Our Brave New Digital World

O wonder!
How many goodly creatures are there here!
How beauteous mankind is! O brave new world,
That has such people in't

William Shakespeare, *The Tempest*,
Act V, Scene I, ll. 203–206

Rise and Fall of a Civilization

It is the spring equinox in the year 818 CE. At the appointed hour, the Mayan high priest at Chichen Itza slowly ascends one of the four staircases of the pyramid of Kukulkan, a giant temple named in honour of the feathered serpent deity. As the sun's shadow creates the illusion of the snake descending the pyramid, the priest gazes down upon the crowd of some 40 000 people. He begins a slow hand clap. The crowd responds, the clapping builds to a crescendo. The echo from the top of the pyramid reflects the call of the resplendent *quetzal*, the sacred bird, across the city. A human sacrifice is made. The crowd is in rapture. The gods are pleased. It will be a good year.

A civilization way ahead of its time, the Mayans thrived for more than 3000 years. They were brilliant architects, mathematicians, and astronomers. They invented the concept of zero. Their calendar was accurate to within one day every 6500 years. The Mayans had one of the most advanced writing systems of any ancient civilization. Their cities were centres for arts, science, and religion, that teemed with more than 2000 people per square mile (which is comparable to modern Los Angeles County). Their creation and adoption of highly sophisticated technology propelled them forward.

However, by around 900 CE the population had crashed. Perhaps as many as 95% of the Mayans had died and the great cities were deserted. Many theories exist as to the cause of this great decline. The leading hypothesis is that the Mayans simply overextended themselves. They overpopulated and over-farmed their natural resources, leading to deforestation and drought on a massive scale.

Like the Mayans, are we in danger of becoming the authors of our own demise? Will a future artificial intelligence record that at some point during the twenty-first century, biological humans seemed to stop building, producing, or making – they scattered from their cities and by the mid-2100s had almost entirely ceased to exist? Or will we have created a digital utopia that ensures our survival for the next millennia?

Our history is populated with stories like this. Technological change, upheavals, and the promise of new worlds all harness our dreams of a better life. Professor Klaus Schwab, founder and executive chairman of the World Economic Forum, has suggested we are currently in the 'Fourth Industrial Revolution' – the blurring of physical, technological, and biological domains. The First Industrial Revolution transformed production with water and steam power.

The Second brought electric power and mass production. The Third refers to automation and the Fourth Industrial Revolution is the shift from analogue to digital.

In the time of Elizabeth I and the discovery of what was called the New World, Francis Bacon published a story in which the positive and supportive relationships between people in Atlantis (Bacon 1627) created a utopian society. It is little known that Shakespeare used this tract as a basis for the utopian portion of his play *The Tempest* (Shakespeare 1611/1994). The genius of *The Tempest*, of course, is that his world is also populated with monsters.

When the Internet was first being built and http coding was all the rage, the dreams of a new society were projected onto it. It heralded a new age. We didn't imagine that the dark web might emerge or that the Internet could spawn just as many opportunities for criminals as prospects for entrepreneurs. In the shift to digital, we encounter both angels and demons.

The digital world has the capacity to unleash incredible human potential by connecting us to each other and to our vast array of knowledge. It promises open democracy and fairer access to resources for all. It enables massive parallel processing for problem solving in society. It lowers barriers to entry for creating new innovations, new businesses, and almost instantaneous launching of new services. These are the positive outcomes we strive for. The dangers to avoid, like the bleak future described in Aldous Huxley's *Brave New World* (1932), include a future in which human life has been almost entirely industrialized. One in which society is controlled by a handful of people at the top of a world state; where the Internet and debate is mediated by monopolistic and oligarchical forces and where rights of access and the rights of freedom of information are skewed by self-serving policies that twist the neutral platform accessible to all into a monster that promotes only the interests of the few.

The Shift to Digital

Consider the scale and influence of the technology businesses today. At the time of writing (2022), according to statista.com four of the five largest organizations by market cap are technology firms. Apple's market cap is close to three trillion (three times their pre-pandemic value), which would put it as the sixth largest national economy in the world, just US$500 billion behind the United Kingdom. Microsoft (US$2.3 trillion), Google (US$1.8 trillion), and Amazon (US$1.5 trillion) would all rank in the top 15 national economies worldwide.

The contours of our new world across business, society, and nation states have been forever changed. Business today is an interconnected global ecosystem. A digitally connected human is likely to have as many 'friends' in places they have never been to as in their own town. Our supranational structures are shifting and politicians are often seen to struggle with understanding this new reality as they rush to create policy that ensures safety, identity, security, and growth. There is tension between our political institutions and businesses that are larger, wealthier, and more powerful than many countries. We only have to look at the European response to Google and Microsoft in the courts, or the attempts to regulate for cryptocurrencies or gather taxes from huge organizations that are able to shift financial structures to wherever it is most advantageous. Consider the backlash against Uber's ability to disrupt the protections that exist in the cab industry in a manner never anticipated by legislation.

Artificial intelligence (AI) has been introduced into the healthcare field to aid clinical decision making for disease diagnosis and treatment such as detecting cancer based on medical images, and has achieved superior performance in multiple data-rich

application scenarios. In the COVID-19 pandemic, AI techniques were also used as a powerful tool to overcome the complex disease. AI techniques were used extensively in combating the COVID-19 pandemic – from diagnoses to rapidly creating vaccines (Xu et al. 2021).

A Brief Digital History

It is a long way from 1965 when two computers at the Massachusetts Institute of Technology Lab (Leiner et al. 1997b) used packet switching to communicate with one another for the first time. In 1973, global networking became a reality as University College London and Norway's Royal Radar Establishment connected to Arpanet. The term Internet was born. In 1974, Telenet become the first commercial **Internet service provider (ISP)**. In 1987, the number of computers connected to the Internet exceeded 20 000. In 1990, Tim Berners-Lee, a **CERN (European Council for Nuclear Research)** scientist developed **Hypertext Mark-up Language (HTML)**, technology that continues to underpin how we navigate and use the Internet today. The following year, in 1991, CERN introduced the world wide web to the public. In 1995, Amazon, Craigslist, and eBay went live and in 1998 the way we engage with the Internet (Leiner et al. 1997a) changed entirely, with the launch of Google.

By the time the dot-com bubble burst in 2000, around 600 million users were online. In the aftermath, faster mobile data (3G) became commercially available and a new kind of online organization emerged, giving us social media as we now know it. Facebook launched in 2004, YouTube in 2005, Spotify in 2006, and more. Many of these original services have already been devoured (remember Friendster, Del.icio.us, Diaspora, and MySpace?).

We see the current shift to what we now call 'digital' as starting in 2007 with the launch of a new kind of smartphone. Smartphones had been around since the late 1990s. NTT DoCoMo's smartphone had huge success in Japan. Nokia had also launched one. But with the launch of Apple's iPhone and HTC's device they began to scale massively. These phones had far better data capacities and large touch screens. Suddenly, access to the Internet was mobile. A plethora of affordable devices quickly followed that meant entire populations could leapfrog decades of development to join the digital masses. In Africa, many people now own two or more smartphones. The cost of entry has continued to decrease.

In 2007, less than 10% of the world's population was on the Internet. At time of writing, almost five billion of the world's population use the Internet, that's nearly two-thirds of the world's population online.

In only half a century, we have changed the way we live, work, learn, connect, problem solve, and communicate so dramatically that our world is unrecognizable from the time we first had personal computers. The extremity of this shift can be seen dramatically in places such as Rwanda and Uganda today. The optical-fibre backbone and wireless Internet was only turned on in 2010. Already, the younger generation's taste in dress, hobbies, and music have more in common with their contemporaries in Brooklyn, New York, than their parents who are living an urban African or even tribal village lifestyle. As computer scientist Alan Kay said at a Hong Kong press conference in the late 1980s: 'Technology is anything invented after you were born.'

Impact on Individuals

Digital has opened all of our eyes to a world of possibility. The access to knowledge, people, things, and places means that we can bring dreams into reality that were never reachable or even

conceivable before. New careers, opportunities, and places to live and work are available. People can leapfrog social situations, they can use a smartphone to set up a global supply business and find out how to run it on YouTube for free.

There are millions of young people around the world who have caught the entrepreneurial bug. The ability to launch a business by simply creating a webpage and a supply network is revolutionizing the world and creating jobs for the next generation. It is spawning innovation and experimentation on a mass scale.

As we continue to transform our working world, what will we look to achieve as a society? How will we configure our organizations and institutions next?

Impact on Organizations

People have organized themselves in many ways throughout history: tribes, armies, cities, nations, monarchies, democracies, clubs, and societies. What happens when one type of organizational form meets another? What happens when armies meet guerrillas?

It was entirely appropriate for the European armies of the eighteenth century to fight in formation, given that they encountered each other in the open field and wore strikingly different uniforms to distinguish who was who in the heat of battle.

Yet, when the British fought the Native Americans in the wilderness of East Coast America, these tactics and rituals were inadequate. It is hard to imagine what the Native Americans – camouflaged, experts in stealth, fond of ambushing, and entirely unpredictable – would have made of the brightly coloured targets who noisily marched shoulder to shoulder, line after line. Clearly, there are many dimensions to how we organize, but the most important principle is that our choice of organization must be

appropriate for the context it inhabits. As context changes, so must we adapt.

Research looking at leadership during the pandemic found that managers with an adaptive personality are more likely to have increased levels of self-efficacy to lead during the times of a crisis. The findings also indicate that crisis leader self-efficacy was found to be significantly related to motivation to lead during the COVID-19 crisis, suggesting that managers who have high beliefs regarding their capability to lead in any crisis were more likely to be motivated to lead during the COVID-19 crisis. We not only have to be adaptable; we have to believe in ourselves and our abilities to rise to the new shifts and challenges we encounter (Abdulah et al. 2021).

In today's digital economy, old, rigid, and inappropriate business models are being destroyed. Organizational models are emerging that take advantage of new tools and technologies as quickly as they are invented. The successful organizations of the future will be more like living systems. They will be able to adapt and respond to their markets and environments quickly and flexibly. They will be able to scale up, and down, as needed.

Digital has led organizations of today to take many new and complex forms such as organic, freelance, and knowledge-worker networks. They operate in a state of continuous flux that mutates to swarm around specific projects. This has been the norm in film making and architectural work and is fast infiltrating every sector.

In the new digital world, organizations are beginning to have multiple forms within themselves, determined by what they are attempting to get done. They might adopt rigid top-down controls where that is required (for reasons of regulation or safety) whilst at the same time they may adopt matrix models that enable complex value chains to bring products to market. They might use flexible

workforces, fixed teams, networks, open innovation, closed-loop development, and more, depending on the outcomes desired.

The uniformity we used to expect from institutions is breaking down. We believe that organizations are becoming more tribal in their nature, gathering numerous different types of employment contracts within a single brand: full time, part time, agency, and associates co-exist in one ecosystem.

Workforces are also becoming more diverse. Age groups are more widely spread. Teams come from numerous countries. Personal situations such as single parenthood or caring for an older relative are more easily accommodated by the flexibility that digital working brings. The recent pandemic has shown that many workers prefer to work from home or from bases outside a fixed office.

Employers find themselves managing a greater variety of relationships with all their different employees. If they are to attract and retain talent, they are having to learn to take a more personalized approach to how they engage their people. One size does not fit all in the digital world.

The identity and the culture of the organization has an impact on the talent that is attracted to its brand. At the heart of managing organizations today is the requirement to create an overarching narrative and identity that provides a sense of community and purpose. One of the most potent ways of doing this is through the set of tools, apps, and platforms that combine to create the online, digital experience of work. The ability of this set of tools to connect people, provide access to knowledge, to account for the organization, and to promote unique customer experiences is at the cutting edge of competitive behaviour between organizations in the digital world.

Digital Challenges

For those who adapt to these digital challenges, the opportunities for finding new competitive forms are immense. Those organizations not making this shift risk a decline in performance or eventual extinction. The same is true for everyone working within organizations. What will be the new roles and how will we navigate in today's complex, interconnected world? How much will we be asked to work in different ways and employ new skills? Most importantly, how will organizations motivate, equip, and engage their people and stakeholders in this brave new digital world?

History is littered with examples of organizations that could not adapt quickly enough or failed to see what was about to eat its lunch. Kodak did not fail because it missed the digital age: they actually invented the first digital camera in 1975 (Kodak 2022). Unfortunately, Kodak took the view that they were primarily in the camera film business. They didn't realize that they were actually in the storytelling business. They held back for fear of hurting their lucrative film revenue and believed they could protect their massive market share with brand strength alone. By the time Kodak finally decided to commit to the digital game, it was too late.

A New Way to Deal with Change

If we want machines to think, we need to teach them to see.

Fei-Fei Li (Ford 2018)

We find ourselves at a turning point in history. Our experience of being human has changed profoundly in the past 10 years and is about to change as profoundly again in the next 10 years. Our capabilities as humans are fast merging with digital. We already depend on our smartphones and wear digital devices to look after us.

We already have digital companions in our homes and workplaces that guide us through our everyday lives.

In evolutionary terms, we are starting to think about how digital systems might literally as well as figuratively, become alive and compete with us. When will AI exceed our human capabilities? Commonly known as the 'singularity', Ray Kurzweil (2005), a leading futurist and director of engineering at Google, expects it to occur by 2045. He expects a computer to pass the Turing test – the point at which a human cannot distinguish between whether we are interacting with a computer or a human – by 2029. At the point of the singularity, our digital world may not only be alive, it may be fully conscious.

Many fear that humans will indeed be superseded by AI, robots, and automation; that digital will disrupt our lives, destroy our jobs, and our standards of living. These doomsday scenarios are entirely possible. Every major technological change in history has provoked violent responses and certainly disrupted old ways of working. So far though, each technological revolution has in the long run created new experiences and more jobs. Where people are given access to technology, it generally improves their lives.

Ethics are not universal and some feel that the use of robots to control situations such as social distancing is acceptable, whilst others see it as an abhorrent erosion of privacy and human agency (Sathyamoorthy et al. 2021).

A new digital model is emerging that significantly shifts the way change is delivered across large, global, networked groups of people. For digitally enabled organizations, transformation is about building capability internally and lining up the right digital tools to enable the people to transform the organization themselves. For example, through a single software platform, organizations can provide access for virtual teams to unlock new knowledge, enable new processes,

and reinforce engagement. They can use virtual dashboards to provide feedback on results that are immediate and continuous. Strategy development and execution is now happening in real time and the people who will be impacted the most are creating informed solutions themselves.

The advantage that external consultants once had of accessing large numbers of specialists at relatively low cost is disappearing too. Organizations are less tolerant of standard solutions delivered by junior teams. They are also realizing that they can solve major transformational challenges by using digital platforms that only take two or three specialists to support. The process and content knowledge required to achieve engagement, consensus, and research-led decision making is embedded in the technology. Instead of a programme team of hundreds, perhaps only 5 or 10 members are now required. We are not predicting the demise of consulting, just a radical change in their role. We think what will remain of the consulting team will be deeply experienced experts who bring their knowledge and access to the latest thinking.

Human nature doesn't change and the essence of change remains psychological. It was interesting to see what the impact of the pandemic would have on changing behaviours. For example, some believed we as humans would take the opportunity to make a major shift to a sustainable economy. Studies are showing that whereas some behaviours may have changed, the return of a 'new normal' is not quite as impactful. In order for change to occur we have to be mindful of psychology and other social studies that suggest we should be scrutinizing beliefs, concerns, social relations, and ideologies related to a change of behaviours. Engaging with these is more important than just new technology to enable ideological shifts – such as sustainable consumption (Perkins, Luis, and Nora 2021).

References

Abdulah, B., Saleh, B., Mohammad, A. et al. (2021). Adaptive managers as emerging leaders during the COVID-19 crisis. *Frontiers in Psychology* 12. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.661628/full

Bacon, F. (1627). *The New Atlantis*. ed. G.B. Wegener. https://thomasmorestudies.org/wp-content/uploads/2020/09/Bacon-New-Atlantis-2020-Edition-7-6-2020.pdf (accessed 26 March 2022).

Ford, M. (2018). Fei-Fei Li interviewed by Martin Ford. In: *Architects of Intelligence: The Truth About AI from the People Building It* (ed. M. Ford), pp. 145–162. Birmingham: Packt.

Huxley, A. (1932). *Brave New World*. London: Chatto & Windus.

Kodak (2022). Company milestones – 1975 Kodak invented the world's first digital camera. https://www.kodak.com/en/company/page/milestones (accessed 4 April 2022).

Kurzweil, R. (2005). *The Singularity is Near: When Humans Transcend Biology*. New York: Viking.

Leiner, M.B., Cerf, V.G., Clark, D.D. et al. (1997a). A brief history of the Internet. https://www.internetsociety.org/internet/history-internet/brief-history-internet/ (accessed 26 March 2022).

Leiner, M.B., Cerf, V.G., Clark, D.D. et al. (1997b). The past and future history of the Internet. *Communications of the ACM*, 40 (2): 102–108. https://groups.csail.mit.edu/ana/Publications/PubPDFs/The%20past%20and%20future%20history%20of%20the%20internet.pdf (accessed 26 March 2022).

Perkins, K.M., Luis, V. and Nora, M. (2021). The impact of COVID-19 as sustainable consumption. *Frontiers in Sustainability* 2. https://www.frontiersin.org/article/10.3389/frsus.2021.721384 doi: 10.3389/frsus.2021.721384 ISSN=2673-4524 (accessed 26 March 2022).

Sathyamoorthy, A.J., Patel, U., Paul, M. et al. (2021). COVID surveillance robot: monitoring social distancing constraints in indoor scenarios. *PLoS One* 16 (12): e0259713. https://doi.org/10.1371/journal.pone.0259713 (accessed 26 March 2022).

Shakespeare, W. (1611/1994). *The Tempsest*. Ware, UK: Wordsworth Editions.

Xu, Z., Su, C., Xiao, Y. et al. (2021). Artificial intelligence for COVID-19: battling the pandemic with computational intelligence. *Intelligent Medicine*. https://www.sciencedirect.com/science/article/pii/S2667102621000863 (accessed 26 March 2022).