europe. Founded in 2013, Doctolib focused on a clear and simple value proposition: launching a booking platform that helps patients find a specialist and make an appointment. With this clear goal, the platform aimed to quickly achieve scale by prioritizing local density. Doctolib conquered the French market, city by city, and became the leading booking platform for doctor appointments in the country. When the company expanded to Germany, it followed the same strategy of creating local clusters, starting in Berlin and expanding to other major cities. To promote network effects, Doctolib charged doctors for its services (€129 per month per physician), but not patients. Building on its leading position in France and Germany, Doctolib began to expand its service from primary care physicians to hospitals. At the same time, the scope of the platform was expanded step by step, with new solutions for doctor-patient communication, marketing offerings for providers, consulting services, digital referrals of patients, and telemedicine. Eight years after launch, the company is worth more than \$1 billion.

## CREATE AND HARNESS DATA FLYWHEEL EFFECTS

Data can be a key source of network effects in health care ecosystems. Sharing data among ecosystem participants can not only remove existing frictions and enable a seamless patient journey, but also enable new insights and innovation, such as preventive and predictive interventions, faster drug development, improved clinical decision making, and customized treatments. Take the example of Moderna. For years, the company has invested in data and artificial intelligence to improve its chances of success with drug development. During the coronavirus crisis, the company leveraged its digital and AI capabilities to gain an edge over many vaccine makers.

Data sharing can also amplify flywheel effects. (See Exhibit 1.) As more users join the ecosystem, more and richer data are available, which enables deeper and better insights, which expands the value proposition of the ecosystem and encourages even more users to join. When the data flywheel gains speed, it can propel two additional flywheels in a health care ecosystem. A growing number of users will attract more partners to the ecosystem, which further increases the breadth and improves the quality of the offering and thus attracts more users. Such indirect network effects are well-known from ecosystems in other sectors (from video games to online food-delivery platforms) and can lead to a dominant market position. In addition, a growing number of users will also enable economies of scale by spreading the fixed costs of the ecosystem over more users, while lowering unit costs, further increasing the attractiveness of the ecosystem for additional users and partners.

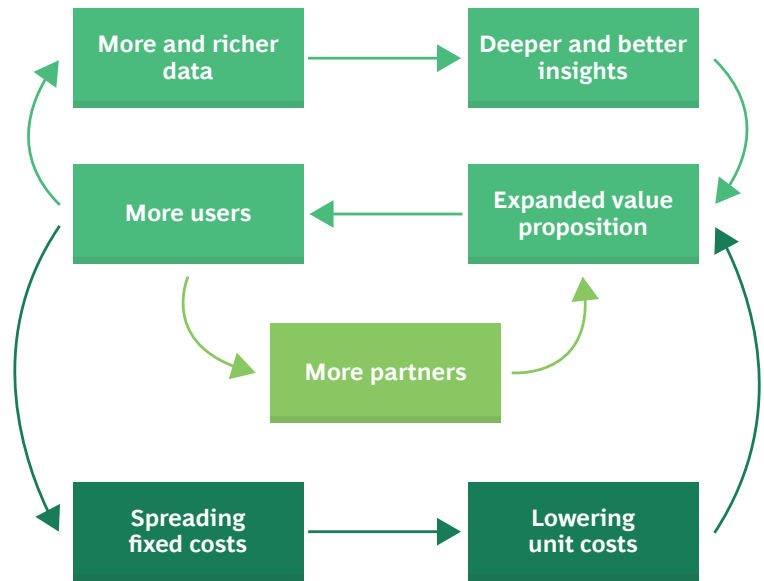
Ping An's Good Doctor exemplifies this flywheel effect. The platform was initially designed by 200 AI specialists using a data set of 400 million consultations. By integrating a range of online and offline services and digitizing most processes, Ping An was able to build a comprehensive ecosystem based on data analytics. The insights provided by Ping An's data set increase with every new user and every additional interaction on the platform, and the company uses this data to constantly improve its offerings. Its AI system has grown to incorporate 3,000 diseases and cover the entire consultation process. As a result, Ping An has doubled the efficiency of consultations, greatly reduced the risk of misdiagnosis or missed diagnosis, and constantly improved patients' experiences. The platform nearly doubled its number of registered users from approximately 193 million in 2017 to 346 million in 2020, according to company reports, and became the first AI health care system to reach the highest level of certification of the World Organization of Family Doctors (the world's largest family physician organization and a World Health Organization partner).

Of course, there are significant barriers to data sharing and analytics in health care. Existing data often lack precision and are difficult to analyze, data from different sources are not compatible, and integrating data analytics into existing workflows is complex and challenging for many incumbent health care players. At the same time, the stakes are high because health decisions can be life or death, and mistakes are costly. What's more, patients and regulators are rightfully concerned about data privacy and security.

To overcome these barriers, health care can learn from ecosystems in other sectors that face similar challenges. Two ingredients are essential. First, it's important to have an operating model that enables an effective data workflow among ecosystem participants, with clear data standards and application programming interfaces (APIs). Second, you need a [data governance framework that strikes a balance between value creation and privacy risks](#) by providing clear answers to the following three questions: Who owns the data? Who decides about access to the data? Who can use the data for which applications? For example, in many EHR systems ownership lies with the patient who can make decisions about access and whether to share data with partners in the ecosystem. However, ownership and decision rights can also be separated, as in Google's smart home ecosystem, where the user owns the data, but Google broadly shares it with third parties, based on clearly defined rules and standards.

Beyond these concerns, effective data sharing requires a change of mindset. Providers, payers, and suppliers to the health care system need to stop guarding their data to protect their share of the pie and seek out innovative ways to share their (anonymized or aggregated) data in order to create new value and thus increase the overall size of the pie. The potential benefits are enormous. With over a quarter of US health care spending attributable to conditions related to modifiable risk factors, according to research published in the journal *The Lancet Public Health*, data-driven prevention alone could substantially improve the health of large parts of the population and reduce costs for the entire system.

# Data Sharing and AI Propel Flywheels in Health Care Ecosystems



Source: BCG Henderson Institute analysis.

## Taking Action, Jointly and Individually

Payers, providers, and suppliers, as well as startups, tech companies, and regulators, all have a unique role to play in navigating, managing, and leading a successful ecosystem.

All stakeholders must act now to seize the opportunities ahead. Several trends are fueling the emergence of health care ecosystems, providing huge opportunities for new and enhanced value propositions. As new ecosystems emerge, the established roles in today’s health care landscape will be unbundled, so it’s critical to have a strategic vision of what the future might hold and what your role in it might be. Don’t wait for regulators to provide all required conditions and incentives. Embrace a collaborative mindset, build trust, and forge positive relationships with partners. Put yourself in the shoes of the other ecosystem participants and be sure every partner has an incentive to join and contribute.

Payers, providers, and suppliers must be active, not reactive. Too many incumbents have yet to develop an ecosystem strategy or establish clear positioning. New players threaten to disrupt the industry, and the time to build competitive advantage is now. Actively screen the market and expand your network to include new partners, such as startups and tech players, while leveraging your strong central position and deep expertise in the health care sector. Set up pilot projects focused on a clear value proposition for a specific population or region, then scale up. Organize this value proposition around the customer, not the service you deliver. Invest in new capabilities to gain a competitive advantage by strengthening digital competencies, digitizing processes, building interoperable data lakes, and developing a data (and data-sharing) strategy.

Startups and tech companies should focus on cooperation rather than a “move fast and break things” approach. Health care is a sensitive and highly regulated sector, with many inherent challenges; it’s important to learn the specifics of the industry and build on existing expertise. Clearly define the position you want to secure, whether it’s as an enabler providing infrastructure or analytical services, a realizer offering specific solutions, or an orchestrator offering broad services or solutions. To thrive in this space, tech companies must deliver services that are interoperable, seamless, and modular. **Trust is also key**—and plays a crucial role in building relationships with patients as well as ecosystem partners.

Regulators should encourage pilot projects and use cases that enable ecosystems and new care delivery models, such as integrated, remote health offerings that provide telemedicine and digital therapeutics as not just stand-alone offerings, but as integrated, value-adding services. Over the long term, regulators should facilitate cooperation by enabling outcome-based or value-based payment structures and easing the boundaries between sectors. They should also encourage digitization to facilitate data sharing and data use cases.

Incumbent and new health care players that follow the five principles embraced by the most successful and sustainable next-generation health care ecosystems will do more than just optimize operational efficiency. They will finally overcome the traditional tradeoff of the iron triangle in health care by improving quality, enhancing access, and lowering costs—all at the same time.

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# Building a Resilient Government

By Daniel Acosta, Matthew Mendelsohn, Jaykumar Patel, Martin Reeves, and Lucie Robieux

*The pandemic won't be the last global crisis we face. Here are six principles public sector organizations should follow to prepare for future disruptions.*

The COVID-19 pandemic has brought into sharp relief the **importance of government resilience**—the capacity to absorb shocks, adapt, and then quickly thrive in an altered environment. As the virus spread around the globe last year, some governments managed the crisis relatively well, while others struggled to match the moment.

This lack of resilience poses an increasing danger, and not just in terms of pandemic preparedness. There is a growing probability of future global crises, with disruptions more widespread and long lasting than in previous eras. Such shocks are nearly inevitable given how profoundly connected the world's economies and societies have become; as the pandemic has shown, disruptions in one region can spread rapidly to others. We are equally vulnerable from a technological standpoint—with so much of modern life dependent upon digital systems, the potential impact of a large-scale cyber attack is immense.



That's why governments should see the events of the last 18 months as a call to action to strengthen their resilience. No doubt, the pandemic has tested the private sector as well, with [many companies demonstrating the ability to adapt to a new environment](#). But resilience is even more vital for [public sector organizations](#). There are no alternatives to government, after all; when businesses fail consumers can turn to competitors, but when governments fail there is no backup. Governments that focus on their own resilience, on the other hand, will be able to support resilience more broadly in the economy and in society as a whole.

Based on our extensive work with private and public sector organizations, as well as [the study of resilience in natural systems](#), we have identified six characteristics of resilient governments: prudence, modularity, redundancy, diversity, embeddedness, and adaptiveness. Certainly, governments must be proactive about averting crises when possible, including moving swiftly to drive decarbonization of their economies and head off the most severe impacts of climate change. But they must simultaneously incorporate these six characteristics into their organizations. Those that do so will be well positioned to respond quickly and ensure the continued delivery of services and resources to their citizens when shocks occur.

## Prudence

Prudence, as we define it, is the ability of governments to anticipate and prepare for different scenarios—operating on the principle that if something can plausibly happen, it eventually will.

Governments can enhance this characteristic by conducting scenario-building and tabletop exercises to identify both high- and low-likelihood events. That risk identification process should involve experts both from within and outside the country, state, or city conducting the exercise as well as from a variety of domains, including health, economics, geopolitics, sciences, and sociology.

Governments should then plan and prepare for the most likely and high-impact events. Risk management efforts should be undertaken at all levels of government, from the offices of the president or prime minister to ministerial or cabinet-level offices and down to the state and local level. Central governments should also encourage collaboration and transparency across all levels of the public sector. They should, for example, support local governments in developing their own resilience by leading scenario exercises, sharing information and insights from those exercises with other local governments, and coordinating planning related to national, state, and local responses.

In recent years some governments have put a greater focus on risk management. The federal government in Australia, for example, conducted a scenario-planning exercise in 2018. The effort started with the identification of megatrends, including climate change and the rise of AI, and an analysis of those trends that had the greatest uncertainty in terms of direction, speed, and magnitude. From there the government identified potential scenarios, success factors for each scenario, and recommendations for how the government could close any gaps in preparedness that were uncovered. The work was part of an overall effort to strengthen Australian public service, and it has led to a number of changes. Among them: the development of a new model for digital skills development and the creation of the Australian Public Service Academy to help employees develop necessary skills and expertise.

## Modularity

[Modularity is a defining feature of a robust system](#)—ensuring that its components are loosely connected to avoid turning risk to individual components into systemic threats.

Governments operate as complex systems, with thousands of individual actors across multiple agencies. Like most such systems, they can benefit from integration and interdependency between components. However, this can also amplify risk: seemingly localized shocks or disruptions can rapidly spread throughout a system in ways that are hard to predict. Conventional wisdom around the efficiency gains of cross-agency integration needs to be balanced against the importance of modularity for systemic resilience. Governments are better able to withstand shocks when the risk of component-level failure is contained by design.

Consider the disparate impact of the 2007-2008 financial crisis in the US and Canada. In the US, a “localized” shock to the subprime lending market spread catastrophically to the entire global financial system. In Canada, by contrast, banks emerged largely unscathed from the crisis in part because regulation mandated lower exposure to the type of complex financial instruments that created hidden connectivity across firms in the U.S.

## Redundancy

Redundancy involves the creation of buffers to cushion against unexpected shocks. Governments that build this expanded capacity in areas such as IT, infrastructure, energy, and operations—including emergency stockpiles of, for example, food, medical devices, and communication tools as well as plans for expanded public transportation and housing solutions for displaced persons—will be better positioned to respond to shocks, whether local or systemic.

The Estonian government, a leader in moving the services it provides to citizens onto digital platforms, explored a number of options to create redundancy for those digital systems in the event of a physical or cyber attack. The solution: the government set up a “data embassy” in another country—Luxembourg. The embassy houses a high-security data center that holds backups of Estonia’s most critical data and information.

Building redundancy into systems can be challenging for governments, which almost always face pressure to remain highly efficient on costs and spending. This can lead to “[overoptimization](#),” in which a government has little ability to expand capacity when it needs to. Many governments, for example, have winnowed the number of suppliers they use to ensure vendors are selling at scale and therefore at the best price. However, that makes their systems less resilient. The issue can be compounded if suppliers are concentrated outside a government’s home country, exposing it to disruptions in supply chains due to natural disasters or trade wars.

Given those pressures, governments should make the development of redundancy an explicit objective—and communicate that objective broadly throughout their organizations. That can help shift the mindset of their workforces and limit the incidence of short-sighted decisions to overoptimize systems, capacities, and costs. Governments should also communicate this clearly to the public, explaining why redundancy is critical and where investments in excess capacity have been made. That will help prevent such investments from being characterized as waste—and therefore minimize the likelihood of political blowback from citizens and others in government. And as part of ongoing planning exercises, governments should identify resources that can be redeployed from lower priority areas to help absorb shocks elsewhere in their organizations.

## Diversity

Governments with diverse operations—in areas such as talent, locations, and types of contracts—have a variety of options when responding to a crisis. But resilience isn’t just about responding well to crises. It’s also about [ongoing adaptability](#), which requires the kind of constant experimentation enabled by diversity.

Consider diversity in the area of talent. Governments should cultivate a diverse set of skillsets throughout their organizations as a whole and minimize hyperspecialization in their workforces. Hyperspecialization, with employees becoming skilled at a narrow set of tasks or processes, reduces the ability of workers to step into other roles as needed during a crisis. And diversity strengthens an organization’s response mechanisms beyond the ability to redeploy operational capacity. Adaptation to rapidly changing environments requires a wide repertoire of emerging solutions from which to select and amplify—and the variety of such solutions depends on the underlying heterogeneity of the people, ideas, and skill sets involved.

Governments can also build diversity in skills, capabilities, and resources by drawing upon partners such as companies and foundations as well as citizens themselves. For example, deals can be struck with private clinics to provide surge capacity in the event of a health care crisis. And governments can train citizen volunteers who are able to provide support to civil servants, including those in health and defense departments, during a crisis.

To support these sorts of collaborations, governments should ensure that appropriate and agile legal frameworks are in place to allow them to strike flexible contracts with vendors, under which those suppliers can readily provide support if needed. In addition, governments should engage with and support community partners on an ongoing basis—not just during periods of crises when their assistance is needed.

The government of France was able to draw on both the private sector and the public during the COVID-19 pandemic. Not only did the government tap retired doctors and nurses to work in hospitals early in the crisis, but it also relied on the cooperation between public hospitals and the national railway company for developing a plan for managing peaks in demand for health care. The resulting plan involved outfitting high-speed trains to transport intensive care patients to regions in western France that were less affected by the pandemic and where hospitals had the capacity to treat them. Since March of 2020, more than 1,000 patients have been transported for treatment.

## Adaptiveness

Adaptiveness refers to the ability of a system to rapidly adjust to new circumstances. Resilient governments can quickly adjust programs and policies, deploy resources where they are needed, and scale quickly when necessary. In short, adaptive governments need to be able to become truly iterative learners that intentionally pursue what natural selection does in nature: create variations, conduct experiments, and amplify the successes.

Governments should cultivate adaptiveness across a variety of activities:

- They should ensure they are adaptive in policymaking—particularly in economic and social areas—and able to make changes quickly in response to fluctuating macro events. This adaptiveness requires robust and timely data to identify the most impactful measures.
- They should also build adaptiveness into budgeting so they can make rapid shifts in the allocation of funds. This, of course, can be challenging given that government budgets are set annually and typically have limited flexibility. Still, the COVID-19 crisis demonstrated that [many governments were able to pass stimulus aid packages swiftly](#)—adjusting budgetary rules and processes in some cases—to limit the economic hit of lockdowns.
- They need flexible human resources contracts, rules, and processes for managing and deploying talent. For example, HR rules should allow staff with transferrable skills who are willing to move to be quickly redeployed during a crisis, while encouraging the development of a diverse talent pipeline for the future.
- Finally, governments should actively pursue an agenda of policy and program experimentation, piloting new models and ideas from which to learn, iterate, and amplify. And mechanisms should be established to ensure that lessons and best practices are shared in a way that enables the scaling of successful programs or efforts across different jurisdictions.

Many public sector organizations were successful in adapting to the dramatically altered environment in the months after COVID-19 first erupted. In May of 2020, for example, Texas established Operation Connectivity, a task force to assess and identify solutions for addressing the digital divide among the state’s students in the wake of the shift to remote instruction. Based on insight from that task force, the state moved quickly to deploy \$900 million of combined funding from the CARES Act and state and local education agencies, executing a bulk order of roughly 4.5 million devices for remote instruction. The devices not only helped students learn remotely during the pandemic but will also be used post-COVID to support student instruction.

At the same time, many countries in Asia adjusted their policies and plans in 2020 based on lessons learned from the SARS, H1N1, and MERS outbreaks. Japan and South Korea, for instance, revised emergency legal frameworks related to pandemics and clarified responsibilities for central and local governments during such emergencies.

Ultimately, true adaptiveness is not merely about surviving an individual crisis. It’s about learning from that crisis to better respond to the next one. As the pandemic recedes, governments face the challenge of capturing and codifying lessons for the future.

## Embeddedness

Embeddedness is the alignment of a government’s goals and activities with those of the broader economic or social systems they inhabit. Individual government agencies sit within a wider system of government; a government operates within a nation’s economy and society, which in turn operate within the global economy and society as well as the natural environment. All of this makes it critical for government organizations to ensure that their own long-term goals with respect to resilience are harmonized with those of the broader systems within which they operate.

Creating alignment within government requires finding opportunities for win-win collaborations among different public organizations. When a crisis hits, governments therefore can swiftly bring together an effective team from the ministries or departments that need to lead the response. For example, even before the first COVID-19 case was confirmed in Singapore, its central government established a dedicated taskforce that included the ministries of Health, National Development, Communications and Information, Trade and Industry, Environment and Water, Education, Home Affairs, Social and Family Development, and Transport. Central governments also should coordinate and align with leaders in major cities, many of whom have extensively studied and prepared for a number of potential shocks. (See [“Building a Resilient City.”](#))

Alignment beyond the confines of government is just as critical. Public sector leaders must find ways to cultivate strong, trust-based relationships with the private sector and other societal players—from organizations with a global reach, such as NGOs and foundations, to smaller groups such as local citizens’ associations—ties that should be cultivated over time and not just during moments of crisis. Meanwhile, government can strengthen the overall resilience of the public by promoting civic engagement, social cohesion, education, and the overall preparedness of citizens to respond to a crisis. Research by Daniel P. Aldrich, a professor at Northeastern University, found that social cohesion and social networks helped communities in Thailand, Japan, and New Zealand recover quickly from natural disasters.



## Building a Resilient City

City leaders are increasingly focused on resilience—and for good reason. First, cities that have honed their resilience will be better positioned to respond to increasingly frequent natural disasters. Second, efforts to improve resilience also tend to reduce the strain on urban infrastructure and resources. Third, investments in resilience will minimize the economic hit to a city from a crisis.

Tokyo, for example, refocused on its resilience in the wake of the 2011 earthquake and tsunami. The city has deployed antiseismic devices, floodgates, and levees to reduce the risk of catastrophic flooding, funded in part by the central government. The city now boasts the world's tallest shock-absorbing broadcast tower to transmit information in the event of a disaster, and it has deployed an advance rain-measurement system to provide early warning of potential flooding issues.

Rotterdam, meanwhile, has taken steps to enhance the resilience of its large port related to both physical and cyber events. The city created nine “water plazas” to soak up excess rainfall, and it has developed digital systems to monitor sea levels hourly and shut floodgates as needed. Rotterdam has also partnered with the private sector, including Microsoft, to reinforce the port’s cyber defenses.

The success of cities like Tokyo and Rotterdam in enhancing resilience has revealed a few valuable lessons. First, bringing in other government players, including central government stakeholders, increases the odds of success. Second, cities that invest in early warning systems to spot potential events early will be able to respond quickly and effectively. Finally, R&D partnerships with the private sector can create customized, high-impact resilience solutions.

## Five Steps to Building Government Resilience

Government leaders typically invest time and energy into improving policies, programs, and processes with an eye toward delivering maximum value to the public. But many have not spent enough time thinking about resilience. Governments now have an opportunity to change that—to take stock of their organizations’ capacity to absorb shocks, learn from their performance during the pandemic, and build more capacity—so they can thrive in the face of new disruptions.

There are five basic steps to this journey:

- 1. Assess Resilience.** Governments should determine their overall level of resilience and identify the most critical gaps.
- 2. Build a Resilience Roadmap.** With an understanding of where action is needed, governments can build a plan for how to bolster resilience—a plan that should include a prioritization of initiatives and clear governance.
- 3. Integrate Resilience in Critical Areas.** Based on the roadmap, government can launch a select number of high-priority initiatives and begin to generate early wins.
- 4. Expand Resilience Across Government.** With early successes to demonstrate the power of resilience, governments can push new initiatives more broadly across their organizations.
- 5. Go Beyond Mitigation to Reimagine the Future.** While resilience requires survival and adaptation, the accelerating pace of disruption makes it critical for governments to become imagination machines—organizations that can harness the power of imagination to redefine the art of the possible and flourish in new, fast-evolving circumstances.

As these resilience initiatives gain traction, governments will begin to drive a fundamental change in mindset—one that is focused on preparing for unexpected events based on an understanding of the systems within which they operate. Such a shift will enable governments to better protect and support their citizens in an era of rising disruption.

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# Note to the Reader

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