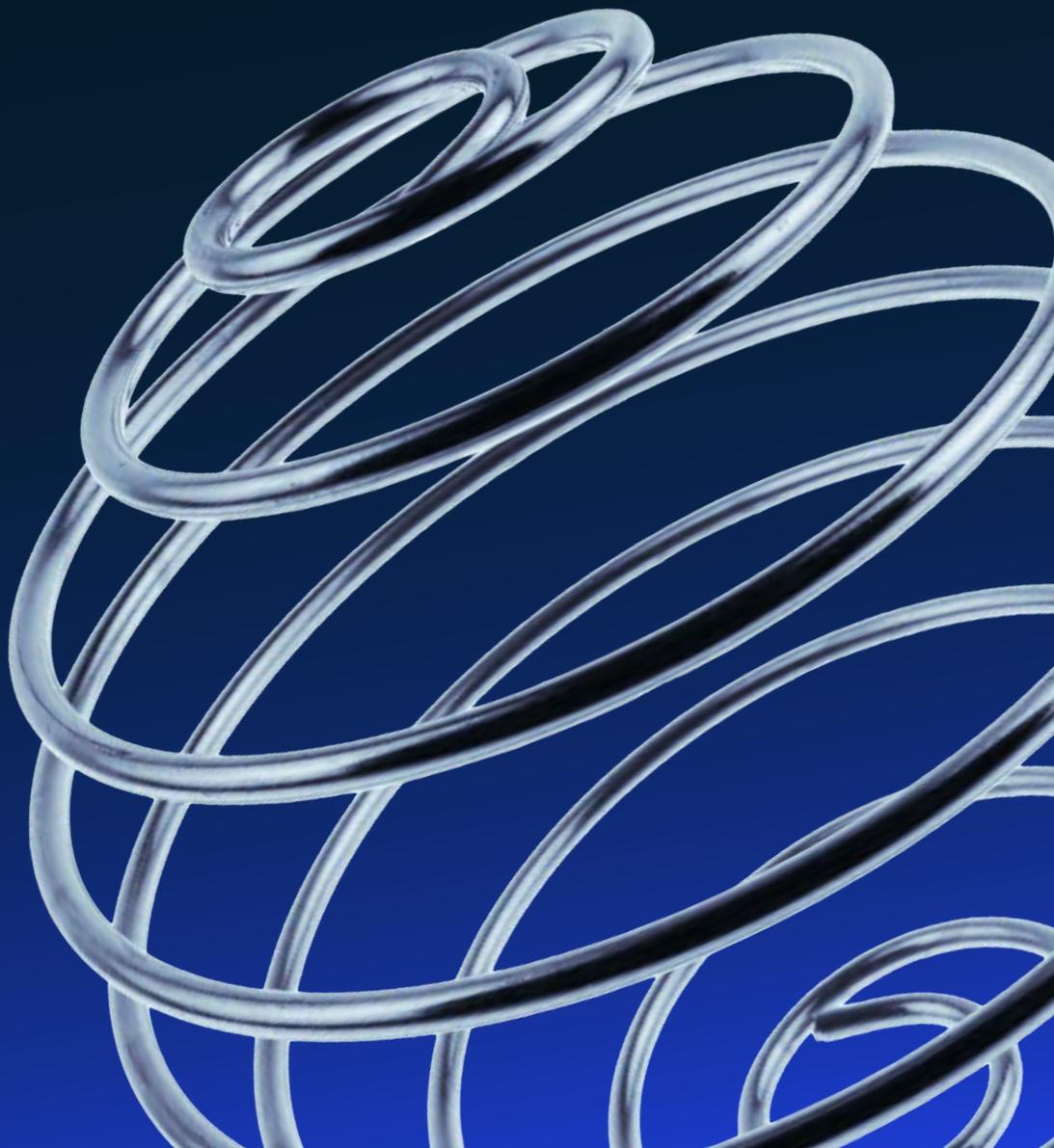


McKinsey  
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The Next Normal

# Reimagining operational resilience

Building future-proof strategies



February 2021

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The Next Normal

# Reimagining operational resilience

Building future-proof strategies

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# Introduction

Welcome to the “next normal,” the new reality emerging from the ongoing COVID-19 pandemic. How will life, public health, and business continue to change? We’ve chronicled our response in a wide-ranging series of publications—more than 600 articles and counting since the outbreak began.

This volume is the last of five edited collections produced to accompany our multimedia series, airing on CNBC, examining the forces and themes shaping the next normal. Prior segments and their accompanying collections can be found at The McKinsey Download Hub, on [McKinsey.com](https://www.mckinsey.com), where you can also find many of our most recent and popular reports and special collections.

This collection focuses on operational resilience and why it’s imperative to an organization’s survival. The COVID-19 crisis has exposed vulnerabilities in operating models and the urgency to reimagine them. Now is the time to create future-proof strategies and adopt the best practices that organizations need to generate value through business cycles—despite profound disruption and economic and social shifts.

These pages contain some of our best recent insights on how organizations across industries can maximize their operational resilience and identify opportunities for reimagination. We’ve also included articles that have resonated particularly powerfully on [McKinsey.com](https://www.mckinsey.com), plus articles authored by Katy George, leader of McKinsey’s Operations Practice in North America and co-leader of the practice globally, as well as anchor of the resilience segment of our CNBC series. We hope you find these insights useful as you continue to navigate your way through the evolving next normal.

You can download this and other collections in this series at [McKinsey.com/thenextnormal](https://www.mckinsey.com/thenextnormal), where you will also find our entire collection of insights related to the coronavirus.

**Raju Narisetti**

Publisher

McKinsey Global Publishing

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The next normal in construction: How disruption is reshaping the world's largest ecosystem

# Reimagining operations



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# Jump-starting resilient and reimagined operations

COVID-19 has created an imperative for companies to reconfigure their operations, and an opportunity to transform them.

*by Edward Barriball, Katy George, Ignacio Marcos, and Philipp Radtke*

**The coronavirus pandemic has** radically changed demand for products and services in every sector, while exposing points of weakness and fragility in global supply chains and service networks. At the same time, it has been striking how well and how fast many companies have adapted, achieving new levels of visibility, agility, productivity, and end-customer connectivity—while also preserving their cash. Leading retailers have boosted their e-commerce capabilities, delivering food to thousands of customers confined in their homes. One European healthcare provider abandoned its two-year plan for the rollout of e-health services and deployed the new remote treatment system to thousands of patients in only ten days.

The virus has shown that, when they align around a common purpose, operations teams can achieve goals that would have been considered impossible before the crisis. As they plan their transition to the next normal, companies are looking for ways to maintain this sense of purpose and speed.

In our conversations with operations leaders, we find that many are energized and inspired by the progress the crisis has forced them to make. Production lines have achieved record levels of availability and output: one automotive company found that manufacturing productivity actually increased when it introduced physical-distancing measures. After switching to daily planning cycles and gaining real-time visibility of their operations, managers don't want to return to the old cadence of monthly planning and metrics that lag behind the situation on the ground. With physical stores closed, online and direct-to-customer sales are booming in many categories. That's inspiring companies to upgrade their sales and distribution capabilities to meet this new type of demand.

Across industries, companies are realizing that they can aspire to much more than simply a safe return to work. They want to take what they have learned during the COVID-19 crisis and create a new kind of operational performance. Our ongoing discussions with leaders in multiple industries suggest that this effort will focus on five key themes (Exhibit 1).

Exhibit 1

**Five themes shape post-COVID-19 recovery efforts in operations.**

<b>Building operations resilience</b>	<b>Accelerating end-to-end digitization</b>	<b>Rapidly increasing capital- and operating-expense transparency</b>	<b>Driving the future of work</b>	<b>Reimagining a sustainable operations competitive advantage</b>
Review asset strategy, including geographic footprint and concentration risks	Accelerate customer-back Industry 4.0 digital and analytics as well as digital services capabilities to raise performance in	Apply digital acceleration tools for spend transparency and opportunity identification	Establish next normal of remote working through digital communication and collaboration tools	Step-change customer-centric development of new products, services, and customer-service models
Reassess make-or-buy decisions for flexibility	<ul style="list-style-type: none"> <li>customer experience</li> <li>productivity</li> <li>flexibility</li> </ul>	Reassess total operational cost structure	Reskill the workforce to accelerate transition from manual, repetitive tasks to human-only capabilities	Establish collaborative ecosystems and rewrite value-creation role relative to suppliers, customers, and adjacent players
Transform for agility, eg, through asset modularity and workforce upskilling		Establish robust cash and liquidity management	Sustain new safety norms through physically distributed yet integrated operations teams	Capture rapid value creation from M&A
Build robust supply-chain risk-management function		Reassess capital projects based on defined scenarios and frequent portfolio reviews		Embed sustainability throughout operations

## **Building operations resilience**

Successful companies will redesign their operations and their supply chains to protect their business against a wider and more acute range of potential shocks and disruptive events. That calls for action on three fronts.

First, companies will revisit their global asset footprint. In consumer services, for example, we expect the crisis to significantly increase the adoption of online and omnichannel delivery models. As leading banks restart their retail operations, some are considering substantial changes to their branch networks to better match reshaped demand patterns.

The trend for product value chains to become more regionalized is also likely to accelerate, as companies reassess the risks of globally integrated asset networks and supply chains. For example, to increase agility in the event of regional shutdowns, a leading fashion company has already started to develop new supply sources beyond its current network in Southeast Asia.

Second, companies will likely reassess their make-versus-buy options. A leading consumer company has accelerated the outsourcing of manufacturing and logistics for some products to specialized players in different regions. This approach improves security of supply, thanks to increased local content, while also reducing costs and allowing the company to ramp volumes up or down more rapidly.

Third, more companies will set up dedicated supply-chain risk-management functions. Working alongside the manufacturing, procurement, and supply-chain functions, these units assess vulnerabilities across supply nodes and apply robust risk-mitigation frameworks to address those vulnerabilities. The resulting actions might involve accelerating decentralization, deploying inventory closer to customers, and developing crisis-response plans and capabilities.

To win in the next-normal environment, companies will need to achieve this step-change in resilience without unsustainable increases in their costs. The acceleration of end-to-end operations digitization, which is described next, will be critical in resolving

the long-standing trade-off between efficiency and resilience. New digital technologies are already improving companies' ability to predict problems, make effective decisions, and rapidly adapt their operations in response.

## **Accelerating end-to-end digitization**

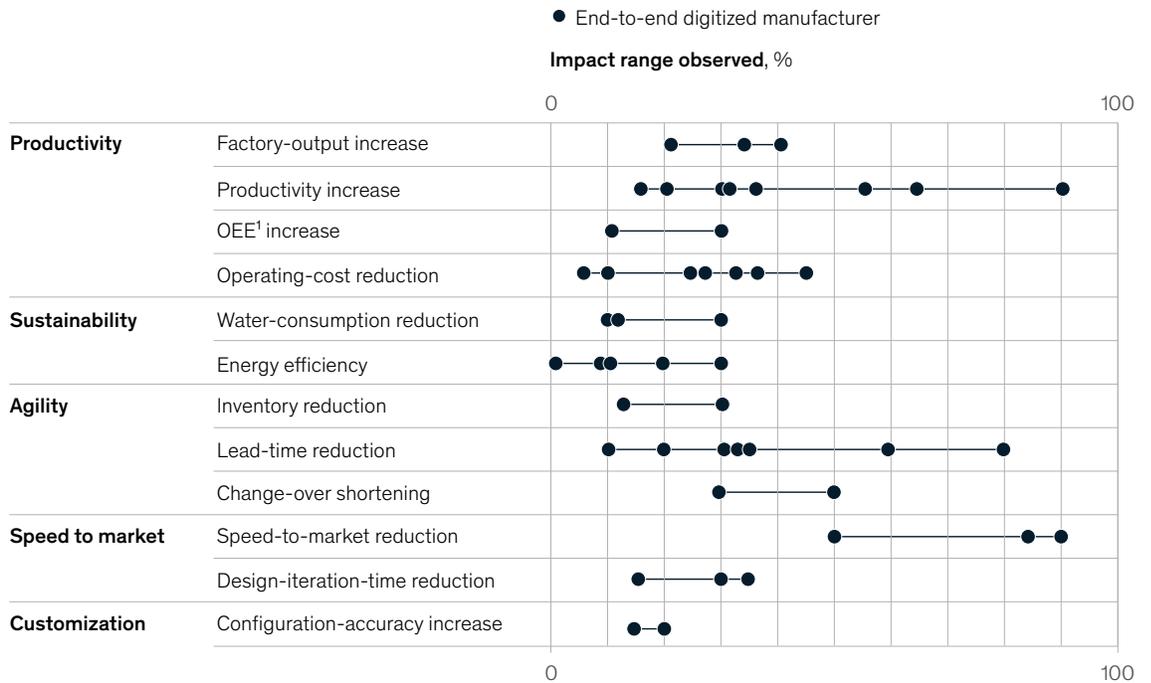
Before the coronavirus hit, most companies were already accelerating the digital transformation of their customer journeys and value chains. We expect digital technologies to be at the core of the next normal, enabling organizations to better meet the needs of their customers, and improving the agility and responsiveness of operations without increasing their costs. Research by the World Economic Forum, in collaboration with McKinsey, shows that companies often achieve significant and simultaneous improvements across multiple performance measures when they integrate advanced digital technologies across the value chain (Exhibit 2).

During the crisis, many companies have been able to overcome staff shortages by automating processes or developing self-service systems for customers. These approaches can accelerate workflows and reduce errors—and customers often prefer them. One telecom player found that it could apply robotic process automation (RPA) to more than 50 percent of its back-office and invoicing tasks. And in its technical call centers, up to half of all tasks could be automated, freeing up agents to deal with the complex queries where they could add the most value.

Digital approaches can transform customer experience and significantly boost enterprise value when applied end to end. Before the crisis, one North American insurer recognized that it needed to fundamentally change its offerings and the way it engaged with customers and agents. The company rebuilt its entire operating model, starting with a deep understanding of customer needs, a refreshed product shelf, and an integrated set of changes (including digital, analytics, and lean management) to meet those needs. The organization invested in a strategic set of hires and the development of design, digital, and advanced-analytics capabilities.

## End-to-end digitization creates a more agile, customer-focused organization.

### Key-performance-indicator improvements for end-to-end digitized manufacturers



<sup>1</sup>Overall equipment effectiveness.

Source: World Economic Forum; McKinsey Lighthouse analysis

It continued to weave the same digital thread through all back-office operations, redesigning and automating its processes and outsourcing activities where it made sense to do so. The new approach dramatically increased the speed and efficiency of the company's operations: policy-servicing tasks that used to take 20 days are now completed in two, and products are brought to market three times faster. Overall, the holistic transformation has put the organization on a path to \$1 billion in additional enterprise value.

A leading healthcare company has employed digital tools across its entire value chain, offering user-friendly product evaluation and selection software for patients and medical professionals and using advanced analytics and real-time planning to control its complex direct-to-customer supply chain. The company has also built a modular digital platform to accelerate the introduction of new

products. The system uses robots, advanced control systems and Internet of Things (IoT) technologies, built into interchangeable hardware "blocks" that allow the rapid configuration of production lines. Dedicated simulation software accelerates the qualification of new production lines and the scale-up of production. Finally, as discussed later under "Reimagining a sustainable operations competitive advantage," companies are using digital platforms that connect the entire value chain to create innovative business models.

### Rapidly increasing capital- and operating-expense transparency

The economic fallout from the COVID-19 crisis will outlive the pandemic itself. We know companies will need to build their next-normal operations around a different cost structure. They will need to make these changes quickly.

# Organizations can begin with a review of their operating costs. Technology-enabled methodologies can accelerate cost-transparency work, compressing months of effort into weeks or days.

Organizations can begin with an in-depth review of their operating costs. Technology-enabled methodologies can significantly accelerate cost-transparency work, compressing months of effort into weeks or days. These digital approaches include procurement-spending analysis and clean-sheeting, end-to-end inventory rebalancing, and capital-spend diagnostics and portfolio rationalization. One leading retailer has used the drop in activity triggered by the crisis to conduct a systematic, cross-functional review of its network, logistics operations, and procurement model. The company has applied advanced analytics to slim down its product assortment, trim its warehouse and logistics requirements through optimized planning, and significantly reduce its procurement costs. It is now ramping up its new operating model, which it expects will cut overall operating costs by around 30 percent.

Operations functions can also play a central role in companies' cash- and liquidity-management activities. Optimizing an organization's cash position in the potentially volatile postcrisis environment will require companies to increase their visibility of the cost structure of their own operations and those of suppliers. A leading chemicals player has set up analytical tools to anticipate changes in raw-material prices, allowing it to manage potential supply-demand imbalances proactively. A leading automotive player has established a permanent unit within its finance function to monitor liquidity across its business.

Most companies have paused their capital plans as they assess the rapidly changing economic environment. When they start investing again, they will need to be smart and careful in their approach. Leading organizations are adopting increasingly sophisticated techniques in their capital planning, assessing each project's return on investment against multiple scenarios, and continually reviewing their capital-project portfolios as the environment changes and new data emerge. Companies will likely want to rethink the way projects are executed, too, redefining their scope to reduce initial capital requirements, accelerating construction and commissioning, and managing risks across the full project life cycle.

In similar fashion, many services organizations have already moved away from the construction of capital-intensive data centers, preferring the more flexible option of leasing capacity from commercial cloud providers. We expect this trend to accelerate in the services sector, and to expand into other industries.

## **Driving the future of work**

Many people's jobs have been fundamentally changed by the COVID-19 pandemic. With access to workplaces limited to essential staff, employees have had to learn how to complete tasks remotely, using digital tools to communicate and collaborate with colleagues.

The transition to the next normal is likely to accelerate trends that were already underway in many industries, with a marked reduction in manual and repetitive roles and an increase in the need for personnel with analytical and technical skills. Experience in large-scale digital operations transformations demonstrates that these programs are highly worker-centric and rely on high work-force engagement to achieve results. This shift to the future of work will therefore require an unprecedented wave of reskilling, with operations roles affected more than most.

Some companies have already used this period as an opportunity to boost skills, encouraging people not fully occupied by the crisis response to participate in remote learning and coaching programs. Postcrisis, organizations will need to ramp up their reskilling and upskilling programs significantly to develop a workforce with the capabilities needed to run their next-normal operations.

One leading steel company is applying advanced-analytics approaches at scale to improve the productivity of its global operations. In support of this effort, the company has established a dedicated internal training academy that equips process engineers with the skills they need to run analytics projects. The academy is also retraining staff to fill new roles, such as data scientists and data engineers. And, when technological and strategic shifts led to major changes in its operating footprint, a European bank used a combination of e-learning, classroom training, and on-the-job coaching to reskill and redeploy nearly 10,000 people over a five-year period. The approach helped to lift employee-satisfaction scores by ten percentage points.

The recovery from the crisis will also be a catalyst for changes in where work is done. With the need for physical-distancing measures likely to remain in place for some time, remote working may become the norm for many employees. As organizations master the challenge of managing physically distributed operations teams, they may adapt their operating models accordingly, with staff on the ground in local markets able to draw upon the expertise of specialist colleagues who provide support remotely via digital connectivity tools.

## **Reimagining a sustainable operations competitive advantage**

Dramatic shifts in customer expectations, demand patterns, and industry structures create the opportunity for equally dramatic shifts in companies' operations and beyond, as leaders reexamine the role that operations plays in connecting with customers and building an entire corporate strategy.

We are already seeing multiple ways in which organizations can adapt their operations to create lasting competitive advantage and to meet environmental and social-responsibility goals. Informed by customer insights, some companies will reinvent themselves entirely in the coming years, focusing on specific technologies or market niches—or repositioning themselves within their industry's value chain by ramping up direct distribution while increasing delivery speed and flexibility. A number of companies in the food-service sector are working to create “one-stop shop” online B2B portals, for example. Offering hotels and restaurants rapid delivery of everything they need, these portals allow customers to hold less inventory and reduce their procurement costs.

Other companies will transform the way they develop products, using agile processes and digital links to improve their connection with customers and the speed at which they can introduce new and customized designs. A leading carmaker in Asia has already launched a large-scale consumer-to-business program for new-vehicle development. The company uses online 3-D tools to share ideas and gather feedback from thousands of customers during product development. Their inputs are used to shape the final design of vehicles and to tailor the organization's marketing and after-sales service offerings.

Relationships based on close collaboration and data sharing won't just involve companies and their end customers. We expect entirely new ecosystems to emerge that also include suppliers and adjacent industry players. The public–private collaboration that allowed the US healthcare supply chain to improve the supply of critical equipment during the peak of the coronavirus crisis shows just what such ecosystems can achieve. In a matter of

weeks, medical-device manufacturers, component suppliers, government officials, logistics companies, and advisers came together to deliver quality equipment in record time.

In some cases, companies will go further than ecosystem coordination by restructuring through mergers and acquisitions. Depending on the industry, M&A opportunities may be informed by the potential value generated by reimagined operations, either through creating operational synergies or by building new, competitive capabilities through vertical or horizontal integration. Operations can therefore play an essential role in identifying new ways to drive competitive advantage up or down the value chain. For example, investing in local producers of crucial raw materials can help manufacturing companies ensure continuity of supply.

Under lockdown, cities experienced significant increases in air quality, something that was noticed and appreciated by citizens. As people seek to retain the few benefits of the pandemic, the sustainability imperative will return to the top of the corporate agenda. Operations plays a decisive role in an organization's environmental performance, with the opportunity to adopt manufacturing technologies and supply-chain arrangements that consume less material, use less energy, and generate less waste. Consumer companies are at the forefront of this trend, launching major initiatives in packaging to move from single-use plastics to more sustainable materials, formulating healthier products, and developing sourcing strategies that minimize negative environmental and social impact.

## Transforming operations to win in the next normal

To prepare for a different economic and business environment, operations leaders are looking to transform their organizations urgently—and they want to maintain the momentum that has carried them through the early phases of the pandemic.

With the likelihood of prolonged uncertainty over supply, demand, and the availability of

resources, we believe that COVID-19 will be the trigger for operations functions to adopt an agile approach to transformation. Teams involved in the transformation will need to respond quickly to rapidly changing circumstances, modifying their planning, design, and execution as new information becomes available.

The nerve centers or control towers that many companies have already established to navigate the first phase of the crisis will provide a model for a more robust and agile type of operations management. As companies transition to the next normal, they can retain these powerful and effective structures, which have helped many organizations achieve unprecedented visibility and cross-functional agility in their operations, rather than dismantle them. Indeed, they can digitize, industrialize, and scale up this new way of working. One option is to create a strategy and transformation office, including a cascading network of three types of teams (Exhibit 3).

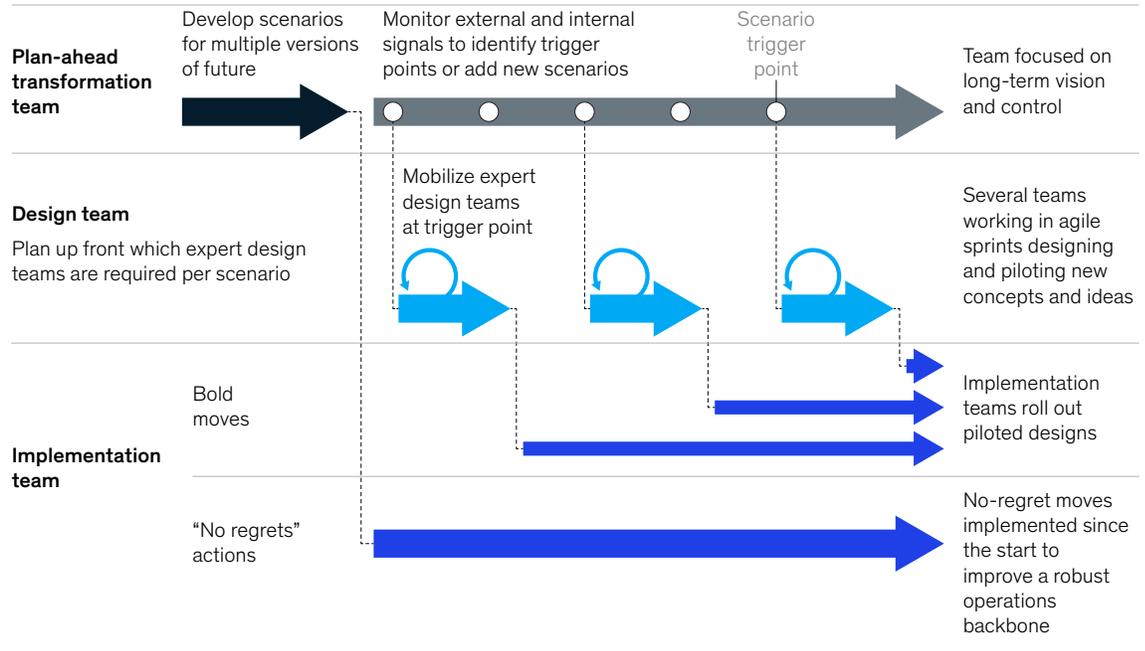
First, a *plan-ahead team* develops scenarios, a vision, and a set of initiatives to enable the change. Some initiatives are no-regret moves, appropriate for all scenarios, such as accelerating end-to-end digitization efforts. These will form the backbone of the organization's transformation and can begin immediately. Other actions will be initiated by specific triggers, such as altering the company's product mix as evidence emerges of changing consumption habits.

Second, a number of *design teams* work in sprints to develop concepts and design the initiatives to be executed. These teams can then be ramped up and down on an ongoing basis as defined by the transformation office.

Third, an *implementation team* coordinates across the operations teams to execute changes on the ground. This team helps to scale operations up or down by coordinating workforce capacity, raw-material supply, and transport and distribution networks. It collects and analyzes data to make fact-based decisions, establishes the pace of

Exhibit 3

**The next-normal team structure blends scenario thinking with agile implementation.**



change, follows up rigorously to ensure timely implementation of actions, and tracks the actions' impact against the organization's objectives.

essence. Companies that are willing to maintain their momentum while also setting new standards and upending old paradigms will build long-term strategic advantage.

As business operations make the transition to the next normal, speed will continue to be of the

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# From surviving to thriving: Reimagining the post-COVID-19 return

For many, the toughest leadership test is now looming: how to bring a business back in an environment where a vaccine has yet to be found and economies are still reeling.

*by Kevin Sneader and Bob Sternfels*

**The 1966 World Cup marked a low point for Brazilian soccer.** Although the winner of the previous two tournaments, the team was eliminated in the first round, and its star player, Pelé, failed to perform. Fouled frequently and flagrantly, he threatened never to return to the World Cup. Many wondered if Brazil's glory days were over. Four years later, however, Brazil won again, with such grace and style that the 1970 team is not only widely regarded as the best team ever to take the pitch but also as the most beautiful. And Pelé was named the player of the tournament.

Making this turnaround required innovation, in particular, the creation of a unique attacking style of soccer. It required building a cohesive team, even as most of the roster changed. And it required leadership, both in management and on the field. The result: by reimagining everything, Brazil came back stronger.

As businesses around the world consider how they can return from the torment inflicted by the coronavirus, Brazil's journey from failure to triumph provides food for thought. In a previous article, McKinsey described five qualities that will be critical for business leaders to find their way to the next normal: resolve, resilience, return, reimagination, and reform. We noted that there would likely be overlap among these stages, and the order might differ, depending on the business, the sector, and the country.

In this article, we suggest that in order to come back stronger, companies should reimagine their business model as they return to full speed. The moment is not to be lost: those who step up their game will be better off and far more ready to confront the challenges—and opportunities—of the next normal than those who do not.

There are four strategic areas to focus on: recovering revenue, rebuilding operations, rethinking the organization, and accelerating the adoption of digital solutions.

## 1. Rapidly recover revenue

Speed matters: it will not be enough for companies to recover revenues gradually as the crisis abates. They will need to fundamentally rethink their revenue profile, to position themselves for the long term and to get ahead of the competition. To do this companies must SHAPE up.

***Start-up mindset.*** This favors action over research, and testing over analysis. Establish a brisk cadence to encourage agility and accountability: daily team check-ins, weekly 30-minute CEO reviews, and twice-a-month 60-minute reviews.

***Human at the core.*** Companies will need to rethink their operating model based on how their people work best. Sixty percent of businesses surveyed by McKinsey in early April said that their new remote sales models were proving as much (29 percent) or more effective (31 percent) than traditional channels.

***Acceleration of digital, tech, and analytics.*** It's already a cliché: the COVID-19 crisis has accelerated the shift to digital. But the best companies are going further, by enhancing and expanding their digital channels. They're successfully using advanced analytics to combine new sources of data, such as satellite imaging, with their own insights to make better and faster decisions and strengthen their links to customers.

***Purpose-driven customer playbook.*** Companies need to understand what customers will value, post-COVID-19, and develop new use cases and tailored experiences based on those insights.

***Ecosystems and adaptability.*** Given crisis-related disruptions in supply chains and channels, adaptability is essential. That will mean changing the ecosystem and considering nontraditional collaborations with partners up and down the supply chain.

Rapid revenue response isn't just a way to survive the crisis. It's the next normal for how companies will have to operate. Assuming company leaders are in good SHAPE, how do they go about choosing what to do? We see three steps.

**Identify and prioritize revenue opportunities.**

What's important is to identify the primary sources of revenue and, on that basis, make the "now or never" moves that need to happen before the recovery fully starts. This may include launching targeted campaigns to win back loyal customers; developing customer experiences focused on increased health and safety; adjusting pricing and promotions based on new data; reallocating spending to proven growth sources; reskilling the sales force to support remote selling; creating

flexible payment terms; digitizing sales channels; and automating processes to free up sales representatives to sell more.

Once identified, these measures need to be rigorously prioritized to reflect their impact on earnings and the company's ability to execute quickly (exhibit).

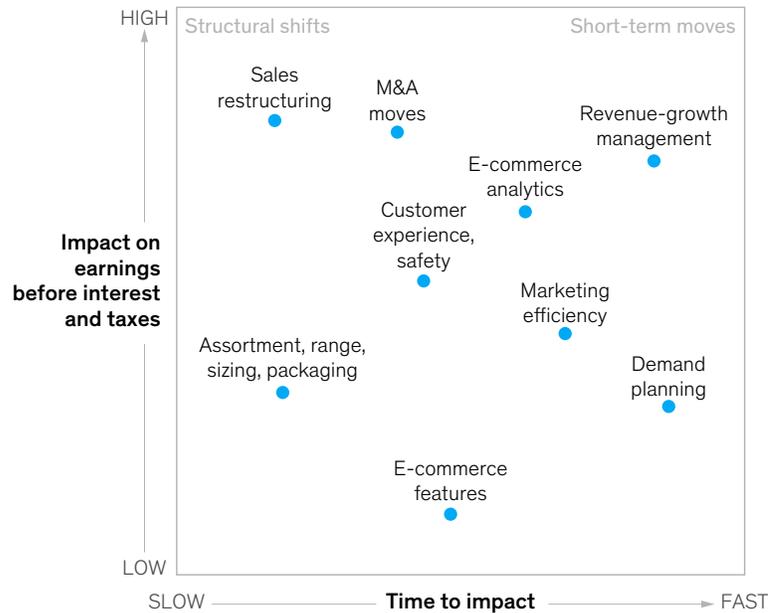
**Act with urgency.** During the current crisis, businesses have worked faster and better than they dreamed possible just a few months ago. Maintaining that sense of possibility will be an enduring source of competitive advantage.

Consider a Chinese car-rental company whose revenues fell 95 percent in February. With the roads

Exhibit

**Recovering revenues is an important element of reimagining the return.**

Matrix for prioritizing measures for rapid revenue recovery, illustrative



# During the current crisis, businesses have worked faster and better than they dreamed possible just a few months ago. Maintaining that sense of possibility will be an enduring source of competitive advantage.

empty, company leaders didn't just stew. Instead, they reacted like a start-up. They invested in micro-customer segmentation and social listening to guide personalization. This led them to develop new use cases. They discovered, for example, that many tech firms were telling employees not to use public transportation. The car-rental company used this insight to experiment with and refine targeted campaigns. They also called first-time customers who had cancelled orders to reassure them of the various safety steps the company had taken, such as "no touch" car pickup. To manage the program, they pulled together three agile teams with cross-functional skills and designed a recovery dashboard to track progress. Before the crisis, the company took up to three weeks to launch a campaign; that is now down to two to three days. Within seven weeks, the company had recovered 90 percent of its business, year on year—almost twice the rate of its chief competitor.

***Develop an agile operating model.*** Driven by urgency, marketing and sales leaders are increasingly willing to embrace agile methods; they are getting used to jumping on quick videoconferences to solve problems and give remote teams more decision-making authority. It's also important, of course, for cross-functional teams not to lose sight of the long term and to avoid panic reactions.

In this sense, "agile" means putting in place a new operating model built around the customer and

supported by the right processes and governance. Agile sales organizations, for example, continuously prioritize accounts and deals, and decide quickly where to invest. But this is effective only if there is a clear growth plan that sets out how to win each type of customer. Similarly, fast decision making between local sales and global business units and the rapid reallocation of resources between them require a stable sales-pipeline-management process.

## **2. Rebuilding operations**

The coronavirus pandemic has radically changed demand patterns for products and services across sectors, while exposing points of fragility in global supply chains and service networks. At the same time, it has been striking how fast many companies have adapted, creating radical new levels of visibility, agility, productivity, and end-customer connectivity. Now leaders are asking themselves: How can we sustain this performance? As operations leaders seek to reinvent the way they work and thus position themselves for the next normal, five themes are emerging.

***Building operations resilience.*** Successful companies will redesign their operations and supply chains to protect against a wider and more acute range of potential shocks. In addition, they will act quickly to rebalance their global asset base and supplier mix. The once-prevalent global-sourcing model in product-driven value chains has steadily

declined as new technologies and consumer-demand patterns encourage regionalization of supply chains. We expect this trend to accelerate.

This reinvention and regionalization of global value chains is also likely to accelerate adoption of other levers to strengthen operational resilience, including increased use of external suppliers to supplement internal operations, greater workforce cross-training, and dual or even triple sourcing.

***Accelerating end-to-end value-chain digitization.***

Creating this new level of operations resilience could be expensive, in both time and resources. The good news, however, is that leading innovators have demonstrated how “Industry 4.0” (or the Fourth Industrial Revolution suite of digital and analytics tools and approaches) can significantly reduce the cost of flexibility. In short, low-cost, high-flexibility operations are not only possible—they are happening. Most companies were already digitizing their operations before the coronavirus hit. If they accelerate these efforts now, they will likely see significant benefits in productivity, flexibility, quality, and end-customer connectivity.

***Rapidly increasing capital- and operating-expense transparency.***

To survive and thrive amid the economic fallout, companies can build their next-normal operations around a revamped approach to spending. A full suite of technology-enabled methodologies is accelerating cost transparency, compressing months of effort into weeks or days. These digital approaches include procurement-spend analysis and clean-sheeting, end-to-end inventory rebalancing, and capital-spend diagnostics and portfolio rationalization. Companies are also seeking to turn fixed capital costs into variable ones by leveraging “as a service” models.

***Embracing the future of work.*** The future of work, defined by the use of more automation and technology, was always coming. COVID-19 has hastened the pace. Employees across all functions, for example, have learned how to complete tasks remotely, using digital communication and collaboration tools. In operations, changes will go further, with an accelerated decline in manual

and repetitive tasks and a rise in the need for analytical and technical support. This shift will call for substantial investment in workforce engagement and training in new skills, much of it delivered using digital tools.

***Reimagining a sustainable operations competitive advantage.***

Dramatic shifts in industry structure, customer expectations, and demand patterns create a need for equally dramatic shifts in operations strategies to create competitive advantage and new customer value propositions. Successful companies will reinvent the role of operations in their enterprises, creating new value through a far greater responsiveness to their end customers—including but not limited to accelerated product-development and customer-experience innovation, mass customization, improved environmental sustainability, and more interconnected, nimble ecosystem management.

***Taking action.*** To keep up during COVID-19, companies have moved fast. Sales and operation planning used to be done weekly or even monthly; now a daily cadence is common. To build on this progress, speed will continue to be of the essence. Companies that recognize this, and that are willing to set new standards and upend old paradigms, will build long-term strategic advantage.

### **3. Rethinking the organization**

In 2019, a leading retailer was exploring how to launch a curbside-delivery business; the plan stretched over 18 months. When the COVID-19 lockdown hit the United States, it went live in two days. There are many more examples of this kind. “How can we ever tell ourselves that we can’t be faster?” one executive of a consumer company recently asked.

Call it the “great unfreezing”: in the heat of the coronavirus crisis, organizations have been forced to work in new ways, and they are responding. Much of this progress comes from shifts in operating models. Clear goals, focused teams, and rapid decision making have replaced corporate bureaucracy. Now, as the world begins to move into the post-COVID-19

era, leaders must commit to not going back. The way in which they rethink their organizations will go a long way in determining their long-term competitive advantage.

Specifically, they must decide who they are, how to work, and how to grow.

**Who we are.** In a crisis, what matters becomes very clear, very fast. Strategy, roles, personal ownership, external orientation, and leadership that is both supportive and demanding—all can be seen much more clearly now. The social contract between the employee and employer is, we believe, changing fundamentally. “It will matter whether you actually acted to put the safety of employees and communities first,” one CEO told us, “or just said you cared.” One noticeable characteristic of companies that have adapted well is that they have a strong sense of identity. Leaders and employees have a shared sense of purpose and a common performance culture; they know what the company stands for, beyond shareholder value, and how to get things done right.

**How we work.** Many leaders are reflecting on how small, nimble teams built in a hurry to deal with the COVID-19 emergency made important decisions faster and better. What companies have learned cannot be unlearned—namely, that a flatter organization that delegates decision making down to

a dynamic network of teams is more effective. They are rewiring their circuits to make decisions faster, and with much less data and certainty than before. In a world where fast beats slow, companies that can institutionalize these forms of speedy and effective decentralization will jump ahead of the competition.

Organizations are also showing a more profound appreciation for matching the right talent, regardless of hierarchy, to the most critical challenges. In an environment with strong cost pressures, successful leaders will see the value in continuing to simplify and streamline their organizational structures. Experience has shown a better way, with critical roles linked to value-creation opportunities and leadership roles that are much more fluid, with new leaders emerging from unexpected places: the premium is placed on character and results, rather than on expertise or experience. This can only work, however, if the talent is there. To hire and keep top talent, the scarcest capital of all, means creating a unique work experience and committing to a renewed emphasis on talent development.

**How to grow.** Coming out of the crisis, organizations must answer important questions about growth and scalability. Three factors will matter most: the ability to embed data and analytics in decision making; the creation of learning platforms that support both individual and institutional experimentation

**Many leaders are reflecting on how small, nimble teams built in a hurry to deal with the COVID-19 emergency made important decisions faster and better.**

and learning at scale; and the cultivation of an organizational culture that fosters value creation with other partners.

Those organizations that are making the shift from closed systems and one-to-one transactional relationships to digital platforms and networks of mutually beneficial partnerships have proved more resilient during the crisis. “Every business is now a technology business, and what matters most is a deep understanding of the customer, which is enabled by technology,” remarked a retail CEO.

By organizing to encourage insight generation—for example, by linking previously unconnected goods and services—technology is revolutionizing how organizations relate to their customers and their customers’ customers. Creating digitally enabled ecosystems is therefore critical because these catalyze growth and enable rapid adaptation. When the crisis hit, one company moved all its full-time direct employees into a virtual operating environment; meanwhile, its outsourcing partner, the CEO recalled, “hid behind their contract and played one customer off against another.” It is not difficult to imagine who is better placed to succeed in the more flexible post-COVID-19 business environment, where value creation is shared and strategic partnerships matter even more.

#### **4. Accelerate digital adoption to enable reimagination**

Over the past few months, there has been a transformation in the way we interact with loved ones, do our work, travel, get medical care, spend leisure time, and conduct many of the routine transactions of life. These changes have accelerated the migration to digital technologies at stunning scale and speed, across every sector. “We are witnessing what will surely be remembered as a historic deployment of remote work and digital access to services across every domain,” remarked one tech CEO. He is right. Through the COVID-19 recovery, too, digital will play a defining role.

During the early recovery period of partial reopening, business leaders will face some fundamental challenges. One is that consumer behavior and demand patterns have changed significantly and will continue to do so. Another is that how the economy lurches back to life will differ from country to country and even city to city. For example, consumers may feel comfortable going to restaurants before they will consider getting on a plane or going to sporting events. Early signals of increased consumer demand will likely come suddenly, and in clusters. Analyzing these demand signals in real time and adapting quickly to bring supply chains and services back will be essential for companies to successfully navigate the recovery.

To address these challenges, leaders will need to set an ambitious digital agenda—and deliver it quickly, on the order of two to three months, as opposed to the previous norm of a year or more. There are four elements to this agenda:

***Refocus digital efforts to reflect changing customer expectations.*** To adapt, companies need to quickly rethink customer journeys and accelerate the development of digital solutions. The emphasis will be different for each sector. For many retailers, this includes creating a seamless e-commerce experience, enabling customers to complete everything they need to do online, from initial research and purchase to service and returns. For auto companies, this could mean establishing new digital distribution models to handle trade-ins, financing, servicing, and home delivery of cars. For industries such as airlines, ensuring health and safety will be essential, for example, by reinventing the passenger experience with “contactless” check-in, boarding, and in-flight experiences.

***Use data, Internet of Things, and AI to better manage operations.*** In parallel, companies need to incorporate new data and create new models to enable real-time decision making. In the same way that many risk and financial models had to be rebuilt after the 2008 financial crisis, the use of

data and analytics will need to be recalibrated to reflect the post-COVID-19 reality. This will involve rapidly validating models, creating new data sets, and enhancing modeling techniques. Getting this right will enable companies to successfully navigate demand forecasting, asset management, and coping with massive new volumes. For example, one airline developed a new app to manage and maintain its idle fleet and support bringing it back into service; and a North American telecommunications company developed a digital collection model for customers facing hardship.

**Accelerate tech modernization.** Companies will also need to greatly improve their IT productivity to lower their cost base and fund rapid, flexible digital-solution development. First, this requires quickly reducing IT costs and making them variable wherever possible to match demand. This means figuring out what costs are flexible in the near-to-medium term, for example, by evaluating nonessential costs related to projects or maintenance, and reallocating resources. Second, this involves defining a future IT-product platform, establishing the skills and roles needed to sustain it, mapping these skills onto the new organization model, and developing leaders who can train people to fill the new or adapted roles. Third, the adoption of cloud and automation technologies will need to be speeded up, including bringing cloud operations on-premise and decommissioning legacy infrastructure.

**Increase the speed and productivity of digital solutions.** To deal with the crisis and its aftermath, companies not only need to develop digital solutions quickly but also to adapt their organizations to new operating models and deliver these solutions to customers and employees at scale. Solving this “last mile” challenge requires integrating businesses processes, incorporating data-driven decision making, and implementing change management. There are different ways to do this. A wide variety of companies, from banks to mining operations, have accelerated delivery by establishing an internal “digital factory” with cross-functional teams dedicated to matching business priorities to digital practices. Others, in addition to reinventing their core businesses, have established new business-building entities to capture new opportunities quickly.

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For companies around the world, the qualities that brought Brazilian football to new heights in 1970—imagination, leadership, and on-the field execution—will be paramount as they consider how to navigate the post-COVID-19 environment. Business as usual will not be nearly enough: the game has changed too much. But by reimagining how they recover, operate, organize, and use technology, even as they return to work, companies can set the foundations for enduring success.

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# Reopening safely: Sample practices from essential businesses

The safety protocols of hospitals, grocery stores, and other establishments that stayed open during the COVID-19 pandemic can offer ideas for businesses preparing to welcome employees and customers back.

*by Suzanne Rivera, Kate Robu, Virginia Simmons, and Shubham Singhal*

**After weeks of shutdowns and remote working,** businesses around the world are gradually resuming on-site operations. Of course, some businesses—those considered essential—kept their doors open and operated at full capacity, even at the height of the COVID-19 pandemic. While the list of essential businesses varies by jurisdiction, in most cases it includes healthcare facilities, pharmacies, grocery stores, convenience stores, banks, and gas stations, as well as delivery, sanitation, plumbing, and electrical-repair services. Those businesses offer valuable lessons for companies in any sector considering reopening: How does a business stay operational while keeping employees and customers safe and preventing new COVID-19 outbreaks?

Work environments differ vastly from each other, and there are no one-size-fits-all solutions. That said, as we studied the safety practices of essential businesses during the pandemic, two principles clearly stood out as effective: tailoring safety measures to the unique business environment and implementing them across the full range of business activities (not just on-site operations). This article describes several practices that essential businesses have adopted, some of which are

applicable in other sectors as well. These practices are well worth considering as the business world charts a path toward the next normal.<sup>1</sup>

### **Different workplaces, different risks**

Some workplace environments are easier to control than others. Exhibit 1 illustrates six types of work environments based on the proximity of exposure (how closely and how long people interact with each other in person) and the extent of exposure (how many other people an individual tends to encounter in a typical workday). Some businesses may operate in more than one of these work environments—for instance, a retail chain has stores but might also have warehouses and offer delivery services. Businesses must adjust safety measures to fit the specific environments in which they operate.

In addition, businesses must implement safety measures across the full range of activities associated with their operations, including activities that take place outside the work environment. Businesses must also define protocols and policies for pre-entry, travel to and from work locations, use

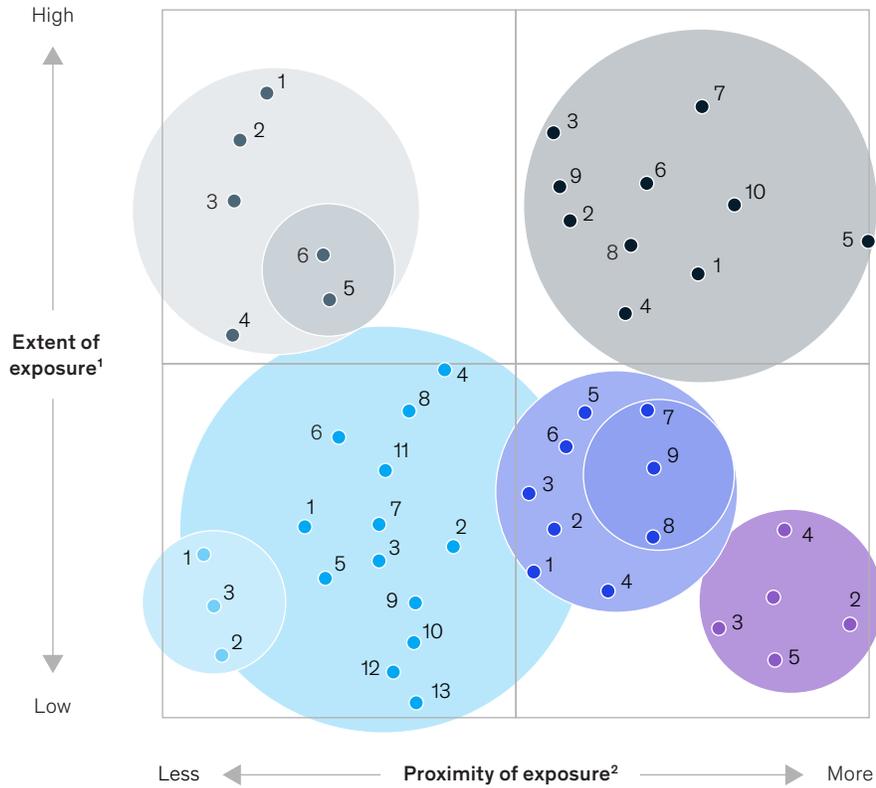
## **Businesses must define protocols and policies for pre-entry, travel to and from work locations, use of common spaces, and postinfection.**

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<sup>1</sup> Shubham Singhal and Kevin Sneader, "From thinking about the next normal to making it work: What to stop, start, and accelerate," May 15, 2020, McKinsey.com.

## Risk levels vary across different types of work environments.

### Proximity and extent of exposure in select work environments



<ul style="list-style-type: none"> <li>● <b>Significant public interaction</b> <ol style="list-style-type: none"> <li>Airports</li> <li>Banks</li> <li>Grocery stores</li> <li>Gyms and fitness studios</li> <li>Hospitals</li> <li>Hotels</li> <li>Public transit</li> <li>Restaurants</li> <li>Retail stores</li> <li>Stadiums and theme parks</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Large confined spaces</b> <ol style="list-style-type: none"> <li>Engineering labs</li> <li>Factories</li> <li>Schools (K–12)</li> <li>Sports arenas</li> <li>Universities</li> <li>Warehouses</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Professional working spaces</b> <ol style="list-style-type: none"> <li>Call centers</li> <li>Large offices</li> <li>Public-service functions</li> <li>Small offices</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Isolated</b> <ol style="list-style-type: none"> <li>Artisanal work</li> <li>Construction</li> <li>Farming</li> <li>Firefighting</li> <li>Landscaping</li> <li>Mail delivery</li> <li>Moving services</li> <li>Police</li> <li>Real estate</li> <li>Repair services</li> <li>Sanitation</li> <li>Trucking</li> <li>Waste management</li> </ol> </li> </ul>
<ul style="list-style-type: none"> <li>○ <b>Physical contact required</b> <ol style="list-style-type: none"> <li>Barbershops and hair salons</li> <li>Nursing homes</li> <li>Performing-arts venues</li> <li>Physical-therapy offices</li> <li>Spas</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Large confined spaces (low compliance)</b> <ol style="list-style-type: none"> <li>Day-care centers</li> <li>Mental-care facilities</li> <li>Preschools</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Professional working spaces (physical presence required)</b> <ol style="list-style-type: none"> <li>Air-traffic-control towers</li> <li>Research labs</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Solo</b> <ol style="list-style-type: none"> <li>Fine arts</li> <li>Graphic design</li> <li>Programming</li> </ol> </li> </ul>

<sup>1</sup>Number of unique contacts in a typical workday.

<sup>2</sup>How closely and how long people interact in person within the work environment.

of common spaces, and postinfection. Exhibit 2 can provide guidance for business leaders as to the levels of risk associated with work-related activities and the types of safety measures to implement.

### Actions to consider

Based on our recent research and our work with leading companies around the world, we have compiled a list of some of the safety measures that essential businesses across a range of industries have put in place. This list of practices could be helpful to business owners and operators as they seek to reopen their workspaces.

#### Pre-entry

Before reopening, employers can take measures to educate employees on new protocols, identify at-risk individuals, and provide additional resources to make the return-to-work experience safe and orderly. The following issues merit consideration:

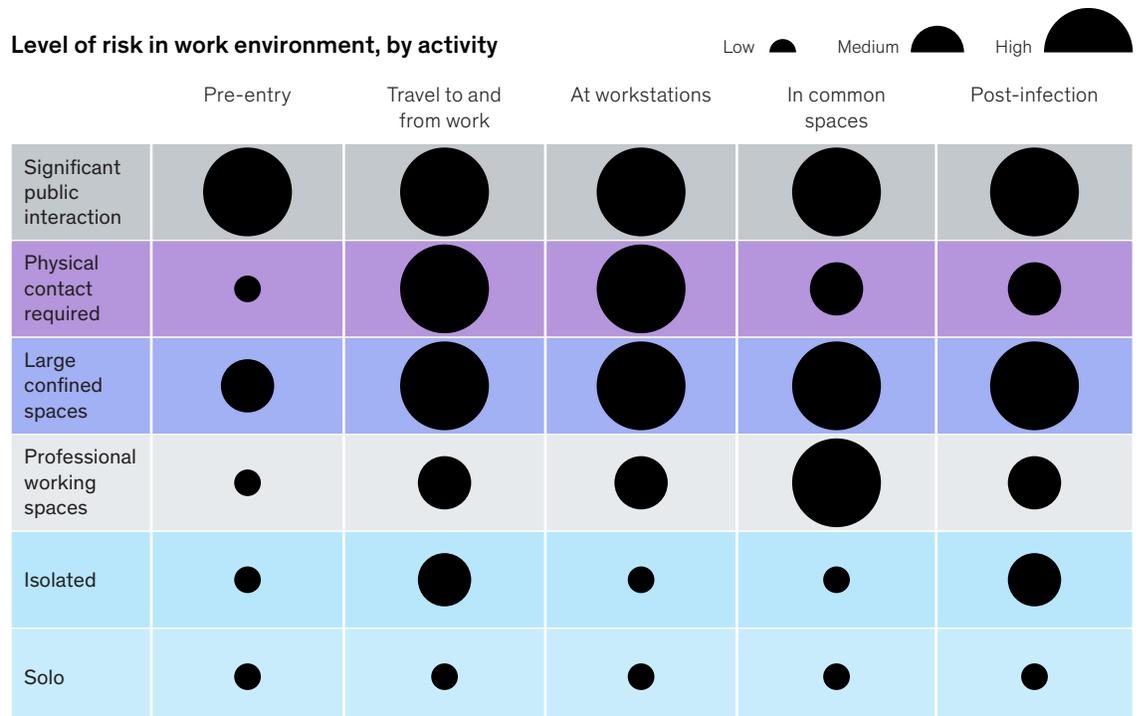
- **Shift to remote work.** The most obvious risk-mitigation measure is to continue remote work where possible. Even at businesses where much of the work cannot be done remotely (such as grocery stores), company leaders have made significant efforts toward contactless services. For instance, grocery chains introduced contactless pickup in their parking lots. Manufacturers moved functions that don't require access to on-site equipment (functions such as finance, procurement, and marketing) to a remote model. Physical therapists are leveraging telehealth and at-home, virtual exercise routines.
- **At-scale testing.** In places where COVID-19 testing is widely available, companies have found it a highly effective way of protecting employees' health.<sup>2</sup> Electronics manufacturer Foxconn, with more than one million workers across Asia, has tested more than 50,000 employees.

<sup>2</sup>Mohammed Behnam, Li Han, Pooja Kumar, and Shubham Singhal, "Major challenges remain in COVID-19 testing," May 1, 2020, McKinsey.com.

Exhibit 2

## Businesses must implement safety measures across the full range of work-related activities.

Level of risk in work environment, by activity



E-commerce giant Amazon has pledged to test all of its employees and build its own COVID-19 test center.

- **Symptom assessment.** In places where tests haven't been available, businesses have used various forms of symptom assessment to screen for high-risk employees, who they then prohibit from coming to work. For example, Alibaba employees must fill out a daily health questionnaire on an internal app before they travel to the company's headquarters office; they must then present the color-coded results to get past building security. Similarly, several companies in South Korea are requiring employees to fill out online health self-assessment surveys every Sunday before coming to work the following day. A US ad agency segmented its employees into three risk levels and staggered its return-to-work plan accordingly: level-one employees, those who have tested positive for COVID-19 antibodies, can return to work right away. Level-two employees, those younger than 65 and without any health conditions, are in the next wave allowed back into their offices. Finally, the return of level-three employees—those who are immunocompromised or aged 65 or older—has been deferred until further notice.
- **Training and education.** The experience of essential businesses suggests that softer safety measures, such as training and education, played a significant role in instilling new habits among employees and customers. Several US companies have developed online training and education modules to familiarize employees with the new safety and hygiene protocols before they return to work. In China, some corporate offices are going as far as denying workplace access to those who haven't completed the training; they're also requiring employees to pass an app-based test on the new safety measures. Internet giant Tencent produced a video for employees to watch before coming back to their workplaces. The video covers basic information on COVID-19 and explains the company's return-to-work process in detail.

- **Childcare.** Challenges related to childcare have been among the biggest impediments to the availability and productivity of essential workers during the pandemic. Childcare is therefore a major focus area for both employers and local authorities. Some hospitals arranged for medical students to provide childcare for essential employees; caregivers kept children in the same groups every day to minimize potential exposure. Companies and local governments have been offering childcare subsidies or reimbursing workers for virtual babysitting services: remote babysitters entertain children with virtual activities for up to 90 minutes, giving their parents time to get some work done. A few governments have also granted emergency licenses for day-care facilities. The licenses allow day-care centers, subject to specific safety measures, to care for the children of essential workers during the pandemic.

- **Mental health.** Businesses are helping employees take care of not just their physical safety and well-being but also their mental health. Companies are starting to provide mental-health tools—providing free subscriptions to meditation apps, for instance. Many universities and businesses are offering on-demand video counseling to employees and constituents.

#### **Travel to and from work**

Businesses should account for the various modes of transportation that employees use to travel to and from their workplaces. The mix typically includes public transportation, private or individual transport (such as cars, bikes, and walking), and, for some companies, employer-sponsored transportation. Equally important, businesses must introduce new safety measures for entry into and exit from the workplace. The following are some issues to consider:

- **Transportation.** To minimize the risk of employees' exposure to infection during transit, some New York City hospitals have arranged for organized transportation (such as shuttle buses), encouraged carpooling, or subsidized ride sharing

# The experience of essential businesses suggests that softer safety measures, such as training and education, played a significant role in instilling new habits among employees and customers.

for staff. Healthcare facilities with more operational flexibility, such as dental offices and primary-care physicians' offices, have adjusted their working days and hours to minimize the employee commute during rush hours.

- **Temperature checks.** Many establishments in China and in the US states that have reopened are requiring temperature checks for all employees and customers upon entry. Some are stationing employees at the entrance and equipping them with contactless thermometers; others have adopted automated temperature checks. Taipei Rapid Transit has set up infrared thermometers in its most crowded stations. Passengers with temperatures higher than 38°C are prohibited from entering the station.
- **Staggered entry and exit.** To minimize crowding at entrances and exits, some factories in China have established staggered start times for each workday: employees arrive in waves every ten or 20 minutes. Many US grocery stores are restricting the number of shoppers they allow in stores at one time and have created decals on the sidewalks leading up to the store to guide customers in lining up six feet apart. Similarly, some small and medium-size businesses are limiting the number of people inside their facilities by seeing customers only by appointment (no walk-ins) and asking customers to wait in their cars or outside the facility until they receive a text inviting them to come in. US amusement parks have replaced physical queuing with virtual waiting areas in digital apps.

To limit close contact among children, parents, and staff members, US day-care centers have set staggered curbside drop-off/pickup times, allowing only one parent or guardian—who is required to wear a face covering—to drop off or pick up each child.

- **New cleaning protocols.** Businesses must significantly enhance their cleaning protocols. For example, grocers and other retailers are now routinely making hand sanitizer or disinfecting wipes available at store entrances. Nail spas and salons are requiring customers to wash their hands before and after appointments.
- **Protective equipment.** Entry into and exit from a workplace are opportunities to remind individuals about safety protocols and enforce the wearing of personal protective equipment (PPE). At one Chinese retailer, customers are greeted by employees carrying signs encouraging shoppers to wear masks. Many business establishments across the globe don't allow customers to enter unless they're wearing face coverings. Medical facilities have created strict rules regarding PPE, with dedicated rooms for healthcare workers to change their clothing at the start and end of their workdays.

## At work

Enforcing physical-distancing protocols is easier in some work environments than in others. Essential businesses have had to adapt quickly during the pandemic to keep their employees safe at work. Here are some of the ways they've done it:

- **Ongoing reminders and conditional service.** Many US grocers have created signage for one-way aisles; floor decals indicate where shoppers should stand when lining up for checkout. Kroger has been making in-store loudspeaker announcements about healthy habits and urging shoppers to keep their distance. Some companies have been sending their employees reminders to sanitize workstations every few hours. A real-estate company in New York, RXR Realty, is launching an app that tracks whether an employee is at least six feet away from another person. The intent is to incentivize positive behavior among employees and to monitor compliance with physical-distancing rules. Meanwhile, restaurants in China have introduced a range of new conditions for serving customers, including spacing tables farther apart to adhere to local distancing guidelines, using conveyor belts to transport food to customers, and requiring customers to wear masks when not eating or drinking.
- **Enhanced hygiene protocols.** In work environments where people are required to be in close physical proximity to each other, the focus has been on dramatically enhancing cleaning protocols. Several companies have installed hand-washing stations in high-traffic areas at their facilities. Grocers are assigning employees to sanitize shopping carts after each use; gyms and hotels are doing the same with fitness equipment. Other companies have upgraded their air-filtration systems. Deep cleaning is particularly important in facilities where individuals may have trouble following a set of safety guidelines, such as day-care centers, schools with young children, and institutions caring for people with disabilities. For example, the US Centers for Disease Control and Prevention (CDC) recommends that day-care centers keep the same groups of children and care providers in the same rooms every day. In addition, the CDC recommends separating those who are at higher risk of exposure—such as children of first responders or healthcare workers—into their own classrooms; spacing out mats and placing children head to toe during naptime to reduce high-risk contact; discarding toys that can't be disinfected; and creating soiled-toy bins filled with soapy water for toys that have been placed in a child's mouth.
- **Workspace redesign.** Many US grocers and convenience stores—as well as manufacturing plants where workers are required to stand close together on an assembly line—have installed plexiglass partitions at checkouts or workstations. At telecom company BT, call-center workers now sit two meters apart and walkways have been designated to be one way. Cushman & Wakefield, a global commercial real-estate-services company, has designed the 6 Feet Office concept, which it has implemented in its Amsterdam headquarters and across offices in China. The design includes barriers between desks, bold circles on the carpets around desks indicating where people can stand, and increased signage—all to encourage physical distancing.
- **Working in consistent teams.** Chinese food-delivery company Meituan divided employees into three teams, allowing only one team in the office each day. Several US health systems have separated staff working in COVID-19 zones from staff working in non-COVID-19 zones, and have made changes to their care models (such as batching activities or using mobile devices to conduct hospital rounds), to minimize the risk of virus spread and of nurse and physician shortages. In Denmark, primary schools adjusted their operating model by splitting up children into groups of about a dozen, with each group taught by the same teacher every school day. Each group has assigned start and end times and holds separate classes, meal-times, and playground activities.

#### **In common spaces**

Businesses have been taking measures to eliminate or at least minimize gatherings in common spaces. US grocery stores have closed down high-contact parts of their stores, such as food courts and self-serve food stations. At the Pentagon, strategy meetings regularly attended by 40 to 50 people take place across three rooms, with video-conferencing in each room. Such an arrangement allows individuals to address all attendees and collaborate in smaller groups, without crowding into

a single conference room. Petrochemical group Sinochem in Beijing delivers food to employees' desks to prevent crowding in lunchrooms. At a Foxconn factory in China, workers eat at cafeteria tables separated by tall dividers. Some Chinese manufacturers have staggered lunch breaks and on-site meal offerings. Others, including electronics manufacturer TCL, require employees to scan QR codes upon entering common spaces, such as cafeterias, thus facilitating contact tracing in case of an infection. Corporate offices throughout Asia are installing motion-control doors and removing shared appliances from office kitchens and pantries.

### Postinfection

Given the high transmission rates of the coronavirus, every business must have plans and processes in place in the event that an employee or customer gets infected. It's critical that a business clearly communicates its postinfection processes to all levels of the organization.

- **Contact tracing.** The capabilities for contact tracing—whether through the use of technology, a team of human contact tracers, or both—have been important for sustaining safe working environments for essential businesses.<sup>3</sup> Some telecom companies in Asia are supporting their governments in contact tracing. When a confirmed COVID-19 case is identified, the infected person's location history is tracked, and the government sends SMS alerts to people who may have come in contact with that person. In San Francisco, a joint partnership of the city Department of Public Health; the city government; the University of California,

San Francisco; and mobile-technology provider Dimagi has recruited more than 250 public-health workers to help with contact tracing. Those workers conduct interviews with individuals who have been infected and help trace and notify contacts. Each location should choose contact-tracing solutions consistent with local privacy norms and standards.

- **Clear triggers for returning to work.** Businesses have defined clear activation triggers and protocols for handling an infection or outbreak. For example, hospitals seal off and deep clean areas that may have had virus exposure; individuals who may be infected are placed in isolation. Some US businesses have defined return-to-work triggers for infected employees. Common triggers include multiple negative tests for COVID-19, a positive antibody test, and a two-week period of self-quarantine during which the person shows no symptoms.

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As businesses prepare to reopen, setting up a plan-ahead team to guide and accelerate decision making may be appropriate.<sup>4</sup> The team's responsibilities will include critically evaluating all return-to-work policies and protocols, stress-testing workforce safety interventions, and reviewing and refining processes after implementation. Because every day brings new developments in the fight against COVID-19, a plan-ahead team can help a company adapt and react quickly—and, ultimately, be better positioned to protect the health and safety of employees and customers alike.

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<sup>3</sup>Molly Bode, Matt Craven, Markus Leopoldseider, Paul Rutten, and Matt Wilson, "Contact tracing for COVID-19: New considerations for its practical application," May 8, 2020, McKinsey.com.

<sup>4</sup>Yuval Atsmon, Chris Bradley, Martin Hirt, Mihir Mysore, Nicholas Northcote, Sven Smit, and Robert Uhlaner, "Getting ahead of the next stage of the coronavirus crisis," April 2020, McKinsey.com.



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# Beyond contactless operations: Human-centered customer experience

As we look forward to the next normal, consumers are already demonstrating a preference for companies that deliver great service while reducing risks all along the customer journey.

*by Melissa Dalrymple and Kevin Dolan*

**As the global fight** against COVID-19 continues and much of normal daily life remains on hold, organizations are trying to navigate a rapidly evolving landscape. Many have moved beyond initial actions to protect the lives and livelihoods of their people and are working to tackle the concerns of the estimated millions of consumers who expect the effects of COVID-19 to be long lasting—customers who are making decisions about whether or not to engage with a company based on its actions to address safety concerns and the way it communicates changes. Beyond addressing safety concerns, organizations that find ways to rebuild the human experiences that existed before COVID-19—among everyone from suppliers to employees and customers—within a contactless world will differentiate themselves and gain customer loyalty.

Companies are moving quickly to institute new policies and processes that will allow them to reopen—or in some cases, remain open. Many are investigating opportunities to shift toward contactless service and operations, allowing the cores of their businesses to continue operating while assuring both employees and customers of their safety. Companies that develop a long-term strategy now to mitigate risks while delivering distinctive and human-centric experiences

will emerge from the pandemic with stronger operational resilience, more agile organizations, and sustainable competitive advantage that can better respond to a changing economic context and any future shocks.

It will be important that companies work across silos to provide solutions that deliver effective, end-to-end employee and customer experiences, maintaining the value of their brands through the operational adjustments they make. A new, data-driven perspective, summarized as IDEA (*identify* interactions, *diagnose* and prioritize risks, *develop* and *execute* solutions, and *adapt* and sustain), can provide crucial structure and rigor in helping an organization see risks, assess their intensity, and create solutions to address them iteratively as the external environment evolves.

Leaders can then develop interventions and redesign critical customer and employee journeys, enabling their organizations to reopen or sustain operations while also building trust with both customers and employees, such as redesigning the way hotel guests check in by developing a completely digital experience without a check-in counter. Over time, IDEA can flex to include more human elements while keeping safety and security at its core.

Exhibit 1

**Four steps help businesses enable contactless operations from risk identification to solution execution.**



**Identify interactions**

Identify types of in-person interactions in your value chain within these three buckets:

- employee to employee
- employee to customer
- customer to customer



**Diagnose and prioritize risks**

Define risks associated with each interaction type, then prioritize risks based on factors such as intensity and frequency



**Develop and execute solutions**

Understand which types of interventions will be most effective for your business and begin executing solutions



**Adapt and sustain**

Work across the organization to continually adjust solutions to meet the needs of the evolving global situation

Source: McKinsey analysis

## **IDEA for managing risks**

Across all industries, levels of consumer concern for personal safety when interacting with a company are increasing. Across a wide range of countries, consumers have dramatically increased their use of low-touch service options, ranging from restaurant and grocery delivery to online fitness and telemedicine. And even once stay-at-home orders are lifted, customers are expected to continue to make careful selections about which businesses to engage with—even those that had long been central to their lives and livelihoods.

At the same time, although reassuring customers of safety will remain a baseline for customer retention, the impact will likely diminish as more businesses minimize personal contact in their operations. As the pandemic evolves, companies will likely be able to differentiate themselves further by finding ways to make contactless operations retain a sense of human connection. For example, one retailer is using augmented reality to let customers shop in a store, browsing products while interacting with store clerks.

Internally, organizations that take steps to protect their workforce and implement policies to limit and redesign in-person interactions—both employee to employee and employee to customer—can build crucial employee trust. Yet it's still possible to retain a human touch, often at little cost: a large restaurant chain's contactless delivery process can simply ask the delivery person dropping off the food to wait for the customer to collect it before leaving. The employee and customer have an in-person interaction and the reassurance that both are safe.

### **Identify interactions**

The first step in applying IDEA is to identify the interactions among employees and customers across the value chain that pose a risk. While in-person interactions were a central part of the day-to-day operations of many organizations, even minimal connections now pose a potential risk to the health of employees and customers. In Europe alone, some 54.8 million workers fall into high-risk occupations that require them both to work in close proximity to others and to have significant exposure to the general public; they include roles in industries such as retail, leisure, and food services.

The three points of contact—employee to employee, as in handoffs of paper files or warehoused materials; employee to customer, as in a medical office or an in-home service visit; or customer to customer, as in a checkout line or boarding queue—all require detailed review. The physical environment, including the space allotted for the activity and the surfaces that people touch, also enter into the analysis. Even for the relatively short and self-contained customer journey involved in checking in at a hotel, the analysis reveals at least 15 potential interactions among customers and employees, from greeting at the front door to taking a pen to sign a credit-card charge to using the same buttons in an elevator.

### **Diagnose and prioritize risks**

Moving to the next normal and restarting operations will require adaptations to ensure that both employees and customers feel safe and reassured. Careful mapping of customer and employee journeys can help diagnose risks across all of the in-person interactions. Within the three in-person interactions, three types of transfers typically pose a risk: goods transfer, service provision, and internal tasks and processes (Exhibit 2).

The hotel example illustrates how organizations must understand risks from multiple journey perspectives. For the customer, handing over a credit card and receiving it back poses only a single risk; for the employee, who may handle dozens of credit cards over the course of a busy evening, the level of risk can look quite different. Once those risks have been diagnosed, managers can prioritize them according to business and regulatory context, as well as by effect on customer and employee experiences. That process will allow organizations to effectively allocate resources to the highest-priority risks and journeys, rating them according to intensity of exposure, duration of exposure, and frequency of contact.

### **Develop and execute solutions**

As the global economy moves through and beyond the current crisis, companies can think iteratively about solutions to develop contactless operations. Success will rest on developing a through-line perspective across both customer and employee experience—how much, and what kind, of contact

## Mapping the customer and employee journeys helps identify the risks across interactions.

Interface scenarios	Example risks in each interaction type		
	Goods transfer	Services	Internal tasks/processes
<b>Employee to employee</b> 	In a distribution center, goods may be transferred from person to person (eg, from order picking to packing) and may involve close proximity and touching the same goods	2 field-service technicians may ride in the same truck to a customer site, which may involve touching the same surfaces and breathing the same air	An employee may go to the IT-support desk for help with a computer malfunction, and the 2 employees may stand in close proximity and touch the same devices
<b>Employee to customer</b> 	Purchasing a garden hose in a hardware store may involve a customer and an employee in close proximity and touching the same bags and cash	A field-service technician servicing a piece of equipment (eg, gas turbine, airplane) may come into contact with the customer to understand the problem and may share tools with other employees	A package-delivery employee may need to get a delivery-confirmation signature, requiring both employee and customer to touch the same scanner or tablet
<b>Customer to customer</b> 	2 customers may meet in person for a consumer-marketplace purchase, which may lead to close proximity and touching the same products	Multiple patients may share the waiting room of a doctor's office, which may lead to close proximity and touching of communal objects (eg, furniture, door handles, magazines)	Customers may use the same working surface to complete forms in a bank or to ship packages, which may lead to close proximity and touching the same surfaces and pens

Source: McKinsey analysis

the customer wants to have and that the employee can safely give. The exercise is likely to bring together teams that are unused to collaborating with each other. It will require leaders to use a hands-on approach to facilitate and encourage collaboration between, say, a delivery-management team used to prioritizing speed and accuracy and a marketing-insights team focused on understanding customers' qualitative experiences. There will be little room for traditional siloed thinking in which each functional group focuses only on its own role; instead, the real value will come from better understanding how the functions affect one another and can change to support better end-to-end processes, such as freeing up just enough time on delivery so that the customer and delivery person can acknowledge each other.

The risk assessment developed in IDEA's diagnose phase can help companies prioritize actions, balancing customer, employee, and business needs.

Those risks that are identified as mission-critical can be addressed first, redesigning journeys and implementing people-, process-, and technology-based solutions in two main phases

- **Return:** creating safe experiences to reopen and address immediate needs. These are the must-haves to restart a business and reassure customers and employees that leaders are addressing the most serious risks through temporary or permanent actions that comply with regulatory or governmental requirements. They will involve the redesign of both the customer experience and its supporting processes and will be communicated to both consumer and employee stakeholders to build confidence. For example, a grocery store limiting the maximum number of customers in its building will lower both frequency of contact and intensity of exposure for employees and customers. Similarly, telecom

engineers confirming service through text messaging rather than in-person signatures will demonstrate how technology solutions can have the same effect as traditional practices while reducing (or even eliminating) the need for employee–customer contact.

- **Reimagine:** reorchestrating and accelerating initiatives to prepare for the long term and build distinctiveness. Reviewing operations through a COVID-19 lens will help prioritize ongoing and new initiatives. This focus can help companies consider which broader initiatives now underway they should accelerate and shape to match new requirements and which new initiatives they should begin.

Consider digitization efforts that can be accelerated to enhance safety efforts toward reduced contact by enabling omnichannel interactions. For example, a consumer bank is accelerating the consolidation of its physical-branch network to reallocate resources and serve customers more effectively through digital channels. That also has the effect of reducing in-person contact and potential exposure—but reduces the bank’s opportunity to connect with customers on a human level.

As companies shift to less risky operational models, they can seek out ways to engage their customers as people and maintain a high bar for customer experience. New initiatives may include broader process or policy redesign, or a redefinition of strategies and associated business-case development. Going beyond contactless, hotels are creating virtualized in-room experiences that allow guests to experience a property’s amenities and the surrounding areas—taking note of customers’ preferences to create customized welcome gifts so that once travel resumes, hotel staff will be able to welcome and interact with guests in a more tailored way throughout their stays.

As postcrisis norms and regulations emerge, there will be new opportunities to build brand loyalty and create innovative customer and employee experiences. This effort will likely start with a reexamination of a company’s brand and corporate

values against the emerging context, using that analysis to develop distinctive positioning that redefines loyalty programs or creates new custom offers. Companies can consider new collaboration models, policies, and protocols with ecosystem partners, adapting the examples from major airlines and hotels that have extended loyalty status and launched additional perks lasting beyond the current crisis.

As companies work through opportunities to develop and execute new solutions, a cocreation process involving all stakeholders can help reduce concern among employees and customers while improving the likelihood of success. The process can bring together cross-functional teams and stakeholders to review journeys and create solutions that minimize or remove risks. By doing so—and by bringing together central players, such as vendors, customers, and industry experts—organizations can synthesize the redesigned employee and customer journeys, ensuring that new solutions both address the risk and reassure all parties.

### **Adapt and sustain**

In the current fluid environment, employees across an organization can continually work to improve processes to ensure that their teams and customers are safe. In practice, doing so will translate to tangible actions across a few areas:

- **Learning and adjustment.** Companies will need to test and adjust solutions continually to the changing environment. To guide the adjustments, key performance indicators will need regular reassessment to ensure that the most important ones are being tracked—perhaps deemphasizing transaction speed in favor of new metrics to reinforce physical distancing. Equally important, companies can measure the impact of changes that they make, learn from them, and adjust accordingly.
- **Management systems.** Improved management systems help ensure that a new operating model is sustainable. More frequent touchpoints—often digital to minimize burdens on managers—

throughout an organization help leaders check progress, while the institution of cross-functional teams supports more effective root-cause problem solving and innovation.

- **Team accountability.** It is vital for everyone across the entire organization to share responsibility for continuous improvement and be expected to contribute. In the current environment, a part of that improvement is instilling a culture of well-being so that people feel secure as they adjust to new ways of living and working.
- **Contactless but human.** As operations shift to contactless to reduce risks to employees and customers, companies can reorchestrate the customer journey to maintain a sense of human contact in their interactions with customers. Companies that can not only ensure that their operations are safe but also give customers a sense of greater connection will differentiate themselves in the next normal.

- **Employee engagement.** An operating model in which employees can ask questions and help improve on redesigned journeys can strengthen engagement—an especially critical task when they are also making many changes to the way they work. Transparent, frequent communication of efforts and adjustments with customers, vendors, and employees alike helps reinforce the message that employees are valued.

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Companies that can move toward human-centered service operations that reduce risks and improve safety—without compromising on their employee and customer experiences—will have the opportunity to emerge stronger and with justified loyalty as we reimagine the world around us in the next normal.

**Melissa Dalrymple** is a partner and **Kevin Dolan** is a senior partner in McKinsey's Chicago office.

The authors wish to thank Sergio Gutiérrez, Nicolas Guzman, Adele Hu, Rodolfo Maciel, Daniel Orbach, Jim Pallotta, Ellen Scully, and Trevor Siu for their contributions to this article.

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# Resetting supply chains for the next normal

The coronavirus pandemic's unprecedented tests are inspiring companies to consider bold moves in rebuilding their supply chains for the future.

*by Knut Aliche, Richa Gupta, and Vera Trautwein*

**At the height of the COVID-19 pandemic**, bare supermarket shelves and worldwide shortages of critical personal protective equipment made supply chains headline news. Across industries, companies had little time to address logistics disruptions, shortages of parts and materials, and sudden swings in demand. That required many organizations to rewire their supply chains at short notice—all while keeping their people safe and complying with government policies designed to slow the spread of the virus.

Now, as businesses embark on the journey to recovery, supply-chain leaders are telling us that they have no intention of returning to the status quo ante. In the second quarter of 2020, we surveyed 60 senior supply-chain executives from across industries and geographies, asking them about the impact of the pandemic on their operations and their future plans to make supply chains far more flexible and agile.

#### **Preparing to drive change**

The overwhelming majority of respondents said that the crisis had revealed weaknesses in their supply chains that they're now working to address. For

example, 73 percent encountered problems in their supplier base, and 75 percent faced problems with production and distribution. In the food and consumer-goods industries, 100 percent of respondents had experienced production and distribution problems, and 91 percent had problems with suppliers.

A whopping 85 percent of respondents struggled with inefficient digital technologies in their supply chains. And while just over half of the executives felt that they had been able to manage supply-chain planning following the abrupt introduction of remote working, 48 percent said the changes had slowed down decision-making in planning (Exhibit 1).

Our group of supply-chain leaders was broadly aligned on the actions they want to take in response to those challenges: about 93 percent of respondents told us that they plan to increase the level of resilience across their supply chain. They intend to do that using a variety of mechanisms, including dual sourcing of raw materials, increasing their inventories of critical products and, to a lesser extent, by near-shoring,

Exhibit 1

## **Supply-chain leaders say that the issues COVID revealed will transform supply chains.**

**Respondents, %**

**73%**

Encountered problems in the **supplier footprint** that require changes in the future

**75%**

Faced issues in the **production and distribution footprint** that require changes in the future

**48%**

Experienced delays in **planning decisions** because of remote working

**85%**

Struggled with insufficient **digital technologies** in the supply chain

Source: McKinsey surveys of global Supply Chain leaders (May 15 – May 22, 2020, N=60)

dual-sourcing, or regionalizing their supply chains (Exhibit 2).

Respondents also see an urgent need to get better control over their supply-chain technology, which will likely be possible only with a skilled workforce trained to use new digital tools at speed and scale. Some 90 percent of leaders surveyed say they plan to increase the amount of digital supply-chain talent within their organizations, through a combination of in-house reskilling and external hires. Just over half also expect permanent changes to their planning processes in the next normal, such as greater centralization of planning activities, shorter planning cycles, and introducing advanced-

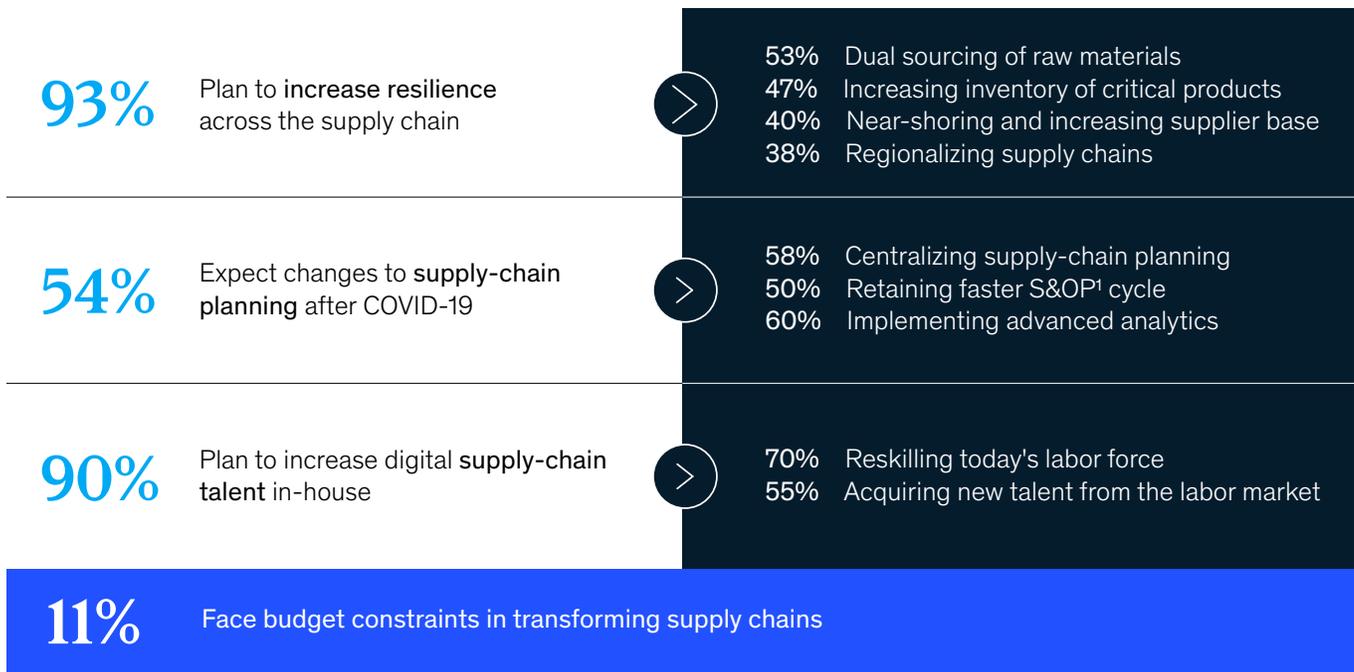
analytics techniques. Intriguingly, only 11 percent of respondents said that budgets were a constraint on their ambitions to make these changes, suggesting that resilience requires smart investments, not just pouring money into the supply chain.

**Making transformative investments**

To succeed in the next normal, companies will need more than makeshift, duct-tape solutions that address specific problems. The coronavirus pandemic has already exposed gaps in many existing setups, and it may also drive long-term changes in customer requirements and behaviors. For example, consumers who switched to on-line retail channels during the crisis, or who opted for

Exhibit 2

**Supply-chain leaders expect to focus on resilience and digitization.**



<sup>1</sup>Sales and operations planning

# The coronavirus pandemic has already exposed gaps in many existing setups, and it may also drive long-term changes in customer requirements and behaviors.

curb-side and in-store pickup of online orders, may stick to their new behavior well beyond the pandemic. And the desire to retain the environmental benefits that were a byproduct of reduced economic activity may lead to an increase emphasis on sustainability in future business operations.

We believe that leaders should take this moment not just to fix their supply chains temporarily, but to transform them. Reimagining supply chains to avoid past traps and meet future needs will require a more comprehensive approach (Exhibit 3).

To address the desire for increased resilience, companies can consider establishing dedicated supply-chain risk-management functions and processes. Working alongside manufacturing, procurement, and supply chain, these units assess vulnerabilities across supply nodes and apply a robust risk-mitigation framework in response. Actions might include accelerating decentralization, deploying inventory closer to customers, and developing crisis-response plans and capabilities.

And while existing supply-chain risk organizations have typically focused on a narrow range of risks, such as logistics delays or suppliers' financial stability, the scope of the risk-management function can expand to include factors such as prolonged interruptions of cross-border flows, or social and geopolitical disruptions. Managing these risks will demand investment in improved business-discontinuity prediction capabilities, risk-transfer mechanisms, and crisis planning. It may also drive physical reconfiguration of supply chains, particularly for critical components and raw materials.

Similarly, boosting the supply chain's end-to-end digital capabilities requires a coordinated view across nodes so that companies can connect the dots with the latest digital tools and capabilities. Autonomous planning systems with machine-learning capabilities can base their forecasts on many more factors and learn the "next normal" much faster than traditional approaches for building business continuity, preserving cash, and strengthening supply-chain resilience.

## Five themes could drive a post-COVID transformation in supply chains.

Observations during the crisis		Emerging trends in supply chains of the future
Rapidly redeploying resources in government and industry to meet essential demands		Developing more-agile mindsets and behaviors, with increased acceptance for previously disputed centralization opportunities
Increasing exposure of supply-chain risks that were previously unrecognized or dismissed		Establishing dedicated risk-management functions to prepare long-term risk-mitigation strategies with a greater emphasis on supply-chain management
Rising concerns about supply-chain disruption and shortages of critical goods		Increasing regionalization and inventory storage closer to end consumer, with reexamination of the supplier footprint
Discovering new ways of doing things—eg, online ordering for all essential goods and working remotely		Focusing on capability building, not only for online channels but also for embedding digital tools and skills, eg, in automation, end-to-end planning, and shared service centers for supply-chain management
Recognizing environmental benefits of shutdowns while societies adapt to lower activity levels		Accelerating societal push for sustainability, with high-pollution activities increasingly perceived as expendable

**Whether through more accurate forecasts, reduced downtime, or faster delivery and turnaround times, digitization of the end-to-end supply chain will help businesses eliminate inefficiencies, improve responsiveness, and dramatically reduce overall supply-chain costs.**

In manufacturing, robots and cobots can increasingly provide additional data to flag problems or identify improvement opportunities. For example, many companies still conduct routine maintenance on major equipment according to a fixed schedule, with little to no visibility into whether action is actually needed. Digital diagnostic capabilities allow for real-time monitoring of equipment, helping lower cost by reducing wasteful maintenance practices. And in product delivery, firms can employ digital logistics practices, using thousands of datapoints to optimize, track, and optimize again with real-world inputs for real-time solutions.

Digitization today can empower firms to reap benefits long into the future. Whether through more accurate forecasts, reduced downtime, or faster delivery and turnaround times, digitization of

the end-to-end supply chain will help businesses eliminate inefficiencies, improve responsiveness, and dramatically reduce overall supply-chain costs. It will also be a critical tool in supply-chain organizations' responses to future challenges. The next normal may see a stronger push for sustainability and reduced environmental impact by customers and regulators, as lower pollution levels have been one of the few fortunate byproducts of reduced activity.

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It can be challenging to see these positives in the wake of disruptions caused by the coronavirus; however, the crisis has given companies a unique moment to reimagine operations to create a better future.

**Knut Alicke** is a partner in McKinsey's Stuttgart office, **Richa Gupta** is an associate partner in the **New Jersey** office, and **Vera Trautwein** is an expert in the Zurich office.

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# Reimagine: Preparing for SG&A in the next normal

As the COVID-19 pandemic continues and its economic impact increases, the productivity and reallocation imperative for sales, general, and administrative (SG&A) activities continues to sharpen.

*This article was written collaboratively by the global leaders of the McKinsey Corporate Business Functions Practice, a group that spans regions and includes Steven Eklund, Heiko Heimes, Matt Jochim, Rowan Mawa, Carey Mignerey, Jung Paik, Rob Pepper, Abhishek Shirali, Ed Woodcock, and Megan Wells.*

The **COVID-19 pandemic** has brought rapid change to organizations as they strive to adapt to the next normal. Transformations that would typically take years to implement are being achieved in a few months—such as skyrocketing growth in e-commerce and omnichannel platforms and the rapid implementation of automation technologies.

We see similar trends in the findings from our survey of nearly 300 global CXOs across a wide range of industries and functions: organizations are increasing their cost-reduction targets, modifying their operating models on the fly, and redefining their functional priorities. Conducted as a follow-up to "Reset and reallocate: SG&A in the next normal" from May 2020, the latest poll asked how executives are thinking about SG&A in the months ahead.

### Cost reduction continues, but not at the expense of growth

Given current challenges, it's hardly surprising that 76 percent of executives reported cost management and growth as two of their top three priorities over the next 12 months. More noteworthy are the respondents' plans for spending: building digital capabilities has risen to become as a clear top-three priority, with 61 percent of respondents citing it as a top priority, up from 42 percent just one quarter earlier.

Reorganization also increased in priority since last quarter, rising from 26 percent to 37 percent. That finding matches what we have heard from individual CXOs: months of remote working and rapidly changing circumstances have prompted fundamental questions about new ways of working and decision-making (Exhibit 1).

Exhibit 1

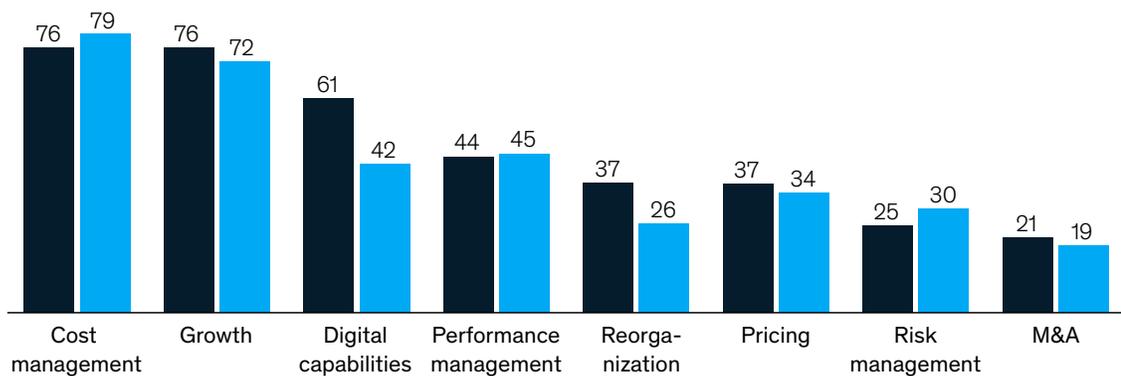
## Executives are prioritizing cost and growth for the next 12 months.

### Digital capabilities are a rising focus



**Top 3 priorities for next 12 months**  
Frequency of response among top 3, %

■ Q3 (August 2020) ■ Q2 (May 2020)



Source: McKinsey Corporate Business Functions Practice

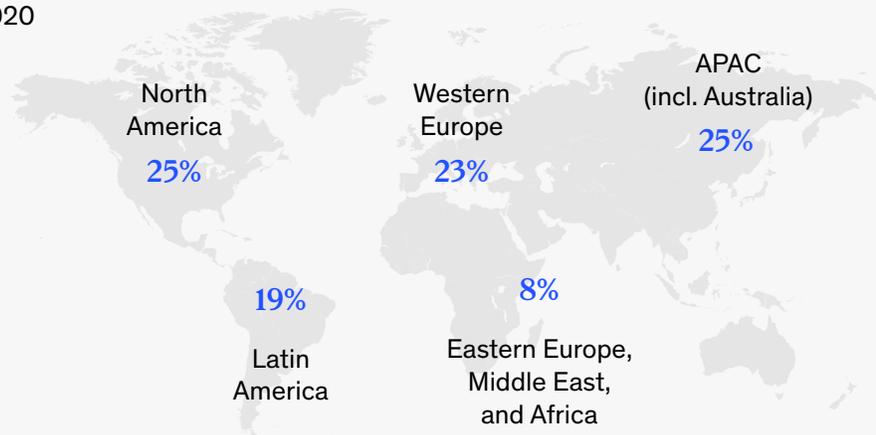
## Our methodology

The latest edition of our quarterly survey of CXOs across the world gathered responses from 289 C-suite leaders, split across the major geographic regions and with representation across manufacturing, service industries, and corporate functions (exhibit). A wide range of sectors were represented, with the highest number of responses from the telecom, media, and technology subsectors at 22 percent, financial services close behind at 21 percent, and retail accounting for 15 percent. Functional representation was diverse as well, with finance, HR, procurement, and IT together accounting for just over 60 percent of the total responses.

Exhibit

### We listened across industries and regions.

**289 CXOs**  
as of September 2020



#### Industry, %



#### Function, %



Source: McKinsey Corporate Business Functions Practice

## Cost targets get tougher, with little tailoring

We also explored how companies intend to achieve these priorities, beginning with cost reduction. Since the second quarter, the reduction targets have increased by as much as 5 percentage points, depending on category (Exhibit 2). What has not changed, however, is the uniformity of the targets across the organization: one-size-fits-all continues to be the dominant model. Almost 80 percent of executives reported a dispersion among targets

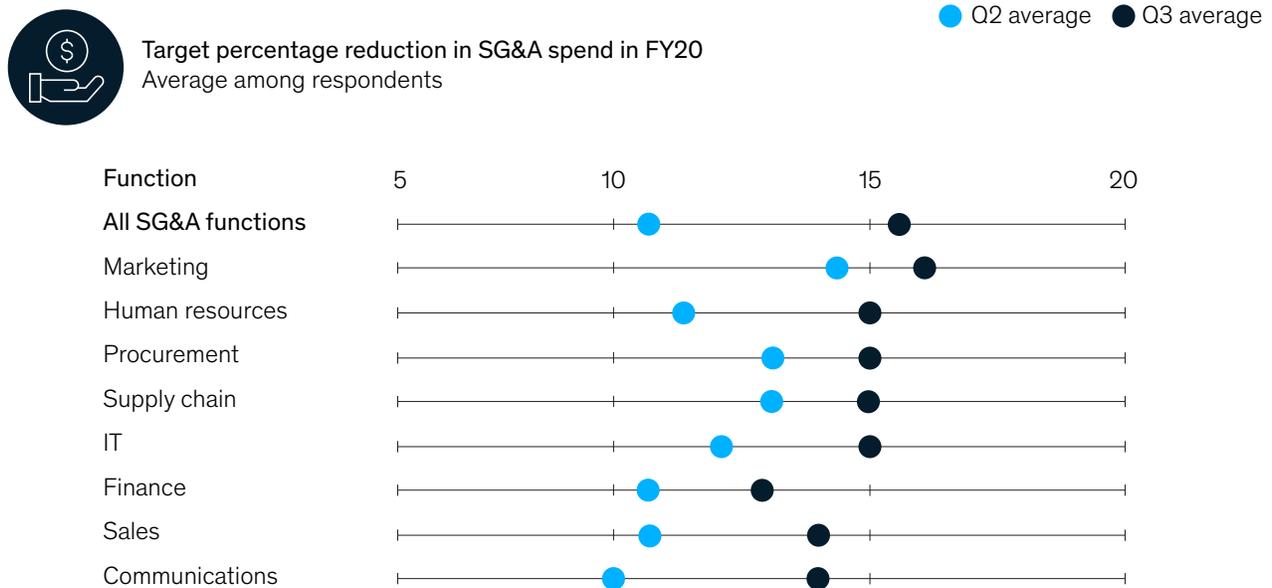
of less than 20 percent across functions. As we have said earlier, while this approach might seem fair, it often leaves money on the table, and risks sacrificing future strategic needs to current short-term demands.

## The road ahead looks complicated

When we undertook this survey, most organizations had already launched SG&A improvement programs. The findings indicate a significant

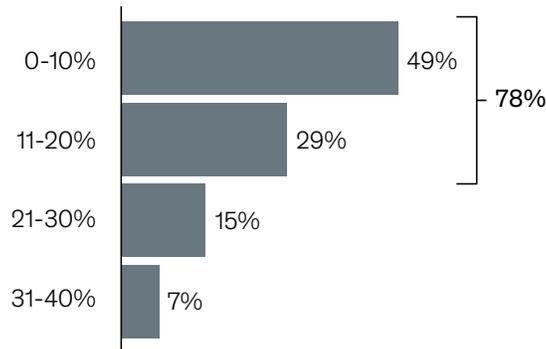
Exhibit 2

### Reduction targets have risen, but still follow a 'one size fits all' model.



### Dispersion of reduction targets among functions

% of respondents



Source: McKinsey Corporate Business Functions Practice

pessimism regarding the potential outcome of these transformations, with most respondents feeling at least “somewhat unprepared” or worse when asked about their confidence in meeting targets (Exhibit 3). Our guidance for SG&A programs is threefold: set the efficiency and effectiveness ambition high, realize the value creation potential in those investments, and reset from a zero base.

### Remote work is hard work

A shift to remote work often changes an organization’s operating model. Although the resulting challenges are not new, organizations face increasing pressure to maintain productivity while further accelerating the adoption of digital and analytics technologies. Even as executives increasingly accept that remote working is here

to stay, they also acknowledge that making it sustainable will involve a combination of hard and soft success factors—from technology infrastructure and data security to improved collaboration, coaching, and performance management (Exhibit 4).

### The center rises

To manage the complicated road ahead, executives say they are looking to their corporate centers to steer the ship. As organizations usher in the next normal, they expect greater centralization, with the corporate center playing an increasingly pivotal role in operating-model changes, strategy setting, and financial governance (Exhibit 5).

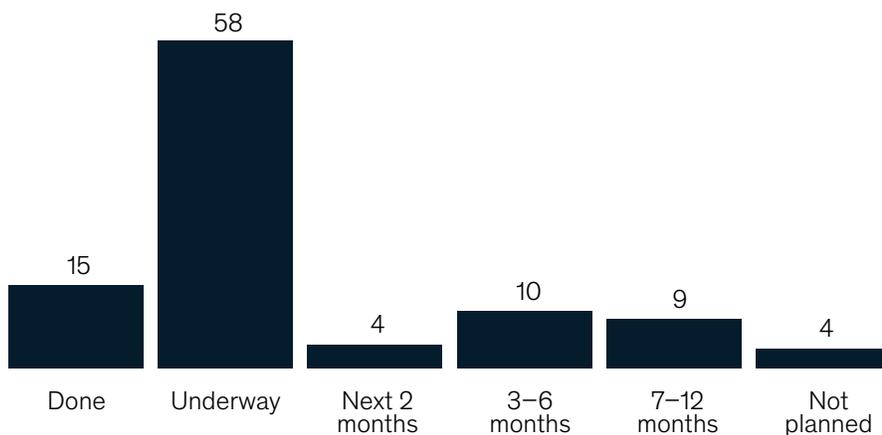
Exhibit 3

## Targets appear out of reach for many SG&A programs now underway.

### Pessimism is widespread about meeting SG&A targets



Timeline to launch SG&A improvement program  
% of respondents<sup>1</sup>



Yet...

# 66%

Feel “somewhat unprepared” or worse when asked about confidence in meeting spend-reduction targets

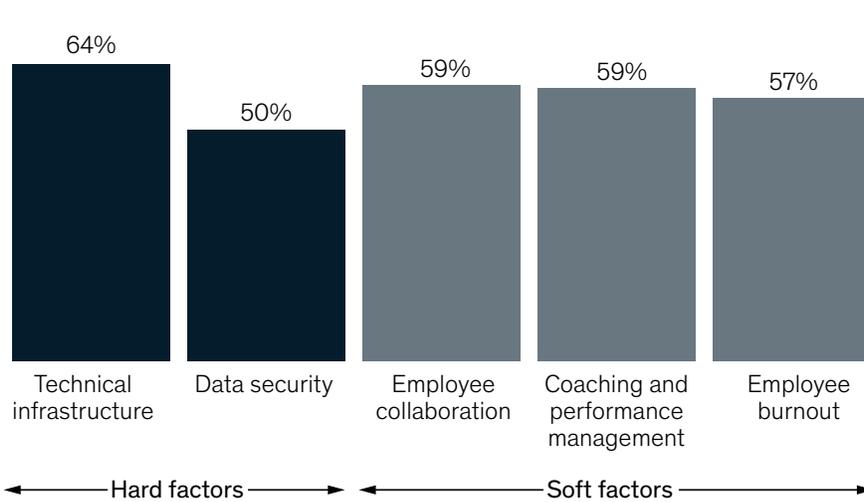
<sup>1</sup>35 respondents did not provide an answer  
Source: McKinsey Corporate Business Functions Practice

Exhibit 4

### Long-term work from home raises technology and human challenges.



Top challenges in implementing work from home  
% of respondents



# 72%

of executives say that their organizations have started adopting permanent remote-working models

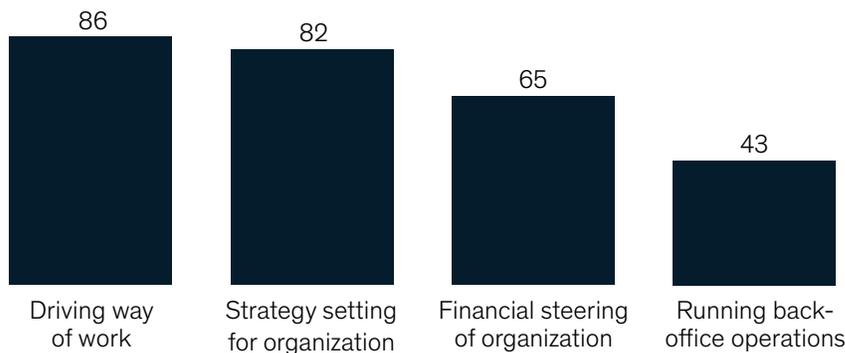
Source: McKinsey Corporate Business Functions Practice

Exhibit 5

### Executives foresee the corporate center taking a greater lead in shaping activities.



Corporate center's responsibilities in a post-COVID world  
% of respondents



# 70%

of executives expect the corporate center to play a more relevant role in steering the organization

Source: McKinsey Corporate Business Functions Practice

At the start of the COVID-19 pandemic, executives acted with speed and agility to address challenges head-on.

The rapid shift to remote work in the last year appears likely to stick. Now organizations have the

opportunity to transform their operating models with new priorities, new capabilities, and a new flexibility to reflect the changing needs of the next normal.

**Steven Eklund** is a partner in McKinsey's Stamford office, where **Ed Woodcock** is a senior expert; **Heiko Heimes** is a senior expert in the Hamburg office; **Matt Jochim** is a partner in the London office; **Rowan Mawa** is an associate partner in the Sydney office; **Carey Mignerey** is a partner in the Singapore office; **Jung Paik** is a partner in the Boston office; **Rob Pepper** and **Abhishek Shirali** are both associate partners in the Atlanta office; and **Megan Wells** is a knowledge expert in the Vancouver office.

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# Reimagining procurement for the next normal

Procurement has led the way out of a crisis before, and can again. But success will mean rethinking every aspect of the function.

*by Tarandeep Singh Ahuja, Yen Ngai, Sukrut Kharia, and Harkanwal Singh Sidhu*

**The COVID-19 pandemic** has put an enormous strain on global supply chains, at times halting manufacturing while shutting down airports and seaports, interrupting delivery of raw materials and finished goods. At the pandemic's onset, procurement departments switched to crisis-management mode to help companies alleviate disruptions, including sourcing personal protective gear for employees and helping smaller suppliers manage their cash flow.

Based on our research and feedback from global procurement leaders, we believe that companies can continue to rely on procurement to recover from the current crisis, in much the same way that they used the function to recover from past crises. But for procurement to lead the way, companies will want to reimagine not just what the function does but also how it operates and which new capabilities it will need.

Our analysis suggests that procurement could gain the most by focusing its strategic initiatives in five key areas: strengthening supply-chain resilience, zero-basing the design of category value-creation strategies, investing in supplier partnerships and innovation, accelerating adoption of digital and analytics, and transforming to an agile operating model. By proactively making these changes, procurement leaders can not only counter some of the worst effects of the crisis, but can also set themselves up to prosper in the future.

### **Procurement has led prior crisis-recovery efforts**

Companies have a lot to bounce back from. As of this writing, many of the world's largest economies were experiencing record-breaking economic contractions.

Yet procurement has helped companies weather global crises before. According to our research, in the five years immediately following the 2008 global financial crisis (GFC), total return to shareholders (TRS) for companies with top-quartile procurement capabilities was 42 percent higher than for companies whose procurement operations were in the bottom quartile (Exhibit 1).

We also found that companies with top-performing procurement functions saw valuations return to pre-GFC levels an average of three years faster, and were able to lower costs of goods sold (COGS) as a percentage of revenue, thus improving EBITDA by 3 percentage points more than bottom performers.

### **New crisis, new challenges**

While procurement can again play a crucial role in recovering from a crisis, this time procurement leaders will want to take a different approach to the function in addressing a range of new issues. In a recent survey we conducted, top Asia-Pacific procurement leaders pointed to a significant difference between recovery efforts after the GFC and what's happening now. Then, most companies focused on strategies to recover from the financial effects of the recession. Today, in addition to recovering profitability and finding ways to preserve cash, companies face the added challenges of shifting supply-market dynamics, changing ways of working, increasingly volatile demand, and de-risking their supply chain to make it less vulnerable to disruption (Exhibit 2).

A closer look at the most significant challenges shows exactly what procurement leaders are up against:

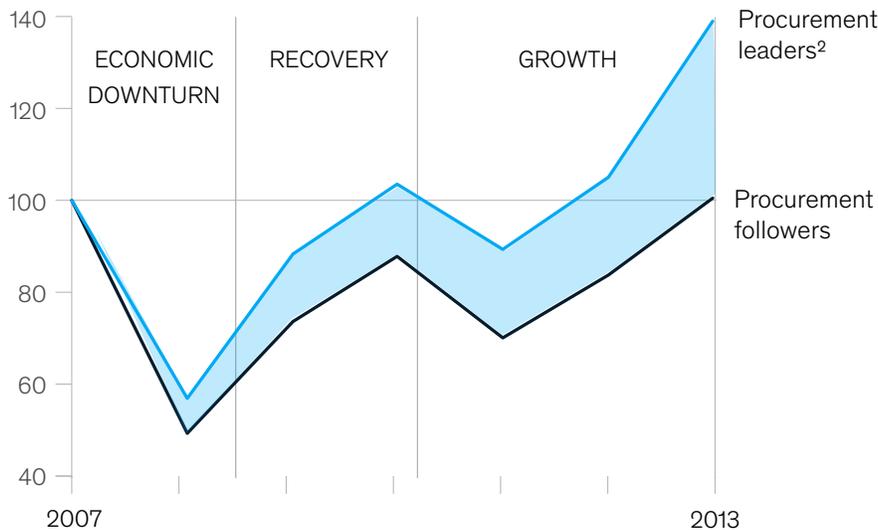
***Region-specific shutdowns and supply disruptions.*** When the pandemic disrupted deliveries, it highlighted the issues in a complex global supply chain. In a separate McKinsey survey, 93 percent of procurement and supply-chain leaders said they planned to increase the resilience of their supply chains, and 44 percent said they would be willing to give up some short-term efficiencies to get it—although this sort of trade-off can prove avoidable in some cases. Building relationships with more diverse suppliers may help companies withstand further disruptions in supply availability.

***Shifting market dynamics and value pools.*** The pandemic upended market dynamics and value pools in many industries: for example,

Exhibit 1

## High-performing procurement functions helped companies recover from the 2008 global financial crisis.

Cumulative TRS<sup>1</sup> performance, indexed to 100 (FY2007)



Following the global financial crisis (GFC), procurement leaders significantly outperformed followers

**42%**

higher cumulative TRS in the 5 years postcrisis

**~3 years**

faster recovery to pre-GFC TRS

<sup>1</sup>TRS = total returns to shareholders, calculated as average of subsectors' median performance within resilient and nonresilient categories; n = 265 companies; excludes financial companies and public-sector enterprises.

<sup>2</sup>Companies across the sample set identified as in top quartile of performance in global purchasing excellence. Source: Capital IQ, CPA analytics, McKinsey analysis

expanding value pools for tech companies with cloud-based platforms that help remote workers communicate and collaborate, while adding pressure to commercial real-estate markets and the airline industry. Decades-old paradigms are being upended: ever-increasing global sourcing now potentially giving way to regionalization of supply, and lean inventory targets being reset in favor of higher buffer stock.

**Shortages created by volatile demand.** Early in the pandemic, demand spikes and supply disruptions created shortages of consumer essentials such as toilet paper, bleach, and hand sanitizer. Now, construction may see increased demand for selected types of services as governments allocate resources to encourage infrastructure and residential projects. Procurement leaders will need to collaborate even more closely with sales and

demand-planning teams to anticipate and react to market shifts quickly.

**Changing ways of working.** Work from home was becoming popular even before the pandemic. Forced physical distancing accelerated the reimagining of the workplace—and in particular the switch to remote work—faster than almost anyone could have predicted. As in other departments, the shift changed how procurement operates. Team meetings, supplier site visits, negotiations, and other face-to-face interactions that procurement professionals took for granted went virtual, or went away—all calling for a new ways of working.

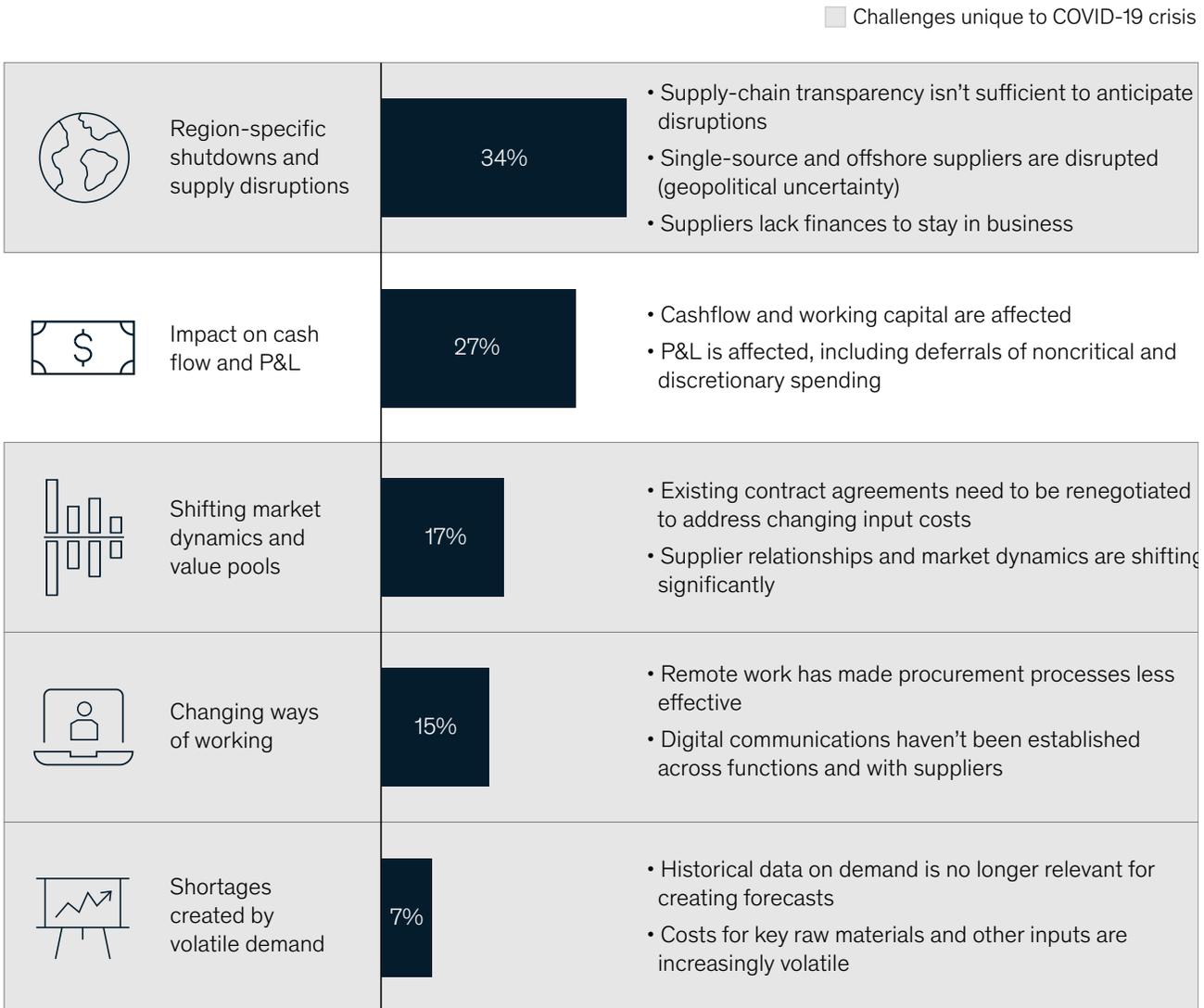
### Five steps to reimagining procurement

Based on our research, conversations with global procurement leaders, and our work with large organizations, we believe that five steps will help

Exhibit 2

**The COVID-19 crisis created a unique set of challenges for procurement leaders.**

**Asia-Pacific procurement leaders who selected the following as the top challenges they face because of the pandemic, %**



Source: CPO survey conducted April, 2020 (n=298)

procurement leaders address the current situation and set up their organizations for success (Exhibit 3).

**Strengthen supply-chain resilience.** As supply chains become more global and interconnected, they face a range of challenges, including climate change, the rise of a multipolar economic system,

added geopolitical risks, and risk of mass health-care events. In the past several years, at least one company in twenty has suffered a supply-chain disruption costing at least \$100 million. Companies with complex supply-chain networks, such as automotive and technology manufacturers, are especially vulnerable.

**Leaders can reimagine procurement in five key areas.**



**Strengthen supply-chain resilience**



**Zero-base category strategies and value creation**



**Develop supplier partnerships and co-innovation**



**Accelerate digital and analytics adoption**



**Transform to a future-ready operating model**

**Build transparency** into the supply chain beyond Tier-1 suppliers

**Multisourcing** of critical input

**Run simulations and develop business-continuity plans** for range of scenarios

**Completely rethink category strategies** where demand-supply dynamics have significantly shifted

**Reassess price, demand, and specification opportunities** lever by lever

**Explore vendor partnerships** to co-innovate products, services, and even business models

**Develop contractual arrangements** that incentivize performance

**Accelerate digitization of procurement processes** to enhance remote working

**Leverage spend analytics to build competitive advantage** and counter margin pressures

**Adopt agile methods**, enabling teams to respond quickly to changing goals and circumstances

**Build capabilities** needed to work in new ways

The time is right to do a thorough assessment of supply-chain risks and manage them more thoughtfully. Companies can create better transparency by working with suppliers to gain information about their next-tier suppliers and their upstream value chains. Business-continuity planning has taken on a new meaning, designing contingencies not just for a single supplier plant to go offline, but for entire countries to be inaccessible. War game-like simulations of possible supply-chain disruptions can uncover hidden vulnerabilities. One global electronics manufacturer conducted a detailed stress test of its supply chain, finding that around a quarter of its spend was at high risk—concentrated in three critical component categories. The company is now implementing a multistep plan addressing 100 suppliers, with the aim of reducing high-risk spend by 40 percent.

**Zero-base category strategies and value creation.** Procurement leaders are reevaluating individual spend categories to make the most of shifting market dynamics and address the risks posed by

changing value pools. At the onset of the pandemic, some of the most dramatic value-pool shifts occurred in commercial real estate and oil and gas, which were among the sectors most affected by forced shutdowns. To capture or regain the potential value the shifts created, procurement leaders may need to completely rethink their strategies for the affected categories. To create value in commercial real estate, for example, instead of simply renegotiating leases, a procurement leader can consider how the organization’s work practices will likely evolve in the future as flexible and remote working grow. By collaborating with HR and IT in category-strategy deliberations to determine an optimal office footprint, procurement can help in realizing better long-term outcomes, such as by emphasizing “access to space as needed” over simply “the most space at the lowest price.”

Some procurement organizations may seek to minimize risk exposure by structuring contracts to build in performance incentives. Instead of contracting with IT suppliers on the basis of time

and materials, procurement departments can look to peg contractor fees to performance. Or they can negotiate a switch to subscription-based contracts that tie fees to usage or outcomes, which can improve performance and reduce upfront capital costs.

***Invest in partnerships and innovation.*** Companies are looking for opportunities to create competitive advantages for themselves to counter the downturn that the pandemic has created, including through partnerships and joint innovation. Connecting with partners that have an existing infrastructure or complementary service can make it faster and easier to adapt to a changing environment. In Australia, in the immediate aftermath of the crisis, supermarkets in need of extra personnel to handle a sudden surge in sales contracted with thousands of airline workers who had been sidelined when airlines downsized. An Indian grocery chain rolled out home deliveries by partnering with a local ride-sharing company rather than taking on the cost of buying its own truck fleet. Strategic investments can also be an attractive option, as illustrated by digital-platform investments in sectors including financial services, industrial equipment, and retail. Partnerships of this type are likely to continue as outperformers look to create competitive advantages by partnering with suppliers for new products or services.

***Accelerate adoption of digital and analytics.*** Procurement leaders have talked about digitizing procurement for some time. But our discussions with them indicate that progress has been slow. Many are trapped in pilot purgatory, making small investments in select use cases that never scale up to achieve real business impact. The rapid adoption of new ways of working that the pandemic necessitated forced companies to accelerate the shift to digital. As remote work becomes the next normal, digitization can be an important enabler of effective collaboration across functions. An Asian steel manufacturer improved collaboration in procurement by adopting a cloud-based supplier-

negotiation platform. Procurement, operations, and legal staff log onto the platform to prepare and review proposed contract terms, ultimately speeding up negotiations with suppliers and reaching better outcomes.

To counter crisis-induced margin pressures and increased volatility, spend analytics can provide a rich source of new insights and opportunities that together create new forms of competitive advantage. For example, in procurement of selected minerals, predictive analytics can already be used to integrate information including mining activity, shipping data, weather, and economic indicators—and it can even analyze satellite images of at-port stockpiles to give a much more accurate prediction of market prices.

***Transform to a future-ready operating model.*** To lead in the next normal, procurement departments need to transform how they operate and collaborate with internal and external stakeholders. Adopting an agile operating model could help procurement functions scale up or down quickly to respond to sudden supply challenges. Agile methods could be applied to key strategic issues, such as assigning a cross-functional “sprint team” to accelerate capturing value in a specific spend category, or creating a “negotiation factory” to deliver contract negotiations in assembly-line fashion or rapidly onboarding a new supplier.

These new ways of working require new skills: data engineers and data scientists are becoming increasingly commonplace in leading procurement departments, and demand for data capabilities is increasing across the function. Procurement leaders will also want to step up on the soft skills required to cultivate solid partnerships with suppliers and to collaborate more effectively with internal functions across the business in a more agile manner. This will require attracting new talent and upskilling the existing talent. Leading organizations are adopting virtual training methods and gamified digital tools

to engage experienced workers and develop their talent. The winning procurement organizations will adopt a continuous learning culture as a way of life.

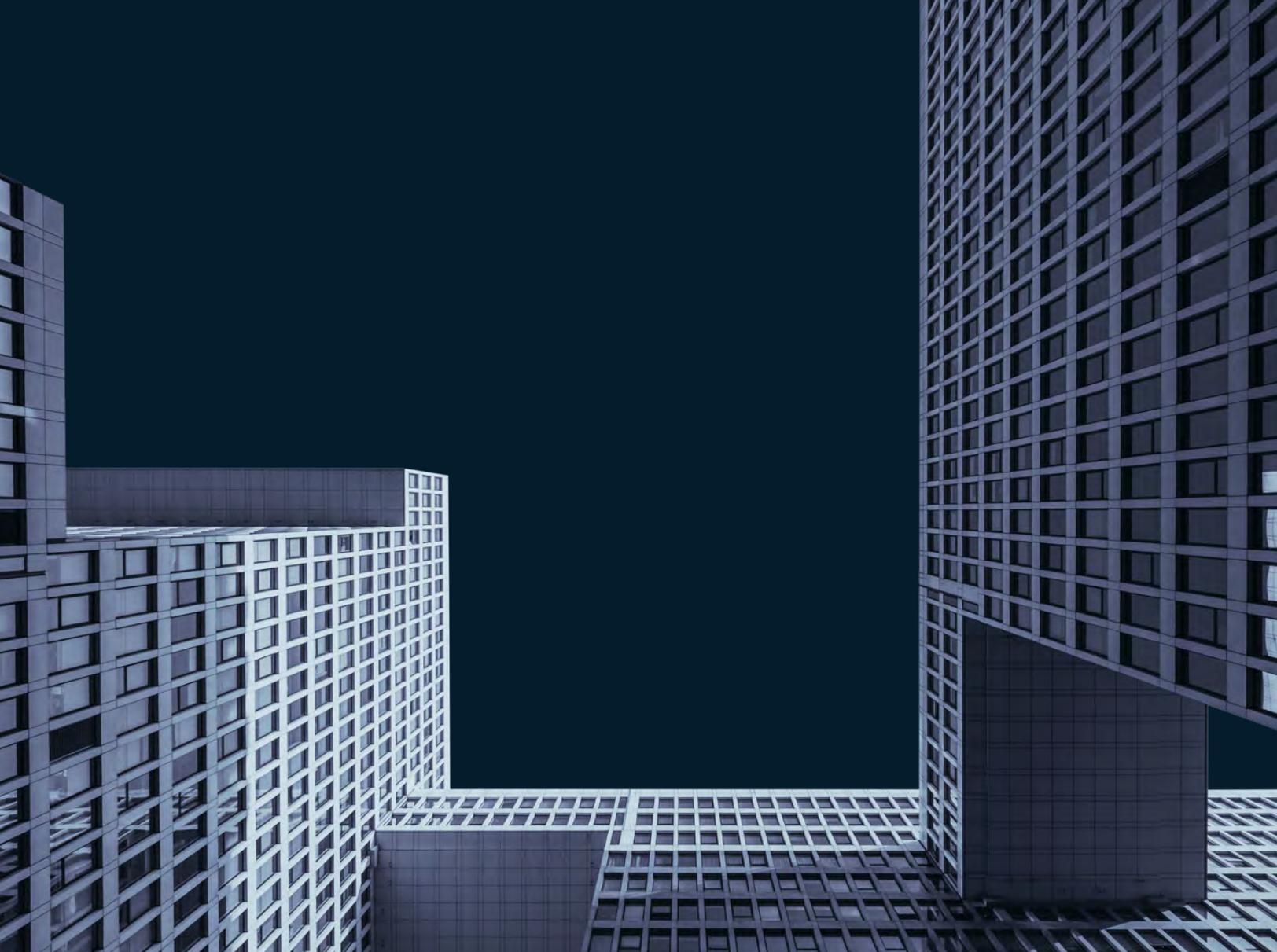
deliver. Investing in stronger, future-ready practices and capabilities will pay off in the short term, and help organizations emerge stronger and better prepared for any future crisis.

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Procurement can drive an organization's pandemic recovery efforts. Forward-looking companies will go a step further and completely reimagine what the function looks like to enhance the value that it can

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Executive summary

# The next normal in construction: How disruption is reshaping the world's largest ecosystem

How disruption is reshaping the world's largest ecosystem

**Construction, which encompasses** real estate, infrastructure, and industrial structures, is the largest industry in the global economy, accounting for 13 percent of the world's GDP. A closer look at its underlying performance highlights the industry's challenges in good economic times, let alone in times of crisis. We expect a set of nine shifts to radically change the way construction is done. Companies that can adjust their business models stand to benefit handsomely, while others may struggle to survive.

### **Historically, the construction industry has underperformed**

Construction is responsible for a wide range of impressive accomplishments, from stunning cityscapes and foundational infrastructure on a massive scale to sustained innovation. However, in the past couple of decades, it also has been plagued by dismal performance.

Annual productivity growth over the past 20 years was only a third of total economy averages. Risk aversion and fragmentation as well as difficulties in attracting digital talent slow down innovation. Digitalization is lower than in nearly any other industry. Profitability is low, at around 5 percent EBIT margin, despite high risks and many insolvencies. Customer satisfaction is hampered by regular time and budget overruns and lengthy claims procedures.

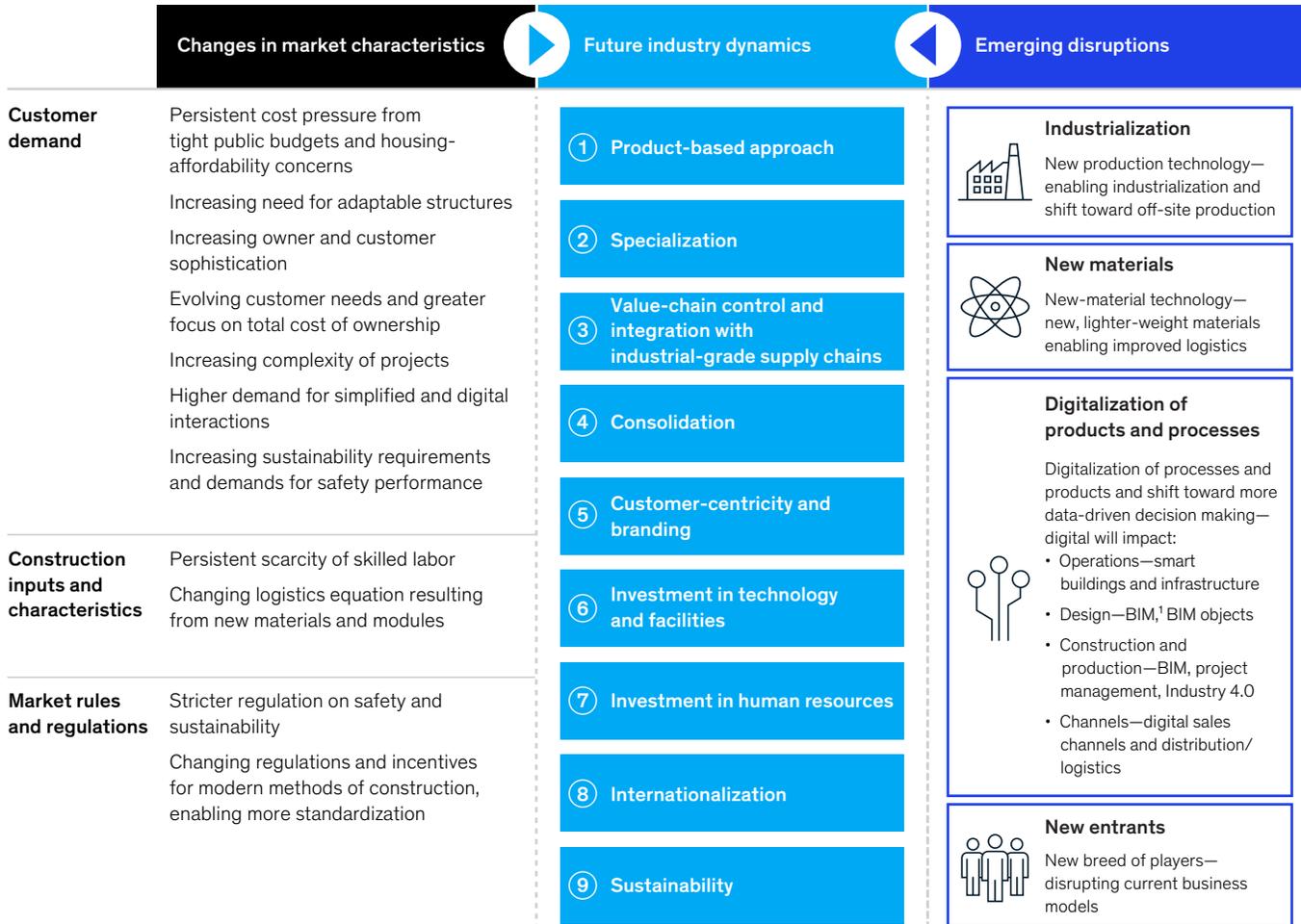
The industry will feel the economic impact of the COVID-19 strongly, as will the wider construction ecosystem—which includes construction companies' component and basic-materials suppliers, developers and owners, distributors, and machinery and software providers. At the time of writing, high levels of economic uncertainty prevail worldwide, and the construction industry tends to be significantly more volatile than the overall economy. MGI scenarios suggest that if things go well, construction activity could be back to pre-crisis levels by early 2021. But longer-term lockdowns could mean that it takes until 2024 or even later. In the past, crises have had an accelerative effect on trends, and this crisis is also expected to

trigger lasting change impacting use of the built environment, like online channel usage or remote-working practices.

The lagging performance of the construction industry is a direct result of the fundamental rules and characteristics of the construction market and the industry dynamics that occur in response to them. Cyclical demand leads to low capital investment, and bespoke requirements limit standardization. Construction projects are complex, and increasingly so, and logistics need to deal with heavy weight and many different parts. The share of manual labor is high, and the industry has a significant shortage of skilled workers in several markets. Low barriers to entry in segments with lower project complexity and a significant share of informal labor allow small and unproductive companies to compete. The construction industry is extensively regulated, subject to everything from permits and approvals to safety and work-site controls, and lowest-price rules in tenders make competition based on quality, reliability, or alternative design offerings more complicated.

In response to these market characteristics, today's construction industry must grapple with several dynamics that impede productivity and make change more difficult. Bespoke projects with unique features and varying topology have a limited degree of repeatability and standardization. Local market structures and ease of entry have resulted in a fragmented landscape (both vertically and horizontally) of mostly small companies with limited economies of scale. Moreover, every project involves many steps and companies in every project with scattered accountability, which complicates the coordination. Contractual structures and incentives are misaligned. Risks are often passed to other areas of the value chain instead of being addressed, and players make money from claims rather than from good delivery. High unpredictability and cyclicalities have led construction firms to rely on temporary staff and subcontractors, which hampers productivity, limits economies of scale, and reduces output quality and customer satisfaction.

## Changing characteristics and emerging disruptions will drive change in the industry and transform ways of working.



<sup>1</sup>Building-information modeling.

### A changing market environment, technological progress, and disruptive new entrants will trigger industry overhaul

The construction industry was already starting to experience an unprecedented rate of disruption before the COVID-19 pandemic. In the coming years, fundamental change is likely to be catalyzed by changes in market characteristics, such as scarcity of skilled labor, persistent cost pressure from infrastructure and affordable housing, stricter regulations on work-site sustainability and safety, and evolving sophistication and needs of customers

and owners. Emerging disruptions, including industrialization and new materials, the digitalization of products and processes, and new entrants, will shape future dynamics in the industry (Exhibit A).

#### Sources of disruption

*Rising customer sophistication and total-cost-of-ownership (TCO) pressure.* Customers and owners are increasingly sophisticated, and the industry has seen an influx of capital from more savvy customers. From 2014 to 2019, for example, private-equity firms raised more than \$388 billion to fund infrastructure projects, including \$100

billion in 2019 alone, a 24 percent increase from 2018. Client demands are also evolving regarding performance, TCO, and sustainability: smart buildings, energy and operational efficiency, and flexibility and adaptability of structures will become higher priorities. Expectations are also rising among customers, who want simple, digital interactions as well as more adaptable structures.

The industry is facing persistent cost pressure because of tight public budgets and housing-affordability issues. McKinsey analysis found that \$69.4 trillion in global infrastructure investment would be needed through 2035<sup>1</sup> to support expected GDP growth and that every third global urban household cannot afford a decent place to live at market prices.<sup>2</sup> The economic fallout of the COVID-19 crisis magnifies the cost and affordability issues.

***Persistent scarcity of skilled labor and changing logistics equations.*** Skilled-labor shortages have become a major issue in several markets, and retirements will drain talent. For example, about 41 percent of the current US construction workforce is expected to retire by 2031. The impact the COVID-19 crisis will have on this dynamic in the long term is unclear at the time of writing.

***Safety and sustainability regulations and possible standardization of building codes.*** Requirements for sustainability and work-site safety are increasing. In the wake of COVID-19, new health and safety procedures will be required. The global conversation about climate change puts increasing pressure on the industry to reduce carbon emissions.

At the same time, in some markets, governments are recognizing the need to standardize building codes or provide type certificates and approvals for factory-built products rather than reviews of each site. The process, however, is still slow.

***Industrialization.*** Modularization, off-site production automation, and on-site assembly automation will enable industrialization and an off-site, product-based approach. The shift toward a more controlled

environment will be even more valuable as the COVID-19 pandemic further unfolds. The next step in the transition to efficient off-site manufacturing involves integrating automated production systems—essentially making construction more like automotive manufacturing.

***New materials.*** Innovations in traditional basic materials like cement enable a reduction of carbon footprints. Emerging lighter-weight materials, such as light-gauge steel frames and cross-laminated timber, can enable simpler factory production of modules. They will also change the logistics equation and allow longer-haul transport of materials and greater centralization.

***Digitalization of products and processes.*** Digital technologies can enable better collaboration, greater control of the value chain, and a shift toward more data-driven decision making. These innovations will change the way companies approach operations, design, and construction as well as engage with partners. Smart buildings and infrastructure that integrate the Internet of Things (IoT) will increase data availability and enable more efficient operations as well as new business models, such as performance-based and collaborative contracting. Companies can improve efficiency and integrate the design phase with the rest of the value chain by using building-information modeling (BIM) to create a full three-dimensional model (a “digital twin”)—and add further layers like schedule and cost—early in the project rather than finishing design while construction is already underway. This will materially change risks and the sequence of decision making in construction projects and put traditional engineering, procurement, and construction (EPC) models into question. Automated parametric design and object libraries will transform engineering. Using digital tools can significantly improve on-site collaboration. And digital channels are spreading to construction, with the potential to transform interactions for buying and selling goods across the value chain. As in other industries, the COVID-19 pandemic is accelerating the integration of digital tools.

<sup>1</sup>“Bridging infrastructure gaps: Has the world made progress?” McKinsey Global Institute, October 2017.

<sup>2</sup>“Tackling the world’s affordable housing challenge,” McKinsey Global Institute, October 2014.

**New entrants.** Start-ups, incumbent players making new bets, and new funding from venture capital and private equity are accelerating disruption of current business models. As the COVID-19-propelled economic crisis unfolds, we also expect an increase in corporate restructuring and M&A activity.

### **The nine resulting industry shifts**

In response, we expect nine shifts to fundamentally change the construction industry. According to our executive survey, more than 75 percent of respondents agree that these shifts are likely to occur, and more than 60 percent believe that they are likely to occur within the next five years. The economic fallout from the COVID-19 pandemic looks set to accelerate them.

**Product-based approach.** In the future, an increasing share of structures and surrounding services will be delivered and marketed as standardized “products.” This includes developers promoting branded offerings, with standardized but customizable designs that can improve from one product generation to the next, and delivery using modularized elements and standardized components produced in off-site factories. The modules and elements will be shipped and assembled on site. Production will consist of assembly line–like processes in safe, nonhostile environments with a large degree of repeatability.<sup>3</sup>

**Specialization.** To improve their margins and levels of differentiation, companies will start to specialize in target niches and segments (such as luxury single-family housing, multistory residential buildings, hospitals, or processing plants) in which they can build competitive advantages. And they will specialize in using different materials, subsegments, or methods of construction. The shift toward specialization will also require companies to develop and retain knowledge and capabilities to maintain their competitive advantages. Obviously, players will need to weigh carefully the effectiveness, efficiency, and brand positioning that greater specialization enables against the potential risk or cyclical benefits of a more diversified portfolio.

**Value-chain control and integration with industrial-grade supply chains.** Companies will move to own or control important activities along the value chain, such as design and engineering, select-component manufacturing, supply-chain management, and on-site assembly. Companies will be able to achieve this goal through vertical integration or strategic alliances and partnerships by using collaborative contracting and more closely aligned incentives. Digital technology will change the interaction model: BIM models will lead to more decision making early on in the process, distribution will move toward online platforms and advanced logistics management, and end-to-end software platforms will allow companies to better control and integrate value and supply chains. Value-chain control or integration will reduce interface frictions and make innovation more agile.

**Consolidation.** Growing needs for specialization and investments in innovation—including the use of new materials, digitalization, technology and facilities, and human resources—will require significantly larger scale than is common today. As product-based approaches, with higher standardization and repeatability, further increase the importance of gaining scale, the industry is likely to increasingly see a significant degree of consolidation, both within specific parts of the value chain and across the value chain.

**Customer-centricity and branding.** With productization—that is, turning development, engineering, or construction services into easy-to-market products or solutions<sup>4</sup>—and specialization in the industry, having a compelling brand that represents an organization’s distinctive attributes and values will take on added importance. As in traditional consumer industries, a strong brand can tie customers more closely to the construction company’s or supplier’s products and help to build and maintain relationships and attract new customers. Similar to brands in other manufacturing industries, such construction brands will encompass, among other aspects, product and service quality, value, timing of delivery, reliability, service offerings, and warranties.

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<sup>3</sup>Hostile environments include outdoor construction sites, places where weather conditions vary, and dangerous settings such as high-rise buildings. Nonhostile environments are typically indoors, on the ground, and measurably safer.

<sup>4</sup>An example would be a student residency “product,” with a standardized design and service package, built from modules produced in factories.

***Investment in technology and facilities.***

Productization implies a need to build off-site factories, which requires investments in plants, manufacturing machinery and equipment (such as robotics to automate manufacturing), and technology. Where modular is not used, the construction site also will likely become more capital intensive, using advanced automation equipment and drones, among other technologies. R&D investment will become more important for specialized or more productized companies, so companies are likely to increase spending to develop new, innovative products and technologies.

***Investment in human resources.*** Innovation, digitalization, value-chain control, technology use, and specialization in end-use segments all increase the importance of developing and retaining in-house expertise, which will compel players to invest more in human resources. The importance of risk management and other current capabilities will decrease and be replaced by an emphasis on others, such as supply-chain management. To build the necessary capabilities, companies will need to further invest in their workforces. This becomes even more important in light of the transition to the future of work.<sup>5</sup> Most incumbents struggle to attract the digital talent they need, and will need to raise excitement about their future business models.

***Internationalization.*** Greater standardization will lower the barriers to operating across geographies. As scale becomes increasingly important to gaining competitive advantages, players will increase their global footprints—both for low-volume projects in high-value segments such as infrastructure, as well as for winning repeatable products that will be in demand across the world. The COVID-19 pandemic might slow down this development.

***Sustainability.*** While sustainability is an important decision factor already, we are only at the very beginning of an increasingly rapid development. Beyond the carbon-abatement discussions, physical climate risks are already growing and require a response.<sup>6</sup> Companies will need to consider the

environmental impact when sourcing materials, manufacturing will become more sustainable (for example, using electric machinery), and supply chains will be optimized for sustainability as well as resilience. In addition, the working environments will need to radically change from hostile to nonhostile, making construction safer. Water consumption, dust, noise, and waste are also critical factors.

Today's project-based construction process looks set to shift radically to a product-based approach (Exhibit B). Instead of building uniquely designed structures on the jobsite, companies will conduct their production at off-site construction facilities.<sup>7</sup> Standardized sub-elements and building blocks will likely be designed in house in R&D-like functions. The elements will be manufactured separately and then combined with customization options to meet bespoke requirements. To produce efficiently and learn through repetition, developers, manufacturers, and contractors will need to specialize in end-user segments. Data-driven business models will emerge. Overall, the process may resemble manufacturing in other industries such as shipbuilding or car manufacturing.

There is reason to believe that a winner-take-most dynamic will emerge, and companies that fail to adjust fast enough risk seeing market shares and margins erode until they eventually go out of business.

Construction is not the first industry to encounter lagging productivity and disruption across the value chain. Lessons can be learned from others that had similar traits and encountered the same challenges that construction faces now. We have analyzed shifts in four of them: shipbuilding, commercial aircraft manufacturing, agriculture, and car manufacturing. Clear patterns of the shifts are evident in all of them, and value shifted to those handling the change best. Innovation in production technology and new work methods kick-started all four of the industries' journeys. Today, across industries, winners continue to heavily invest in technology, many with focus on digitalization and data-driven products and services.

<sup>5</sup>"Skill shift: Automation and the future of the workforce," McKinsey Global Institute, May 2018.

<sup>6</sup>"Climate risk and response: Physical hazards and socioeconomic impacts," McKinsey Global Institute, January 2020.

<sup>7</sup>"Nick Bertram, Steffen Fuchs, Jan Mischke, Robert Palter, Gernot Strube, and Jonathan Woetzel, "Modular construction: From projects to products," June 18, 2019, McKinsey.com.

## The future construction ecosystem will be radically different.

### Today's construction ecosystem

A highly complex, fragmented, and project-based construction process . . .



The construction process is highly **project based**—developed from unique customer specifications, using designs **planned from scratch**, and with limited degree of repetition

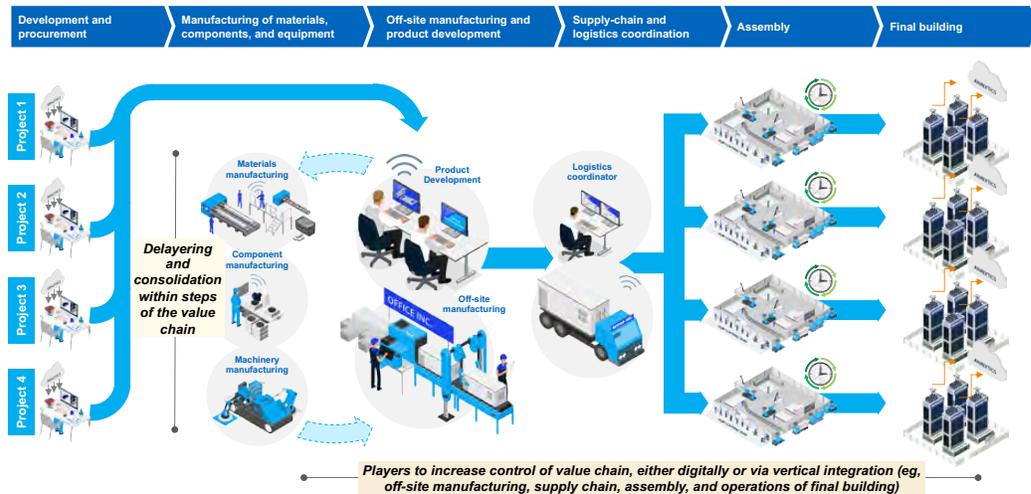
The value chain and player landscape are **local and highly fragmented vertically and horizontally**, resulting in a multitude of players involved at each step and major interface frictions

Construction is performed by generalists **on site in hostile environments**, with a large part of the workforce being **temporary and manual**

Limited use of **end-to-end digital tools and processes** as well as a capital-light delivery approach

### The construction ecosystem of the future

. . . A more standardized, consolidated, and integrated construction process



The construction process is increasingly **product based**, meaning structures will be products and manufactured off site by branded product houses **specializing** in certain end-user segments

Developers choose **entire designs or specific components** from a **library** of options developed in house or offered externally on the market

**Value chain is more consolidated, both vertically (delayering) and horizontally**, with increased degree of **internationalization**

**Disintermediation** takes place through digital marketplaces and direct channels

Contractors focus on **lean, on-site execution and assembly of products**

**Data and analytics** on customer behavior generated after completion to optimize total cost of ownership and future designs

In commercial aircraft manufacturing, for example, the industry landscape was highly fragmented. Each airplane was built from scratch in a bespoke and project-based-manufacturing setup. Industrialization sparked a shift toward assembly-line manufacturing, which later became highly automated. As a result of the subsequent standardization, the industry entered a phase of consolidation that led to the rise of two major players: Airbus and Boeing. The transformation resulted in a significant shift of value to customers. This transformation journey took roughly 30 years to complete, as commercial aircraft manufacturing faced barriers to change similar to those now confronting construction.

### **Almost half of incumbent value added is at stake**

The transformation of the industry will create both large opportunities and sizable risks as value and profit pools shift in the next 15 years. Over the past years, approximately \$11 trillion in value added and \$1.5 trillion in profits have been unevenly distributed along the construction value chain and across all asset classes. Looking ahead, up to 45 percent of incumbent value may be at stake in those parts of the market most heavily affected by shifts, such as hotel construction (Exhibit C). Of this total, 20 to 30 percentage points will be kept and redistributed within the ecosystem to enable the shifts to take place. The remaining 15 to 20 percentage points will be value up for grabs as a result of the cost savings and productivity gains generated by the shifts, with the benefits accruing to players or customers (in the form of price reductions or quality increase). If that value is captured fully by players in the ecosystem, total profit pools could nearly double, to 10 percent, from the current 5 percent.<sup>8</sup> Players that move fast and manage to radically outperform their competitors could grab the lion's share of the \$265 billion in new profit pools.

Some players will be more affected than others. For example, software providers are expected to significantly increase their value-added contribution, albeit from a small base of 1 to 2

percent of the value chain. Also, a large share of value is expected to move from construction jobsites to off-site prefabrication facilities. In contrast, general and specialized contractors could face a large decline unless they reposition themselves as companies that go beyond execution alone. Basic design and engineering and materials distribution and logistics may face substantial commoditization and automation risks.

The value at stake could benefit either the players in the ecosystem as profits increase, workers in the form of higher wages, or customers through lower prices and higher quality. Companies that move fast and manage to lower their cost base and increase productivity will have an advantage over the competition. These early movers could translate their productivity gains into profit. In the long term, as other players adjust and competition intensifies, the dynamics in other industries suggest that a large share of the gains will be passed on to customers.

Our baseline scenario estimates that 10 to 12 percent of construction activities will move along shifts outlined in this report by 2035, but change will vary significantly by asset class because of different starting points and abilities to transform. In real estate, for example, we expect that by 2035 an additional 15 percent of new building projects could be completed through a redesigned value chain. This higher-than-average number is partly the result of the potential for standardization in single- and multifamily residential, hotels, offices, and hospitals. For infrastructure, approximately 7 percent of additional new building volume could be delivered in a transformed way—with bridges, airports, and railways, for example, having particular potential. Industrial construction could see an additional penetration of about 5 percent, as several of its subsegments have already made significant progress in the past.

### **Transformation will take time, but the COVID-19 crisis will accelerate change**

The full transformation of the construction industry could take decades, but the process has already begun. Our survey shows that industry leaders

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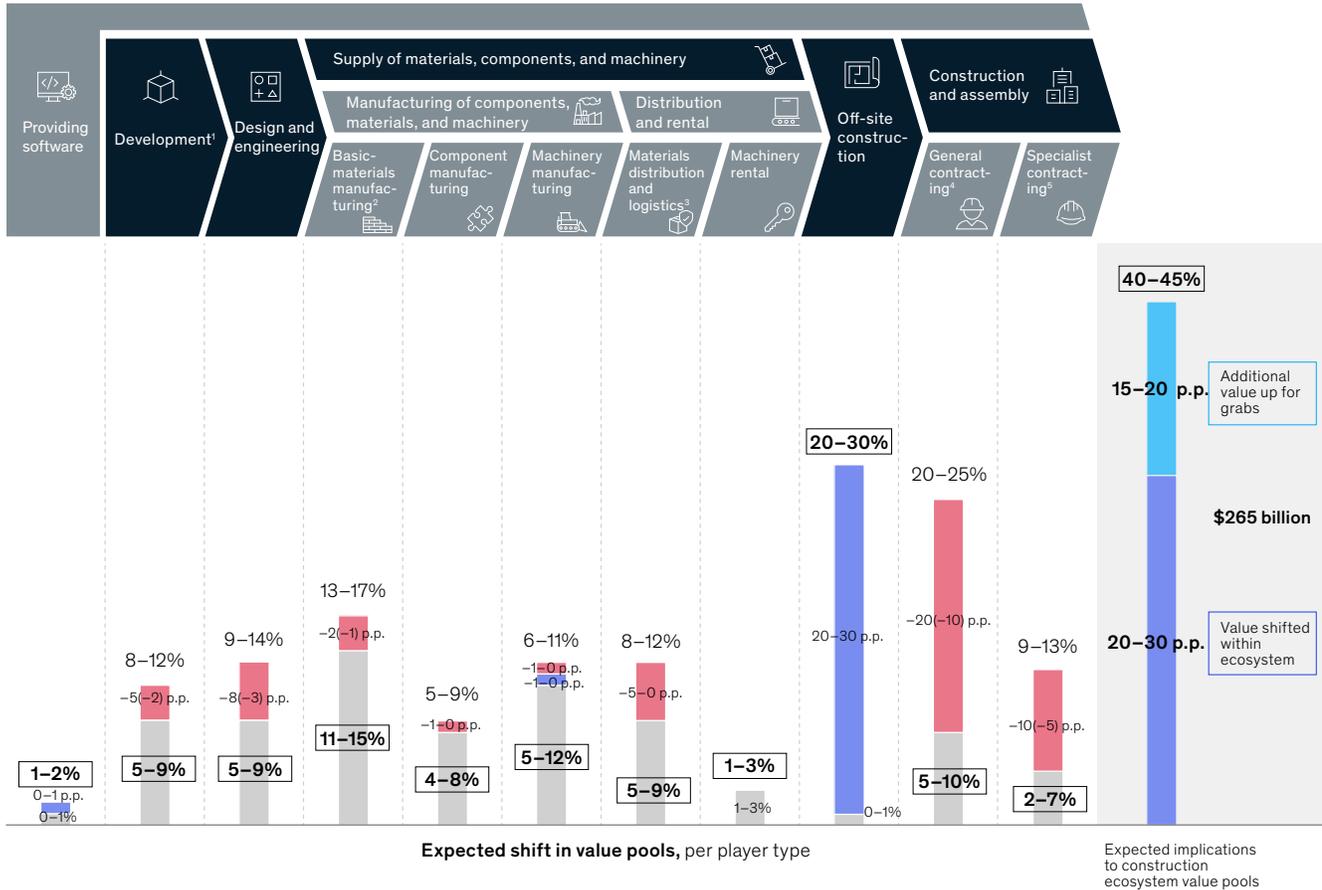
<sup>8</sup>EBIT margins are calculated on revenues, not value pools. We see large variances in EBIT margins among players; the profitability of some segments and regions is considerably higher than that of others.

Exhibit C

# Forty to 45 percent of value pools are expected to shift and impact all players along the value chain.

Example of fully productized value chain (eg, real estate new build), current and future value pools, p.p.

Value at risk Remaining value added Value shifted Value captured



Value pools, \$, bn											
0-100	900-1,300	1,200-1,600	1,500-1,800	500-900	800-1,200	900-1,300	100-400	0-100	2,400-2,800	1,000-1,500	~11,000

Profit pools, \$, bn											
0-30	350-450	90-110	150-180	70-90	70-90	150-250	30-50	0-60	250-350	80-100	~1,500

<sup>1</sup> Calculated by applying an assessed share of total value of development of output per asset class, allocated on top of total market output, since a limited number of stand-alone, pure-player developers have been identified.  
<sup>2</sup> Looking at players processing raw materials but not the actual manufacturing of raw materials (eg, mining). If all steps of producing and refining raw materials were included, the value pool would be ~2.5x bigger.  
<sup>3</sup> Adjusted downward to reflect that some things materials distributors sell don't contribute to construction output (eg, clothes, white goods).  
<sup>4</sup> General builders (buildings and other heavy construction).  
<sup>5</sup> Specialized trade construction.  
<sup>6</sup> Defined as value added per player type.  
<sup>7</sup> EBIT pools.

Source: CapitalIQ; Euroconstruct; FMI; McKinsey analysis

largely agree that the shifts outlined in this report are likely to occur at scale within the next five to ten years, and that the COVID-19 crisis will accelerate shifts.

Our executive survey of 400 decision makers in November and December 2019 found that the attitudes of executives have evolved materially since three to five years ago (see sidebar “About the executive survey” in chapter 1 for more details on the survey). In all, 90 percent of the respondents strongly believe that the industry needs to change and that this sentiment has grown in the past ten years. Eighty percent also believe that the construction industry will look radically different 20 years from now.

Beyond our analysis and the overwhelming beliefs of the surveyed executives, we see signs today that the industry had already started to change before the COVID-19 crisis began. For instance, adoption of product-based approaches is increasing. In North America, the permanent modular-construction market share of new real-estate construction projects grew by approximately 51 percent from 2015 to 2018, and revenues for the segment grew (from a small base of \$2 billion) by a

factor of 2.4 over the same period. Also, emerging players as well as incumbents are already seeking to control a larger part of the value chain; Kattera, for instance, used new technology to control the value chain, including design and engineering and off-site manufacturing. Indicators suggest the construction industry is increasing its emphasis on R&D, and companies that have invested in construction technology and facilities are gaining traction. Global R&D spending by the top 2,500 construction companies grew by 77 percent from 2013 to 2017.

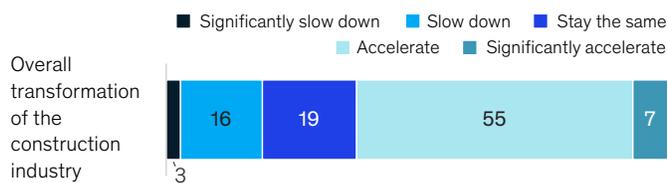
The COVID-19 crisis looks set to accelerate change (Exhibit D). We conducted an additional survey in early May 2020 to understand the potential implications of the crisis on the disruptions and shifts outlined in the report. Respondents comprised 100 decision makers out of the same sample that responded to our first survey. Nearly two-thirds of respondents believe that the COVID-19 crisis will accelerate industry transformation, and half have already raised investment in line with the shifts. Investments in digitalization and supply-chain control are most pronounced, while

Exhibit D

## Two-thirds of survey respondents believe that the COVID-19 crisis will accelerate industry transformation.

**As a result of COVID-19, do you believe that transformation of the construction industry will accelerate, stay the same, or slow down?**

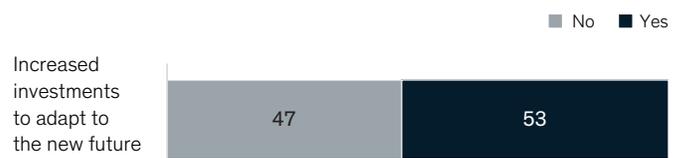
Share of respondents, %



Around two-thirds of respondents believe that the COVID-19 crisis will accelerate the overall transformation of the construction industry

**As a result of COVID-19, has your company increased overall investments to adapt to the new future?**

Share of respondents, %



More than 50% of respondents' companies have started to invest more to adjust to the new future

Source: Survey of 100 industry CxOs, May 2020

# In the face of this transformation, companies all along the value chain need to review where they want to play.

respondents believe the crisis will slow down internationalization and the rise of new entrants—giving incumbents a rare opportunity to step in and drive change.

## **All players must prepare now for a fundamentally different next normal**

Our research shows that leaders leave laggards behind in times of crisis. Those that go beyond managing their survival to take fast, bold, strategic action tend to emerge as the winners. During past economic cycles, companies that managed to move quickly to improve their productivity (for example, reducing their cost of goods sold through operational efficiency), divest earlier and are more acquisitive during the recovery. They cleaned up their balance sheets ahead of a downturn and outperformed competition in both revenues and earnings before interest, depreciation, taxes, and amortization (EBITDA).

Players in the ecosystem will need to develop strategies to deal with the disruption ahead. Our survey respondents identified four types of players set to face the largest long-term decline: design and engineering firms, materials distributors, general contractors, and specialist contractors. Furthermore, respondents believe that general contractors will be required to move first, as they could experience commoditization and a declining share of value.

In the face of this transformation, companies all along the value chain need to review where they want to play: which asset classes, segments, geographies, and value-chain steps. They will need to assess the impact of each of the disruptions and the nine shifts, decide how they want to act on them, and define new-business models and operating models in line with those decisions. This process is critical whether they aim to defend their core business and adjust to the new environment or fundamentally reinvent themselves and attack. For success, it will be critical for companies to invest in a set of enablers, such as agile organizations. Finally, companies can choose how to implement the new strategy and transformation, whether it's trying to evolve incumbent operations to work within the new setup, starting up new divisions or arm's-length operations, or applying targeted M&A.

In the materials-distribution and logistics segment, for instance, off-site manufacturing facilities will shift demand for shipments to factory hubs, the main logistics nodes, which will increase customer expectations for just-in-time delivery. The segment will be further reshaped by online and direct sales channels (including new competition from online-distribution behemoths), rising customer expectations, and increased use of technologies such as advanced analytics or automated warehouses. A shift in procurement activity, from small specialized trades firms to larger contractors,

will affect companies' bargaining power, and internationalization will enable companies to source more from low-cost countries.

In response, companies could try to defend their core by, for instance, focusing on the refurbishment market, becoming leaner, and undertaking category reviews. They could adjust to the changing environment by, for example, strengthening customer relationships, offering new business solutions to avoid disintermediation, consolidating to gain scale, and developing industrial-grade supply-chain capabilities. Reinvention would entail becoming the logistics hub of the future construction landscape. Strategies could include partnering closely with off-site manufacturers and materials suppliers to optimize logistics and inventory according to their needs, helping with international sourcing, or offering credit financing.<sup>9</sup>

Companies that familiarize themselves with the next normal and move quickly will be best positioned to both create value and maintain their competitive edge.

Organizations that are adjacent to the construction ecosystem should look to facilitate—and benefit from—the coming changes. Investors are well advised to use foresight to anticipate the respective shifts and generate above-market returns. Insurance companies are already factoring use of modern methods of construction into their terms. Policy makers should help the industry become more productive and thereby attain better housing and infrastructure for citizens. And building owners stand to benefit from better structures at lower costs if they play their part in making the shifts happen.

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Construction is already in the perfect storm. Industrialization, globalization, and digitalization have been key drivers of change in all industries. While this change happened in sequential waves—for example, in auto industrialization in the 1970s and 1980s, globalization in the 1990s and 2000s, and digitalization in the 2010s and ongoing—all of these drivers are hitting construction simultaneously. It is a daunting task and will require bold and agile moves to maneuver, but the size of the prize is enormous.

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<sup>9</sup> Alex Abdelnour, Amna Hussein, Nick Malik, Steve Reis, Nick Santhanam, and Sri Swaminathan, "The coming shakeout in industrial distribution: And five keys to outperformance in the years ahead," McKinsey, May 2019, on McKinsey.com.





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# Digital collaboration for a connected manufacturing workforce

Fourth Industrial Revolution technologies provide crucial support for factory workers to collaborate effectively—an even more urgent requirement as physical distancing becomes the next normal.

*by Enno de Boer, Andy Luse, Rahul Mangla, and Kartik Trehan*

**Many experts predicted** that with the coming of the Fourth Industrial Revolution (4IR), automation and advanced technologies would rapidly displace factory jobs and workers world-wide.

Thus far, this prediction has not panned out. In fact, our research with the World Economic Forum (WEF) reveals that leading factories (“Lighthouses”) have invested significantly in people. And the importance of people has only intensified as the COVID-19 pandemic has swept across the globe.

The need to augment workers with technology stems in part from four major trends that are transforming the manufacturing landscape: retiring baby boomers, regionalization, the proliferation of shop-floor data, and now COVID-19. These forces are creating a workforce that is more spread out, less experienced, and more overwhelmed by data with untapped potential.

Manufacturers therefore need tools that help their workers collaborate and stay connected across geographies and functions—particularly as physical distancing and tighter employee-safety measures take hold. Digital collaboration tools are primed to play a critical role in enabling workers to tap into the collective knowledge of the enterprise, solve problems with experts remotely, and turn internet of things (IoT) data from the shop floor into lasting value.

We estimate that digital collaboration has the potential to unlock more than \$100 billion in value—thanks in part to productivity boosts of 20 to 30 percent in collaboration-intensive work processes such as root cause investigation, supplier management, and maintenance.

## **The manufacturing landscape is changing**

An aging workforce, regionalization, and data proliferation are changing the composition of the manufacturing labor force and how work gets done—with the COVID-19 outbreak compounding some of the effects. As a result, manufacturers face an urgent imperative to help less experienced workers build knowledge and capabilities, and take advantage of data through collaboration.

**Aging workforce.** In 2019, the United States-based National Association of Manufacturers estimated that one-quarter of the US manufacturing workforce was age 55 or older. It comes as no surprise, then, that one of the biggest concerns among US manufacturers has been “brain drain,” with 97 percent of firms having expressed some concern. To prevent this loss of institutional knowledge as aging workers retire, manufacturers have intensified efforts to codify knowledge, so that they can pass on more efficiently and effectively to the next generation of employees.

At the same time, manufacturers have also reported difficulty in recruiting and retaining qualified workers, with recent college graduates seeming more inclined to work in businesses that were more obviously digitally oriented. Whether the very different economic conditions businesses and workers now confront will make a sustained difference in hiring is unclear. Yet the fact remains that these young workers neither share the same skillset as previous generations, nor have they been exposed to the same training and apprenticeship programs. Manufacturers can start to appeal to this new generation of workers by making it easier to train and help them learn. Collaboration tools allow factories to better leverage their experts across a broader group of people to help train the less experienced workforce.

**Regionalization.** Over the past several years, traditional offshore factory zones were becoming less attractive as transportation costs and labor rates continued to rise. In response, manufacturers were already beginning to relocate factories, either “nextshoring” to be close to the customer in developed markets or shifting to other regions, such as the MINT countries (Mexico, Indonesia, Nigeria, and Turkey). If, as appears possible in response to the pandemic, regionalization continues to disperse the workforce and alter the factory footprint, manufacturers will need new and improved ways to share learnings across geographical boundaries.

**Data proliferation.** Within the past decade, machine connectivity in factories has grown exponentially, generating vast amounts of new and enriched data. But many manufacturers have been challenged to

help their workers use the data to maximum effect in solving problems and making better decisions. Tools that connect workers both to other workers and to data will help manufacturers turn the data into actions that generate real value: Imagine an operator who wants to troubleshoot a piece of equipment, and can share real-time machine data with a remote expert to get precise guidance.

**COVID-19.** The COVID-19 pandemic has resulted in major adjustments to ways of working and staffing models in factories globally. The physical distancing, worker (and customer) safety issues, and economic reality that companies now face will have lasting impact even in the post-COVID-19 world. Lasting structural changes to fundamental work processes such as shift handovers, daily huddles, and root-cause investigations may be required in order to minimize physical contact between factory workers and mitigate risk. Manufacturers are therefore looking for innovative ways to help these workers interact virtually while maintaining (or even increasing) productivity.

## Embedding digital collaboration into workflows

The technologies available to most employees for collaboration thus far have been limited to basic communication tools, such as e-mail, chat, and text messages. These tools are typically disconnected from actual information flows related to business processes, resulting in back-and-forth status updates and complex handoffs that diminish employees' productivity.

Embedding digital collaboration into process workflows can enable faster, better decisions that improve key performance indicators (KPIs) and drive bottom-line value, as shown in Exhibit 1.

To better understand how collaboration can be used to reimagine a range of business processes, we explored two examples with two different collaboration intensities: root cause investigation and maintenance. We found that the greatest value potential lies in processes that entail a large number of roles and daily interactions across roles (Exhibit 2).

Exhibit 1

## Embedding digital collaboration in process workflows generates a wide range of benefits.

Core business process, eg, maintenance or inventory operations



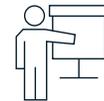
### Increased transparency throughout process

Clear view of end-to-end workflow for better work planning  
Decreased back and forth between stakeholders since all information required to make decisions is available on one platform



### Knowledge and expertise codification

Immediate access to expertise and documents relevant to each process substep, supporting improved problem solving and decision making



### Real-time updates and reporting

Real-time view of changes and needs, aiding quick decision making and streamlining processes

# Improved collaboration would not only facilitate the teams' efforts to find experts and coordinate across calendars, but would also save time and expense by allowing them to use virtual meetings and quickly search for relevant information.

## **Reforming root-cause investigation**

In a manufacturing facility, the real cause of a production problem can usually be traced back to a series of events that caused it—a process called “root cause problem solving” or “root cause investigation.” As the investigation of a particular issue proceeds, it usually requires a deeper level of expertise, so the relevant roles and parties involved continuously change—making it intensely collaborative. The topics typically investigated include safety and maintenance issues (machine failures, major breakdowns), quality issues (such as scrap and rework), and technical issues (product performance, material variance).

For example, an electronics contract manufacturer might find that its production line is generating too much scrap—waste that, over time, accumulates into substantial costs. At a high level, a root-cause investigation process would likely entail up to nine main steps, from capturing and coding issues through to analyzing data, initiating and conducting a detailed investigation, identifying and implementing solutions, and finally evaluating effectiveness, together with codifying and sharing best practices.

## **Solving poor coordination speeds problem resolution**

Within each step, pain points arise from poor connectivity among workers and between workers and data. Finding a solution to a problem often requires

multiple iterations across many unique roles—and can take upwards of 90 days from start to finish.

Just one step, the deeper investigation, illustrates these issues. The effort to identify experts and coordinate calendars can cause weeks of delay and spiraling costs in order to bring the right people to a specific location. Ineffective data capture can result in wasted time for multiple individuals during the problem-solving session. Inadequate coordination can result in redundant efforts or failure to take advantage of previously developed solutions.

Improved collaboration would not only facilitate the teams' efforts to find experts and coordinate across calendars, but would also save time and expense by allowing them to use virtual meetings and quickly search for relevant information. A reimagined process for root cause investigation uses technology to improve information collection, enable continuous collaboration, and share knowledge across all of the roles involved in a root-cause investigation.

Engineers can take and upload photos of production issues, fill out templates detailing important facts to record, and access equipment data from sensors or tools if applicable. The result is better data capture and categorization. The leader of the continuous-improvement effort can then easily pull and analyze the data to identify the highest-impact issues and automatically select a group of collaborators. From

Exhibit 2

**Some processes show higher potential for effective collaboration.**

Process	Activities	Potential value that collaboration could unlock			Collaboration potential	
		Costs avoided	Working capital freed	Revenue generated	More unique roles involved in the process	More daily interactions across all roles
Maintenance	Routine maintenance checks on equipment Troubleshooting machine-part failures Responding to emergency equipment failures					
Root-cause investigation	Troubleshooting product defects due to production issues Addressing equipment failures on the line					
Product development and industrialization	Design iterations Rapid prototyping Aligning development and design					
Inventory operations	Setting optimal inventory levels Prioritizing shipping for aging inventory Shipping products					
Order processing	Receiving and entering customer orders Responding with delivery commitments Communicating changes to orders and commitments					

there, all collaborators, wherever located, can work together to digitally share images, files, insights, and discussions simultaneously. Collaborators can readily be changed as the core team shifts to a more specialized team of technicians. When the issue is finally resolved, the documented solution will continue to help future teams that may encounter similar problems.

**The impact from better problem solving**

For a hypothetical manufacturer with revenues of \$10 billion, these sorts of changes can yield significant financial results due to better service and lower costs.

**Improved service levels.** Unexpected issues lead to factory downtime that depresses service levels for order fulfillment, potentially reducing customer satisfaction. If the use of collaborative and digital tools improve service level by 1 percent and decreases downtime by 1 percent, the resulting effect on revenue is an increase of 0.2 percent—or \$20 million.

**Reduced cost of quality (scrap rate).**

Quality issues can lead to significant costs for manufacturers in the form of scrap, rework, and warranty claims. Identifying and solving quality problems faster through collaboration tools has the potential to decrease scrap

by approximately 25 percent, which translates to a 0.5 percent increase in revenue, or \$50 million.

All told, re-imagining the root cause investigation process through digital collaboration could create \$70 million of revenue for a \$10 billion manufacturer.

### **Managing maintenance more effectively**

For asset-intensive industries where the amount of invested capital is enormous and the value of a day's production is high, routine maintenance to maximize plant uptime is especially important. Yet typical maintenance work processes today are still paper-based and manual, with many handovers resulting in important information losses—or “leakage”—at each step.

Consider the example of a heavy-industry manufacturer. At a high level, the maintenance process—as with root-cause investigation—entails about nine steps, starting with work identification, prioritization, and planning, proceeding to materials management, scheduling, and permitting, and then execution, close-out, and finally contractor invoicing.

The pain points with maintenance are familiar: poor documentation and knowledge sharing, inefficient communication between stakeholders, and long wait times due to manual checking and scheduling. Moreover, the maintenance process is even more complicated than root-cause investigation because of the need for transparent record keeping and the intensity of coordination required among

stakeholders (both internal and external) to manage materials, staffing, and production schedules.

### **Reimagining collaboration simplifies maintenance process**

The team that performs maintenance often consists of one or two internal employees and a handful of outside contractors. As the team begins fixing the issue at hand, secondary issues often arise. A seemingly simple problem with a fan motor can turn into a complex rewiring effort requiring team members return to the office, order more materials, and search for—and possibly fly in—an expert on wiring. And this long, costly process may end up addressing a maintenance issue that is not nearly important to production as a long list of other maintenance tasks.

The reimagined process leverages collaborative technology to help gather, prioritize, and track work orders, coordinate across multiple stakeholders, and share knowledge and expertise throughout the plant. Inspectors can check and gather information using a digital template, reducing paperwork in maintenance inspections. Plant managers can view work orders more comprehensively, allowing them to better prioritize work based on relevant criteria.

Managers can also easily decide which materials to order and which experts to pull in. Just within the “execution” step, digital tools can allow technicians to efficiently collaborate within their team and across the company with relevant experts to troubleshoot problems, allowing for fast access to

**The reimagined process leverages collaborative technology to help gather, prioritize, and track work orders, coordinate across multiple stakeholders, and share knowledge and expertise throughout the plant.**

specialists, information, and proven solutions in the field. That means less downtime for important equipment, and lower costs to address issues.

#### **The value from maintenance redesign**

Embedding collaboration into maintenance processes can reduce maintenance-applicable spending (excluding parts, equipment rental, and contractor costs) by 10 percent to 15 percent. But the effects are visible in other KPIs as well.

*Overall equipment effectiveness (OEE).* Reduced downtime increases OEE by 2 to 3 percentage points.

*Wrench time.* The amount of time workers spend performing value-added tasks versus increases by approximately 5 percent to 10 percent.

*Maintenance cost as a percentage of replacement asset value (RAV).* Annual maintenance spend as a percentage of RAV can decrease by approximately 5 to 10 percent.

All told, for a manufacturer with \$10 billion in revenue, these results can equate to \$110 million in revenue.

#### **How manufacturers can capture this value**

To capture the opportunity, manufacturers can take several tactical steps.

#### *Map out processes with collaboration potential.*

Mapping out the most important processes within an organization reveals which ones involve the highest cost and the greatest collaborative friction. Typically, only a small subsection of processes is responsible for the majority of cost and complexity.

*Identify an integrated set of responses.* Understand which levers to pull to decrease cost and complexity—including increasing collaboration, improving data capture, or eliminating manual work, among others. These translate to use cases that technology solutions can address, such as facilitating teamwork across distributed locations.

*Detail the technical roadmap.* For the top use cases, identify the technology and tools required to address pain points in the most inefficient processes and enable further collaboration. Prioritize tools that relate to overall strategic goals, rather than focusing on “sexy” technology solutions.

*Embed collaboration into overall digital transformation plan.* By embedding digital collaboration-enabled processes into the enterprise’s overall digital transformation strategies and technical roadmaps, companies can better achieve scale and avoid wasting time on ideas that aren’t likely to yield sustained impact.

*Drive user adoption and instill a digitally focused culture.* Foster a culture that stresses the importance

**Embedding collaboration into maintenance processes can reduce maintenance-applicable spending (excluding parts, equipment rental, and contractor costs) by 10 percent to 15 percent.**

of digital. Incorporate frequent training sessions to ensure that employees fully understand how to use technology and are excited about the changes.



Manufacturers face an urgent need to unleash the next wave of productivity in their operations. Ever-increasing cost pressure often leads companies to make short-term tradeoffs that compromise quality and reliability—trying to do more with a smaller or

lower-cost workforce. Digitally enabled collaboration offers a solution. By digitizing processes to improve equipment management and optimize physical assets, digital collaboration tools give manufacturers ways to boost productivity while enhancing quality. Ultimately, these tools allow manufacturers to realize the vision of the “connected worker”—empowered by a continuous flow of real-time data from physical assets. The first manufacturers to fully capture the benefits of digital collaboration will achieve a significant competitive advantage.

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# An operating model for the next normal: Lessons from agile organizations in the crisis

Companies with agile practices embedded in their operating models have managed the impact of the COVID-19 crisis better than their peers. Here's what helped them cope.

*This article was a collaborative effort by Christopher Handscomb, Deepak Mahadevan, Lars Schor, and Marcus Sieberer of McKinsey and by Euvyn Naidoo and Suraj Srinivasan of the Harvard Business School. It represents views from across McKinsey's Agile Tribe.*

**For many companies,** the first, most visible effects of the COVID-19 pandemic quickly created a challenge to their operating and business models. Everything came into question, from how and where employees worked to how they engaged with customers to which products were most competitive and which could be quickly adapted. To cope, many turned to practices commonly associated with agile teams in the hope of adapting more quickly to changing business priorities.

Agile organizations are designed to be fast, resilient, and adaptable. In theory, organizations using agile practices should be perfectly suited to respond to shocks such as the COVID-19 pandemic. Understanding the experiences of agile—or partially agile—companies during the crisis provides insights around which elements of their operating models proved most useful in practice. Through our research, one characteristic stood out for companies that outperformed their peers: companies that ranked higher on managing the impact of the COVID-19 crisis were also those with agile practices more deeply embedded in their

enterprise operating models. That is, they were mature agile organizations that had implemented the most extensive changes to enterprise-wide processes before the pandemic.

That suggests implications for less agile companies as economies reopen. Should they set aside the agile practices they adopted during the pandemic and return to their traditional operating models? Or should they double down on agile practices to embrace the more fundamental team- and enterprise-level processes that helped successful agile companies navigate the downturn?

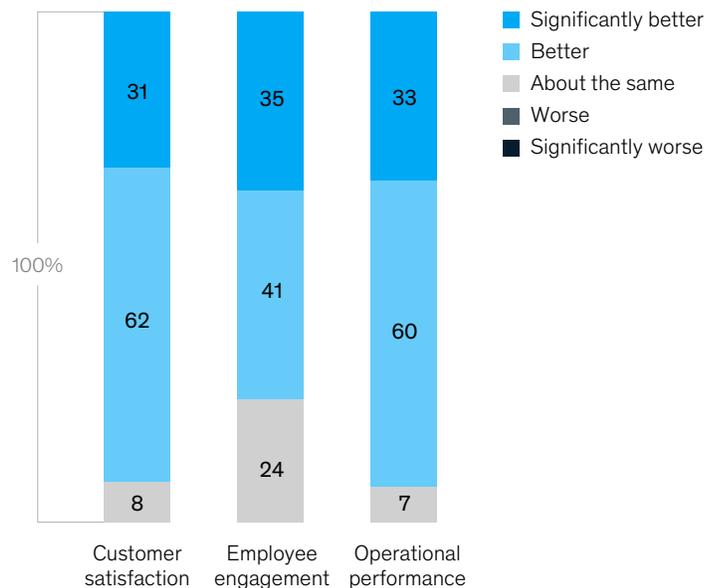
### Evaluating the effectiveness of the response

We analyzed 25 companies across seven sectors that have undergone or are currently undergoing an agile transformation. According to their self-assessments, almost all of their agile business units responded better than their nonagile units to the shocks associated with the COVID-19 pandemic by measures of customer satisfaction, employee engagement, or operational performance (Exhibit 1).

Exhibit 1

### Business units that had fully adopted an agile model before the COVID-19 crisis outperformed units that hadn't.

**Performance self-assessment of agile business units relative to nonagile units in same organization,** % of respondents (n = 25 organizations)



Note: Figures may not sum to 100%, because of rounding.

Executives emphasized that the agile teams have continued their work almost seamlessly after the shock, without substantial setbacks in productivity. In contrast, many nonagile teams struggled to transition, reprioritize their work, and be productive in the new remote setup. The alignment between agile teams' backlogs and their business priorities allowed them to shift focus quickly. Stephen Gilderdale, chief product officer at SWIFT, told us his organization reprioritized about 20 percent of its work, and agile teams contributed by quickly aligning to updated priorities: "They knew their business objectives and had sophisticated reasoning for each of them. This allowed them to reprioritize their work within a few days."

Reprioritization comes naturally to agile companies. They do it by embedding customer-centricity in their processes, delayering and empowering the organization, and bringing business and IT together. For instance, an Asian telco had to shut down its offshore call center when the COVID-19 situation started, which resulted in the messaging queue increasing to an average of 36 hours of waiting time. In reaction, managers asked retail

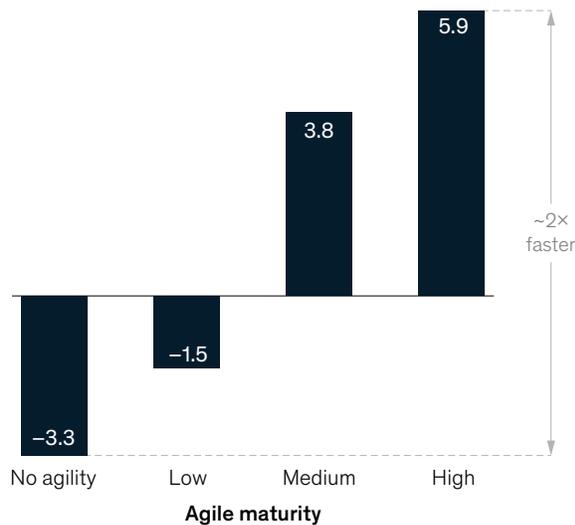
staff to support call-center functions, established microsites in an offshore location to reopen call centers, and switched on chatbot access for all of their customers. Within a month, the queue had fallen back down to just a few minutes. The leader of the telco's agile center of excellence particularly highlighted that such a reaction could have taken six months in the old way of working. Now, resources could be reallocated quickly, allowing teams to shift focus and deliver digital prototypes within days.

Many of the executives of agile companies we interviewed also highlighted that their organizations reacted faster than their peers. To validate that trend, we analyzed the speed of service adjustment of companies with different agile maturities. For instance, we measured the time that 36 telco providers across 11 Asian and European countries took to launch services in response to the COVID-19 pandemic, such as providing additional data or bandwidth. Results of our research confirm that telco operators that adopted an agile operating model before the pandemic responded significantly faster, on average, than their peers (Exhibit 2). We observed similar trends when measuring

Exhibit 2

### Agile telco operators reacted faster than peers to the COVID-19 crisis.

Telco-operator reaction time to COVID-19 crisis relative to country average, by agile maturity level,<sup>1</sup> number of days ahead of country average



<sup>1</sup>Reaction time of telco operators in Australia, Austria, Belgium, Denmark, Germany, Hungary, Netherlands, New Zealand, Poland, Switzerland, and United Kingdom; measured as number of days between date of 100th COVID-19 infection per country and launch of a COVID-19-specific product or service; reaction time for nonresponders capped at 150% of slowest mover per country; n = 36 (6 with no agility, 12 with low agile maturity, 8 with medium agile maturity, and 10 with high agile maturity).

the reaction time of banks to launch services in response to the COVID-19 crisis.

## **The elements of a successful response**

Most organizations, agile or not, witnessed a faster pace of decision making as the realities of the COVID-19 pandemic evolved. Under immense pressure to set up an operating infrastructure very quickly to allow hundreds and thousands of employees to work from home, many organizations gave up traditional processes and bureaucracy and solved instead for faster outcomes. Priorities became clearer, and there was a razor-sharp focus on what needed to get done in the very short term as many organizations went into survival mode. Even considering that across-the-board step-up from many organizations, agile organizations managed to outperform.

We asked executives and agile leaders of the 25 analyzed companies which elements and practices helped them and their teams cope with the shock. Their responses fell into two categories: elements at the team level (many of which, incidentally, were also exercised by many nonagile organizations or units) and more advanced, enterprise-level elements, which were only observed in organizations that had already undergone a radical transformation.

### **Team-level elements**

Team-level elements enabled teams to focus and to swarm—or rally those with the necessary skills around a task—to keep work moving on schedule. Even nonagile organizations and units called upon such practices in reaction to the crisis. They included a set of structured events, or ceremonies, at the team level that allowed teams to keep their pace and rhythm, even if the priorities were changing quickly and team members were no longer co-located. In fact, the events and ceremonies gave the teams platforms for effective, faster decision making as things changed. Some companies increased the frequency of ceremonies—doubling the cadence of status-check sessions, for example, or halving the length of their sprints to cope better with changing priorities. That ensured better communication within the team and provided for regular social interactions. Remote-collaboration tools then helped the teams continue working

together and track their progress transparently, even while working remotely.

Consider the experience at MSD Japan, for example. In 2019, MSD Japan transformed into an agile organization so it could adapt to changing environments and customer needs. Its president, Jannie Oosthuizen, told us that the application of agile practices allowed the company to have a seamless up-and-down flow of information. That information flow was enabled by the use of agile ceremonies at each level so that teams could keep the rhythm going and make switches easily and seamlessly. For instance, Oosthuizen described underestimating the impact of the shock on employees and their workloads. For MSD Japan, agile ceremonies provided a regular pulse check of team health and workload. And it realized rather quickly that keeping the agile pace in a remote setting isn't something an organization can do for a long time, leading it to reduce team workloads consciously.

The ability to restructure an evolving list of product requirements, or backlog, allowed teams to focus on changing customer needs, even as what mattered most to their customers rapidly changed. As Oosthuizen observed, “Even before COVID-19, we were bad at prioritizing, and it's still a challenge. Looking back, we should have put more focus on it. Then we would have been in a better position to cope with the shock.”

Most agile teams practiced such foundational agile elements before the pandemic, so they could continue their work almost seamlessly under lockdown. As SWIFT's Gilderdale told us, “At the beginning of the pandemic, our agile teams were able almost seamlessly to move to a remote setup. The agile teams particularly benefited from their cross-functional nature and way of working. They had their tasks transparently described in digital-issue tracking tools and were experienced in using digital remote-collaboration tools. In fact, many nonagile teams started to adopt some of the practices of the agile teams during the pandemic so that they could work remotely effectively.” That adoption of select agile elements by nonagile teams is a trend we saw broadly, and agile coaches often played a key role. We heard from managers

at several companies who explicitly reallocated coaches to nonagile teams to help them conduct effective agile ceremonies and more effectively collaborate with each other.

While co-location has often been seen as a prerequisite for the agile way of working, the pandemic has shown that agile teams can be highly effective in a remote setting. The critical success factors have been a stringent adherence to the agile cadence, efficient use of remote-collaboration tools, and the creation of a virtual co-location. Many organizations reported that being remote helped them to be virtually co-located and become more effective. For instance, a product owner at a global consumer-goods organization described his team as distributed across two geographical locations before the pandemic. When everybody was forced to work remotely, the team's cohesion increased because every team member was equally co-located.

#### **Enterprise-level elements**

Enterprise-level elements helped companies rapidly align their entire organizations around shifting priorities during the crisis. Executives and agile leaders particularly emphasized the importance of empowering cross-functional teams at the lowest level to step up and make decisions essential to coping with the shock.

For instance, the transformation lead of a global financial-service provider attributed its success in managing the pandemic to empowering teams and product owners and having reorganized into almost independent cross-functional teams. That allowed senior leaders to focus on steering the company and engaging with customers. Elsewhere, the transformation lead of an insurance company in Asia told us that his company didn't require many COVID-19-response committees to cope with the shock. While the company had struggled to set up complex response committees for previous crises—even small ones—its empowered, cross-functional, agile teams were able to react to the COVID-19 shock on their own.

A structured governance process for the regular review and reset of business priorities, top to bottom, across the full organization also helped

companies to realign and implement their response strategies. That proved especially helpful, for instance, when it became necessary to shift resources from offline channels to online channels. Multiple companies conducted ad hoc quarterly business reviews (QBRs) two to three weeks before the regularly scheduled cadence to review the priorities of their business units. For instance, MSD Japan CEO Oosthuizen emphasized the importance of the QBR process to align the company's recovery strategy across all business units and allocate the resources properly to what mattered most.

Last, among the most successful agile companies we reviewed, an outcome-based, digital, and automated tracking system gave them daily transparency on their performance. An agile leader of a telco operator described knowing, for example, exactly what the impact was going to be in product delays if it was shifting people around, since everything was so transparent on a priority level. Similarly, companies that didn't implement an enterprise-wide performance-tracking system highlighted that as a missed opportunity. The transformation lead of a European bank mentioned that it was almost blind about performance during the pandemic. Automated dashboards, the lead said, would have helped the bank identify the key issues and focus on what mattered most during the crisis.

Executives often highlighted that the combination of different team- and enterprise-level elements made the real difference. For instance, to be fully productive, agile teams must be cross-functional, truly empowered, and adhere to agile ceremonies. Similarly, efficient goals and resource reprioritization required outcome-based performance tracking and full transparency.

#### **Inflection point: Reopening an organization after the pandemic**

Agile ways of working helped even nonagile companies cope with the COVID-19 pandemic. As economies open up, previously nonagile companies must decide whether to double back or double down on agile ways of working. Many of them have adopted agile ways of working out of necessity—and often in a quite unsustainable way. As the adrenaline runs out, they will need to return to a

steady state that is sustainable for all employees and that allows them to cope effectively with change in an uncertain future. For instance, the business model of a European machine-building company has significantly shifted during the pandemic, with customers increasingly focusing on digital solutions. To react to that demand, the company implemented its first agile practices during the crisis and is now weighing how much change it can sustainably manage in the first few months after reopening.

With the speed of change expected to continue, the need has never been greater for an operating model that can keep up. To use this momentum and fully embrace an operating-model shift, organizations need to engage actively now, following three steps for the next normal:

1. **Reflect.** Companies need to reflect systematically on what they have learned, assess what practices worked and what didn't work during the pandemic, and decide which of those they want to embed sustainably. For instance, they could ask what differentiated the teams that coped well with the shock from the teams that struggled the most and what practices they can sustainably manage in their operating models. At the same time, they should also look toward more agile organizations to get inspiration from their broader recipes. It's key to not only look at what actually worked but also identify the gaps and engage actively in a discussion on how to close those gaps.
2. **Decide and commit.** Leadership teams, after reflection, should make conscious decisions on where to start, how to start, and which elements of their operating model need

structural shifts. There is a wide spectrum of elements to pick and choose. Some may start with an effort to simplify decision making across the board. Others may opt for a fundamental reorganization while focusing on one area or unit to learn from. There is no one right answer. The road to a new operating model starts by experimenting with new behaviors and practices and learning from them before scaling them across the organization. Successful companies have thoroughly measured the impact of initial efforts to identify what works and what doesn't. The toughest part is then the decision to move to the next step of scaling the practice across the organization. A flattening learning curve is therefore often a good marker that you should move to the next step.

3. **Embed and scale.** The next steps are to transition and scale the selected practice across the company and to go deeper into each of the levers of the operating-model transformation, including structural capability building, people-modeling changes, and enterprise-process changes. A critical success factor for scaling an agile operating model is that the whole organization, agile or nonagile, is optimizing for the same objectives and spinning in the same direction.

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We believe the changes that some companies have already been making during the pandemic can give them a leg up in honing their agile practices for an uncertain future. Now they should reflect on what helped them and sustainably embed those practices for the long term.

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# Launching the journey to autonomous supply chain planning

For many companies, the COVID-19 pandemic has provided the impetus—and a uniquely apt moment—for transitioning toward autonomous planning.

*by Christoph Kuntze, Shruti Lal, and Karl Seibert*

*This article was written collaboratively with Ignacio Felix and Ketan Shah, who lead McKinsey's work in supply chain and operations within the Consumer Goods practice.*

**Over the past few months**, people everywhere have been worrying about the supply chain. Items have been out of stock at stores for weeks; shortages in crucial categories such as packaged food, cleaning supplies, and, more critically, medical safety equipment have been all over the news. At the same time, with stores closed and most people staying home, demand for other types of products has fallen precipitously. How will companies handle continued uncertainty and fluctuations in consumer demand as cities, states, and countries start to reopen?

The COVID-19 crisis poses many new challenges to supply chain planning. In forecasting, for instance, the pandemic has rendered traditional techniques ineffective, since those techniques rely heavily on a company's historical sales data rather than on forward-looking external data. Some manufacturers, therefore, couldn't react fast enough when consumers shifted most of their spending away from brick-and-mortar stores toward e-commerce; others couldn't ramp up production to meet soaring demand from pantry-loading consumers. Yet some companies will be (and, indeed, have been) consistently able to meet demand in the near term—thanks in large part to their advanced supply chain capabilities.

For many companies, the COVID-19 crisis has provided not just the “burning platform” for transforming supply chain planning but also a set of circumstances conducive to such a transformation. For one, because of mandatory closures of factories and stores in various regions, manufacturers are dealing with fewer suppliers and customers in fewer geographic markets. Also, some manufacturers are temporarily reducing the number of SKUs they make, devoting their factories and warehouses to only the highest-demand products—thus allowing for greater visibility into the supply chain and targeted interventions. Furthermore, the crisis has forced marketing and sales teams and supply chain planners to collaborate more closely with each other, creating opportunities for end-to-end redesign of planning processes.

In the early days of the crisis, many companies rushed to assemble a supply chain control tower—a cross-functional team reviewing real-time data to make decisions quickly. Done right, the control-tower approach can be an effective one, whether in a crisis or not. It's also a potentially big step toward what we believe should be an aspiration for every consumer company: autonomous planning. The vision for autonomous planning is one in which big data and advanced analytics are used in every step of the supply chain planning process, enabling faster and better decision making with minimal manual intervention.

In this article, we describe the elements of a successful control tower to help companies make data-driven decisions during the COVID-19 crisis and in the immediate aftermath. We also discuss how companies can use a control tower as a springboard toward autonomous planning. The goal, ultimately, is for companies to be better prepared to provide the products that consumers want and need, at the best cost and in the most environmentally sustainable way—even in times of crisis.

### **Do now: Strengthen the control tower**

Some companies mistakenly believe that an effective control tower is simply a team doing round-the-clock work in a war-room setting during a crisis. In the best-run companies, however, a control tower is part of the normal way of doing business, not an ad hoc initiative hastily dusted off in crisis periods and then dismantled afterward. Successful control towers have the following elements in common:

- ***The authority to make critical decisions.*** The control tower can't fulfill its purpose if it's made up of junior planners and midlevel personnel tasked with generating reports for their higher-ups. Rather, the individual leading the control tower must be an executive who has the trust and respect of the CEO and COO; the rest of the team members should be high-performing supply chain planners, plus managers from customer

service, supplier management, manufacturing operations, warehousing, and transportation (Exhibit 1). This cross-functional team must be empowered to make important business decisions quickly, with reasonable limits.

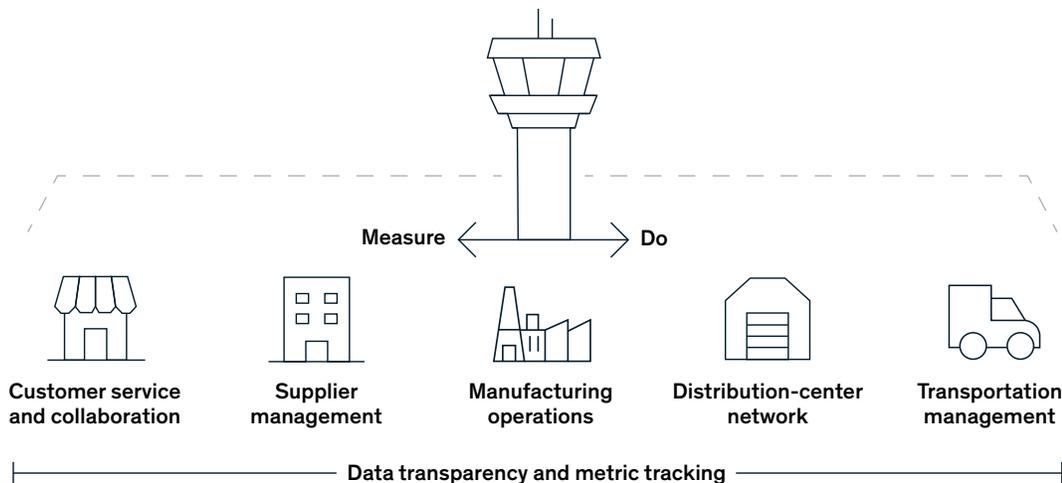
- **Data-enabled decision-making processes.** Gathering accurate data from internal and external sources—and integrating all the data into a “single source of truth”—is important but not sufficient. The data must then be delivered to decision makers in digestible, user-friendly formats. Control-tower team members won’t be able to make decisions in a timely manner if they first have to wade through and pressure-test hundreds of spreadsheets and documents that yield limited insights for their work. That said, a company shouldn’t wait to establish a control tower until it has the perfect data or the perfect tool. It can start with the available data sets and build on them over time.
- **Scenario-planning capabilities.** The most effective control towers are equipped with the

tools, talent, and processes to conduct scenario planning regularly and rapidly. In minutes or hours instead of days or weeks, they can develop a range of scenarios, model the implications and trade-offs (financial and otherwise) in each of the scenarios, and generate recommendations for action. Discussions and debates about the right path forward are data driven, instead of being dominated by the loudest and most insistent voices.

A control tower’s impact will be felt in every part of the supply chain. At a consumer-health company, for example, the control tower mobilized fast in the early days of the COVID-19 pandemic to distribute personal protective equipment to factory workers, track the evolving situation at its facilities around the world, reduce its SKU portfolio by 50 to 70 percent (depending on the brand), and develop an allocation process that it swiftly communicated to retailers. Even with unprecedented spikes in demand for its products, the company has been able to maintain a higher case-fill rate than its competitors.

Exhibit 1

**A control tower is cross-functional, has access to real-time data and metrics, and is empowered to make critical decisions fast.**



## Shape the next normal: Move toward autonomous planning

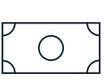
A control tower's accelerated planning cadence and rapid decision making can serve as the foundation for building more sophisticated autonomous-planning capabilities. Practically, autonomous planning enables ongoing, machine-supported decision making in every part of the planning value chain, with planners intervening only to manage exceptions (Exhibit 2). In other words, the machines do what they do best—crunching data and applying advanced analytics—thus freeing up planners' time for higher-value activities.

## A case example: Autonomous planning in packaged food

About a year before the COVID-19 outbreak, a multinational packaged-food manufacturer sought to improve its supply chain planning processes. The company had historically adhered to a monthly planning cadence, but by the end of each month, supply conditions and demand profiles had changed, rendering monthly optimization a useless exercise. In addition, the company was routinely taking longer than three days to respond to demand-change requests, partly because of highly manual processes and a complex data ecosystem that made it difficult for planners to access and review data inputs. The company wanted to be able to react faster to changes in either supply or demand—and to do so in the most profitable way.

Exhibit 2

## Autonomous planning differs from traditional supply chain planning in several ways.

					
Features of autonomous planning	Efficient	Powered by advanced analytics	Fast	Hardwired into business	Self-transforming
<b>From</b>	Many manual steps and interventions	ERP <sup>1</sup> and standard software functionality; software potential largely unrealized	Monthly, weekly, and daily cadence (eg, for S&OP planning, S&OP execution, IBP <sup>2</sup> ); lots of data review and discussion of resolutions	Owned by supply chain/operations; not integrated with company-wide functions	One-and-done projects replacing one black box with another
<b>To</b>	Automation of inputs to demand and supply planning; streamlined order management; exceptions elevated	Advanced analytics with artificial intelligence and machine learning in forecasting; multiechelon, continuous supply-planning optimization	S&OP cadence replaced by short, tactical, cross-functional touchpoints relying on real-time information	KPIs <sup>3</sup> fully aligned across functions; planning fully integrated with all business processes	New talent (eg, data scientists) embedded in teams to pilot new use cases continually

<sup>1</sup>Enterprise resource planning.

<sup>2</sup>S&OP = sales and operations; IBP = integrated business planning.

<sup>3</sup>Key performance indicators.

# A control tower's accelerated planning cadence and rapid decision making can serve as the foundation for building more sophisticated autonomous-planning capabilities.

Company leaders assembled an agile, cross-functional team to lead the supply chain organization toward autonomous planning. In just four months (versus the typical timeline of six to eight months), the team developed a minimum viable product (MVP) that included a tool to integrate and cleanse data from more than 100 data tables. The effort was a success: the company speeded up its tactical-planning cadence from monthly to weekly and achieved a 24- to 48-hour response time to demand-change requests.

When COVID-19 hit, the autonomous-planning system detected unusual patterns in point-of-sale data and other demand signals (such as retail traffic, mobility data, and social-media “buzz” analytics) in certain markets. Using automated forecasting models powered by machine learning, the system could rapidly evaluate millions of data points to uncover the drivers of shifts in demand. The system then sent automatically triggered alerts to the company’s planners. It also generated a set of scenarios, as well as recommendations for maximizing both revenue and profit in each scenario. For example, in a scenario in which one of the company’s manufacturing plants runs out of certain materials or ingredients, should it shut down that production line entirely? Or should it manufacture a different product on that line instead—and, if so, which product? Planners then collaborated with the marketing and sales teams to agree on the best path forward.

As a result, when demand for the manufacturer’s products more than tripled in several categories and regions, it could react speedily. It was able

to optimize inventory levels by two to three days across categories, even at the peak of the crisis. The company is now even more committed to building its autonomous-planning capabilities further.

## Getting started on autonomous planning

The packaged-food manufacturer in our case example is using a phased process to move toward autonomous planning. The following principles are helping ensure the transformation effort’s success:

- **Focus on use cases that drive the most value.** Instead of taking the traditional, protracted “waterfall” approach and launching every single module of the new tool—thereby overwhelming the supply chain function with too many new goals and targets—the company first zeroed in on specific pain points and desired outcomes, translating them into use cases and embedding machine learning into those use cases. For example, it identified supply issues (measured in service levels) as the biggest problem to solve, given the potential market opportunity. It piloted the MVP in a handful of manufacturing plants, using it to optimize production plans. Planners found that the new system enabled them to create better plans—and to do it five times faster than they did before.
- **Challenge the operating model.** The company didn’t just launch a tool and declare victory. Instead, it jettisoned its traditional planning cycles, redesigned its planning processes, and built employee capabilities (for example, in data engineering and advanced analytics) through intensive training. It reconfigured

planners' workspaces to facilitate closer collaboration, immediately transitioning to remote collaboration when planners started working from home. Agile methodologies, such as sprints and kanban boards, have become the norm in day-to-day operations for the 20-plus planners that form the core of the company's new autonomous-planning capabilities.

- **Use data as the backbone.** The company spent many hours unifying the data into a cloud-based ecosystem that can be frequently and automatically refreshed and that can potentially draw from dozens of data sources. Various stakeholders across functions collaboratively made decisions about the technology stack, focusing on the areas of highest importance. With a solid data infrastructure as the backbone of supply chain planning, the company can

seamlessly advance from the initial steps of autonomous supply planning to other areas, such as inventory optimization, material-requirements planning, and, eventually, production scheduling.

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The COVID-19 pandemic has severely tested supply chains around the world, exposing weaknesses in companies' planning processes and operating models. Manufacturers must take the lessons of this crisis to heart and act quickly to address them. By embedding a control-tower approach into standard ways of working, then using it to jump-start a decisive transition to autonomous planning, companies can strengthen their businesses to thrive in the recovery and beyond.

**Ignacio Felix** and **Christoph Kuntze** are both partners in McKinsey's Miami office; **Shruti Lal** is an associate partner in the Chicago office, where **Ketan Shah** is a partner; and **Karl Seibert** is an associate partner in the Detroit office.

The authors wish to thank Richa Gupta and Aldo Rosales for their contributions to this article.

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# From defense to offense: Digital B2B services in the next normal

After playing a crucial role in adapting service operations to COVID-19 disruptions, digital and analytics can help B2B service companies emerge stronger in the postpandemic reset.

*by Guy Benjamin, Markus Forsgren, and Nicolas Guzman*

**In the wake of COVID-19**, service organizations have faced the difficult task of balancing the immediate need for new safety measures and additional resources against the longer-term need to manage the recovery. Yet despite the vulnerabilities the pandemic exposed in their operations, some service companies are starting to redefine business-as-usual, allowing them to find a new path through the next normal.

Forward-looking leaders are rethinking how they run their service operations, with digital front and center. Digital and analytics (DnA) played a critical role in addressing the multitude of challenges that arose at the start of the crisis. It also shed new light on the transformative power of DnA to reimagine and transform a services business across three major areas: sales, delivery, and support.

For any individual organization, the extent of the digital transformation will naturally depend on the specific changes required to adapt the current operating model and leverage cutting-edge technologies. But what the most advanced businesses have in common is that they're using DnA to develop solutions that make their operations not just safer, but stronger.

### **Digital speed for reactive action—and proactive planning**

Companies that were early adopters of digital to improve their service delivery were better equipped to react with speed and plan proactively, both of which are essential to thrive during a recovery. An analysis of performance during and after the 2008 global financial crisis shows that companies that proactively planned not only managed the crisis better, but also grew disproportionately in terms of market share and value creation during the following years.

Over the last few months, service-leading companies have started to make the necessary steps towards digital. These companies designed new ways of operating that adapted their business based on learnings from disruption—creating a new form of offense rather than staying on the defense

and simply reacting to demand shocks and changes in customer preferences.

The pandemic has resulted in severe economic distress for B2B companies: in recent months, a survey our colleagues conducted found that around 50 percent of US B2B organizations have reduced their budgets due to decreased demand. To stay competitive in the next normal, companies have expanded and accelerated their use of digital solutions. Indeed, in just the first few months of the pandemic, 96 percent of B2B organizations shifted their operating model to emphasize digitally enabled self-serve, remote, and contactless operations.

But digitization is about more than defending against threats. Our analysis shows that companies can capture 30 percent revenue growth by implementing new technologies such as augmented and virtual reality, and integrating data-based tools through the use of artificial intelligence (AI) and machine learning. Organizations around the world that have implemented these levers in reopening have achieved rapid bottom-line impact.

To date, the share of companies implementing transformative actions in each of the three functions that span a services business—sales, delivery, and support—varies considerably (Exhibit 1). Although many companies recognize the need to transform, those that do not accelerate the implementation of these digital levers risk being left behind by their competitors who have already taken action.

### **Enabling a best-in-class sales experience**

For many companies, sales are highly dependent on in-person experiences, some of which occur on-site. Yet our colleagues' research has shown that changes in consumer behavior during the COVID-19 crisis have resulted in a doubling of digital sales relative to traditional B2B sales transactions. To thrive in the next normal, leading service organizations are leveraging DnA to improve leads and sales-team productivity without face-to-face interactions. We find that companies that have embraced digital are not only building customer

Exhibit 1

**Only a few digital responses have achieved widespread implementation among B2B service providers.**

**Survey of industrial/OEM aftermarket and service executives, (n=107)**



<sup>1</sup>Including maintenance guided by augmented or virtual reality.

confidence and seeing higher sales conversion, but are also improving sales support effectiveness by approximately 25 percent.

As companies transition to contactless operations in response to customer and employee preferences, some have pushed further to adopt virtual solutions—such as video conferencing and virtual reality—to replace in-person interactions.

For example, a heavy-equipment manufacturer implemented virtual reality to provide an interactive test-use experience that highlights the major components of the product, without requiring a customer to have an in-person interaction with a salesperson.

Companies are also reinforcing competitive advantage by incorporating advanced analytics

throughout the sales process. More data is becoming available, capturing customers' preferences and e-commerce interaction patterns. Sales leaders have built an infrastructure that allows them to mine the data for insights to prioritize key customers and dedicate more time to those with a higher propensity to buy, while minimizing time spent on low-propensity leads.

Companies have built advanced-analytics models to predict the probability of purchase across customer segments and products. These tools empower innovative sales leaders to make strategic decisions that maximize sales efforts, which can lift sales by 10 to 20 percent. A heavy-machinery manufacturer aggregated data from sources ranging from contract and sales records to product details and customer demographics to build a predictive

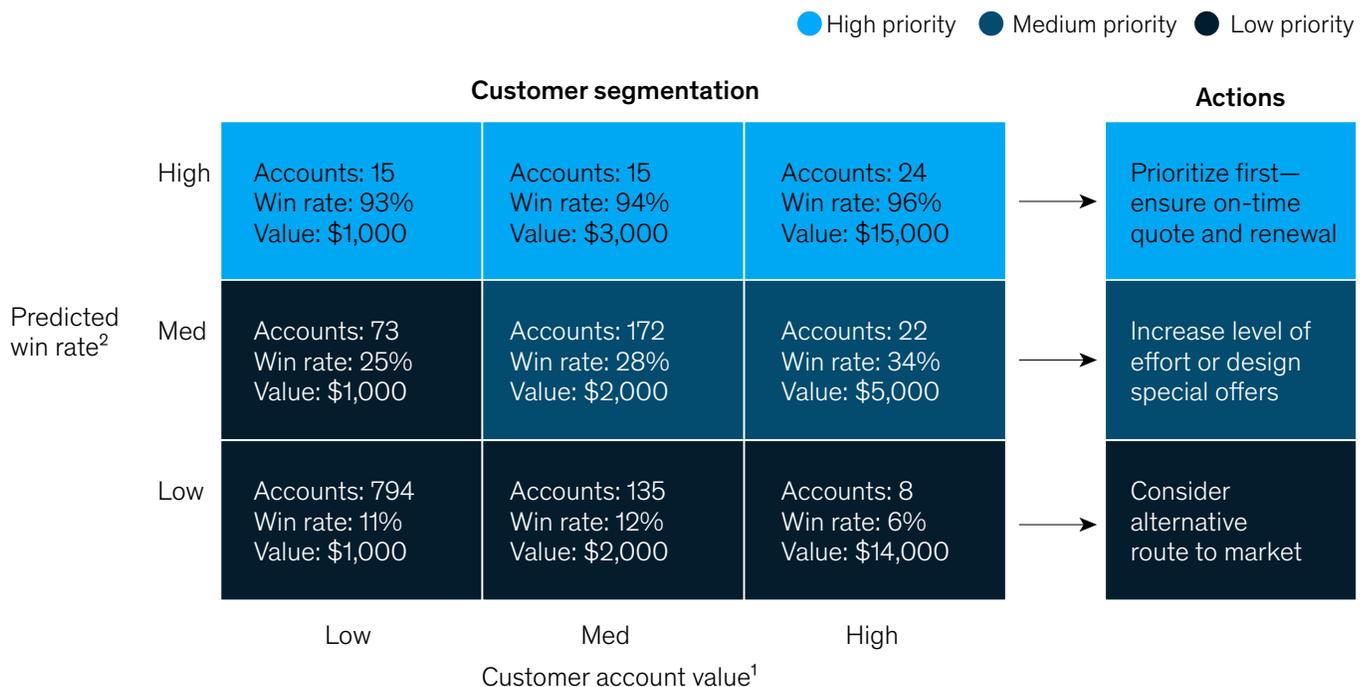
model that yielded a list of customers with a high propensity to buy (Exhibit 2). By quickly shifting focus to providing these customers with tailored offerings, the sales organization generated more than \$30 million in incremental revenue.

The adoption of self-serve sales has increased by approximately 250 percent since the onset of COVID-19, according to a survey our colleagues conducted of B2B companies—increasing the need for a digital transformation to build the capacity that handling these sales will require. And because it appears unlikely that customers will revert to precrisis channels in the next normal, forward-looking organizations are taking the necessary steps to refocus their long-term strategies that prioritize digital. An

Exhibit 2

**Predictive models help prioritize high-value, high-propensity-to-buy leads, and define a customized sales approach.**

**Illustrative**



<sup>1</sup>Cutoffs for customer account value (in \$): low (<\$2,000), mid (\$2,000–\$5,000), and high (>\$5,000).

<sup>2</sup>Cutoffs for predicted win rate: low (<=20%), mid (20–50%) and high (>50%).

aerospace OEM implemented a digitally backed sales transformation across the organization, which resulted in more than \$500 million in incremental orders. The company captured this growth by increasing its digital sales capabilities, as well as implementing digital performance-management tools to incentivize sales representatives.

### **Low-touch service delivery with high-tech capabilities**

Businesses that have relied on in-person interactions have shifted to remote or virtual solutions to facilitate contactless operations. While safety risks have eased in some regions, executives report that consumers remain sensitive to in-person interactions, which will likely lead to a sustained need for virtual delivery models and fuel an acceleration of digital adoption. As an executive of a machine builder said, “We had a five-year plan for digitizing our service delivery. Now, after one year, given COVID-19, we are almost 70 percent there.”

In situations where remote servicing is not possible, such as a service call requiring parts replacement, service companies have increasingly deployed technology to reduce in-person interactions as much as possible. For example, field technicians use text messages for contactless signatures and payment. To reassure customers, leading companies communicate the steps they are taking to train their field technicians and the protocols they follow in protecting worker health. “Customers are moving to us from because they see we provide a safer and more reliable service”, an executive of an MRO service provider told us. “Our demand is higher than ever.”

The proliferation of connected devices and sensors in the Internet of Things (IoT) enables automation and the increased use of self-serve and sophisticated remote solutions. Companies use the data generated by connected sensors to develop remote-delivery platforms that dramatically increase remote-servicing abilities and early problem resolution. Combining IoT with AI allows machines to improve their predictive-maintenance capabilities, while empowering service providers

to track asset health in real time and proactively address issues before a breakdown occurs. In the event of an equipment failure, remote resolution and AI gives technicians the visibility to fix the issue with minimal downtime for their customers—often resulting in a reduction of 8 percent to 10 percent in asset downtime.

As organizations embrace DnA, they empower technicians and customers with the information necessary to make quick decisions on mission-critical operations (Exhibit 3). Imagine that on Tuesday morning before the commuter rush, an elevator sends a signal that maintenance is required. A worried landlord needs to decide whether or not to shut down the elevator, but a remote technician has already received the alert and understands the cause. The technician reassures the landlord that it can continue to operate the elevator during the busiest time of the day. In parallel, the technician is able to determine the precise resources required to address the issue in the minimal amount of time.

In addition to improving the reliability of a customer’s assets, remote monitoring and resolution tools increase the productivity of service organizations and reduce the need for in-field service. A telco leveraged machine learning to determine which machine-generated signals are actual alarms (10 percent) and which are noise (90 percent). Using this data, the service support team was able to remotely resolve more than 90 percent of the machine-generated signals, which increased overall service and repair productivity by approximately 15 percent.

Organizations are also using DnA tools to improve field-technician productivity. Across industries, field technicians tend to be underutilized, which leaves potential revenue on the table and reduces customer satisfaction. Low utilization is primarily driven by poor scheduling and dispatching practices. A building controls manufacturer therefore used an advanced analytics-based staffing platform to address scheduling issues and deploy labor more flexibly, meeting demand

## Remote monitoring and predictive maintenance help reduce equipment downtime.

### Constant eye on critical parameters



Proactive maintenance actions performed

Earlier discovery of service needs enables fixes before they develop into problems

9 early symptoms found per piece of equipment per year

### Advanced technology detects faults in advance



Time saved and user convenience improved

Significant decrease in number of stoppages and other major incidents

60% fewer issues reported by customers

### Full transparency throughout



Problems solved more often during one visit

Technicians know the nature of the fault before they arrive, so they have the right spare parts and can fix the problem quickly

25% increase in resolving all issues during one visit

when and where it was needed. Within about a month, field-technician utilization rose from approximately 70 percent to 90 percent.

tasks, which allows support staff to focus on high-value activities. The opportunities are significant, as the finance function illustrates that at least 30 to 40 percent of back-office tasks can be automated.

### Support functions, supported by automation

To maximize productivity and effectiveness, companies have incorporated DnA tools across all areas of the value chain (Exhibit 4). This allows an organization to make rapid strategic decisions that address issues before they interrupt delivery service and, in worst-case scenarios, directly impact the customer experience.

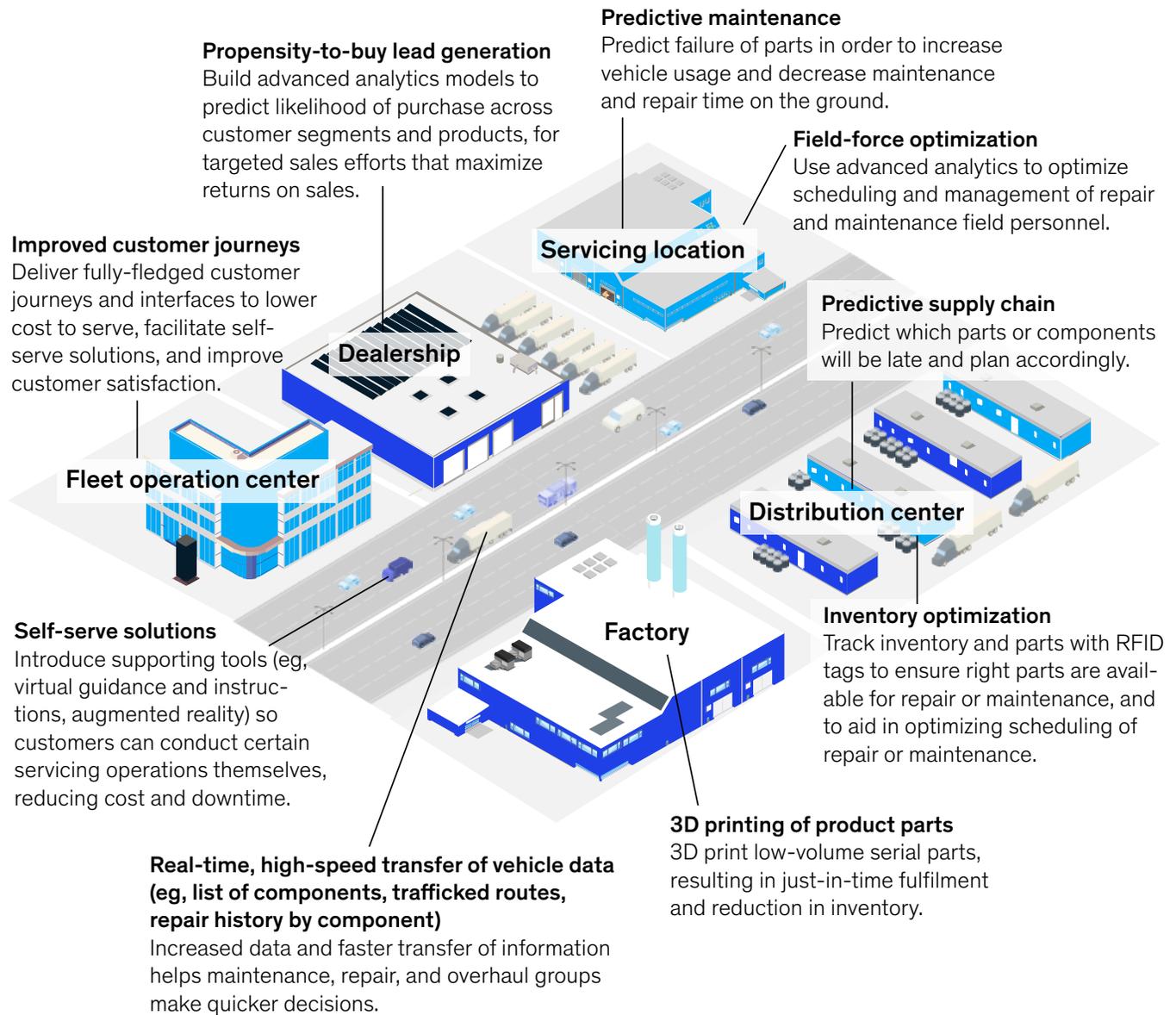
Companies are using process automation and digital performance management to improve the efficiency of administrative support in functions such as HR, accounts receivable, and IT. According to our colleague's research, the use of nearly all digital support options—such as live chat—has increased by 10 percent as companies responded to COVID-19, while the use of most traditional support solutions has decreased by 20 percent. Companies have quickly implemented robotic process automation (RPA) to complete basic

### Playing the long game: Adapting and sustaining change

The execution of DnA tools across sales, service, and support is essential for initiating a digital transformation. However, sustaining the change is the most critical component of any transformation and is often overlooked. Coming out of COVID-19, leading companies are building an agile and resilient operating model to execute transformation and then sustain it through iterative improvements.

A transformation involves changing ingrained mindsets and behaviors, which makes a focus on change management critical to success. In many service organizations, especially those that have grown through M&A, mindsets and processes can wind up stuck. The digitization of processes and tasks is daunting for field technicians—processes will fundamentally change and some will be eliminated. Enabling someone who has performed

**The aftermarket services organization of the future combines digital tools across the value chain.**



the same tasks the same way for 35 years to do his or her job differently requires a significant mindset and cultural shift.

Companies are overcoming the challenges. For example, as part of a field transformation, a heavy-equipment manufacturer rolled out a performance-

management dashboard that applied advanced analytics. While this tool gave frontline managers and technicians visibility into performance, most of them greeted it with distrust, pushback, and fear. To address this, leaders involved field technicians in the process of improving the tool, and in problem-solving ways to improve each metric. Through this

collaboration, field technicians grew accustomed to their new way of operating and embraced the culture of continuous improvement that the dashboard instilled.

Service leaders understand the pressure to incorporate DnA solutions in the current environment, from both their customers and their employees. The good news is that DnA solutions are real-world, proven technologies that organizations are already using today to increase productivity, improve customer experience, reduce costs, and make their operations not just safer, but better. Companies that delay digitization may survive in the near term, but they risk losing their competitive advantage to those that are embracing the changes the next normal is calling for.

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In a time of crisis, employees and customers expect changes. What they may not expect is that some of the changes may be improvements. “We found that the new way of doing things in sales and servicing was superior,” an executive of a commercial-vehicles manufacturer told us. “For the most part, we will never go back to our old operating model.”

**Guy Benjamin** is an associate partner in McKinsey's New York office, where **Nicolas Guzman** is a consultant; **Markus Forsgren** is a partner in the Stockholm office.

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# Analytics helps global business services fuel resilience and return

As companies navigate the COVID-19 reset, global business services organizations can deploy advanced analytics to equip leaders with the information needed for better, faster decision making.

*by Luiz Fernando Ramos, Samir Singh, and Paul Welti*

**Companies everywhere** were suddenly thrust into rapid-fire decision-making mode when the COVID-19 pandemic struck. They needed to ensure workers' safety and maintain business continuity—to mobilize teams for remote working, sustain operations (to the extent possible), manage customers and channel partners, and steady disrupted supply chains—all while adjusting to seismic shifts in customer demand.

But to make the right decisions, companies needed the right data, and they needed it in a timely fashion. How many actually had it?

In any rapidly unfolding situation, particularly in the uncharted territory of a pandemic, it would be an understatement to say that decision-making is challenging. Traditional KPIs, as lagging indicators, are inadequate. Last quarter's sales numbers won't help much in forecasting demand when a sales channel suddenly goes dark, or customer needs make 180-degree turns, or other tried-and-true assumptions become moot overnight. Companies need reliable micro- and macroeconomic indicators to discern emerging trends, new behaviors, and new correlations. The insights derived from these indicators can give companies the ability to be proactive, which can mean the difference between securing competitive advantage and enduring prolonged performance woes. In starker terms, it can also mean the difference between a sustainable business and a slide into irrelevance.

These insights are actually at companies' fingertips. Global business services (GBS), the central organization for general and administrative functions including finance, HR, IT, procurement, and legal, has often played an important role as data "first responder" when reliable data were needed fast. As the central data repository of financial, HR, procurement, and other crucial processes that touch every aspect of a company's operations, GBS can be a gold mine of information.

With the right analytic capabilities in place, GBS organizations are well-positioned to help the enterprise quickly harvest actionable insights from the wealth of enterprise data they handle—data that are processed and updated regularly, often in real time. Carefully designed advanced-analytics algorithms, applied to GBS data in analyzing a

specific business issue, can dramatically reduce subjectivity and bias in supporting clearer-eyed decision-making. Moreover, GBS functions' ongoing analytic works gives their people the skills and mindsets needed to draw insights from the data.

As companies navigate the COVID-19 recovery, an advanced-analytics program can help GBS serve as information broker, equipping leaders with the information they need to make proactive decisions quickly. GBS is designed to reap economies of scale, so playing this data role represents a natural evolution. Such an arrangement also allows GBS to work more efficiently, freeing it from the manual reporting it must sometimes perform so it can serve the enterprise more strategically.

## From retrospective analysis to forward-looking insights

The pandemic—and institutional responses to it—triggered all sorts of operational challenges for businesses: supply-chain disruption, collapses (or spikes) in demand, worker shortages, stoppages of indeterminate length, and cash-flow interruptions. These challenges were compounded by the gamut of policies that varied by region.

In times of disruption, a GBS-led advanced-analytics capability can help companies answer multiple questions in determine the right strategic levers to pull:

- What if, in assessing the order-to-cash cycle time, companies could at any moment know their numbers on sales orders, renewals, and customer revenue—replacing the indicators they often rely on today, such as bills per full-time employee (FTE)?
- What if, instead of cash apps per FTE, companies could access customer short-pay and payment-data trends—that is, they could see the direction and speed of these trends at any point in time?
- In assessing the procure-to-pay cycle, companies normally must wait for payments to be made before they can track on-time payments. What if they could compare the

value of extending payment terms to that of offering early-payment discounts—or better yet, evaluate the effects of those changes dynamically?

- What if, instead of waiting for monthly KPIs on inventory aging, or on maintenance, repair and operations, companies were able to forecast these KPIs with greater accuracy?

The impact on spending, cash-management, and resource-allocation decisions could be dramatic, which in a time of crisis or volatility could have significant business repercussions.

### What's holding companies back?

Certainly, companies today understand the value of data and analytics. But they face many common obstacles in adopting an analytics program. Often companies are missing a key asset: our analysis finds that fewer than 20 percent have all of the necessary building blocks. Some have the data, but not the right platform for analysis; others have the platform but lack the right data, or can't access it in a useful way. Others lack the workforce with necessary digital and analytics skills.

Reaping the value of a GBS-based advanced analytics program can be difficult for a number of reasons:

- **Siloed data, siloed teams.** Much of the data resides in the business unit, geographic region, or a particular service-management system. Take sales data: usually owned and managed by the sales function, it's often out of reach of the GBS function and not always consistent in quality. At many organizations, finance teams and sales teams interact only minimally, creating few opportunities to collaborate in reviewing data, making improvements, or exchanging insights.
- **Lack of data standards.** With no specific definitions of data types, it can be difficult to compare process data. For instance, general-ledger codes might not be consistently or sufficiently detailed across the company's chart of accounts. It's not unusual for sales teams in

the same company to follow different standards. Analyzing data trends thus requires substantial manual effort.

- **The sheer volume of data.** The growing digitization of business and customer processes, along with the proliferation of devices—including mobile devices and industrial Internet of Things sensors embedded in manufacturing and service-delivery equipment—has caused an exponential increase in the quantity of data businesses are producing. Managing all this data and ensuring its quality calls for an increasingly sophisticated, enterprise-wide capability.
- **Few, if any, standards on using external data.** Most enterprises lack protocols for obtaining and using data from external sources, whether to extract, validate, or transform it (for example, cleaning the raw data for a particular use), or even to load data into their own data stores. That's because usage depends on specific agreements, which can only be made on a case-by-case basis. This lack of standards can create long lead times and delay use—another impediment to decision making.
- **No formal career path in data science or data engineering.** By not seeing data science and engineering expertise as being vital to the organization, companies handicap their data effort in two ways: they're less likely to attract such talent, and risk losing in-house talent due to limited options for career progression.
- **Lack of faith in the model.** Before entrusting a new technology or process to a critical business process, internal stakeholders must be convinced that it works: that it's sufficiently robust and that its risks are limited. Then the company must develop a well-thought-through, reliable methodology that allows teams to define and test algorithms. Once the new approach passes muster, it takes a change-management program to incentivize adoption. The lack of a strong data culture in a GBS organization, along with functional-area managers who are used to relying on gut instinct, can increase resistance.

## **Rapid analytics in the real world**

Several GBS teams and third-party GBS service providers are already putting advanced analytics to work in generating bottom-line impact.

***Cash-flow forecasting cuts time and the cost of capital.*** One multinational facing new demands on its capital recognized that it needed a more accurate and timely perspective on accounts payable, so that it could find more flexibility in managing its working capital. Over the course of about two months, the company designed and piloted a model to predict end-of-the-month outstanding accounts payable, not only at the enterprise level but also by location and type of expense. By developing the pilot for two business units with different business dynamics, the company was able to build a prediction model that offered a 90-day advance view with an error rate of approximately 3 percent. The model also gave finance managers a clear view of the company's payment patterns, revealing opportunities to extend days payable outstanding with minimal consequences. Ultimately, the approach improved forecasting accuracy, cut the company's cost of capital, and reduced controllers' workloads, allowing them more time to focus on strategic matters.

***A supply chain-planning COE.*** A leading consumer packaged-goods company is using its supply-chain planning group in GBS to plan product allotment and direct-store delivery for its regional plants. Because the group is co-located with the company's procurement and sales-order management groups, it can help resolve supply disruptions or problems with customer product receipt. With its network view of local inbound and outbound supply and logistics constraints (such as a transportation lockdown), the GBS organization can now optimize product supply in a rapidly changing local environment.

***A third-party IT entity helps government leaders while identifying its own service-demand trends.*** A large IT services provider deployed greenfield COVID-19 response centers with analytics capabilities for its government clients. Each center collects data from across local communities in real time, converting them into visualizations that help guide planning and decision making on COVID-19 response efforts. The data is helping local

authorities calibrate policy decisions and manage the transportation of essential supplies to areas of greatest need.

Technologies such as natural language processing (NLP) and machine learning are helping the IT services provider track and respond to its own customer needs in real time. Specifically, these technologies are helping the provider perform topic modeling in real time, drawing from thousands of publications from international health agencies and news outlets, and automating the extraction of quantifiable trends along with actionable information relevant to a manager's role and responsibilities. The company has also developed forecasting that tracks and predicts (directionally) when regions critical to the service provider and its customers will reach peak infection, and conversely, when a turnaround occurs and recovery rates begin to rise. The technologies have also helped the company create a multi-dimensional simulation model as a proxy for the pandemic so it can develop service-demand scenarios.

## **Eight weeks to value**

As illustrated by the foregoing examples, organizations can mount a rapid advanced analytics approach in as little as eight weeks (Exhibit 1). The work model brings together teams from across functions: IT personnel, data engineers, data scientists, business subject-matter experts, and so forth. The first two weeks focus on prioritizing use cases—a process involving a fair amount of deliberation (including determining criteria) and one that can take a few rounds of iteration (Exhibit 1). The next, step is to assemble analytics teams with the right subject-matter and data skills. Then it's time to collect the data and define the analytical approach (Exhibit 2).

Early on, it's important to establish a governance model to fuel rapid decision making and progress. Adopting an investor's mindset helps teams find ways to overcome resource or talent bottlenecks. Over the next five weeks, the company can build a minimum viable product (MVP) for three or four priority use cases. In parallel, it assesses current analytics capabilities to see what is needed to scale up analytics efforts throughout the organization.

**Advanced analytics supports a wide range of GBS use cases.**

Area	Business process/Sample use case
Cash flow/working capital	<p><b>Order to cash</b></p> <ul style="list-style-type: none"> <li>• Credit monitoring and customer cash-flow forecasting</li> <li>• Risk-based collections strategies</li> </ul> <p><b>Procure to pay</b></p> <ul style="list-style-type: none"> <li>• Price harmonization, real-time input-cost monitoring (eg, compliance with purchasing policies, real-time recommendations for category managers)</li> <li>• Payment terms: segmentation and optimization</li> </ul> <p><b>Inventory</b></p> <ul style="list-style-type: none"> <li>• Inventory segmentation and forecasting of critical stock levels</li> <li>• Distribution forecasting and integration with transportation and delivery channels</li> </ul>
Order to cash	<ul style="list-style-type: none"> <li>• Monitoring order trends in customer accounts for continuous forecasting and for indicators of demand or mix changes</li> <li>• Forecasting order bottlenecks and proactive resolutions (eg, providing a temporary credit-limit adjustment)</li> </ul>
Source to pay	<p>Supplier risk monitoring:</p> <ul style="list-style-type: none"> <li>• Tracking lead times for critical commodities or parts</li> <li>• Liquidity forecasting for smaller suppliers and providers</li> </ul>
GBS operations	<p>Forecasting employee capacity and availability; Critical-skills planning relative to demand forecasts</p>
Customers	<p>Forecasting delivery dates based on continuously updated inbound logistics and operations</p>

Finally, in the last week, the company rolls out the MVPs, synthesizes findings, creates a high-level roadmap for further use cases, and fleshes out its capability-building plans.

Demonstrating proof of concept is not enough, however. At this point, it's critical to train users of the data, who may need persuasion to abandon their manual analysis, put their trust in algorithms, and adapt to a new way of working. Success can therefore be measured in large part by the speed with which

cases can be scaled up—which in turn depends on garnering widespread user support.

Once a rapid implementation has demonstrated the value of a full-fledged, GBS advanced-analytics program, in relatively short order the company create a center of excellence (COE) to oversee a program. A COE would have dedicated resources and formal investment and organization committees for serving functions and business units.

## Advanced analytics supports a wide range of GBS use cases.

### Six core questions will help determine use-case feasibility

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- 1 Is enough data available to develop a model? What sources can it come from, and is it readily extractable?
- 2 Is the data of good quality?
- 3 Are there any external dependencies that might affect implementation, such as the inability to change a business process?
- 4 What about legal considerations—for example, a third party that might restrict data access; or a compliance-related concern (such as data privacy)?
- 5 Can the implementation be done quickly—say, within 2 or 3 months?
- 6 Can the company quantify the benefits, in terms of revenues, cost savings, or other efficiencies, that an implementation would provide?

At this point, GBS could proceed with capability building in earnest. That means acquiring new talent and training existing staff in new data and analytics roles, as well as the use of analytics tools. GBS will likely also refine its operating model, improving its data infrastructure and establishing the right tools and processes. Over time, data-driven decision-making can become the norm in GBS in its interactions with stakeholders and customers. Through the data insights it generates, the GBS organization could shift its orientation to outcome-based process optimization.

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The COVID-19 pandemic has tested companies' planning and resilience as never before. The next three to six months represent a critical rebuilding time for businesses. Having a clear view of demand, supply, and other critical operational and customer trends can give them a major jump-start.

Beyond its role as the keeper of the transactional record, GBS holds the key to strategic insights that are particularly elusive in a time of crisis and rapid change. Putting this to use requires GBS to shed its passive, process-oriented mindset. Rapid analytics with GBS calls for a fresh approach that brings together cross-functional teams from IT, the business side, and the data engineering and science areas to work together in agile fashion.

Instead of continuing to play security guard at the data gold mine, GBS can stake its claim as master and broker of the organization's most precious asset: its rich store of data. But as automation and analytics advance, the window of opportunity may be closing. Now is the time to recognize the value GBS can create—and unleash its power in helping guide the enterprise to recovery, resilience, and competitive advantage.

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# Performance Management 2.0: Tech-enabled optimization of field forces

Businesses with large field forces have more reasons than ever to boost effectiveness and efficiency. New technology options can help shatter old barriers to higher performance.

*by Guy Benjamin, Harrison Lung, and Raghu Murali*

**In recent years**, companies that manage large field forces have made great strides in improving productivity, safety, and customer satisfaction. However, despite multiple initiatives, including implementing lean management and process improvements, significant improvement opportunities remain untapped.

The root of the problem lies with how companies manage and use the significant amount of data they already have. They typically collect and analyze data streams in silos—developed at different times, by different people, and for different purposes. As a result, the data made available to frontline managers lacks sufficient granularity to enable data-driven performance discussions with field workers.

By building and rolling out a technology platform that integrates multiple data feeds, companies can enable granular performance management. We call this tech-enabled optimization of the field force “Performance Management 2.0.” By combining a data foundation with an agile approach, a company can develop a tech platform that provides detailed insights. More than just a dashboard, this type of platform can serve as a single operating system that replaces the multiple systems used by companies today.

At the same time, a company needs supporting initiatives and a strong change-management process to put the insights into action. The potential upside includes a productivity improvement of more than 10 percent as well as significant enhancements to safety, quality, and customer service.

These improvements are especially vital for enabling companies to meet the spike in services demand in the aftermath of the COVID-19 crisis. Higher levels of productivity also allow technicians to minimize exposure to the virus during on-site visits. To capture these benefits, managers need to better understand which tasks take the longest for which technicians and who needs training on specific topics. For companies that are still experiencing low demand for services due to the crisis, the pause provides a unique window of opportunity to accelerate digital initiatives and transform the operating model.

## **The need for granular performance management**

Efforts to improve field-force productivity, safety, quality, and customer service are limited by how much transparency is available to frontline managers on a day-to-day basis. The lack of transparency not only makes it hard to identify problems, but also limits visibility into best practices that would eliminate bottlenecks and help field workers improve their performance and meet targets.

For example, high-level metrics, such as number of jobs per day or number of hours per job, tend to give managers only directional views on performance, rather than pinpointing specific productivity-improvement opportunities. Similarly, an aggregated safety scorecard for each technician provide little insight into the factors that may have led to an unsafe environment (such as speeding to arrive at a job on time). Shortcomings such as these prevent managers from supporting field workers with customized, practical guidance on improvement opportunities—for example, how to complete a job in a single site visit, or how to use GPS-powered apps to find the fastest route to a site.

### **Breaking data siloes**

The problems arise because companies typically take a siloed approach to reviewing data. For example, frontline managers check overtime data and dispatch information, while the dispatch group reviews payroll data, and the fleet group reviews the GPS data. The siloed systems make it hard for managers to stitch together data from different sources to form a complete view of the root causes of performance issues. Frontline managers may require hours or even days to conduct a simple root-cause investigation. Consequently, they often have very little specific feedback to give their technicians when performance issues occur—except when they have directly observed the technician during a field visit.

A case in point is performance management at a Fortune 500 company with more than 1,000 field-service technicians who install and

repair equipment in customers' homes. The times for completing jobs were high, but managers had low visibility into the root causes. To perform an investigation, they needed to work across five or six different IT systems—a task that required half a day or more.

### Acting on data insights

The solution is to give frontline managers easier access to information about specific productivity- and safety-improvement opportunities, enabling them to provide the field force with more granular coaching. Conversations between a manager and technician can focus on the root causes of issues and the specific actions to improve performance, rather than just reviewing high-level metrics that may not relate well to workers' day-to-day activities.

To make it happen, companies can improve how they leverage the significant amounts of data they already collect. Companies are sitting on a trove of data—GPS location services, workforce-safety reports, timecards, equipment activation records, customer communications, and warehouse management. By integrating these time-series data together, companies can gain significant insights. The benefits range from answering basic questions, such as when the technician reached a customer site, to gathering information about specific safety or quality incidents, and communicating to the customer prior to arrival (Exhibit 1).

Enhanced performance management generates significant value. Companies can capture productivity improvements of about 10 to 20 percent by reducing discretionary time, improving job efficiency, and reducing drive time. They can also improve customer service, both by improved communication to the customer prior to arrival and by closer adherence to on-time arrival at job sites. Additionally, they gain more visibility into safety incidents—such as speeding, tickets, falls, or sudden stops and acceleration of vehicles—and potential best practices for improving safety. Other impact areas include improved quality, higher employee morale, and better inventory management.

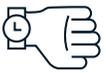
### A flexible, responsive approach to implementation

To build a technology platform that brings together multiple data streams, companies can adopt a user-centric approach.

*Set up a performance infrastructure.* The first step is to identify what data is needed versus what is currently available, assessing where real-time, live data feeds are required instead of batch feeds. The types of interfaces needed to access the data will require consideration as well, along with measures supporting consistent data quality.

Exhibit 1

## By matching time-series data, managers can uncover more detail about field-force performance.

Data sources		Insights	
	GPS data	Vehicle/tablet GPS	 Safety Speeding, longer routes taken
	Job timing data	Dispatch, time card, job arrival time	 Quality Repeat/incomplete jobs
	Equipment data	Activation time, inventory level, replacements/repairs	 Productivity Closeout/customer departure
	Customer data	Communication with customer, job address, job arrival window	 Customer service Timely communication, arrival, service

**Analyze the opportunities.** In identifying the most valuable improvement opportunities, companies can start by focusing on a few common themes, such as improving drive-time efficiency, increasing the use of multiple stops, or shortening the time required to close out a job. Bottom-up analysis, based on interviewing managers and observing technicians at job sites, helps focus efforts on the most important problems and improves the likelihood of successful implementation.

**Define priority features.** Starting with a hypothesis of the top features needed for the platform gives this stage of the process more structure. A user-centric approach will emphasize workshops with frontline managers to get their feedback and identify the list of features to prioritize. The end result is a one-year roadmap that details which features will be covered in each quarterly release of the platform, creating a steady cadence of platform development and rollout.

**Build the minimum viable product (MVP).** The team building the initial, MVP iteration of the platform should ideally include a data expert, an enterprise architect, a product owner, and a business lead, as well as a subteam responsible for development and testing. Including these profiles makes it easier for the organization to align the business and the IT function on how to develop the MVP and deploy it in the field.

Their work will be easier if they have complete access to high-quality data, which means paying attention to details such as the data's reliability (Are the GPS coordinates accurate?) and accessibility (How machine-readable are our sources? Can we stream the data in real time?). Companies operating multiple legacy systems face the additional question of whether they can leverage their existing infrastructure, without major rewiring of IT systems.

Under a user-centric approach to building the MVP, the team may develop early mockups and conduct workshops with field managers to get feedback on each iteration. Their perspective can help teams avoid the inclination to add more and more features, as it's the field managers who will use the system every day. Their needs will matter more to the system's success than building in nice-to-have add-ons for the head of the field force or the area manager.

An easily understandable interface for frontline managers will often prove critical to the MVP's acceptance. An individual-level dashboard provides managers with a granular view into a "day in the life" of a specific worker (Exhibit 2). A team-level dashboard gives frontline managers a quick view of which members of the field force to focus on for coaching and training (Exhibit 3).

**Pilot the MVP.** Rolling out the MVP to a select few sites allows the development team to gather initial reactions for additional iteration on the user interface and functionality. To enable effective pilots, organizations can launch supporting field initiatives that leverage the platform to improve operational excellence over a three- to six-month period. Good results build positive word-of-mouth that can help in building scale across the enterprise.

For example, an initiative to improve job-execution time focuses on freeing up slices of time based on analyses of arrival and departure times from job sites, equipment activation times, and support center call times. It also would likely roll out skill mapping and upskilling to ensure supply flexibility. Through such initiatives, managers can use the platform to pinpoint opportunities to provide tailored support to field workers, rather than simply monitor their performance.

As part of the foundation for these pilot initiatives, managers can consider standardizing the operating model at each site. This entails ensuring compliance with basic guidelines, such as time-card entries, checking out vans every morning, and keeping the fleet GPS switched on. The standardized operating model provides a solid foundation that enables accurate and consistent data collection from the field.

**Scale up.** A carefully phased plan allows an enterprise-wide rollout to proceed over the course of three to four months. Successful deployment at scale depends in part on basic technology hygiene measures, such as strengthening the platform with appropriate privacy and access-control features. Stress tests help ensure that the system is resilient. At the same time, developers can start adding further tools to provide ready insights to frontline managers as well as senior management.

Exhibit 2

Dashboards provide a day-in-the-life view of field-force workers' activities.

Tech 1

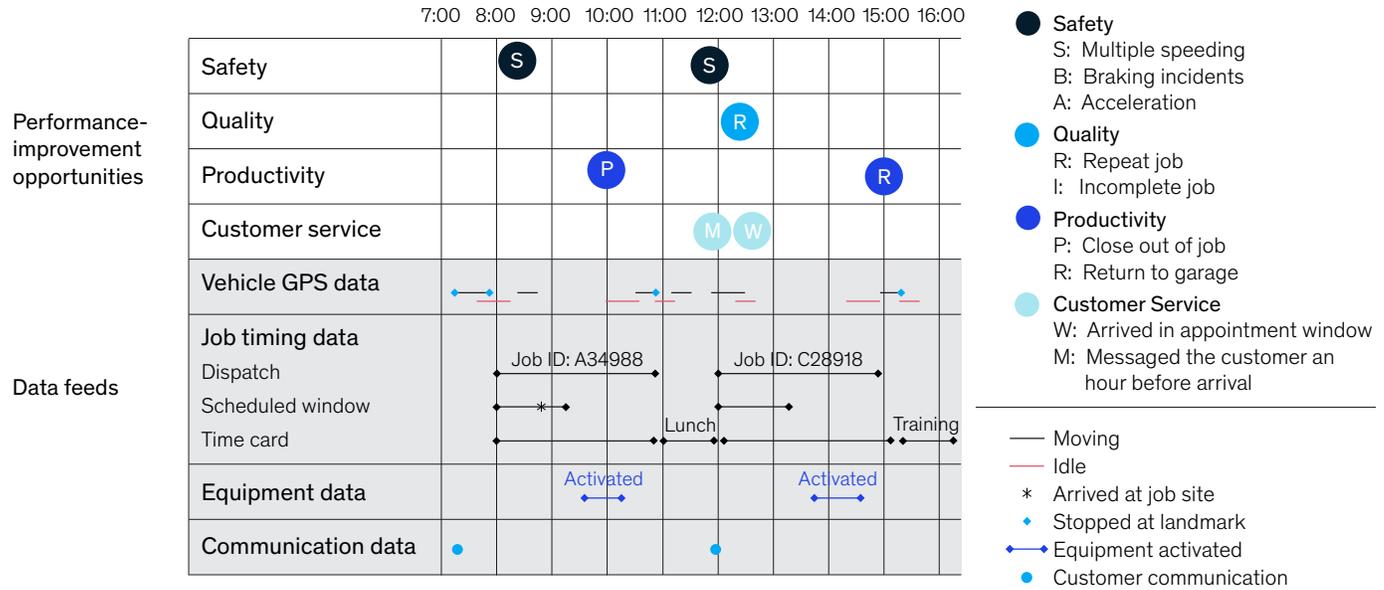


Exhibit 3

Team-level summaries reveal associates' coaching and training needs.

Associate	Safety	Quality	Productivity		Support center call time (hrs/job)	Drive time per job (hrs)	Ideal drive time per job (hrs)	Drive time delta ranking	On-time arrivals per week	Customer Comm. per week
	Safety incidents per week	Successful job completions per week	Job time reported (avg. hrs)	Job time allocated (avg. hrs)						
Tech 1	↑ 9	78%	3.6	3.9	0.46	1.3	0.6	●	▶ 95%	83%
Tech 2	→ 5	97%	3.4	3.3	0.28	1.3	1.1	●	▶ 91%	92%
Tech 3	↑ 8	87%	2.8	3.4	0.42	1.1	1.3	●	▶ 96%	92%
Tech 4	→ 5	93%	2.8	3.6	0.82	0.5	0.7	●	▶ 91%	92%
Tech 5	→ 6	76%	3.1	3.7	0.92	1.7	1.6	●	▶ 98%	90%
Tech 6	→ 5	77%	3.0	3.5	0.97	0.5	0.5	●	▶ 95%	94%
Tech 7	→ 5	95%	3.3	3.6	0.69	1.2	1.1	●	▶ 94%	84%
Tech 8	↓ 3	90%	3.2	3.7	0.95	1.4	1.5	●	▶ 94%	84%
Tech 9	↓ 3	83%	3.3	3.7	0.68	1.1	1.1	●	▶ 96%	92%
Tech 10	↑ 8	68%	3.2	3.0	0.35	1.2	1	●	▶ 92%	84%

● Positive ● Neutral ● Negative ■ Associates needing coaching

As with pilots, strong initiatives to drive improvement can encourage use of the platform and help managers see that the benefits are worth the effort.

Change management provides the essential foundation for capturing performance improvement, starting with a compelling story to communicate the overall objectives to the organization, as well as the vision, goals, and milestones. The platform will likely require people to learn new skills, which capability-building programs can provide. To establish reinforcement mechanisms, companies can build new structures and processes designed so that people know what is expected of them day to day, and what the consequences will be for not meeting a commitment. Finally, the senior team's role modeling of the new practices and behaviors will likely have the deepest impact in underscoring the importance of the transformation and the organization's alignment on the new approach.

The Fortune 500 company referred to above developed a tech-enabled platform to give its frontline managers easy access to performance data and facilitate granular performance management. The company integrated data from multiple sources, matching time stamps and visually laying out the activities for each day. The platform provides comprehensive metrics by technician, peer group, and work site, creating a single operating system that eliminates the need for managers to navigate multiple systems that previously wasted time and effort. Metrics are summarized to provide digestible insights. To drive the rollout, company defined specific initiatives that leverage the platform, building on previous efforts around lean and process improvements. It has launched pilots at multiple sites and plans to eventually scale up the platform across its network.

The transition to the platform is expected to generate substantial impact for the company, helping sustain the 10 percent productivity increase that lean and process improvements had already achieved, while also driving an additional 5 to 10 percent productivity improvement for technicians.

The company is on target to capture additional savings both in fleet usage, relating to reduced fuel consumption and avoided capex, and in equipment usage. Better on-time arrival rates and enhanced communication with customers before arrival will likely mean higher customer satisfaction, while personalized coaching and targeted skill-building provide new opportunities for boosting employee morale. And less driving, combined with faster escalation of safety issues, leaves fewer opportunities for safety problems.

A call-center operation provides an additional example of how these changes can improve results. A global services provider used a combination of technologies to develop an integrated platform that enabled granular performance management and coaching. The system used data from multiple sources, including from its customer relationship management system, its call routing records, and its interactive voice response system. By calculating performance metrics for each agent and presenting the results to team leaders, the platform highlighted the actions of concern and recommended specific coaching actions to improve performance. This resulted in a 15 percent increase in productivity.

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To enable data-driven performance management of their field force, most companies do not need more data. In many cases, they are already sitting on all the data they need. What's required instead is greater accessibility and visibility into this data and the analytical horsepower to derive actionable insights. A technology platform that integrates multiple data feeds provides a unified operating system that enables companies to capture the potential of previously untapped data assets. By deploying this new operating system at scale, companies can achieve step-change improvements in productivity, safety, quality, and customer service. These benefits will be especially valuable for companies as they seek to manage the spike in demand following the COVID-19 crisis while minimizing risks to field workers on site.

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# Resetting capital spending in the wake of COVID-19

Amid the pandemic, many CFOs are struggling to stabilize cash flows. A quick reset of capital spending—which can usually be achieved in about four weeks—can help them reach their goals.

*by Tom Brinded, Zak Cutler, Erikhans Kok, and Prakash Parbhoo*

The **COVID-19 pandemic** will have an enormous impact on people's lives and livelihoods—that much is clear. The path to recovery is far less so, though it is evident that the crisis has significantly impeded many organizations' ability to execute capital projects, and may continue to do so for some time.<sup>1</sup>

The availability of labor and materials has decreased worldwide, while more and more balance sheets and cashflows are becoming capital-distressed. Physical distancing and travel restrictions have

made it difficult for sectors and countries to get workers safely into plants and construction sites, and vital supplies into global production networks. Government-enforced public-health measures, for example, have disrupted the operations of fabrication yards and construction sites across Asia and Europe.

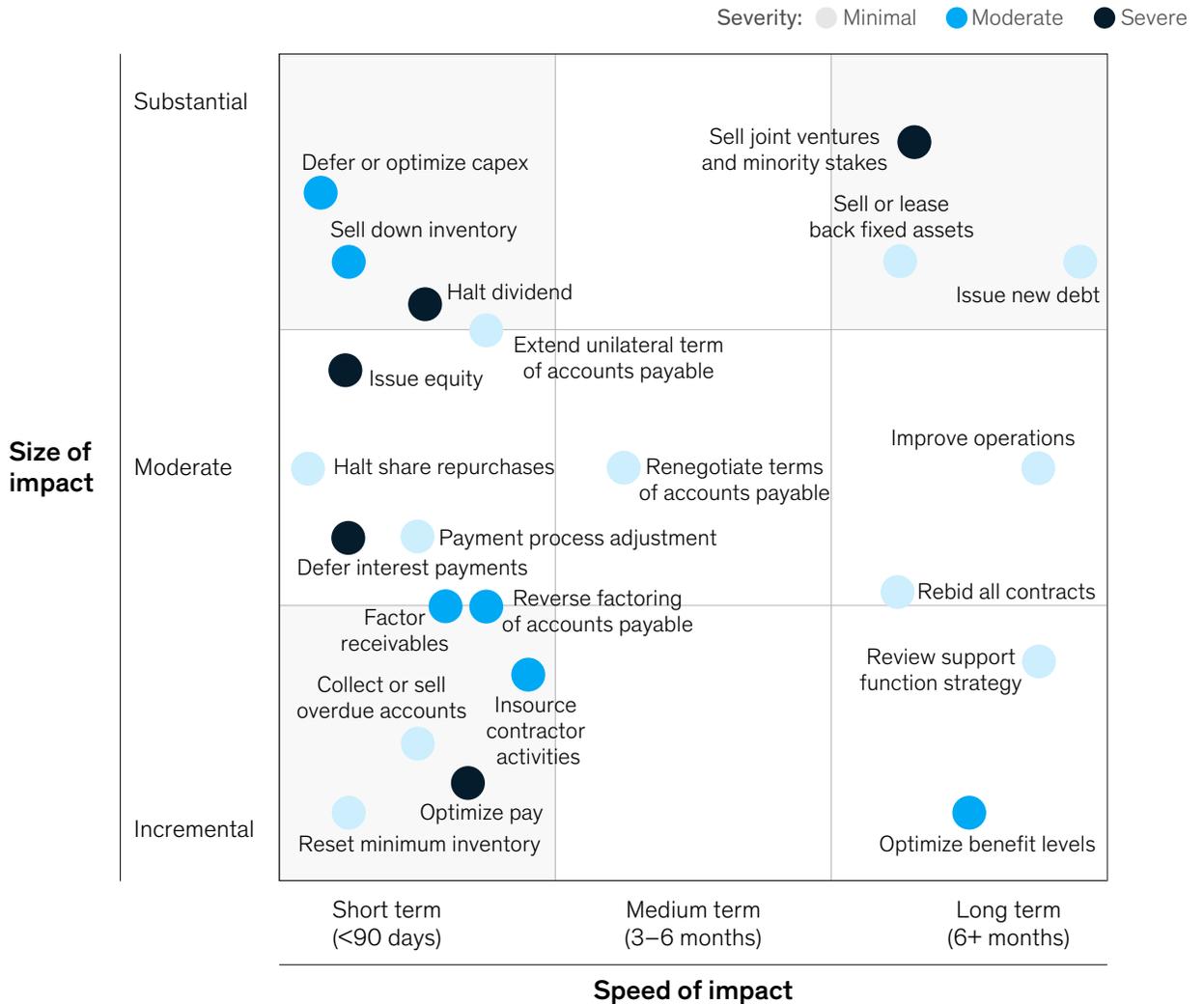
Freeing up cash by deferring capital expenditures is one of the fastest and most substantial ways to mitigate these ill effects (Exhibit 1). As such,

<sup>1</sup>For more on potential recovery scenarios, see "COVID-19: Implications for business," updated June 18, 2020, McKinsey.com.com.

Exhibit 1

## Deferring capex rapidly frees up significant amounts of cash.

### An illustrative example of priority areas for high impact and quick implementation



companies across sectors and the globe have announced capital-expenditure cuts ranging from 10 to 80 percent (Exhibit 2). To gain insight on the extent to which specific industries have been affected, we analyzed publicly available notices from some of the largest companies in the world: 98 had announced capital reductions. Although many have announced top-line cuts to capital budgets, however, finance leaders often don't know which projects to cut or where best to reallocate their capital.

As the pandemic-fueled crisis has illustrated, CFOs and company leaders will need to quickly reset their capital-project portfolios. To do so, companies should follow a four-step process: triaging their portfolio, prioritizing options,

optimizing individual projects, and finalizing the portfolio plan. This approach sets up a blueprint for companies for long-term, effective portfolio optimization in the next normal.

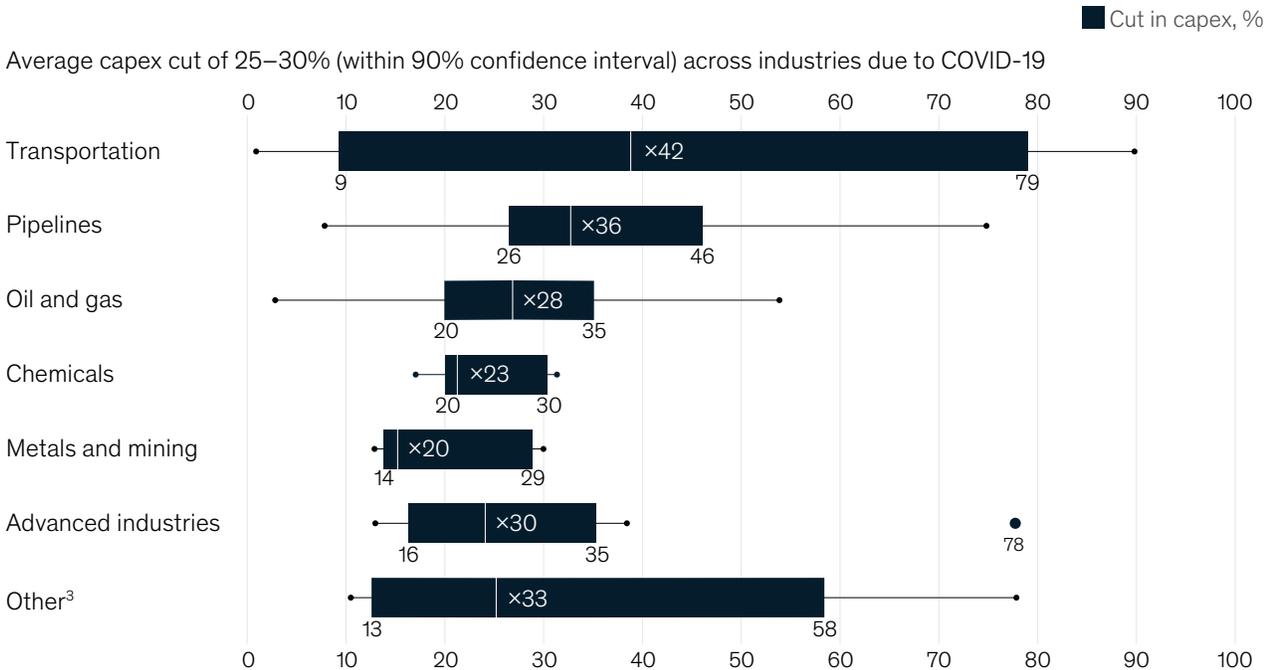
### A reset is difficult but worth the effort

In our experience, successfully executing this approach not only maintains delivery of business objectives and results—they also reduce capital spending by 15 to 30 percent, and boost ROIC by 2 to 4 percent. Furthermore, our analysis shows that the reward will likely be worth the effort. In studying 1,500 companies based in the United States over a 20-year period, our colleagues found that those that dynamically reallocated

Exhibit 2

## Oil and gas and transportation have announced the largest capital reductions.

### Capex reductions, by industry<sup>1</sup>



<sup>1</sup> Research targeted top 500 global companies and revised capital-expenditure guidance given the COVID-19 environment.  
<sup>2</sup> Capex-reduction percentage is calculated as percentage reduction in planned capex for the same period starting FY 2020.  
<sup>3</sup> Includes companies in advanced industries, automobile, telecommunications, and utilities.  
 Source: Publicly available investor materials; press search

their capital outperformed those that did not<sup>2</sup>—their median compound annual growth rate for total shareholder returns was 10 percent, compared with 6 percent for companies that did not. This evidence suggests that companies' response to this crisis is critical for not just short-term liquidity but also long-term success once the coronavirus crisis has passed.

Attaining these results is more easily said than done, however. Crisis situations require leaders to be well-equipped with facts to act quickly. Given the uncertainty surrounding the pandemic, however, fact-finding and knowing how much is necessary to cut to sufficiently improve cash flow can be difficult. Indeed, our April 2020 survey of 43 capital-projects leaders found that determining how deep to cut and a lacking fact base were their biggest challenges (Exhibit 3).

Regardless of whether business has grown, slowed, experienced closures, or prepared for a return to something approaching normalcy, all companies and

their capital projects are undoubtedly affected by the COVID-19 crisis. Understanding the implications of the crisis and recovery on 2020 and 2021 project portfolios is critical. Until now, most leaders have been focused on the immediate response to the crisis, and many have been forced to make rapid cuts early. But as the crisis effects linger, CFOs and capital project leaders would be wise to revisit and refine their capital portfolios.

### A better approach to resetting a capital portfolio

Once an enterprise has determined the level of capital expenditure it can afford, we recommend four steps toward a fast reset of its capital portfolio.

#### 1. Triage the capital portfolio

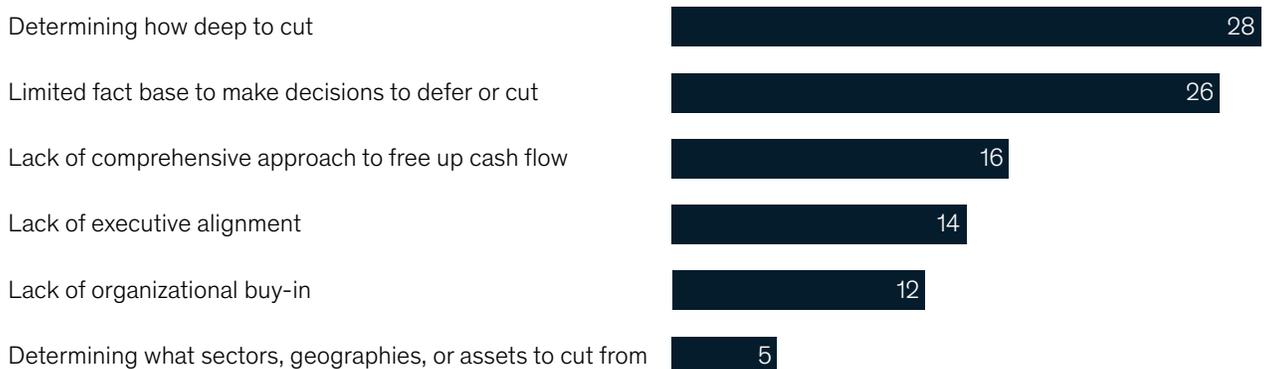
The first step is to rapidly assess where to reduce or defer capital spending while minimizing liabilities. In some cases, physical threats to continued project execution, such as restricted site access, may cause more harm than financial ones do. In March 2020,

<sup>2</sup>Stephen Hall, Dan Lovallo, and Reinier Musters, "How to put your money where your strategy is," *McKinsey Quarterly*, March 1, 2012, McKinsey.com.

Exhibit 3

## Capital-project leaders and executives face numerous challenges in resetting their portfolios.

### Responses to "What is the biggest challenge your company is facing?," %



Source: Webinar conducted April 28, 2020 (n = 43)

for example, facing the rapid spread of COVID-19, many North American operators with strong finances closed sites to contractors and sent nonessential personnel home because of health and safety concerns.

Some existing projects may no longer be viable in the current environment. Work restrictions affecting suppliers and contractors, limited availability of materials and equipment, and changing market conditions could all eliminate a project's need or ability to execute. In addition to assessing the existing portfolio, capital project leaders must also identify the largest potential opportunities for projects that have not started or are not essential to core operations.

## **2. Assess each project and prioritize**

The second step begins with analyzing each project to develop a fact base to support informed decision making. These facts might include, for example, spending to date, committed spending, stoppage costs, as well as a measurement of expected benefits, stakeholder impact, and risk trade-offs.

Criteria used for this type of assessment differs by industry. Chemicals companies typically assess a project's production impact—for example, if a project is not completed, is it likely to result in a shutdown? Upstream oil and gas operators consider several criteria, such as lease obligations, the cost of supply, and the cost of development, to make decisions regarding which reservoirs to drill or let expire. And utilities might measure specific risks to assess each project; for example, utilities in California would prioritize completing wildfire-prevention work before the start of the summer fire season, and these important, risk-mitigating projects must continue.

In our experience, utilities that focus on projects that add the most value—that is, using a risk-adjusted economic metric to replace or sustain projects rather than performing maintenance on a calendar schedule—can reduce their capital spending by 20 to 35 percent.

## **3. Optimize selected projects**

Once the priority projects are clear, the third step involves maximizing each one's value by refining its business case and scope, enhancing design, striving toward contracting excellence, and improving construction execution.

For projects that continue, this step provides an additional opportunity to save on capital expenditure by pressure testing a minimum technical solution and identifying market opportunities. As such, companies should select the largest and most complex projects to upgrade, moving onto additional projects if time permits.

One North American chemicals company that was able to improve its sustained projects negotiated significant reductions in its engineering and construction contracts and other portions of the scope. In total, the savings on capital spending for those projects were nearly 25 percent.

## **4. Reset the portfolio**

Finally, operators need to combine what they've learned in the first three steps to create a robust trade-off analysis. Portfolio decisions must be finalized—changes implemented across the organization. A reinforcing fact base will help not only make adjustments in the near term but also adapt to changing conditions over time. In addition, principles applied during a rapid resetting may also yield substantial benefits when applied to existing capital-planning processes that may affect future allocation cycles.

CFOs and other business leaders often have capital decision-making processes already in place, but working in crisis mode introduces new urgency and competing priorities for their time. It is therefore crucial for leaders to have an impartial foundation and forum to inform debiased decision making.<sup>3</sup>

<sup>3</sup>For more on eliminating bias in decision making, see Tim Koller and Dan Lovullo, "How to take the 'outside view,'" March 5, 2019, McKinsey.com.

Rapidly setting their capital portfolio will allow companies to quickly free up capital spending according to their needs; various scenarios will prescribe which projects should be cut, reduced, optimized, deferred, or continued as planned. Using this four-step approach, one North American real-estate developer achieved a cost reduction of more than 60 percent by standardizing a set of priorities across investments for the most critical asset needs. Furthermore, the optimized investment portfolio that resulted still met program requirements and constraints—including, for example, acceptable living standards.

As operators get to work on resetting their capital portfolios, they should keep a few things in mind. First and foremost, they should implement a more-nimble process for capital allocation: companies will need to respond to the rapidly changing environment and focus more on projects that are “shovel worthy” rather than “shovel ready.” This requires investors to be strategic as they watch the world unfold—to save worthy projects that are affected by the crisis and weed out projects that were on shaky ground from the start.

One head of a Canadian public-infrastructure agency described his approach to prioritizing projects by thinking about different time horizons in parallel: keeping immediate assets and projects running while also considering the long term. The organization isolated a few indicators deemed important for recovery and manages its pipeline based on those elements. It is also working closely with its government partners to set a new post-coronavirus baseline for infrastructure priorities—in which sustainability in all forms will play a significant role.

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In service of nimbler capital allocation, operators must also consider these realities:

- ***Having the right fact base is crucial.*** Difficult trade-off portfolio decisions will rely on foundational information to minimize impact or risk to the company.
- ***Investing in new types of capital is imperative.*** Reallocate capital to new areas of investment or growth (such as operational improvements in the next normal, including digital efforts).
- ***Speed matters, and portfolio choices will have a lasting impact.*** Companies will need to react quickly and competently to stabilize cashflows while balancing effects on future growth and operations.
- ***Collaboration is more critical than ever.*** Conditions are progressing more rapidly and in ways we haven't experienced. Operators, stakeholders, and suppliers will therefore need to think differently about partnerships going forward.

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Uncertainty surrounding the pandemic and economic recovery will persist. It will become increasingly important for operators to rapidly reprioritize their capital portfolios. Doing so will operationally and financially benefit both them and—once they can continue their projects—the broader economy.

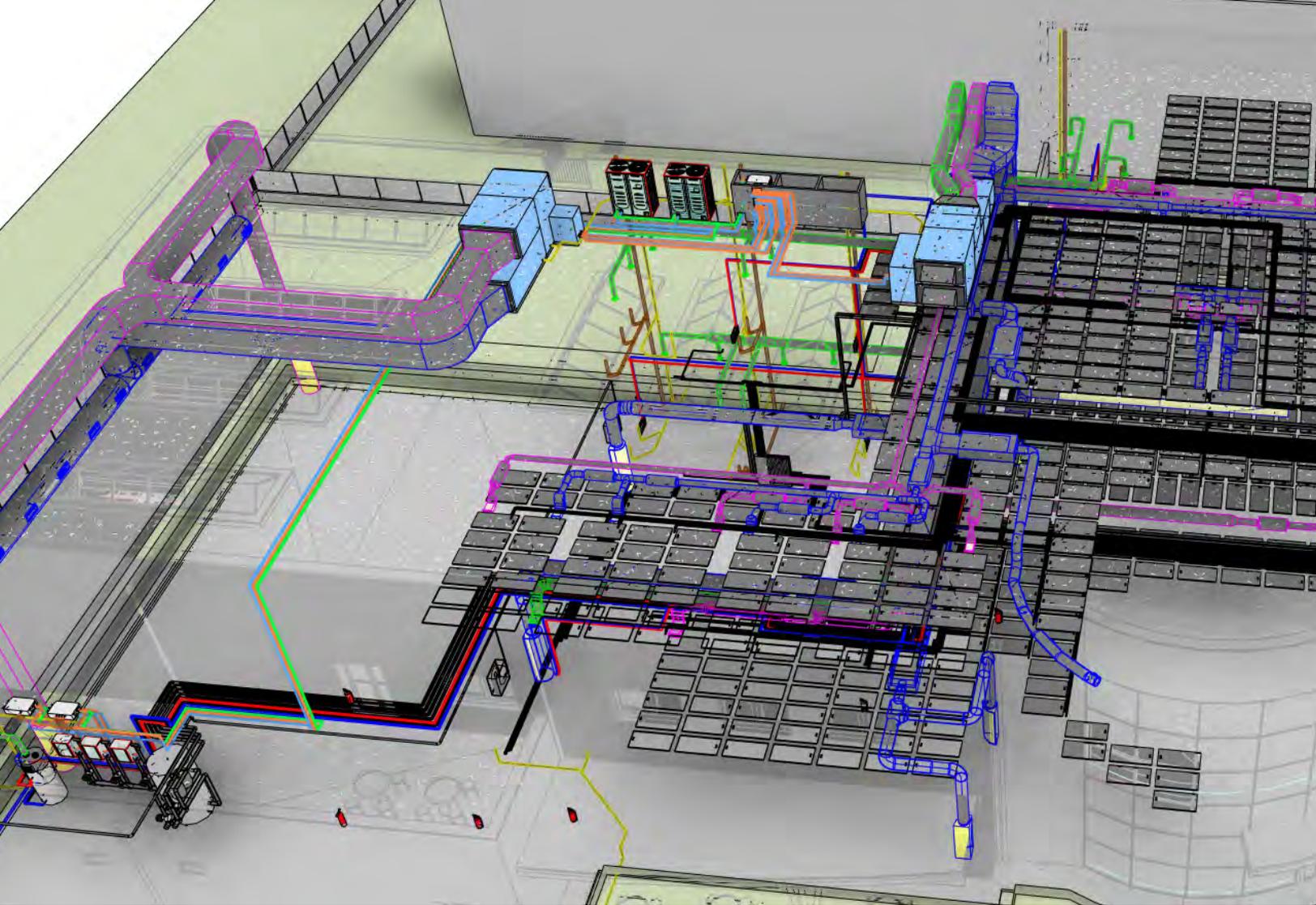


Image courtesy of Consorzio Ponte Rosso

# Walking the talk: Best practices for digital construction

We are taking the advice we typically give our clients and applying it to our own construction project—and we'll be sharing the challenges and lessons as we go.



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**It's no secret** that digital innovations can improve productivity and help the construction industry navigate disruptions and mitigate risks. And in the wake of the COVID-19 pandemic, many project owners have been forced to step up their use of technology to enable their teams to work and collaborate remotely.

But beyond the context of the current crisis, adoption of digital innovations has been slow. This delay is at least partly due to a lack of digital standards and experience within the industry. In addition, many players likely anticipate high up-front costs and a long wait before their investment pays off. Project owners are understandably wary of testing new digital tools on multibillion-dollar projects. And given that project success typically hinges on collaboration, introducing new digital workflows—which may be unfamiliar to some of the parties involved—can seem daunting.

But the benefits can be greater—and the barriers lower—than many industry players expect. In the design phase, a fully digital construction project can reduce drawing revisions, redundant conversations, and version errors while lowering project risk and facilitating clash detection.<sup>1</sup> Going digital also supports procurement across work packages and over time, increasing safety standards and allowing better workforce planning and machinery use. Of course, achieving these benefits requires parties to be willing to explore new solutions and fundamentally shift the way projects operate.

So when it came time to add a building to the McKinsey Digital Capability Center in Venice—an almost unique opportunity for us to build a project from the ground up—we chose to take our own medicine. Together with our partners on the project, we decided to roll out core digital tools, build the required capabilities, and push the boundaries of what is possible: exploring new ground to see for ourselves (and for the

industry) what these tools and a new way of working can do.

Although we are still in the early stages of construction, a number of unforeseen challenges have already shown us how quickly digital tools can improve collaboration among stakeholders. These challenges, and the ones that will surely follow, will allow us to better understand the benefits of digital tools in construction and to empathize with companies facing these hurdles. We plan to share everything about our process—good and bad—so that construction leaders who are starting their digital-transformation journeys can take our lessons to heart and capture all of the value on offer.

### **Three pillars of digital construction**

The entirety of our new building was designed using a building-information-modeling (BIM) process. Our goal was to bring digital tools into the construction phase to influence the following:

- **Collaboration.** A digital control tower brings together owner representatives, the lead contractor, and subcontractors to discuss plans and track progress around one common source of truth, with an integrated master schedule.
- **Tracking and forecasting.** Using drones as well as fixed and hand-held scanners, frequent 3D site scans linked to the BIM model can automatically detect deviations, forecast potential clashes in constructability or work-package execution, and ultimately feed into the reporting dashboards of the digital control tower.
- **Worker safety and material workflows.** Sensor-based safety technology fosters a safer and more focused on-site work environment, helping workers follow safety protocols more closely and remain aware of their surroundings.

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<sup>1</sup> Clash detection is a feature of BIM that identifies areas where parts of a building may conflict with one another before construction begins.

## First steps toward fully digital construction

Pushing technology frontiers is less important to success in digital construction than a shared commitment to changing the approach. Most architects and engineers today work in BIM, but finding other critical partners with experience in—or who are open to other new solutions as part of a fully digital construction model—can be complicated.

In our initial discussions, contractors expressed great curiosity about the applications of digital tools. In particular, executing contractors worried that a rollout of digital tools might actually create more work, especially at the beginning of the effort. This initial hesitation was not unwarranted—the 3D site scans, digital tracking tools, and sensor equipment for workers all had to be budgeted for, and some foundational work, such as creating a more meticulous schedule, had yet to be completed.

Indeed, before putting these digital tools to work, we needed not only to champion tangible, granular data but also to reset the general understanding of collaboration. The digital control tower is intended to facilitate this new way of working among parties—shifting from reporting only on specific milestones to routine, almost real-time reporting that allows for ad hoc problem solving.

More important, we have learned that walking toward rollout together is essential for building trust in the tools. Digital tools create value not by reinforcing old mechanisms, where the project owner exerts control and contractors struggle to deliver, but by serving as catalysts to a joint understanding, joint truths, and joint success.

For example, by collaborating on schedule granularity and quality, our owners and

contractors established physical key performance indicators (KPIs) to guide the project—such as the volume of concrete that had been poured or the area of semi-precast slabs that had been installed, both of which could be found in the scans. Monitoring this activity in almost real time enabled daily tracking. The significant effort paid off in multiple ways. For example, it increased the owner's understanding of what needed to be done, where to expect bottlenecks, and the challenges facing contractors (which were sometimes as simple as making sure ensuring an adequate workforce was available on a holiday). The effort also yielded immediate performance improvements—for instance, better visibility allowed us to resequence activities and reclaim several weeks of delay due to COVID-19 shutdowns.

## Keeping ambition high—what's next

We are still at the beginning of our digital-construction journey, but the benefits of using digital tools have already outweighed the added up-front cost.

Thinking ahead, we want to better link our tools and enhance our analytics. We are striving, for instance, for fully automated progress reporting that links the performance KPIs embedded in the digital control tower with the evaluation of the 3D scans against the BIM model. We also want to optimize our integrated master schedule so that all parties benefit from improved activity sequencing, earlier alerts on required worker mobilization, real-time knowledge of timing and logistics (for both off- and on-site materials), and safer working conditions.

And we are keen to train additional subcontractors as they come on site to ensure they have a consistent level of capabilities and

continuously foster a shared understanding of this new way of working.

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We have high hopes for the outcomes this approach will deliver. We are wading through uncharted waters, and we are bound to make some mistakes. But once we learn from those mistakes, we expect that these improved methods—enabled by digital tools—will unlock new value. If players across the construction ecosystem capture all the value at stake, total

profit pools for general contractors could nearly double, to an average of 10 percent.<sup>2</sup> For those that succeed, a \$265 billion annual profit pool awaits.

And, as further disruptions confront the construction industry, all players will need to prepare for the next normal, work through the uncertainty, and determine how to capture that value.<sup>3</sup>

Learn more about our Venice Capability Center [here](#). We will be adding new content as the project progresses and hope you will check back regularly.

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<sup>2</sup>For more on the disruptive trends facing the industry, see Maria João Ribeirinho, Jan Mischke, Gernot Strube, Erik Sjödin, Jose Luis Blanco, Rob Palter, Jonas Biörck, David Rockhill, and Timmy Andersson, "The next normal in construction: How disruption is reshaping the world's largest ecosystem," June 4, 2020, McKinsey.com.

<sup>3</sup>Ribeirinho, Mischke, Strube, Sjödin, Blanco, Palter, Biörck, Rockhill, and Andersson, "The next normal in construction."



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# Managing a manufacturing plant through the coronavirus crisis

Manufacturers can follow three guiding principles to keep their workers safe while preparing for increased uncertainty and long-lasting changes to the work environment.

*by Vivek Furtado, Tom Kolaja, Curt Mueller, and Julian Salguero*

**As the COVID-19 pandemic sweeps** across the globe, manufacturing organizations face significant operational challenges. Some companies have temporarily shuttered factories in response to government restrictions or falling demand, but others are facing significant increases in demand for essential supplies.

Frontline manufacturing staff can't take their work to the relative safety of their homes. Plant leaders are therefore looking for ways to operate through the immediate crisis—all while preparing for a potentially much longer period of heightened uncertainty regarding demand and supply, and a lasting need to maintain enhanced hygiene and physical distancing.

Three areas of focus can help plant leaders navigate the transition from initial crisis response to the “next normal”:

- 1. *Protect the workforce:*** Formalize and standardize operating procedures, processes, and tools that help keep staff safe. Build workforce confidence through effective, two-way communication that responds to employees' concerns through flexible adaptation.
- 2. *Manage risks to ensure business continuity:*** Anticipate potential changes and model the way the plant should react well ahead of the fluctuations to enable rapid, fact-based actions.
- 3. *Drive productivity at a distance:*** Continue to effectively manage performance at the plant while physical distancing and remote working policies remain in place.

## **Protect the workforce**

The most critical focus for every organization is to keep employees safe in an environment where repeated outbreaks are a persistent threat. To achieve this, companies can deploy a comprehensive set of policies and guidelines, including enhanced hygiene measures, provision of additional personal protective equipment (PPE) where necessary, physical distancing, and modifications to existing governance and behaviors.

Protecting employees' mental health has also emerged as a high priority, with companies in China (and elsewhere) providing counseling services to employees returning after prolonged quarantines. These measures, developed in the initial response to the crisis, can be integrated into an organization's standard procedures as it makes the transition to next-normal operations.

## **Communication is key**

Ramping up internal communications is vitally important, including regular sharing of information about the company's evolving knowledge of the crisis and how it is using that knowledge to protect employees and the organization. Clarity, simplicity, and framing all matter—research from earlier epidemics shows that positive messages focused on best practices were more effective than negative messages designed to address misinformation. Frequency counts as well, as audiences need to hear a message repeatedly before fully absorbing it. And that implies consistent content, reflecting a single source of truth at the corporate center.

Finally, the best communication is two-way, with managers answering questions and engaging in an open dialogue with employees at all levels. One equipment maker, for example, asks supervisors to collect queries and concerns from frontline team members every morning. The company's HR department then publishes an updated daily list of questions and answers, which are displayed on monitors around the factory. After the introduction of the new policy, absenteeism among shop-floor staff dropped significantly and productivity returned to precrisis levels. As an additional, unintended benefit, the approach uncovered a number of frontline concerns unrelated to the pandemic, allowing managers to take additional steps to boost productivity and improve workforce satisfaction.

Plant leaders are already telling us that their frontline personnel appreciate the increased frequency and clarity of two-way communication necessitated by the outbreak. Organizations can capitalize on these improvements by standardizing their enhanced communication approach, rather than letting things regress to precrisis norms as the situation stabilizes.

### Enabling workplace physical distancing

To keep staff safe over the longer term, companies can retain and formalize appropriate parts of their emergency-response guidelines, so they become part of plants' standard operating procedures. Such guidelines might include enhanced health surveillance, restrictions on the use of communal tools and areas, regular sanitization of equipment along with periodic deep cleans of whole workplaces, and HR policies that ensure workers can stay at home if they feel unwell. Regulatory changes also merit extra attention, as governments introduce new rules on mandatory sick pay, or requirements for employees to limit contact with products or one another.

At the onset of the crisis, some companies began to ask employees to take a digital survey before starting on-site work, confirming that they do not have any COVID-19 symptoms, sharing their travel history since their last shift, and verifying they understand new health and safety guidelines. This approach provided valuable data that could aid contact tracing (where consistent with local practices) in the event of a positive test at the plant. It also helps to reinforce the importance of following health policies and reminds employees to avoid the risk of getting others sick.

Minimizing the potential future impact of infections will require companies to alter team structures and working methods in order to limit contact across the workforce. One way this can be done is by establishing “pods” for all on-site personnel, organized for self-contained teams with clearly defined tasks and workspaces that can be physically and socially separated from each other as much as possible.

Organizational changes to support the introduction of pods include dedicating workers to a single production line and removing “floating” workers—for example, by making pod members responsible for collecting materials and for conducting their own routine quality checks and maintenance. Shift handover meetings can be conducted remotely, using videoconferencing technology, while the start, stop, and break times of different pods can be staggered to minimize contact in communal areas of the plant. Plants may even choose to modify shift patterns, so lines in close proximity to one another are staffed and run at different times.

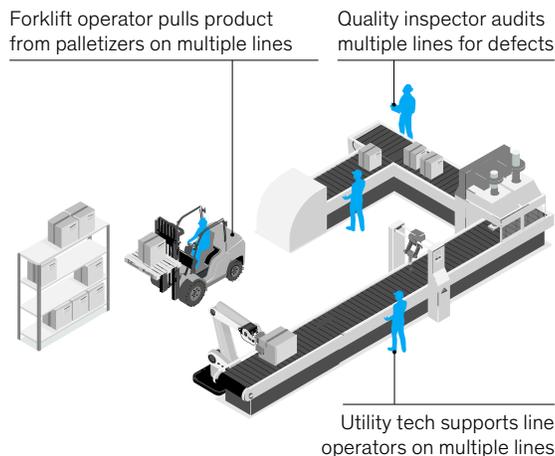
Exhibit 1 shows how the pod approach might work on a packaging line. Before the changes, operators working on the line were responsible for multiple machines, supported by logistics, quality, and utility

Exhibit 1

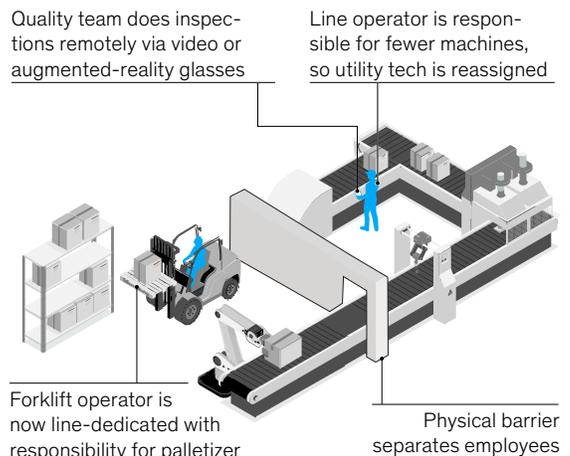
## Employee and workspace ‘pods’ enable shop-floor physical distancing.

### Illustrative workspaces

**Before: 4 together—4 operators, 1 line**



**After: 2 plus 1 plus 1—2 operators in pod, plus 1 remote, plus 1 reassigned**



personnel who worked across multiple lines. Under the pod system, operators are assigned to fewer machines but responsible for more tasks within their work area, thereby minimizing contact with staff and equipment outside the pod.

Instead of multiple employees handling each pallet, for example, a single team member is responsible for its entire journey. Some tasks, such as quality assurance, are now conducted by remote specialists, aided by cameras and digital tools. New physical barriers guard against accidental contact between pod workers, while allowing the unimpeded movement of product.

### **Manage risks to ensure business continuity**

The coronavirus crisis has dramatically increased risk for every business, with many experiencing shocks in both supply and demand. Manufacturing plants are at the center of that uncertainty, and their continued operation through the crisis and beyond will depend in large part on the organization's ability to navigate these wider risks. We have written elsewhere about the necessary steps to build resilience into the wider supply chain, and plant leaders will play a central role in their organization's response.

Plant leaders can also plan their own response to risks that could directly affect operations in their facility—starting with what to do if an employee anywhere in the plant tests positive for a COVID-19 infection. Responses can include—but would not be limited to—consulting with health authorities,

quarantining the affected person (together with any other staff who were working in close proximity), and isolating and sanitizing exposed products, tools, and workspaces.

Facing higher levels of uncertainty over the medium term, plants will likely find it useful to ramp up their scenario planning, with a higher planning cadence and a wider range of potential scenarios included in their analysis. When closely tied to the organization's wider response and recovery strategy, this accelerated planning helps the plant develop strategies to accommodate substitute materials, or produce hard-to-source parts in-house.

Some companies are using digital twins of their facilities to simulate operation under different staffing levels and production scenarios. This approach can support many aspects of operational planning, from evaluating the impact of changes to plant layout to determining the mix of skills that on-site teams will require.

The transition to the next normal in manufacturing plants will require both leaders and frontline teams to develop new capabilities. The introduction of pods on the production line, for example, may call for operators with a wider range of skills, so they can complete all the tasks required in their pod or cover for absent colleagues.

New digital approaches can accelerate the capability-building process and allow employees to develop new skills remotely. Such techniques include the remote delivery of training using e-learning

## **New digital approaches can accelerate the capability-building process and allow employees to develop new skills remotely.**

systems or the use of virtual-reality technologies to familiarize operators with new tasks or plant layouts. Augmented-reality systems help shop-floor staff to receive training, advice, and support from remote colleagues. Specialist contractors can use such systems to guide shop-floor staff through machine maintenance or troubleshooting.

### Drive productivity at a distance

For as long as virus transmission among employees remains a risk, companies will naturally want to minimize unnecessary contact between personnel. Anybody not absolutely required on-site, including managers and many support functions, can be encouraged to work remotely as much as possible to protect the health of their shop-floor colleagues. To minimize the risk that an entire leadership cohort would need to enter quarantine at the same time, leadership staff who do need to stay on-site can be separated into at least two teams, with no physical contact between them.

As they reconfigure their operations to keep employees safe and respond to changes in the wider value chain, companies still need to maintain manufacturing performance. In many plants, leaders have long managed performance face to face, using daily shift briefings, visual management, and regular “gemba walks”—observant walk-throughs of the shop floor and wherever else the “real work” is being done. Physical-distancing and remote-working

policies will make these established approaches more difficult, compelling companies to find new ways to manage shop-floor performance.

The technology necessary to support these changes doesn’t need to be expensive. Staff working off-site can use secure remote-access programs from their personal devices to handle shift handover meetings and similar activities. Some plants have equipped operators with two-way radios, assigning channels to specific teams or functional groups. This approach can actually increase the speed at which issues are communicated and resolved.

Now is a good time for companies to revisit the suites of metrics they use to track manufacturing performance. To make up for reduced in-person access to the shop floor, some factory-management teams are already beginning to identify and track leading key performance indicators (KPIs) in addition to the standard first- and second-level KPIs they usually rely upon.

Exhibit 2 illustrates this approach with a simplified cascade of KPIs from a high-speed production line. Each of the top-level performance KPIs on the left of the chart sits over a number of second-level KPIs that describe the major sources of losses experienced on the line. The leading KPIs in the third column track previously agreed-on actions designed to minimize those losses.

Exhibit 2

### For remote management, leading key performance indicators (KPIs) provide early warning of shop-floor issues.

Standard KPIs	Second-level KPIs	Leading KPIs
Overall equipment effectiveness (OEE): Performance	Bottleneck infeed jams	Number of times infeed rails cleaned
	Bottleneck discharge jams	% of shifts when centerline was validated
	Bottleneck speed losses-jams	% of downtime of upstream equipment
OEE: Availability	Breakdown losses	% of preventative maintenance tasks completed
	Changeover losses	Number of pre-changeover checklists completed
OEE: Quality	Automatic in-line rejects	Number of reject bin audits
	Quality holds	Number of inline checks completed

Monitoring how often frontline teams are cleaning, checking, and adjusting critical parts of the equipment—perhaps using sensors, if available—can give team leaders and plant managers a useful early warning of potential problems before they weaken operational performance. Historically, senior managers would rely on line leaders to review these activities in person, but with only remote monitoring possible, these data points can fill critical information gaps for managers. For example, if the number of times the infeed rails are cleaned starts to fall on a filler line, managers can follow up with the operators rather than wait for jams to reduce the line’s overall equipment effectiveness—the standard KPI that leadership teams usually follow.

on a day-to-day tactical basis and, together with scenario modeling, guide decisions about staff training or recruitment requirements. Even a simple spreadsheet can quickly highlight problems and identify opportunities for reskilling or upskilling to improve workforce resilience.

In the longer term, the organization’s response to COVID-19 should accelerate the digital transformation that is already under way in many manufacturing environments. For teams working remotely or under physical-distancing guidelines, real-time data collection and advanced-analytics technologies can provide a more detailed, accurate, and up-to-date picture of plant operations.

Absenteeism rates are another important area of focus. Understandably, employees concerned about COVID-19 exposure could be reluctant to come to work, while others may be prevented from doing so by sickness or by quarantine rules. Some companies are proactively reaching out to employees the day before and the morning of their shifts to ask if they are planning to come to work, while others are offering hazard pay or soliciting volunteers to be “on call” for overtime, depending on vacancies. With advance notice of absenteeism and clear production priorities, plant teams stand a better chance of developing and executing efficient production plans.

Handheld cameras and smart glasses can give remote staff a virtual shop-floor presence, allowing them to assist frontline teams with troubleshooting tasks or even participate in gemba walks to support line supervisors and operators. Digital standard operating procedures (SOPs) and problem-solving guides can support frontline teams when managers or more experienced colleagues are not on hand. Online learning technologies can help staff develop new skills quickly, creating a more flexible, more technology-savvy workforce at every level of the organization (Exhibit 4).

Managers can use a skills matrix (Exhibit 3) to identify potential shortages of critical capabilities

The next normal is also likely to drive a change in the metrics and targets companies use to optimize manufacturing performance. Management systems

Exhibit 3

**A skills matrix highlights potential skills gaps and upskilling opportunities.**

**Skills matrix**

	Employee skills				
Position	1	2	3	4	5
Position #1	4	4	5	5	4
Position #2	4	3	3	4	5
Position #3	3	4	3	2	4
Position #4	1	2	2	1	1
Position #5	1	1	1	1	3

Quantifies, on a scale from 1 to 5, the level of competency of each employee in each position. Highlighting the scores of 1 and 2 shows training needs.

**Skills-need matrix**

	Employees needed			
Position	3	4	5	Total
Position #1	7	3	1	11
Position #2	1	1	1	3
Position #3	11	6	3	20
Position #4	7	4	2	13
Position #5	9	7	3	19

Identifies the number of employees needed for each position and at each competency level. Ideally, these estimates are adjusted for projected absenteeism.

**Output-availability matrix**

	Employees available			
Position	3	4	5	Total
Position #1	5	5	3	13
Position #2	1	1	0	2
Position #3	13	15	13	41
Position #4	4	3	2	9
Position #5	4	7	7	18

Combines the skills and skills-need matrixes, summing up the number of employees available for each position at each competency level. Highlighted cells indicate gaps to be filled.

## Digital capabilities offer essential support as companies adapt their operations.

### Digital capability use cases, non-exhaustive



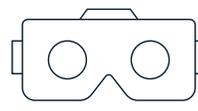
#### Real-time data collection

Programmable logic controllers and related technology automatically collect data (eg, downtime pareto, speed reduction)



#### Digital capability building

Employees complete digital modules offsite



#### Augmented-reality capability building for operators

Operators receive real-time digital training and support for tasks (eg, assembly operations, machine changeovers)



#### Remote meetings

Technology enables face-to-face meetings from different spaces through cameras, microphones, screen sharing, and virtual whiteboards



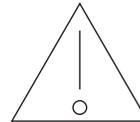
#### In-line or remote quality testing

Automatic sorting system identifies and segregates defects



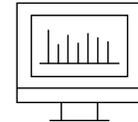
#### Track-and-trace functionality

System stores and reports all relevant information for each batch to enable root-cause analysis of issues



#### Advanced solutions to monitor supply-chain vulnerability

Advance analytics used to determine critical supplies needed for production and changes to supply based on micro and macro risks



#### Autonomous planning to identify demand changes

Autonomous and exception demand planning used to predict future demand accurately based on spikes or decreases from specific inputs

that typically emphasize productivity and quality will expand to include a greater focus on flexibility (for example, the number of staff cross-trained to perform multiple tasks on the line) and resilience (the number of component shortages due to supply-chain or quality issues, or the skills that are in short supply because only a small number of employees have the necessary training or experience). Companies can reinforce those changes by adjusting targets and incentives for individual employees, such as by emphasizing adherence to health and safety guidelines. Staff could be rewarded for developing broader skill sets, reducing reliance on external contractors and increasing the overall resilience of the workforce.

The coronavirus will have long-lasting—perhaps permanent—effects on manufacturing organizations, forcing companies to restructure their operations to maintain production while protecting their workers. The coming weeks and months will remain extremely challenging for plant leaders, but the crisis also creates an opportunity to reimagine the way work is done. By accelerating the adoption of new digital technologies and by drawing on the flexibility and creativity of their frontline staff, companies have the opportunity to emerge from the crisis with manufacturing operations that are safer, more productive, and more resilient.

**Vivek Furtado** is a consultant in McKinsey's Denver office, **Tom Kolaja** is a partner in the London office, **Curt Mueller** is a senior partner in the Chicago office, and **Julian Salguero** is a partner in the Miami office.



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# The Fourth Industrial Revolution and manufacturing's great reset

Manufacturers that are ahead in scaling advanced production technologies are successfully navigating four durable shifts that are critical to managing unprecedented disruption.

*by Francisco Betti, Enno de Boer, and Yves Giraud*

**Since its inception in 2018**, the Global Lighthouse Network (GLN) of advanced manufacturers has demonstrated how leading companies can work toward realizing the full potential of the innovations and advances at the core of the Fourth Industrial Revolution (4IR). Beginning with a select collection of leading-edge organizations, we have seen how lighthouse factories can help entire organizations navigate their modernization journeys, inspiring and catalyzing change among partner organizations along the way.

That's why GLN now comprises 54 sites, with ten sites added in Q3 2020 (Exhibit 1). This growth reflects the accelerating adoption of core 4IR technologies, and their infusion into daily manufacturing and supply-chain operations, as organizations act on a new urgency to remain competitive—even as others have fallen behind, still stuck in pilot purgatory.

GLN includes companies that have achieved remarkable 4IR advancements within the four walls of factory sites or have effectively implemented end-to-end (E2E) digitization across the value chain. Indeed, in both cases, 4IR technology has powered the reimagining of manufacturing and supply chains across industries and sectors.

Moreover, an essential aspect of lighthouses' success lies in a dedicated focus on workforce development and capability building through a variety of means. Indeed, these organizations have prioritized their people by transforming the nature of work through intentional upskilling and/or reskilling efforts, empowering workers to realize their potential through new ways of working.

Recent world events, most notably the COVID-19 pandemic, have led to significant disruptions on a scale unprecedented in recent times, affecting nearly every aspect of global industry and calling for a “great reset” across all sectors of the global economy: a decisive set of actions oriented toward delivering

value not only to companies themselves but also to society as a whole. While supply-chain shocks have uncovered operational vulnerabilities, they also have presented transformative opportunities for manufacturing and supply-chain leaders. The advances in technology and new ways of working implemented by these trailblazing organizations have enabled them to adapt quickly during disruption, while remaining viable and operational.

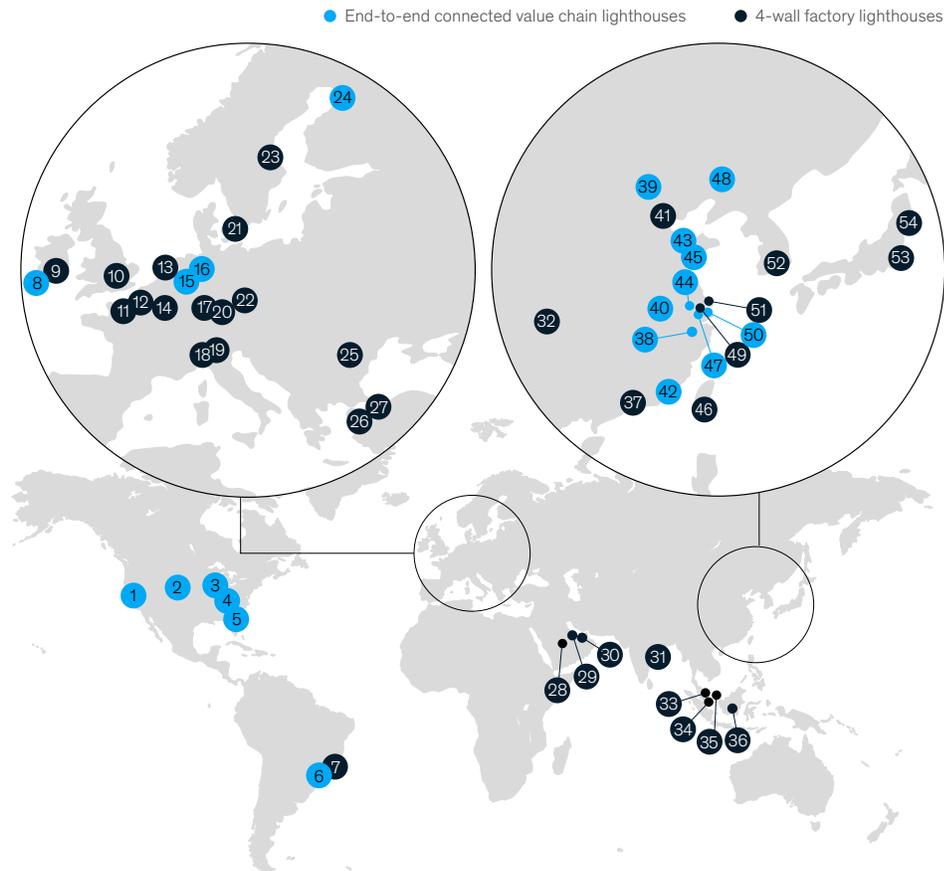
Even before the massive disruptions imposed by the pandemic, the gap between 4IR frontrunners and the majority was growing rapidly. Now, four durable shifts in manufacturing and supply chains have emerged as particularly critical:

- Improved **agility and customer centricity** across E2E manufacturing and supply chains facilitates faster recognition of customer preferences. This, in turn, enables quicker adjustments to manufacturing flows at next-generation, small-scale modular plants to allow higher levels of customization.
- **Supply-chain resilience** provides a competitive advantage, requiring connected, reconfigurable n-tier supply ecosystems and regionalization.
- **Speed and productivity** are attained through increased levels of automation and workforce augmentation coupled with upskilling and reskilling efforts.
- **Eco-efficiency** is increasingly considered a must-have to remain in business and ensure compliance with an increasingly complex regulatory landscape.

The level of agility and resiliency that these shifts require sits at the core of true 4IR innovation, with valuable assets that serve as critical levers during unexpected adversity. The benchmarks and achievements heralded in previous findings about these leading companies remain impressive in their

Exhibit 1

The Global Lighthouse Network includes 54 sites as of June 17, 2020.



- 1 Zymergen  
Biotechnology
- 2 DCP Midstream  
Oil and gas
- 3 Fast Radius with UPS  
Additive manufacturing
- 4 Schneider Electric  
Electrical components
- 5 Johnson & Johnson Vision  
Care Medical devices
- 6 Groupe Renault  
Automotive
- 7 MODEC  
Oil and gas
- 8 Johnson & Johnson  
Janssen Pharmaceuticals
- 9 Johnson & Johnson DePuy  
Synthes Medical devices
- 10 GSK  
Pharmaceuticals
- 11 Schneider Electric  
Electrical components
- 12 Groupe Renault  
Automotive
- 13 Tata Steel  
Steel products
- 14 Groupe Renault  
Automotive
- 15 Henkel  
Consumer goods
- 16 Phoenix Contact  
Industrial automation
- 17 AGCO  
Agricultural equipment
- 18 Rold  
Electrical components
- 19 Bayer  
Division pharmaceuticals
- 20 BMW Group  
Automotive
- 21 Novo Nordisk  
Pharmaceuticals
- 22 Procter & Gamble  
Consumer goods
- 23 Sandvik Coromant  
Industrial tools
- 24 Nokia  
Electronics
- 25 Arçelik  
Home appliances
- 26 Petkim  
Chemicals
- 27 Ford Otosan  
Automotive
- 28 Saudi Aramco  
Oil and gas
- 29 Saudi Aramco  
Gas treatment
- 30 Unilever  
Consumer goods
- 31 Tata Steel  
Steel products
- 32 Siemens Industrial  
automation products
- 33 Infineon  
Semiconductors
- 34 Schneider Electric  
Electrical components
- 35 Micron  
Semiconductors
- 36 Petrosea  
Mining
- 37 Foxconn Industrial  
Internet Electronics
- 38 Alibaba  
Apparel
- 39 FOTON Cummins  
Automotive
- 40 Unilever  
Consumer goods
- 41 Danfoss  
Industrial equipment
- 42 Midea  
Home appliances
- 43 Weichai  
Industrial machinery
- 44 SAIC Maxus  
Automotive
- 45 Haier  
Home appliances
- 46 Micron  
Semiconductors
- 47 Johnson & Johnson DePuy  
Synthes Medical devices
- 48 Haier  
Appliances
- 49 Bosch  
Automotive
- 50 Procter & Gamble  
Consumer goods
- 51 Baoshan Iron & Steel  
Steel products
- 52 POSCO  
Steel products
- 53 GE Healthcare  
Medical devices
- 54 Hitachi  
Industrial equipment

Source: World Economic Forum; McKinsey analysis

own right. Nevertheless, the turmoil of recent events affords us an even more sophisticated appreciation for the very qualities that have sustained them, and have further advanced the impact that lighthouses have achieved, whether within a single factory or end to end, across the organization (Exhibit 2).

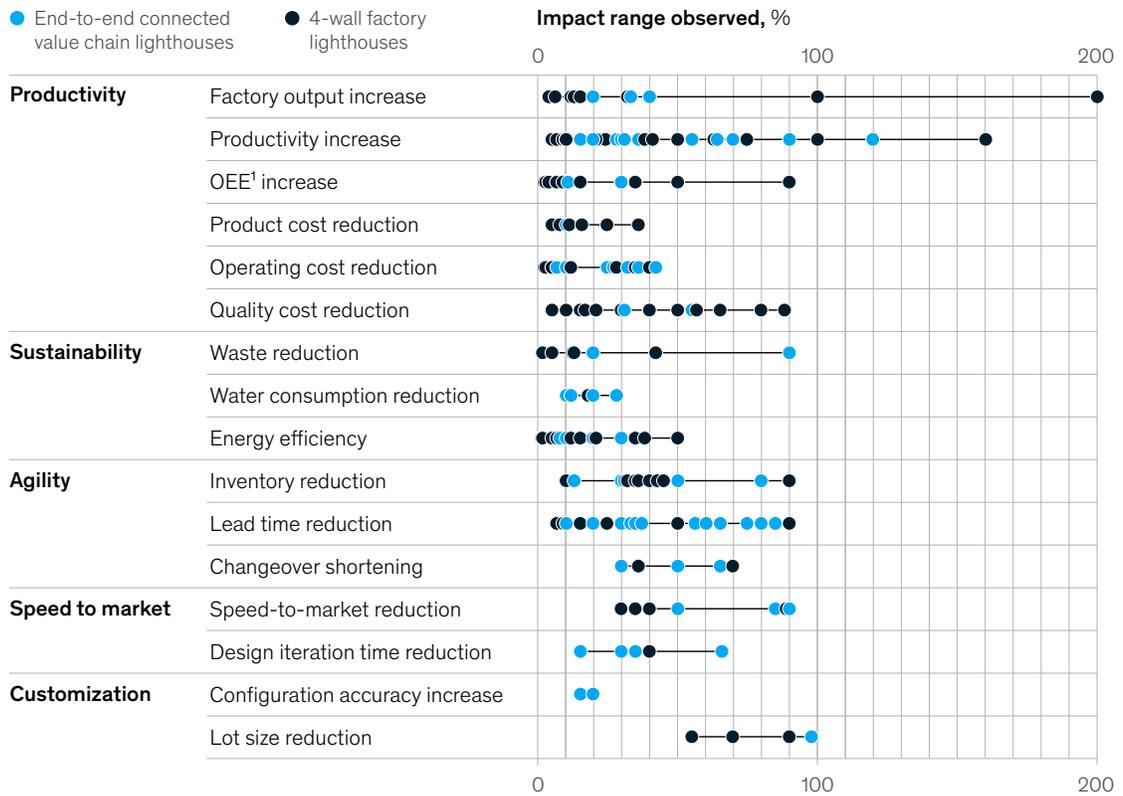
Thus, it is in this context of unprecedented challenge that lighthouses serve as models of transformation

and beacons of light that can guide us through the storm into a stronger, more resilient future. These organizations are leading the way by demonstrating how to reimagine and rebalance operations now and into the next normal. They are showing us how companies can provide value not only to their shareholders but also to a broader set of stakeholders including workers, consumers, and the environment—indeed, society at large.

Exhibit 2

## Lighthouses use digital technology to generate impact beyond productivity to build more agile, customer-focused organizations.

### Key performance indicator improvements



<sup>1</sup>Overall equipment effectiveness.  
Source: World Economic Forum; McKinsey analysis

# While supply-chain shocks have uncovered operational vulnerabilities, they also have presented transformative opportunities for manufacturing and supply-chain leaders.

Perhaps most important, today's challenges make clear that lighthouses are not at the end of their transformation journeys—they are only just starting to unlock the true potential of 4IR technologies. As the network of lighthouses grows, its light will shine

brighter, helping even more organizations be better prepared to weather the inevitable future storms, whenever and wherever they occur.

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The authors wish to thank Max Kleine Büning, Katy George, Magnus Larsson, Mathilde Lavacquery, Ingrid Millan, Julian Salguero, and Ken Somers for their contributions to this article.

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# US food supply chain: Disruptions and implications from COVID-19

Changes in consumer behavior continue to ripple through the US food and agricultural supply chains. What should companies do now?

*by Ignacio Felix, Adrian Martin, Vivek Mehta, and Curt Mueller*

### **Until early 2020, consumer spending on food**

in the United States had been remarkably stable, growing by around 4 percent over the previous five years. Total sales were roughly split evenly between retail outlets (such as grocery stores and supermarkets) and food-service companies (such as restaurants, hospitals, and schools). And until February, revenues were continuing in the same direction.

Then came March and with it, the COVID-19 pandemic. Since then, physical distancing and associated lockdowns have dramatically reversed the trend of consumer spending on food. Consumers, forgoing public venues and eating at home, stocked up on groceries and supplies, boosting sales for the month by 29 percent over the prior year.<sup>1</sup> Meanwhile, sales declined at restaurants, fast-food locations, coffee venues, and casual-dining locations by 27 percent (Exhibit 1).

By now, ripple effects into that previously balanced system have become clear. Distribution channels have been upended, with food stranded upstream, creating food-security risks for vulnerable populations. Companies that produce, convert, and deliver food to consumers and businesses face a web of interrelated risks and uncertainties across all steps in the value chain—from farmers to end-customer channels. Food-service suppliers, for example, faced abrupt order cancellations across their entire customer bases. That left many of them with excess stock that they couldn't easily redirect to consumers because of packaging-size mismatches. Few home chefs have the cupboard space to accommodate restaurant-size cans of fruit and vegetables, but creating consumer-friendly formats would require additional investment of capital and time. And that would put perishable materials at risk, threatening narrow margins among prices, logistics, and transaction costs.

Not surprisingly, all that creates uncertainty across the global value chain, with distinct challenges for farmers, distributors, producers, consumer-

and packaged-goods companies, and retailers alike. Managers with a clear understanding of the challenges across the sector will be better prepared to decide whether to wait out the crisis or to invest for a longer-term shift in consumer spending. Much also depends on whether—and how quickly—they expect a return to prepandemic norms.

### **Farmers**

For many farm operations that require significant amounts of labor (mainly, production of specialty crops, such as strawberries and lettuce), the most pressing pandemic-related challenge faced so far was the availability of workers. Some farmers faced other distinct challenges, such as a steep drop in grain prices following a shock to oil demand. Those value chains are operated in rural areas with low population density and limited opportunities to find skilled labor.

Within the United States, multiple farming and processing value chains are dependent on migrant workers, including those under sponsored visa programs. Only three in ten workers in the US agricultural workforce are born in or are citizens of the United States; the rest are born in other countries, and many are in the United States on guest agricultural visas.<sup>2</sup> If concerns related to the COVID-19 pandemic persist, it may be challenging to find workers, even at a premium, as people avoid close-quarters activities and limit their own exposure risk. Since worker wages are already a significant cost factor for farms, the pandemic may further strain farm economics.

Moreover, movement restrictions related to the COVID-19 pandemic could deter nonlocal workforces from moving among counties or states for work. That would further increase labor challenges for farms, leading to shortages during production peaks and putting harvests at risk. Difficulties in redeploying workers to farms connected to retail-demand-driven organizations or to processing plants with consistent or increased demand could further amplify the imbalance among channels.

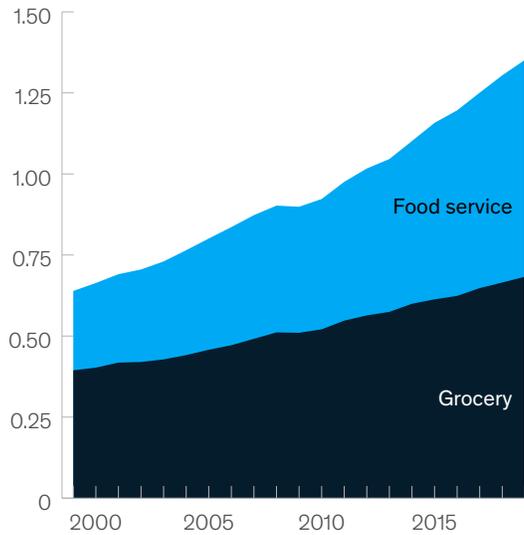
<sup>1</sup>Russell Redman, "Food sales stay strong in April despite U.S. retail sales plunge," Supermarket News, May 18, 2020, supermarketnews.com.

<sup>2</sup>"Farm labor," Economic Research Service, April 22, 2020, ers.usda.gov.

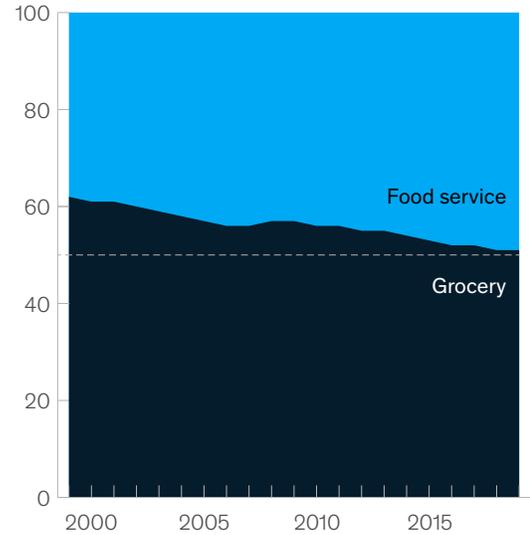
Exhibit 1

**Until March 2020, consumer food spending had converged on equilibrium between grocery and food service.**

**US consumer food spending, \$ trillion**



**US consumer food spending, % of total**



**US consumer food spending, Mar 2019 vs Mar 2020, \$ billion**



Source: Administrative records; McKinsey Annual Retail Trade Survey; McKinsey Monthly Retail Trade Survey; McKinsey Service Annual Survey

With such uncertain futures, the dilemma farmers face is whether they should change crops; plow ahead with planned crops, hoping for a return to normal; or exit production entirely. For many value chains, crops can be returned once rotations are complete. For value chains in areas such as dairy, it can take years to recover production after farmers decide to reduce herds. Already, farmers are taking extreme measures to deal with excess product—for example, breaking eggs, spilling milk, and plowing under crops. If farmers go a step further to reduce capacity, such as eliminating hens, culling herds, and selling farmland, they could reduce capacity for the long term. That could lead to product shortages and price increases for both food producers and consumers when downstream demand returns.

**Food-service distributors**

Distributors run an optimized and stable supply chain, with upstream orders coming in that anticipate downstream orders going out. Margins depend on there being a steady flow in both directions and having only a subset of products in inventory awaiting orders.

Immediately after coronavirus-related shutdowns, outbound orders suddenly stopped because of government-mandated closures of restaurants, even though inbound orders of food kept coming in from farmers, food-service producers, and processors. That led to logistical bottlenecks and storage-space shortages as distributors worked to cancel incoming shipments of inventory from

# With such uncertain futures, the dilemma farmers face is whether they should change crops; plow ahead with planned crops, hoping for a return to normal; or exit production entirely.

farmers. Distributors have been significantly affected by quick-service and casual-dining restaurants in their switch to takeout only, with slow recovery given the staged return to full service. Some distributors have also adapted by at least partially initiating online-ordering and delivery services, but that has not been universal. For those unaccustomed to supplying the retail channel, redirecting their sales adds the complexity of modifying their current supply chains—and that can also add to costs.

Having rebalanced supplies with outgoing orders, food-service distributors are now left with overcapacity in their storage facilities and distribution networks, including the costlier “cold chain”—the temperature-controlled storage, equipment, and logistics needed to maintain a desired low temperature. The dilemma distributors face is how to stabilize their network cost structures in the interim. They could scale down support within each facility while maintaining a footprint. Or they could consolidate their networks of state-aligned distribution centers into regional ones, in spite of increased miles and lead times in a highly competitive environment. But consolidating some distribution centers and exiting others would reduce overall capacity in the long term. It would also limit local distribution options for food-service companies when demand returns, reducing channels for food-service producers as well.

## **Food-service producers**

Food-service producers, such as produce and meat processors, face similar volume declines as their distributors do. Although in-store sales have increased to date, that increase has not covered the scale of decrease in food service, so plant utilizations remain significantly reduced. Additionally, many producers' brands may not be recognized by retail consumers, making it difficult to gauge demand immediately.

Moreover, many food-service producers have already invested in equipment and facilities to produce and package food in large multi-serving formats for complex prepared-, processed-, frozen-, canned-, and packaged-food value chains. It would be highly inefficient to reconfigure those investments to single service sizes. In addition, producers' plant personnel may be at risk of infection, since, in some cases, the factories require associates to work in close proximity.

For food-service producers, the dilemma is around the two- to five-year payback period of new packaging lines. Reinvesting and rebalancing a food-service network for retail is not a straightforward decision. Companies making new investments would be facing a 40 percent or more decline in revenue. And any number of issues could extend the payback period or make investments

unrecoverable. Forecasts are uncertain, for example, about the duration of pandemic-related demand shifts, the recovery of the food-service economy, and the timeline of returning to full employment. Competition for volume is already putting downward pressure on prices. And short-term solutions, such as manual packing, are labor intensive and face incremental challenges because of physical-distancing precautions.

### **Consumer and packaged-goods companies**

Retail-facing consumer- and packaged-goods companies are facing multiple challenges because of the COVID-19 crisis. As with many companies in manufacturing, they bear risks related to employees working in close quarters at plants functioning at peak capacity. They also face significant increase in demand for certain product types (especially shelf-stable products) and packaging types (such as smaller sizes for home consumption) for which they have limited capabilities and capacity to supply. And they have distribution challenges because of a heightened demand for trucking coupled with a reduction in third-party-logistics capacity. That increases both competition and prices for trucking capacity.

Recent COVID-19 infections at meat-processor plants have raised the possibility of mass closures of plants, causing significant risk to a value chain with limited excess capacity. As of this writing, 18 processing plants in the United States have already been closed, affecting more than a third of the country's beef and pork supply. The US government recently invoked the Defense Production Act of 1950 to keep plants open. To comply, companies are offering a blend of incentives and incremental safety investments to maximize worker attendance and plant production—and to keep the food supply chain running.

Companies are increasing production to maintain their presence on retail shelves, offering incentives

to keep employees at work, and expediting raw materials (or engaging new suppliers) to meet production demand. Some companies are also increasing their e-commerce presence by going direct to consumer, given the spike in e-commerce purchases during the COVID-19 crisis.<sup>3</sup> Those actions can add costs even as on-shelf prices stay fixed—in the face of competition or to avoid raising prices under crisis conditions, some have already brought mothballed production lines back into service and are evaluating their manufacturing footprints to reduce the number of plants.

But consumer- and packaged-goods companies still face the dilemmas of how to approach demand peaks and what demand scenario to prepare for. A company might continue scaling up production at the expense of margin, but when capacity is truly maximized, it will need to decide whether to activate mothballed facilities, make acquisitions, or invest in new or external capacity. It might also partner with food-service producers that likely have excess capacity or even pass up volume requests from retailers, allowing consumer trials and potential long-term share loss to competitor brands and private labels.

### **Grocery retailers**

Grocery stores are benefiting from significant demand increases from demand previously met by food-service companies. However, they face additional challenges and extraordinary activities to protect and serve their consumers. Those include constant and visible cleaning of stores, frequent loading of shelves to keep up with demand, hazard-pay bonuses and incentives to maintain employee numbers, and hiring of additional labor, with limited time for training.

Challenges also include the cost of expanded hours of operation (since foot traffic is limited because of physical distancing), the cost of scaling up online-ordering and delivery systems, and the associated cost of handling consumer complaints for late and

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<sup>3</sup>Tatiana Walk-Morris, "Adobe: COVID-19 spurs spike in e-commerce," *Retail Dive*, May 25, 2020, [retaildive.com](https://retaildive.com).

# E-commerce has bridged the gap of declining foot traffic in the retail world, with surging delivery volumes across multiple channels escalating the importance of last-mile delivery during the COVID-19 crisis.

errant deliveries. E-commerce has bridged the gap of declining foot traffic in the retail world, with surging delivery volumes across multiple channels escalating the importance of last-mile delivery during the COVID-19 crisis. The e-commerce channel now represents 10 to 15 percent of total grocery spend, increasing fivefold in the past few weeks. That has created a lot of strain in the system, as there are multiple challenges associated with last-minute delivery, given the significant ramp-up in labor required with limited training time. Walmart, for example, has hired 50,000 additional people, and Instacart has hired 300,000, even as they navigate new COVID-19-related safety precautions.

In the months since the pandemic began, Amazon, Walmart, and most grocers have reported impressive sales increases,<sup>4</sup> but margin growth has significantly lagged. At the same time, consumers are facing increasing economic hardship, limiting their ability to pay for goods. Many retailers are caught between the demand of reassuring consumers, protecting workers, and maintaining supply at increasing costs and the need to maintain value for consumers. They may be able to increase throughput for their supply chains, despite what will likely be a finite period of increased demand, but will need to maintain high product quality even while establishing relationships with new suppliers. And there is always the risk of potential new entrants and additional channel shifts in the next normal.

## What can be done now and in the future?

In the short to medium terms, in the absence of a COVID-19 vaccine, the challenges for each value-chain participant will continue. The severity of those challenges will depend on how quickly and safely governments open up economies and how quickly channels restabilize. Even after reopening, food service will continue to face significant challenges (such as requirements for a minimum distance between patrons, causing operating constraints) that may affect demand.

Given fixed prices and cost-driven margin compression in retailer value chains, the returns on investment may not exist for farmers, producers, distributors, and retailers to make medium-term investments to address channel mismatches via investments and rebalancing. Therefore, channel mismatches may continue, with significant consequences to individual participants. If inaction leads to exit by food-value-chain players, it will remove food capacity from the value chain that would, under equilibrium conditions, have been consumed. That may create inflationary pressures when demand returns, if it exceeds supply. Such exits will also remove jobs from the economy well beyond the initial recovery phase, limiting the strength of the rebound.

Food-service companies will need to pursue creative solutions, such as continued delivery and

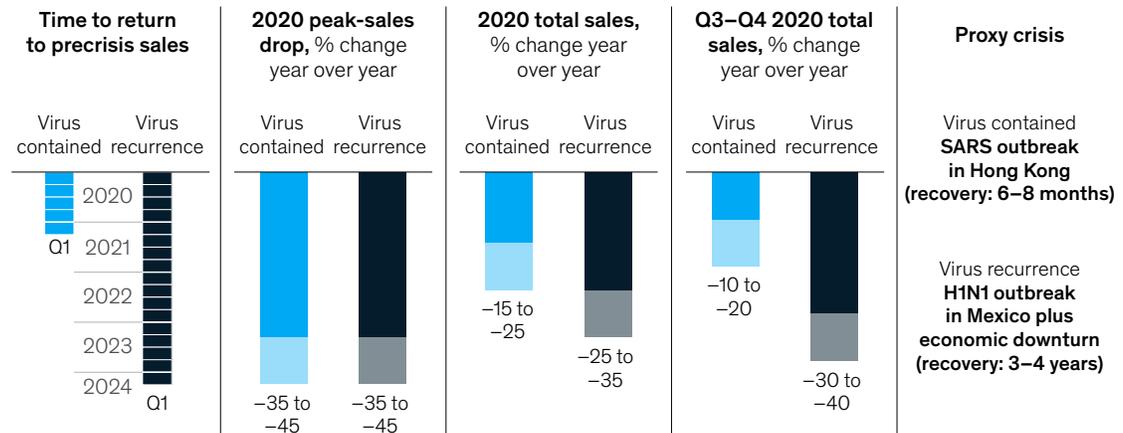
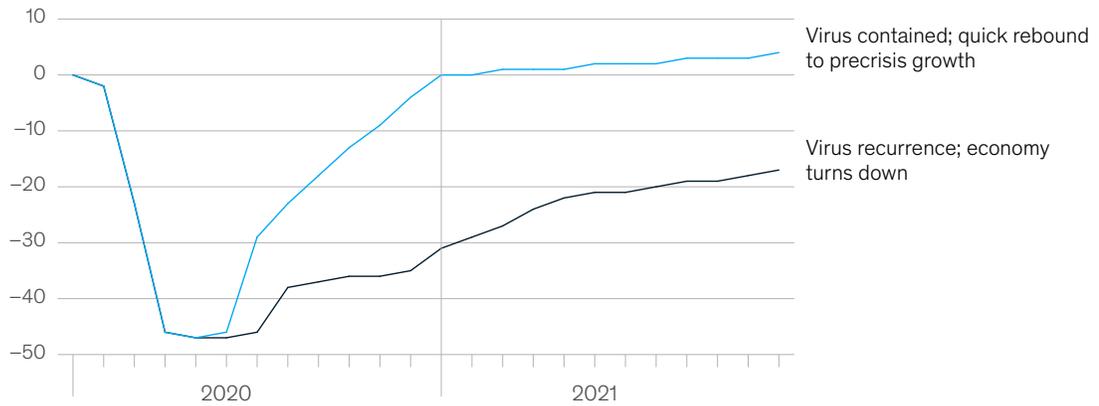
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<sup>4</sup>Russell Redman, "Kroger sees March identical-store sales jump 30% due to coronavirus," Supermarket News, April 2020, supermarketnews.com.

Exhibit 2

## US food-service recovery will vary, depending on how the coronavirus is contained.

Monthly restaurant sales, % change from 2019



Note: Includes quick-service and fast-casual restaurants; excludes fine-dining restaurants. Based on 2 most likely scenarios expected by US executives. See Sven Smit et al., "In the tunnel: Executive expectations about the shape of the coronavirus crisis," April 2020, McKinsey.com. Source: Earnest; expert interviews; Foursquare; industry reports; McKinsey analysis, in partnership with Oxford Economics; McKinsey COVID-19 US Consumer Pulse Survey, Mar 30-Apr 5, 2020

pickup services, to hit break-even volumes when there is limited seating in restaurants. Retail-channel participants, from farm to shelf, will need to coordinate in unprecedented ways to ensure continuity in supply despite rolling plant closures and pockets of equilibrium rebalancing. Profit margins will likely be affected at each step during messy rebalancing. Companies will need to rewire for agility versus trying to achieve static optimization states.

Over the long term, the impact of uncertainty on the food supply chain could take many shapes, depending on how business owners expect the situation to evolve and resolve. On a spectrum of nine potential economic scenarios,<sup>5</sup> a plurality of executives expect two to be most likely. Those two assume that some combination of effective or relatively effective public-health and economic-policy interventions will either contain the virus or

<sup>5</sup>Kevin Buehler, Arvind Govindarajan, Ezra Greenberg, Martin Hirt, Susan Lund, and Sven Smit, "Safeguarding our lives and our livelihoods: The imperative of our time," March 2020, McKinsey.com.

limit it to some minor recurrences, resulting in a slow recovery. Under those scenarios, the recovery for food services, for example, has its own trajectory, shaped by shifts in consumer habits, safety at restaurants, and the overall economy (Exhibit 2). Depending on how well the virus is contained and the level of any recurrences, it could take between one and four years for food service to recover. However, it is possible that demand will never return to prepandemic levels, creating further challenges across the value chain.

Trying times up and down the food value chain vex company managers with considerable uncertainty. Profit pools are bound to continue shifting, with M&A activity (including potential integration across the value chain) to be expected, raising the need for efficient but resilient supply chains.

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# Pharma operations: The path to recovery and the next normal

Pharma operations leaders have increased their focus on network risk management, agile and transparent operations, and shaping the workforce of the future in the post-COVID-19 path to recovery.

*by Katie Kelleher, Ketan Kumar, Parag Patel, and Ulf Schrader*

**Some might argue** that leaders of operations in the pharmaceutical industry have been historically slow to respond to changing times. During the COVID-19 pandemic, however, many across the industry have been highly responsive. Industry operations leaders have rallied to enable the supply of key medicines across borders, manage workforce safety, and handle evolving government restrictions all while beginning to prepare for new vaccines and therapeutics. And most companies have put crisis-response command centers in place to appropriately manage and bring stability to an otherwise unstable time.

With these initiatives established, companies can begin taking stock of what lies ahead. Given the shifts that have taken place seemingly overnight in response to the immediate crisis, companies are also turning their attention to recovery and the path to the next normal. This will likely bring about fundamental changes in pharma operations. While individual companies will drive many of

these changes, some will be driven industry-wide, and external factors, including government’s involvement, will also have impact on shaping the post-COVID-19 recovery (Exhibit 1).

At the industry level, for example, network strategy has evolved. Landed costs are no longer the key metric as the focus shifts to the cost implications of location risk. As the pandemic has reinforced, supply chains can be at significant risk when there is over-reliance on a location that may be vulnerable to disruption. Shifting production locations so that production is closer to end markets or in lower-risk countries that are less subject to disruption are now routine considerations in risk mitigation.

Supply chains are also becoming more patient-centric due to the increased adoption of digital tools, telehealth, and app-based ecosystems. New technologies are expected to also emerge, such as mRNA-based vaccines, that may alter the market dynamics for capacity.

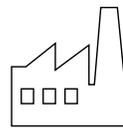
Exhibit 1

## Pharma operations: The path to recovery and the next normal.



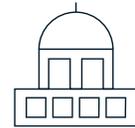
### Considerations for companies

- Reorganizing assets and supply chains will create resilience
- Agility and transparency will be critical, with digital and analytics being the engine of acceleration
- The future of work will likely be remote and distributed, and new capabilities and talent will be needed now



### Considerations for industry

- Landed cost is no longer paramount as networks rebalance cost and risk
- Supply chains could become patient-centric with different end points of delivery and information
- New technologies should emerge and shift the overall industry



### Implications for governments

- Governments and regulators might continue to get more involved, the industry is at a crossroad, and respective actions in the next few weeks and months should determine the extent of this involvement

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In the path to the next normal, operations organizations should consider adapting quickly as an imperative

# In the aftermath of COVID-19, the intense focus on risk management across networks and supply chains will likely continue, despite the inevitable increased costs.

At the individual company level, companies are now more focused on operational resilience and accelerating initiatives that enable more agility—including workforce agility as workforces become more remote and distributed—and transparency through greater deployment of digital and analytics tools and automation.

As the recovery begins to shape, there are considerations for governments and regulators as well. This is likely to evolve as the industry itself evolves in its recovery from the crisis.

Each of these shifts—at the industry, company, and government level—will have fundamental implications for pharma operations and its path to recovery.

## **Recovery and the next normal: Company perspective**

In the path to recovery, COVID-19 has increased the focus on risk management as companies reassess their supply-chain strategies and footprints to make them more agile and resilient to disruption. This also includes the potential for disruptions to the workforce as changes in design and operating models will drive redistribution of talent and new skill sets.

**Reorganizing assets and supply chains will create more resilience.** In the aftermath of COVID-19, the intense focus on risk management across networks and supply chains will likely continue, despite the inevitable increased costs.

Companies should consider reevaluating their strategies, risk tolerance, and overall network footprint to address these risks. Their considerations may include how much excess capacity they will need, dual sourcing, and geographic diversification. Make versus buy decisions will also be impacted and will be dependent on the way companies evaluate their contract development and manufacturing organizations (CDMOs), such as weighing solvency risks, the amount of control they want to have, the need to choose partners based on diversifying locations and other considerations that balance cost versus risk.

These shifts may have fundamental implications for contract manufacturing as companies reevaluate their strategy, supply chain, and distribution networks. There may also be growth in the demand for last-mile production/postponement and a gradual shift away from global supply chains to self-sufficient local supply chains. These changes may require sourcing strategies to evolve as there will be areas of limited supply in the short term—in categories such as sterile fill/finish and logistics/air freight—and fundamental changes in the long term as contract manufacturing organizations and supplier industries change and potentially consolidate. To adapt to this evolution, more agile and strategic procurement organizations may emerge.

**Digital and analytics tools and automation will be the engines that accelerate agility and transparency.** The demands on risk mitigation will drive companies to seek more transparency across

the value chain and create more agile operating models. In the shift, companies will rely even more on digital- and analytics-led solutions. For example, if international transparency on stocks of essential (and possibly all) medications and medical supplies become the norm, digital will play an essential role. Distributors and drug manufacturers may also begin to collaborate to create better stock visibility and improve forecasting.

Automating manufacturing processes and warehouses will also play an important role in the future, increasing data availability and, more importantly, decreasing a reliance on manpower. “Lights out” fully automated facilities will also reduce the risk of future disruptions due to infectious disease. Digital tools will also enable some key business processes—such as auditing or product release—to be done remotely, potentially decreasing the risk of disruption while improving efficiencies.

Agility, especially in product transfers and new material validation, will become distinctive features of a resilient strategy. More traditional pharmaceutical processes will shift to agile models that allow for expediting processes for future emergencies. These may include simplified medical-equipment approval, quality and risk-assessment processes for new material qualification and validation, remote monitoring for site quality audits, and more rapid adoption of electronic batch records.

**As the future of work becomes more remote and distributed, demand may shift to new capabilities and talent.** Reevaluating the future of work will be a key focus for most industries and pharmaceutical operations will be no exception. As overall network costs come under scrutiny driven by increased costs elsewhere, traditional organizations may come under pressure, driving changes in design and operating models and resulting in a significant redistribution of talent. For example, there may be less focus on requirements to work on site—and the post-COVID-19 workforce will be more at ease working remotely. This workforce agility will in turn enable leaner, more flexible, and well-distributed organizations.

The post-COVID-19 workforce and organization will also likely adopt new, more efficient ways of working. Out of necessity, organizations have stopped a great deal of relatively low-value work during the COVID-19 slowdown, developing ways to be more efficient and productive. Organizations focused on retaining and building on these new efficiencies will do well when work resumes.

Within operations functions, new capabilities will also be needed as the workforce shifts from manual skills to more technical skills. As the adoption of digital and analytics tools and automation increases, pharmaceutical-operations organizations may have a greater need for talent that can program, operate, and interpret data from these new technologies. This will require significant up-skilling and capability-building efforts alongside ongoing strategic planning.

### **Recovery and the next normal: Implications for the industry**

At an industry-level, the changes will likely be more sweeping with more focus on network optimization, patient-centricity, and new demands on capacity and efficiency.

#### **New networks will balance total cost and risk.**

Network optimization in the industry has recently been focused on total landed costs, but the new optimal state will place more consideration on balancing cost with risk. This will result in fundamental shifts in what the industry footprint will look like. There has long been an underlying sense of unease in the industry as core centers of supply are located far from their demand. The COVID-19 crisis has reinforced this unease and forced companies to consider moving a portion of last-mile production-supply capacity closer to end markets.

Additionally, companies should consider reassessing today’s global supply hubs, with special attention paid to higher-risk areas. To further mitigate risk, companies may also consider creating excess capacity in the global network to enable flexibility, increasing the extent of dual sourcing,

diversifying their partner portfolios, and/or adopting near-shoring or local-for-local strategies. This shift may result in increased industry-wide capacity and investment in some markets or product types.

Investors in current supply hubs may provide this supply capacity by shifting their investments. Local manufacturers in Europe and the United States may also choose to invest in capacity. Additionally, there could be a significant growth in last-mile production across the industry.

For small-molecule drugs and manufacturing, the trend of creating excess capacity in particular could impact final dosage form more than active-pharmaceutical-ingredient (API) manufacturing as labor arbitrage is higher for API manufacturing than finished-goods manufacturing. Scalable economics for API manufacturing will also be more difficult to reach for some markets.

Biologics manufacturing is comparatively more geographically diverse, so this trend may have less of an impact in this space. However, this may be an important factor when deciding where to locate new investments, such as in sterile fill/finish capacity.

**Supply chains will become patient-centric with different end points of delivery and information.**

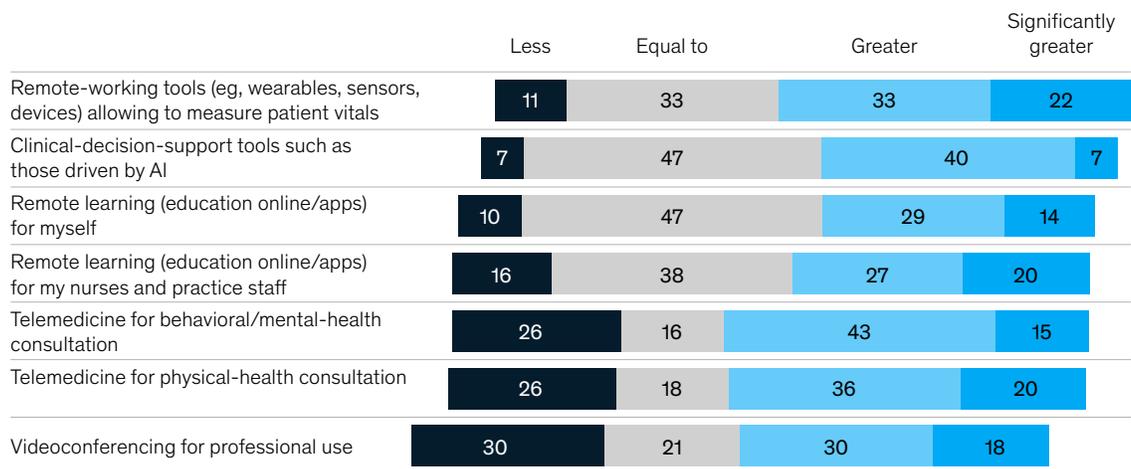
As the increased adoption of digital tools, telehealth, and app-based ecosystems make patient-level data more available, patient-centric supply chains should consider how to serve this demand. In a recent survey of physicians, significant increases in telemedicine, video-conferencing, remote-working tools, and clinical-decision-support tools are all expected (Exhibit 2).

Customers and patients will expect increased supply-chain transparency and information, and this move to telehealth and app-based ecosystems

Exhibit 2

**Physicians expect significant growth in the use of digital tools.**

**Physician expectations of remote-working-tool usage postcrisis relative to precrisis,**  
% of respondents by remote tool (n = 213)



Note: Figures may not sum to 100%, because of rounding.  
Source: Sermo COVID-19 HCP survey, April 2020

# Operations organizations need to consider quickly adapting as the industry evolves to include both the traditional players as well as the new entrants.

will require a tech-enabled delivery model. The digitization of supply chains will accelerate, and investors may step in to further disrupt and reform supply chains.

Pharmaceutical-distributor and pharmacy models could also be fundamentally disrupted, and customer-acquisition costs may change by an order of magnitude. This could lead to differentiated business-delivery models that find new sources of relevance in the market (such as strategic reserves of pandemic inventory) and also drive new partnerships to scale a more patient-centric delivery model.

**New technologies will emerge and shift the overall industry.** mRNA technology has rapidly accelerated as several of the COVID-19 vaccine candidates are mRNA-based. In an April 2020 McKinsey survey on the impact of COVID-19 to date, four out of five of top pharmas surveyed predicted a significant increase in demand for lyophilisation, as well as for mRNA and other technologies.<sup>1</sup> The industry may look for novel ways to rapidly increase this capacity as well as repurpose existing capacity. This may have significant implications if companies redistribute capacity to products with higher landing costs.

The same could also be said for traditional biologics-drug-substance capacity, some of which may be

repurposed from traditional mAB production to produce new technologies and products to support COVID-19 response. There may also be a wider adoption of continuous manufacturing technologies, which requires less space, less upfront investment and creates flexibility in potentially enabling more local production.

**Operations organizations should consider adapting quickly in the path to the next normal.** As individual actions in the pharmaceutical industry stack up, change will be inevitable for the industry. Operations organizations would need to consider quickly adapting as the industry evolves to include both the traditional players as well as the new entrants, who have come to stay. The market could also see more vertical integration and joint ventures.

## **Recovery and the next normal: The role of government**

The industry is at a crossroads and change is inevitable. How the industry responds, both to the immediate crisis and in the path to the next normal will affect decisions at the government level.

Key stakeholders in the recovery will include governments and regulators who have become more involved in crisis decisions and response. In

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<sup>1</sup> McKinsey Survey of Large Innovative Pharma Companies, April 2020, n = 5.

a recent survey of top pharma companies, four out of the five respondents reported an increase in government involvement in key markets.<sup>2</sup> One example in the United States is the Food and Drug Administration's recently announced Coronavirus Treatment Acceleration Program (CTAP), which aims to better support companies and scientists looking to field trials as well as helping to expeditiously qualify new treatments for use.<sup>3</sup> Similar actions from other governments have been seen across the world.

The respective actions in the next few weeks and months will determine the future of government involvement and regulations. So far, the industry has come together like never before, with increased collaboration industry-wide to ensure product supply. For example, a wide group of pharma companies have come forward with plans of ramping up the production of hydroxychloroquine in light of the increased demand for COVID-19 treatment coupled with export challenges from India.<sup>4</sup> The European Medicines Agency has also seen pharmaceutical companies, who have been competitors, come together to secure critical, high-demand medicines for hospital intensive-care units by setting up the industry-single-point-of-contact (i-SPOC) system, which enables close monitoring of possible disruptions in supply.<sup>5</sup> This continued collaboration could change how governments and regulators play a role in oversight.

Intense public scrutiny, however, means governments and regulators could take a more proactive approach in a scenario where pharma companies may be perceived to be falling short. And increased regulatory attention could materialize in different ways: Governments could mandate higher minimum safety stocks for select products and start applying heavier penalties for stockouts. Or it could become mandatory for pharma companies to have flexible capacity for key drugs and medical products which would drive an even more focused wave of

SKU standardization. Some governments may also become involved in private companies and push for stronger regulation on operators' access to products.

## Preparing for recovery

Given the many changes likely to unfold, operations leaders in the pharmaceutical industry have much to consider. The following questions can help prepare for the years ahead:

1. What is your view on risk mitigation and what are the key decisions you will need to consider to execute your risk strategy?
2. Is your organization considering changing its partnership strategy (such as with contract manufacturing organizations) or will it do more on its own?
3. How diversified is your network in balancing landing costs versus risk? What is your point of view on the locations for specific supply points (such as India and the United States as supply points)?
4. The industry cost curve will likely flatten in the move toward more transparency. What are the changes needed in your operations organization to improve transparency and agility in this scenario?
5. As the increased adoption of digital tools, telehealth, and app-based ecosystems make patient-level data available, how will your organization adapt its operating model and who will be the driver of change?
6. How will you budget for the additional cost buckets due to COVID-19 and what will be the order of magnitude of this impact—both on operating costs and on capital requirements?

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<sup>2</sup>Ibid, n = 5.

<sup>3</sup>Coronavirus Treatment Acceleration Program, US Food and Drug Administration, [fda.gov](https://www.fda.gov).

<sup>4</sup>Sandra Levy, "Pharma companies ramp up production of hydroxychloroquine to support COVID-19," *Drug Store News*, March 20, 2020, [drugstorenews.com](https://www.drugstorenews.com).

<sup>5</sup>"Update on EU actions to support availability of medicines during COVID-19 pandemic," European Medicines Agency, April 10, 2020, [ema.europa.eu](https://www.ema.europa.eu).

7. As you prepare to go back to work, what is your people strategy? What are the key capabilities you need to start building immediately as well as the talent you need to begin recruiting now?
8. What role do you believe government will play in future supply and inventory needs and what are the implications for your supply-chain and manufacturing strategy?

COVID-19 is first and foremost a humanitarian crisis and the role played by pharmaceutical organizations is fundamentally critical. As pharma leaders focus on their crisis response, it is important to consider these questions and the implications for their respective companies in increasing resiliency and better adapting to the post-COVID-19 world.

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# Power and people: How utilities can adapt to the next normal

With economies and energy demand hit hard by the COVID-19 crisis, European and North American utilities need to rethink their operations to put themselves into position for long-term success.

*by Adrian Booth, Tom Carlowitz, Elizaveta Malashenko, and Jesús Rodríguez González*

**Utilities in Europe and North America** have done their jobs throughout the coronavirus crisis by keeping the lights on without interruption. But like players in other industries, they are facing challenges. McKinsey has identified five stages that businesses need to go through on the path to the next normal. Along these stages, we have seen utilities addressing a set of key themes (Exhibit 1).

At the beginning of the COVID-19 outbreak, utilities had to *resolve* to meet the immediate issues posed by operating during a pandemic and then build *resilience* to meet immediate operational demands. The priority was to ensure the safety of their people while guaranteeing the security of supplies and addressing risks. Crisis teams had to stabilize supply chains and operations, which were disrupted by physical distancing and on-site restrictions. They also had to cope with the financial impact of the crisis. Lower industrial power demand and rising consumer defaults had hurt cash flows and balance sheets. Hence, it was crucial to stress-test financials and engage customers.

As lockdowns have started easing in many countries, the focus is shifting toward a safe *return*: how to bring more workers back to their jobs and to ramp up operations as demand begins to rise. At the same time, utilities need to think longer term by

recognizing the operational shifts experienced in the sector as they *reimagine* and *reform* their operating environments. The priority will be to understand which of the temporary disruptions they have experienced are likely to persist. Finally, the COVID-19 crisis will have longer-term implications for the industry, and companies should take stock of the regulatory- and competitive-environment shifts to balance their future business footprints.

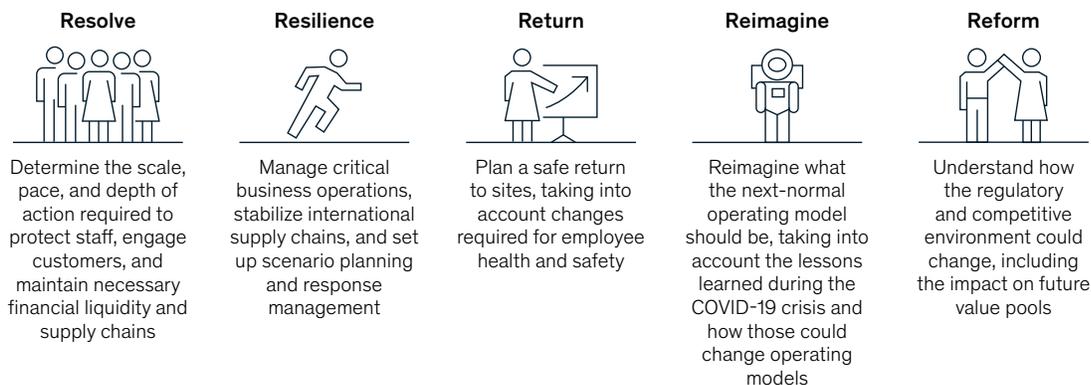
In this article, we describe five themes that are reshaping the utility sector and offer practical suggestions on how leaders can adapt their organizations to meet the needs of the next normal.

### Theme 1: Power demand will take time to recover to precrisis levels

In many affected countries, power demand has started to recover. But despite those positive early signs, we are not expecting power demand to recover fully before the end of 2020 (Exhibit 2). McKinsey has developed nine scenarios that describe the possible economic impact of the COVID-19 crisis, depending on the effectiveness of public-health responses and economic policies. Although there is still uncertainty around the future impacts of the COVID-19 pandemic, we consider the most likely scenarios to be virus contained with slow recovery

Exhibit 1

## There are five stages for utilities to reach the next normal.



and virus recurrence with muted world recovery. Under those scenarios, the expected economic shock will mean that power demand will not recover until the end of the year—and not to precrisis levels. If that is the case, some generators could be pushed out of the market. Sustained lower demand could also depress electricity prices, leading to lower revenues for unhedged power plants or utilities with coupled rate structures.

**How to adapt: Advance risk-management strategies**

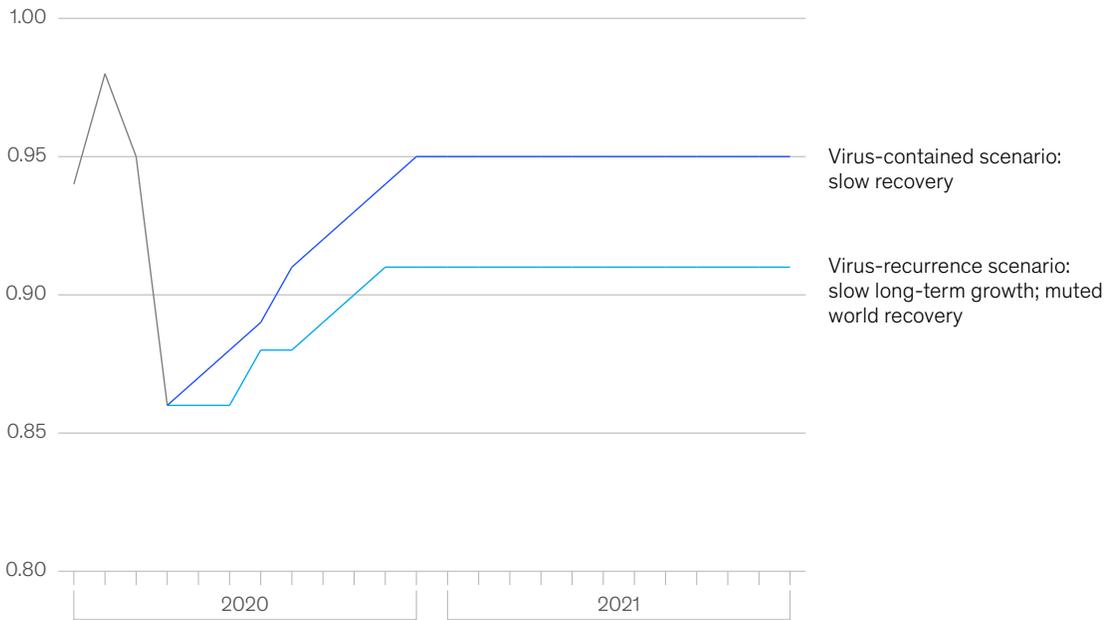
To mitigate the consequences of lower power demand and depressed prices, utilities with a large generation exposure need to reconsider their risk-management strategies. First, they need to update their market-risk governance to ensure that they can make decisions faster. Players will also need to reassess their long-term hedging

strategies, mitigating merchant-price exposure. That will prepare them if the future is volatile, being characterized by demand contraction and commodity-price fluctuations. Utilities may also want to look into reviewing their contract portfolio to move toward more short-term agreements. In particular, there are large volumes of FOB and long-term liquefied-natural-gas contracts across Europe that could be reviewed. Similarly, the changing market fundamentals of pipeline gas create opportunities for shorter contracts priced using hybrid or alternative indices. Taken together, the changes mean that utilities should advance their risk-modeling and forecasting practices. Practical methodologies that could emerge include the more frequent use of market data, extensive stress-testing, risk-limit dashboards, and advanced scenario modeling.

Exhibit 2

**Power demand will probably not recover to precrisis levels before the end of the year.**

**Projected power-demand evolution in Europe, indexed month by month**



Note: Scenarios based on analysis in *Safeguarding our lives and our livelihoods: The imperative of our time*, March 2020, McKinsey.com.

# Utilities need to be aware of the long-term impact of changing economics on their financials and manage their credit risk carefully.

## **Theme 2: Economic conditions will put pressure on revenues and increase credit risk**

A number of European countries, including France, Germany, Italy, Spain, and the United Kingdom, have allowed households to defer utility payments or have suspended service cuts for defaulting customers. Several state governments and commissions in the United States took similar actions by placing moratoriums on disconnections for nonpayment and, in some cases, suspending late fees. Utilities have also taken steps to help customers in distress. Such actions provide needed help for customers but mean lower revenues for utilities.

Governments may begin to lift some of these customer protections, but the economic hardship of households is likely to persist. According to the International Monetary Fund, the average unemployment rate in advanced economies, which increased from 4.8 percent in 2019 to an estimated 8.3 percent in 2020, could remain as high as 7.2 percent in 2021. Historically there has been a correlation between unemployment rates and arrears on consumer utility bills.

McKinsey's latest COVID-19 Global Consumer Pulse Survey found that 11 percent (Denmark) to 28 percent (Portugal) of European households and 17 percent of US households expect the negative impact on their finances to persist for longer than a year. The effect on utility financials and credit risk could be significant, depending on the market and

customer characteristics. Moreover, regulators that want to protect consumers might choose to keep prices low for the foreseeable future—again depressing revenues.

### **How to adapt: Engage customers and manage credit risk**

Utilities need to be aware of the long-term impact of changing economics on their financials and manage their credit risk carefully. Methods such as advanced analytics can help segment customers precisely and predict delinquency rates. In addition, they can improve the collection process, minimize default risks, and even identify customers who may require extra help. To help those who are struggling, utilities need to demonstrate understanding and provide personalized solutions. For instance, they could offer special support programs, new payment plans, and tariff adjustments. They could also work with financial institutions to offer flexible payment plans. Customers have individual needs; utilities need to acknowledge them with targeted communications and solutions.

### **How to adapt: Improve B2C digital channels**

Utilities also need to enhance their digital customer engagement to stay connected to customers. When the crisis hit, utilities had to change how they typically interacted with their customers. With payment offices closed and customers staying at home, digital channels became much more important. There is a general trend of customers moving online, with some online activities growing more than 40 percent.<sup>1</sup>

<sup>1</sup>"Survey: US consumer sentiment during the coronavirus crisis," June 2020, McKinsey.com.

The most obvious action to take is to digitize all payment and communication channels. But that is only the start: a digital-focused consumer strategy needs to go deeper. Utilities in Spain and the United Kingdom are using online performance marketing to acquire new customers. In Germany and the United Kingdom, utilities have launched new online campaigns to demonstrate care and support for customers and to reposition their brands.

### **Theme 3: Operations will continue to be disrupted**

The crisis has delayed many operations and maintenance (O&M) and capital projects. Renewable projects, in particular, were hit by supply-chain and on-site restrictions. Utilities and developers need to expect that some of these restrictions will remain in place. Measures that have already been put in place, such as requiring prequarantines for workers embarking on offshore wind vessels and limiting vehicle sharing, might need to be expanded. But limiting crew sizes and other physical-distancing measures could slow down ventures that require close physical contact.

Ongoing safety measures could also affect customer-service operations, such as meter replacement and installation of rooftop solar panels. Especially in the United States, residential solar-panel installations will continue to be disrupted by physical-distancing measures. And, of course, if there is a resurgence of the virus, stricter restrictions may be imposed. Another operational challenge is the distressed financial condition of external contractors: if they go bankrupt, utilities will find it difficult to ramp up operations. Some European grid operators, for example, rely on external services for more than half of their maintenance activities.

#### **How to adapt: Double down on safety**

European and North American utilities have instilled a culture of safety among their field and operations workforces and generally have strong safety records. Dealing with the COVID-19 crisis, however, means that they now have to go the extra mile. Some leaders are having “red teams” perform walk-throughs to identify areas in which new safety

techniques need to be instituted or strengthened.

Another approach is to implement a safety-management system (SMS), a comprehensive effort to identify, prevent, and fix safety hazards. Aviation and other high-hazard industries often use this approach, and it is now spreading into the utility space. In 2019, for example, the American Gas Association recommended that its members implement SMSs for their pipelines.

Doubling down on safety can also improve both resiliency and efficiency. For example, a typical utility sees the most worker injuries from vehicle accidents. Identifying methods for accomplishing work with smaller crew sizes and performing more work remotely reduces windshield time, thus increasing overall worker safety and improving efficiency.

#### **How to adapt: Expand digital operations and channels**

Utilities that started digital programs before the crisis have been more resilient. In the post-COVID-19 world, many will need to reconsider their technology priorities. For example, they might be able to reduce O&M costs by using analytics to create risk profiles that generate better asset-maintenance cycles. Using remote supervision could help grid operators minimize the risk for their workforces while simplifying operations.

At a time when every truck roll matters, digital technologies could also improve field operations. Digitally enabling field workforces could help utilities reduce crew sizes, improving both safety and efficiency. Remote troubleshooting could do the same. And given the possibility of ongoing travel restrictions, remote supervision could play a bigger role in the construction of new sites too.

### **Theme 4: The strategic reshaping of the sector will be accelerated**

The market valuation for the electric-power and natural-gas (EPNG) sector was down 15 percent at the end of March but has already begun to recover. Moreover, many utilities had relatively healthy balance sheets heading into the crisis. So while the number of M&A dropped in the first quarter

# Digitally enabling field workforces could help utilities reduce crew sizes, improving both safety and efficiency.

of 2020 (global power industry deals dropped by 15.1 percent, from 906 in the first quarter of 2019 to 769 in the first quarter of 2020),<sup>2</sup> activity could pick up quickly, reshaping the sector.

Pre-crisis trends, such as strategic portfolio reshaping of utilities and investment by new market entrants, are already resuming and could accelerate. Many utilities will expand their renewables and new downstream activities while disposing of other assets to free up liquidity. Funds and oil and gas (O&G) companies will probably update their portfolio strategies too.

Infrastructure funds, like utilities, could be more likely to prioritize investments in renewables. There has been disruption of renewables operations, but the sector has demonstrated market resilience and stability. Market capitalization of renewables players has recovered faster than in other archetypes, not least because of priority dispatch and contracted revenues. That being the case, funds may be willing to take higher risks and show increasing interest in merchant projects. They will have the required resources: infrastructure fundraising reached a record high of \$98 billion in 2019, with available dry powder of \$212 billion at the end of year.<sup>3</sup> Other players in the EPNG space, such as O&G companies, might increase their efforts as well—although they may have their hands full managing the financial impact of much lower oil prices.

## **How to adapt: Reconsider the portfolio strategy**

Utilities need to be aware of their new market environment and reconsider the strategic orientation of their portfolios. For some players, there will be

opportunities to start financial partnerships, while others will take the chance to sell assets that no longer fit with their core strategies. With the possibility of more competition from new entrants, utilities need to be able to act nimbly.

## **Theme 5: Operating models have changed, with more remote working and more flexible structures**

When the COVID-19 crisis erupted, many utilities formed crisis teams that had the mandate to make quick decisions. It was not at all unusual for operational decisions that previously took three weeks to finish to be completed in three days. Organizations shifted toward a flatter, more agile model in which teams collaborated remotely across business functions and geographies—and often found this process to be more productive than physical meetings were. Changes took place along all segments of the value chain; we have seen cases in which engineers and project designers worked more productively remotely than when they were physically together. In other instances, executives were able to discover new talent to keep operations running, such as with multiskilled workers in power plants.

## **How to adapt: Implement hybrid operating models**

As lockdowns ease, utilities will want to maintain organizational agility and prioritize remote capability building: almost three-quarters of CFOs surveyed across industries plan to move to remote working.<sup>4</sup> In our own discussions with utility executives, they indicate growing interest in hybrid working models. They will need to plan carefully because different roles and teams have different virtualization

<sup>2</sup>GlobalData, globaldata.com.

<sup>3</sup>Prequin, prequin.com.

<sup>4</sup>"Gartner CFO Survey reveals 74% intend to shift some employees to remote work permanently," Gartner, April 3, 2020, gartner.com.

potential. Leaders will therefore need to embed remote working in their organizational cultures. One way to do so is to work remotely themselves; another is to involve employees in the planning process. Remote working also opens new possibilities: utilities can hire talent in different geographies, possibly enhancing both their diversity and their resiliency. It will also be an opportunity to build the right set of skills for the future. With a hybrid working model, an agile, digital, collaborative, and cross-skilled workforce will provide a competitive edge.

The potential to adapt should not stop with hybrid working and new skill sets. Utilities can also adopt digital tools to set up centralized expert hubs to

enhance remote troubleshooting capabilities and create agility. Maintaining the accelerated decision-making structures created during the crisis will require taking specific actions, such as segmenting and delegating noncritical decisions and cutting out unnecessary process steps. In short, utilities need change their organizational mindsets—and fast, before there is a drift back to the precrisis status quo.

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If utilities recognize how the post-COVID-19 world is changing and implement the right strategies to adapt, they will be more likely to survive—and maybe even emerge stronger. The future, by definition, is unpredictable, but the need for resiliency is certain.

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# How retail can adapt supply chains to win in the next normal

Retailers in consumer discretionary categories were already struggling in the US before COVID-19. Better supply-chain management could be critical to their recovery.

*by Ashutosh Dekhne, Sonam Gupta, Aniket Joglekar, and Sajal Kohli*

**The US retail sector** is facing one of the most challenging times in recent memory. For discretionary retailers, the headwinds are especially strong given considerable uncertainty driven by competitive dynamics, concerns over consumer confidence, and heightened demand for last-mile delivery.

It's increasingly clear the pandemic has materially changed US consumer behavior, perhaps permanently, with many retailers looking to alter their supply chains to compete in the next normal.

### Major shifts in consumer behavior

Our consumer sentiment survey from late September 2020 shows that more than half of US consumers expect that the personal and financial impact from COVID-19 will last more than an additional four months. Not surprisingly, they

also report becoming more mindful about how they're spending, looking for more ways to save money when shopping and taking steps to be more disciplined in their choices (Exhibit 1).

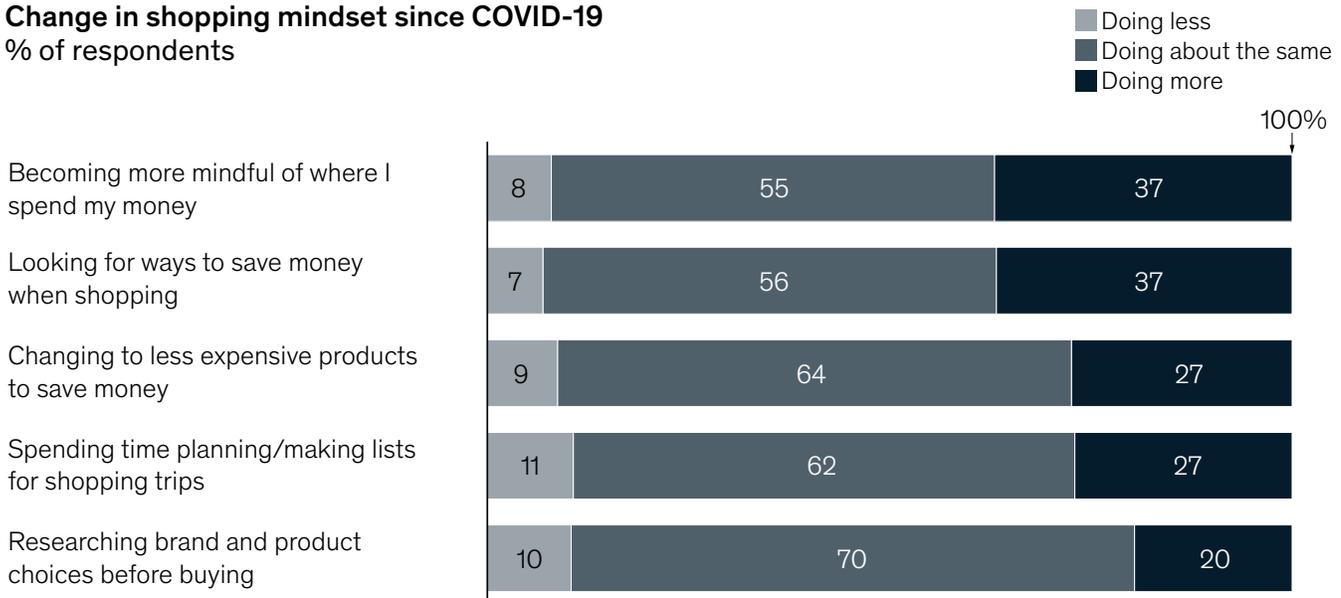
The survey also shows that consumer use of the online channel has increased for discretionary product categories. Consumers report that they expect to reduce many high-traffic, in-person activities in the future, including going to the mall. Given the physical-distancing norms, consumers en masse embraced digitally enabled omnichannel fulfillment. For example, store curbside pickup has almost doubled compared to pre-coronavirus levels, while "buy online, pickup in-store" (BOPIS) has grown by almost 50 percent (Exhibit 2).

Online shopping of nondiscretionary items—through both conventional e-commerce channels, as well as new shopping channels with omnichannel

Exhibit 1

## Americans are becoming more mindful of how they spend their money.

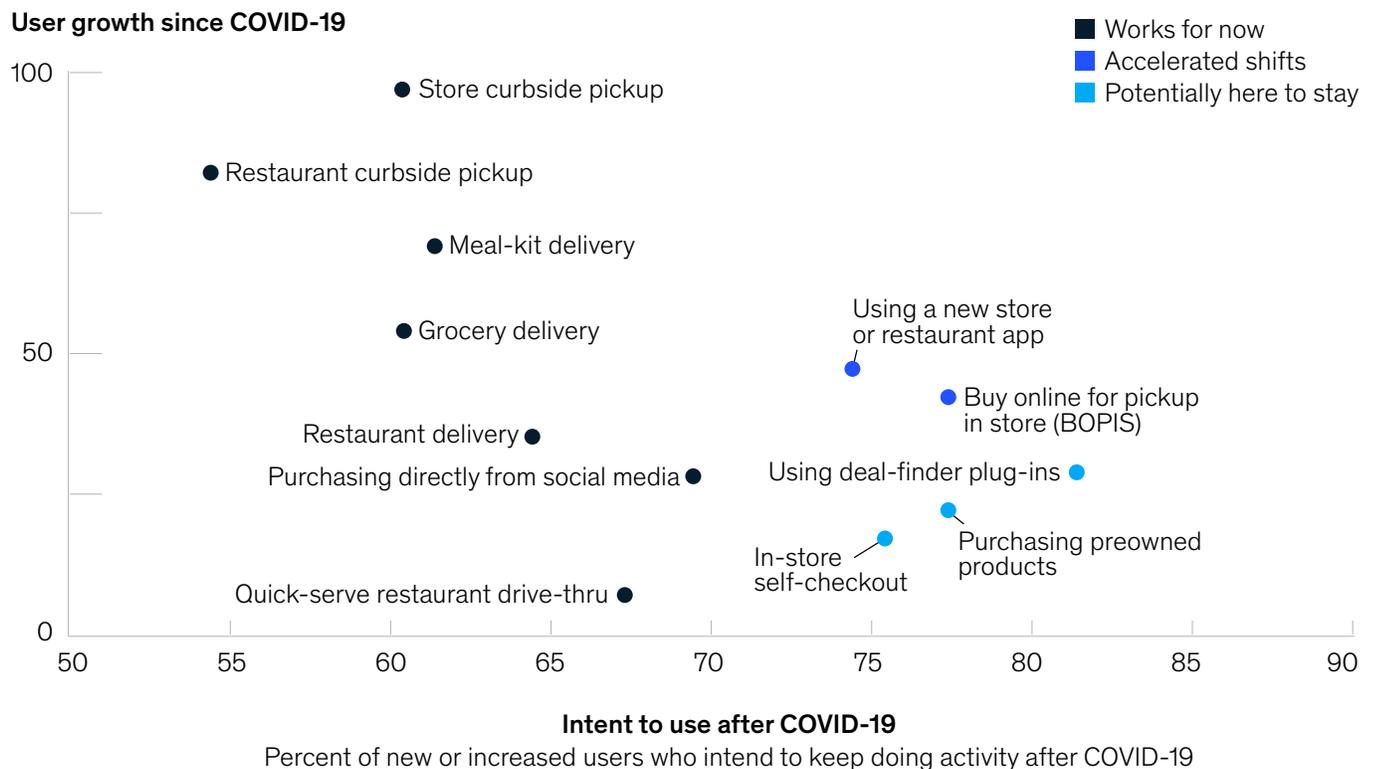
### Change in shopping mindset since COVID-19 % of respondents



Source: McKinsey & Company COVID-19 US Consumer Pulse Survey 9/18–9/24/2020, n = 1,026, sampled and weighted to match the US general population 18+ years

Exhibit 2

**Many consumers intend to continue newly acquired habits even after the crisis is over.**



Source: McKinsey & Company COVID-19 US Consumer Pulse Survey 9/18–9/24/2020, n = 1,026, sampled and weighted to match the US general population 18+ years

fulfillment—seems poised to continue to grow post-COVID-19 as consumers become more comfortable about buying without trying products first in physical stores. Even for categories such as footwear, apparel, and home furnishings and appliances, 30 percent or more of US consumers now say they make most or all of their purchases online (Exhibit 3).

**Supply-chain implications**

Retailers have been planning for changes in consumers’ expectations and online behavior, but they’ve generally assumed these changes would occur over a fairly long period of time. But COVID-19 has accelerated these changes almost overnight, leaving most retailers’ supply chains unprepared to respond. As retailers look to the future, they will need to contend with consumers’ expectation

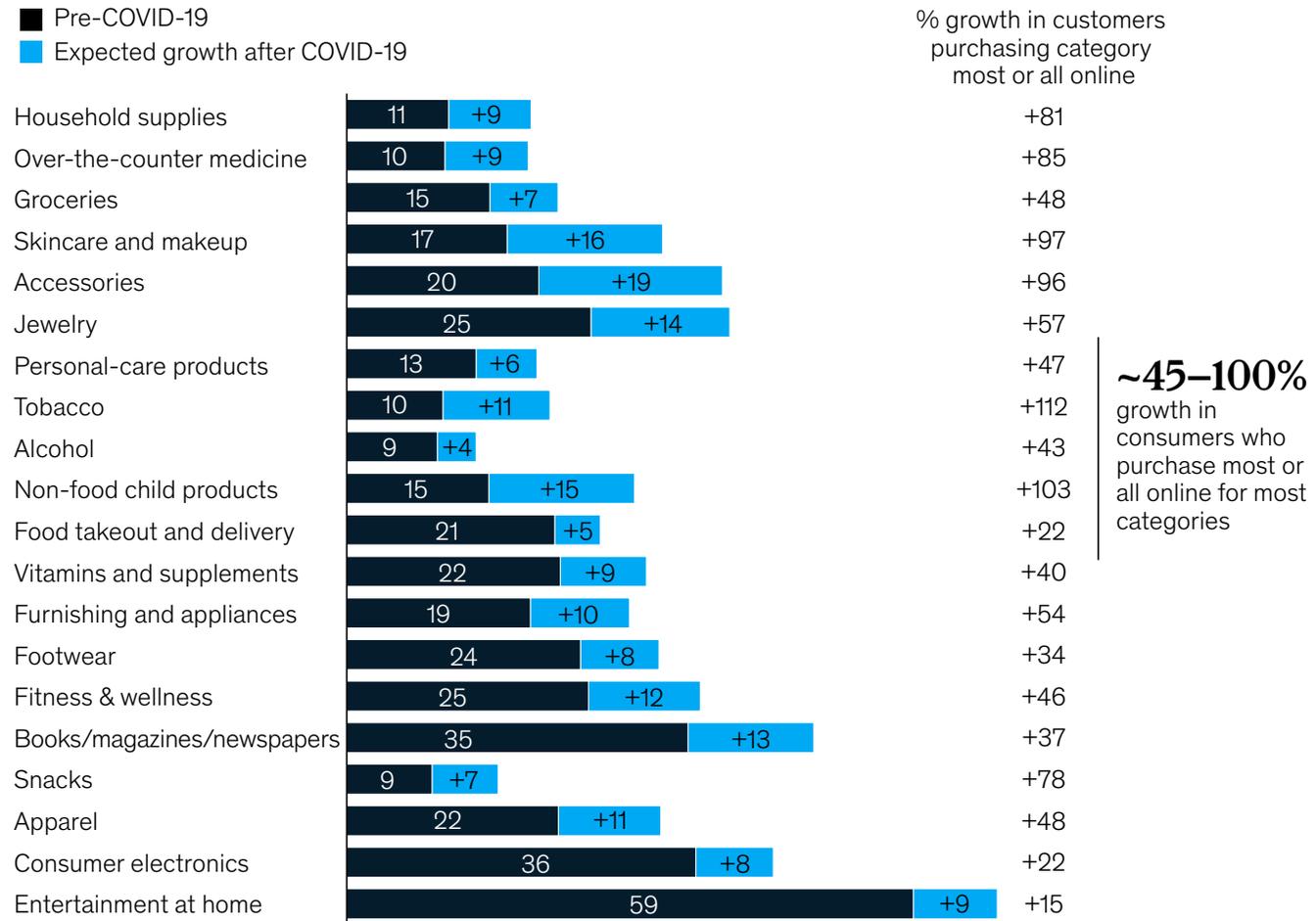
for seamless omnichannel fulfillment, as well as retailers’ own increasing productivity pressures.

**Robust omnichannel offerings have become table stakes**

Physical distancing and stay-at-home mandates compelled retailers large and small to accelerate omnichannel initiatives (Exhibit 4). Most grocers and established players in discretionary retail, such as electronics sellers, department stores, and sporting-goods specialists, have accelerated the rollout of curbside pickup throughout their store network. Even mom-and-pop restaurants and stores have found creative ways to offer contactless, curbside pickup and omnichannel fulfillment. Moreover, higher willingness to purchase online (and to switch brands) is expected to intensify competition from single-brand, online-only retailers,

**Many US consumers report planning to shift their purchases almost completely online.**

**Consumers' actual use of online channel before, and expected use after, COVID-19,**  
 % of respondents purchasing most or all online



Source: McKinsey & Company COVID-19 US Consumer Pulse Survey 9/18–9/24/2020, n = 1,026, sampled and weighted to match the US general population 18+ years

which already have built e-commerce supply chains.

As omnichannel capabilities become essential, retailers can differentiate their customers' experience in various ways. This includes the speed of delivery (such as same-day or next-day); wider assortment and end-to-end visibility (such as giving a real-time view of inventory in the nearest store, as well as real-time orders and returns tracking); and a better experience (such as seamless orders and

returns, easy personalization, and subscription services).

**Productivity under pressure**

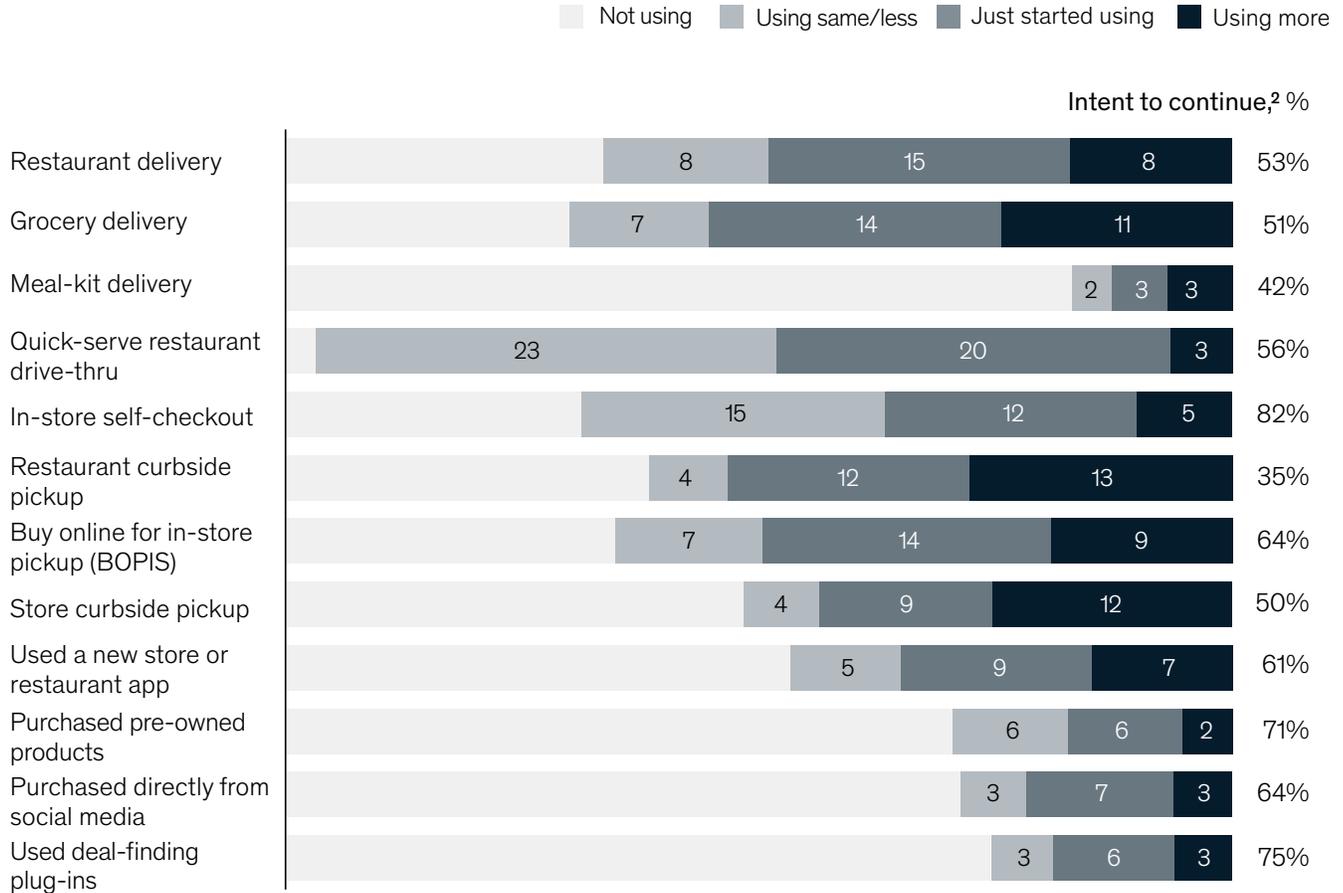
Productivity pressures for many retailers are nothing new, as many have responded to rising e-commerce demand by getting more out of legacy infrastructure and systems. But for most players, e-commerce fulfillment is inherently more expensive than traditional brick-and-mortar

Exhibit 4

**Use of digital and low-contact channels has grown markedly.**

**Have you used or done any of the following since COVID-19 started?**

% of respondents



Source: McKinsey & Company COVID-19 US Consumer Pulse Survey 9/18–9/24/2020, n = 1,026, sampled and weighted to match the US general population 18+ years

logistics because more inventory must be held in the network—creating a barrier to the faster and more predictable service levels that consumers now expect.

To help address the combined challenges of fulfillment cost, service requirements, and productivity improvement, retailers have sought to keep inventories closer to consumption centers. In some cases, this practice has led to higher total inventory in the network. For example, the inventory-turnover ratio at most US department

stores has decreased over the past five years. Unless countermeasures are taken, as e-commerce sales increase as a percentage of total sales, this trend may intensify—leading to higher capital requirements and increased markdowns if retailers are driven to sell off extra inventory at the end of the season (Exhibit 5).

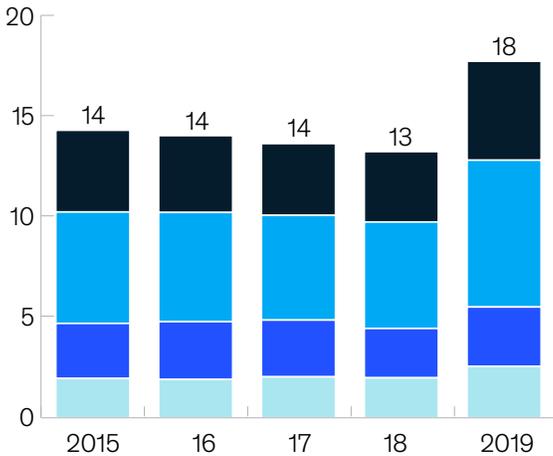
Some of the productivity loss could be offset by lower transportation rates depending on crude-oil prices. However, these transportation savings (and

Exhibit 5

## Higher residual inventories often mean heavier discounting.

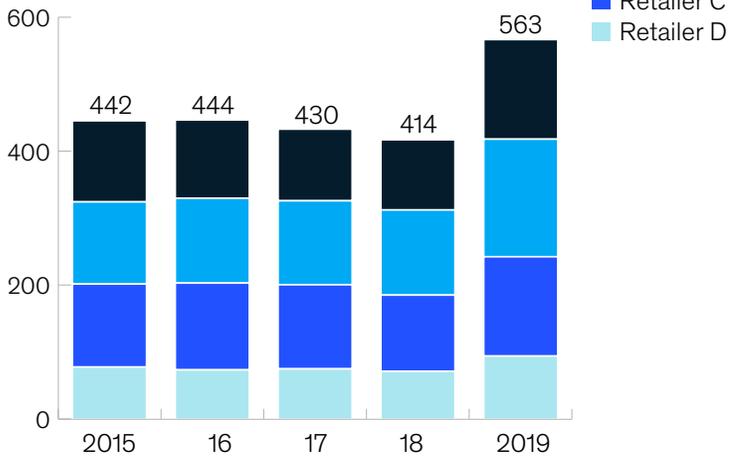
### Inventory in retail sector

Units, thousand



### Days of inventory

#



related factor-cost decreases) are likely a short-term benefit. Ultimately, retailers will likely need to look elsewhere for sustainable value capture, particularly in their supply chains.

Since the start of the pandemic crisis, most retailers have taken actions to address some of the short-term challenges (Exhibit 6). But only a few have truly set the foundations for the next normal, illustrated five strategic supply-chain imperatives.

### Taking advantage of supply-chain opportunities

Those retailers that are thinking big and bold—taking a cleansheet view of their supply chains, making big strategic bets to reshape the supply chain's role in value creation—can position themselves to thrive over the long term. Creative problem solving that accepts constraints on capital availability as a given can help narrow the focus on finding flexible alternatives—and not just survive, but win.

### Challenge each node's role in the supply chain

Retailers can start by thinking critically about the role of each node in their supply-chain network. Many, if not most, retailers have already started leveraging their store footprints for omnichannel fulfillment. Some have gone further—building state-of-the-art microfulfillment centers in metro areas, and converting portions of their stores as mini, in-region distribution centers (DCs) with faster delivery promise and faster fulfillment. All nodes in the network, including stores, distribution centers, deconsolidation centers, returns-processing centers, pop-up shops, and urban lockers, can be reassessed for their role. It's important that this comprehensive, rapid supply-chain analysis consider not only new demand profiles for the nodes owned by the retailer, but also how best to work with potential partners (such as local couriers and on-demand delivery players) to improve supply-chain performance.

Rethinking the role of all distribution nodes will likely prove essential in creating a sustainable omnichannel fulfillment model. For example, while most retailers have carried less inventory in their DCs by pushing product to stores, the result can

Exhibit 6

**Checklist of actions using near-term levers**

Omnichannel building block	Near-term actions (0–3 months)	Mid-term actions (3–6 months)
Customer-centric supply-chain model	Analyze the extent of shift in consumer sentiment and channel preferences to model demand in the new normal	Closely monitor seasonal demand shifts and refine forecasts
Network and ecosystem of the future	Identify quick-win opportunities to optimize product flows through nodes (eg, sending material directly from vendor to store or from import deconsolidation warehouse to store)	Repurpose stores either partially or fully to serve as fulfillment centers for e-commerce
End-to-end planning and information flow	Revise safety stocks and inventory-allocation algorithms to ensure enough stocks in digital channels	Quickly deploy bespoke advanced analytics tools to enable dynamic optimization of allocation, markdowns, and promotions based on new demand patterns
Omnichannel fulfillment and node operations	<p>Reorganize distribution center (DC) operation schedules to preserve physical distancing and other safety considerations</p> <p>Ensure enough staffing for increased e-commerce operations (eg, each-picking)</p>	<p>Improve visibility in DC operations by deploying digital performance management to indentify bottlenecks</p> <p>Accelerate automation improvements in conjunction with future network strategy</p>
Omnichannel fulfillment—transportation and logistics services provider management	<p>Conduct market events by factoring in changes to shipment volumes by lanes</p> <p>Partner with local delivery services (and gig-economy players) to improve service and cost economics for expected increased parcel volumes</p>	Improve visibility and use dynamic routing optimization using real-time analytics to quickly respond to demand shifts
Digitization and process automation	Review portfolio of digital investments that were put on hold to identify no-regreat digital initiatives for the next normal	Leverage bolt-on analytics tools to augment current digital and analytics capabilities with minimal investment
Operating model and change management	<p>Embed safe working policies across the organization</p> <p>Rebalance roles and responsibilities to service increased demand in digital channels and the consequent higher use of analytics</p>	Identify gaps in analytical and technical capabilities to redeploy and upskill employees across functions

be higher markdowns and unsold inventory. To solve this, some retailers are starting to use their port warehouses as temporary stocking points for imported products. These port warehouses could assume a greater role in pooling inventory upstream, so that retailers can push inventory to stores opportunistically rather in quantities too large for the stores' demand to absorb. A few retailers have considered repurposing stores to serve as fulfillment nodes for fast-moving products.

### **Embrace collaboration (even with competitors)**

Retailers' survival and growth could depend in part on carefully considering which activities should be done in-house rather than outsourced. Historically, discretionary retailers have been shy of outsourcing logistics, fearing they might lose their ability to beat competitors to market. But the purported advantage was rarely worth the cost—and now the cost is simply too great. Moreover, new technologies and business models mean that retailers can have more visibility (and even control) over outsourced logistics than they had when running everything themselves.

With the need to preserve cash, retailers could explore partnerships with each other—or with third-party logistics (3PL) companies, real-estate or warehouse providers, or fourth-party logistics providers that take over management of even more of the supply chain. For example, noncompeting retailers could enter into a consortium-like partnership to use each other's distribution nodes, or a common 3PL provider to achieve wider geographical reach with little additional capex. These could help companies deleverage their balance sheets while improving service and lowering costs—but it would likely require them to adopt a more collaborate stance in partnering with 3PLs, rather than viewing them merely as transactional providers.

### **Build resilience in the supply chain**

COVID-19 has demonstrated how important it is to have resilient supply chains that can adapt quickly and continue to deliver during times of disruption. Building resilience is a matter of establishing

contingencies, engaging in flexible resource planning, and (in some cases) adding redundancy for critical products in the system.

Part of being resilient is building an agile network of suppliers and partners. Certain major nondiscretionary retailers are diversifying their supply chains to mitigate dependencies on geographically concentrated suppliers. Retailers dependent on offshore production might explore alternative sources and locations, perhaps developing manufacturing capacity closer to core markets. Rethinking production footprints could help drive down risk while providing new value propositions for product that are sourced or made locally.

### **Focus on rapidly deployable bespoke analytics**

Retailers have historically forecast demand based on sales in prior years. The current crisis has upended the underlying assumptions, rendering these historical statistics less effective. The inability to predict demand has a snowball effect on a retailer's ability to hold the right amount of inventory, plan seasonal merchandise, and avoid unnecessary markdowns.

In response, retailers can deploy advanced analytics for forecasting, as well as for assortment and allocation decisions based on emerging market trends. But the answer is not necessarily to deploy expensive analytics systems; instead, retailers could explore bespoke, plug-and-play solutions that use their existing systems while providing a more credible view of demand trends—and the optimal inventories at each node. A few large retailers, for example, have deployed advanced analytics to segregate the impact of pantry loading so that they can better estimate the sustained demand increase that's critical for improved demand forecasting.

### **Prioritize end-to-end visibility, achieved through simplicity**

Visibility into strategic and tactical actions and their impact on service, cost, and capital is vital in this dynamic environment. Retailers can quickly (and inexpensively) deploy a supply-chain control tower

to orchestrate actions across different functions and improve end-to-end visibility in responding quickly to emerging trends.

Multiple grocery retailers have deployed supply-chain control towers within four to six weeks, achieving significant benefits from real-time visibility. These chains have responded to unprecedented demand swings by quickly reallocating inventories, analyzing and de-bottlenecking warehouse operations, and rebalancing timing of vendor contracts. They've achieved such end-to-end visibility and responsiveness by using relatively simple tools

linked to existing data streams and requiring little or no capital expenditure.

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Retailers with the most robust growth over the past decade have often done so by prioritizing supply-chain optimization. That makes sense, because a supply-chain strategy focuses on the sustainable creation of value for the retailer, the customer, and the broader community. Five strategic moves led by the supply-chain organization might prove to be the most critical factors to win in the next normal.

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# Making healthcare more affordable through scalable automation

As more healthcare companies start to implement automation technologies, the ability to coordinate across the organization in achieving scale will be a major determinant of success.

*by Brandon Carrus, Sameer Chowdhary, and Rob Whiteman*

**Automation technologies**, such as robotic-process-automation bots, machine-learning algorithms, and physical robots, have the potential to reshape work for everyone: from miners to commercial bankers, and from welders to fashion designers—and even CEOs.

Our colleagues' research on the future of work estimates that, using currently demonstrated technologies, almost half of the activities that people are now paid to do in the global economy could feasibly be automated. Certain types of repetitive and routine activities, such as data collection and processing, thus show a high automation potential. By contrast, certain tasks that are customer-facing or that involve innately human

skills—such as creativity, problem-solving, and effective people management and development—are more resistant to automation (Exhibit 1).

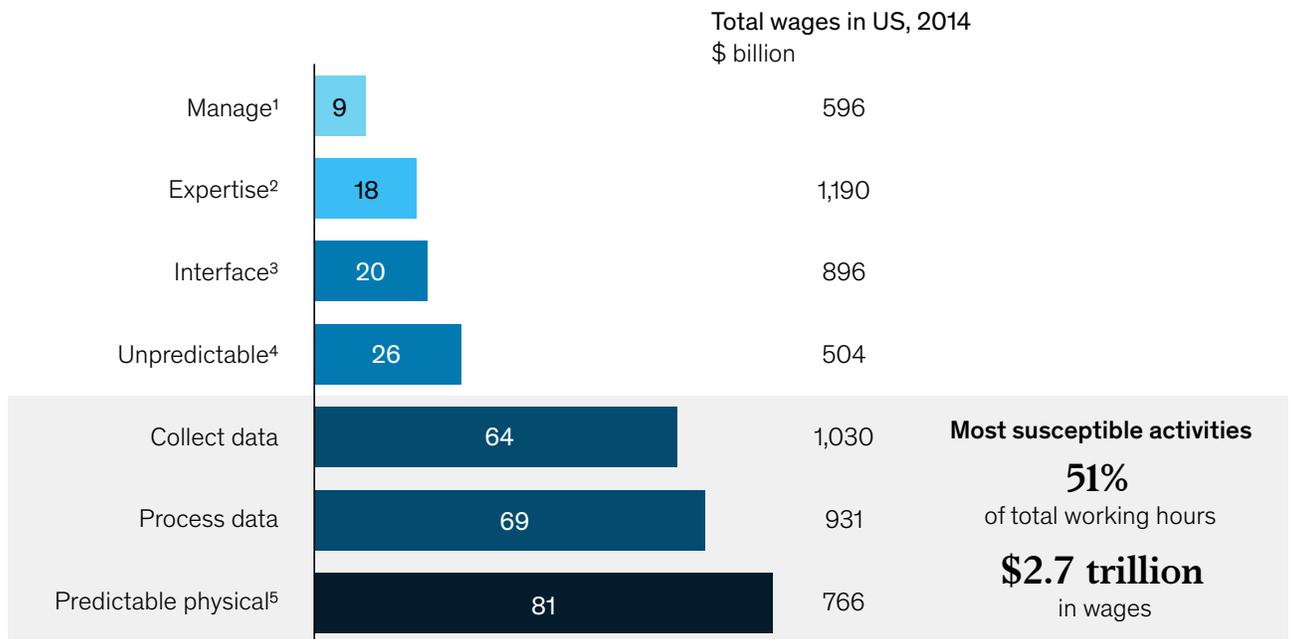
Partly because of task-level differences in automation potential, sectors' automation potential varies widely, ranging from 26 percent in educational services to 60 percent in manufacturing. Healthcare is bifurcated between payers and providers. Payer work, reflected in Exhibit 2 as part of "finance and insurance," is fairly automatable: about 43 percent of tasks show technical automation potential, as activity such as administering claims or enrolling members primarily involves collecting and processing data in a controlled environment.

Exhibit 1

**Three categories of work activities have significantly higher technical automation potential.**

**Time spent on activities that can be automated by adapting currently demonstrated technology**

%



<sup>1</sup>Managing and developing people.

<sup>2</sup>Applying expertise to decision making, planning, and creative tasks.

<sup>3</sup>Interfacing with stakeholders.

<sup>4</sup>Performing physical activities and operating machinery in unpredictable environments.

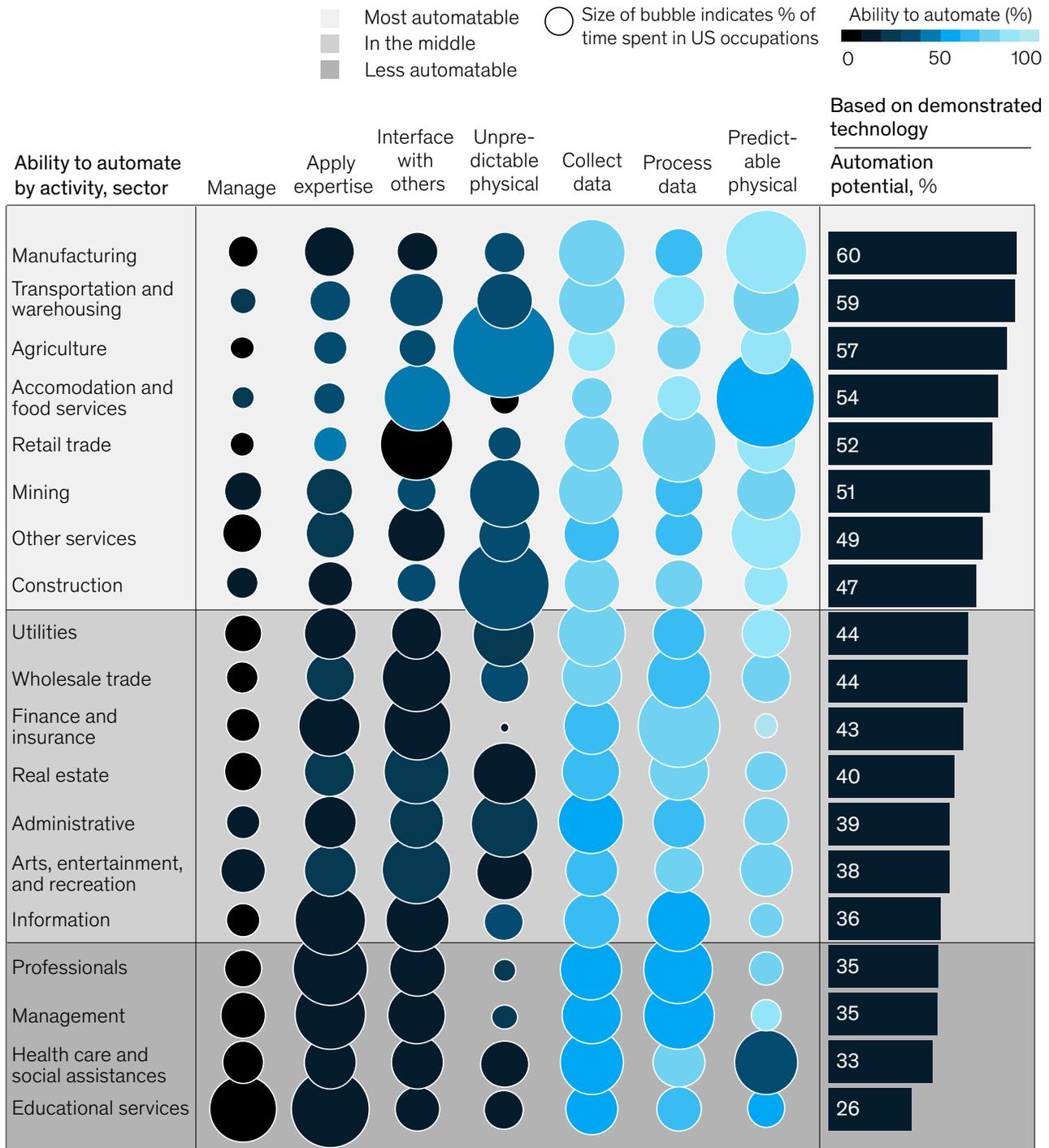
<sup>5</sup>Performing physical activities and operating machinery in predictable environments.

NOTE: Numbers may not sum due to rounding.

Source: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit 2

**The impact of automation will vary by sector and type of work.**



Provider work is somewhat less automatable because its activities occur primarily in a clinical setting, such as patient consultation and surgical procedures. Still, an estimated 33 percent of the tasks in this area are likely to be automatable. The net result is that if automation's full potential were achieved, it could have a significant impact on reducing costs and improving affordability of healthcare.

The healthcare industry is in the middle of a multidecade shift attributable to multiple forces, including technology, national and state regulatory changes, and consumer-centric trends. Automation has the potential to reshape the industry, but many players are only beginning to capitalize on the opportunity. The success of these efforts is dependent on the ability to scale and coordinate automation activities across the enterprise.

### Automation stands to transform payers

Automation represents an estimated \$150 billion opportunity<sup>1</sup> for operational improvement, including reduction in administrative cost, improvement in quality control, and strengthened insights to achieve strategic objectives. Payers appear to have the most to gain from automation programs in healthcare, given the large portion of their work that is based on collecting and processing data.

The importance of automation was frequently cited in a recent survey that our colleagues conducted, which found that 85 percent of the 25 largest US payers ranked automation among the highest administrative cost-reduction levers (Exhibit 3). While 72 percent of respondents agreed that claims processing is the single area where

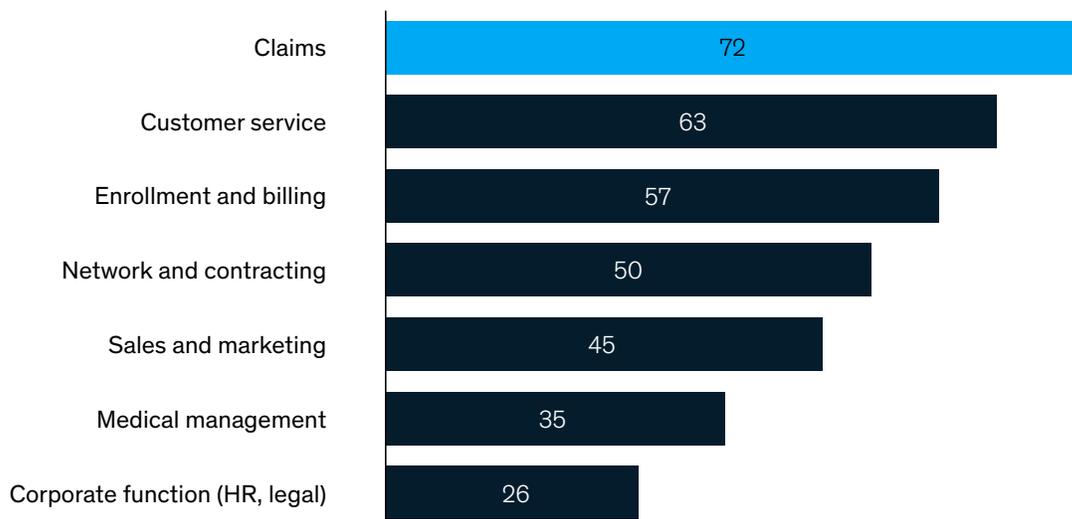
<sup>1</sup>Based on total healthcare spending in the US \$3 trillion, out of which approximately 15 percent is administrative cost, of which 40 percent could be automated.

Exhibit 3

### Automation can yield significant impact for payers—starting with claims.

#### Survey of healthcare payers (n=500), %

Where could automation yield its greatest cost impact for your organization?



automation could create the greatest impact, the survey confirmed that opportunities are available throughout the payer value chain, and across a broad range of automation technologies. Example areas of potential success include improving data quality through auto-validation algorithms, strengthening customer-agent relationships using portals and smart workflows, and simplifying the enrollment and onboarding process using bots.

Moreover, automation can deliver benefits beyond cost savings. Enhanced customer experience and satisfaction, improved data to drive decision-making, and improvements to organizational health can all help support long-term sustainability.

### Three success factors for automation

Our research finds that while most payers have launched automation efforts, many are struggling to build capabilities and generate bottom-line impact. According to a recent survey from our colleagues, each of the largest 25 healthcare payers in the US have started an automation program—but only half are beginning to scale. Pitfalls include lack of implementation expertise, lack of proper governance, and lack of funding. For example, at one healthcare company, a lack of coordination across business units meant that after spending more than \$25 million on automation, the company has seen less than \$5 million in realized annual benefits.

Our experience shows that across industries, successful automation programs do a few things differently:

- **Take a top-down, strategic approach.** While many companies begin by deploying technologies in a bottom-up way, often involving many “proof of concepts” in a thousand-flowers-bloom approach, successful organizations make automation a strategic initiative. That means doing the up-front work to understand the size of the opportunity, thoughtfully evaluating where to invest resources (is the opportunity greater

in enrollment or billing?), and assessing what new capabilities may be required. By creating a roadmap early, successful companies better deploy financial and human capabilities in a systematic way across the enterprise.

- **Focus on people to capture value.** Focusing more on technology itself rather than the people charged with using it can lead to wasted potential, such as when companies undertake only passive reinvestment of the extra capacity automation generates. For example, automating a portion of a person's workload without rethinking the role that person fills can leave that person only partly occupied, reducing the value automation could have produced. Successful companies instead are methodical in assessing which types of work are to be automated, which organizational structures and roles could be redesigned to fill gaps in people's capacity and capture full value, and how to sustain the impact over time. They further strengthen this focus by incorporating it into targets and individual performance evaluations to increase accountability.
- **Design a deployment model to support scale.** Deploying automation technologies using a centralized, “factory” model can be a good way to build early capabilities. However, companies often find that this type of broad and shallow deployment model can sputter after capturing the easy opportunities. Successful organizations create structures capable of deploying multiple technologies in sequence—such as digitizing member forms, orchestrating workflows, and then launching bots and algorithms—across specific domains, whether processes, functions, or locations. Often, this means using cross-functional labs or pods that fundamentally redesign work in an area before moving on to the next part of the business. In effect, many organizations start with a centralized model but shift to a federated model in order to scale.

The healthcare sector, and particularly payers, stands to gain meaningfully from automation technologies. To capture the opportunity, companies will want to be more thoughtful and organized around orchestrating and scaling automation programs. This will require

strengthening buy-in across the organization, creating a scalable deployment model, establishing a repeatable process for converting activity into impact, and finding innovative ways to reskill and redeploy employees.

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# How artificial intelligence can improve resilience in mineral processing during uncertain times

Even before the COVID-19 pandemic, mineral processing companies were grappling with profound uncertainty. Those that took steps to harness the power of AI improved agility and operational resilience.

*by Sean Buckley, Gaurang Jhunjunwala, Agesan Rajagopual, and Christos Sermpetis*

**As COVID-19 continues** to affect millions of lives and livelihoods, it is delivering perhaps the most significant shock to industries—from education to healthcare to food supply—in almost a century.

Mineral processing companies also have to grapple with profound uncertainty and volatility. Before COVID-19, some were already taking steps to build their capabilities to cope with fluctuations inherent in commodities markets. But recent events triggering challenges in workforce availability, supply chains, and demand created a need for higher levels of operational resilience in a short period of time.

Here is where recent advances in artificial intelligence (AI) helped. Typically, processing plants have terabytes of data stored over several years that can be combined with financial and market data to gain unique insight into profitability under different scenarios. Several pioneering operators are starting to harness AI to not only resolve the short-term challenges but also enhance operational resilience as a long-term competitive advantage. The following case studies shed light on the approaches taken by two players in employing these new capabilities.

### **Integrated fertilizer producer: Creating operational agility**

In recent years, frequent changes in market prices have buffeted fertilizer companies, requiring new ore-processing strategies in order to maximize long-term profitability. This integrated player had already started building AI tools and agile-operations capabilities in its processing. When COVID-19 struck, the company expanded these capabilities to weather the crisis.

The first step was using AI to understand correlations between market prices and profitability in different operating models. In particular, it compared the effects of maximizing production (immediate profits) or yield (long-term profits) with the economic life of the mine. It also looked at the effects of maximizing grade of beneficiated ore and the impact of different ore characteristics on downstream costs.

By building AI models to better understand these drivers, the company was able to identify more profitable strategies—and it gleaned some surprising insights.

For instance, maximizing production was not always the most profitable operating model. Mine planning and manpower deployment were the least resilient—and hardest to adapt—amid changes in market dynamics. In addition, beneficiation plant decisions could lead to more than 20 percent variability in downstream processing costs.

With a deep understanding of profit drivers across the company's complex value chain, it realized the intricate correlations among hundreds of variables involved required more than just "operator experience."

Instead, it built an AI tool on many historical data layers, allowing plant leadership, including operators, to understand the financial implications of several operational decisions (exhibit). This helped operators to do the following:

- Pinpoint optimal ore characteristics instead of processing whichever ore the mine was currently producing, leading to dynamic changes in mine plans.
- Change plant parameters to optimize throughput, grade, and yield to maximize profit per hour for the plant.
- Increase agility of sales and operations planning process, bringing operators closer to market realities.

The COVID-19 crisis is only a few months old, so it is too soon to quantify the effects of this data-driven operations approach over a diverse-enough, meaningful interval. However, this player is already more resilient financially and well positioned to make the most out of the recovery phase.

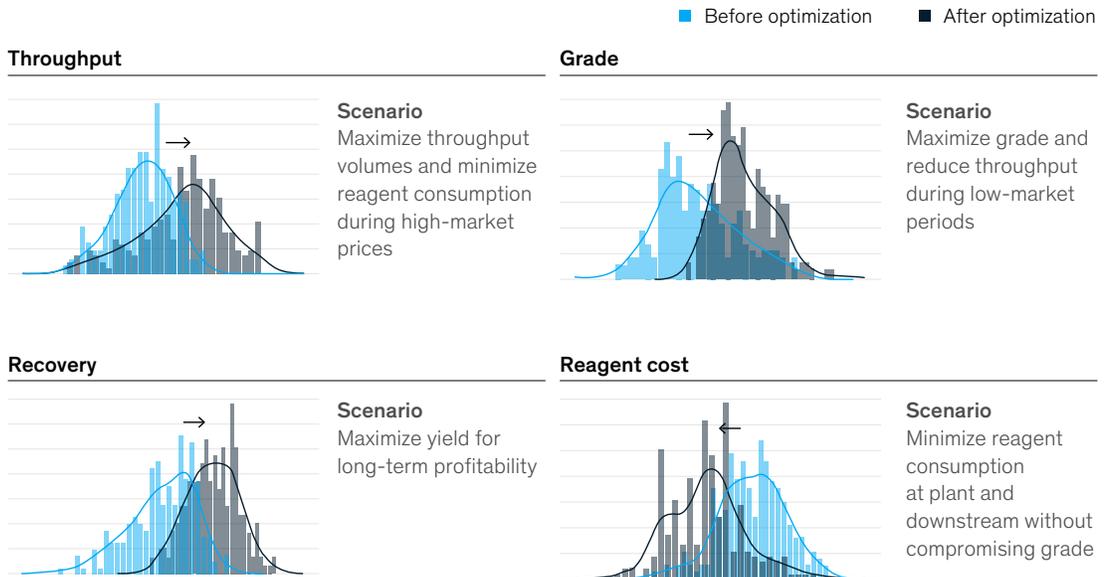
### **Base-metals producer: Pivoting to manage through crisis**

For some companies, the current crisis has offered a chance to test new skills. That was the case for

Exhibit

## Using machine learning to respond to market scenarios helped mitigate the financial trade-offs.

Histograms of output parameter performance in different scenarios using artificial intelligence models



a integrated base-metals producer. The company was already far along in its journey to build agile and AI capabilities when COVID-19 emerged. By using its new capabilities, the company was able to increase production and yield while debunking some long-held operational assumptions. The results helped build greater confidence in AI and agile methods across the business.

The crisis has quickly affected market demand and pricing in end markets for the base-metals producer. It has also affected the company's ability to operate a number of its assets. As a first response, the operator considered a number of traditional crisis-response strategies, including reducing costs, curtailing operations, and revising its mine plan to target more profitable ores.

But it also had several new tools it could use. First, the company began retraining the AI models it had built

from optimizing for metal production to optimizing for yield, cost, or both in this new environment. The company also used AI to complement traditional mine-planning efforts to determine the potential profitability at different levels of production and to supplement scenario planning.

Second, the organization deployed its recently created agile teams in new ways once the crisis hit. Teams had already embraced radical new approaches to problem solving, working through two-week sprints and implementing minimal viable products to test, learn, and improve iteratively rather than laboring on perfect solutions.

Agile teams that were focused on reducing bottlenecks or optimizing production pivoted to support the COVID-19 response. In one instance, a cross-functional agile team focused on how it could dramatically reduce the exposure risk for its haul-

truck operators. The team developed creative ways to change morning huddles to improve the safety of its crews and to support operational goals. Other agile teams have successfully turned their attention to how they can reduce costs.

At the enterprise level, both sites and functions are using blueprinting and objectives and key results<sup>1</sup> to develop plans to respond to their new operating reality. The company had already used blueprinting to align the organization around a clear, simple set of goals when the overall focus was on optimizing production. Now, teams are using the same process to help the company quickly adapt goals to the new environment and build realistic plans for achieving them.

Because of work it had already done, the company was more flexible and responsive to change when the crisis hit. Teams had already learned to trust the data, take risks, and adapt to situations on a real-time basis. Those skills have helped the company learn and adapt to radically changed conditions. The situation continues to evolve for this miner, but the agile value, principles, and processes, and the AI tools it developed over the past year, have enhanced its resilience by helping it respond faster to the crisis.

## Takeaways for mineral processing companies

As companies work to protect their workforce and maintain profitability during and after the COVID-19 crisis, the need to embrace AI and agile methods has only become more acute. Here are key components of the journey to a nimbler and data-driven way of operating:

- Switching from using empirical models to AI in day-to-day management and operations decision making

- Moving from relatively rigid production planning using long-term budgets to short two-week-horizon planning and increased agility across the value chain
- Shifting from single-recipe, plug-and-play tools to multiple value-driven, built-for-purpose methods tailored to specific requirements
- Turning from rigid workforce planning to more agile models, with a multidimensional team focusing on the highest-priority areas

### How to get started

Processing companies that are just beginning digital transformations have an even stronger incentive to move quickly to build their agility and AI muscle because doing so is essential to managing the crisis.

They can begin by setting up a team with new skill sets required for implementation. This team would include data scientists to build the machine-learning tool, data engineers to structure and clean the data, and an agile coach to accelerate agile deployment.

In addition, selected workforce members should be upskilled as product owners to ensure the final product addresses specific needs of the business and as translators to form the bridge between deep operations experts at the plant site and data scientists. In parallel, it is important to access historical data across operational, financial, and other fields, and then clean, structure, and combine the data for analytics.

An AI model can be built with this new team structure—and by adopting agile principles—starting with a prototype and then deploying it at scale and testing for multiple objective functions as required by the business.<sup>2</sup>

Another key step is to invest in change management: being willing to discard long-standing assumptions

<sup>1</sup>For more on agile blueprinting, see Santiago Comella-Dorda, Christopher Handscorn, and Ahmad Zaidi, "Agility to action: Operationalizing an agile blueprint," June 16, 2020, McKinsey.com. Objectives and key results (OKR) is a popular management strategy for goal setting within organizations; the purpose is to connect company, team, and personal goals to measurable results while having all team members and leaders work together in one direction.

<sup>2</sup>For an impact story, see Red Conger, Harry Robinson, and Richard Sellschop, "Inside a mining company's AI transformation," February 5, 2020, McKinsey.com.

and processes and empower teams to take risks—within clear boundaries and in line with modeling insights. This element also includes establishing an agile cadence within operations teams and market analysts to assess market conditions and discuss business implications for using the model. For periods of significant uncertainty, a shorter frequency of assessments will be needed.

Given the advancements in computing power and data availability, AI is already top of mind for executives of leading mineral processing companies. The COVID-19 crisis provides an additional stimulus to accelerate its deployment—building capabilities to harness the power of AI is an imperative in this new economic reality.

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# Selecting infrastructure projects for the next normal

Infrastructure projects can create jobs and spur economic growth—both critical as the world reckons with the fallout from COVID-19. But budgets are tight, so which projects should be prioritized?

*by Aaron Bielenberg, Sarah Brody, Paul Jacobson, and Rebecka Pritchard*

### **Even as governments and business leaders**

manage the immediate health crisis and address citizens' and businesses' urgent financial needs amid the COVID-19 pandemic, they are looking for ways to stimulate economic recovery. Infrastructure is at the core of many leaders' plans. China, the European Union, Japan, and the United States have all announced stimulus programs in which infrastructure investment is a key component.<sup>1</sup> Investing in new infrastructure can create jobs and have a direct, positive impact on economic growth and meet critical healthcare infrastructure needs—which are particularly relevant and acute now. New and upgraded technology-enabled infrastructure can also reduce costs related to congestion and environmental damage, as well as enable the transition to more efficient, safer, and lower-carbon infrastructure solutions.

However, not all infrastructure projects can begin immediately and have an impact on jobs and the economy in the near or medium term. And to deliver services efficiently and equitably, prioritized projects should address the future needs of the population and integrate new design tools and technologies. Furthermore, money for infrastructure projects is tight, and governments face competing priorities for constrained budgets as revenues decline and scarce resources are allocated to immediate health and welfare needs.

It is critical in this moment that governments select the infrastructure projects that can both spur recovery in the near term and make the most of available funds. Specifically, governments might consider focusing on projects that are both shovel ready and shovel worthy and using public–private partnership models to attract private capital for infrastructure. What might success look like? McKinsey analysis suggests that a selection of potential priority projects in the United States alone could generate \$80 billion in investments and create more than two million new jobs.

### **Selecting infrastructure projects to spur economic recovery and attract private capital**

By focusing on spurring the economy and making use of private capital, governments may find a few project archetypes to be most attractive.

#### **Spurring economic recovery**

Many infrastructure-stimulus programs focus on projects that may take years before their impact is felt. However, for infrastructure to spur economic recovery, construction needs to begin immediately. That means selecting infrastructure projects that are both shovel ready and shovel worthy. Road projects with existing plans or administrative projects that don't require lengthy approvals would be considered shovel ready. The shovel-worthy requirement asks whether a proposal fulfills urgent economic and social needs and favors projects that generate a large number of construction jobs, for example, or provide long-term connectivity to vulnerable populations.

Prioritizing in this way can lead to a set of projects that generally fall within one of four categories:

- **Projects that are already part of near-term capital plans, for example, those led by a department of transportation, a city buildings department, a parks department, or a water utility.** These are projects for which the need has been established and the planning completed; therefore, construction can be accelerated. A program to upgrade and expand capacity on local bridges and roads that have longstanding congestion issues and well-defined solutions is one example.
- **Projects that provide “smart” upgrades to existing assets.** These are projects where integrating new technology and design vastly improves the way the infrastructure operates and reduces costs and environmental impact. Examples could include installing energy-efficient and low-cost LED lighting,

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<sup>1</sup> Policy responses to COVID-19, International Monetary Fund, January 8, 2021, [imf.org](https://www.imf.org); *Invesco Blog*, “Nations pledge trillions in fiscal stimulus to boost their economies,” blog entry by Kristina Hooper, June 1, 2020, [blog.invesco.us.com](https://www.invesco.us.com).

or redesigning an urban curbside and parking system to enable deliveries, rideshares, and pedestrian and bicycle use.

- **Projects that are modular, replicable, and distributed in nature.** These projects are most effective when they can be delivered quickly and efficiently as part of a large, at-scale program to spur economic development. The model hinges on design having been completed and on limited need for site-specific design. An energy-retrofit program applying proven, replicable energy-efficiency technologies to hundreds of buildings could meet the requirements, while reducing energy consumption and cost for thousands of people.
- **Projects that meet immediate health and safety needs.** The COVID-19 pandemic has highlighted the significant gaps in our healthcare infrastructure, from too few ICU beds and vaccination sites to deficiencies in the cold-storage supply chain. While building and expanding hospitals, particularly in rural and underserved communities, can be a medium-term infrastructure objective, many of the immediate needs can fortunately be met through rapid conversions and modular construction. Converting stadiums and gymnasiums to sterile vaccination centers and increasing cold-storage supply-chain units and vehicles can happen quickly, and such projects offer many of the positive job- and economic-growth benefits of core infrastructure while also addressing today's most urgent needs.

#### **Attracting private capital**

Given limited budgets and stimulus funding, governments may consider prioritizing some infrastructure projects that can be delivered in a way to attract private capital. In 2020, the top ten investing firms, globally, raised—but did not deploy—\$84 billion in infrastructure capital.<sup>2</sup> Much of this is earmarked for long-term infrastructure projects, with investors still looking for both

brownfield and greenfield infrastructure investment despite coronavirus-related impacts to traffic. Governments therefore may choose to encourage the deployment of private and stimulus capital in helping fill urgent infrastructure needs.

Governments can use concessions and create new operational and maintenance structures to transfer the operation and management of some infrastructure to the private sector—as well as the obligation to pay for improvements. Private-sector involvement can also allow governments to launch more infrastructure work sooner, and for less money up front, by bundling infrastructure upgrade projects (such as for bridges, local roads, and culverts) into large construction programs for private companies to complete. And availability-payment structures can spread payments over a period of 15 to 20 years, in contrast to traditional arrangements where all payments come due during construction. Transferring risk to the private sector can create benefits when done through clear and efficient procurements that articulate the infrastructure-service and social benefits and commit the partner to delivering in a way that is aligned with equity and sustainability considerations.

#### **Five project archetypes**

Five project archetypes meet all of these criteria—projects that are shovel ready, shovel worthy, and can attract private capital. This is, by no means, an exhaustive list—but rather, these are examples of the types of projects that may warrant government and investor consideration (Exhibit 1).

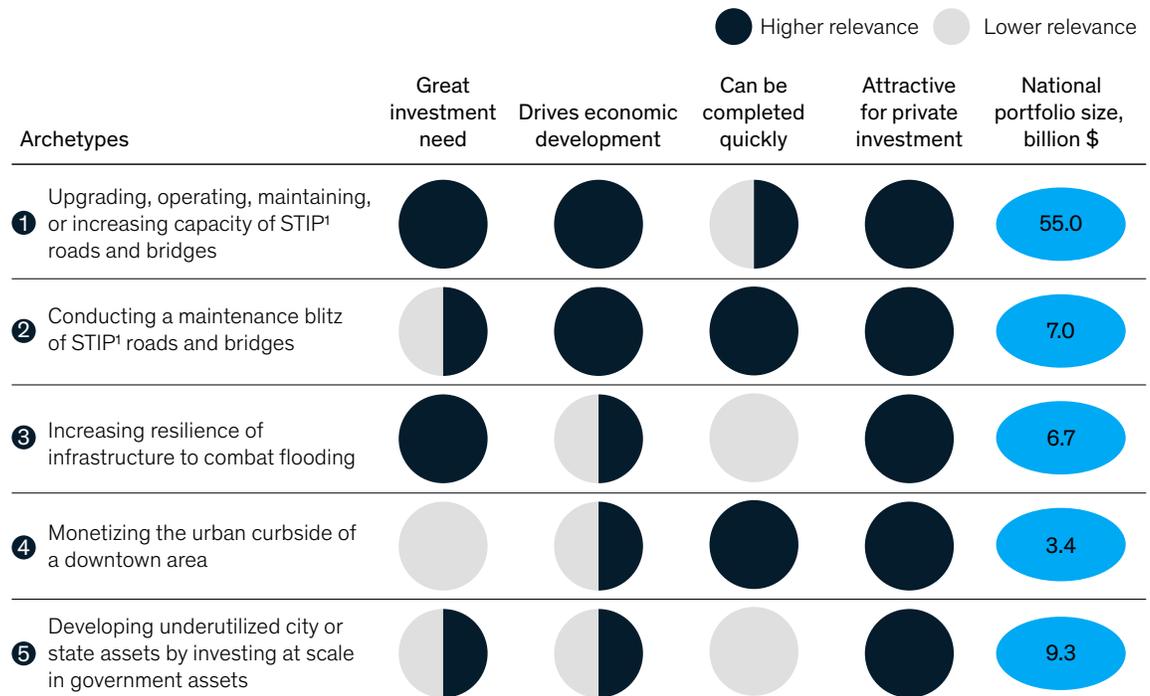
- **Upgrading, operating, maintaining, or increasing capacity of State Transportation Improvement Program (STIP) roads and bridges.** To address congestion and boost traffic on a specific road, for example, governments can establish a concession

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<sup>2</sup> Data is from paid data source Preqin, preqin.com.

Exhibit 1

**These five project archetypes meet public needs, can quickly drive economic development, and could attract private investment, to varying degrees.**



<sup>1</sup>Statewide Transportation Improvement Program.

Note: These figures are based on specific projects that are available in prioritized states and extrapolated based on miles of roads, GDP or population growth, state of environmental infrastructure across cities, and other factors.

Source: Emsi, Q2 2020 Data set for United States

contract where a private firm adds a managed lane and smart technology to that road. STIP upgrades are planned, priority projects and are likely to be completed more quickly than new ones.

- **Conducting a maintenance blitz of STIP roads and bridges.** Maintenance projects often have systems in place that can allow for quick turnarounds. Many state governments also prioritize maintenance projects, which can quickly provide economic stimulus.
- **Increasing resilience of infrastructure to combat flooding.** The implementation of replicable green infrastructure can address flood management and wastewater issues. This could include, for example, a citywide program to install landscaping and culvert solutions and convert flood plains to public parks to manage

runoff. Resiliency efforts are a necessary upgrade that can keep environmental disasters from compounding economic ones.

- **Monetizing the urban curbside of a downtown area.** Privatizing parking and creating commercial and rideshare zones can provide significant value to governments and citizens by reducing congestion and facilitating new uses of urban roads.
- **Developing underutilized city or state assets by investing at scale in government assets.** Governments might consider developing vacant land into affordable housing as part of a transit-oriented project. This archetype creates and maintains a source of governmental revenue from something that would otherwise be vacant.

If applied across the United States, these five nonexhaustive archetypes could generate \$80 billion in investment and create up to two million jobs. In turn, the investment in these projects could create \$70 billion to \$215 billion in GDP impact in the United States (Exhibit 2).

While each government will have a specific set of infrastructure project priorities, this framework can be applied anywhere in the world. The opportunity for investment and the jobs created can be

sized specifically to that country, city, or regional jurisdiction.

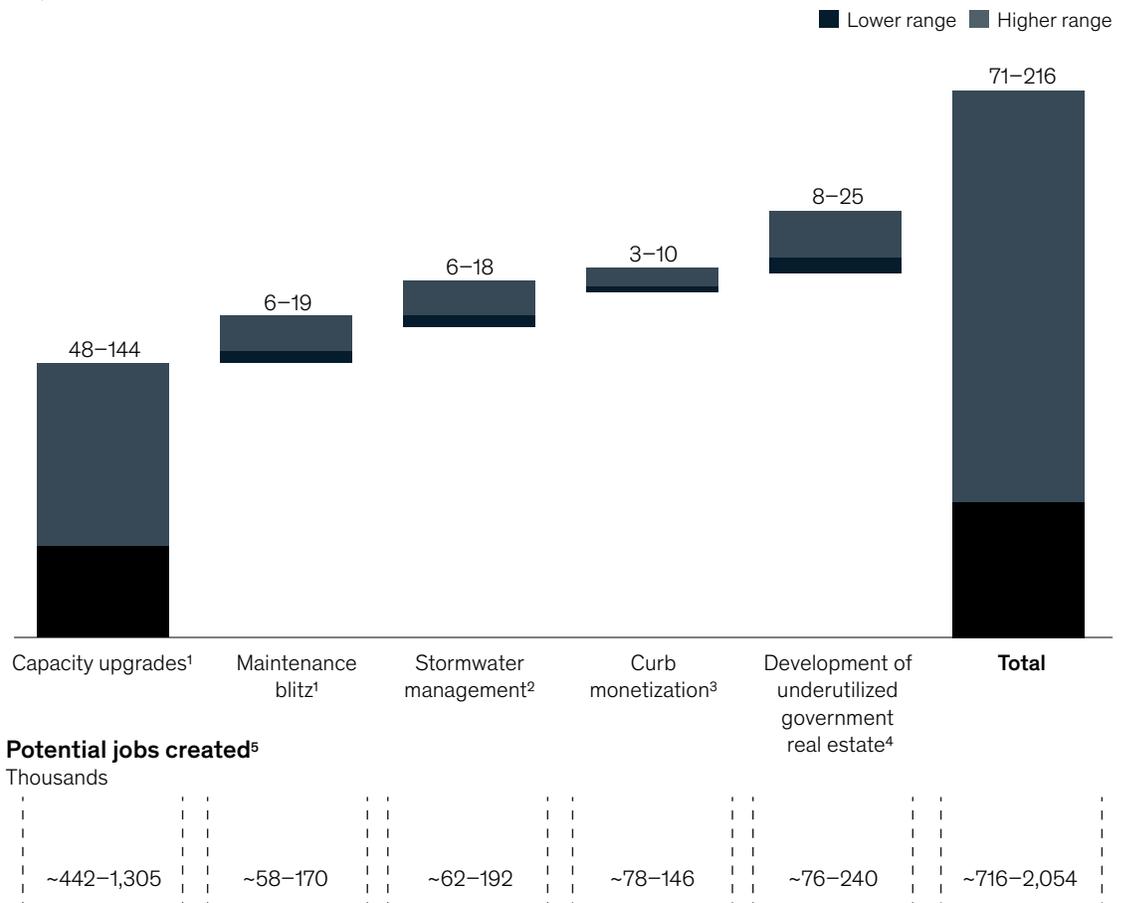
### Making it happen

In addition to building a portfolio of shovel-ready and shovel-worthy projects and considering new funding and partnership models, governments could consider accelerating procurement (to create jobs in the near term) and launching programs at scale (to take advantage of efficiencies in procurement

Exhibit 2

## The five archetypes could potentially bring significant near-term economic benefits and deliver up to approximately two million jobs nationwide.

**Additional GDP stimulus by 2040 if ~\$80 billion is invested in prioritized archetypes**  
Billion, \$



<sup>1</sup> Based on highway, street, and bridge construction industry.

<sup>2</sup> Based on water and sewer line and related structures construction industry.

<sup>3</sup> Based on parking lots and garages industry.

<sup>4</sup> Based on commercial and institutional building industry.

<sup>5</sup> Range based on difference between including induced value and jobs which are the result of spending from wages of workers.

Source: Emsi Q2 2020 data set for United States

and delivery). They can also integrate technology at every stage of the process to ensure both the infrastructure design and the process for implementation are as efficient and future-proofed as possible.

To contribute to economic recovery, infrastructure investors have actions to consider beyond working to develop innovative engagement and funding models. For example, they will need to identify which investable opportunities support economic development and address public-sector needs. They can take risks on early-stage development by investing in design and feasibility studies for projects that support economic recovery and develop unsolicited proposals even before a

request, knowing that their limited investment may ultimately be a public good. And they can engage with public-sector entities to build support for the project and establish the value private investment could bring—and build coalitions with technology providers, labor unions, communities, and citizens in a constructive way.

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Governments across the globe face the threat of a deep recession. Infrastructure investments won't be enough on their own, but they can go a long way to creating jobs and contributing to GDP—if approached thoughtfully.

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# Supply-chain recovery in coronavirus times—plan for now and the future

Actions taken now to mitigate impacts on supply chains from coronavirus can also build resilience against future shocks.

*by Knut Aliche, Xavier Azcue, and Edward Barriball*

**Even as the immediate toll on human health** from the spread of coronavirus (SARS-CoV-2), which causes the COVID-19 disease, mounts, the economic effects of the crisis—and the livelihoods at stake—are coming into sharp focus. Businesses must respond on multiple fronts at once: at the same time that they work to protect their workers' safety, they must also safeguard their operational viability, now increasingly under strain from a historic supply-chain shock.

Many businesses are able to mobilize rapidly and set up crisis-management mechanisms, ideally in the form of a nerve center. The typical focus is naturally short term. How can supply-chain leaders also prepare for the medium and long terms—and build the resilience that will see them through the other side?

## What to do today

In the current landscape, we see that a complete short-term response means tackling six sets of issues that require quick action across the end-to-end supply chain (Exhibit 1). These actions should be taken in parallel with steps to support the workforce and comply with the latest policy requirements:

1. *Create transparency* on multitier supply chains, establishing a list of critical components, determining the origin of supply, and identifying alternative sources.
2. *Estimate available inventory* along the value chain—including spare parts and after-sales stock—for use as a bridge to keep production running and enable delivery to customers.

Exhibit 1

## There are multiple immediate, end-to-end supply-chain actions to consider in response to COVID-19.

### Supply-chain actions

#### Create transparency on multitier supply chain

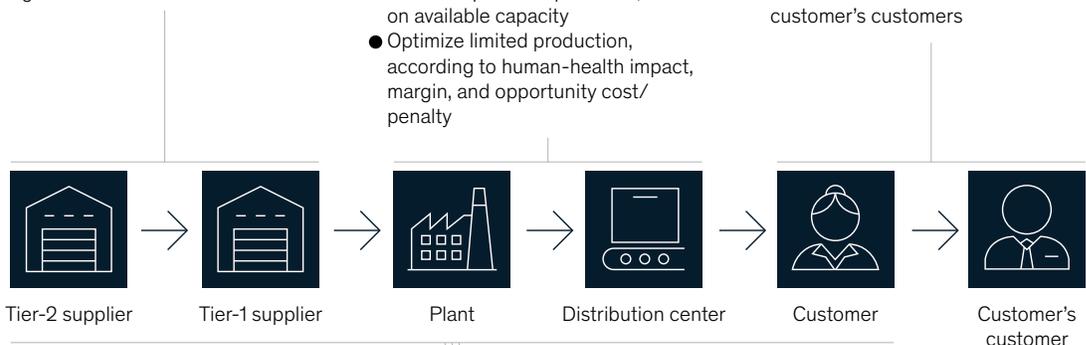
- Determine critical components and determine origin of supply
- Assess interruption risk and identify likely tier-2 and onward risk
- Look to alternative sources if suppliers are in severely affected regions

#### Optimize production and distribution capacity

- Assess impact on operations and available resource capacity (mainly workforce)
- Ensure employee safety and clearly communicate with employees
- Conduct scenario planning and assess impact on operations, based on available capacity
- Optimize limited production, according to human-health impact, margin, and opportunity cost/penalty

#### Assess realistic final-customer demand

- Work with sales and operations planning to get demand signal to determine required supply
- Leverage direct-to-consumer channels of communication
- Use market insights/external databases to estimate for customer's customers



#### Estimate available inventory

- Estimate inventory along the value chain, including spare parts/remanufactured stock
- Use after-sales stock as bridge to keep production running

#### Identify and secure logistics capacity

- Estimate available logistics capacity
- Accelerate customs clearance
- Change mode of transport and prebook air/rail capacity, given current exposure
- Collaborate with all parties to leverage freight capacity jointly

#### Manage cash and net working capital

- Run supply-chain stress tests vs major suppliers' balance sheets to understand when supply issues will start to stress financial or liquidity issues

3. *Assess realistic final-customer demand* and respond to (or, where possible, contain) shortage-buying behavior of customers.
4. *Optimize production and distribution capacity* to ensure employee safety, such as by supplying personal protective equipment (PPE) and engaging with communication teams to share infection-risk levels and work-from-home options. These steps will enable leaders to understand current and projected capacity levels in both workforce and materials.
5. *Identify and secure logistics capacity*, estimating capacity and accelerating, where possible, and being flexible on transportation mode, when required.
6. *Manage cash and net working capital* by running stress tests to understand where supply-chain issues will start to cause a financial impact.

In the following sections, we explore each of these six sets of issues.

### **Create transparency**

Creating a transparent view of a multitier supply chain begins with determining the critical components for your operations. Working with operations and production teams to review your bills of materials (BOMs) and catalog components will identify the ones that are sourced from high-risk areas and lack ready substitutes. A risk index for each BOM commodity, based on uniqueness and location of suppliers, will help identify those parts at highest risk.

Once the critical components have been identified, companies can then assess the risk of interruption from tier-two and onward suppliers. This stage of planning should include asking direct questions of tier-one organizations about who and where their suppliers are and creating information-sharing agreements to determine any disruption being faced in tier-two and beyond organizations. Manufacturers should engage with all of their suppliers, across all tiers, to form a series of joint agreements to monitor

lead times and inventory levels as an early-warning system for interruption and establish a recovery plan for critical suppliers by commodity.

In situations in which tier-one suppliers do not have visibility into their own supply chains or are not forthcoming with data on them, companies can form a hypothesis on this risk by triangulating from a range of information sources, including facility exposure by industry and parts category, shipment impacts, and export levels across countries and regions. Business-data providers have databases that can be purchased and used to perform this triangulation. Advanced-analytics approaches and network mapping can be used to cull useful information from these databases rapidly and highlight the most critical lower-tier suppliers.

Combining these hypotheses with the knowledge of where components are traditionally sourced will create a supplier-risk assessment, which can shape discussions with tier-one suppliers. This can be supplemented with the described outside-in analysis, using various data sources, to identify possible tier-two and onward suppliers in affected regions.

For risks that could stop or significantly slow production lines—or significantly increase cost of operations—businesses can identify alternative suppliers, where possible, in terms of qualifications outside severely affected regions. Companies will need to recognize that differences in local policy (for example, changing travel restrictions and government guidance on distancing requirements) can have a major impact on the need for (and availability of) other options. If alternative suppliers are unavailable, businesses can work closely with affected tier-one organizations to address the risk collaboratively. Understanding the specific exposure across the multitier supply chain should allow for a faster restart after the crisis.

### **Estimate available inventory**

Most businesses would be surprised by how much inventory sits in their value chains and should estimate how much of it, including spare parts and

remanufactured stock, is available. Additionally, after-sales stock should be used as a bridge to keep production running (Exhibit 2).

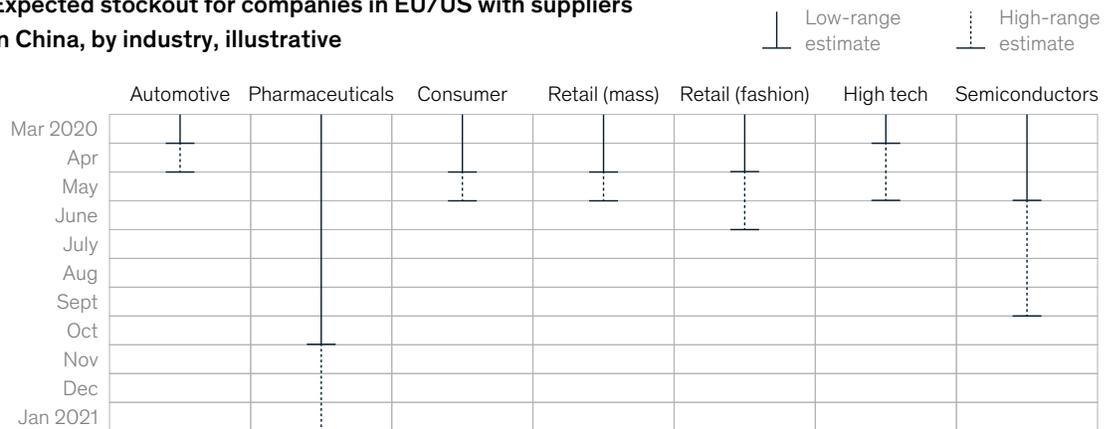
This exercise should be completed during the supply-chain-transparency exercise previously described. Estimating all inventory along the value chain aids capacity planning during a ramp-up period. Specific categories to consider include the following:

- *finished goods* held in warehouses and *blocked inventory* held for sales, quality control, and testing
- *spare-parts inventory* that could be repurposed for new-product production, bearing in mind the trade-off of reducing existing customer support versus maintaining new-product sales
- *parts with lower-grade ratings or quality issues*, which should be assessed to determine whether

Exhibit 2

## Built-in inventory in the supply chain will delay the full impact of halted production.

### Expected stockout for companies in EU/US with suppliers in China, by industry, illustrative



### Inventory, days of stock (including supply in transit)

	Automotive	Pharmaceuticals	Consumer	Retail (mass)	Retail (fashion)	High tech	Semiconductors
2nd-tier supplier	30–40 (China)	35–70 (China)	20–30 (China)	N/A	N/A	40–60 (China)	N/A
1st-tier supplier	7–17 (EU/US)	120–140 (EU/US)	60–90 (China)	60–90 (China)	15–35 (China)	55–70 (China)	70–110 (China)
Assembly/packaging	2–12 (EU/US)	55–100 (EU/US)	10–17 (EU/US)	10–17 (EU/US)	15–29 (EU/US)	19–45 (China)	60–90 (Philippines)
RDCs <sup>1</sup>	N/A	80–90 (EU/US)	14 (EU/US)	15–17 (EU/US)	15–23 (EU/US)	N/A	N/A
Market buffer	0–30 (EU/US)	N/A	N/A	7 (EU/US)	21–28 (EU/US)	24–40 (EU/US)	20–30
Total inventory days <sup>2</sup>	40–70	230–320	60–90	70–100	70–110	40–100	130–200

<sup>1</sup>Regional distribution centers.

<sup>2</sup>Figures for total inventory buffer and expected stockout are calculated assuming production stop at latest link based in China.

the rework effort would be justified to solve quality issues or whether remanufacture with used stock could address supply issues

- *parts in transit* should be evaluated to see what steps can be taken to accelerate their arrival—particularly those in customs or quarantine
- *supply currently with customers or dealers* should be considered to see if stock could be bought back or transparency could be created for cross-delivery

### **Assess realistic final-customer demand**

A crisis may increase or decrease demand for particular products, making the estimation of realistic final-customer demand harder and more important. Businesses should question whether demand signals they are receiving from their immediate customers, both short and medium term, are realistic and reflect underlying uncertainties in the forecast. The demand-planning team, using its industry experience and available analytical tools, should be able to find a reliable demand signal to determine necessary supply—the result of which should be discussed and agreed upon in the integrated sales- and operations-planning (S&OP) process.

Additionally, direct-to-consumer communication channels, market insights, and internal and external databases can provide invaluable information in assessing the current state of demand among your customers' customers. When data sources are limited, open communication with direct customers can fill in at least some gaps. With these factors in mind, forecasting demand requires a strict process to navigate uncertain and ever-evolving conditions successfully. To prepare for such instances effectively, organizations should take the following actions:

- Develop a demand-forecast strategy, which includes defining the granularity and time horizon for the forecast to make risk-informed decisions in the S&OP process.

- Use advanced statistical forecasting tools to generate a realistic forecast for base demand.
- Integrate market intelligence into product-specific demand-forecasting models.
- Ensure dynamic monitoring of forecasts in order to react quickly to inaccuracies.

With many end customers engaging in shortage buying to ensure that they can claim a higher fraction of whatever is in short supply, businesses can reasonably question whether the demand signals they are receiving from their immediate customers, both short and medium term, are realistic and reflect underlying uncertainties in the forecast. Making orders smaller and more frequent and adding flexibility to contract terms can improve outcomes both for suppliers and their customers by smoothing the peaks and valleys that raise cost and waste. A triaging process that prioritizes customers by strategic importance, margin, and revenue will also help in safeguarding the continuity of commercial relationships.

### **Optimize production and distribution capacity**

Armed with a demand forecast, the S&OP process should next optimize production and distribution capacity. Scenario analysis can be used to test different capacity and production scenarios to understand their financial and operational implications.

Optimizing production begins with ensuring employee safety. This includes sourcing and engaging with crisis-communication teams to communicate clearly with employees about infection-risk concerns and options for remote and home working.

The next step is to conduct scenario planning to project the financial and operational implications of a prolonged shutdown, assessing impact based on available capacity (including inventory already in the system). To plan on how to use available

capacity, the S&OP process should determine which products offer the highest strategic value, considering the importance to health and human safety and the earnings potential, both today and during the future recovery. The analysis will draw on a cross-functional team that includes marketing and sales, operations, and strategy staff, including individuals who can tailor updated macroeconomic forecasts to the expected impact on the business. Where possible, a digital, end-to-end S&OP platform can better match production and supply-chain planning with the expected demand in a variety of circumstances.

### **Identify and secure logistics capacity**

In a time of crisis, understanding current and future logistics capacity by mode—and their associated trade-offs—will be even more essential than usual, as will prioritizing logistics needs in required capacity and time sensitivity of product delivery. Consequently, even as companies look to ramp up production and make up time in their value chains, they should prebook logistics capacity to minimize exposure to potential cost increases. Collaborating with partners can be an effective strategy to gain priority and increase capacity on more favorable terms.

To improve contingency planning under rapidly evolving circumstances, real-time visibility will depend not only on tracking the on-time status of freight in transit but also on monitoring broader changes, such as airport congestion and border closings. Maintaining a nimble approach to logistics management will be imperative in rapidly adapting to any situational or environmental changes.

### **Manage cash and net working capital**

As the crisis takes its course, constrained supply chains, slow sales, and reduced margins will combine to add even more pressure on earnings and liquidity. Businesses have a habit of projecting optimism; now they will need a strong dose of realism so that they can free up cash. Companies will need all available internal forecasting capabilities to stress test their capital requirements on weekly and monthly bases.

As the finance function works on accounts payable and receivable, supply-chain leaders can focus on freeing up cash locked in other parts of the value chain. Reducing finished-goods inventory, with thoughtful, ambitious targets supported by strong governance, can contribute substantial savings. Likewise, improved logistics, such as through smarter fleet management, can allow companies to defer significant capital costs at no impact on customer service. Pressure testing each supplier's purchase order and minimizing or eliminating purchases of nonessential supplies can yield immediate cash infusions. Supply-chain leaders should analyze the root causes of suppliers' nonessential purchases, mitigating them through adherence to consumption-based stock and manufacturing models and through negotiations of supplier contracts to seek more favorable terms.

### **Building resilience for the future**

Once the immediate risks to a supply chain have been identified, leaders must then design a resilient supply chain for the future. This begins with establishing a supply-chain-risk function tasked with assessing risk, continually updating risk-impact estimates and remediation strategies, and overseeing risk governance. Processes and tools created during the crisis-management period should be codified into formal documentation, and the nerve center should become a permanent fixture to monitor supply-chain vulnerabilities continuously and reliably. Over time, stronger supplier collaboration can likewise reinforce an entire supplier ecosystem for greater resilience.

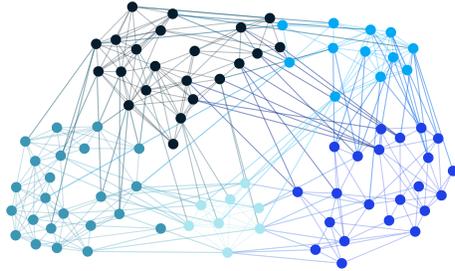
During this process, digitizing supply-chain management improves the speed, accuracy, and flexibility of supply-risk management. By building and reinforcing a single source of truth, a digitized supply chain strengthens capabilities in anticipating risk, achieving greater visibility and coordination across the supply chain, and managing issues that arise from growing product complexity. For example, Exhibit 3 shows how a digitally enabled clustering of potential suppliers shows the capabilities they have in common.

Exhibit 3

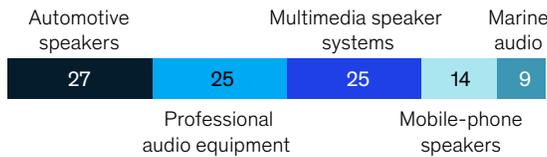
### Cluster maps reveal alternative sourcing options for all the materials affected.

#### Cluster map, durable speaker suppliers, illustrative (n = 87 suppliers)

● Company — Common capabilities



#### Cluster characteristics, %



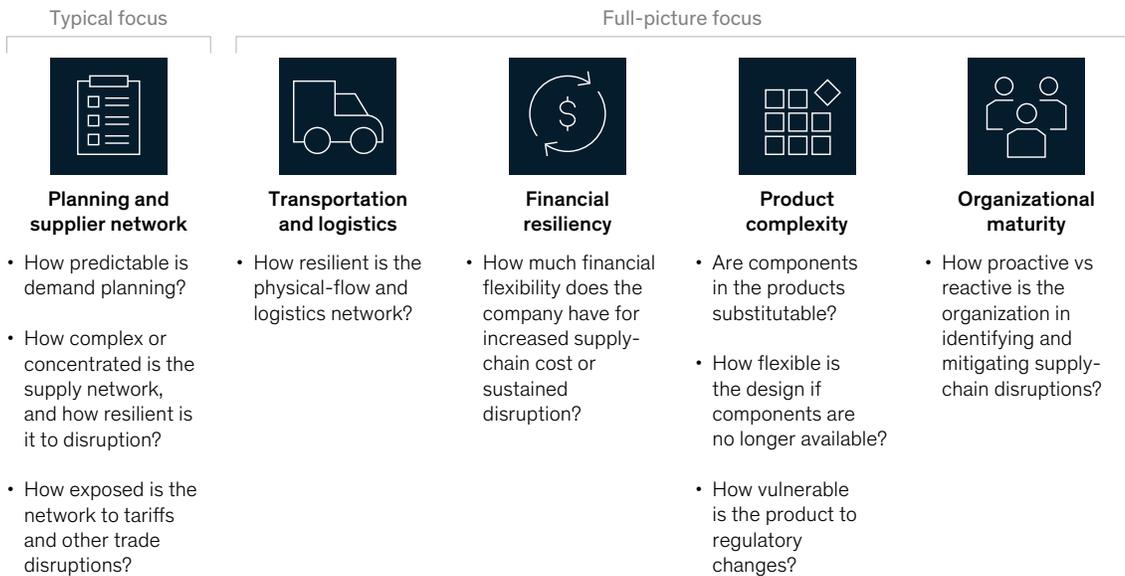
Estimating a medtech company's degree of connectiveness helped it expand its supplier base by 600 percent, while an industrial-tools maker identified request-for-qualifications-ready suppliers for highly complex parts that it had been previously unable to source.

Finally, when coming out of the crisis, companies and governments should take a complete look at their supply-chain vulnerabilities and the shocks that could expose them much as the coronavirus has. Exhibit 4 describes the major sources of vulnerability. The detailed responses can reveal major opportunities—for example, using scenario analyses to review the structural resilience of critical logistics nodes, routes, and transportation modes can reveal weakness even when individual components, such as important airports or rail hubs, may appear resilient.

Exhibit 4

### Supply-chain vulnerability occurs across five dimensions.

#### Drivers of potential vulnerability



Organizations should build financial models that size the impact of various shock scenarios and decide how much “insurance” to buy through the mitigation of specific gaps, such as by establishing dual supply sources or relocating production. The analytical underpinnings of this risk analysis are well understood in other domains, such as the financial sector—now is the time to apply them to supply chains.

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Triaging the human issues facing companies and governments today and addressing them must be the number-one priority, especially for goods that are critical to maintain health and safety during the crisis. As the coronavirus pandemic subsides, the tasks will center on improving and strengthening supply-chain capabilities to prepare for the inevitable next shock. By acting intentionally today and over the next several months, companies and governments can emerge from this crisis better prepared for the next one.

**Knut Alicke** is a partner in McKinsey's Stuttgart office, **Xavier Azcue** is a consultant in the New Jersey office, and **Edward Barribal** is a partner in the Washington, DC office.

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© Isabel Pavia/Getty Images

# Elevating customer experience excellence in the next normal

Companies that make the right investments now could build an enduring advantage in serving customers. Three priorities will be key.

*This article was written collaboratively by the global leaders of the McKinsey Customer Experience Practice, a group that spans different regions and includes: Constance Emmanuelli, Nimish Jain, Nicolas Maechler, David Malfara, Stefan Moritz, Kevin Neher, Adrian Nelson, and Anna Thomas.*

**The impact of COVID-19** on customer behavior has been sweeping and immediate. Spending across most industries is down, purchases have shifted from in-person to digital channels, and public safety has become a top priority for companies and consumers alike. Executives who had carefully crafted omnichannel strategies to create unique, compelling customer experiences have had to throw out their playbooks and improvise to keep pace.

As companies prepare for the long haul—what we refer to as the “next normal”—the path forward is anything but clear. The situation continues to change by the week and can vary dramatically by region. Among the most vexing challenges is determining which customer behaviors and trends are here to stay and which ones will eventually recede. Companies that invest in the wrong capabilities could find themselves on the outside as competitors that can offer exemplary customer experiences cement their advantage.

To win in the next normal, companies need to identify the current behaviors that will define customer experience in the near term. They must then ensure that these opportunities are aligned with their business strategies and capabilities. We believe three priorities will define customer experience in the postpandemic era: digital excellence, safe and contactless engagement, and dynamic customer insights. Each organization will pursue these priorities differently based on its industry and starting point as well as competitive landscape. Many companies are already demonstrating their understanding of what matters to customers as well as innovative ways to meet their old and new expectations. These early movers offer a valuable point of reference for how to proceed.

### **Emerging trends in consumer behavior**

Customers are significantly scaling back their spending across nearly all categories, anticipating tougher times ahead. This trend is likely to continue. As the crisis peaked across Western economies, more than one-third of Europeans and Americans said their income has been negatively affected by

COVID-19. In fact, one-half reported reducing their spending in the past two weeks, and 40 percent of Americans and 44 percent of Europeans expected to continue spending less in the next two weeks. Overall spending is expected to decrease by 50 percent across all consumer categories, but certain shelter-in-place necessities will rise: groceries (up 14 percent), entertainment (up 13 percent), and household supplies (up 3 percent).<sup>1</sup>

China, which is several weeks ahead of other countries in the COVID-19 crisis, has yet to see consumer spending return to normal. McKinsey research found discretionary spending has fallen 30 to 60 percent, and retail transactions have dropped by 20 to 50 percent. These movements are accompanied by diminished foot traffic in retail outlets and an increased reliance on convenience-focused digital channels.

### **Increased traffic in online channels**

While financial flexibility may be increasingly limited, many customers now face a surplus of time. Shelter-in-place requirements have stimulated record-high engagement for online and digital platforms, and customers are quickly replacing or complementing physical and in-person activities with digital equivalents. Customers are spending significantly more time online: nearly half of consumers have started or increased online streaming since the onset of the pandemic. At the same time, demand for data and bandwidth have spiked; in fact, a recent review of web analytics reveals a fourfold increase in Google searches for “data plan upgrade.”

Around the world, companies have moved quickly to accommodate the massive shift to digital channels. Every possible activity—from meals and groceries, to finance and education, to fitness—now has a digital or online equivalent, many of which have seen soaring usership. Nearly all organizations, whether traditional companies or start-ups, are reorienting their business models to be more digital. It's highly likely that consumers will prefer to use many of these digital offerings after the crisis. For example, China's market anticipates that online penetration will see a permanent bump of three to six percentage points due to embedded COVID-19 behaviors.

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<sup>1</sup> McKinsey COVID-19 US Consumer Pulse Survey, April 2020.

### **A greater emphasis on health and safety**

The pandemic's massive health implications and associated public-health policies have normalized physical distancing and the need for constant sanitation. Indeed, McKinsey research shows that most of customers' main concerns about COVID-19 are related to health and safety,<sup>1</sup> so companies must keep these issues front of mind as they plan their transitions to the next normal.

Such concerns have led customers to rapidly change how they want to engage with the world, with safe and contactless operations a top priority. In immediate response to the pandemic, some companies instituted policies to safeguard customers. Grocery stores have designated certain hours for elderly shoppers. Urgent-care clinics have established drive-through service to allow passengers to get fast, safe COVID-19 testing without physically entering a health facility. In many cities, customers can now have their cars repaired via a mobile service or car pick-up. Companies that have made these adjustments have clearly demonstrated their understanding of what matters to customers and their willingness to adapt. Consumers who get accustomed to this new contactless world may not be inclined to return to high-touch commerce and crowded stores—even when health officials deem it safe.

### **Behaviors that are here to stay**

The shifting customer behaviors brought on by COVID-19 reflect the acceleration of anticipated trends, the emergence of new preferences, and a complete reversal of some long-held routines. Together, this mix will continue to evolve and form the foundation of the next normal. The good news is that companies have the potential to not only guide future customer behavior through “nudging”—proactively encouraging behaviors that are likely to endure after the pandemic—but also position themselves at the vanguard of shaping customer experience in the next normal.

The most successful companies to date have been adept at understanding which behaviors and experiences are picking up steam and making targeted investments to address them. This approach is easier said than done: companies must

simultaneously monitor consumer trends, adapt their business models, plan for business continuity, and ensure their employees are safe and healthy—all while managing the chaos and ambiguity of the crisis. In this environment, executives must have the skills to prioritize what is most important and avoid the temptation to simply chase the latest news or become distracted by shiny objects. The wave of products and apps to meet coronavirus-specific demand may soon oversaturate the market, and we are likely to see standout offerings rise to the top while others fail to capture significant traffic.

To get a better understanding of the next normal's contours, our analysis evaluated consumer trends along two criteria: user growth since the pandemic hit and the likelihood that these behaviors will continue (exhibit). With these lenses, we segmented activities into four quadrants:

- *Return to old normal*—mature or less-relevant experiences that may not sustain COVID-19 growth spurts
- *Exciting . . . for now*—stopgap solutions with the potential for user erosion after the pandemic
- *Potential to stick*—new experiences with momentum and the potential to be cemented in the next normal
- *Fast accelerators*—high-performing replacements for traditional in-person experiences that will likely persist in the next normal

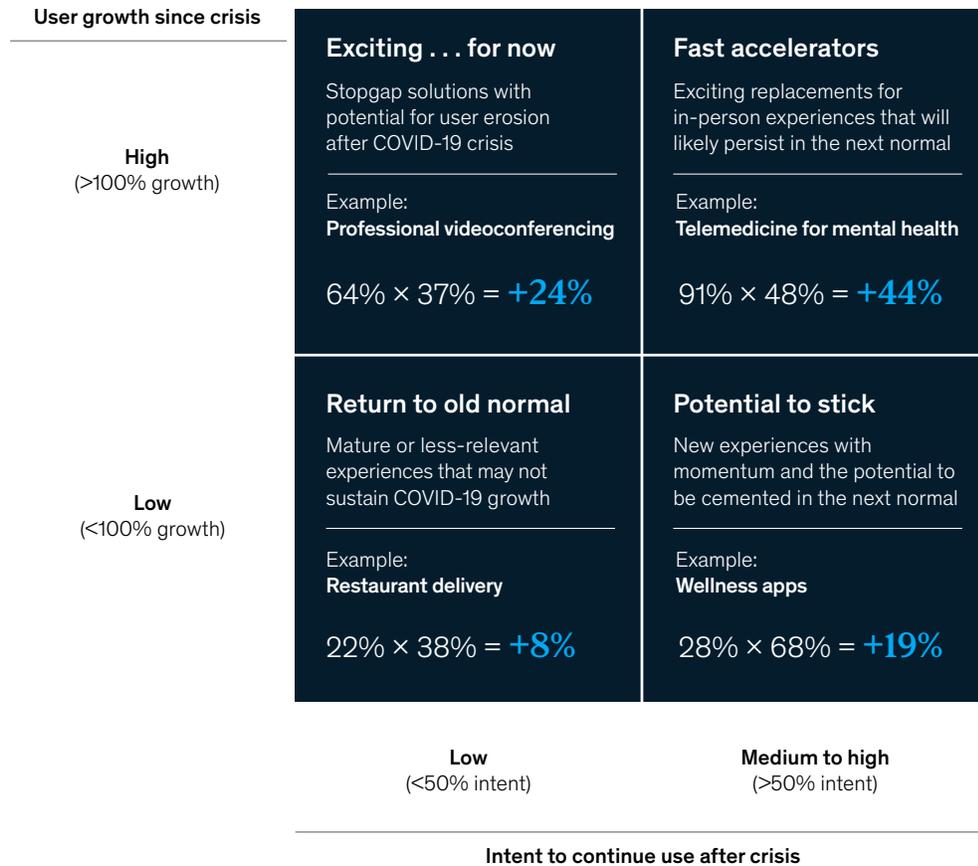
Fast accelerators, which include offerings such as telemedicine, have grown 91 percent since the pandemic hit, with 48 percent of consumers expressing an intent to embrace them in the longer term. Potential-to-stick services, such as wellness apps, have experienced comparatively slower growth but are the most likely to become embedded in the next normal.

As companies seek to ensure that their products and services are firmly positioned in the right-hand quadrants, they will have to balance competing factors. For example, convenience will continue to be a priority for consumers, but people are also craving the return of quality engagement. Speed and response times are important, but not

Exhibit

## A framework can help classify behavioral changes for the next normal.

XX% growth × XX% intent to continue = XX% potential next normal usership



Source: McKinsey Consumer Sentiment Study, April 2020

if they result in poor execution. And on top of it all, companies need to figure out new ways to create a differentiated customer experience.

### A focus on three priorities

In the next normal, winning companies will capitalize on opportunities to adapt to evolving customer behaviors, deliver short-term business success, and strengthen their long-term strategic positions. These efforts require executives to reimagine and reform customer experience through thoughtful, targeted investment, starting with three priorities. Companies that have already laid the groundwork prior to the crisis will have an advantage, but all organizations can make meaningful progress with careful decision making.

### Prepare for a digital recovery

Digital channels will help companies both meet changing customer needs and expectations and prepare for future industry disruption. The bar for digital excellence, already high before the pandemic, has gone through the roof.

Many companies, from mobile carriers to food delivery services, have made targeted investments to build or augment their digital capabilities. Several themes have emerged. Successful companies have used an agile, iterative approach and design thinking to identify new digital opportunities beyond their comfort zone. These companies also emphasize digital opportunities that strengthen the core business and lay the groundwork for a larger digital

transformation. Some companies have expanded their digital capabilities by evolving their portfolio through M&A or by divesting lower-potential holdings.

Tesla's sustained commitment to reinventing the car-buying process using digital has proved especially prescient. Its state-of-the-art digital showroom and virtual user guide offer customers an immersive online experience, and the contactless car delivery is tailor-made for the current environment. An active online community of owners augments Tesla's customer support. To broaden its online reach in China, the carmaker partnered with Alibaba on a Tmall online store. From December 2019 to March 2020, Tesla saw its sales in China double while other carmakers experienced a 50 percent drop over the same period.

In Poland, Orange designed and implemented Flex, a fully digital operator with no shops and no call center. Customers can use an app to handle all requests, from onboarding to service, roaming, and package changes. Orange redesigned the product for simplicity and a customer experience that could be intuitive and satisfactory while remote. In April 2020, Flex sales grew by more than 80 percent.

Companies that accelerate their digital offerings can see increased engagement now—digitization forces simplification, which customers love—and be prepared for lower-cost operations in the years ahead. They should focus on creating a virtual, digital experience that is on par with—or even better than—the in-person experience. Success in digital channels also has the potential to reduce the costs for in-person sales and increase reach: the greater shareability of virtual experience enables satisfied customers to become advocates. To expand their virtual presence, companies will need to assess their capabilities and then determine how best to augment them. Even retailers without a strong digital presence, for example, could partner with online marketplaces or delivery services.

### **Accept a safe and contactless customer journey as your default**

Given embedded fears about public health and excitement about innovations in contactless operations, safe approaches to offering products

and services will be critical. Customers will continue to recalibrate their expectations for safety during the pandemic, so companies must respond accordingly. Simple adjustments, such as methods to facilitate physical distancing in stores, have already become ubiquitous, if not compulsory. However, companies that offer creative alternatives to fully in-person journeys can improve customer experience and increase return on investment.

To determine where to invest, companies should first identify in-person interactions in their value chain that may need to be addressed. By developing and prioritizing risks based on safety as well as operational and financial risks, companies can develop a road map and execute immediate and longer-term solutions. The environment and customer preferences will continue to evolve, so companies should be prepared to adapt, iterate, and operationalize changes across the organization.

Companies across industries have redesigned their processes to increase safety and demonstrate their commitment to both customers and employees. Delivery companies have instituted touch-free packing and shipping as well as text notifications to avoid face-to-face contact. Leading retailers have moved quickly to offer online ordering with delivery or safe pickup.

Kroger has implemented a range of measures to meet the increased expectation for safety. The grocery chain designed a fully “click and collect” store to fulfill online-order pickup. For customers shopping in-store, the company offers Kroger Pay, a contactless payment tool rolled out before the pandemic. On the employee side, Kroger instituted a “hero bonus” raise for frontline employees working during the pandemic. And its partnership with Ocado to launch robotic grocery warehouses, initially rolled out a year ago, has enhanced its resilience. Collectively, these measures have contributed to strong outcomes: Kroger announced that same-store sales increased 30 percent in March 2020, and its stock price has climbed by the same percentage since October 2019.

Companies seeking to emphasize safety should focus on designing a contactless end-to-end

journey, but with thoughtful human touches. For example, one food-delivery service includes the name of the person dropping off the meals, conveying that the company values the well-being of both employees and consumers. By doubling down on ease of access and use across digital and physical channels, companies can improve both customer safety and satisfaction.

### **Anticipate, don't just ask for, customer feedback**

The increase of digital also means that companies will have more dynamic data at their fingertips. Now is the time to make investments in the data, technology, and systems required to deliver exceptional experiences in a rapidly changing environment. These investments should aim to anticipate and predict customer sentiment and customer value. This often means being more proactive and responding in real time, requiring companies to harness data and analytics tools that can extract immediate customer-experience insights and overcome the short-sighted and reactive nature of surveys.

One airline, for example, developed a data-driven system using machine learning to predict and act on customer satisfaction and revenue performance. The predictive insight from the system allows a broad range of use cases, from near-real-time performance measurement, to strategic planning, to proactive engagement strategies like personalization and “surprise and delight” programs. An early application allowed the team to respond to delays and cancellations more effectively. By acting based on predicted customer sentiment and outcomes, the airline was able to more effectively focus its effort on customers that were most at risk of defecting and achieved an 800 percent rise in customer satisfaction and a nearly 60 percent decrease in intent to churn.

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Investments in these types of comprehensive, predictive, data-driven systems could allow organizations to gather insight and respond more quickly to customer needs during times of crisis. Companies that capture all customer data, not just that of survey respondents, will gain a more accurate view of customer needs and expectations. With these insights, they can provide more meaningful interventions to sustain and build customer confidence while increasing customer lifetime value and reducing cost to serve.

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The next normal will be anything but static. The customer experience landscape is evolving with each passing week, so companies can't “set it and forget it” and still expect to stand out. Instead, executives should consistently monitor business trends—what is growing, stagnating, and declining—against their current business strategies to identify new opportunities in the fast-accelerator and potential-to-stick quadrants. To respond quickly to a constantly changing environment, companies will need to have a broad base of employees that know how to empathize with the customer, apply customer insights, and redesign the experience through digital excellence and contactless engagement. More than ever before, this is the time for organizations to invest in building these capabilities and taking advantage of all digital-learning tools that are now available to us.

Companies that review the digital portfolio, map out core interactions on the value chain, and focus on key customer-experience issues will be well positioned to please customers regardless of how expectations and preferences evolve.

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