

# Think:Act

Leading thoughts, shaping vision

ACCELERATE AND RESET PRICE \$19.95

Think:Act #32 10 | 2020

HOW CRISIS CAN  
FAST-TRACK BUSINESS  
TRANSFORMATION

## SURF THE TSUNAMI OF CHANGE




**Corporate history lessons**  
What you can learn from  
the East India Company

**How to safeguard innovation**  
Vinton Cerf on the impact of  
the internet and its evolution

Roland  
Berger







**"We need our technology  
now more than ever, but we  
need to make it smarter,  
better and more humane."**

**RANA EL KALIOUBY**  
CEO of Affectiva and  
author of *Girl Decoded*

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**"The biggest concern that we generally have is companies exercising some kind of monopoly power to inhibit competition – and there may not be an opportunity for new market entrants."**

**VINTON CERF**

Founding father of the internet  
and 2004 Turing Award winner

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**"Some people think we might go back to how things were before. But we're not going back to a 'before!'"**

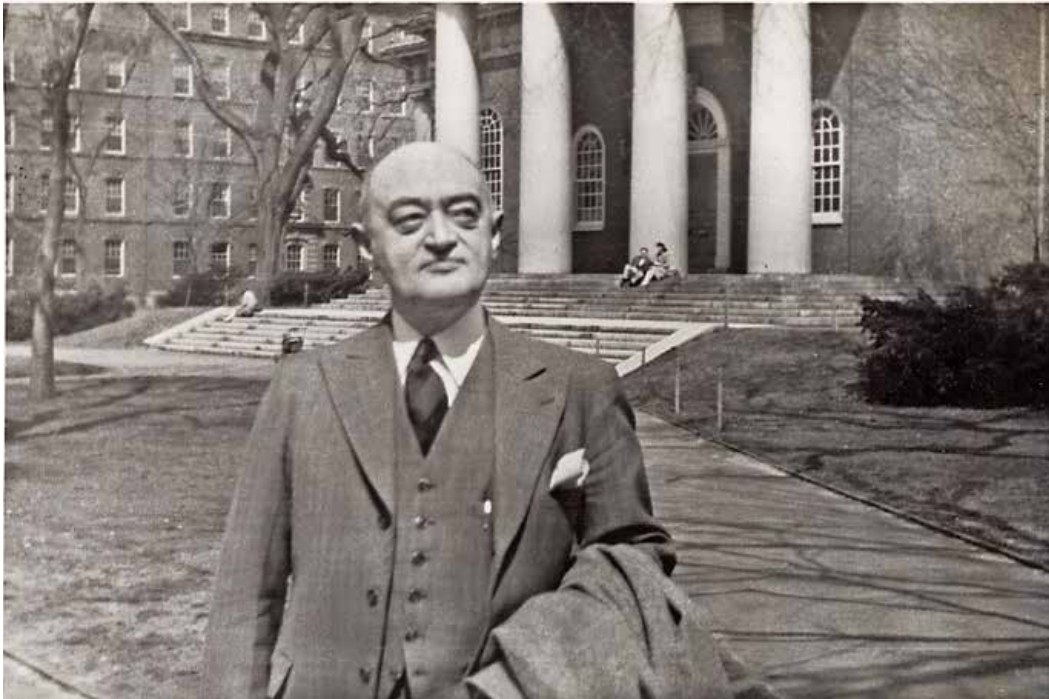
**TSEDAL NEELEY**  
Professor of business administration  
at Harvard Business School

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## /// ACCELERATE AND RESET ///

"Situations emerge in the process of creative destruction in which many firms may have to perish that nevertheless would be able to live on vigorously and usefully if they could weather a particular storm."



→ Closely associated with the idea of "creative destruction," Austrian-born **Joseph Schumpeter** (1883-1950) established a theory of economic innovation and business cycles. The Depression-era economist suggested that new business and new productivity can rise out of the rubble of destruction, but for that to happen the old businesses or rules or methods cannot be protected or preserved. His ideas suggested that the disruption of existing industries will open up the space for innovation and new players. His thinking seems particularly pertinent today as we face the unprecedented situation of a global and debilitating pandemic. The destruction bit seems fairly obvious, but what will replace what is being destroyed? This issue explores how to ride the wave of change and to look with fresh eyes to find the opportunities that the destructive power of change might bring. A need to *accelerate* and *reset* – and create in the middle of chaos.

# Think:Act 32

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ACCELERATE AND RESET

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ILLUSTRATION: JOE WALDRON, LAURINDO FELICIANO, MATHIS REKOWSKI

PHOTOS: COURTESY OF RITA GUNTHER MCGRATH, UBTECH, ALAMY/WU KAILIANG

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**Think, act and stay informed**



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ACCELERATE AND RESET

**Think:Act Ideas for Action**

Sign up online to download this issue's Ideas for Action with insights on how regionalization is poised to become the next chapter in the globalization story.  
[rolandberger.com/deglobalization](http://rolandberger.com/deglobalization)





Think  
in  
numbers

PUTTING  
A FIGURE ON ...

CORONAVIRUS  
AIRLINE BAILOUTS

**\$85**

BILLION

The amount governments spent to rescue airlines in March and April 2020.

**20%**

THE STAKE

the German government will acquire in Lufthansa as part of a bailout deal approved by the airline's shareholders in June 2020.

**\$5**

BILLION

The value of the Cathay Pacific bailout deal in June 2020, which saw the Hong Kong government take a 6% stake in the airline.

**2.5**

HOURS

The duration a train connection must exceed to justify a flight, a condition of France's \$7.7 billion aid package to Air France-KLM.

SOURCES:  
BLOOMBERG; LUFTHANSA; BBC;  
BLOOMBERG

Food  
for  
thought

**We have had the web and social, but what is the new emerging platform to take notice of – and what could it mean?**

WITH *Kevin Kelly*

**THE NEXT STAGE** after the smartphone is smart glasses. As portable as a pair of sunglasses, but with clear lenses and audio nodes near the ears, these lightweight devices will enable anyone/everyone to access a virtual overlay to the real world. Wearers will see their real room, real street, real people, but also a digital twin of the same at the same scale and in the same place overlaid and embedded into the real. For example, you see the street you are walking down, but also a street

annotated with information about the street. Or a worker repairing a machine would see a repair diagram of the machine overlaid in the machine. This virtual layer enables the network to search the real world, and for consumers to manage and manipulate the real world by managing and manipulating virtual twins. It enables others to share what you are seeing and hearing in real time – just as GPS did, it gives wearers the superpower of navigating through the real world with incredible knowledge and power.

Manhattan, NY  
87°

**Thin**  
AT A GLANCE





**KEVIN KELLY** describes himself as senior maverick for *WIRED*, the magazine he helped co-found. His most recent book is *The Inevitable: Understanding the 12 Technological Forces That Will Shape Our Future*.

Thoughts to live by

"You never want a serious crisis to go to waste ... [it] is an opportunity to do things that you think you could not do before."

— Rahm Emanuel  
Former mayor of Chicago and White House chief of staff under Barack Obama

Re-thinking buzzwords

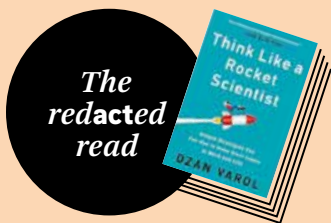
Get to grips with new industry lingo in a flash with our stripped-down explanations of the latest jargon.



"BC/AD"

You may think you know these abbreviations, but 2020 has given them a new meaning. Yes, you've guessed it, Covid-19 has given us a new timeline: There is "Before Corona" and "After Domestication." The AD bit is important as WFH ("Work From Home") came to the fore. Twitter employees were told they could work from home permanently and Google recently made a similar commitment, saying its workers won't return to the office before mid-2021. AD could last longer than we think before there is any kind of RTN ("Return To Normal").

Think: Act



The redacted read



Chain Reaction

## Be like Armstrong and take your own giant leap

*Astrophysics-student-turned-law-school-Professor Ozan Varol offers nine principles that rocket scientists follow to achieve success in a high-risk venture.*

**AS ROCKET SCIENTIST** Varol has noted, thousands of things can happen when a rocket is launched – but only one is good. To overcome the risks of all those other potentially disastrous outcomes, rocket scientists have developed a way of thinking that can be usefully applied to life far from the launch pad. Here are Varol's tips, redacted by us for you:

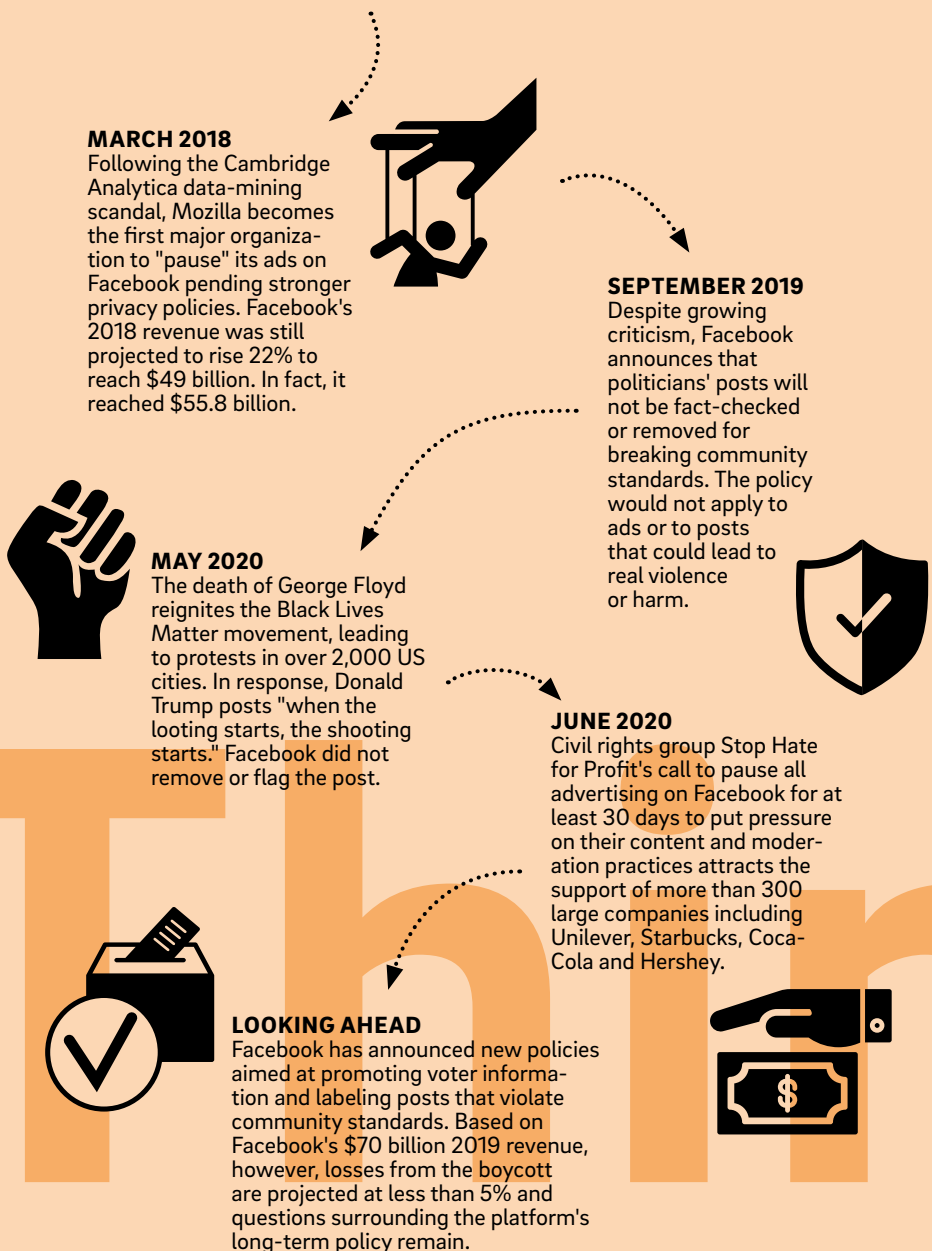
Don't get overly invested in one opinion. "The first principle is that you must not fool yourself – and you are the easiest person to fool," said legendary physicist Richard Feynman. Before making any important decision, come up with a number of hypotheses about the best course of action and adjust them as you get more data. American astronauts were trained to fly rockets and operate space stations under as realistic and adverse conditions as possible. The harder your simulation, the more likely you are to perform well in the actual event.

Each failure has two parts. Failures are both the event and the lessons you take away. Make sure you learn all you can from every mistake. Nothing fails like success. Success is a lousy teacher. If you did succeed, how much was due to luck? Were there any near misses?

→ *Think Like a Rocket Scientist: Simple Strategies You Can Use to Make Giant Leaps in Work and Life*

by Ozan Varol. 368 pages. Public Affairs, 2020. \$16.99.

**WHERE DOES THE BUCK STOP NOW?** In May 2016, Pew Research Center reported that 62% of US adults read at least some news over social media – a factoid that became a weighty issue just months later when Facebook came under fire for spreading false information leading up to that November's election. Here's how concerns surrounding voter manipulation grew into a debate over who's responsible for moderating online content and just how much leverage advertising dollars have against a social media giant.

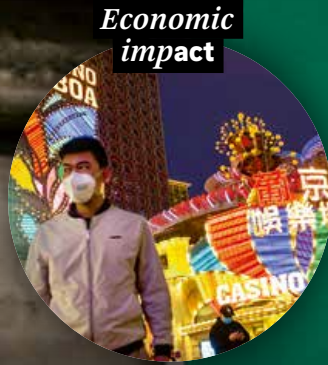
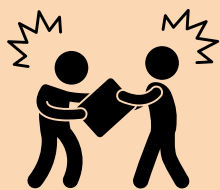






## How to ... prepare for tough negotiations

**BUILDING TRUST** and finding common goals are by far the best ways to negotiate, but for some people negotiations mean playing hardball. If you are entering into a discussion with a partner who is likely to use tough tactics, it's a good idea to be aware of the tools they might use. So watch out for these three tell-tale tricks. Firstly, don't be put off by a good cop/bad cop team. Just realize that they are working together and don't be taken in by it. Secondly, don't be ruffled by personal insults. If you find there is some kind of personal attack during the negotiation, take some time out and then make clear you won't tolerate that kind of tone. Thirdly, if you are confronted with a "take it or leave it" attitude, just ignore it and find what is behind the position. There is an offer there and you can make a counteroffer to meet both your needs.



*Economic  
impact*

### High stakes

**THE ODDS ALWAYS FAVOR THE HOUSE,** but not even casino capitals Las Vegas and Macau could have bet on the impact of the coronavirus. Macau – where gambling accounts for 80% of government revenue – shuttered on February 4 with its 41 casinos reporting individual daily losses between \$1.5 million and \$2.6 million. And even though Macau's casino closures lasted just 15 days, decreased tourism toppled its April gross gaming revenue to \$95 million, down 97% from the same period in 2019. In Las Vegas, the 78-day closures that began on March 18 saw unemployment reach 28.2%, the loss of \$2 million in gambling-related tax revenue per day and estimated losses of \$39 billion to Nevada's economy over the coming year. The reopenings, however, can best be described as a roll of the dice. While Macau went into its lockdown with 10 confirmed Covid-19 cases and had reported a total of 46 cases by the end of June, Las Vegas went into lockdown with 126 total cases only to see a day-on-day rise in the weeks following its June 4 reopening, with 827 new cases reported on June 30 alone.

娱乐场  
暂停开放  
THE CASINO IS CLOSED

冠状病毒疫情, 由 2020 年  
娱乐场暂停开放, 直到另行通  
敬请见谅。  
the development of the novel  
virus epidemic, from  
2/05, the casino will be  
arily closed until further  
notice.  
ologize for any inconvenience.



# Act

AT A GLANCE



NW  
NW  
NW

# In focus



*In this issue we take a close look at how business can flourish in an era of accelerated change.*

ACCELERATE AND RESET



AW  
AW





UPSIDE DOWN

## PREPARING FOR ACCELERATED CHANGE IN THE POST-PANDEMIC ERA

Consolidation and slow-paced, long-term planning are out. What do you need to be thinking about to get ready for the post-pandemic era? Read on for some expert opinions on what could shape the future of business.

BY *Bennett Voyles*

ILLUSTRATIONS BY *Joe Waldron*

ACCELERATE AND RESET IT

WORLD TURNED





ACCELERATE AND RESET

**S**OMETHING HAS DEFINITELY CHANGED. For many commentators, the change is so great that they say things will never be the same again. Covid-19 has torn through countries and businesses, devastating some and threatening others. After weeks and months of lockdown, disrupted supply chains, inhibited consumerism and frustrated social interaction, a zeitgeist is emerging around how to engage with a brave new world – how to face tomorrow. And it's pointing towards acceleration: What some companies thought might take five or 20 years is now being achieved in a few months, even weeks. Acceleration can drive transformation, changing our assumptions about what works. With it comes the need to reassess. Even reset. There is a consensus emerging that companies will have to work in very different ways compared to how they did prior to this "black swan" event. As Sir Cary Cooper puts it: "We're not going back to the same world we came out of." Who you are, what you sell, how you sell – and maybe even why you sell – are all up for a fundamental rethink.

Senior executives have had the toughest of times and experienced something that large organizations abhor: a number of surprises in quick succession. Some of them have been dramatic and relentless. The deepest recession since the Great Depression has been coupled with a moral and often legal obligation to adopt an ever-evolving list of new hygiene

rules. Add to that the most serious race protests in the US and around the world since the 1960s, and the foundational principles of business seem to be shifting. There is scope to think that new rules, assumptions and a rethink of everything you thought you knew are all up for grabs. As the chorus sang in the last act of *Hamilton*, the successful hip hop musical about the American revolutionary, it's clear that we live in a world turned upside down.

**THIS NECESSITATES NEW WAYS** of thinking within a rapidly changing landscape. The companies that succeed will be those that adapt quickly, like Disney, which abandoned pre-corona plans for a theatrical release of its \$79 million filmed version of *Hamilton*, and released it direct-to-stream on July 3 to spur subscriptions to its Disney+ service.

For Edward D. Hess, the change is more like the challenge faced by our prehistoric ancestors after the rainforest dried up and they had to adapt to life on the savannah. Perhaps we don't have to go that far back for an analogy, though. Carl Benedikt Frey has studied consumer behavior in the aftermath of the Spanish flu of 1918. "Something you see from after the 1918 pandemic is that in the places that were most badly affected and where a lot of people died from the virus, you see persistent declines in social trust and interactions," he says. While some people – as many as 90% – will act as if things are back to normal, if 10% stay home, it's still a shift that will drive huge changes in society, the economy and business.

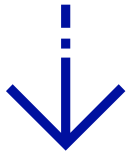
Even in normal times, such shifts are extremely difficult. "Companies are run by plans and operating manuals," says Jagdish Sheth. But now, suddenly, many of the old rules don't apply, and executives face an enormous challenge. Instead, Sheth thinks "leaders and managers need to learn how to improvise." A new ecosystem, then, with new threats – but new opportunities too.



**EDWARD D. HESS**

is a professor of business administration and Batten Institute executive-in-residence at the University of Virginia's Darden School of Business.





**IN A QUIP ABOUT** Oakland, California – “there is no *there* there” – the novelist Gertrude Stein said something that’s now equally true for business: The virtual is fast becoming the core of every enterprise, whatever business you are in. For safety, convenience and cost-saving, a cloud-based platform is now a prerequisite for facing the years ahead. “Clearly digital transformation has moved way up on the agenda,” says Rita Gunther McGrath. “Things that were on the 3-5 years plan are on the 12-18 month plan ... because businesses have no choice. They have to operate in a different way.”

Many business thinkers are now arguing that beyond enabling companies to better streamline their enterprise resource management, a digital backbone makes it possible for them to take advantage of the streams of data at every stage of business operations and give workers the tools they need

to work remotely and then reinvent themselves faster. Some companies’ business models have already become more virtual during the lockdown. Retailers, for instance, are now operating in a world where e-commerce is rapidly becoming the dominant sales channel.

In the pre-coronavirus era, virtual shopping was discretionary and physical



**RITA GUNTHER McGRATH** is a strategic management scholar, professor of management at Columbia Business School, and author of *Seeing Around Corners: How to Spot Inflection Points in Business Before They Happen*.

shopping was primarily for groceries and other day-to-day types of purchases. That has changed now, with more reliance on online ordering and delivery. Going to the store is becoming a novelty, Sheth argues, as consumers have learned over the past months to order more of their staple products online.

Services too, particularly medical services, are also moving increasingly online – and that’s a good thing. “Why should I go to the service provider? A virtual appointment saves both of us cost and time,” Sheth says. Service providers should think how they can translate as much as possible to the virtual sphere.

**“CLEARLY DIGITAL TRANSFORMATION HAS MOVED WAY UP ON THE AGENDA.”**

— RITA GUNTHER McGRATH

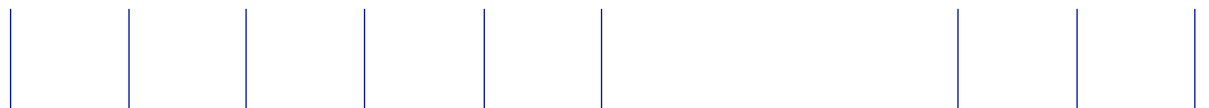


“ACCELERATE AND RESET”

01

# STRATEGY:

THERE IS NO *THERE* THERE.





02

# SALES

## BEING THERE WITHOUT *BEING* THERE.

ACCELERATE AND RESET IT

**THE AFTERMATH** of the Covid-19 pandemic will mean different things to different people in different places, speculates Steve Blank. Older people may not want to fly; younger people may not want to stay home. In the US, people in different parts of the country may also respond differently, depending on how severe the outbreak was near them. For the near future, Blank argues, marketers trying to reach consumers will need to take a narrower approach.

It is both an instinctive reaction and a gut understanding that the rules of the game have fundamentally changed and are now in the course of being rewritten. "We just ran a science experiment that accelerated remote everything by more than 10 years," says Blank reflecting on the rapid changes the pandemic has forced on our systems. Blank thinks a takeaway is that

video calls are not only a reasonable substitute for in-person meetings, but for some uses, such as market assessments, they may be even better. "I would say to everyone: All your first meetings should be online. It's not a replacement for a discovery period but boy, don't waste your time driving places."

While video calls aren't perfect, they're good enough, and a much more cost- and time-effective way to begin a sales conversation. But deeper online discussions may remain challenging for a while yet. "A big percentage

of the cues we get from meetings in person, whether they're business meetings or social, are all the unconscious physical cues, non-verbal cues that as

human beings, we're wired to understand," Blank says.

**NON-VERBAL CUES** are also environmental. "You put that in conjunction with where we're meeting – is it a strip mall or is it a great conference room on the 47<sup>th</sup> floor? What are people wearing? And there are also some theories about pheromones and smells as well – all those cues are gone."

People are also working at overcoming that hurdle [see article p. 60] and Blank is sure that the limitations will create new opportunities for companies to develop tools that can extract more information from a video call. Blank predicts software packages that interpret facial expressions will be popular and should reach the market relatively soon, given facial expression reading software exists but is yet to be applied to videoconferencing.



**STEVE BLANK**  
is a Silicon Valley entrepreneur and co-founder of the Lean Startup movement.

I WOULD SAY TO  
**EVERYONE: ALL YOUR  
FIRST MEETINGS SHOULD  
BE ONLINE."**

— STEVE BLANK



03



**THIS ALL MEANS NEW RULES** – and that, of course, means new roles. Managers are increasingly seeing their systems being run by other means, and therefore they need to put more time into their teams. The human touch becomes vital. It always was, but the emphasis will change, and with it the foundational principles of what used to be a manager's role. So, a shift from running the business to running the people who help the business (while the computers run that in the background), and on top of that being able to do so with new tools and at arm's length too. The golden rule here is to enhance your people skills; keep in touch; connect.

Despite the challenges of remote work, no one expects every office to open back up after the pandemic ends. "Dumb companies will go back to business as usual; smart companies will realize that they can reduce the cost of their physical assets and make lives easier," Blank says. With so many more people working remotely, managers will need to behave in a different way. "We are going to need a different line manager from shop floor to top floor," says Cooper. "We are going to need people who have good people skills."

**IN THE FUTURE**, he says, people skills will be just as important for managers as technical expertise. The reason is that if routine jobs go away, and working at a distance becomes increasingly easy, the premium for talent will climb.

The importance of putting the right team together for innovative, project-based work means that managers will need to get better at keeping their team happy. In Europe, if, as expected,

● **ONLY  
CONNECT.**



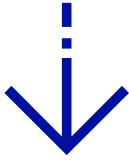
**SIR CARY COOPER**

is the 50<sup>th</sup> anniversary professor of organizational psychology and health at Manchester Business School, University of Manchester.

laws change and hiring becomes more flexible, managers will need to work harder to retain their talent – people who are good but have no strings attached to their employment will be quicker to leave if they aren't happy, especially if more work stays online. "If you see that you become dependent on a number of the short-term contract workers, and they're good, and you want to retain them, you have to treat them better," Cooper says.

**ONE CARROT THAT WILL BE** less effective: the office as a social outlet. After three months at home, many people are becoming closer to their neighbors than they were, according to Cooper, who expects the trend to continue. "We will make our friends in our neighborhood. We won't have to meet them by working long hours in an office environment," Cooper says.

In the beginning, part of this challenge will be simply learning how to communicate via a new medium. "Most executives, excepting IT, were never trained to run global operations remotely," says Sheth. "How do you read people without body language? How comfortable are you chairing meetings online?" In short: How do you think close, but act remote?



**INNOVATION DEPENDS ON** interaction, however. And you can't really get that from a video call. "How do we have the water cooler conversation?" asks Blank. "There are no real good software packages like that." Although there is some evidence that the importance of proximity has gone down in the digital era – the average distance between co-applicants on patent applications has increased enormously with the popularity of the internet, according to Frey.

Yet patent applications go down in the event of a conference cancelation, an indication that these distant partners and teams still meet physically to advance their work, Frey says. Tools like Donut.com, a startup in which Blank is an investor, are trying to find virtual



**CARL BENEDIKT FREY**  
is director of the Future of Work Programme at the Oxford Martin School and author of *The Technology Trap: Capital, Labor and Power in the Age of Automation*.

ways to compensate for the limitations of online connections. It aims to build trust and form friendships "by making it easy to launch virtual coffee or group lunches, encourage peers to meet for learning opportunities, and build important internal networks for new hires," according to the website. But

although video is good enough for an initial call, Blank says, it would be difficult to form a team online.

Blank suggests that a startup team is like a marriage: You may meet through online dating, but you will want to get to know each other in person before you tie the knot. "You could do online dating to kind of first see [if you like someone], but to establish a long-term trusting relationship, you need to have a physical component," he says.

**BEING ENTIRELY ONLINE** would, in general, be difficult for teams. "You could put together a virtual team," says Blank, "but it makes trust a lot harder and it also makes problem-solving harder." Why is that? First, because online communication has a context deficit, Blank says. Second, because people tend to be a lot less careful with their words online than in person. Blank is not the only one who foresees a continuing need for physical

ACCELERATE AND RESET



04

# INNOVATION:

SHARING THE SAME SPACE MATTERS.



05

## FINANCE

## THE VALUE OF BOUNCE-BACK POTENTIAL AND RACIAL EQUALITY.



space, despite the move to the digital sphere: Frey also believes offices and urban industrial clusters will remain important for innovation. "I think urban density has huge benefits that outweigh the cost ... innovation clusters from Renaissance Florence to Victorian Birmingham and Manchester to 20<sup>th</sup>-century Detroit to Silicon Valley and Seattle today [have always been in cities] ... knowledge-intensive industries benefit from proximity to each other."

Others have pointed to the role of proximity in innovation. Just look at UC Berkeley's AnnaLee Saxenian's analysis *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* for some insight on how real-world locality informs innovation, not least in its relationship to university campuses.

Regardless of what might be the best way of communicating or what mix of real and virtual meeting is optimal, if you have a fresh idea that fits this particular moment, McGrath says it would be foolish to wait for better conditions. "It's a fabulous time for innovation," she says. "History suggests that bad times, downturns, are often the spark for incredible resourcefulness," she adds. "We've seen that over and over again."

ILLUSTRATION: JOE MCKENDRY (1)

**MOST INVESTORS** look for companies that can boast a solid balance sheet, loyal customers and secure, resilient and probably near-shore supply chains. That last bit – namely coronavirus-resistant operations and business models – might become even more important from an investment standpoint.

At the same time, Blank predicts that private equity funds, still flush with cash, will be taking advantage of assets that were hurt during the lockdown but seem likely to bounce back. "I think they're going to be buying up all the people whose cash flow dropped off the cliff, but who have good long-term prospects," he says. While out in Silicon Valley, venture capitalists may be looking for more diversity in team

leadership, partly a response to the awareness created as a result of the recent Black Lives Matter protests.

**THINGS HAVE CHANGED** a lot in Silicon Valley over the past four decades, Blank says. "Silicon Valley 40 years ago used to be white guys in boat shoes ... There truly was a glass ceiling. If you were Asian, you were possibly the VP of engineering – possibly – at least if you were in electronic design automation of semiconductors. No other business segment had Asians ... But there's no way you'd be the CEO – they'd hire some white guy."

Now, he says, he expects that in the wake of the new racial awakening in the US venture capital firms will possibly earmark more money for teams led by people of color. It's a long-overdue corrective. There are other faultlines in business that could also now be corrected in the wake of post-corona shifts – an opportunity to correct problems of diversity and inequality as well as questions of sustainability.

**URBAN DENSITY HAS HUGE BENEFITS THAT OUTWEIGH THE COST."**

— CARL BENEDIKT FREY

# 06 IREGULATION: THE PRICE OF PROTECTION.

**POLITICIANS WILL BE** under enormous pressure to deliver more security for citizens who are feeling vulnerable, and this will likely translate into tougher enforcement of existing consumer protection laws and other regulations. Companies will need to think not just about what's most profitable or popular, but what can make the biggest social contribution, particularly with racial and gender inclusion now a high priority with the electorate, say Sheth and others.

Companies may feel particularly pushed if unemployment stays high. While some are predicting a bigger and better robot workforce, Frey believes that hard times could lead politicians to put the brakes on rapid automation. "We saw during the Great Depression, for example, that President Roosevelt in the National Recovery Act had certain limits on introduction of machinery in some industries," he explains, "and so it's possible that we may see some of that." In China, for instance, he adds, one poll pre-lockdown found that 27% of people favored policies that limit the adoption of new machinery to reduce job replacement. Several months later, that number has doubled and stands now at 54%.

**ONE MITIGATING FACTOR**, and one which could either reduce policymakers' ability to act or increase their determination, could be the amount of trust the public has in their government by the time the pandemic ends. Frey suggests that trust in government may be either higher or lower depending on how well it handled its public health management during the pandemic. "Trust in government tends to see increased support during the early days of crisis management," Frey says. "And then when people realize that things haven't been going



**JAGDISH SHETH**  
is professor of marketing at Emory University's Goizueta Business School and a noted corporate strategist.

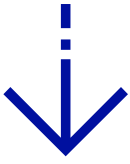
that well, trust declines very rapidly. I haven't seen any data coming out on that so far, but I would imagine that in places where the pandemic has been badly mishandled, trust in institutions might deteriorate and might also depend, to some extent, on how prominently those institutions have featured in the public discourse," Frey says. "In Sweden, for example, the Public Health Agency has been very much at the forefront of this, obviously, and they haven't handled the pandemic very well."

ACCELERATE AND RESET

# 07 SOCIAL... RESPONSIB







**THERE IS STILL MORE** to be considered in the context of the post-pandemic world. "I think two issues are coming together – the pandemic and the economic pain and on the other side we've got the social inequity and the recognition that for many of our citizens this is not an economy that is very productive or forgiving," says McGrath.

The last Gilded Age, an age when robber barons were able to extract most of the value being created, took some time for the world to overcome – and even then humanity proved to be a very slow learner. "It took a union movement, a couple of world wars and a Great Depression for us to realize that it was maybe not the best way to organize a society," she says.

Sheth argues that the response of big business has not been as strong as he had hoped. Even as government agencies, NGOs and small businesses are working hard to help people hurt by the virus, "[s]itting on the sidelines and hoping for a dole-out are the large corporations, especially multinationals. It's mind-boggling!" Companies need to think about what might

have been unthinkable before. Consider that going forward a successful company will need to think through more areas of alignment not only with employees, customers, investors and society, but even with competitors. If you need some inspiration here, think of pharma's unprecedented level of cooperation on a Covid-19 vaccine.

**FAMILIAR BOUNDARIES** are changing, with financial pressures leading to more talk of dialing back subsidies on some industries, such as oil and gas fracking in the US, even as other governments pursue direct investments in companies pursuing certain strategic goals – for example, the surprise \$340 million investment by the German government in CureVac, a vaccine startup.

Nor will the need for this level of social cooperation end with a vaccine. The Covid-19 pandemic is the first truly global challenge humanity has faced in our lifetime, but most people agree it won't be the last – and maybe not even the most serious (think climate change). More than ever, management thinkers are saying, the business of business will be about much more than business.



### AND FINALLY, IS IT TIME TO LEARN TO EARN ... AND RE-LEARN?

Most of all, our experts agree that success in the coming weeks, months and even years will depend on how quickly you can adapt to change. That might mean pivoting, or small incremental changes, but it also points toward how to learn. In the end, Hess says, we will need to develop "[a] mindset of hyperlearning: continuous high-quality learning, unlearning and relearning. The faster we accept that, the faster we can get on with transforming ourselves and our society so that we can flourish and thrive in the coming decades."

It's a good time to be bold, McGrath says. "If you accept the premise that everybody's numbers are going to be messed up and everybody is going to have a different set of things they need to worry about, I think the opportunity that you have in a situation like this is you're going to be given a lot of leeway," she says.

And now, more than ever, could offer the opportunity to turn fear and concern into positive morale. There is a unique chance to meet the decades ahead with the speed and dynamism to reset and react to the foundational principles of business that have guided us for so long. The future is there to be written.

PIVOT

TO THE

FUTURE

ACCELERATE AND RESET

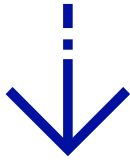
Many businesses reacted to the Covid-19 pandemic with creativity and agility. But conditions are still in flux and now is the time to start preparing for a significantly transformed landscape. Get ready to pivot to the new reality.

BY Janet Anderson



A NEW IMAGE IN AN INSTANT Fujifilm may be known for its photo products, but is also working on drugs to fight Covid-19.





**OF ALL THE COMPANIES** coming up with drugs to fight Covid-19, it's likely that you never thought that Fujifilm would have a dog in the fight. Yes, you read that right: Fujifilm. The camera film manufacturer. It's a startling thought. How did Fujifilm – a household name associated with holiday snaps – become an antiviral pharmaceutical provider? In some ways, the company's pivot from one position to another is a tale of survival and ingenuity and in others it's a story of how it shifted successfully into a new business area.

Adapting to change is a vital skill for any business, of course. Entrepreneurs Eric Ries and Steve Blank first used the term "pivot" in 2011 to describe the phenomenon they saw in the startup community – you hit a roadblock, so you change course. Move fast and break things, as the now well-worn saying

**R** goes. The term has since come to represent a skill that all businesses of whatever size aspire to. If the digital transformation had not taught us that already, Covid-19 has come along with a sledgehammer to drive the message home.

In the wake of a global pandemic, businesses have no choice but to be responsive and agile. By definition, smaller businesses with simple supply chains and flat command structures can move faster than corporate behemoths with baked-in systems, hierarchies and conventions. When the coronavirus struck, UK packaging business Charpak switched to producing personal protective equipment (PPE) for key workers

such as delivery drivers, warehouse staff and shop workers. The company began manufacturing the facial visors while simultaneously triggering its internal pandemic strategy.

Managing director Paul Smith explains: "This was a short-term project to keep sales coming in. The sales team were tasked with finding outlets for the visors and clips via email and video calls. We used materials already in stock and acquired new cartons and printed matter." The business spent about \$3,000 on development and \$5,000 on qualifying for a CE health, safety and environmental standard for the new product, which broadened potential market penetration to health services.

Visor sales plateaued as the initial race for PPE waned and was replaced by market oversupply. But this event coincided with the return of Charpak's core customers. "We can turn on production very quickly to react to demand. Our old order book is beginning to fill up. We have 90% of staff back from furlough and working to meet increased demand for packaging." It's easier, perhaps, for SMEs to make quick changes, but bigger companies can do it too. Dyson, Toyota, Vauxhall and Airbus all contributed to the drive to build more hospital ventilators; Louis Vuitton's parent company LVMH produced hand sanitizer, while Burberry made hospital gowns and masks.

**PIVOTS SHOULD NOT BE RESERVED** for times of crisis. Twitter's origins were as a podcasting subscription service called Odeo. It switched to microblogging when iTunes took a foothold in its original market. Starbucks began life selling espresso makers and coffee beans, but changed to an in-house experience after the then-CEO visited Italy and saw coffee houses in action. In the Covid-19 era it created an enhanced service for food and drinks deliveries as well as a prepay platform for smartphone orders.

Hewlett-Packard launched its first personal computer after two decades in business. Nintendo experimented with everything from vacuum cleaners to hotels before settling on game consoles. Other big pivoters include Suzuki, Wrigley, Nokia and PayPal.

**FUJIFILM IS A STARTLING EXAMPLE**, not least in contrast to its competitor Kodak, which declared bankruptcy in 2012. The story of Fujifilm versus Kodak is usually framed by one's ability to pivot and the other's failure to do so. But in fact, both saw the decline of analog cameras and film and invested heavily in alternatives; it's just that one acted swiftly and decisively, while the other did not.

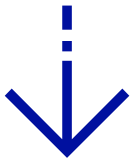
Both companies saw the potential of switching to pharmaceuticals – the chemicals used in film production can be adapted for human benefit, particularly antioxidants. But while Fujifilm focused on the Asian pharma market, Kodak made a delayed bet on digital cameras – its first prototype was in 1975 – and sold its pharma business. Digital cameras replaced film: Smartphones ultimately trumped both. Undaunted, Fujifilm continued expanding into products from flat-screens to biotechnology and, as of today, has more than 300 subsidiary operations.

Perhaps the most gut-busting aspect of Kodak's decline was that it created a website to share pictures online, but failed to see the promise of social media and didn't give it the backing to become an early Instagram. "Over the [recent months] we have seen lots of tactical adaptations," says Peter Fisk, author of several business books and CEO of GeniusWorks. "But I'm not sure we have seen many real strategic pivots, yet.

ACCELERATE AND RESET



PHOTOS: SHUTTERSTOCK/IVAN SHENETS, PICTURE ALLIANCE/DPA/JIJI PRESS/FUJIFILM CORP.



Most companies have been in survive and learn mode, rather than transform and thrive mode," he says. "Standout examples include Airbnb, as much for what they stopped doing – renting homes, booking flights – as for what they started [doing], such as at-home services, cookery and dance courses. Restaurants have generally been impressive in transforming themselves into kitchens for home delivery, street food vendors, pop-up stores and sources of inspiration online. Health care had to adapt most: GPs shifting from 2% to 98% remote consultations, repurposing of hospitals to cater for acute patients, consolidation of cancer care teams for national coverage. Many of these are likely to have permanent impact, so [they are] more like strategic pivots."

have an openness to shift and to be responsive," says Angèle Beausoleil, director of the business design initiative at the Rotman School of Management in Toronto. "It's about being prepared for something you can't control. Most of us can't control a lot, but we can control our ability to be flexible."

The biggest hindrance to innovation, she says, is the leader who cannot see beyond the company's historical success. "Success can be a noose that kills an organization because you believe the structures in which you've invested are the same structures you're

folio will make them more progressive, adapt faster to changing situations, and continually shift their core over time," he says.

**IF COVID-19 HAS TAUGHT US ANYTHING**, it is that nobody can tell you what the world is going to look like in two years from now. According to Saras Sarasvathy, professor of business administration at



**OUTSIDE THE BOX**  
From Nintendo's vacuum cleaner to Bulgari hand sanitizer and Burberry masks, survival can mean leaving your comfort zone.

ACCELERATE AND RESET IT

**A REAL STRATEGIC PIVOT**, Fisk says, is a fundamental reorientation – the business shifts to a new core from which it will eventually generate most of its income. Over the next year or two, he expects to see many more of such transformations as businesses adapt to lasting changes in attitude and behavior among customers. But how do businesses go about doing this? How can they Fujify themselves? What are the steps they should take and what are the pitfalls to avoid?

The first step is to learn to think of pivoting as a process, not a result, and to accept that when you start, you won't know exactly where you are going. "The art of the pivot requires you to feel that while you are not fully prepared, you

going to need to continue to offer a product or service that customers still value." Like Kodak, you would be continuing to offer the best camera film in the market as your customers go digital.

For Fisk, this implies a transition to business models that permit experimentation, diversification and a multi-pronged attack in which businesses can intensify or mothball operations in response to market change. "Over time, companies should develop a much richer range of business options from products and services to alternative business models and entire new businesses: a portfolio of current and future businesses, if you like. Having this port-

the University of Virginia's Darden School of Business, it is possible to make decisions while accepting this fundamental unpredictability.

Her 2001 study of high-performance entrepreneurs led her to propose the effectuation theory of entrepreneurship. She found that expert entrepreneurs make decisions under uncertainty without using prediction at all. She argues that rather than starting by asking yourself what you think will happen and then placing a bet on it, you should instead start by asking what are the things



that are reasonably within your control and what are the things that are probably not within your control.

The next step is to then ask what you can do, but more importantly, what you can do together with other people. Each step opens up new paths. "It may not seem very visionary. You're just looking at things you can change and the people around you, and how you can get together and do something," she says. How effective these conversations are depends on you keeping an open mind to the role others could play and listening to their ideas. An existing supplier could become a business partner or even a customer.

**SURVIVING MEANS** reconnecting with the market, understanding what has changed and engaging with the new priorities. "You need to reinvent aspects of your business and utilize your assets and capabilities in new ways to develop new solutions that respond to these changing needs," says Fisk. The future may not be predictable, but it is formed by our choices and action, argues Sarasvathy. "Never fall into the trap of thinking that the future is formed through changes in technology or regulation or demographics. All of that is useful information, but the future comes from what we actually do with that information," she says.

Remember also that it's never too late to take action. In 2019, seven years after its bankruptcy, Kodak diversified into printing, software, audio products, drones, apparel and ... puzzles. The company's turnover last year topped \$1.2 billion, with net earnings of \$116 million. And more recently, it is now also joining the race to devise an effective treatment for Covid-19, producing some of the pharmaceutical ingredients that might be needed. Photos can fade away, but a decisive pivot can secure your future. ■

PHOTOS: COURTESY OF BEFOREMARIO.COM, COURTESY OF LVHM | ILLUSTRATION: JOE MCKENDRY



## How to reposition for uncertain outcomes

BY **Bill Fischer**

**COVID-19 HAS TAUGHT** us all one thing: We are now in the world of the unknown. In the past, things might have been uncertain in your business. In the uncertain, even if there are variables at play, things are familiar. But in the unknown, it's another matter: There is little or no familiarity, no prior experience, no confidence in your stockpile of knowledge.

Pivoting in the unknown is dangerous. There are no maps, no markers, no reliable insights. Worse still, the unknown becomes the largest part of our foreseeable future. So how can you be confident to pivot correctly? How will you get the right direction at the right time, with no map?

Here's a solution. Think of the challenge differently. Let's liken a pivot of a large, complex organization to that of re-directing an ocean liner. If you only have one object to move, but you get it wrong, you're

sunk. So, don't take up such a constrained position in the first place. Putting everything on one bet – or one change of direction – is madness. But placing many small, experimental bets, each run by autonomous, value-sharing microenterprises to see what floats (and what doesn't) will give you a much better chance of success.

Ignore all talk of focusing on your core. It's an error. Who cares what your historical core is? The real question is what might work in the future? A core can be a legacy asset that simply constrains rather than enables. Stop thinking from the inside out; "outside-in" must become your mantra from now on. You can't make the market fit your core – and Covid-19, and all the other unknown things it will bring, doesn't care about that either.



**Bill Fischer** is professor of innovation management at IMD and a member of the Thinkers50 Hall of Fame.

ACCELERATE AND RESET

Genetically speaking, we're still close to our Stone Age ancestors. But technologically, we are preparing to fly to Mars. Between rapid acceleration and stubborn standstill, somehow we have to manage without getting torn apart. We, the people. We, the economy. We, the society.

BY **Detlef Gürtler**

ILLUSTRATIONS BY **Mathis Rekowski**

|| ACCELERATE AND RESET ||



# DO WE NEED A SPEED LIMIT FOR CHANGE?



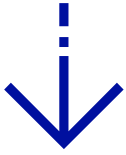


**G**eological processes aside, the slowest speed of change we can observe is the one happening inside our cells: Genetic evolution is slooow. Sure, mutations are happening all the time and all over the place – their number and pace growing in line with the population, as the geneticists Robert Moyzis and Eric Wang recently discovered. But to become a persistent and widespread feature, such a mutation must offer a selective advantage: Either from a sex appeal or procreative angle (you get more children than without the mutation), or from one of survival (others die before you do).

The procreative or sex appeal part of change often goes step by small little step: We now have, for example, smaller teeth than our Stone Age ancestors – an indication that it has become less and less interesting to choose fierce, aggressive-looking males. The survival part leads to major, less frequent changes. Take humanity's latest genetic disruption: A mutation that arose about 8,000 years ago in northern Europe enabled lactase persistence. People whose DNA shows this mutation can digest lactose (the main sugar in milk) not only as babies, but also as adults. If you keep cattle herds, this mutation opens up an additional source of nutrients and helps to survive famine. About two-thirds of all Europeans have the gene responsible for it in their DNA – but less than 15% of all Chinese.

**THE FAMINE ASPECT POINTS** to one of the most persistent – and for our purposes, perhaps the most interesting – features of change: It speeds up when disaster strikes. When does it really make a difference whether you can run 2% faster than the others? When a lion is chasing your tribe. When does it really make a difference whether your company's financial reserves are 10% bigger than others? When your industry is in lockdown.

And the cattle-keeping aspect points to the most unique feature of human change: Almost all of the changes we experience today are not driven by nature, but by culture. Cultural change is by order of magnitudes bigger and faster than the adaptations or mutations we see in our DNA. So, culture means speed. Or better, speeds. That's because not all areas develop at the same pace. "Modern humanity is distinguished by Paleolithic emotions, medieval institutions like banks and religions and God-like technology," the →



US biologist E.O. Wilson noted. The speed differences between technical, economic and social progress have never been greater than they are today. Exponential growth (like Moore's Law) meets traditional order (like the rule of law), digital disruption meets straight-line depreciation method – sooner or later, something's got to give.

The most frequent result of those varied speeds in different sectors of economy and society is, of course, a mixed one: New technology doesn't spread as fast as it could because people and companies need time to adapt and adopt. That, by the way, hasn't changed whether you're talking about cars, computers or credit cards – people change slower than inventors imagine. For every new technology, it takes decades between breakthrough innovation and broad adoption – one or two generations of cautious parents and curious kids.

**BIOLOGICALLY OR TECHNOLOGICALLY**, the time that passes between two generations is a good measure for the speed of change. Not the whole lifespan: The question isn't about how old a man, a car or a mobile phone gets, but the span until the next generation arrives. How much time lies between Baby Boomers and Generation X? 15 to 20 years. How much time lies between two generations of the VW Golf? 5 to 10 years. How much time lies between two generations of iPhones? 1 to 2 years.

As long as we are in the sex appeal part of economic change, there's no speed limit. The decisive element is sales: If people today want to buy something different from yesterday, then so be it. This can be a matter of technology, as with mobile phones, or a matter of style, as in fashion. Haute couture presents two new collections each year, fast-fashion chains like Zara or H&M opt for monthly changes. Yes, there may be competitors that can't stand the pace – and the revenue and the jobs they end up losing are absorbed by the winners. But as long as there are clients demanding something new, the sales feed the change.

So, no sales = no change? Erm, no. This is where we look at the survival side of change – and at the global economy of 2020, rattled by the coronavirus pandemic. The outlook looks grim in aggregated numbers: In many countries it is the



**"MODERN HUMANITY IS  
DISTINGUISHED BY  
PALEOLITHIC EMOTIONS,  
MIEVEAL INSTITUTIONS AND  
GOD-LIKE TECHNOLOGY!"**

biggest and fastest economic disruption since World War II, with global GDP shrinking about 5% according to IMF projections and even more than 10% in some European and Latin American countries. The only major country still in positive terrain is the one where the pandemic started: China with a projected GDP growth of 1%. And for some, it is not about numbers, but about existence. Covid-19 has extinguished whole industries, corporations and business models. Or if not already, soon. "We spent 12 years building Airbnb's business and lost almost all of it in the matter of four to six weeks," says Airbnb co-founder and CEO Brian Chesky. "Travel as we knew it is over. It





*FROM WOODEN CLUB TO CODE Humans have eventually adapted to the changing weapons of competitive advantage.*

and revenue experienced by losing industries are in no way compensated for by the gains in winning industries. That's the big difference to changes that occur in sex appeal mode. It's also highly influential for the course of the change because this is not just an economic competition. It's politics.

**"MAN MUSS DIE MENSCHEN MITNEHMEN"** – "You have to take the people with you" – was a pillar of the political philosophy of Gerhard Schröder, German chancellor from 1998 to 2005, and the meaning boils down to whatever changes are inflicted upon a society, they shouldn't overwhelm the people living in it. So, yes, there's a speed limit for change, definitely. But, no, it cannot be written out as a simple number.

While Germany is famous for being the only country without a speed limit on highways, it's also famous for rather rigid speed limits on change – when they are in any way connected to job losses, that is. Its non-competitive coal industry was allowed to survive on subsidies for more than 50 years until 2018. Massive job retention schemes during the financial crisis of 2008-09 and the coronavirus crisis of 2020 helped to prevent, or at least postpone, layoffs. It's an example that has been followed almost everywhere in Europe this time. And it's a great way to get over short-term hiccups in the economy. But not so much when it comes to structural disruptions. In 1990, the East German economy collapsed during the country's reunification process. Job retention schemes "saved" millions of jobs, though there was nothing to do at these former workplaces – and the former status quo would never return. It was like trying to reduce the speed of change after a hurricane.

The country best known for high-speed change has always been the US. Its main instruments for fostering this change are highly competitive financial markets. They direct the capital to where it's best used – a great tool for Silicon Valley-style disruptions. So when the global economy gets out of survival mode once again and back into sex appeal mode, the US will have a huge competitive advantage for whatever new development may arise. Although, that's assuming it is a "when" and not an "if" ...

ACCELERATE AND RESET

doesn't mean travel is over, just the travel we knew is over, and it's never coming back." How on earth shall the cruise ship industry recover, or entertainment parks, music festivals and trade fairs?

**PERHAPS THEY CAN'T** – and perhaps something and someone else will take their place. Deep crises often help to speed up disruptive change. Take, for example, the budget earmarked by a manufacturer to communicate and present innovative products. The lion's share has always been eaten away by trade fairs and industry gatherings: You have to go where the important people are, with overpriced event tickets, travel and accommodation. Always a pain, but there simply was no alternative – and for the alternatives that were there, there was no budget. Now that fairs and events have stopped taking place, these alternatives hog the spotlight. Sophisticated 3D technology can, for example, bring your new products into the home offices of those (still) important people. It may soon turn out that this is money better spent than on the inflated room rates you pay for substandard hotels during a trade fair.

So there's an upside to a survival mode change: Disruptive innovations get better, faster traction. But there's a heavy downside: The losses in jobs

161

The number of US bankruptcy cases between March and July 2020 that cited Covid-19 as a factor.

1

The number of economies projected by the IMF to show positive growth in GDP in 2020: China.



QUALITY ASSURED  
*A worker inspects  
a part in Fictiv's  
Guangzhou office.*

ACCELERATE AND RESET

# FAST SUPPLY ON DEMAND





**The coronavirus outbreak has exposed the flaws in some supply chains. When things go wrong, they can go very wrong – with factory closures and transport disruption leading to product availability grinding to a halt. The solution? Find a smart way to source. Say hello to the uberization of manufacturing ...**

BY *Jessica Twentyman*

**R**ecent disruptions caused by the coronavirus pandemic might have hit Warwick Acoustics harder had the company not already made significant steps to diversify its supplier base. The award-winning sound quality of the company's headphones and in-car audio systems relies on numerous components, many from third-party, specialist manufacturers. Transportation to the company's UK headquarters took time. Language barriers were often a sticking point. And, buying in smaller volumes, it often had to fight to get its orders prioritized. Now when the company's Chief Mechanical Engineer Ben Lisle needs a part, he uploads its specifications as a computer-aided design (CAD) file to an online manufacturing platform, 3D Hubs, which matches the order with pre-vetted manufacturers able to fulfill it at a given price based on specialization, location and speed.

Once the supplier is selected and the order placed, Lisle can hop online to get updates on its progress. It's similar to how Uber matches people with drivers. The result? Warwick Acoustics can now source parts more flexibly and has been able to shift to a more European supplier base and get its

*THE SUM OF ITS PARTS  
The UK's Warwick Acoustics creates its award-winning headphones from multiple 3D-printed layers.*



hands on components "quicker, cheaper and with far fewer headaches than before," says Lisle.

It's not just small companies gravitating to online manufacturing platforms, referred to as "manufacturing-as-a-service," or MaaS. Users of Amsterdam-based 3D Hubs include Swiss-Swedish industrial giant ABB, carmaker Audi and US space agency NASA. US-based competitor Xometry lists BMW, Bosch and General Electric on its customer roll call, and CEO Randy Altschuler claims that 40% of the Fortune 100 companies have used its platform. While vetting processes will differ, 3D Hubs asks manufacturers to fulfill multiple test orders. "They've all gone through a very thorough onboarding process that typically includes an actual site visit, an inspection of the factory and an in-depth audit of their quality assurance and quality control processes," says 3D Hubs CEO Bram de Zwart, who explains that continuous assessment is part of their program.

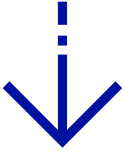
**INVESTORS SEE THE POTENTIAL:** In 2019, they pumped some \$73 million in funding into 3D Hubs and Xometry. San Francisco-based rival Fictiv, meanwhile, received a \$33 million investment round. And the reach of these firms is already impressive. 3D Hubs has 240 manufacturing partners and has been used by 35,000 businesses to order more than 4 million parts and products since its 2013 inception. Meanwhile, US-based Xometry's December 2019 acquisition of Munich-based platform Shift saw the company expand into 12 new countries and increase its worldwide network to over 4,000 manufacturers.

Most of the platforms also aim to offer as wide a supplier base as possible – as well as many different processes – because of the value in being able to pick and choose according to cost, speed and quality criteria for a specific order. Moreover, on-demand manufacturing platforms bring a much-needed dose of digital efficiency and transparency to the relationships between original equipment manufacturers (OEMs) and third-party suppliers. OEMs have long relied on other companies to supply components and parts they need. But overreliance and longstanding relationships mean OEMs may not get the best price available. It's time-consuming to seek out new suppliers – and smaller suppliers often lack the resources to get OEMs' attention and bid for business.

The Covid-19 pandemic has also amply demonstrated that on-demand manufacturing platforms offer OEMs valuable ways



ACCELERATE AND RESET IT



to navigate disruption and mitigate its worst effects by enabling them to quickly identify alternative sources. For example, when the outbreak hit, the Xometry platform saw an influx of entirely new customers: health care providers looking to source personal protective equipment (PPE). Likewise, it also saw an upsurge in orders from existing manufacturing customers that were looking to switch their existing production processes in order to make PPE and ventilators instead.

**THE TECHNOLOGY THAT** matches buyers to suppliers – and rerouting of orders – is very much akin to the technology that matches Uber passengers with drivers. In the words of Fictiv CEO Dave Evans, "It is hardcore Silicon Valley software, based on artificial intelligence and machine learning. That's what's under the hood here." In other words, on-demand manufacturing platforms are replacing what might have once been largely manual, time-consuming work with computer-enabled automation. "Automation enables products and parts to be made when they are needed and where they are needed – often very close to the OEM, so they are minimizing the time they have to wait to put parts into production and the amount of inventory they need to hold. That's going to make a lot of sense, because it's a far more efficient model," says 3D Hubs CEO Bram de Zwart.

This AI technology goes further than matching and pricing jobs, de Zwart stresses. "It's also a question of manufacturability analysis, because our technology can look at a CAD file and offer suggestions of different ways to make it," he says. For example, 3D printing may offer an alternative that the OEM hadn't even considered. So these platforms can help manufacturers explore better, faster or cheaper ways in which their vital components might be built, based on automatic analysis of a 3D CAD file and without having to make capital expenditure investments in new, unfamiliar equipment in-house. As Altschuler puts it, "Even at the biggest companies in the world – at BMW or Bosch – engineers might not be clear on the best way for their suppliers to manufacture a part. And that's understandable, given the speed at which new manufacturing approaches like 3D printing are developing.

**PRECISE INPUT**  
 Founded by Dave and Nate Evans (pictured right), Fictiv uses computer numerical control (CNC) machine processes (above).

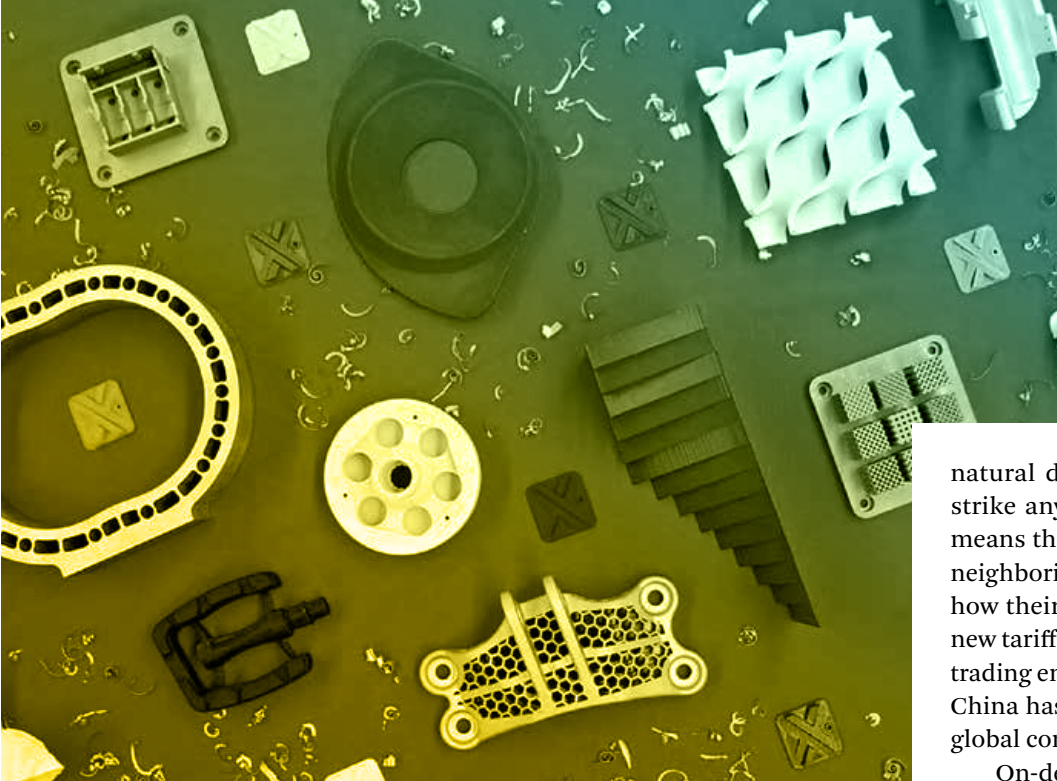


**"IT IS HARDCORE  
 SILICON VALLEY  
 SOFTWARE, BASED  
 ON ARTIFICIAL  
 INTELLIGENCE AND  
 MACHINE LEARNING."**

— DAVE EVANS, CEO OF FICTIV







#### FLEXIBLE ADVANTAGE

*MaaS technology can suggest ways to make parts that an OEM may not have yet considered.*

For a particular part, order or assembly, they may have stuck in the past to tried-and-tested methods from established suppliers, but there's often a better way now, and what we do is alert them to that."

**THERE'S ALSO A SUSTAINABILITY ANGLE** to consider here, according to Michael Mandel, chief economic strategist at Washington DC-based think tank The Progressive Policy Institute and senior fellow at the Mack Institute for Innovation Management at the Wharton School. "Manufacturers reach out to suppliers 10,000 miles away and it involves shipping product long distances across carbon-intensive transportation networks," he says. "On-demand manufacturing platforms could potentially provide a massive boost to the environment, because they're providing companies with information they need on more local suppliers that could enable them to make better decisions."

That, in turn, plays well with the wider trend of reshoring – a debate that is receiving new attention since coronavirus has refreshed boardroom minds on the very real risks posed by supply chain vulnerabilities. Many business leaders have concerns around the quality issues and transport costs associated with outsourcing to low-cost economies and the economic benefits of doing so have, in many cases, dwindled as wages have risen in those regions. A more local supplier base now has much to recommend it, says Mandel. At the same time, plant floor machinery that has already been installed worldwide, and which might otherwise sit idle, gets put to work.

Business leaders might also consider that a global pandemic isn't the only "black swan" crisis event they may face in future. Political uncertainty,

natural disaster and climate-related chaos can strike anywhere, at any time. In Europe, Brexit means that manufacturing bosses in the UK and neighboring countries will be forced to figure out how their supply chains must change in light of new tariffs, new regulations and a new, unfamiliar trading environment. In the US, the trade war with China has already had an impact on the nation's global competitiveness.

On-demand manufacturing platforms could provide solutions. In some cases, they already are. At Pittsburgh-based Hebi Robotics, co-founder Dave Rollinson describes last year's trade problems with China as a "dress rehearsal" for coronavirus, in terms of accessing vital components it needs to build its robots. Over the past two years, he says, Hebi Robotics has used Fictiv to source some 14,500 parts, including custom-machined gears and injection-molded housing for those gears. In short, ongoing, worldwide disruption will call for new approaches to sourcing. As Altschuler at Xometry puts it: "I think it's safest to assume that, as there are more black swan events around the world, your traditional supply chain just isn't going to work. That's unacceptable – and it absolutely doesn't need to be this way."

The question as to whether this will disrupt traditional manufacturing remains open. But for now, the answer seems to be: not yet. Although Mandel notes that the new platforms are attractive to investors "because they are collecting data that attacks a fundamental inefficiency in manufacturing today: a lack of shared knowledge about the best ways to make things at the right cost." After all, what's needed by manufacturers, says Mandel, is not just new resilience, but new innovation. "This should be the model for 21<sup>st</sup>-century manufacturing. Resilience is about a platform with the smarts to tell a manufacturer, 'Why source from there, when you can source from here?' And innovation is about enabling that manufacturer to focus its talent and expertise on product development because if they don't have to worry about where parts and components are made, they can focus their energies on building a much better product in future. And that's good for them and good for their customers." ■

# 86%

The percentage of respondents to a Fictiv-sponsored study that see supply chain resilience as either "critically" or "very" important.

# 61%

The percentage of respondents to the same study that think Covid-19 will be looked back on in five years as having a positive impact on innovation.

# HOW TO FUTURE- PROOF YOUR COMPANY

It's time to ramp up your tech and digital plans – not cut them back. If you want to do more than survive, and rather thrive on the other side of this crisis, try following these three practices.



BY  
**Saikat Chaudhuri**

**D**URING TIMES OF ECONOMIC SLOWDOWN and uncertainty, firms inevitably face pressures to reduce costs and focus on the near term. It is tempting to put new or ongoing investments – such as ones driving digital transformation and innovation – on the back burner. Yet, it is those very initiatives which will ensure survival and a healthy future. Companies aspiring to come out ahead will need to prioritize digitalization and technological innovation. It is those areas which will provide new sources of competitive advantage and it is already obvious that the crisis will only accelerate the technology-driven disruption underway.

For instance, retailers are not only forced to, but are profiting from, ramping up online sales – even as brick-and-mortar revenue has plummeted. It is hard to imagine a post-Covid-19 world where the ratio shifts back, even though in-store shopping will likely not go away. Even in the pharmaceutical industry, where drug development takes several years due to the reliance on proven combinatorial



chemistry-based techniques, big data analytics and AI are now making rapid inroads as companies race to come up with a Covid-19 vaccine in record time. Note here that it is not just investments in product innovation, but often process or business model innovation which hold the key. So how should companies approach investing in future-proofing digital transformation and technological innovation initiatives, amid the current cost pressures? Here are three practices that can help to assess, justify and implement such measures.

**FIRST, FRAME THE INVESTMENT DECISION** in terms of a strategic opportunity as opposed to just a cost. Could the investment provide the company with a competitive advantage, an enhanced market position or an ability to grow an emerging business? Might it provide a product or service considered table stakes to remain a relevant player, or even provide potential for differentiation and hence add to the top-line revenue or margins? Where the answer is yes, it is important to forge ahead.

For example, Disney's push into streaming at the end of 2019 couldn't have been better timed, occurring just before the pandemic struck (although they didn't know it at the time). In the work-and-play-from-home confinement that has followed, the streaming media market has soared. Now, as their theme parks remain closed – or open to limited demand – and movie theaters remain shut, doubling down on the Disney+ service will enable the streaming business to dramatically scale faster than ever anticipated and accelerate Disney's rise as a formidable competitor to Netflix, which has been disrupting so much of the media and entertainment industry.

**SECOND, LEVERAGE THE CRISIS** as a catalyst for internal transformation. Making future-oriented investments in innovation-oriented and digital transformation initiatives now is also more valuable for another reason. Creative destruction and fundamental change are often easier to orchestrate during times of crisis. In times like these, organizational inertia and resistance typical of incumbent firms wanes.

For Disney, it would have been more difficult to devote disproportionate resources towards its fledgling streaming units while visits to its theme parks and movie theaters were booming. But it has been evident for a few years now that the future of entertainment delivery lay beyond the parks and traditional broadcasting – not acknowledging that would pose an increasing threat to the company. So

doubling down on investments into Disney+ at this juncture enables that business to assume substantial significance – and it will be instrumental in transitioning Disney to an entertainment powerhouse fit for the decades to come.

**THIRD, DRAW ON EXTERNAL SOURCES** of technology and innovation, including partnerships and acquisitions, to obtain the needed capabilities and limit the cost exposure. Engaging in partnerships and outsourcing can defray expenses and risk while giving access to the upside potential – with the benefit of speed. Whether it's Pfizer with BioNTech, AstraZeneca with Oxford labs, or others, many of the major pharma companies in the race for developing a Covid-19 vaccine are tying up with smaller biotech startups or academic institutions – with the latter performing the R&D, and the former facilitating clinical trials, sales and eventual distribution.

Acquisitions offer an even more powerful means to quickly gain novel technological expertise, strengthen competitive positions and drive forward strategic transformation, though at higher cost and risk in the short run. Market leaders in the high-tech sector such as Microsoft, Cisco, Intel, Google and Amazon all purchased prominent startups in 2020 to continue to remain at the cutting edge and consolidate their positions ahead of their competitors. Other firms have been using acquisitions to accelerate their reinvention for a more online-delivered world – including credit card issuer Mastercard's buyout of fintech Finicity and Uber's purchase of food delivery rival Postmates.

While every crisis brings challenges, it also provides opportunities. Taking advantage of those through smart investments in future-oriented areas like digitalization and technological innovation can pave the way for not only survival, but also a thriving new era of growth on the other side. The key is the right mindset and approach. ■



## Saikat Chaudhuri

is executive director of the Mack Institute for Innovation Management, a research institute at the Wharton School of the University of Pennsylvania, where he serves as adjunct professor of management. His research is focused on high-technology mergers and acquisitions, high-end outsourcing, and technological innovation in dynamic environments.

# ROBOTICS



*STATE OF THE ART  
An Ubtech Cruz  
robot checks visitors'  
temperature and  
mask compliance  
at the UCCA  
Gallery Beijing.*



## The Covid-19 crisis has boosted health care automation in China and around the world as patients and professionals embrace the potential for safer, reduced-contact hospital visits. As manufacturing ramps up, industry experts are already looking to the next wave of robot applications.

BY **Henrik Bork**

**A**t the Huoshenshan Hospital in Wuhan, which literally translates as Mount Fire God Hospital, a robot cruises down the corridor. The high-tech device, donated by the Orion Star company in Beijing, bears more resemblance to a refrigerator on wheels than the futuristic robots that populate science fiction films: At its top end, two sensors blink like a pair of eyes while below a wide slit seems to give off a friendly smile. A nurse wearing a protective mask receives laboratory results from her new colleague, which "he" has just obtained from the ward. She then sends him to another ward on the right with some medication – one more nursing chore that can be done without calling on flesh-and-blood personnel.

It's February 2020 and the entirety of the Huoshenshan Hospital on the shore of Zhiyin Lake has been built within the last few weeks to accommodate and treat patients infected with the dreaded coronavirus. The whole world saw the pictures: A swarm of excavators appeared on a green field, their arrival followed literally weeks later by the doctors and nurses of the People's Liberation Army – and the robots. Just two months later with dwindling patient numbers, the hospital closed.

At the height of the epidemic, hospitals throughout China were the first port of call for the sick. At the same time, they became dangerous epicenters for the further spread of infection. Liang Wannian of the National Health Commission in Beijing told reporters on February 24 that China already had more than 3,000 members of medical staff infected with the coronavirus. "Just a year ago, we had a rather difficult time selling our robots in hospitals," says Wang Bing, chief strategy officer of Beijing Orion Star Technology Co, Ltd. "Doctors



**Dai Zhendong is clear about why robots have a big future in medicine: Their "hands never tremble."**

are very busy. They often lack the time to learn something new, to deal with a new tool. Before the epidemic, they didn't think they needed to use something like a service robot in the hospital." That has now changed. "During the crisis, everyone was happy to see our robots. Not only do they save doctors and nurses time and relieve them of work, but they can also actually save their lives by protecting them from infection," says Wang. "We have a much easier time now."

It is a trend that can currently be observed worldwide. "The demand, especially for service robots, has risen directly in the wake of the coronavirus epidemic," says Susanne Bieller, secretary general of the International Federation of Robotics (IFR). However, it may take a while before reliable figures are available. "Our members now have their order books full, but first they have to work through this," says Bieller.

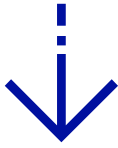
According to Bieller, one thing was certain by the summer of 2020: The demand for robots of all kinds was "already rising noticeably again" and the robotics and automation industry could look forward to a faster post-coronavirus crisis "restart"

than other industries. She lists delivery robots such as the Orion Star robot with a 30-kilogram load capacity, disinfection robots, reception desk robots and communication robots that enable initial conversations between a doctor and an infected patient as those among the most popular models.



**INTELLIGENT PATROL**  
*An Ubtech Aimbot monitors temperatures at the Wuhan Central Hospital.*





**WIRELESS AT WORK**  
*The AirFace 5G robot allows doctors to remotely view patients in isolation wards.*



ACCELERATE AND RESET

At the Third People's Hospital of Shenzhen in southern China, three different types of robots manufactured by Ubtech Robotics have been in use since the coronavirus outbreak began: The "Aimbot" monitors the temperature of patients and medical staff indoors both automatically and remotely; the consultation robot "Cruzr" enables dialogues between doctor and patient without the need for physical proximity; and "Atris" can be sent to patrol a mall, a hospital or a company lobby to monitor whether everyone is wearing a mask.

But the change that's currently taking place in the minds of many could prove to be what's most important in the long run. The coronavirus crisis is, in many ways, giving robotics an indirect boost in the service and industrial sectors. Companies worldwide experienced a partial collapse of their supply chains due to the lockdowns in February and March of this year and are now thinking about "reshoring," says Susanne Bieller of IFR. This is leading to a desire to have individual production steps closer to the core business again.

From an economic point of view, however, many companies in countries with relatively high wages could only manage this "if they used more automation," Bieller says. But nowhere else in the world is currently seeing as much investment in robotics and automation as China. "The speed in China is impressive," adds Bieller. This was the case before the pandemic – now it's accelerating. China's government has announced that it will focus around \$500 billion of its coronavirus crisis stimulus package for the manufacturing industry on robotics and digitalization. Instead of pouring concrete into new bridges, docks and aircraft terminals – as was the case after the Global Financial Crisis of 2008-2009 – this time the communist state and party leadership is deliberately investing a considerable sum of the aid package aimed at its domestic economy into future technologies.

Although robotics is a top investment priority, fields such as artificial intelligence, autonomous driving, 5G, data centers and digital health care are

also high on the list. The party is bundling all these fields together under the heading of "new infrastructure" and is looking to make China the world market leader in as many of them as possible. "I think that digital solutions in the health care system will now become established in China even faster than before," says Su Jianbo, a robotics professor from Shanghai Jiaotong University. The focus on a "new infrastructure" was important here, but not the only factor. "Our country is large and full of resources, but they are geographically very unevenly distributed." The first pilot projects with enormous potential for the future – for telemedicine in surgical operations, for example – are already underway between universities and specialist hospitals in major cities such as

16

The number of countries using robots for public safety and non-clinical public health uses by April 20, 2020.

"OUR ROBOTS CAN DECIDE FOR ITSELF WHETHER A ROOM SHOULD BE DISINFECTED."

— SU JIANBO, CO-FOUNDER OF SHANGHAI LINGZHI TECHNOLOGY CO LTD.





**REMOTE CONTROL**  
A tablet computer is used to operate a disinfecting robot in use at Renmin Hospital, Wuhan University.



**UNDER WATCH**  
The Shanghai First People's Hospital has featured a 5G remote fever clinic since June 2020.

demand will at least double annually from now on," says Orion Star's Wang Bing.

The potential of robots in medicine isn't limited to service. "The potential applications for robots in medicine are very diverse," says Dai Zhendong, who teaches robotics at Nanjing

University of Aeronautics and Astronautics. One reason is quite simple: "Robot hands never tremble," says Dai. This is one of the reasons why the da Vinci robotic surgical systems made by US company Intuitive Surgical are becoming increasingly popular in China, says the professor.

Precise usage of scalpels and needles is often easier with mechanical support, and so Dai predicts a great future for robots even in tra-

ditional Chinese medicine, like acupuncture. But the applications will take hold at different speeds. "In the field of surgery, diagnosis and treatment are very difficult with robots or via digital platforms," says Dai, who spent two years researching bionics at the Max Planck Institute. "In dermatology, however, digital solutions are easier to implement. My wife is a dermatologist and she regularly helps Chinese patients in remote areas of the country via the internet," says Dai. Inspired by his experiences in Germany and at the Fraunhofer Institute, he joined forces with the city of Nanjing to found an institute for applied bionics research: the Institute of Bio-inspired Structure and Surface Engineering. "Robots," he says, "have a great future. And we are only at the very beginning." ■

ACCELERATE AND RESET IT

Shanghai and Beijing and hospitals in remote western provinces of China.

Su isn't just involved with robots in the classroom – he is also co-founder of Shanghai Lingzhi Technology Co Ltd. which produces disinfection robots. During the crisis, his startup distributed several robots to hospitals in Wuhan, where the virus originated and where hospitals had to cope not just with a flood of infected people, but also those concerned that they might be. "Our robot can decide for itself whether a room should be disinfected by spraying hydrogen peroxide or by UV radiation," says Su Jianbo. This allowed hospital administrators to control the intervals and time periods of the operations, he says.

The Chinese Institute of Electronics estimates that the market for service robots will grow to a volume of around \$5.7 billion this year in China alone. Orion Star, whose investors include Cheetah Mobile, a successful mobile internet company, has already sold more than 10,000 service robots in about 18 months, according to its own figures. "I estimate the total market demand in China at 20,000-30,000 robots per year and I think that this



20x

The increase in efficiency using an Ubtech Aimbot to monitor human body temperature in crowds compared with manual scanning.

# VIRAL CULTURE

## ARTISTIC EXPRESSION IN THE CORONA ERA

Artists reflect the world around us. But for many, when the pandemic hit, the world shrank to just four walls. Creativity was no longer only about *making* art: It was also about how to get that art in front of an audience.

ACCELERATE AND RESET



PHOTOS: LAIF/REDUX/RE/THE NEW YORK TIMES/ALEX WELSH, SCREENSHOT



## WORKING ACROSS PLATFORMS

→ THE NEW HOME THEATER

Los Angeles-based Thomas Wesley Pentz – better known by his stage name Diplo – was one of many musical artists who took to live-streaming sets from home after the lockdown began. Reaching out to fans over YouTube, Instagram and Twitch, the DJ, producer and lead member of Major Lazer said he was "having the best time ever."

// ACCELERATE AND RESET //







|| ACCELERATE AND RESET ||

## BREAKING RULES – TO ASK OTHERS TO FOLLOW THEM

→ A MESSAGE SENT OUT OVER INSTAGRAM

In July, British street artist Banksy stepped onto the London Underground with a small team dressed as a clean-up crew and proceeded to spray-paint stencils of rats struggling with hand sanitizer and face masks onto the walls of the train. Transport for London removed the work quickly citing a strict anti-graffiti policy, but a video of the action posted to Instagram sent a message around the world with the caption: "If you don't mask – you don't get."





## A SHOW OF THANKS, AND OF STRENGTH

→ BALANCING HOME LIFE AND ART

Dancers from the Ballet de l'Opéra de Paris offered their gratitude to workers on the front lines of the pandemic with a video that took viewers into their homes and straight to the heart of a struggle shared by so many – finding the strength and balance to navigate the demands of professional life from within one's own domestic sphere. The video, choreographed to *Dance of the Knights (number 13)* from Prokofiev's *Romeo and Juliet*, follows the dancers as their own rooms, furniture and families become the backdrop for a story that is still unfolding.



/// ACCELERATE AND RESET ///



## SENDING OUT A SIGNAL

→ A CHANCE TO SPREAD JOY

Ranked the 11<sup>th</sup> best DJ in the world according to *DJ Mag*, DJ Alok did more to surprise his fans during the lockdown than showing up to stream as his own character in *Free Fire*, 2019's "best popular game" on Google Play. The São Paulo resident also created a light show as part of his livestream-from-home series of web and social media broadcasts that left fans wondering if it was real. He said he wanted to "bring a little joy to the people who are at home ... to send a message of hope, that everything will be all right."

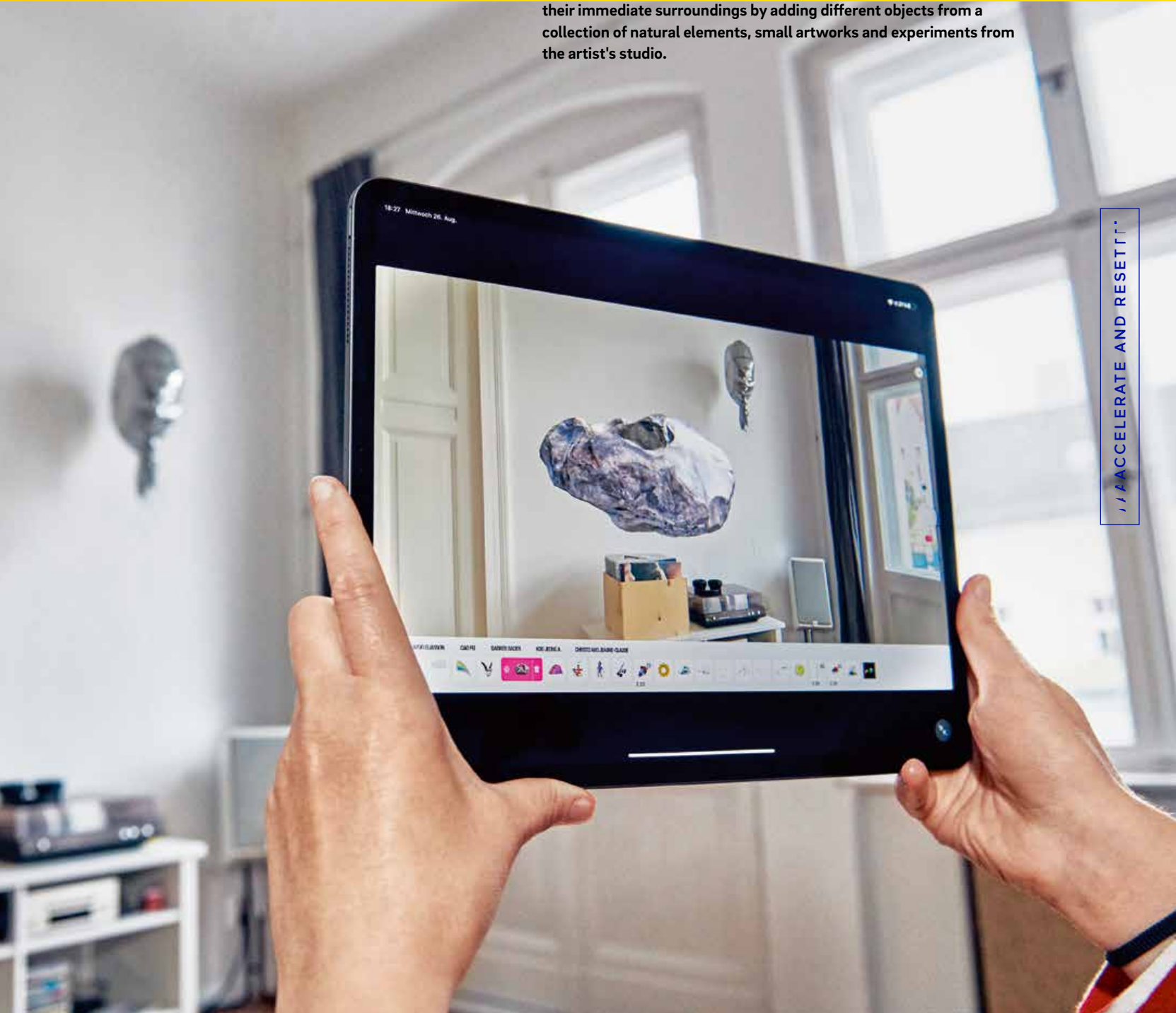
ACCELERATE AND RESET



## A WAY TO REIMAGINE THE SPACE THAT SURROUNDS US

→ FINDING THE MAGICAL IN THE MUNDANE

Berlin-based artist Olafur Eliasson responded to the restrictions on movement and gatherings with *Wunderkammer* – German for "cabinet of curiosities" – an app conceived as a means to "meld the well-known with startling movement and unexpected actions." Experienced purely through a screen, the augmented reality work invites users to "sculpt" their immediate surroundings by adding different objects from a collection of natural elements, small artworks and experiments from the artist's studio.



“ACCELERATE AND RESET”



## IN SEARCH OF HUMAN WARMTH

→ FINDING OUR COMMON GROUND

French photographer Antoine d'Agata was preparing to travel to Mexico to launch a book and exhibition when the Covid-19 pandemic hit. Instead of boarding a plane, he immersed himself in the streets and special coronavirus hospitals of the Parisian lockdown between March 17 and May 11, 2020. He first used the same thermal imaging camera to capture the religious services commemorating the three-year anniversary of the 2018 Bataclan attacks. He is drawn to how the tool "reduces the human subjects in his images to a heat source, an essence of humanity, stripped of cultural specificity," according to Magnum Photos.







## BREAKING THE SOUND OF SILENCE

### → A CAPTIVE AUDIENCE

Some three months after Covid-19 forced its seats to wait empty for the pandemic to end, Barcelona's Liceu opera house welcomed 2,292 plants to a concert of Puccini's *Crisantemi*, which translates to "chrysanthemums." Spanish artist Eugenio Ampudia, artistic director at the opera house, wanted to ask the question of whether humans can expand empathy to include our relationships with other species. The June performance was live-streamed; the plants donated to health care professionals.



# FROM IFAR SHORES

// ACCELERATE AND RESET //







# TO YOUR SHORE?!"

ACCELERATE AND RESET!"

Globalization as we know it might have run its course as technological changes and corporate strategies lead to more products being made locally or delivered digitally.

BY **Steffan Heuer**

ILLUSTRATIONS BY **Joe Waldron**

**P**ick a big port, any big port, and behold: More than 32 million shipping containers are in circulation worldwide, enabling an elaborate ballet of components and finished goods circling the globe. The humble, stackable container has become such a symbol for globalization that it has its own monograph simply entitled *The Box*. If you ordered the newest iPhone, chances were it would leave a factory in China and make its way to your door in just a few days.

And that was the familiar state of affairs until the Covid-19 pandemic suddenly brought global trade to a halt. At least since the 1980s, globalization was the only show in town, its upward trajectory all but inevitable and beneficial to most. China and other parts of Southeast Asia became the world's factory, with China alone contributing more

than 28% of global manufacturing output in 2018 – almost twice as much as the US and more than four times the volume of export powerhouse Germany. Now in 2020, globalization is being fundamentally questioned – and not only due to the novel coronavirus. As the intricately woven global value chains (GVC) have been disrupted or even severed, long-simmering talk of "deglobalization" has gained traction. Companies ranging from clothing manufacturers to car makers are starting to rethink their approach how and where their goods are made.

The aftershocks of the pandemic have the potential to accelerate "near-shoring" as enterprises look to reduce their reliance on a handful of countries and want to shorten their GVC, driven not only by economic considerations, but also technological changes and the rise of populism and →

protectionism. According to Chinese customs statistics, Chinese exports dropped by 17% during the first two months of the year compared with 2019, while imports fell by 4%. Exports to the EU decreased by almost 30% and to the US by 27%, while imports fell by 19% and 8% respectively. And not only container shipments have tanked. Global hubs like Singapore's Changi Airport saw their passenger count implode from 5.9 million in January to 25,200 in April. The number of airlines serving the airport fell from 91 to just 35.

This dramatic drop may not be mere blip. As of late June 2020, the WTO calculated global merchandise trade

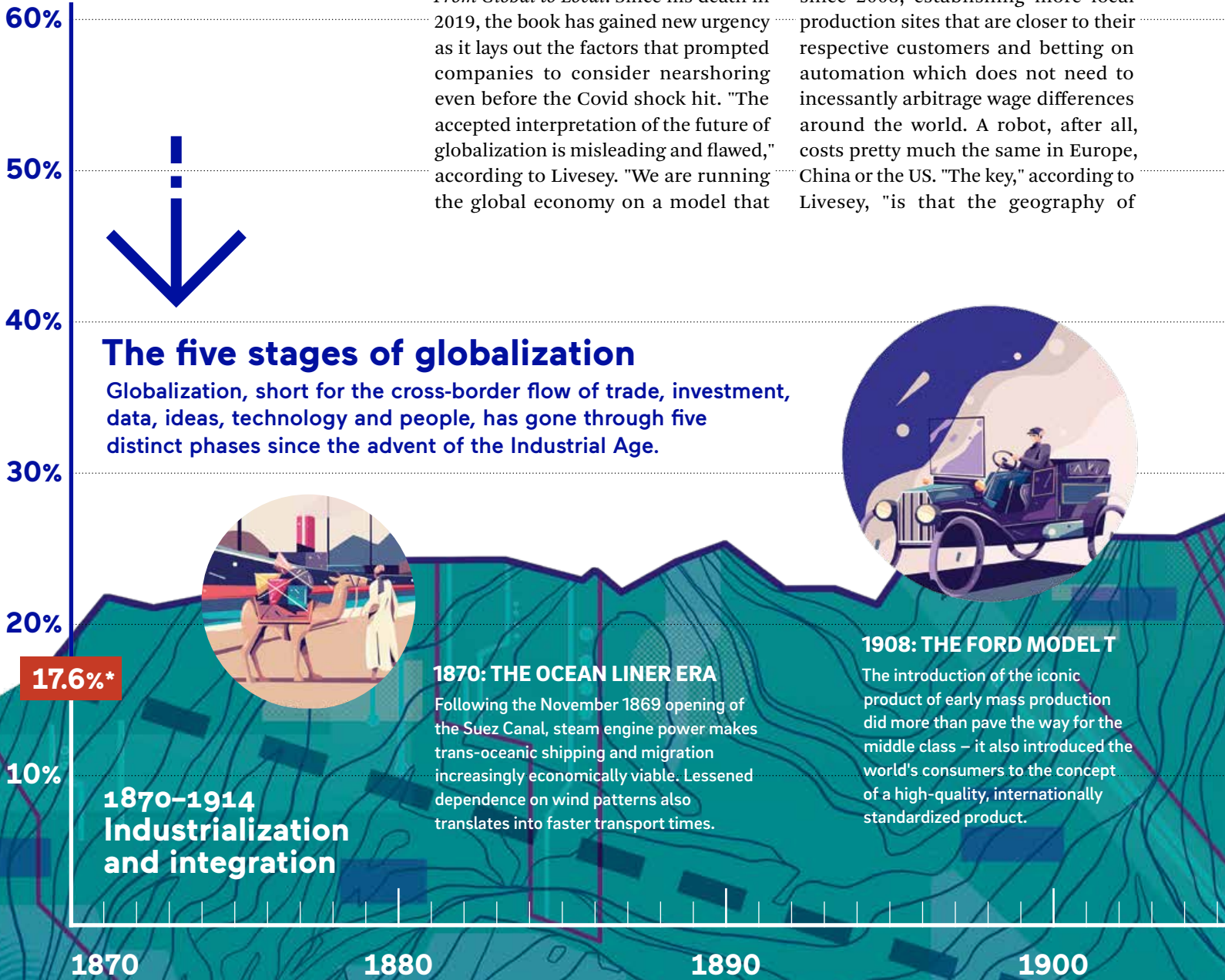
shrank by 3% in the first quarter and could fall another 18.5% in the second quarter. Depending on how the pandemic is held in check, world trade could contract between 13% and 32% for the whole year. "Trade may have possibly bottomed out in the second quarter," according to the WTO, with its director-general pointing out that "it could have been much worse."

**THE OPTIMISTIC HOPE** for a rebound may be misplaced if one looks at the larger picture painted by the late Cambridge University economist Finbarr Livesey. Globalization as we know it has long gone out of date, but the experts haven't noticed, he argued in his 2017 book *From Global to Local*. Since his death in 2019, the book has gained new urgency as it lays out the factors that prompted companies to consider nearshoring even before the Covid shock hit. "The accepted interpretation of the future of globalization is misleading and flawed," according to Livesey. "We are running the global economy on a model that

went out of date without anyone noticing at some point in the past decade."

Globalization, he thinks, has been falsely portrayed as the end of economic history, while the global economy had already started to change its rules. Different economic phenomena have been lumped together and mislabeled as "globalization," such as the fall in transportation costs, dense communication networks and changes in production technologies. Equally important metrics of globalization, Livesey writes, are foreign direct investments (FDI) and the steadily rising flow of data or bits which all follow their own trajectories.

In his view, companies are the key players that have been driving change since 2008, establishing more local production sites that are closer to their respective customers and betting on automation which does not need to incessantly arbitrage wage differences around the world. A robot, after all, costs pretty much the same in Europe, China or the US. "The key," according to Livesey, "is that the geography of



\* The sum of world exports and imports divided by world GDP.



production is changing and ownership will matter more as companies will have to be producing in their final market."

Companies and countries therefore need to ask themselves "whether we've become too wedded to one answer to this problem of location and organization, based on an outmoded, out-of-date understanding of technology and organization." In that vein, nearshoring is not an either-or choice that calls for closing overseas plants. Instead, it should be a hybrid model that takes into account the specific market a company wants to serve and how it can keep its supply chain short and reliable.

**THAT IS WHERE TECHNOLOGY** comes in. A tight integration of physical and digital processes enables shorter production in multiple locations and quick customization. Spanish fashion brand Zara, for instance, has long followed a strategy of having its clothes made in places like Portugal, Morocco or Turkey instead of shifting its entire production to Asia. That way, it is able to achieve a shorter cycle time between design and in-store arrival, a crucial advantage in a market as fickle as fashion.

The shipping container, introduced in 1956, may have seen its best days. Shipping costs, Livesey pointed out,

have not further declined since hitting a low point of about 6% of total costs back in the 1990s. Having components and finished products crisscross the world has another disadvantage besides the longer time to market.

Today, sustainability plays a greater role. "This is not a green agenda or a labor agenda," the late academic concluded, "this is the economic context changing and providing companies with a solution that is more local than global." He believed it is ultimately companies like Zara shaping this new world of production and growing trade rather than politicians from the UK to the US who push protectionist and populist agendas and want to force relocations.

The rethinking of global production is also driven by the rise of automation and new technologies like 3D printing. The startup Desktop Metal, as its name implies, wants to empower companies to print metal parts from a desktop file, replacing automated machining or injection molding. If it works, it could transform where and how car parts or electronics components are manufactured. Combine that with smart factories that are instrumented with loads of sensors and connected to the industrial internet of things, and a company can turn every production line into a

data-rich environment where it can gain insights in almost real time.

**THE VERDICT TO BID FAREWELL** to the old model of globalization is echoed by Anil Gupta, an economist at the University of Maryland and expert on strategy, globalization and entrepreneurship. He takes a different tack than Livesey, though, arguing that old globalization is already being replaced by a new digital globalization. According to Gupta, merchandise trade has been on a glide path to history for a while and globalization in 2020 is defined by technology and digitalization, particularly the rise in services →



ACCELERATE AND RESET



**1929-39: THE GREAT DEPRESSION**

After the market crash of 1929, the US implements protectionist trade policies. Other countries retaliate, slowing trade. While European countries begin leaving the gold standard in 1931, the US waits until 1933, deepening the crisis.

**1914-18: WORLD WAR I**

Destabilizing the economic and social ties established during the first wave of globalization and expanding control of trade and migration, some say the effects of the war lasted into the 1990s.

**1914-1945 Interwar era**

18.0%\*

1910

1920

1930

1940

and data transfers. That's why he dismisses the term deglobalization as a "complete mischaracterization" and adds: "To argue that the world is undergoing deglobalization is not all that different from sitting in 2000, looking at the declining sales of chemical films and lamenting the supposed end of photography."

Demand for containers may be going down, but services trade, capital and data flows keep rising. Gupta foresees a new "digital globalization" where economies and enterprises are connected by bits and software and digital services make up a growing part of many products and their ancillary services, from automobiles to smart sneak-

ers. The innovation inherent in these digitally enhanced products will be the single biggest contributor to economic growth going forward.

Foreign direct investments, another motor of globalization, are also on hold, according to the UN Conference on Trade and Development (UNCTAD). It expects businesses to slash FDI by 40% this year and as much as 10% in 2021. Overseas investments will remain subdued through the rest of the current decade. Tellingly, they mention the same factors that Livesey laid out: growing automation, economic nationalism and carbon emissions standards all give companies pause before they sink money into a site half a world away.

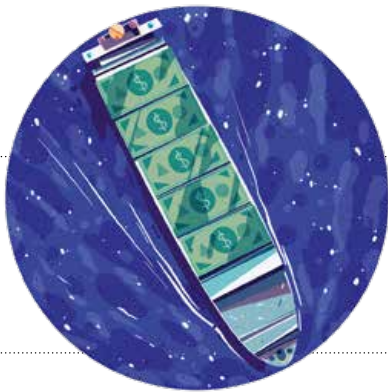
workers, which may have helped cause the globalization backlash," Krugman critiques the academic consensus on trade since the 1990s. "Rapid growth and surging trade imbalances meant that globalization produced far more disruption and cost for some workers than the consensus had envisaged."

His prediction dating from 2018 is worth revisiting: "Major disruptions now would be more likely to come from an attempt to reverse globalization than from leaving the current trade regime in place." Which raises the question: How will countries such as China and India, let alone smaller emerging or outright poor economies, fare under this new globalization paradigm where fewer goods and more data and ideas need to flow freely across borders?

Gupta thinks that China has been the biggest beneficiary of merchandise trade growth and thus has the most to lose if the downward trend in overseas manufacturing and nearshoring gains momentum. The ongoing rifts between the US and China over access to key technologies as well as hosting and

**ECONOMISTS HAVE EXPLORED** the adverse effects of global trade for quite some time and Nobel laureate Paul Krugman, for instance, says that if one looks at labor and income distribution in a rich country such as the US, a more nuanced picture emerges that the profession overlooked. "Soaring imports did impose a significant shock on some US

ACCELERATE AND RESET



**1948: GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)**

The first worldwide multilateral trade agreement, GATT had 125 nations as signatories and served as a code of conduct for 90% of world trade by the time it was replaced by the World Trade Organization in 1995.

**1962: THE RISE OF THE COMPUTER**

The earliest metal-oxide-silicon integrated chip (MOS IC), a 16-transistor chip built by Fred Heiman and Steven Hofstein at RCA, is introduced. The term "personal computer" is first used in *The New York Times*.



39.5%\*

**1971: NIXON SHOCK/FLOATING EXCHANGE RATES**

In response to inflation, US President Richard Nixon undertakes measures including ending dollar convertibility to gold for foreign governments. By 1973, most currencies float in value.



**1980-2008 Liberalization**

10.1%\*

**1945-1980 Postwar rebound**

1950

1960

1970

1980



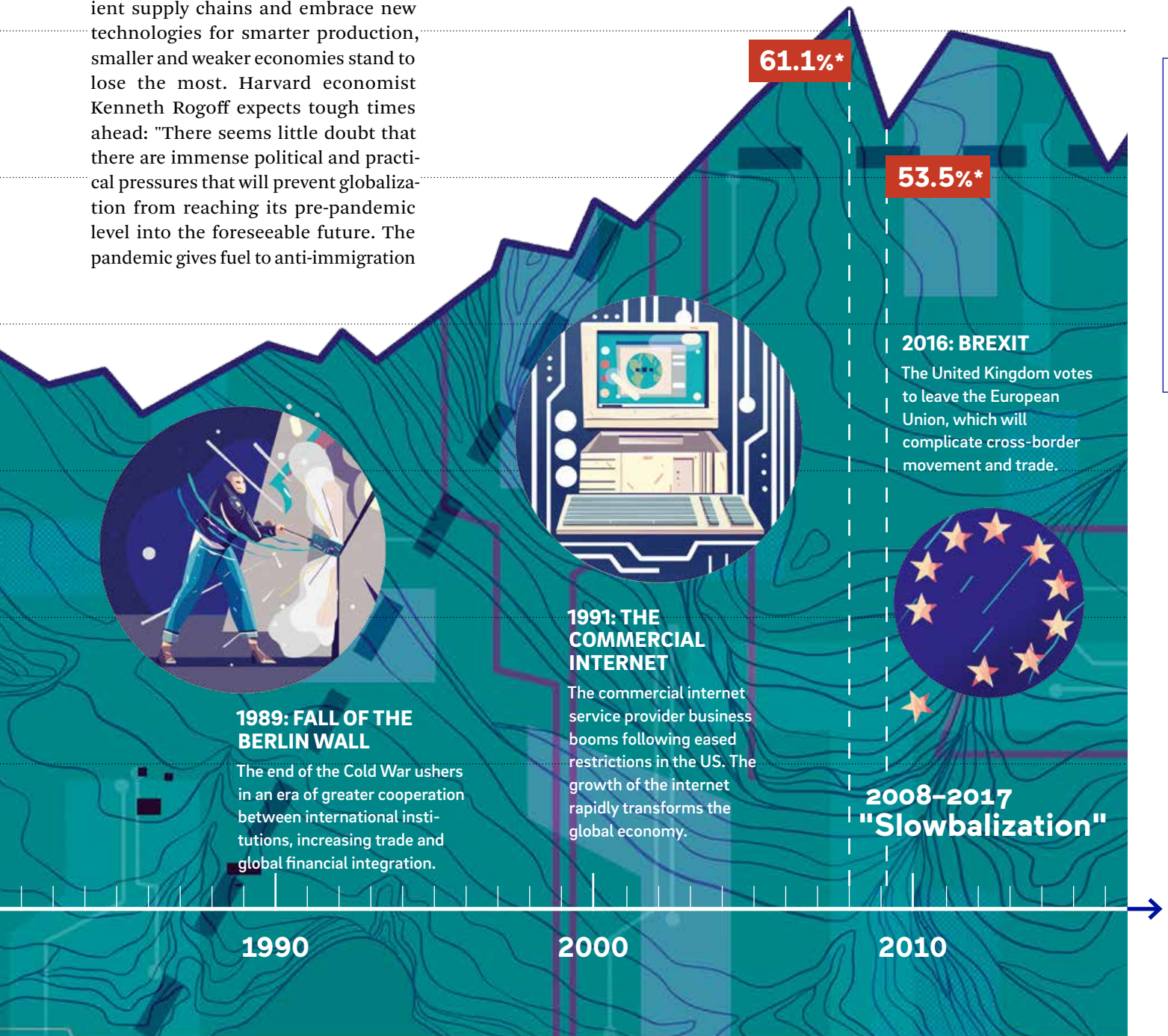
mining potentially sensitive data will further complicate that country's transition to digital globalization. Trying to position its economy for this new world, India announced a strategy for self-reliance in June 2020. That includes tax incentives and preferential procurement for local products and non-tariff barriers to discourage imports. "All our demands during the crisis were met locally," Prime Minister Narendra Modi said when presenting the plan. "Now, it is time to be vocal about local products and help these local products become global."

**AS COMPANIES WORK** their way through rebuilding or building new, more resilient supply chains and embrace new technologies for smarter production, smaller and weaker economies stand to lose the most. Harvard economist Kenneth Rogoff expects tough times ahead: "There seems little doubt that there are immense political and practical pressures that will prevent globalization from reaching its pre-pandemic level into the foreseeable future. The pandemic gives fuel to anti-immigration

and anti-trade forces, which were already on the rise," he says. Rogoff doubts that local production and digital globalization can make up for the losses suffered under the current model. "In some industries, perhaps, in the vast majority, no. China is the workshop to the world, especially in producing intermediate products. Cutting back trade with China will be a huge negative productivity shock," he adds. If there is indeed a retreat from globalization, the academic says, it will hit developing countries hardest and throw hundreds of millions back into poverty.

Small countries, even relatively wealthy ones, he worries, will also suffer. "It is much harder for them to diver-

sify production, and they are quite reliant on being part of global supply chains." No matter who is right, whether globalization is merely entering a new, digital phase or the world's major powers are retreating from trade as we know it, governments also have their work cut out. While companies are rebalancing and retooling their value chains, politicians need to moderate the impact of the social and technical change that comes with it. Or as Livesey put a positive spin on it, it's an opportunity to address and balance the problems of hyperglobalization. ■



A CHANGING  
POINT OF VIEW  
The rise in remote  
work may turn  
office buildings  
into relics of the  
pre-pandemic era.

ACCELERATE AND RESET IT



WFH has become the abbreviation we all learned in 2020. But is the home office here to stay, or will the workplace become a little more homely too?

BY **Geoff Poulton**  
ILLUSTRATIONS BY **DAQ Studio**

# REMOTE CONTROL

RESETTING HOW WE WORK.





**Y**ou can probably tell a lot about what matters to a society by its biggest buildings. The Egyptians had their pyramids, the Romans their aqueducts. Once upon a time, places of worship dominated a city skyline; now it's gleaming boxes of glass and steel, desks and whiteboards. For more than a century these boxes have grown upwards and outwards – bigger, better, more desks, more people. Until suddenly, a few months ago, the lights went out. Crippled by the coronavirus, the world froze and the temples of our modern society sat empty. They may never be full again.

The pandemic has shone a light on the way we work, revealing what some of us may have felt for some time: We don't always need to be in the office. We quickly found that, thanks to the wonders of modern technology, we actually can work productively at home. More work-life flexibility and autonomy? Yes please.

**COMPANIES HAVE RECOGNIZED IT, TOO.** As lockdowns have eased, CEOs have allowed employees to continue working remotely. Dell told much of their workforce they could stay away from offices until the end of the year – and Google until July 2021. Facebook and Twitter will allow remote work forever, if a role allows. The sleep pods, cafés and wellness centers designed to keep employees at work as long as possible may be a thing of the past.

Organizations are rethinking their physical footprints. To the question of when at least 90% of their workforce will return to the office, just over a quarter of Fortune 500 CEOs replied "never." Morgan Stanley CEO James Gorman said the bank would need "much less real estate" in the future, while Barclays boss Jes Staley said there will be an adjustment in thinking about thousands of workers in a corporate office. As companies shift from crisis management to planning the new normal, it's clear that the effects of Covid-19 on the way we work will long outlive the virus. "This is a massive culture change," says Tsedal Neeley, professor of business administration at Harvard Business School and author of the upcoming book *Remote Work Revolution*. "Some people still don't realize that; they think we might go back to how things were before. But we're not going back to a 'before.'"

Breaking free of deeply engrained ways of working won't be easy, though. Prior to the coronavirus outbreak, few organizations had a detailed work-from-home policy with clear

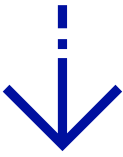
**76%**

The percentage of office workers in a Global Workplace Analytics study who want weekly work-from-home days even after the pandemic is over.

**16%**

The percentage of global office workers in the same study who say they never want to return to the office again.

HOME FIELD  
ADVANTAGE  
Productivity  
has been shown  
to increase  
without office  
distractions.



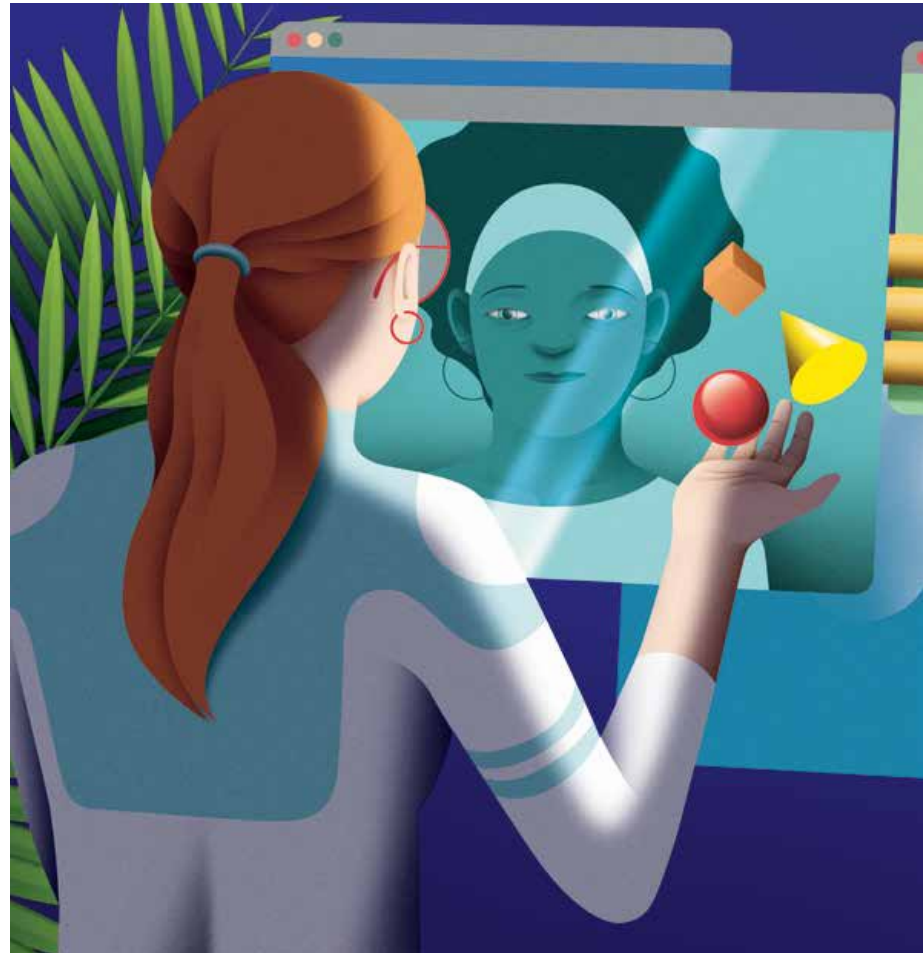
guidelines for employees. Many still don't. But according to a post-Covid-19 global survey by Global Workplace Analytics, 94% of workers say they want to work from home at least occasionally in the future. Two-thirds said they work "very successfully" from home. There were once fundamental technological barriers to this, but now the digital toolkit for remote knowledge workers is incredibly effective and progressing at an astounding rate, says Andrew McAfee, co-director of the MIT Initiative on the Digital Economy and co-author of *The Second Machine Age* and *Machine, Platform, Crowd*. "What's more, recessions accelerate technological changes by driving efficiency," he explains. "We can expect many companies to deploy more tech over the coming months."

ACCELERATE AND RESET

**FOR MANY COMPANIES**, the most pressing emphasis is on finding the right balance between remote and in-person work, learning how to manage remote teams and facilitating effective collaboration. These are all skills that will take time to master, says Tsedal Neeley. "Leaders are learning and improving as they go. Some have been too hands-off, leaving team members lost, while others have micromanaged to try and maintain stability, exacerbating already heightened levels of stress."

Trust and autonomy are the most important factors in successful remote working. A lot of managers are anxious, because they don't know how to make people produce when they can't see them, Neeley says. Desperate to ensure their employees aren't lounging around, some companies are even monitoring keystrokes and tracking other online behavior. "That's not helpful," she says. "We need macromanagers who create clarity with meaningful goals and purposeful roles. They have to learn to measure on outcomes not processes."

Of course, we didn't put large numbers of people in an office just to keep an eye on them. A virtual meeting doesn't have the same immediacy as a physical one and we can miss non-verbal cues, creating confusion and frustration. And while virtual teams can exploit existing knowledge to fuel speed and productivity, creation and innovation relies more on unstructured face-to-face encounters. Managing communication is one of the hardest



"WE NEED  
MACROMANAGERS WHO  
CREATE CLARITY WITH  
MEANINGFUL GOALS!"

— TSEDAL NEELEY, PROFESSOR OF BUSINESS  
ADMINISTRATION AT HARVARD BUSINESS SCHOOL

43

The number of  
minutes per day  
remote workers  
are distracted at  
home, compared  
with 78 in the  
office, according to  
Global Workplace  
Analytics.

aspects to remote working. To find the right approach, companies must discuss how often team members should connect virtually during the week and with what tools. Some interactions might be more suitable for delayed communication platforms, like email, which allows team members time to think and prioritize before responding – a favored approach among experienced remote teams [see box p.57]. Other topics might require instant communication tools, where team members interact in real time.

The limitations of videoconferencing, as well as an innate need for social interaction, mean that post-pandemic, those who can will likely split their







time between remote and office work to make the best of both worlds. According to global research company Gartner, almost half of employees will work remotely at least part of the time.

**SO WHAT DOES THAT MEAN FOR THE OFFICE?** While nobody can say for sure how long some antiviral hygiene measures will be needed, the coronavirus outbreak has accelerated several underlying trends that look set to fundamentally change the workplace. Simon Pole, global director of design at Unispace, an office design company, predicts companies will hand back 20-30% of their office footprint. What they keep will be 20-30% better, though, he says. "Traditionally, we planned the office around a sea of desks ... From now on, it will be more about bringing teams together to share knowledge and wisdom. We're already seeing greater demand for communal spaces around problem-solving, innovation and socializing."

Meeting spaces will become more informal, a pleasant side effect of conducting months of Zoom calls from living rooms and kitchens during lockdown. According to Despina Katsikakis, head of occupier business performance at Cushman & Wakefield, a commercial real



## Trailblazers? These companies are remote by design.

While many businesses are just getting to grips with remote work, some have been doing it for years. For them, Covid-19 has been less of a "wake-up call" than proof that, yes, it is possible to successfully run a distributed workforce.

### AUTOMATTIC

Automattic, which makes WordPress and other software products, has more than 1,000 employees across 77 countries and has been almost entirely remote for 15 years. CEO Matt Mullenweg believes there are five levels of autonomy for distributed working. Most companies are at level two, he says – they've accepted work at home, but don't know how to make it work efficiently. Level four, where he currently sees Automattic, allows a company to tap into a global talent pool. Virtual meetings are infrequent but respected and productive. Baton passes between teams allow work to follow the sun 24/7 around the world. So what's level five? "Nirvana!" he says. It may not be wholly attainable, "but that's when you consistently perform better than any in-person organization could."

### BASECAMP

Basecamp's roughly 60 employees have been working remotely since 1999. The software company designs tools for remote teams and

co-founders Jason Fried and David Heinemeier Hansson have written several bestselling books, including *REMOTE: Office Not Required*. Companies don't know how to work remotely, so they've been trying to simulate how to work in the office, says Fried on the company's blog. "If you have meetings all day at the office, don't simply simulate those meetings via video. This is an opportunity not to have those meetings. Write it up instead ... Improve the way you communicate."

### INVISION

Digital design platform InVision is produced by a distributed team of over 850 employees. The company goes out of its way to ensure workers feel valued. There are coffee and fitness stipends, an official director of employee happiness and even a house-swap Slack channel. "It's about results, not where your IP address is," says Chief People Officer Mark Frein. And with a client list containing tens of thousands of companies, including the entire Fortune 100, it's hard to argue with those results.



estate services firm, faceless, grey cubicles and meeting rooms will disappear as the office becomes a stronger embodiment of brand culture and values. "There'll be more focus on experiences, curated events, innovation and communities of mentoring. When people have more choice about where they work, you need to create an inspiring destination."

Cutting back on pricey city-center real estate could even lead to more fundamental changes in how we live and work. Instead of regularly commuting into central offices, workers could walk or cycle to local community work hubs, where they can connect with colleagues or other remote workers. Facebook, for example, is already looking to build up hubs of work-from-home employees in Atlanta, Dallas and Denver.

ACCELERATE AND RESET

The experiences of recent months will lead a lot of people to conclude that they're very close to 100% effective as remote workers, says Andrew McAfee. According to Gartner, there are already a billion knowledge workers, many of whom need little more than a laptop and a decent internet connection. Some will feel empowered to leave expensive city center living behind, accelerating the trend of 'digital nomadism.' According to one survey, while almost five million US workers already identify as "nomadic," more than three times as many would like to be.

And it's not just workers that benefit from geographical freedom – employers benefit as well. Sendible, a London-based software business, began to embrace remote work in 2019. "Suddenly,



*AN OFFICE ANYWHERE  
Geographical freedom is good for employee happiness and the employer's talent pool.*

we could open our recruitment opportunities to the whole world," says the company's Martine Hammar. "We were no longer restricting our search to the UK, but able to recruit the most talented and qualified people we could find."

Remote work isn't for everyone, and when the pandemic eventually passes, some will still favor the daily interaction and work-life divide the office brings. But it is providing a genuine 'Wizard of Oz' behind-the-curtain moment that proves the face-time-obsessed office of the 20<sup>th</sup> century is over. It turns out that plenty of those meetings really could have been emails; some of those conferences could have just been watched online; and giving employees greater freedom and flexibility can make them happier and more productive. ■

## The office of the (near) future

It's 2021. You're spending less time in the office but when you do head in, you'll notice some things have changed. It's cleaner, greener and more cutting-edge – with reduced contact and touchpoints.



More space for bike parking as well as shower facilities



Voice-activated commands for lifts and lighting



Improved filtration for constant fresh air



Antimicrobial construction materials



Fewer desks, more space for collaboration



Apps to control food and drinks machines and personal lockers

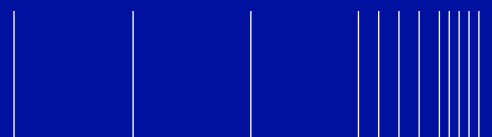


CLOSING THOUGHTS ON ...  
/// ACCELERATE AND RESET ///

"HISTORY SUGGESTS  
THAT BAD TIMES,  
DOWNTURNS ARE OFTEN  
**THE SPARK**  
FOR  
**INCREDIBLE**  
**RESOURCE-**  
**FULNESS."**

**RITA GUNTHER McGRATH**

Strategic management expert  
→ read the full story on page 12



# Wide angle



*Read on for diverse insights into the wider world of business and ideas.*



**EYEBROWS**  
Movement can be a signal of recognition, surprise or sympathy.

**LIPS**  
Smiling, pursed, frowning or bitten, micromovements of the mouth indicate a large spectrum of feeling.

**CHEEKS**  
Raising indicates a smile, most often a signal of friendliness or happiness.

*THE HUMAN ELEMENT  
Rana el Kaliouby is dedicated to bringing emotion into AI.*



# Emotional rescue

*AI systems need to understand human emotions to make technology more humane and useful, says researcher-turned-entrepreneur Rana el Kaliouby.*

BY **Steffan Heuer**

PHOTOS BY **Tony Luong**

**S**CENES LIKE THESE PLAY OUT in millions of cars every day. The driver is glancing at her phone, trying to quickly send a text while stopped at a light. Or is tired after a long day. Or engaged in a lively conversation or argument. Sometimes, these very human behaviors lead to a moment – or several seconds – of distraction and result in a fender bender. Even sophisticated driver assistance tools cannot prevent all crashes. And that's no accident, says computer scientist Rana el Kaliouby, who herself once totaled a car when she was distracted.

Modern software systems can keep us in a lane or apply the brakes, they still don't understand humans and our emotional baggage. "Automation and AI in the automotive industry has historically been very focused on what's happening outside of the car, but the cabin is still kind of a black box. How many people are in the vehicle? How are they interacting? What objects are they holding? Are they agitated, tired, distracted? All these contextual cues are very important," explains the researcher who more than a decade ago turned her scientific passion into a company called Affectiva that's offering what it calls "Emotion AI."

Computers excel at crunching numbers, say identifying a red light or executing a command, but they were not built for rich human interaction. Humans use these systems, whether it's a device or a social media platform, oblivious to the fact that their digital counterparts can't recognize or

respond to their moods or feelings. Her verdict: "Traditional computers are emotion-blind. They have trained us to behave as if we lived in a world that was completely devoid of emotions."

**THE FORMER MIT RESEARCHER** thinks we can and ought to do better. She wants to build holistically intelligent systems with emotional intelligence (or EQ) that adapt to how we feel. "Emotion AI" could be a much-needed antidote to the dehumanizing effect of technology, el Kaliouby believes, as we are becoming more dependent on algorithms, apps and platforms to be productive and stay connected – from semi-autonomous vehicles and social robots to sensor-laden wearables and virtual spaces for conducting job interviews or learning. "We need our technology now more than ever, but we need to make it smarter, better and more humane."

This call to merge a computer's considerable IQ with commensurate EQ is not just a professional goal but also a deeply personal one. Thumb through el Kaliouby's book *Girl Decoded*, published in spring 2020, and it's clear that her journey from a strict Muslim home to successful computer scientist at the MIT Media Lab and finally CEO of a pioneering tech startup is also about decoding her emotions as the rare female programmer wearing a hijab. "I spent my years coding, but at the same time, it was also a process of figuring out who I am and what I stand for," she summarizes her life in a male-dominated tech world. →



## Rana el Kaliouby

is the co-founder and CEO of Affectiva. The Boston-based company was spun out of the MIT Media Lab in 2009. She has been recognized by *Forbes* as one of "America's Top 50 Women In Tech," and by *Fortune Magazine* in its 2018 "40 under 40."

## "Traditional computers ... have trained us to behave as if we lived in a world that was completely devoid of emotions."

As el Kaliouby tells it, she was always a "nice girl." Born in 1978, she grew up in a conservative household in Cairo and later Kuwait. She excelled at school, eventually winning a scholarship at Cambridge University, where she found her calling. "I decided to study computer science and became fascinated not by the nuts and bolts of technology, but how technology changes and empowers the way we communicate as humans."

**SHE CAN EVEN PINPOINT** the moment she realized how regular computers are degrading or even damaging human interaction. It was a winter afternoon at Cambridge, long before webcams and smartphones became ubiquitous, and el Kaliouby was talking to her then-husband back in Egypt by way of typing. That's when it hit her, she recalls, that in spite of all the hours she spent with her computer, it had "zero clue" how bad she felt at that moment. "We all communicate mostly digitally, but 90% of human communication is nonverbal – via our face, our voice, our body language and gestures. All that is lost online. It dawned on me that we have to redesign technology in a way that incorporates nonverbal communication."

From this realization sprang the motivation to write her master's thesis on building a face detector and a facial landmark detector, which led to a PhD in computer vision and machine learning. Once she arrived at the MIT Media Lab, el Kaliouby kept pursuing her research in emotion recognition, initially focused on how to help people with autism. She found a like-minded spirit and mentor in MIT Professor Rosalind Picard who had coined the term "affective computing" back in 1997 when she published a book by the same title. The collaboration led to spinning a startup called Affectiva out of the university in 2009. The two initially steered clear of using the word "emotion" because they worried it wouldn't go over well in the predominantly male tech world. (Picard left the company in 2013 and

**\$50**  
million

The total venture capital raised by Affectiva between its founding in 2009 and April 2019.



founded another startup called Empatica.) The company's first commercial foray was a product to help advertising and media firms decode video clips of audiences to measure the emotional impact of their content, be it an ad, a TV show or a movie trailer. It was different from the original vision in the medical sphere, but reading people's minds for market research turned out to be a commercial success. According to the company, Affectiva is currently used by a quarter of the *Fortune* Global 500 companies in 90 countries, among them Mars, Kellogg's and CBS.

**FAST FORWARD TO 2015** when el Kaliouby was invited to give a TED Talk before a select audience of technology luminaries in California. Her talk entitled *This app knows how you feel – from the look on your face* put the entrepreneur on the map. The surge in interest also convinced the company to come up with the term "Emotion AI." It was a catchy way to stake a claim in an emerging field where a growing number of incumbents and startups were offering





*IN THE DRIVER'S SEAT Affectiva's Emotion AI will help address safety issues in self-driving cars.*

AI tools to read faces and minds, do sentiment analysis or engage with empathetic chatbots.

Competitor Emotient, spun out of UC San Diego, was snapped up by Apple in 2016. Then the car companies came calling. "They were saying, we love what you do with emotions and cognitive states. Can you make it work in a car?" Following the inquiries, the startup expanded its capabilities to include voice analysis by using a training set of customer service calls in English, German and Chinese. The software, though, is not listening to the actual words, but only how fast and how loud somebody is speaking, whether people are speaking in a monotone or showing a variation in pitch and intonation, which indicates excitement.

The end result is a package called "In-Cabin Sensing" that trains cameras and microphones on the driver and passengers. El Kaliouby is quick to point out that people need to know they are being observed and explicitly opt in, even though the data never leaves the local device. The company says it's working with a roster of big manufacturers, among them Aptiv, BMW and Porsche as well as leaders in the field of autonomous driving such as chipmaker Nvidia.

*ON POINT  
Affectiva's Affdex  
Research app uses  
facial movement  
as a measurement  
for emotional  
response.*



**UNDERSTANDING THE COMPLEX WEB** of emotions, facial expressions and voice utterances is a work in progress. Affectiva, which now employs 90 people at its headquarters in Boston and Cairo, has accumulated what it calls the world's largest "emotion data repository" based on more than 9.8 million faces and four billion frames of video collected in 90 countries. She stresses that technology like hers must be designed with the goal of diversity and inclusion from the start. "A European car →



## "Let's humanize technology before it dehumanizes us."

company sent us a training set of faces, but they were all blue-eyed, blond middle-aged guys," she recalls of the data set. "We told them this was not good enough. If our technology doesn't work with darker-skinned people like me, or with people who represent diversity in all of its forms, then that's an epic fail from a business and ethical standpoint."

**GIVING CARS AN EQ** to complement their IQ is but one area where el Kaliouby sees promise, especially as human-to-human interaction is somewhat tainted by the coronavirus pandemic. "We will see a lot of innovation using technology like ours that can quantify and give you analytics on top of a video-conferencing or livestreaming platform." It would help not only presenters to get something akin to emotional ratings in real time, she believes, but also aid audiences and hosts. "If the viewers opt into giving an algorithm access to their device's camera and the algorithm aggregates reactions, the audience can feel they're contributing something that's shared with everybody who's watching."

El Kaliouby wants to see Emotion AI roll out in other areas to "help us become happier, healthier and more empathetic individuals." She envisions social robots in health care settings that can perform the intake assessment at a hospital instead of a nurse and only send those to see a human doctor who need attention. "There is evidence that facial and vocal biomarkers exist for things like depression, stress, anxiety or Parkinson's disease. While we're stuck with our devices for hours and hours every day, these could be opportunities to get a pulse on a person's mental and emotional state."

Using better AI tools can also improve the hiring process. While HR departments are already striving to become aware of and correct for human biases, algorithms have the potential to conduct job interviews without being distracted by the gender, ethnicity, age or looks. Instead, they can home in on the nonverbal communication to determine if somebody is a good fit. And finally, AI with a helping of emotional astuteness stands to improve



*AT HOME WITH TECHNOLOGY*  
Rana el Kaliouby's 2020 book *Girl Decoded* charts her journey through a male-dominated industry.

online learning systems because educators would be able to detect the level of engagement of each student and tailor their approach accordingly.

**AS GOOD AS THIS SOUNDS**, making AI systems even smarter and responsive to human emotions has serious downsides. Historian Yuval Noah Harari has tackled the inherent problems of human-machine interfaces in three books so far. His main criticism, as he explained in a discussion with *Wired*, is this: "To hack a human being is to understand what's happening inside you on the level of the body, of the brain, of the mind, so that you can predict what people will do ... The algorithms that are trying to hack us, they will never be perfect ... You don't need perfect, you just need to be better than the average human being." It's a valid concern addressed in the European Union's "Ethics guidelines for trustworthy AI" presented in April 2019. El Kaliouby admits concerns around privacy, manipulation and discrimination arising from the deployment of emotionally intelligent machines at





## Your muscles give you away: How AI understands our emotional states

To computer scientists, the face is nothing but a jumble of muscle mechanics that needs to be captured, decoded and mapped to underlying emotions.

The technology to recognize the emotional states of a human face that Rana el Kaliouby and her MIT Media Lab colleague and co-founder Rosalind Picard developed is based on pioneering work by the psychologists Paul Ekman and Wallace Friesen from the 1970s.

Ekman and Friesen's Facial Action Coding System (FACS) maps the 43 facial muscles that lie beneath the skin and categorizes a total of 46 basic facial actions, spontaneous and subconscious shifts in expression, such as a raised eyebrow or a curled lip.

FACS itself is only concerned with the mechanics, but Ekman used his system to describe six basic emotions: anger, disgust, fear, happiness, sadness and surprise. He later added contempt.

Combinations of muscle movements correspond to various emotions. Experts like el Kaliouby have since made the argument that there are more – and more nuanced – emotions, but FACS itself has stood the test of time.

Affectiva uses deep learning, computer vision, speech science and massive amounts of real-world data to automate FACS with the goal of understanding hundreds of nuanced emotional and cognitive states in context, going beyond the six basic emotions described in FACS.

So far, Affectiva has trained and improved its emotional decoder through working with more than 9.8 million faces in video clips that it has gathered from across 90 different countries.

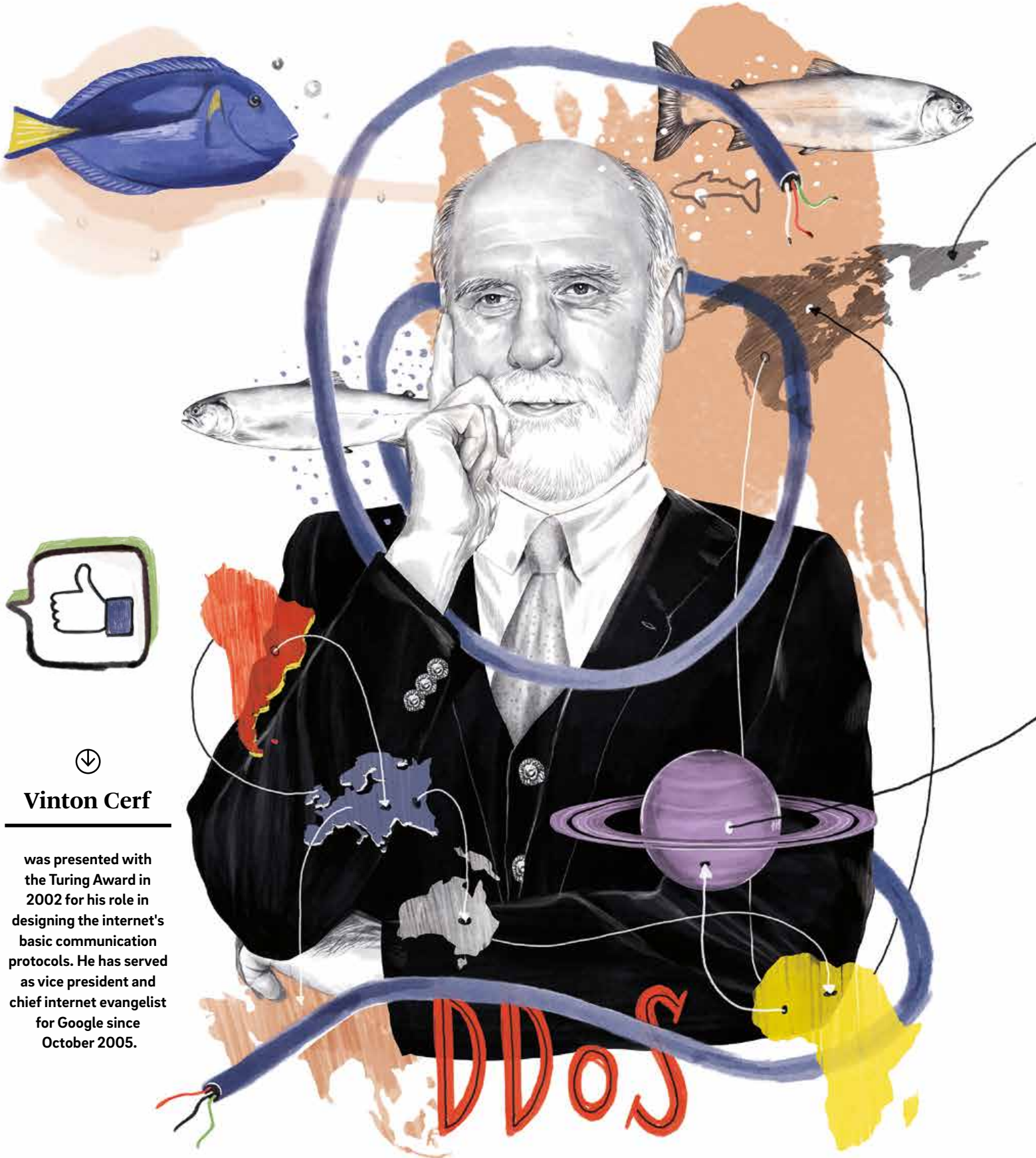
scale. "We don't apply our technology in areas like security, surveillance or lie detection, even though we [might] make a lot of money ... but for use cases like these where there is no opportunity for people to opt in and consent to its use, and there's potential for bias and harm."

Instead, the fairly small company is part of the "Partnership on AI to Benefit People and Society" (PAI) which comprises 100 members from industry, academia and NGOs in 13 countries, among them Amnesty International and American Civil Liberties Union. "Technology is moving really fast, and we need it right now. But that's no excuse to be sloppy," says el Kaliouby, who would like to see a label on tech products and services that tells consumers whether the underlying AI was ethically derived, similar to organic labels on food. "As we train young people to become the future AI leaders of the world, it's important that privacy and the unintended consequences of technology are part of the curriculum. Let's humanize technology before it dehumanizes us." ■

# 2.2%

The percentage of all venture capital raised in the US in 2018 that went to companies founded by women.

See the interview video with Rana el Kaliouby online: [rolandberger.com/kaliouby](http://rolandberger.com/kaliouby)



### Vinton Cerf

was presented with the Turing Award in 2002 for his role in designing the internet's basic communication protocols. He has served as vice president and chief internet evangelist for Google since October 2005.






# Cerf and the internet

*One of the founding fathers of the internet, **VINTON CERF** looks at how his innovation has evolved over the last five decades and the lasting impact it has had.*

BY **Neelima Mahajan**

ILLUSTRATIONS BY **Sören Kunz**



**I**N 1973 **VINTON CERF** and Robert Kahn came up with the technology that would become the backbone of the internet. Now, almost half a century on, the tech pioneer and author of the 1999/2002 memo *The Internet is for Everyone* – a call to defend open access to the internet – reflects on all the things it has brought to our lives and which we now take for granted.

In this edited interview, Cerf covers a range of issues – from the impact of the internet to the concentration of power in the hands of a few companies. For the full conversation – including his thoughts on the coming digital dark ages, the “internet of interplanetary space” and Sir Tim Berners-Lee’s idea for reinventing the web – please visit [www.rolandberger.com/cerf](http://www.rolandberger.com/cerf).

## How do you judge the evolution of the internet and the impact it's had?

Information sharing and collaboration [on the internet] have had very positive effects, and they’ve been so valuable. We’ve also seen the same neutral platform being abused in a variety of ways. We see cyberattacks that are the result of vulnerability in software. We haven’t figured out how to write software that doesn’t have exploitable bugs. We have people launching [distributed] denial-of-service (DDoS) attacks, generating misinformation and disinformation, people taking advantage of social networking to promote extreme content. We’ve discovered a variety of ways in which the internet and the web can be used for harm. It’s complicated by the fact that the perpetrator could be in one →



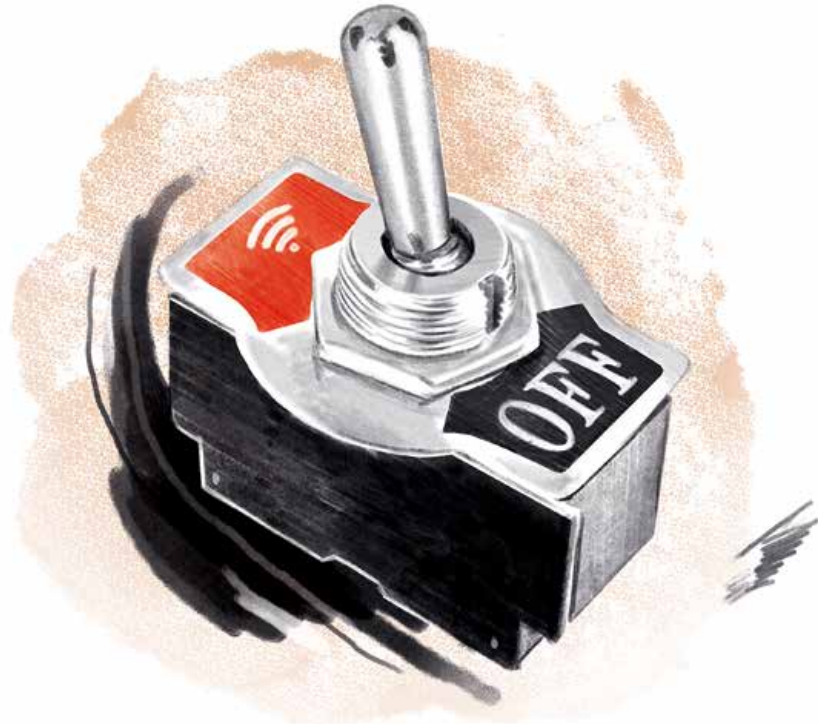
country, and the victim in another. We need international agreements about how to track down, identify and apprehend people doing harmful things.

**How can we go about making sure technological progress doesn't have unintended consequences, forcing governments to enforce regulation that stifles the innovation that comes from the openness of the internet?**

It's sometimes very hard to imagine how people might take something and do with it that which you had not expected or intended. The internet is such an interesting environment because people invent new ways of using that platform, some of [which] are harmful. You need institutions that are, in some cases, global. And you will need to agree on practices that will inhibit or at least punish some of the harmful behaviors. Anonymity has turned out to be a two-edged sword. It's important for people to be able to contribute to discussion anonymously because if they identify themselves, they might be at risk. There are some parts of the world where expressing your views could be hazardous. On the other hand, people can behave badly because they think they're anonymous. So we need the full spectrum of identification. There are some situations where you want to be assured that someone else can't pretend to be you and take actions in your name: financial and real estate transactions, or political assertions.

**Many countries control the internet in unimaginable ways. How do you view developments like those?**

That's a very interesting phenomenon. The Chinese have invested very heavily in the internet and they have more users than any other country in the world. Very large institutions have been created ... At the same time, the Chinese government sees criticism as harmful. From a technical viewpoint, you have to – "admire" is probably not quite the right word – but at least be impressed by how they have managed to fashion their



**"We can teach people to think critically about what they're seeing and hearing."**

implementation of the internet in order to manage the behavior of the population. They've introduced social ranking and other things as a way of providing incentives for certain kinds of behaviors. I don't agree with some of that but the flexibility of the internet design permits these things to happen.

We have a concept that countries have sovereignty within their borders. And so do the Chinese. Within that context, they have every right to do whatever they want in terms of implementation of the internet in their country. Now, when those behaviors leak out or when attempts are made to force those controls outside of a national border, you're starting to get into some international issues and conflict ... There are some countries that shut the internet down during elections, for example, out of the concern for misinformation and disinformation. We have

to learn how to tame this beast so as to maintain its utility while suppressing some of the abuses. We can teach people to think critically about what they're seeing and hearing.

**Many tech platforms trace their roots to Silicon Valley. Not the Chinese platforms. So, you have the US narrative and the emergence of a Chinese narrative. How do you see the future evolving?**

The internet itself did not come out of Silicon Valley exclusively. It has quite an international history. With regard to US and Chinese perspectives, it's a competition like every other product. What is it that people are looking for and which product will suit their preferences best? We tend to want a very open environment. The Chinese products appear to be designed in order to control the environment. You can see tensions because [of] the possible need for some



more behavior control on the network in order to reduce abusive practices. It's not as if these two views are totally incompatible. We have to find some place in between. There's also a simple cost argument, how much does the equipment and the software cost, and there will be competition among the providers of internet-based equipment.

Some people say that the internet will split into the Chinese and the American parts. I am unpersuaded because I think that interoperability will turn out to be very important. Even the Chinese recognize they need to be able to interoperate with the rest of the internet for commercial reasons. Their economy needs to be able to sell products and services outside of the borders of China. I think we haven't seen the end of this story yet.

### Only 4.5 billion people in the world have access to the internet. What can be done to further democratize access?

The cost of getting access to the internet is easily borne in countries where disposable income is high. It's harder if you are in a country where the average disposable income is less. So we have to drive cost out. The cost of the equipment needed to get access to the internet is coming down. Especially in parts of the world where the economies are still growing, you're finding a lot of people designing and building equipment that is less expensive than in the more developed countries. We need to adopt policies that will encourage investment in infrastructure so that we get more mobile phone capability out there, more Wi-Fi, more optical fiber.

In Uganda, Google and others built an optical fiber network in Kampala and then made it available as a wholesale service to retailers who then resold the wholesale access to the internet to customers and added products and services on top of that. Because everybody got the same access through the wholesale system, they could compete – consumers had a choice of different access providers. That's one way in which to

## Safeguarding the internet for everyone

1

**Access:**  
must be kept affordable, available in all languages and unrestricted by government.

2

**Ease of use:**  
must keep up with demand for service and be governed by a positive and global legal framework.

3

**Privacy:**  
must keep users secure and provide an ability to maintain safe space for young people.



## Remain mindful

With the freedom the internet enables comes the commensurate responsibility to use this power with care and develop the tools to find and punish those who seek to abuse its potential.

Discover our video series with Vinton Cerf online: [rolandberger.com/cerf](http://rolandberger.com/cerf)

stimulate competition and offer users choice. Even in the developed world, we'll find places where the internet is inadequate. We're seeing technology stepping up to deal with that. Elon Musk's Starlink system anticipates tens of thousands of satellites in low Earth orbit around the globe providing access to the internet to every square inch of the planet. The question then will be, what will the cost be and will it be sustainable? [There's been] a startling increase in the number of undersea optical fiber cables being built. I wouldn't be surprised if by the end of this decade virtually anyone who wants access to the internet can get it and afford it.

### How big of a problem is the concentration of power in the hands of a small number of digital companies?

The biggest concern that we generally have is companies exercising some kind of monopoly power to inhibit competition – and there may not be an opportunity for new market entrants. Adopting policies that will encourage and facilitate market entry will reduce the potential hazards of the small number of large competitors. It's important to remember that companies that appear to be at the top of the heap often disappear.

### How should we prepare for what lies ahead with AI?

I don't think we're anywhere close to the scary-robots-are-taking-over scenarios. We are at risk with regard to algorithms that we rely on to help make decisions because we should be worried about an algorithm which has bias built into it or has brittleness built into it.

What machine learning has not been able to do is to take a small sample of experiences and then extrapolate and generalize from that. We're far away from emulating what humans are capable of doing from inferring and generalizing from small numbers of samples. I hope we get to the point where we can rely on AI to help us do that, because we might accelerate our ability to understand the world and how it works. ■





*A TIGHT SHIP? Today's tech behemoths wield substantial power, but perhaps not the political influence of the East India Company.*





# Past present?

*With global reach and the ability to command both loyalty and political influence, the East India Company may have its origins in the Elizabethan era, but its rise – and its fall – offer lessons about corporate power that remain strikingly relevant in today's climate.*

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BY **Fred Schulenburg**

ILLUSTRATIONS BY **Laurindo Feliciano**





**H**IGHLY PROFITABLE, globally expansive, exceptionally adept at managing tax and regulation and effective at influencing politics. More powerful than states and able to command more loyalty than many national entities. Sounds like the characterization of a number of 21<sup>st</sup>-century corporate giants who bestride today's global economy with apparent impunity. You know, the ones that leave underfinanced and overstretched governments struggling to catch up.

But the description above isn't of a particular tech titan or banking behemoth of today. It relates to the business that had its origins in the 17<sup>th</sup> century, the East India Company (EIC), which was so colossal it was known simply as "the Company." It might have long passed into history, but it has a profound legacy – and a few lessons for today. Because what began as a speculative venture by merchants in the closing years of the reign of Britain's Queen Elizabeth I to explore new markets in Asia in fact ended up reshaping the world's trade flows, politics and economics – which echoes in the 2020s and its globalized trade. The story of the astonishing wealth of the EIC and its plutocratic executives plus the raw violence it unleashed in South Asia in pursuit of profit has been well told, but it has acquired a new relevance. The trading facilities established by the EIC became the launch pad for broader British economic and political engagement in India. This prepared the ground for the eventual colonization of the subcontinent in the 18<sup>th</sup> and 19<sup>th</sup> centuries as the British state extended its influence over the Company and the territories it had come to control.

**EVEN BEFORE THE CORONAVIRUS** pandemic emerged, the seemingly unbounded powers of corporations have been the subject of increasing attention and concern. That has only increased as policymakers, economists and analysts contemplate scenarios for a post-coronavirus world, a moment when crisis is taken as an opportunity to fix inherent flaws in global capitalism and politics. In Europe, the European Union's Economy Commissioner Paolo Gentiloni has suggested that Covid-19 and the

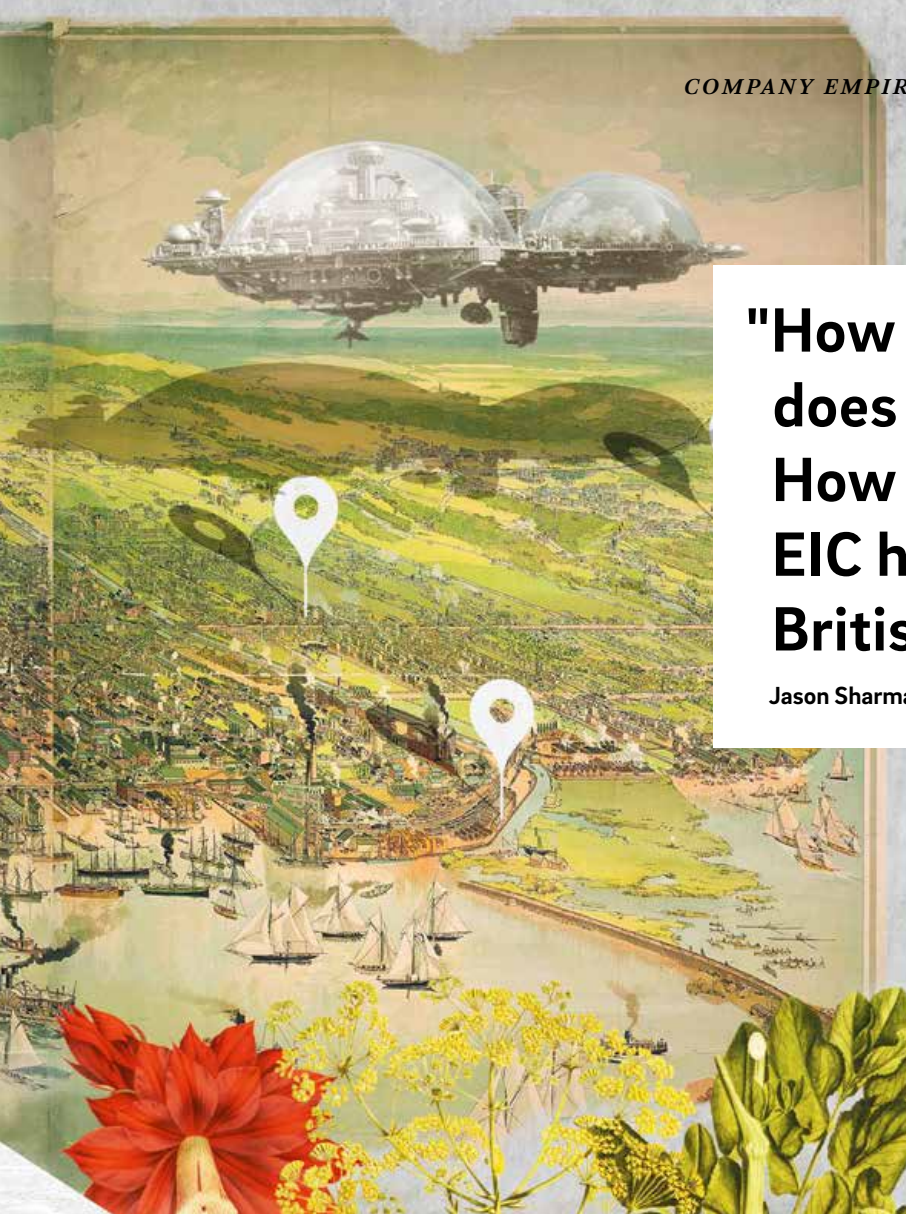
**33%**

The percentage of British income tax collected in the 18<sup>th</sup> century attributed to the East India Company.

economic damage it has wrought will spur long-standing efforts to introduce a digital tax – one of several familiar, if contested, proposals for how to get big tech to pay more into government coffers. "Maybe the crisis will help to give a little bit more boost to multilateralism and international cooperation," Gentiloni told a think tank event this spring. Such a levy would complement the long-standing efforts of his commission colleague Margrethe Vestager, the EU's competition supremo, to crack down on tech giants who, she argues, display monopolistic tendencies and have effectively become their own regulators.

More broadly, an ever-growing number of economists and policymakers from different ends of the political spectrum argue that one legacy of the pandemic will be a resetting of the balance of power between capital and labor, between the private and the public sector. Mariana Mazzucato, head of the Institute for Innovation and Public Purpose at University College London, argues that the coronavirus pandemic has created a chance to





**"How many aircraft carriers does Google have? None. How many divisions did the EIC have? More than the British government."**

Jason Sharman, Professor of international relations at Cambridge

revolutionized the way companies conducted themselves. It created a new class of superrich merchants, the so-called "nabobs" who appalled and fascinated 18<sup>th</sup>-century London society much as the oligarchs do today. Such outrageous individual extravagance was countered by a carefully cultured corporate brand management. The company may have expanded from a few coastal "factories" in Bengal in eastern India, engaged in trading in textiles, to controlling much of the territory and – critically – tax collecting powers of large parts of the subcontinent, yet its five-windows-wide headquarters building in the City of London presented a relatively modest face to the world.

do capitalism differently. It's a sentiment that finds echoes within the UK's governing Conservative party. In this context might a glance in the history books offer some useful insights for the present? Is the story of a company of adventurers who set off round the world in search of spices and ended up giving birth to a new polity relevant for a world where innovative tech billionaires entertain libertarian dreams of seasteading or colonizing Mars? William Dalrymple thinks so. The author of *The Anarchy*, a history of the corporate violence and pillage conducted by the EIC, says that while no corporate leader today would claim to be inspired by the Company, it pioneered methods and practices that are still all too familiar.

From the efficient mobilization and the deployment of shareholder capital to playing off one tax authority against another, from corporate lobbying to the influencing and interfering in political systems, the East India Company wrote the first draft for many of the features of the modern global corporation. Along the way the EIC

**200  
thousand**

The membership of the East India Company's own army in 1800, twice that of the British Army at the time.

**IT HAD AN OVERBEARING INFLUENCE** on British politics. A large number of MPs were EIC shareholders or former Company men who had bought their seats in Parliament and could be called upon to ensure that its interests were looked after. Relations between the Company and the state were always uneasy. While the EIC was a private joint-stock company, free to go about its own business, it was also expected to further the national interest. At the height of its powers in the 18<sup>th</sup> century the EIC, dubbed "the grandest society of merchants in the universe," was directly responsible for a third of Britain's tax income. Its power and importance was such that when it ran into trouble it was judged to be too systemically important not to be bailed out – or to use the modern terminology, it was simply too big to fail.

The EIC was by no means the only corporate power in modern history. Its 17<sup>th</sup>-century contemporaries included the Dutch East India Company and ventures to develop trade in Russia, the →



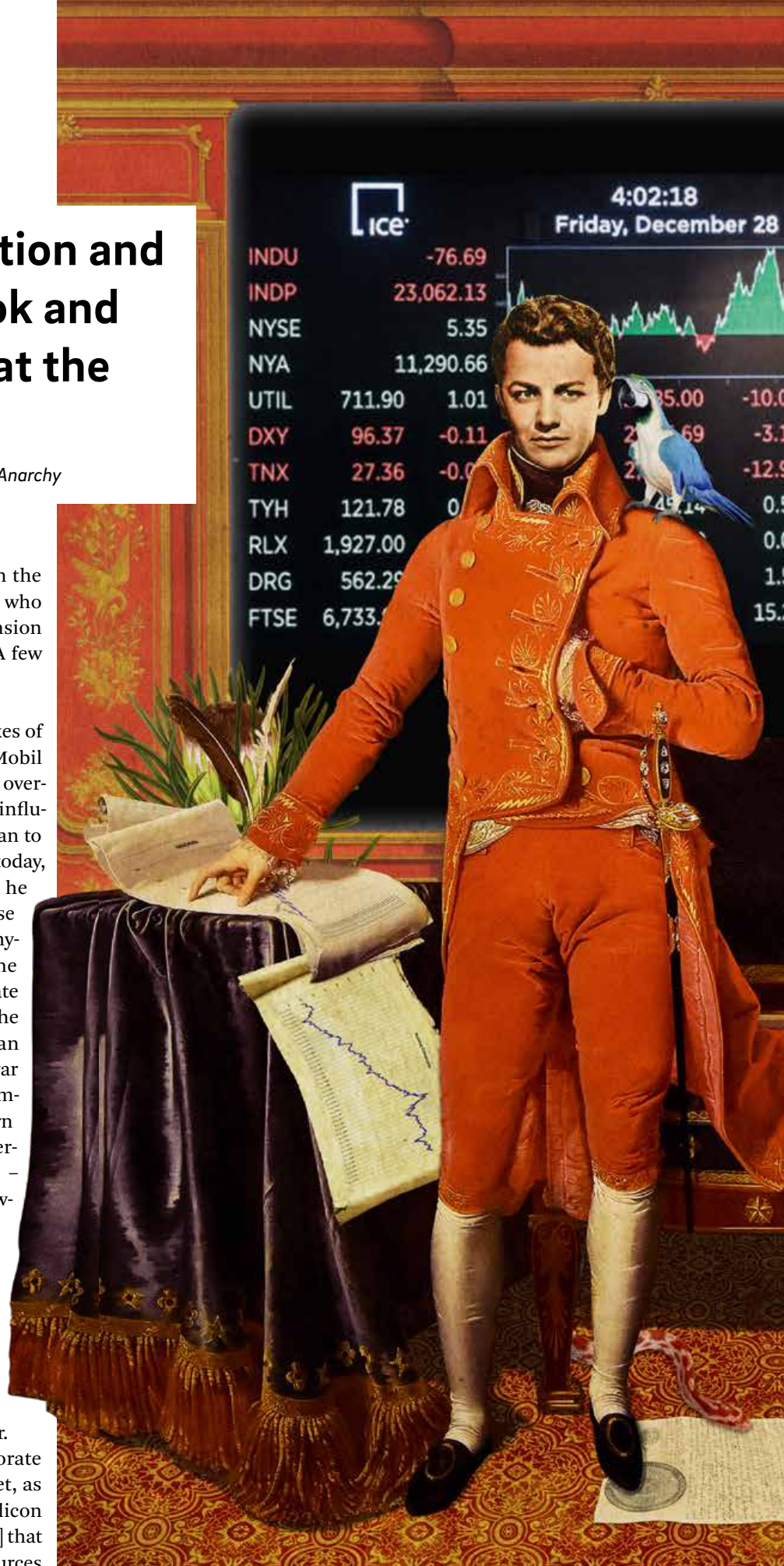
## "Control of information and data gives Facebook and Google a power that the EIC never had."

William Dalrymple, Historian and author of *The Anarchy*

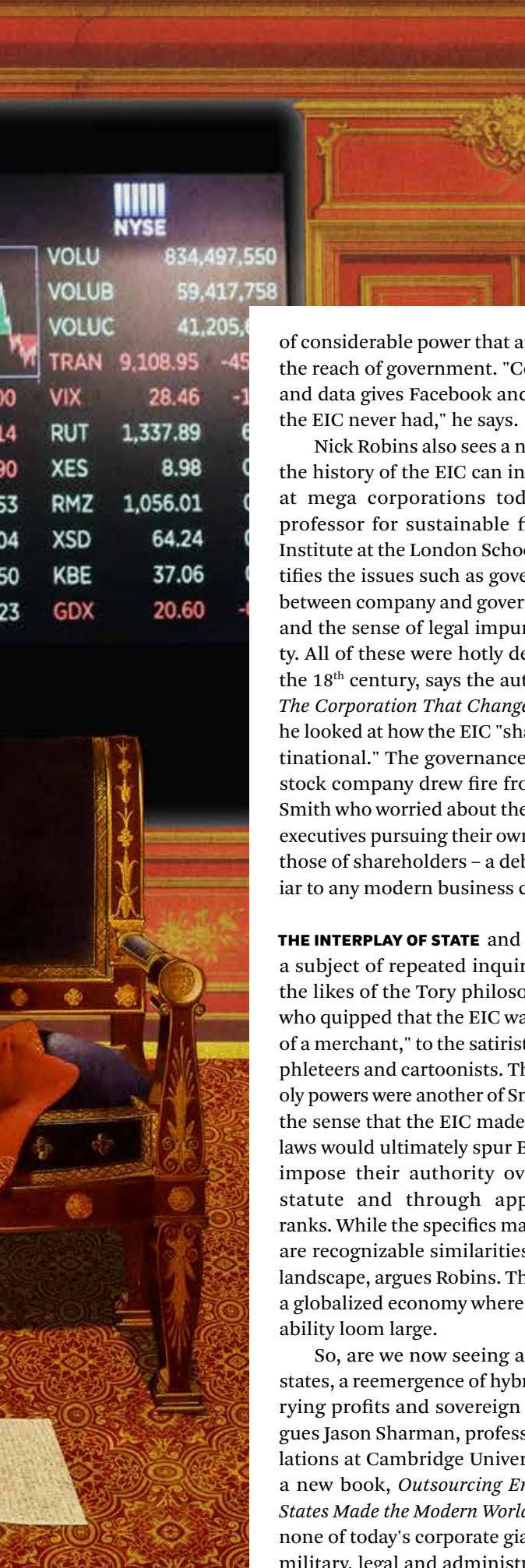
Levant and the Americas. It was followed in the late 19<sup>th</sup> century by a raft of "company-states" who sought to advance European imperial expansion from West Africa to the Solomon Islands. A few flourished, many failed.

**IN THE 20<sup>TH</sup> CENTURY**, Dalrymple notes, the likes of Anglo-Persian, United Fruit, ITT and ExxonMobil were all at times singled out as examples of overmighty private sector corporations able to influence and shape politics in countries from Iran to Guatemala, Chile to Indonesia. In terms of today, alongside familiar targets in Silicon Valley, he says some of the overseas activities of Chinese commercial entities indicate a new era of hybrid corporate power that has echoes of the EIC. And yet in terms of unbridled corporate power, the EIC was in a class of its own. The Company's private armies were bigger than those of nation-states, enabling it to make war and peace or dictate the terms of trade seemingly at will. Its ruthless application of modern technologies – from savvy financial engineering to the deployment of Prussian drill – created the cornerstone for British global power. It was as one of its directors noted: an "empire within an Empire." The rapacious commercial and military expansion of the EIC across the subcontinent, which saw millions die as a result of famine and conflict, horrified even contemporary observers. It would contribute to it being brought to heel by the UK government which successively reduced its privileges and ultimately took it over.

Compared with all that, today's corporate titans may seem like harmless minnows. Yet, as Dalrymple argues, while the tech giants of Silicon Valley may lack the armies of sepoy [soldiers] that the EIC once commanded, they have other sources







of considerable power that at times seems beyond the reach of government. "Control of information and data gives Facebook and Google a power that the EIC never had," he says.

Nick Robins also sees a number of areas where the history of the EIC can inform the way we look at mega corporations today. Specifically, the professor for sustainable finance at Grantham Institute at the London School of Economics, identifies the issues such as governance, the relations between company and government, market power and the sense of legal impunity and accountability. All of these were hotly debated topics back in the 18<sup>th</sup> century, says the author of the 2006 book *The Corporation That Changed the World* in which he looked at how the EIC "shaped the modern multinational." The governance structures of a joint-stock company drew fire from the likes of Adam Smith who worried about the excesses of company executives pursuing their own interests rather than those of shareholders – a debate that will be familiar to any modern business commentator.

**THE INTERPLAY OF STATE** and corporate power was a subject of repeated inquiry and concern, from the likes of the Tory philosopher Edmund Burke, who quipped that the EIC was "a state in the guise of a merchant," to the satirists and scurrilous pamphleteers and cartoonists. The Company's monopoly powers were another of Smith's bugbears, while the sense that the EIC made its own rules or bent laws would ultimately spur Britain's politicians to impose their authority over the company, by statute and through appointees to its top ranks. While the specifics may have changed, there are recognizable similarities in today's corporate landscape, argues Robins. This is especially true in a globalized economy where questions of accountability loom large.

So, are we now seeing a new era of company states, a reemergence of hybrid organizations marrying profits and sovereign power? Not quite, argues Jason Sharman, professor of international relations at Cambridge University and co-author of a new book, *Outsourcing Empire: How Company States Made the Modern World*. For all their powers, none of today's corporate giants has the sweeping military, legal and administrative powers enjoyed

by the company-states of old. "How many aircraft carriers does Google have? None," says Sharman in an interview. "How many divisions did the EIC have? More than the British government." Today's tech giants, he continues, are caught between a cosmopolitan "1990s mindset" – in which the only things that mattered were money and returns, leaving geography and nationality irrelevant – and the realities of politics today. "Whether they like it or not they are political actors in a fraught political process," says Sharman.

**CORPORATE POLITICAL POWER** is also not as strong as it might seem, he adds. Facebook may be able to buy in the services of a former UK deputy prime minister and other West Coast tech behemoths may have packed their ranks with ex-policymakers, but ultimately they still remain vulnerable to any developments that a fast-changing political environment can bring. "Joe Biden wins – how secure are they then?"

John Kay, economist and co-author of the book *Greed Is Dead*, highlights other potential weak spots. Unlike their historic predecessors, today's corporations "don't really own anything." Nor do they make anything: "Their 'product' is coordination and intermediation." Beyond a set of capabilities, there is not much to them. As such, as powerful as today's tech giants might appear they are also vulnerable to the effects of relentless change in innovation and consumer habits. He points to another aspect of the story of the EIC: "In the end it self-destructed – as they all do." The extended power struggle with the state ultimately ended in total victory for government as it curbed and finally neutralized the power of the EIC. It is a trajectory – expansion, triumph, overreach, denouement – that might offer a salutary current relevance.

In the case of the Company, the end was particularly ignominious. In 1857 its own private army rose up in revolt, leading to what in India is called The First War of Independence, and in Britain as the Indian Rebellion – one of the bloodiest episodes in British colonialism. As a result the UK government removed the EIC from power altogether, finally winding it up in 1874 with, as one commentator noted, less fanfare "than a regional railway bankruptcy." ■



*THE CORNER "BANK"*  
Michael Joseph's vision was to have a proliferation of M-Pesa kiosks just like Starbucks in America: every where you look.



# Mobile game changer

*From rewriting the rules of telecommunications to reframing how finance can work, Michael Joseph speaks with Think:Act about how making a positive impact can also translate into profit.*

BY **Neelima Mahajan**  
PHOTOS BY **Fredrik Lerneryd**





**F**OLLOWING THE RULES was never Michael Joseph's style. Two decades on from his arrival in Kenya as founding CEO of Safaricom, he has proven that tailoring a telecommunications model to the needs of emerging economy customers doesn't mean sacrificing profitability – just the opposite. Safaricom has become a market leader and its financial service, M-Pesa, is estimated to have helped lift 2% of Kenyan households out of poverty. In this interview, he shares his thoughts on how better business can also help make a better world.

**When you helped set up Safaricom, what were you looking to achieve?**

I arrived in Kenya in June 2000 [to head Vodafone's joint venture with Telkom Kenya]. The business plan was 300,000 customers in five years. So I started focusing on the person in the street: those who came to work in a *matatu* (mini bus). We started with things that changed their lives: prepaid, per-second billing, free customer service 24/7, low-cost devices, easy-to-get SIM cards. That was the beginning of Safaricom. We had no money. We focused on voice and SMS in the first five years.

But as we grew and had more money, I created a group of people who were innovators. I said, "You have to find me four to five products a year that we can launch. It can be commercially successful, but also change people's lives. I don't care where you get it from, how you get it, just get it for me." That was the ethos. We grew the company very fast because we focused on two things. One, we focused our products and services on those coming to work in a *matatu*, who spend money on a daily basis, not a monthly basis. Two, we totally believed in changing people's lives for the better. Because we had so little money [I decided] to divide [our budget] up into tiny segments and spread it right across the country. Word got out that Safaricom was funding so many things: a roof or electricity for a school, beds in a children's home, a cow, some benches. It created this warm feeling about Safaricom.

**You went to Kenya not knowing anything about the country. Was this a challenge or an advantage?**

I just went in fresh having no preconditions of how I wanted the company to be. I wanted to change people's lives without following anybody's example. As an example, it was conventional when you started a company, in those days, to charge →

**94%**

The percentage of the Kenyan population covered by Safaricom's 3G network as of March 2020.

**\$2.3 billion**

The service revenue reported by Safaricom for the financial year ending in March 2020.

per minute. If you charge per minute, it means that even if your call is 40 seconds long or five seconds long, you round up and pay for a minute. This gives you 20%-25% more revenue. I said, "I'm going to do [pay] per second." And the shareholders basically said, "Oh, you're nuts!" And I did it. [We were the first to do it globally.]

**The most interesting thing about your company is this whole ecosystem of services you've built around it, one of which was M-Pesa which ended up being wildly successful.**

A guy called Nick Hughes at Vodafone saw this request from the UK aid agency DFID (Department for International Development) to come up with ideas for deepening financial penetration to the unbanked. He came up with this idea of using the mobile phone for the disbursement and repayment of microfinance loans. DFID and Vodafone put in money, Nick designed the software and then he started to find who could test it for him. I said, "Of course, we'll do it." We evolved it, refined it and tested it. In the trial phase, the Kenyans started to use it in a way we didn't anticipate. They would get money from the microfinance institution, then they would send it to somebody else. They sent it to one another using a feature. My team wanted to do something with this. I agreed to pay to refine the software – and we launched it.

The key to M-Pesa's success is the distribution network. You need a vast distribution network so that you can go into an agency and convert cash into electronic money or vice versa. I created a distribution network that emulated Starbucks in America: When you want a cup of coffee, you turn around and there's a Starbucks. It's the same with M-Pesa. You want to transact, just turn around, there's an agent. Building this agent ecosystem long before anybody thought about it was the key to our success. In my first year it cost \$10 million.

**These blurred industry boundaries: finance and telecom. Are there any lessons here of how a company from a completely alien industry can succeed in a different one?**

In the early days, all you did with M-Pesa was send money from one person to another. Essentially providing a fundamental financial service to a person who doesn't have a bank account. The way people were sending money was by bus, by taxi and by hand. I didn't think that we were competing with banks. The banks, however, thought I was and tried to stop us. So somebody was paid to ask difficult



## Michael Joseph

was the founding CEO of Safaricom Limited, the largest telecommunications provider in Kenya and is credited with transforming the company from a department of Telkom Kenya into one of the largest corporations in the region. After stepping down as CEO in 2010, he served as interim CEO from July 2019 until April 2020. He is the chairman of Kenya Airways and currently a director in the Safaricom board.

questions about M-Pesa in Parliament saying: "Is the government aware that this is actually a Ponzi scheme, that there's no financial backing?" At one point, the finance minister said on national TV that he was going to investigate this. The next morning, I went to see him. He said, "Michael, what's this all about?" I said, "Minister, how do you pay your workers' salaries?" He had a farm. He said, "Oh, the foreman from my farm comes down here, we work out the wages, I give him a check, he goes to the bank, cashes the check, comes back, we count the cash, we put it in envelopes, and then he drives back to the farm and distributes it." I said, "Do you know you can pay those workers from your office?" He said, "No." I said, "Okay. I will pay your foreman for this week."

I showed him how I sent the money to him via M-Pesa on my phone, and about 10 seconds later, he called the minister and he said to him, "It's astonishing. I just received money from Michael Joseph!" The minister says, "What?! This thing is wonderful. I must tell the boss." The boss being the president. Two days later, a full-page ad appeared in all the local papers saying that the ministry of finance and the central bank had done a full audit of M-Pesa, and it was perfectly fine. That was the end of the banks' [objections].

**M-Pesa began at the base of the income pyramid, but now it has gradually gone up to the top of the pyramid. We don't often see innovation migrating from the bottom to the top.**

No, you don't. Many people in the beginning said, "I don't need M-Pesa, it's for my staff, drivers." In Kenya you have a maid or a driver – and normally you pay them cash. They said, "I don't want cash. I want you to give it to me in M-Pesa because it's safer for me." The tea pickers [when paid with M-Pesa] could put aside money in a savings account before their husbands got hold of it. But still, it was you're paying the base of the pyramid, and therefore you need an M-Pesa account to pay them. That's how it migrated up.

A key part of M-Pesa is it must be 100% reliable. You must never steal or allow anybody to lose their money. We have lots of fraudsters who try to take advantage, but every time somebody invents something to defraud a customer, we take care of it. Now, people are investing in mutual funds or buying government bonds, investing in the bond market or investing in the stock market using M-Pesa. It's an accepted way to pay for things and to invest, paying for insurance, paying rent, buying plane





**"We think about returns in terms of making our customers' lives better, so they become better customers for us."**

tickets. For low-cost carrier Jambojet you can only pay with M-Pesa.

**You have the rare privilege of having worked both in the developed world as well as in developing countries. From this unique perspective that you have, what do you have to say about developing country innovations?**

[In the West], whenever you come up with something innovative, it's always: Where is the return on the investment? The first question people ask in the West is: "What's in it for the company?" I have an idea about a product called DigiFarm, which is to try to change the lives of small-scale farmers, we're testing it now in Kenya. We have a real test going on right now: 45,000 farmers are on DigiFarm. Small-scale farmers have five acres or less, live hand-to-mouth because they don't have enough money to buy quality inputs. So they buy seeds and fertilizer, which invariably are not high quality. So they farm poorly and get poor yields,

and therefore income is very poor and they just have enough money when they sell their crop to keep them going as subsistence farmers and pay back the loan. So I came up with this idea that you can apply to DigiFarm: Tell us what you grow, where you grow and how big is your farm, and based on our database, we will give you a voucher to buy high-quality inputs from our store. So you have high-quality inputs and we have a farmer extension officer that helps you grow and gives you advice. Then we will buy your crop at market prices and at the end, you pay us back. If you're getting better yield, the same as what we predicted or better, we lend you more to manage next time around. This is to change the lives of small-scale farmers who are in the cycle of poverty.

I pitched this idea to my boss and said, "This is applicable in India, wherever you go in the world, this is a big." His reply: "No, we don't want to touch it. Where's the P&L?" There's no profit in this thing for another five years, it will come later. That's the western focus. We're only now starting to understand that as a corporate: We have a bigger responsibility other than to return money to shells.

M-Pesa started out as a mostly break-even product. It was never gonna make money. It was wildly successful. It's now 35% of our revenue and quite a significant contribution to the bottom line. From a western point of view, we think about returns in terms of profit. In our part of the world, the developing world, we think about returns in terms of making our customers' lives better, so they become better customers for us. ■

**7**  
countries

The number of markets that M-Pesa now operates in: the Democratic Republic of Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique and Tanzania.

**24.91**  
million

The number of M-Pesa customers active monthly during the 2019-2020 financial year.

## Deep dives



Take a deep dive and find out more in related articles and studies.

1

**Reboot**  
the culture

2

**Redefine**  
the business  
model

3

**Reconfigure**  
the operating  
model

4

**Redimension**  
the  
organization



### THE BUTTERFLY PRINCIPLE

# Transforming business

**THE BUZZWORD** to fix on right now to help explain where we find ourselves in the 2020s is the "new normal." No one can deny that with Covid-19 we are all in a brave new world that is making unpredictable demands. The quicker you can (re)position yourself the better – and change is always easier when you break it down into stages. To take advantage of the unique opportunities you need to think of embracing the butterfly principle and putting a "re" into everything to reboot, redefine,

reconfigure and redimension your organization.

However, it would be foolish to assume that the "new normal" is the same for everyone. It depends of course on where you are coming from. The structures in place in one industry will be different from another, so any thoughts or solutions for how to handle the road ahead need to be viewed through a specific lens for the sector concerned. On the facing page you can read a snapshot of how the tech, auto

and aviation industries need to front up to the challenges ahead and how their roles and impact are likely to change. The butterfly principle of transformation is a handy rule of thumb for all to help guide change and address many business concerns in the new normal.

#### → LEARN TO CHANGE

Get up to speed with the steps that can help ease the transition into the new normal:  
<http://rb.digital/3kbbEDy>



## TECH INDUSTRY

## Facing global change, defining the local threat

Rebalancing globalization has been in debate for the past few years, but recent events have put localization fully in the spotlight – and that could have a negative impact on the tech sector. The pandemic-induced crisis has led directly to reassessing localized supply chains. True, that makes them more resilient, but in an industry that is so dependent on economies of scale, such a change can have a negative impact. Alongside that, limited freedom of movement and travel will impede collaboration. The result could mean a war for technology with separate competing technological universes, similar, some say, to the Cold War.

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→ **REBOOT YOUR APPROACH**

Read more about how localization is quickly becoming the globalization of a new era: <http://rb.digital/3hBLjyN>

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## AVIATION

## Flight fit?

The headlines left no doubt that the airline industry was badly hit by the pandemic. The drastic drop in customer numbers has had a huge impact on operations, forcing airlines to make strategic decisions. That, in turn, is impacting manufacturers and subsequently parts manufacturers who are projected to see a 25-50% drop in demand during 2020-28. Airlines need to decide on their fleets. The decision will depend upon the long-term relevance of the aircraft, its value on the secondary market, the cost of retiring it and the cost of grounding it. So far the trend is veering towards retiring older wide-body aircraft and retiring aircraft based on age.

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→ **CONTROL THE PATH AHEAD**

Understand all the factors at play for an industry faced with an unprecedented challenge: <http://rb.digital/2ZDWsJD>

## AUTOMOTIVE

## Keeping pace with changing consumer needs



**"Auto-makers need to start planning for the long term now."**

*NORBERT DRESSLER,  
Senior partner  
Stuttgart office,  
central Europe*



**THE PANDEMIC** is likely to leave the automotive industry in a rather strange position and in something of a reversal of attitudes. Before Covid-19, public mood was moving towards shared transport offers and in some regards away from auto ownership. But the advent of the virus has meant that people could be very keen to want to use private vehicles to guard against the risks of public transport – and to have more autonomy. However, many are likely to have less money to spend. So, while demand could be there, reduced consumer buying power will likely lead to cheaper vehicles. And the result could well be a reduction in complexity and material costs. But car use will alter too: Limiting exposure to others will also become a motivator for ride-hailing as well as private vehicle ownership.

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→ **SHIFT PERSPECTIVE**

Study the trends driving customer choice in the Covid-19 landscape: <http://rb.digital/3iJwll0>

# NEW IDEAS TO NAVIGATE A NEW ERA

With his controversial book *Utopia for Realists*, **RUTGER BREGMAN** set out an argument for a better world. Now the Dutch economist and historian has his sights on how humankind can **work together for a better future** – and what part thinkers, entrepreneurs and the state play in it.

**1** Is this a moment when people are looking for a new world based on new ideas?

I felt the zeitgeist was turning even before the coronavirus pandemic. All sorts of ideas that were taken less seriously a couple of years ago had been entering the mainstream – ideas about basic income, wealth taxes, redistribution, a bigger role for the state ... the ideas of people like Greta Thunberg, Mariana Mazzucato, Thomas Piketty, Andrew Yang. This process was accelerated by Covid-19, which has made it clear that many things have to change.

**2** You believe in the power of ideas. Which thinkers were most influential among policy-makers until now?

For a long time, Milton Friedman: the idea that the government is a fool. The story was that real wealth comes from the top, from the Jeff Bezoses, the Steve Jobs, the Elon Musks. That kind of thinking seems to me to have collapsed. Its intellectual basis has been destroyed, certainly in this crisis. Neoliberalism seems to be on its deathbed. I say that with caution: In the past it has often turned out to be a zombie that suddenly rises up again.

**3** Can progressives seize this moment?

The left has spent too much time talking about what it's against: the establishment, austerity, racism, homophobia. I'm against those things, too. But you're giving them oxygen and attention with the culture of outrage. Stop it! Change the subject. Talk about what you want to talk about. Stop defining yourself by pointing to things you don't like. You can also imagine this crisis taking us to a very dark place. History shows that crises can always be abused by people in power: the Reichstag fire and Hitler, 9/11 and two illegal wars and massive spying on innocent citizens. ■



**Rutger Bregman** is also the author of *Humankind: A Hopeful History*. He concentrates his writing on the themes of basic income, the work week and open borders.





### A few of our contributors



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or register for the Think:Act Magazine newsletter at [rolandberger.com/tam](http://rolandberger.com/tam)

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"BAD COMPANIES ARE DESTROYED BY CRISES, **GOOD COMPANIES SURVIVE THEM**, GREAT COMPANIES ARE IMPROVED BY THEM."

— ANDY GROVE, FORMER CEO INTEL

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