



Expert Insights

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Resilience in the new age of risk

Anticipating the unexpected

IBM Institute for
Business Value



Experts on this topic



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Key takeaways

Risk volatility, type, and the amplified effects of overlapping major events require **a new approach to strategy and operations** for enterprises to thrive.

Enterprises need to **shift from an efficiency-driven focus to a balance** between resiliency and efficiency.

To succeed in this new era of risk, **enterprises should adopt scenario envisioning** as a practical work method, supported by digital tools and technologies that can give them insight into the probabilities of different possible futures.

The world has changed, and so has risk

The tardigrade—a microscopic, most unheralded animal—may also be the most resilient creature on earth. It can survive extreme temperatures—up to 150 degrees Celsius, as well as exposure to outer space’s frigid vacuum—extreme pressures high and low, radiation, extended dehydration and starvation. It seems equipped to meet almost any risk the planet might face, save the death of the sun.¹

Considering the era of risk we have entered, its resilience is something businesses today would do well to emulate. It could be time for business to invoke the mantra, *become tardigrade tough*.

Take the sudden appearance of the current global COVID-19—also called SARS-CoV-2—pandemic. Some may have been surprised, but many expected it or something like it. In actuality, it is the eighth such threat the world has faced in 17 years. SARS-CoV-1 appeared in 2003, H1N1 “swine flu” in 2009, and MERS, Ebola and Zika threatened the global community in the decade that followed. In 2015, Bill Gates warned the world was largely unprepared for the next outbreak.²

It’s clear now he and others were right. And it’s not just pandemic outbreaks the world has been unprepared for—it’s really a new era of risk, especially for enterprises. The current pandemic is symptomatic of a more fundamental trend toward greater risk of severe disruption.

Organizations, systems and institutions will need to rethink, not only the way they operate, but in some cases their very raison d'être.

Climate change and its multiplying disruptions—drought, flooding, more volatile hurricanes and storms, extensive wildfires in Australia and California, crop disruption, habitat destruction, to name just a few.³ Cyber-attacks that damage national energy, communication, transportation and healthcare infrastructure, prompting governments to bolster their cyber defenses, such as Australia's recent announcement of investing USD 933 million over the next decade to protect its "economy, national security and sovereignty."⁴ Economic crisis caused by governments defaulting on high levels of public debt. Political unrest and instability, with stable alliances and trading partnerships suddenly torn apart. Civil unrest.

But these disruptions won't wait their turn in line. They can—and often do—overlap, magnifying their untoward effects.

So while the COVID-19 pandemic has had an extreme impact on business and economic activity, it is only a matter of time before another risk event creates a significant disruption as well. For example, it's been reported that hospitals reeling from the strain of caring for COVID-19 patients have been targeted by cybercriminals looking to exploit the strain on the hospital's resources.⁵ And what amplified effects would a hurricane cause if it suddenly struck areas that are also seeing spikes in COVID-19 cases?

Such an interplay of overlapping disruptions could cause a domino effect that intensifies—and makes more difficult to predict—the economic chaos it creates. Not a very pretty picture.

But in the long term, this climate of turmoil could act as a catalyst for increased innovation and, ironically, help the global economy move onto a new path that—with luck—could deliver stronger growth.

However, such an outcome is by no means certain. Indeed, the transformation required to deal with a new era of risk will face significant hurdles. Organizations, systems and institutions will need to rethink, not only the way they operate, but in some cases their very raison d'être. There will likely be resistance to this kind of fundamental change. New innovative approaches will run into institutional inertia and interests vested in the status quo.

To complicate matters further, mitigating different types of risk may be mutually conflicting rather than reinforcing, putting steps to address them at odds with each other. To achieve sustainable transformation at scale, therefore, an organization must develop deep insight into the dynamic and systemic factors that are shaping the levers for change, and adopt a method for evaluating and preparing for a set of possible futures.

New risks, new approaches

While the threat of pandemics is certainly not new, nor are weather events, natural disasters and geopolitical instability, today's overall risk is substantially different. Disruptions will be more frequent, more severe, will extend more broadly across the world and its economies and, critically, will be more difficult to predict. This new risk profile will demand businesses adjust their strategies, operating and business models to be inherently flexible and resilient.

The COVID-19 pandemic's development illustrates this much greater risk profile that business leaders face. The virus will continue to spread with, very likely, periodic resurgence for the foreseeable future. It appears safe and effective vaccines that can be distributed at scale around the globe hold the key to the virus's demise, though it is possible, but far less likely, that "herd immunity" from widespread infections—60 percent to 80 percent of the global population developing immunity from contact with family, friends, work associates, and others—might also bring it under control. Either of those scenarios will take time and be costly in terms of lives and resources.

Consequently, in the near to intermediate term, increased resilience will be the focus. So far financial markets, with the help of the major central banks, have been the most resilient. The global financial system, most notably in the US, was well-capitalized entering the current recession resulting from the pandemic. While capital will erode as the economy struggles, global central banks have been very aggressive in their support. For example, the Federal Reserve has innovated substantially, moving into direct lending to the broader economy, not just to banks.

By contrast, manufacturing supply chains, which have been built for efficiency, have struggled to provide the necessary resilience. With heavy dependence on the Chinese manufacturing sector and conflicting interest over the management and treatment of COVID-19, some

previously well-functioning and efficient supply chains are now at risk. For example, the Council for Foreign Relations reports that Chinese pharmaceutical companies have captured 97 percent of the US market for antibiotics.⁶

In the current crisis, personal services have been the most severely affected. For restaurants, airlines, gyms, salons, and most other personal services, new business and service models are required. International travel is unlikely to resume in a significant way until 2021, and only if country-to-country protocols can be put in place, as well as an internationally recognized testing regimen.

Among service sectors, education has been among the hardest hit by COVID-19. For young learners, equal access to online learning is at best problematic, and often nonexistent. Parents have been learning the challenges that teachers face on a daily basis. For many universities, notably in countries where they rely on student fees for their income, COVID-19 has become an existential threat. The close personal contact that accompanies university living and learning makes program success and revenue generation questionable. Ironically, the transformation of education and learning will be vital for the long-term future. Perhaps the current disruption, while painful, will provide the motivation necessary for deep fundamental, long-term change.

As such, the turbulence associated with the COVID-19 pandemic illustrates the scale and breadth of the disruption—and its diverse manifestations across industries—resulting from the new elevated levels of risk. In short, businesses face a new reality. They will need to rethink how they develop their strategies. They must recreate their operating—and for some sectors, their business—models. They will need to embrace and become adept at scenario envisioning. And now, even as they struggle to survive this current crisis and emerge healthy enough to begin again to grow, they must build the key capabilities and invest in the right technologies to be highly resilient in a future of certain uncertainties.

It's time for a shift in focus to cultivate a resilient toughness and ability to weather many different kinds of storms.

Implications for business: The era of risk demands resiliency

The typical operating model over the last decades has been focused on optimizing wherever possible to create leaner and more efficient processes and organizations. Case in point: just-in-time supply chains, where inventories are kept to a minimum, and components and finished goods are delivered when and where they are needed without delays. Such an approach has served companies well in a business environment characterized by relative stability, reliable distribution channels and limited or localized disruptions.

In this new era of risk, it's time for a shift in focus to cultivate a resilient toughness and ability to weather many different kinds of storms.

Recent events have revealed the weaknesses of this efficiency-first approach. Global supply chains have been shattered and the lack of operational buffers, such as spare inventory or capacity, has created bottle necks for critical business activity. In the new elevated risk environment, where severe disruptions are becoming more frequent and difficult to anticipate, companies with more flexibility and elasticity in their operations have a competitive advantage.

Accordingly, the new elevated risk environment requires an operating model that is focused on resiliency and agility. Some efficiency gains will be sacrificed for greater resilience. Greater resilience, in fact, may have to come at the cost of reduced margins, higher prices, or a combination of the two. Indeed, organizations will need to focus on different priorities for driving long-term value, as markets, supply chains and business environments face continuous change and frequent upheaval.

At the heart of a resilient business and operating model are capabilities that make the enterprise adaptable and able to change. These include a workforce that is able to work safely and effectively from virtually anywhere, agile working methods embedded within every workflow, and operational business continuity throughout a company's supply chain, manufacturing and distribution networks. Moreover, a truly resilient enterprise must be able to respond to rapidly shifting demands through active customer engagement and insight.

Big data, analytics and other digital technologies enable this level of resilience. They can provide real-time insight that helps a company navigate complexity. In concrete terms, companies must have constant situational awareness if they are to respond in an agile manner to sudden market changes and disruptions. Company-wide control towers that provide continuous and up-to-date visibility into internal and external activities can also provide essential insight for intelligent workflows to be adapted on the fly to address the new normal.

But to be able to use this data and insight, organizations must put in place a secure and resilient technology infrastructure to support the new operating model. In particular, the hybrid cloud becomes the foundation for sharing and moving workloads and data across an organization and its stakeholders in a secure and flexible manner (see sidebar, "Asian insurance company"). To succeed in a more uncertain environment, companies will need to adopt today's unprecedented digital capabilities and advanced AI to help analyze corporate structures and workflows, offering opportunities for improving quality and effectiveness, as well as reducing costs.

Moreover, organizations must transform their financial position and shift toward greater cost flexibility. This entails a greater emphasis on cost variability and a rebalancing of capital and operating expenditure. Importantly, companies must approach such improvements strategically. Too many companies cut costs in a linear, uncreative way that preserves cash but diminishes their ability to grow in the future. Rather, companies should carefully balance reduced costs against future-looking opportunities and use the insight available from digital tools to better understand where there are genuine opportunities for cutting waste and improve efficiencies.⁷

Finally, the new operating model for the 21st century must be underpinned by new ways of working that allow remote employees and distributed teams to work effectively and seamlessly to deliver outcomes for clients and the organization. Indeed, the elasticity of the organization as a whole depends on these agile ways of working, supported by digital technologies, being embedded across the entire company.

For example, when the UK bank TSB experienced a spike in customer volumes during the COVID-19 crisis—such as requests for details on how to apply for a repayment holiday on mortgages, personal loans and business loans—the company deployed a “Smart Agent” function to its site in 5 days, enabling customers to ask a chatbot or live agent about measures the bank is taking during the pandemic. In addition, the company enabled over 250 employees, most of whom were working from home.

In a little over a week, more than 11,000 requests had already been made through Smart Agent, and the feature freed up its branch and call center employees to focus on dealing with the most vulnerable customers and those who needed essential services. Since its launch, Smart Agent has been enhanced further to include the ability to authenticate the identity of customers and the service will also be included within the TSB mobile app.

Asian insurance company: Remaining productive in a crisis

A large insurance company in Asia recently needed help building a data management platform solution and had teamed with IBM to do so. The project was interrupted by the spread of COVID-19. As business travel was suspended, the client’s office was also closed, making it impossible for the teams to collaborate in person.

Instead of postponing the project, the two teams used a business continuity engineering platform. The complete digital remote work environment integrates tools, an optimized workflow, simple collaboration capabilities, and an effective project management and execution discipline. It is a cloud-based platform that can be quickly configured for use. The new platform allowed teams to collaborate and advance work on the project with a new, virtualized roadmap.

The development team employed task management tools and a Kanban board to keep track of progress, while project managers and executives used personalized views to track events and outcomes. Teams now enjoy complete visibility even though they are unable to meet face to face. The development team saves work in a centralized source code repository to securely manage the code as they use DevOps tools on the platform. As development is completed, the team can continue to deploy its package to heterogeneous client environments on any infrastructure type.

Use of the new work environment has fostered real cultural change and made them a more resilient development organization.

Start by thinking about potential future states and work backward to understand implications for today and the best ways forward.

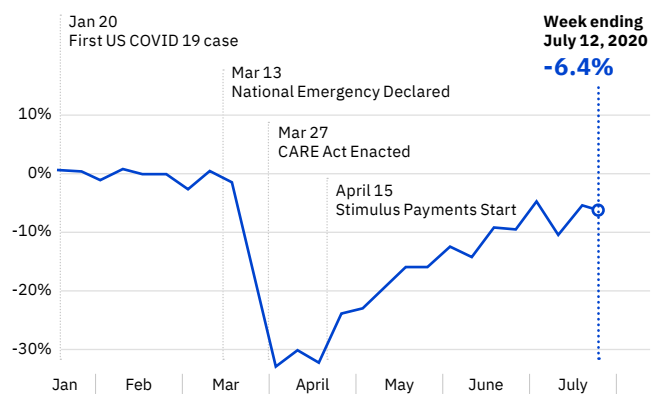
Scenario envisioning: The future of corporate strategy—and survival

Companies today are navigating an environment where it is virtually impossible to derive reliable future expectations from past and current trends. For example, several sectors in the US have seen dramatic shifts in overall sales at a scale that is unprecedented in recent times (see Figure 1). This has significant implications for immediate day-to-day operations, as well as how companies prepare and strategize for the future.

Indeed, the disruptions associated with the new enhanced risk profile of the global economy are of such a nature that traditional planning approaches will be inadequate. The emphasis on current state and trends as the point of departure from which to develop a forward-looking perspective cannot adequately capture the potential opportunities and challenges faced by companies in a more elevated and disruptive risk environment. As is evident in the trend line in Figure 1, merely projecting forward from previous years' data would not have enabled you to strategize or plan for the disruption associated with COVID-19. If such shocks to the system are expected to be a more frequent feature of the future global economy, companies need to change their approach to strategy development and operational planning.

Figure 1

COVID-19 causes unprecedented sales volatility—
Percent change in sales year over year



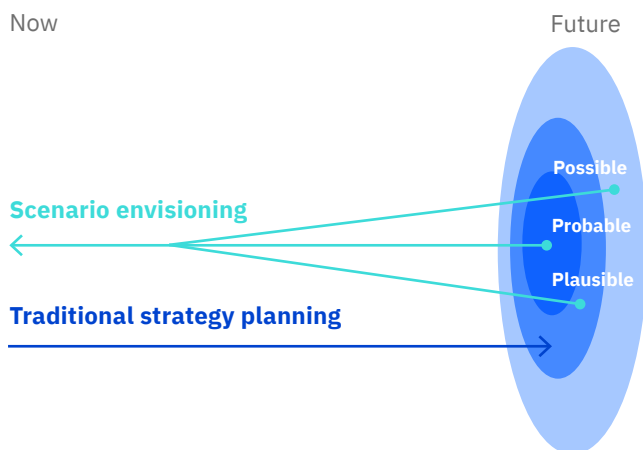
Source: US Census Bureau and IBM Analysis

If current trends are no longer sufficient as a guide for future direction, it will increasingly be necessary to turn the traditional strategy process on its head. Start by thinking about potential future states and work backward to understand implications for today and the best ways forward. To do so, companies need to embrace scenario envisioning (see Figure 2).

In practical terms, scenario envisioning provides a rigorous and structured framework for defining scenarios and ascertaining their potential impact on your organization. It is based on defining the key dimensions that will shape different potential future outlooks and analyzing the implications for your business in each scenario. Such an approach will enable companies to create strategies and operations that are able to thrive in different future scenarios rather than attempt to optimize within a current set of assumptions (see sidebar, “Insight: Retail scenario planning”).

Figure 2

Scenario envisioning versus traditional strategy planning



Source: IBM Digital Strategy and Institute for Business Value

Insight: Retail scenario planning—how many SKUs do we really need?

Received wisdom can be hard to buck. The rationale, “it’s what we’ve always done—it’s what our customers want,” can even seem to be backed by data, data from years of normality. COVID-19 has shown how quickly that normal can be upended. In particular, it revealed how quickly demand forecasts and the integrity of many supply chains broke down.

This prompted one electronics retailer to upend its traditional thinking: what would happen if it reduced its SKUs in a critical category from nearly fifty to under five? Would such a reduction increase the company’s ability to respond to sudden changes in its supply chain and customer buying habits? Would customers balk at the lack of selection? Or would it better mesh with their changed and changing buying habits?

To find answers to questions like these, the company is exploring the use of a decision support system powered by prediction, scenario planning and assortment optimization. The system will use business intelligence (BI) as a foundation to generate scenarios from current data, then assign probabilities to each. It will then help with the challenging task of valuing various scenarios against a range of business objectives, such as profit, sales, inventory risk, and fulfillment preferences. The system will examine various product selections, trying to find an optimal one based on the business objectives, demand forecast scenarios, and where inventory should be placed to mitigate supply chain risk.

The power in the approach is twofold. It values flexibility and adaptability, being able to adjust its answers based on current data as circumstances change, and offers companies a way to codify that value and use it to make decisions. Second, it moves scenario envisioning into the realm of tactics, providing tools for both the strategy level and those driving day-to-day execution.

Scenario envisioning is less about selecting one particular scenario than it is about preparing for different possible outcomes.

Indeed, there will be a premium on the ability to succeed in different futures, known as “option-value,” with greater value attached to agility and flexibility in a company’s business and operating model. Importantly, scenario envisioning is often less about selecting one particular scenario than it is about preparing your organization for different possible outcomes (see Figure 3).






However, understanding which path to pursue and making the decisions needed to support it to achieve such option-value is not easy. An organization will have to define the key criteria against which different opportunities can be

assessed, such as impact on business outcomes and downstream implications. Such insight should encourage dialogue within the organization and guide the organization’s actions to avoid being paralyzed by uncertainty.

If done successfully, the transformation resulting from scenario envisioning can usher in significant new innovations in business and operating models, processes, ways of working and supporting technologies, which in turn can drive enhanced performance and economic outcomes in the longer term.

Figure 3

Scenario planning versus scenario envisioning

| Attribute | Traditional scenario planning | New scenario envisioning |
|---|---|--|
|  Change focus | Possible future changes | Lasting and secondary/downstream impacts of existing shock-induced step changes |
|  Mindset | Extrapolation based on anticipated trends | Non-linear/reordering based on known shocks |
|  Key inputs | Insights from historical trends and industry dynamics | Insights from past crisis, forward regions in existing crisis, and current situational awareness |
|  Required situational awareness | Periodic, low-frequency | Real-time, high frequency |
|  Methods | Traditional analysis and ideation | Experience enhance, including storyboarding |

Source: IBM Digital Strategy and Institute for Business Value

Insight: A practical approach to envisioning scenarios

In practice, it can be difficult for business leaders to make the leap to using scenario envisioning as a decision-making tool. Most want a clear, deterministic view of the future. Of course, the future is probabilistic, not deterministic. But many feel that, without a single view, aligning the company behind a direction can be problematic at best.

How can leaders envision future states in a useful, realistic manner? Begin with observable developments, extract insight about their root causes, and then look elsewhere for similar potential developments.

For example, the sudden switch to work from home and video conferencing is largely possible because costs have fallen so much. So taking a cue from that, a leader might ask, where else are costs falling? Renewable energy, self-driving cars? Across foundational sectors—information, energy, transportation, food, and materials, where are the nonlinearities—the “S-curves”—that are shifting? Beyond the falling costs of technology, where is there functioning infrastructure or where will it be rebuilt, where are the competent governments, where are the R&D investments occurring?

Are there industry sectors or consumer segments more open to change or feeling pressure to change? How are shifting demographics creating pressure to change, shifting preferences, needs, and requirements?

As business leaders answer these questions, possible futures will begin to take shape. Answers to these questions can help them describe where future opportunities could take root. Evaluating them and their probabilities will help a company prepare, not by betting the house on a single course, but by anticipating the most likely scenarios and being ready for some surprises along the way.

Digitally enabled scenario envisioning

Digital technologies can play a key role in supporting scenario envisioning and embedding it as a continuous feature of strategy development and execution. Through better data and analytics, coupled with exponential technologies such as AI, companies are able to develop informed and insightful scenarios. In turn, they can better understand the strategic and operational implications of different futures. As such, digitally enabled decision making will be critical for navigating a disruptive environment and allow companies to respond strategically and tactically to changing business conditions.

Moreover, digital technologies allow companies to engage relevant internal and external stakeholders in the scenario envisioning process. In so doing, they are able to tap into the collective intelligence of the organization for defining the best path forward.

In addition, digital technologies open up new opportunities for incorporating more situational awareness into the scenario envisioning process. This can be done at higher frequency and with real-time data rather than the more periodic insight that has guided scenario planning in the past. Rather than rely on extrapolations of anticipated trends that might imply a particular future, this approach gives guidance fully aware that the economic landscape may change drastically, and difficult to anticipate shocks to the business environment may occur.

For instance, consider the changes being wrought on the pharmaceutical industry in the wake of COVID-19. The enormous pressure to act, combined with new technology, are giving rise to a tremendously accelerated race to a vaccine. It's conceivable that what had previously taken seven to eight years could end up being condensed into just under a year. Along the way, new lessons and ways of operating will undoubtedly take hold and be widely applied. The quest for the vaccine could do more than thwart the virus; it could also transform an industry in the process.

The changes needed to deal with COVID-19's aftereffects could set the global economy on a path to stronger growth and productivity improvement.

Innovation leads to renewed strength

Over the long term, the new elevated risk environment and consequent business innovation may lead to a fundamental global economic transformation with the possibility of stronger growth. A significant portion of the global economy has become dysfunctional, if not ripped apart. Once the pandemic is either managed or defeated, the economic pieces will not be easily put back together. Mass joblessness, widespread bankruptcy, and universal disruption won't yield easily to simple solutions. The global economy that ensues will very likely have to look very different. New businesses, new business models, new business processes, and new technologies will appear.

Post-World War II economic conditions may be instructive. In Europe and Japan, much of the productive capital base had been destroyed. In the US, the manufacturing sector had been converted to wartime production. With much of the workforce serving in the military, new workers, primarily women, had gone to work in manufacturing plants.

New ways replaced the old ways. New technology and modern facilities were built to return to productive activities. While serving in the military, many gained new skills and learned new behaviors. Education levels

increased in the US as the GI Bill provided low-cost education benefits. And women had entered the workforce, setting the stage for a cultural shift in work expectations and an eventual mass change in the workforce, with more married women in the workforce in the 1960s than at any previous time in US history.⁸

The following four decades of strong growth, productivity improvement, and income gains, were, in part, a consequence of the global transformation wrought by the devastating and disruptive events of the Second World War.

While it will likely take years to come to grips with the current pandemic and set the global economy on a solid path to recovery, the changes needed to deal with COVID-19 and its aftereffects could set the global economy on a very long path to stronger growth and productivity improvement.

It's true the future is uncertain. But it would be a mistake for companies to believe the future will not be fundamentally different and not prepare accordingly. We are entering a new era of enterprise risk, and the time to prepare is now.

Action guide

Build now for a resilient future

Preparing for the unknown and its uncertainty is daunting, and transformational change never easy. But a few foundational capabilities can help get you started.

1. Make scenario envisioning a central and continuous feature of strategy development and execution

- Leverage the collective intelligence of your organization and ecosystem for scenario envisioning through methods such as Jams, Design Thinking and Social channels.
- Deploy user experience and storyboarding techniques to bring scenarios to life and ascertain implications for your organization.
- Make use of agile, cross-functional teams to drive innovation speed through rapid ideation, testing and iteration, together with an orchestrated program to operationalize and scale successes.

2. Use data, analytics and exponential technologies for real-time, high-frequency situational awareness

- Develop next-generation business intelligence system supported by technologies, such as AI, to explore, understand, and anticipate global forces driving trends.
- Tap into the full potential of data and insight through IoT for real-time visibility into conditions and potential actions.
- Share relevant data and workloads and make them available throughout the organization and ecosystem with hybrid cloud infrastructure.

3. Transform your operating model for resilience

- Orchestrate and govern through control towers that drive insights to action across organization and ecosystem in support of agile operations and teams.
- Infuse data into business processes for intelligent workflows and a connected supply chain to drive flexibility, resilience, and responsiveness across organization and partner ecosystem.
- Promote agile organization, practices and culture across IT and business, providing organizational foundation for speed and agility at scale.

Notes and sources

- 1 Knapton, Sarah. "World's most indestructible creature - the tardigrade - will be alive on Earth until Sun dies." The Telegraph. July 2017. <https://www.telegraph.co.uk/science/2017/07/14/worlds-indestructible-creature-tardigrade-will-alive-earth>
- 2 Gates, Bill. "The next outbreak? We're not ready ." TED 2015. March 2015. https://www.ted.com/talks/bill_gates_the_next_outbreak_we_re_not_ready?language=en
- 3 "Australia fires: A visual guide to the bushfire crisis." BBC News Australia. January 2020. <https://www.bbc.com/news/world-australia-50951043>
- 4 Cave, Damien. "Australia Spending Nearly \$1 Billion on Cyberdefense as China Tensions Rise." New York Times. June 2020. <https://www.nytimes.com/2020/06/30/world/australia/cyber-defense-china-hacking.html>
- 5 Winder, Davey. "Cyber Attacks Against Hospitals Have 'Significantly Increased' As Hackers Seek To Maximize Profits." Forbes. April 2020. <https://www.forbes.com/sites/daveywinder/2020/04/08/cyber-attacks-against-hospitals-fighting-covid-19-confirmed-interpol-issues-purple-alert/#40030edc58bc>
- 6 Huang, Yanzhong. "The Coronavirus Outbreak Could Disrupt the U.S. Drug Supply." Council on Foreign Relations. March 2020. <https://www.cfr.org/in-brief/coronavirus-disrupt-us-drug-supply-shortages-fda>
- 7 Cattell, Jamie. "The Crisis and Beyond: How to Cut Costs Intelligently." IBM Think Blog. May 2020. <https://www.ibm.com/blogs/think/2020/05/the-crisis-and-beyond-how-to-cut-costs-intelligently>
- 8 "Women and Work After World War II." PBS The American Experience. 2020. <https://www.pbs.org/wgbh/americanexperience/features/tupperware-work>

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