The Coronavirus and Information and Communications Technologies: Operating Impacts, Policy Implications, and Managers' Imperatives

We are peeking out from under the covers of "The Great Pause" of a pandemic – life disrupted, economies listing, personal and global health in question, norms of civic life turned upside down, and protest flourishing. The yellow caution flag is still up, but the sounds of an attempted restart are everywhere.[i]

Emerging from our confinement we see all around evidence of an astounding flood of digital adaptation - in massive moves to e-commerce,[ii] to online telemedicine and health services,[iii] to personalized wearable "fit" devices,[iv] to new modes and means of commerce and engagement. Reported numbers tell the story: internet usage has jumped 70 percent, the use of communication apps by 300 percent, and virtual collaboration tools by 600 percent. "Some video streaming services have grown 20-fold," Klaus Schwab told the World Economic Forum.[v] "We saw 10 years of telehealth adoption in about 8 weeks," a hedge fund executive reported.[vi] "It would've taken between 4 and 6 years to get to the levels of on-line spending that we saw in May," said Adobe.[vii] Satya Nadella, Microsoft's CEO was surprised and satisfied. "We've seen two years' worth of digital transformation in two months."[viii]

Not just on platforms, in software, and on devices, but in process innovation on the job and in the home, too. The Great Pause has engendered the "Great Work-Around,"[ix] with millions of unsung heroes in homes, warehouses, and emergency rooms getting the jobs done, fighting exhaustion, fear, and shortages of equipment, staff and training, and energized by necessity, compassion, and selflessness.[x] In Round 1 of "*World vs. Covid-19*" Kotter's eight cardinal rules of pre-planned change management fell overnight to Nike's simple one, "Just Do It," all adding up to what Benedict Evans called a trifecta of turbulence – *acceleration* as existing trends jump forward; forced *experimentation* as *everything* moves online; and *market resets* as habits break and rush for mindshare, wallet, and customers is on.[xi] [xii]

But the first months of the pandemic also revealed deep digital divides exacerbating the viral consequence – with dramatic differences in impacts on health, education, and prosperity within wealthy countries across demographics of race, age, gender, marital status, and class,[xiii] among rich and poor countries, and among those nations that have little online presence vs. those for whom it is ubiquitous.[xiv] In regions such as the Middle East, North Africa, and Sub-Saharan Africa, a UN report found, "the adverse impacts of COVID-19 could result in poverty levels similar to those recorded 30 years ago."[xv] In the United States, Kaiser enumerated devastating secondary impacts of the pandemic in job losses, school failures, evictions, and hunger that are falling disproportionately on Black and Latino families – and tertiary ones of stress, mental illness, and violence.[xvi]

And we have learned, of necessity, about the "Great Hole" of digital disenfranchisement – huge gaps in worldwide connectivity. More than half the world is without Internet; half without mobile phones; half without laptop, tablet or other device to connect (exact numbers vary by sources,

definitions and denominators, e.g. World Bank, GSMA, Apple, Google, CNNIC, ITU can all present quite different pictures).[xvii] Of the 25 least connected countries, 21 are in Africa. With platform access so biased, our awareness of Covid-19's impact and consequence can be tilted perforce to the pockets and societies of privilege where platform access makes it is visible. "Covid-19," Yale's Keller Easterling has suggested, "is an X-ray of whiteness, inequality, and ineffectual government as well as a rehearsal for climate catastrophe."[xviii]

This all adds up to a turbulent new status quo in town – of disenfranchisement, powerlessness, danger and despair for those less privileged, under-connected, and more oppressed, and personalization, empowerment, and social engagement for those anchored to new social, mobile and cloud infrastructure. The push may be on to close those gaps where possible.[xix] But try now to take all that digital accommodation away from home schoolers or home office-ers and you may run smack into the status quo bias.[xx] Every knowledge worker is within her rights to ask and to know: "Why should I return to the office – what's in it for me?"[xxi] We are reminded of Charlton Heston's epic appearance at a National Rifle Association conference years back. There, clenching an ancient muzzle-loader, the actor challenged any who would dare come for his gun to "pry it from my cold dead hands."[xxii]

Big questions linger. Is the Great Pause real and a permanent quieting, or will the pandemic come crashing back for Round 2…*and then Round n*? Will schools ever teach again as they did before? Will small businesses recover? After countless authoritarian regimes smothered the outbreak under the blanket of surveillance state technologies, will "smart cities" ever earn the trust of democracies? Will the workplace and the workforce return to the fully in-person social?

Perhaps the most important question is this: even if we could return to a pre-pandemic status quo - *should we*? Or should we build from the new to a future perhaps *even better than before* – to close digital divides, to build safe, new smart cities systems, to foster deep learning on-line, to promote new and lasting engagement between citizens and cops? What then would be the imperatives for managers and leaders resolved to continue with change – change that moves us all past efficiency and effectiveness to equity and equality?

At the heart of all this tumult are information and communications technologies that have shaped our experience powerfully and with mind-blowing speed, accelerating shifts already in the making and nurturing new ones overnight. Our social and work platforms connected billions. Apps flourished to become our new playthings, work tools, and distractions. GPS, Bluetooth and beacons created webs of location awareness, repurposed now for precision contact tracing. Sensors of every make and description streamed data from lampposts, roof tops, satellites, and seabed. Servers in the cloud storing, securing, and transporting big and small data, structured or unstructured, real-time or historic, gave scientists, generals, and citizens precision insights to the world all around. If you are "on the grid," right now, anyone who wants to can know *who* you are, *where* you are, *how* you are, and *what* you are, as never before. All with speed, astonishing volume, and now, precision. Aggregated, big data might now predict outbreaks two weeks before emergency room visits skyrocket – based on Covid-related Twitter posts, doctors' searches on physician platforms, mobility data from smartphones, and readings from Kinsa Smart Thermometers uploaded to apps.[xxiii]

Arguably, all that tech saved us from collapse. We flipped the Zoom switch, for example, and the next day bounced millions of students and teachers out of classrooms onto beds, floors and dinner tables for the day's lessons –achieved with nothing more than a URL and near 100 percent adoption.[xxiv]

The forced quarantining worked to flatten the pandemic curve. But every indication is that online K-12 schooling academic achievement - with disproportionate impacts on Black and Latino children most of all, widening existing achievement gaps.[xxv]

Those are broad-brushed claims – and having made the great leap forward without test, proof, or evaluation[xxvi] we have as yet no idea how success and failure among children, teachers and curricula actually segments. "Everybody's telling us that 'asynchronous learning' is the best practice for this age," one New York school principal said. "But think about it. There are really *no best practices*. We've never been in this situation before!" [xxvii] Through all the fog, the test cases are now there, scaled large, awaiting rigorous further analysis.

Arguably, all that tech failed us, too. "In an age of artificial intelligence, genomic medicine, and self-driving cars," David Rotman wrote in *MIT Technology Review*, "our most effective response to the outbreak has been mass quarantines, a public health technique borrowed from the Middle Ages."[xxviii] The press of news cycles and global sifting of massive data by thousands of scientists and big pharma caused minute-by-minute shifts in prognosis and diagnosis. Together with the fecklessness of politicians prone to the suppression of truth[xxix] and the killing of messengers[xxx] we struggled for clarity and truth along a trail of uncertainty, denial, and confusion. Mask, or no mask?[xxxi] Vaccine near, or maybe never?[xxxii] Herd immunity the answer, or a pipe dream until millions more die?[xxxiii] How is it transmitted, what is my personal risk, and what should I do next?[xxxiv] All such questions found few answers that did not change by the next news cycle, many changing still. "Whatever your initial bias, someone somewhere has research to confirm it," wrote John Authers in Bloomberg.[xxxv]

The tech-enabled social, political, and economic disruptions have been seismic. A small sampling:

Education. Zoom and other online meeting services have blown up our idea of how teachers will teach and students learn. Some love it – "he gets all his schoolwork done each day by 9:30AM" [xxxvi] – and others hate it, filled with Zoom fatigue, social missing, and learning dysfunction.[xxxvii] "Of my son's seven teachers," one incensed New York parent wrote – a teacher herself, "six have conducted exactly ZERO ONLINE SECONDS of synchronous instruction." [xxxviii]

Some parents fell out of love with Zoom learning fast.[xxxix] "Looking at the work the teacher has done, I applaud her," One South Los Angeles mother said. "But it's maybe a fraction of what they would be learning if they were in an actual school setting. If they are transitioning into first grade, will there be time to catch up and get them up to par?"[xl]

And the learning loss can be substantial. With some elegant guesswork researchers at Brown's Annenberg Center projected that K-12 students returning this fall will have only 63-68% of the learning gains they would expect in reading a typical year and 37-50% of the learning gains in math.[xli] That all adds up to deepening inequity, not the least of which for New York City's 114,000 homeless school children, for whom even one more loss in a life already replete with deficit can be devastating.[xlii]

Some of this loss can be offset by standardizing curriculum, centralizing administration, and training – as the move to summer school for 143,000 students in New York promises. But all that rigor requires skillful execution – missing in the first few weeks, by some accounts..)[xliii] It's one thing for everyone to get connected – "Just do what you do and do it online!" But now standardize and centralize and scale – as schools have begun to do for summer sessions – and issues abound. "It really does feel like it's a widespread clash of miscommunication, last-minute thinking, and platform issues,"[xliv]

But it also suggests that online learning can have the *reverse* effect and be the great equalizer. Parents who wish to – and many now do – can search out and find online supplements for children's education without fear that they are inferior to the learning the child would otherwise receive. That opens the world of online learning to anyone with Internet as part of schooling's "new normal." [xlv]

Work from Home: Throw in Slack or Microsoft Teams and the same is true for business. In May CNN extended work-from-home till September, followed by other white-collar firms pushing the return even deeper into 2020.[xlvi] In June, the New York Times extended its "stay put" order for employees until January 2021.[xlvii] Gallup reports upwards of 60 percent of the US workforce now works from home, up from pre-pandemic single digits.[xlviii] "Many companies would have switched to telework with just a small push, and now they're getting a great big shove," Monica Kirkpatrick Johnson, a sociologist at Washington State University asserts.[xlix] In the face of tolerable-to-comfortable adaptation, a need for certainty in routine, and repeating waves of viral infection and risk we are beginning to see signs of "The Great Balk" – quietly and loudly, some employees are just saying "No" to any fast return, and suing to stop it.[l] But other companies competing for Gen Z talent are likely to offer just the reverse – controlled, sanitized campuses where everyone is tested, and where the fully social nature of work – and finding mates – can proceed apace.[li]

Hiring: Automated Hiring Platforms take the friction out of prospect evaluations, standardize assessments, turn performance into data, and other so-called management "affordances."[lii] They also let firms turn on a dime. During the pandemic, Amazon rolled out its AI-driven hiring and virtual training tool to bring on 175,000 workers fast. A 26% surge in its online commerce caught Amazon flat-footed. The rollout – reducing time to hire to ten days – took weeks for "a process," reported Hayden Field in *MIT Technology Review,* "that had been expected to take a couple of years."[liii] Were they "good" hires? Did the algorithms reduce bias or add to it? Was there an optimal mix of in-person and virtual? Researchers earlier had disparaged the "junk science" going on in AI-enabled hiring systems.[liv] Whatever. With little proof, experiment, or prototyping, and whether wreaking havoc or miracles, 100% virtual hire and training stormed the beaches and is no doubt the new status quo, here to stay and subject only to refinement, not removal.

E-Commerce: Pandemic revealed the frailty of supply chains, then broke them. Super-efficient, with all fat squeezed out, supply chains also proved extremely brittle[lv]. Trying to accommodate the simultaneous shuttering of ports, the closing of brick-and-mortar stores, and the massive shift to online buying with two-day delivery the norm, with panicked buyers binging every week on some new rarity, from toilet paper to beef, inventories piled up in warehouses and ran low in stores. Curbside pickup went from oddity ("Who needs it?") to crucial for survival to mega-sellers and main street[lvi] (cf., The Gap, which converted 2100 stores to curbside distribution nodes.) The press of last mile deliveries regardless the size of the order introduced the gig economy to traditional logistics and pushed software

and analytics to the limit in a mad-dash to segment customers correctly into new, precision-tailored delivery regimes. Shopify's CEO Harley Finkelstein thinks these shifts may be permanent. "Siloed physical retail stores without an omni-channel presence will not survive." [lvii]

Public Health: From vaccines to testing, contact tracing to individualized monitoring, public health initiatives were replete with new technologies. They were all highly personalized, massively scaled, rapidly brought on, some heavily controlled by governments, others by individuals opting in. Authoritarian regimes learned from each other and perfected mass surveillance – fully repurposing that term from a purely public health definition to one meaning "all-purpose subjugation of individual rights and privacy in the name of the 'greater good'" (John Stuart Mill's utilitarianism on 21st century steroids). And while it proved that the full spectrum surveillance state can squeeze the last drop of Covid-19 out of a city and a nation fast – Korea showed rapid testing could do the same without dropping the iron curtain on its essential freedoms.[lviii]

For contact tracing, in particular, there has been a cannon blast of apps pushed out globally, some supported by tech companies eager to get in the health game, some by surveillance firms like Palantir and Clearview (famous for recently scraping 3 billion images from social media sites with no one's permission[lix]) eager to gather even more data about us, some developed and promoted by governments, others by health insurers.

For each and all, "the idea is to promptly prune branches of further disease transmission in order to keep its reproductive factor non-exponential," Berkman Center's Jonathan Zittrain wrote. "Any number of well-considered plans… depend on a staged, deliberate reopening based on testing, tracing, and supported isolation." [lx] South Korea, for one, was successful – one of the first and earliest testers, it combined aggressive contact tracing with data from various records of mobile phone and credit card and nipped the pandemic in the bud even while neighboring China, from whence it came, was racing to install draconian surveillance measures to stop a pandemic fast spreading beyond its control.[lxi]

Ideal as apps-based contact tracing sounds – the key is speed, and for that nothing beats an app - the real world is decidedly messy. Every new apps-based track-and-trace system is different and non-standard, from who produces the app, to what technologies it uses, to whether it is voluntary and part of apps a user already owns but has to activate, to who owns the data. "If we're going to adopt these systems, and the facile, naive models of the world that these systems create," writes Ali Alkhatib. "it will give us a dangerously incomplete picture of the world" – made worse, still, if we navigate by it.[lxii]

After a few months of these apps rollouts we learned that there were some defining limits of design and execution.[lxiii]

Getting sufficient public participation, for example, is as important as it is difficult – at least by the time pandemic fatigue sets in. "Where before," Zittrain writes, "the question of voluntary participation in a tracing and isolation scheme was seen as how to get from, say, 50% participation up to 70% or more by the general public, the question now is whether nearly anyone would bother to install or use contact tracing tools at all — or, apps aside, change their behavior should they receive a call indicating that they've been exposed by someone who has tested positive." And in a pool of infected citizens replete with asymptomatic-and-infectious users[lxiv] – which even the most advanced contact

tracing apps are blind to -"contact-tracing apps may provide a false sense of security, thus decreasing public health, not increasing it."[lxv]

Hidden in plain view are fundamental limitations of the technologies themselves. The various location services are constrained as such - GPS, for example, is useful only with horizons visible – and that means outside – and too large-grained for locating two individuals right next to each other. Cellphone data is useful – but crude – again, good for placing bank robbers somewhere in the proximity of a tower, but not for knowing who you rubbed shoulders with. For that, Bluetooth data becomes useful, but that data has been deemed unreliable as a true measure of distance,[lxvi] [lxvii] and exceedingly difficult to manage - as the UK has discovered.[lxviii]

Meanwhile, contact tracing the old-fashioned way takes time, *and* a willing public, *and* great management – all in short supply at some city halls these days. New York raced to hire 3,000 tracers at the astounding salary of $57,000 per year – even with no experience, and with predictably desultory results – only 35% of those presumed infected who were contacted gave up other contacts. "Very bad," Perry N. Halkitis, dean of the School of Public Health at Rutgers University said. "For each person, you should be in touch with 75 percent of their contacts within a day."[lxix]

Ultimately, none of this works if the virus is unconstrained by social distancing or other measures. Assessing Covid-19's surge through the American Southwest, Dr. Peter Hotez, dean of tropical medicine at Baylor College of Medicine, was despairful. "The cases are rising so rapidly, that we cannot even do contact tracing anymore." [lxx]

The overwhelming lesson is that on a good day contact tracing is a contact sport and there is no silver bullet from tech here. On a bad day, it is pointless. "Surveillance need not be ruled out as a means by which to address the coronavirus pandemic," observed Tuft University's Susan Landau. "But implementing surveillance without [social distancing and] other measures that make it an effective public health response will not do much."[lxxi]

Public Safety: American tech companies leaned *out* on another technology issue – with Amazon, IBM, and Microsoft promising to de-weaponize facial recognition technologies – which meant dialing down their use by police departments. Skeptics abound, as such systems are part of a portfolio of imperfect, intrusive, and unregulated technologies[lxxii] in wide use, all purporting "precision" in everything from "emotion analysis"[lxxiii] to facial recognition. Ever tolerant of "good enough for government work," impatient with nuance, and never much good at sharing governance over amazing but controversial technologies, cops will now have to dust-off old playbooks for pointing the finger. The face may disappear in the crowd, again. And here come those old biases from ID's made by lineups and mugshots, again - and, again, court challenges to their effectiveness and fairness.

Amidst the pandemic courts did find comfort in the herd – but it was deceptive. Bound to due process and every citizen's right to a day in court, courts were among the last institutions in cities to close. The virus, however, was indifferent to robe, uniform or shackles and spread democratically through crowded courtrooms, hallways, elevators and prisoner transports.[lxxiv] Judges contracted it from the bench and the prisons became medieval nightmares.[lxxv]

Once made, the shift to closure without a tested, proved, and scaled telepresence system to fall back on proved disastrous in some jurisdictions. Unable to run grand juries in New York, for example, the NYPD asserted that 800 individuals whom cops had arrested for gun possession could not be indicted and were released. Another 1,000 who *had* been indicted on gun charges, with open cases, were released, too, as the courts were unable or unwilling to conduct video proceedings for any but the most pressing court matters (this, after thirty years of sporadic practice using video for such purposes.[lxxvi]) Whether this caused a spike in gun violence as a result is hotly debated. But between June 1 and June 18, of the 110 people shot in New York, 24 percent had an open court case for gun possession.[lxxvii]

Meanwhile, Washington State Probation officers found that meeting regularly with their juvenile offenders through teleconferencing without the direct involvement of the court has been — dare we say — easy?

As offices closed in Pierce County Juvenile Court, for example, probation officers Kate Pearson and Susan Miller faced fear and uncertainty no doubt experienced widely – "Are we going to be allowed to work? How can we continue to serve our young people and families without being able to visit them, have court, have access to our community partners and programs? What impact would this new way of life have… and how would we hold young people accountable when our supervision looks so entirely different?"

Their pivot leaned into the values and structures the county already had in place - Opportunity Based Probation - in new and important ways, now connecting with all families by phone, Facetime or Zoom. Connections with their wards seemed even more effective as they learned they did not need a formal hearing for everyone "to feel heard and for accountability to be had. We are moving forward without the traditional tools we have been accustomed to.[lxxviii]

Democracies and Voting: With long lines swollen by new social distancing, the glacial pace of voting should have prompted a move to Internet or mobile voting – but the reverse was true: it prompted a return to in-person and by paper. The non-standard introduction of different state digital voting systems sounded alarms after Russian meddling in the US 2016 elections, and were deemed by security experts as unremediated failures, thoroughly susceptible to attacks and manipulation. The National Academies of Science, Engineering, and Medicine concluded that "no known technology can guarantee the secrecy, security, and verifiability of a marked ballot transmitted over the Internet." Its principle recommendation: "Elections should be conducted with human-readable paper ballots."[lxxix] Lawyers and computer scientists concurred: "We need to keep voting systems as far from the Internet as possible."[lxxx]

The move away from digital *back* toward paper, however, quickly became a new tool in the voter suppression campaigns of public officials – who under cover of the pandemic shut down voting sites in Black and Latino districts in Atlanta, for example, making lines long and dissuading voters from travel.[lxxxi] Fortunately, in Atlanta, the Atlanta Hawks NFL team recently announced it would make its stadium available for voting – turning it into the largest polling place in the history of the United States, staffed with hundreds of Hawks employees. In pandemic, when technology fails, pens, paper and people can still prevail.[lxxxii]

Across the nation and the world, as it did in Arab Spring, social media and cellphones connected like-minded protestors who could mass in a hurry and make visible not only a shared passion for their common cause but each new violent race-based rupture, from a bottomless pit/endless parade of so-called white-privileged "Karens" acting out in stores, bars, and parking lots, to cops losing it with fists, guns and knees to the neck, to the (rather rare) rioters trashing luxury brand storefronts in New York. The insane cackling in tweets of a deranged President* finally prompted first recognition by a major social media platform of its obligation to put some sort of digital strait jacket and gag on him. But perhaps the most stunning, game-changing development in the 2020 Presidential campaign was the savage disruption by self-organizing teenage TikTok users and K-Pop fans of Donald Trump's Tulsa rally – grabbing all but a few reservations for the 20,000 seat arena – and never showing up, leaving a sea of empty blue seats as the lasting (now iconic) visual.[lxxxiii]

Imperatives for Managers. What lessons can we take from all this upheaval – essentially four months in the making and going strong? Here are ten imperatives for managers we can all live by as we navigate this new terrain:

1) **Welcome the shift to the new normal.** Respect the paths that workers, students, families and customers have walked to deliver services and buy products through the thickets of pandemic. Proliferate innovations further - the reconfigured work processes that are actually working. Lay in the technology to smooth the path ahead. There is no way back, only forward.

2) **Now is the time to experiment.** Take advantage of the uncertain times to innovate further. But make it snappy. Multiple models of everything have emerged. Find the experiments no one knew were running – so-called "natural experiments". Harvest the gain: refine with randomized control groups as needed, then scale.[lxxxiv]

3) **Now is the time to lead, not just manage.** Keep your teams resourced, on the same beat, in tune. Don't guess at the pain and dislocation – of customers, citizens or employees -- the tech is here that makes it easy to assess, locate, and accommodate. Be data-driven at the right time and place; do the analytics where and when it counts. There can be a flood of conflicting data: don't be shy about making the call, and then test and fix.

4) **Keep the disruption moving – and mind your own status quo biases.** Expand your palette, your charter, your brief where there's value. Get outside your lane – reorganize, join forces, and collaborate. *If you are standing still amidst all this change… that's a red flag*. Whether you are responsible to shareholders or voters, find and move on those opportunities to create new value. See a broken election process? Repurpose your stadium! Tech makes that easy – but you make it happen.

5) **Move with precision: segment and personalize the solutions.** No one size fits all, needed or wanted. What works – for whom? If you don't segment - by race, age, and gender - you exclude – and you risk losing respect, support, engagement, and

productivity. Tech makes that possible as never before – but managers make that happen. *No segmentation in product and services should be a red flag that something is wrong with your model.*

6) **Make resilience, continuity, and recovery central to your strategy.** Resilience through troubled times is based on recovery – and recovery is based on experience and leadership – yours. Use technologies to help staffs and systems recover to a calmer place. Introduce super-friendly policies, services, and controls. Shift the hours, move the locations, support sick or family time – reconfigure your tech to support all this. You will be remembered and repaid with loyalty and service. Formally, investigate and learn from the loss, celebrate the wins in the face of adversity – then get ready to do it all over again: lay in the people, systems and tech infrastructure to assure resilience in World vs Covid-19, *Round N*. This will not end. If you think yesterday's playbook will work for tomorrow – *that's a red flag to rethink both the playbook and your forecasts.*

7) **Choose your tech well – demand proof of effectiveness before you drink the tech Kool aid.** Be mindful of black boxes and the hidden biases they contain. Be mindful of serious technical limitations that render your tech dreams unfair and unworkable. Bide Susan Landau's caution: "Efficacy should always be the first issue to raise in the deployment of any technology, especially one that involves potentially serious risk to privacy and civil liberties. If a proposed 'solution' is not efficacious, there is no reason to consider the program."[lxxxv]

8) **Fix systems, not just the tech.** Be wary of tech-only solutions – apps that fix everything, platforms that solve world hunger. 99 percent of your wins depend on people adopting and using. That takes leadership *and* engineers – and wherewithal. Tech can turn in a heartbeat – give us capabilities long-needed and fast. But there are no silver bullets. No tech will fix crappy process, a busted civic order, or a depression-ravaged market.

9) **Mind your privilege and spread the wealth.** Tech changes everything – the friction in all sorts of exchange is gone, for the privileged who have it. "No organization wishes they were less digital right now," one CEO quipped. Tech changes *nothing* for those who *don't* have. Yes, the future is already here and, yes, it's just differentially distributed. [lxxxvi] Advantage goes to the half that has it. Fix that divide, fill that gap wherever and whenever you can. There is market share and profit, fairness and goodness in lifting the other half. Get with it.

10) **Choose your partners well.** Beware tech companies bearing gifts. They don't always care what you care about. In their world, the mantra is less often, "Don't be evil," (retired from Google in 2018) and more often, "Eat lunch or be lunch" (timeless, from Sun Microsystem's Scott McNealy). Care about second order effects. How will your products, services and most importantly your data be used? Be clear what happens to your data at every stage. Beware of mission creep, where it gets repurposed, and secondary uses by others whom you did not intend. *If you think your data is yours to trade away, that's a red flag – be mindful of your stewardship.* Consider some new

governance to keep you steered right. Know that tech makes suppression of rights easy and fast. Draw that line now and test every move against it.[lxxxvii]

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[i] "The Great Pause" sourced to Pearson, Kate, and Susan Miller. "Probation Can Be Done Another Way, the Great Pause Taught Us." Juvenile Justice Information Exchange, June 8, 2020. https://jjie.org/2020/06/08/probation-can-be-done-another-way-the-great-pause-taught-us/.

[ii] Koetsier, John. "COVID-19 Accelerated E-Commerce Growth '4 To 6 Years.'" Forbes.com, June 12, 2020. https://www.forbes.com/sites/johnkoetsier/2020/06/12/covid-19-accelerated-e-commerce-growth-4-to-6-years/#5930441e600f.

[iii] "Kate Ryder of Maven Knows that Telemedicine Is the Future of Healthcare." Quartz.com. June 30, 2020. https://qz.com/1869418/kate-ryder-on-covid-19s-impact-on-telemedicine-adoption/.

[iv] Stephenson, W. David. "Boom Time for Telehealth Devices." *Industry Week,* June 26, 2020. https://www.industryweek.com/technology-and-iiot/article/21135287/boom-time-for-telehealth-devices

[v] Lederer, Elizabeth. "Web Inventor: Closing Digital Divide Must Be Top Priority." ABC News, June 12, 2020. https://abcnews.go.com/Technology/wireStory/web-inventor-closing-digital-divide-top-priority-71213079.

[vi] Stephenson, *op cit.*

[vii] Koetsier, *op cit.*

[viii] Waters, Richard. "Microsoft Growth Accelerates as Pandemic Boosts Cloud Business," April 29, 2020. https://www.ft.com/content/ac054397-eb9a-4198-a050-18961f39feb9.

[ix] Edmondson, Amy C., and Anita Tucker. "Why Hospitals Don't Learn from Failures: Organizational and Psychological Dynamics That Inhibit System Change." *California Management Review* 45, no. 2 (Winter 2003).

[x] Potter, Alex. "When Nowhere Feels Safe, Finding Sanctuary on the Drive Home." *The New York Times*, June 10, 2020, sec. U.S. https://www.nytimes.com/interactive/2020/06/10/us/coronavirus-healthcare-workers.html.

[xi] Kotter, John. "Leading Change: Why Transformation Efforts Fail." *Harvard Business Review*, April 1995.

[xii] Evans, Benedict. "Tech and the New Normal." June 2020. https://www.ben-evans.com/presentations.

[xiii] Editorial Board, *The Boston Globe*. "A New Chance to Close the Digital Divide." BostonGlobe.com, April 26, 2020. https://www.bostonglobe.com/2020/04/26/opinion/new-chance-close-digital-divide/.

[xiv] Fisher, Max, and Emma Bubola. "As Coronavirus Deepens Inequality, Inequality Worsens Its Spread." The New York Times, March 15, 2020, sec. World. https://www.nytimes.com/2020/03/15/world/europe/coronavirus-inequality.html.

[xv] Global Citizen. "Economic Fallout From COVID-19 Could Thrust Hundreds of Millions More Into Poverty: Report." Accessed June 30, 2020. https://www.globalcitizen.org/en/content/economic-fallout-from-covid-19-could-thrust-hundre/.

[xvi] Kaiser Health News *Morning Briefing.* "Kids Going Hungry: Nearly Four in 10 Black, Hispanic Families Struggling To Get Enough Food During Pandemic," July 7, 2020. https://khn.org/morning-breakout/kids-going-hungry-nearly-four-in-10-black-hispanic-families-struggling-to-get-enough-food-during-pandemic/.

[xvii] Evans, *op cit.*

[xviii] "Keller Easterling on What Coronavirus Tells Us about This Moment." Quartz. Accessed July 3, 2020. https://qz.com/1869479/keller-easterling-on-the-future-impacted-by-coronavirus/.

[xix] Brown, Deborah. "Closing the 'Digital Divide' Critical in COVID-19 Response." Human Rights Watch, March 25, 2020. https://www.hrw.org/news/2020/03/25/closing-digital-divide-critical-covid-19-response.

[xx] Gourville, John T. "Eager Sellers and Stony Buyers: Understanding the Psychology of New-Product Adoption." *Harvard Business Review* vol. 84,6 (2006): 98-106, 145.

[xxi] "Melissa Gregg Predicts Employers Will Have to Prove Why Workers Should Trust Them." Quartz.com. Accessed July 3, 2020. https://qz.com/1870072/melissa-gregg-on-the-future-impacted-by-coronavirus/.

[xxii] *Charlton Heston; From My Cold Dead Hands. Long Version*, 2008. https://www.youtube.com/watch?v=5ju4Gla2odw.

[xxiii] Carey, Benedict. "Can an Algorithm Predict the Pandemic's Next Moves?" *The New York Times*, July 2, 2020, sec. Health. https://www.nytimes.com/2020/07/02/health/santillana-coronavirus-model-forecast.html.

[xxiv] Evans, Benedict. "What Comes after Zoom?" *Benedict Evans* (blog), June 22, 2020. https://www.ben-evans.com/benedictevans/2020/6/22/zoom-and-the-next-video.

[xxv] Heppen, Jessica B., Nicholas Sorensen, et al. "The Struggle to Pass Algebra: Online vs. Face-to-Face Credit Recovery for At-Risk Urban Students." *Journal of Research on Educational Effectiveness* 10, no. 2 (April 3, 2017): 272–96. https://doi.org/10.1080/19345747.2016.1168500.

[xxvi] Loeb, Susanna. "How Effective Is Online Learning? What the Research Does and Doesn't Tell Us." *Education Week*, March 20, 2020. https://www.edweek.org/ew/articles/2020/03/23/how-effective-is-online-learning-what-the.html.

[xxvii] Widdicombe, Lizzie. "The Great Zoom-School Experiment." *The New Yorker*, April 2, 2020. https://www.newyorker.com/news/our-local-correspondents/the-great-zoom-school-experiment.

[xxviii] Rotman, David. "Why Tech Didn't Save Us from Covid-19." *MIT Technology Review*, June 17, 2020. https://www.technologyreview.com/2020/06/17/1003312/why-tech-didnt-save-us-from-covid-19/.

[xxix] Payne, Adam. "Leaked Documents Reveal China Withheld Crucial Information about the Coronavirus at the Start of the Outbreak." Business Insider. https://www.businessinsider.com/leaks-reveal-china-withheld-crucial-information-who-coronavirus-2020-6.

[xxx] Reporters Without Borders. "Nearly Half of UN Member Countries Have Obstructed Coronavirus Coverage," June 29, 2020. https://rsf.org/en/news/nearly-half-un-member-countries-have-obstructed-coronavirus-coverage.

[xxxi] "Physical Distancing, Face Masks, and Eye Protection to Prevent Person-to-Person Transmission of SARS-CoV-2 and COVID-19: A Systematic Review and Meta-Analysis - The Lancet." Accessed July 2, 2020. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/fulltext.

[xxxii] Algar, Selim. "Fuming DOE Teacher Rips into NYC Schools: They Gave up on Our Kids." *New York Post* (blog), July 1, 2020. https://nypost.com/2020/07/01/nyc-teacher-rips-abandonment-of-live-teaching-at-top-school/.

[xxxiii] Eustachewich, Lia. "Herd Immunity Played No Role in Decreasing COVID-19 Cases: NYC's Top Doctor." *New York Post* (blog), July 10, 2020. https://nypost.com/2020/07/10/herd-immunity-played-no-role-in-decreasing-nyc-covid-19-cases-doctor/.

[xxxiv] Lucey MD, Daniel R. "COVID-19: Eight Questions for the WHO Team Going to China next Week to Investigate Pandemic Origins." Science Speaks: Global ID News, June 30, 2020. https://sciencespeaksblog.org/2020/06/30/covid-19-covid-eight-questions-for-the-who-team-going-to-china-next-week-to-investigate-pandemic-origins/.

[xxxv] Authers, John. "How Risky Is Covid? Here's a Way to Look at It." *Bloomberg.Com*, July 8, 2020. https://www.bloomberg.com/opinion/articles/2020-07-08/covid-19-how-to-weigh-the-market-risks-kccu3uyp.

[xxxvi] Harris, Elizabeth A. "Not Everyone Hates Remote Learning. For These Students, It's a Blessing." *The New York Times*, May 20, 2020, sec. New York. https://www.nytimes.com/2020/05/20/nyregion/coronavirus-students-schools.html.

[xxxvii] Belanger, Lydia. "Escaping 'Zoom Fatigue' Is Surprisingly Complicated." *Fortune*, June 7, 2020. https://fortune.com/2020/06/07/zoom-fatigue-hangovers-children-workplace-stress-privacy/.

[xxxviii] Algar, Selim. "Fuming DOE Teacher Rips into NYC Schools: They Gave up on Our Kids." *New York Post* (blog), July 1, 2020. https://nypost.com/2020/07/01/nyc-teacher-rips-abandonment-of-live-teaching-at-top-school/.

[xxxix] Lankes, Tiffany. "Poll: Satisfaction with Distance Learning Drops, as Pandemic Widens Equity Gaps for Low-Income Students and Students of Color." *The Education Trust - New York* (blog). Accessed June 30, 2020. https://newyork.edtrust.org/press-release/poll-satisfaction-with-

distance-learning-drops-as-pandemic-widens-equity-gaps-for-low-income-students-and-students-of-color/.

[xl] Goldstein, Dana. "Research Shows Students Falling Months Behind During Virus Disruptions." *The New York Times*, June 10, 2020. https://www.nytimes.com/2020/06/05/us/coronavirus-education-lost-learning.html.

[xli] Kuhfeld, Megan, James Soland, et al. (2020). "Projecting the Potential Impacts Of COVID-19 School Closures on Academic Achievement." (EdWorkingPaper: 20-226). Retrieved from Annenberg Institute at Brown University: https://doi.org/10.26300/cdrv-yw05

[xlii] Stewart, Nikita. "She's 10, Homeless and Eager to Learn. But She Has No Internet." *The New York Times*, April 13, 2020. https://www.nytimes.com/2020/03/26/nyregion/new-york-homeless-students-coronavirus.html.

[xliii] Dorn, Emma, Bryan Hancock, et al. "Achievement Gap and Coronavirus." McKinsey & Company, June 1, 2020. https://www.mckinsey.com/industries/public-sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime.

[xliv] Zimmerman, Alex. "With a Glitchy Start, Some NYC Students Are Shut out of Summer School Classes." Chalkbeat New York, July 7, 2020. https://ny.chalkbeat.org/2020/7/7/21316562/summer-school-ilearn-glitch-nyc

[xlv] Miller, Claire Cain. "Pandemic Parenting Was Already Relentless. Then Came Summer." *The New York Times*, June 26, 2020, sec. The Upshot. https://www.nytimes.com/2020/06/26/upshot/virus-intensive-parenting-education.html.

[xlvi] Streitfeld, David. "White-Collar Companies Race to Be Last to Return to the Office." *The New York Times*, May 8, 2020, sec. Technology. https://www.nytimes.com/2020/05/08/technology/coronavirus-work-from-home.html.

[xlvii] Guaglione, Sara. "'NYT' Staff Won't Return to Office Until 2021." PublishersDaily.com, June 2020. https://www.mediapost.com/publications/article/352845/nyt-staff-wont-return-to-office-until-2021.html.

[xlviii] Brenan, Megan. "U.S. Workers Discovering Affinity for Remote Work." Gallup.com, April 3, 2020. https://news.gallup.com/poll/306695/workers-discovering-affinity-remote-work.aspx.

[xlix] Khazan, Olga. "Work From Home Is Here to Stay." *The Atlantic,* May 4, 2020. https://www.theatlantic.com/health/archive/2020/05/work-from-home-pandemic/611098/.

[l] Clough, Craig. "NY Court Cops Sue Over Inadequate COVID-19 Protections - Law360," July 1, 2020. https://www.law360.com/articles/1288654/ny-court-cops-sue-over-inadequate-covid-19-protections.

[li] Singer, Natasha. "Farewell to Gummy Bear Jars: Tech Offices Get a Virus Safety Makeover." *The New York Times*, June 10, 2020, sec. Technology. https://www.nytimes.com/2020/06/10/technology/salesforce-tech-office-coronavirus.html.

[lii] Ajunwa, Ifeoma and Daniel Greene. "Platforms at Work: Automated Hiring Platforms and Other New Intermediaries in the Organization of Work (September 12, 2018). In *Work and Labor in the Digital Age.* Published online: 14 Jun 2019; 61-91. DOI: 0.1108/S0277-283320190000033005 . Available at SSRN: https://ssrn.com/abstract=3248675

[liii] Field, Hayden. "Rumors, Death, and a Tech Overhaul: Inside Amazon's Race to Hire 175,000 Workers during a Pandemic." MIT Technology Review, June 12, 2020. https://www.technologyreview.com/2020/06/12/1003360/inside-amazons-pandemic-hiring-race/.

[liv] Menn, Joseph, and Dastin, Jeffrey. "Researchers Criticize AI Software That Predicts Emotions." *Reuters*, December 12, 2019. https://www.reuters.com/article/us-ai-emotions-report-idUSKBN1YG1G6

[lv] "Bruce Schneier Says We Need to Embrace Inefficiency to Save Our Economy." Quartz. Accessed July 3, 2020. https://qz.com/1872280/bruce-schneier-on-the-future-impacted-by-coronavirus/.

[lvi] "Harley Finkelstein Thinks Covid Has Changed Retail Forever." Quartz. Accessed July 3, 2020. https://qz.com/1870059/harley-finkelstein-thinks-covid-has-changed-retail-forever/.

[lvii] *Ibid.*

[lviii] Fisher, Max, and Choe Sang-Hun. "How South Korea Flattened the Curve." *The New York Times*, March 23, 2020, sec. World. https://www.nytimes.com/2020/03/23/world/asia/coronavirus-south-korea-flatten-curve.html.

[lix] Hill, Kashmir. "The Secretive Company That Might End Privacy as We Know It." *New York Times*, February 10, 2020. https://www.nytimes.com/2020/01/18/technology/clearview-privacy-facial-recognition.html.

[lx] Zittrain, Jonathan. "Is Digital Contact Tracing Over Before It Began?" *Medium* (blog), June 26, 2020. https://medium.com/berkman-klein-center/is-digital-contact-tracing-over-before-it-began-925c72036ee7.

[lxi] Sohn, Soopum. "The Real Reason South Korea Was Able to Stop Covid-19." Medium, May 19, 2020. https://gen.medium.com/the-real-reason-south-korea-was-able-to-stop-covid-19-2742afaea400.

[lxii] Alkhatib, Ali. "We Need to Talk About Digital Contact Tracing." Accessed July 1, 2020. https://ali-alkhatib.com/blog/digital-contact-tracing.

[lxiii] Jee, Charlotte. "8 Million People, 14 Alerts: Why Some Covid-19 Apps Are Staying Silent." *MIT Technology Review*, July 10, 2020. https://www.technologyreview.com/2020/07/10/1005027/8-million-people-14-alerts-why-some-covid-19-apps-are-staying-silent/.

[lxiv] Mandavilli, Apoorva. "The Coronavirus Can Be Airborne Indoors, W.H.O. Says." *The New York Times*, July 9, 2020, sec. Health. https://www.nytimes.com/2020/07/09/health/virus-aerosols-who.html.

[lxv] Landau, Susan. "Looking Beyond Contact Tracing to Stop the Spread." *Lawfare* (blog), April 10, 2020. https://www.lawfareblog.com/looking-beyond-contact-tracing-stop-spread.

[lxvi] O'Neill, Patrick Howell. "Bluetooth Contact Tracing Needs Bigger, Better Data." *MIT Technology Review*, April 22, 2020. https://www.technologyreview.com/2020/04/22/1000353/bluetooth-contact-tracing-needs-bigger-better-data/.

[lxvii] Dehaye, Paul-Olivier. "Inferring Distance from Bluetooth Signal Strength: A Deep Dive." *Medium* (blog), May 22, 2020. https://medium.com/personaldata-io/inferring-distance-from-bluetooth-signal-strength-a-deep-dive-fe7badc2bb6d.

[lxviii] Ball, James. "The UK's Contact Tracing App Fiasco Is a Master Class in Mismanagement." *MIT Technology Review*, June 19, 2020. https://www.technologyreview.com/2020/06/19/1004190/uk-covid-contact-tracing-app-fiasco/.

[lxix] Otterman, Sharon. "N.Y.C. Hired 3,000 Workers for Contact Tracing. It's Off to a Slow Start." *The New York Times*, June 21, 2020, sec. New York. https://www.nytimes.com/2020/06/21/nyregion/nyc-contact-tracing.html.

[lxx] "Contact Tracing No Longer Possible across US South Due to Rapid Coronavirus Surges, Health Expert Says," *CNN.com,* July 7, 2020. https://whdh.com/news/contact-tracing-no-longer-possible-across-us-south-due-to-rapid-coronavirus-surges-health-expert-says/.

[lxxi] Landau, Susan. "Location Surveillance to Counter COVID-19: Efficacy Is What Matters." *Lawfare* (blog), March 25, 2020. https://www.lawfareblog.com/location-surveillance-counter-covid-19-efficacy-what-matters.

[lxxii] Garvie, Claire. "Garbage In. Garbage Out. Face Recognition on Flawed Data." *Georgetown Law Center on Privacy & Technology*, May 16, 2019. https://www.flawedfacedata.com.

[lxxiii] Simonite, Tom. "Amazon Says It Can Detect Fear on Your Face. You Scared?" Wired, August 18, 2019. https://www.wired.com/story/amazon-detect-fear-face-you-scared/.

[lxxiv] Ransom, Jan. "Despite Virus, Hundreds Arrested in Unrest Are Held in Cramped Jails." *The New York Times*, June 4, 2020, sec. New York. https://www.nytimes.com/2020/06/04/nyregion/nyc-protests-jail.html.

[lxxv] Williams, Timothy, and Rebecca Griesbach. "San Quentin Prison Was Free of the Virus. One Decision Fueled an Outbreak." *The New York Times*, June 30, 2020, sec. U.S. https://www.nytimes.com/2020/06/30/us/san-quentin-prison-coronavirus.html.

[lxxvi] Lyall, Sarah. "Video Link Tested for Crime Victims." *The New York Times*, June 24, 1987, sec. New York. https://www.nytimes.com/1987/06/24/nyregion/video-link-tested-for-crime-victims.html.

[lxxvii] McCarthy, Craig, Tina Moore, and Aaron Feis. "NYC Shootings Skyrocket as Court Closures Let Pistol Perps Walk Free." *New York Post* (blog), June 22, 2020. https://nypost.com/2020/06/21/nyc-shootings-skyrocket-as-court-closures-let-gun-possession-perps-walk-free/.

[lxxviii] Pearson, Kate, and Susan Miller. "Probation Can Be Done Another Way, the Great Pause Taught Us." Juvenile Justice Information Exchange, June 8, 2020. https://jjie.org/2020/06/08/probation-can-be-done-another-way-the-great-pause-taught-us/.

[lxxix] Appel, Andrew W. "Securing the Vote — National Academies Report." *Freedom to Tinker/Princeton Center for Information Technology and Policy* (blog), September 11, 2017. https://freedom-to-tinker.com/2018/09/11/securing-the-vote-national-academies-report/.

[lxxx] Halderman, J. Alex and Rachel Goodman. "We Need to Keep Voting Systems as Far from the Internet as Possible." Slate Magazine, January 15, 2020. https://slate.com/technology/2020/01/internet-voting-could-destroy-our-elections.html.

[lxxxi] Cillizza, Chris. "How Did Georgia Get It So Wrong (Again)?" CNN, June 10, 2020. https://www.cnn.com/2020/06/10/politics/georgia-primary-vote-brian-kemp/index.html.

[lxxxii] "Atlanta Hawks to Turn Arena into a Giant Voting Center." CNN, June 30, 2020. https://www.cnn.com/2020/06/30/us/atlanta-hawks-voting-trnd/index.html.

[lxxxiii] Andrews, Travis. "Did TikTokers and K-Pop Fans Foil Trump's Tulsa Rally? It's Complicated." *Washington Post*, June 21, 2020. https://www.washingtonpost.com/technology/2020/06/21/tiktok-kpop-trump-tulsa-rally/.

[lxxxiv] Jena, Anupam B., and Christopher M. Worsham. "What Coronavirus Researchers Can Learn From Economists." *The New York Times*, June 30, 2020, sec. The Upshot. https://www.nytimes.com/2020/06/30/upshot/coronavirus-economists-dexamethasone.html.

[lxxxv] Landau, March 25, 2020, *op cit.*

[lxxxvi] Schwarzmann, Igor. "Here's Why You Should Stop Using William Gibson's "The Future Is Already Here – It's Just Not Very…." *Medium* (blog), July 4, 2019. https://medium.thirdwaveberlin.com/heres-why-you-should-stop-using-william-gibson-s-the-future-is-already-here-it-s-just-unevenly-e5be2d9284f2.

[lxxxvii] Cohen, Julie E., Woodrow Hartzog, and Laura Moy. "The Dangers of Tech-Driven Solutions to COVID-19." *Brookings* (blog), June 17, 2020. https://www.brookings.edu/techstream/the-dangers-of-tech-driven-solutions-to-covid-19/.