
Preparing for the rebound after the COVID-19 crisis

Moving toward an era of data equity



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“We are living in interesting times” – this is a phrase that I have often heard during the last nine months. The experience of many during this time has been one of an unprecedented need to rapidly adapt to new ways of living, working and communicating. Tragedy and loss have never been far away and yet the human spirit drives us on to work through the challenges we face. Those challenges have exposed both strengths and weaknesses in individuals, societies and businesses, and in particular they have revealed just how dependent our world is on digital technology. It is difficult to imagine how much more devastating the pandemic might have been without test-and-trace apps, homeworking and schooling, online shopping and banking, and video calls.

However, for all the positives of digital technologies, we have also observed flaws in some enterprises’ digital strategies as they succumb to the damaging effects of cybersecurity breaches, system failure and the inability to flex and scale services to meet rapidly changing demands.

As we anticipate the emergence from this game-changing crisis, we have a clear responsibility to rebound stronger, more resilient and more sustainable than before. This report, which is written by members of our Atos Scientific Community, explores four imperatives for a successful rebound – seeking to build on technology-related lessons learned during the pandemic and address some of the challenges of sustainability, trust and collective value.

It is my strong conviction that if, as businesses and members of society, we can embrace these imperatives, there promises to be even more interesting times ahead – but in a much more positive way. Please read on to find out more about our vision for the world after the COVID-19 crisis, and an era that is **sustainable by purpose**, enabled by **technology mastery, frictionless working and data equity**.

Abstract: The new era of data equity

After almost a year of enduring the COVID-19 pandemic, we have learned a lot from working with customers as we helped them navigate the crisis. On one hand, we have seen major disruptions in terms of ways of working, business models, travel regulations and security. On the other hand, we have witnessed some impressive and innovative approaches to adapting to the challenges.

Looking ahead, we see many opportunities and a clear requirement to positively reshape our collective futures, rather than merely return to the previous status quo. We identify **four imperatives for a business rebound** that will support the move into an era of rebalancing the benefit and cost equation of digital technology.

Technology mastery

With digital technologies underpinning many aspects of business continuity during the pandemic, we must acknowledge that technology mastery is a critical topic for a company that cannot be restricted to a limited set of experts. We need to ensure that we are able to realize the maximum potential from our application of technology, recognizing that technology needs to work for us, not the other way around. In particular, this demands a comprehensive and seamless approach to security.

Frictionless working

We believe at Atos that the new digital and distributed ways of working imposed by the COVID-19 crisis are not only sustainable but can be further evolved. Technology has transformed the way that most of us work, but have we genuinely become more efficient and effective as a result, or have we just added layers of complication and inertia? What changes should we expect in the very nature of the way we think about work and how can these catalyze a breakthrough in the productivity paradox?

Data equity

Beyond the acceleration of the data economy, we believe that a company's rebound will be driven by its ability to share its data in a fair and trusted way - the data ecosystem created for the COVID-19 vaccine is a powerful example. Data has been referred to as the currency of tomorrow, but should it be merely treated as a tradable commodity? We offer the perspective of "Data equity," where members of data ecosystems establish shareholding interests¹ in the collective value of otherwise disparate datasets. Such interests must be represented in an equitable and trustworthy manner to ensure the whole is greater than the sum of the parts.

Sustainable by purpose

The pandemic has placed health, social and environmental considerations very much in the spotlight, particularly as businesses take stock of the ongoing and wider relevance of their company's purpose. When dealing with the sustainability grand challenges of our planet, societies and economies; digital technology is most definitely part of the solution, and must be viewed as such by governments and enterprises alike. However, robust approaches to cybersecurity and principles of "ethics by design" are fundamental to ensuring that technology solutions are themselves sustainable from a trust perspective.

¹ Note: although this concept could include assigning monetary value to datasets, we would not extend the "stock" metaphor to include concepts of dividends, risk premia etc





Introduction

As the world continues to wrestle with the ongoing and evolving dilemmas arising from the current pandemic, we felt it appropriate to revisit the topic of our first paper² entitled “What the world will look like after the COVID-19 crisis.” More than eight months down the line since we first published our perspectives on this subject, it is important to reflect on the experiences that have unfolded and the lessons that have been learned by businesses, governments and societies at large. In fact, it is just as important to also consider the lessons that we are in danger of failing to learn. It would be a further tragedy if, in our overwhelming desire to get back to normality, we are unable to emerge wiser and stronger from a crisis that has cost so many lives and resulted in so much disruption.

As we see hope emerging with the development, approval and rollout of long-awaited vaccines, **will this lead to a restoration of the way things were before? Or will we see the emergence of the much talked about “new normal” with a reboot of society and economy? Or are we in fact going to experience a rebound where we are continually adapting to ongoing changes?**

In many respects the actions and behaviors that we have experienced over the last nine months have been highly reactive: for example emergency funding support from governments, lockdown measures and constantly changing social distancing, travel restrictions and isolation rules; rapid healthcare responses (including test-and-trace and vaccine approvals); sudden shifts in ways of working etc. - it is inappropriate to extrapolate these out to long-term trends. However, they will undoubtedly leave behind lasting scars that will potentially take decades to heal, if indeed they can be fully healed. We need to be prepared for the likelihood that waves of COVID-19 infection spikes will be followed by waves of economic and social challenge that will be harder to fix by relatively short-term government-driven initiatives.

The responses made by industries at large will likely be the key determining factor in the long-term recovery process. Their reactive measures will shape the new norms - with positive or negative outcomes depending on how they are taken forward.

This paper is not a blow-by-blow analysis of whether our previously stated views and forecasts³ have proven correct. While many of the anticipated short-term disruptions and shifts have indeed come to pass, others are likely to emerge over longer time periods - we are only just beginning to see the tip of the iceberg. Instead, we want to take time to reflect upon the underlying trends that we observe and expect, giving further hints at the kinds of proactive responses

that enterprises, both public and private, should be taking to effectively and positively rebound from the crisis.

Strengths and weaknesses revealed

Before going any further, it is important to emphasize the way that the pandemic has brought into stark relief the imbalances and inequalities that have been allowed to shape our societies for decades. The historical undervaluing of roles that we now consider to be key workers; the alarming alignment of COVID-19 patient outcomes to their economic wellbeing and even their genetic makeup; and the damaging environmental and social externalities caused by businesses whose purposes are solely driven by profit. Not only must we take action to help orchestrate a successful wellbeing and economic rebound from the pandemic, but we must do so in a way that helps to rebalance these damaging inequalities. Failure to take meaningful action now will almost inevitably usher in the next global crisis, whether that be economic, environmental, societal, geopolitical or technological.

It is also important to emphasize the positives that we have seen in terms of community spirit and sacrifices made by groups and individuals for the greater good of those around them. There are significant lessons to be taken from the positive entrepreneurial spirit and impact made by cohesive, collective actions across all areas of society. We believe these lessons send a clear message to businesses as they inevitably look at redefining the way they operate, collaborate and compete.

From crisis management to a sustainable future

Digital technology has undoubtedly been a lifesaver over the past nine months, whether that be through ensuring continuity of food supply, providing insights into the spread

of the virus, or giving the means for mental wellbeing support - as well as ensuring wider business and economic continuity of course. However, in many cases quick, temporary fixes had to be applied to address systemic weaknesses that were exposed in certain areas - in some instances these knee-jerk responses led to further problems through e.g. untested security vulnerabilities. We believe that there is a unique opportunity to carefully and strategically consider how to truly leverage the potential that technology offers, but which (for various reasons) we so often fail to fully exploit. With so many initiatives and projects being put on hold, there is significant pent up energy in the system that will be looking for appropriate outlets once the current constraints are sufficiently relaxed. How this energy is directed will influence whether we pursue a path of returning to normal or build a more sustainable and purposeful future. It is important to note that many companies have reported that in the first three months of lockdown they successfully implemented changes that a) they wouldn't have dared to do before or b) would have previously taken them up to two years to do. Companies have proven that they can implement change quickly, and it is crucial to retain this mindset and momentum, continuing to release the previously hidden capacity to break boundaries, overcome difficulties and redefine the organization.

This paper explores the characteristics of a successful post-COVID-19 economic rebound, paying particular attention to factors that will support the move to an era that we are characterizing with the terms: **technology mastery; frictionless working; data equity and sustainable by purpose.** By embracing the principles behind these concepts, we believe that businesses and societies will be able to build on the best of what we have learned and experienced so far through the pandemic and address those cultural perspectives and behaviors that have been shown to be less than resilient and relevant.

² <https://atos.net/content/2020/atos-report-what-the-world-will-look-like-after-the-covid-19-crisis.pdf>

³ Please refer back to the industry and technology centric scenarios presented in our first paper.



We believe that there is a unique opportunity to carefully and strategically consider how to truly leverage the potential that technology offers, but which (for various reasons) we so often fail to fully exploit.



A brief synopsis of the current situation

Before looking at the factors affecting a positive rebound from the crisis, it is important to take stock of the starting position that we find ourselves in. The following analysis and commentary are intentionally generalized as it would take too long to articulate specific circumstances for each industry, geography and demographic.

Readers should consider how each factor might apply to their situations, but we urge against the dismissal of certain aspects as being irrelevant simply because they have not been relevant in the past. Some important questions are new, or at least newly urgent. It is important to think about how changes being embraced by others will have wider impacts - **Will current business models and processes become obsolete? How will shifts in consumer behavior, industry regulation and even technology possibilities ripple through supply chains?**

We consider six key groupings that cover the primary factors in determining whether the post-COVID-19 world will be marked by **recession, restoration or rebound**. They describe the current emerging situations from a perspective of 1) Businesses, 2) Macroeconomics, 3) Consumers, 4) Citizens, 5) Governments and 6) Data. The sixth category of "Data" may seem to be somewhat out of place beside the others, however, we believe the topic deserves special treatment. The way we gather, use and monetize data can become a significant ally in the exit from the crisis.

The statements made for each of the six areas are intended to be scene setters and thought provokers that will underpin the lessons that we should learn from the pandemic. They inform our recommendations as to how we can collectively engineer a rebound that takes businesses and societies to a better state than before.

Businesses - survival of the fittest

Supply chains have thrived or failed largely depending on their degree of digital resilience. Flexibility and agility within business processes has been shown to be critically important - particularly in dealing with challenges such as vaccine distribution.

Many businesses have experienced a wake-up call in terms of their digital maturity. Superficial and limited digital implementations have been exposed as being no substitute for purposeful transformations.

Some significant industry sectors are failing or have failed (e.g. certain airlines and high-street retail chains) - there may be no viable route to recovery. This may lead to some hard decisions about allowing some sectors to disappear entirely. Could we end up with city centers being hollowed out with no retail outlets and no desirable places to live? Will the sort of decline seen in Detroit up to 2010 become the norm for big cities or can we learn from the good news stories about its regeneration?

New ways of working have been enforced, revealing the fact that what was previously viewed as impossible is actually a perfectly viable alternative. Business leaders and their employees may not want to go back to the way things were. Indeed, Twitter and Schroders have indicated that their employees can continue to work from

home indefinitely⁴. There will be significant implications in terms of how employees are managed, motivated and rewarded; in their use of communication and collaboration tools; and also in terms of real estate (Capita has announced plans to end leases on a third of its office space). Some governments (e.g. Spain) are beginning to regulate remote working, however there are doubts as to whether this is motivated by the protection of workers' rights or the protection of owners of corporate real estate and retail businesses in city centers who would lose out in the move to homeworking.

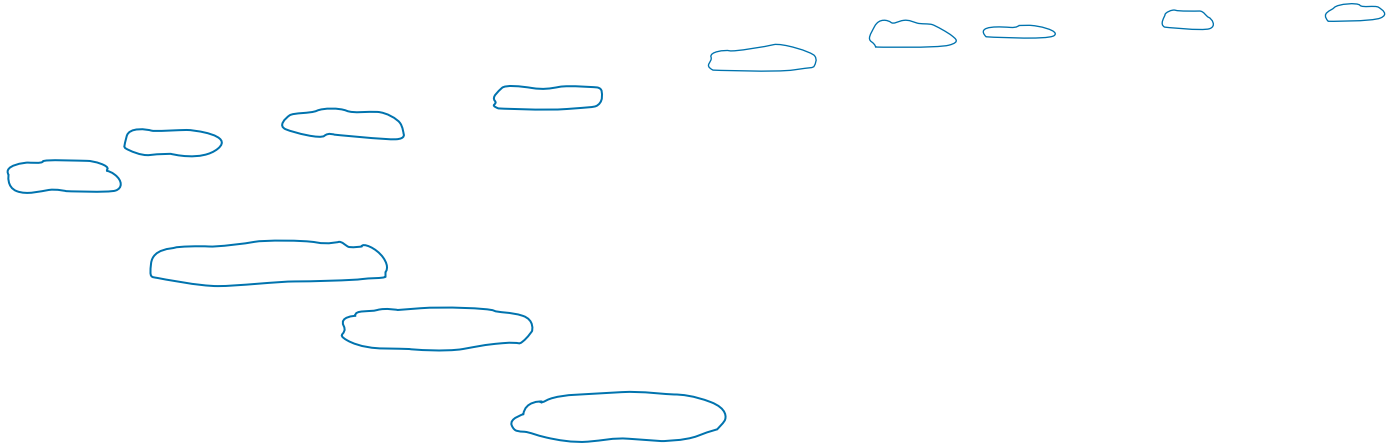
The importance of skills flexibility, adaptability and learning has been highlighted, particularly in the area of digital skills. Some businesses may suffer from the loss of key resources as individual employees take the opportunity of the COVID-19 reset to make a career change or take early retirement.

Many businesses have been cushioned from the full economic impact of the pandemic by government furlough schemes. When these come to an end, businesses will need to act quickly and decisively to reshape the parts of their operations that remain viable (see also the **Governments** section).

Shareholder expectations of financial rebound may drive unhelpful short-term behaviors that stifle the opportunity for more purposeful strategy redefinition.

⁴ <https://www.forbes.com/sites/danabrownlee/2020/05/18/twitter-square-announce-work-from-home-forever-optionwhat-are-the-risks>





Macroeconomics record highs and lows

National debts have spiraled, in many cases to record highs⁵. This has been particularly pronounced in developed markets. Household, business and government debts have all risen, but government debt has seen the biggest increase and now stands at 105% of GDP. This is well over the World Bank's threshold of 77% where future growth potential is adversely impacted. China, Russia and emerging markets seem to be faring better—could this continue to drive a reversal in fortunes between developed and developing nations?

Interest rates are being further squeezed from a position of prolonged historical lows. The disincentive to save and the attraction of further extending low-cost loans will only exacerbate debt leverage ratios and the dependence on government (taxpayer) support. Could this lead to some fundamental rethinking of the core principles of capitalism⁶?

Markets are demonstrating high levels of volatility. The democratization of investment through fintech trading platforms (e.g. eToro and Robinhood), has driven hordes of amateur investors, unable to secure meaningful savings returns, into the equities market. In some areas this is resulting in investment bias towards well-known market names, and short-term behaviors that are

already leading to worrying results and forecasts. However, even more concerning is the fact that asset classes that used to be decorrelated are becoming increasingly correlated: stocks, bonds, gold, bitcoin ... all dropped in the crash at the start of the pandemic, when usually gold and bonds would tend to rise in a crisis. This points at probable additional instability in future crashes.

On a positive note, the accelerated development of ESG (Environment Social Governance) funds are channeling investments toward sustainable companies and activities.

In many countries, domestic property prices have bucked the recessionary trend, being boosted by government stimulus actions, low interest rates and a trend to move away from city living. This is further inflating the household debt bubble and there are significant question marks over the sustainability of this position. The opposite trend is observed in the commercial property market - the pandemic has accelerated the shift to online retailing, severely damaged the hospitality sector and raised uncertainties over the future of office-based working.

There is a growing sense in many quarters that government treasuries and central banks can and should intervene to solve or cushion all manner of widespread economic challenges, even though doing so is at best

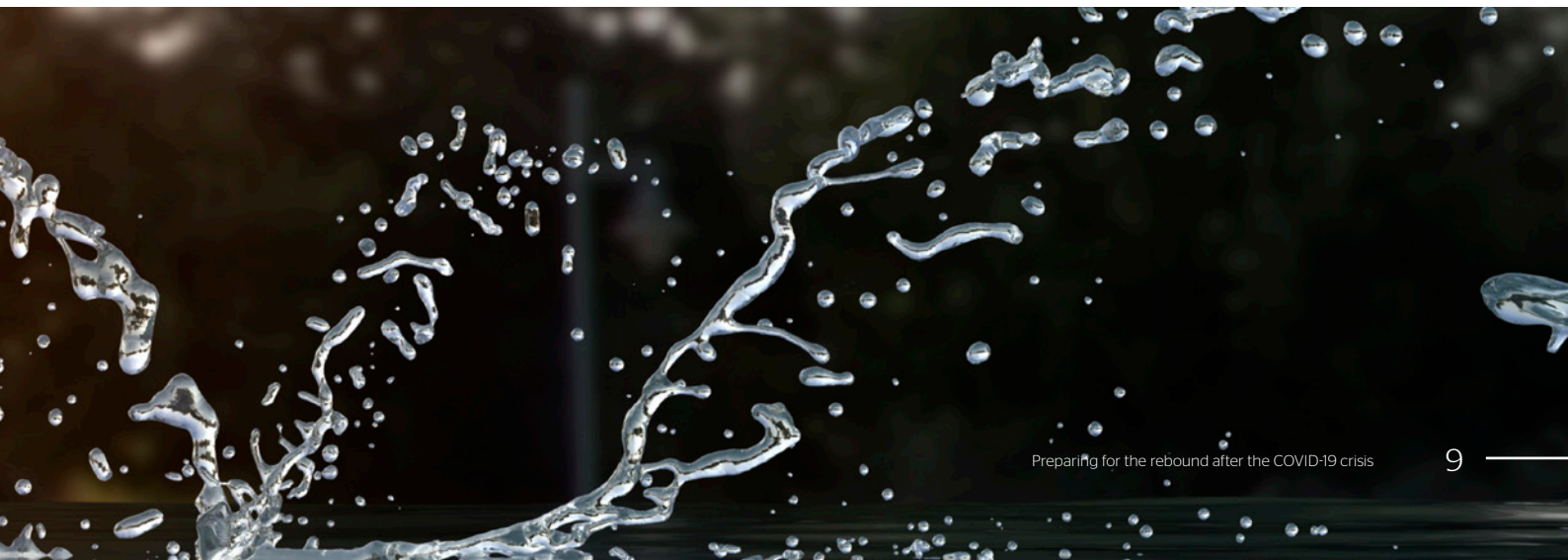
a “bandage” that temporarily masks the real situation.

The COVID crisis is redistributing the world's wealth. Asiatic countries (especially China) have seemingly exited the crisis and their economies are growing again, while Occidental countries' economies are stagnant at best. Airline traffic in Asia is now equal to what it was before the crisis, while the rest of the world is below 50%.

Despite best intents to reduce dependency on Chinese production of critical goods like protective masks, Western businesses have been unable to respond; and the export of masks from China now exceeds €40 billion.

⁵ <https://www.visualcapitalist.com/debt-to-gdp-continues-to-rise-around-world/>

⁶ <https://www.weforum.org/agenda/2020/01/quotes-on-the-future-of-capitalism-davos-2020/>



A brief synopsis of the current situation

Consumers - the demand for value and convenience

Although the significant (~25%) drop in retail spending during the pandemic has largely been recovered, the focus of that recovery has been via online sales at the expense of in-store sales⁷. Online purchases now account for nearly a third of all retail purchases. This has huge implications for logistics businesses and commercial property owners.

The shift to e-commerce has been most marked in emerging economies with the greatest increases being in China and Turkey according to an UNCTAD survey⁸.

There are significant differences between global regions when it comes to the recovery of discretionary spending. China and India are seemingly leading the pack in the bounce back of spending on things like clothing and even travel.

Unsurprisingly, buying behaviors are, more than ever, being driven by value, convenience and availability. Good online retail experiences have proven their worth in influencing buying behavior - the digital giants (eg. Amazon, Alibaba, MercadoLibre and eBay) are leading the way.

There has been a polarized redefinition in the perception of consumer value. At one end of the spectrum we have seen a flight to low-cost products as households wrestle with reduced incomes. At the other end we have those whose incomes have not been adversely affected by the pandemic, but who have seen a big reduction in their disposable income expenditure on things like holidays. This second

group has turned its focus to premium food products, wellbeing and entertainment services (eg. Beyond Meat, Peloton, Netflix).

The consumer value dichotomy raises an interesting question over the consumers' commitment to sustainability. In many ways the post-COVID-19 reset provides a unique opportunity to create a more sustainable future, but are consumers willing to pay the price? Businesses have a significant responsibility to demonstrate that truly sustainable models are the only viable approach in the mid-to long-term.

The retail sector has been a key contributor to CO₂ emissions, plastic waste and the throwaway culture. Can we engineer a recovery that has more emphasis on the circular economy?

Citizens - beware the digital divide

Families and friends have embraced new ways of connecting, sharing and playing. But these are not long-term substitutes for physical interactions. This is being noticed through a growth in mental health issues, declining mental agility of elderly people in isolation, etc.

Those who cannot or will not use digital technologies have faced an increasing digital divide.

During the periods of lockdown, household budgets tended to show a reduction in expenditure (less travel, less eating out, less clothes shopping etc.) leading to a 291% saving ratio (source: ONS). However pre-COVID-19 levels of consumer borrowing and spending (particularly on big ticket items) have now returned. This is good news for manufacturing and retail industries but exposes some worrying

trends in terms of lower levels of consumer savings and hence the ability to deal with downstream economic shocks (such as unemployment and increased taxes).

While in many ways, citizens have benefited from decisive government action and financial support, in some areas there is a growing sense of frustration and distrust. Much of this is driven by objections to the constraining of what are viewed as civil liberties, evidenced through public protests and blatant defiance of lockdown instructions. Conspiracy theories abound and may even lead to a reluctance to embrace vaccination programs.

Despite the above challenges, the spirit of societal goodwill does not seem to have been dampened, demonstrated by the fact that charitable donations and support for special causes like local food banks does not seem to have diminished. How long this continues once the full economic fallout of the pandemic takes effect remains to be seen.

Governments - a difficult balancing act

The desire for a rapid rebound will probably lead to volatility in government policy as those in power seek to balance the need to manage the economy with that of maintaining the support of the electorate.

Tax rises are eventually inevitable and will probably be highly unpopular. The fear of unpopularity and losing the support of voters is leading some governments to delay the implementation of fiscal measures, which in turn puts more pressure on monetary measures. There is a severe risk of creating

⁷<https://www.forbes.com/sites/walterloeb/2020/08/14/july-shows-cautious-climb-in-retail-sales>

⁸<https://www.unctad.org/news/covid-19-has-changed-online-shopping-forever-survey-shows>

an uncontrollable imbalance that fuels asset bubbles and devalues fiat currencies – further widening the gap between the haves and the have nots.

There will be pressure on overseas aid expenditure as governments seek to prioritize the addressing of problems at home. However, this is precisely the time we need greater levels of investment in developing countries. Failure to act may put so much pressure on the so-called developing world that the 2030 Sustainable Development Goals and the Paris Agreement could be derailed.

Poor health, poor education, high unemployment and poor infrastructure are key drivers for migration. Protectionist policies from developed nations are likely to have unintended consequences.

Many governments will look to launch capital investment programs to stimulate the rebound, however these are likely to focus on boosting local growth and may exacerbate protectionist perspectives on e.g. data sovereignty. A delicate balance needs to be struck between protectionism and free trade.

Hard decisions will need to be made about when to end short-term support measures such as furlough schemes or interest-payment holidays – in some cases they are only delaying the inevitable and removing the impetus for businesses to move quickly in tackling the changes that need to be made. It is estimated that 1 in 6 firms is a zombie (not financially viable, but able to continue operating thanks to bailouts, tax holidays, zero interest rates, etc⁹). Is this the best use of taxpayer money? Would it be better to invest in the reskilling of people who

are working in zombie companies?

In an attempt to reverse the mass exodus of workers from city centers, some town halls or governments are planning to tax remote workers for NOT commuting and NOT “using the city.” A balanced approach is required that responds to the generalization of remote working in a way that leads to better development of rural areas and less congestion in megacities.

The pandemic has shown governments’ extreme sensitivity to health crises. The fear of being accused of not doing enough to protect its citizens may lead to overprotection that will constrain economic, mental and physical wellbeing.

Data – an essential ally for a value-driven rebound

- Appropriately implemented digital technologies have been an incredible source of resilience, but the attitudes to leveraging data value have been mixed.
- There is accelerated interest in (and application of) data-centric technologies like artificial intelligence (AI) and blockchain.
- Data sharing has been a huge boost to COVID-19 vaccine research and development.
- In businesses, most data remains in silos (even internally). This makes it very hard to exploit its potential. Yet there are significant opportunities to realize the value of inter-company data sharing. Initiatives like GAIA-X¹⁰ and International Data spaces or the emerging European Alliance for industrial data, cloud and edge are seeking

to enable and promote such value creation.

- Data has driven most government policy decisions. Timeliness, accuracy and completeness of source information is critical – this has not always been realizable.
- There have been many instances where statistics have been presented in somewhat misleading ways, driving unintended responses. E.g. some reported surges in infection cases were amplified by massive ramping up of testing and were not necessarily because rates were genuinely rising.
- Fake news and distorted facts have had a huge influence on individual and group behavior.
- The willingness to embrace fake news and misinformation (not just about the virus) was inevitable against the backdrop of rising populism and mistrust in experts and political leaders.

⁹<https://www.ft.com/content/9b304e20-49cf-4fba-81a0-4d06f930d7a1>

¹⁰https://atos.net/en/2020/press-release_2020_06_04/atos-co-founds-gaia-x-to-build-a-secure-and-transparent-european-data-and-cloud-framework



Preparing for the rebound

There is of course no universal panacea for ensuring that businesses will successfully rebound from the pandemic, but we believe that there are four imperatives that must be addressed in the context of each business entity. These are derived from the distinguishing marks of those enterprises that have thrived over the last few months, and the required responses to the socio-economic conditions that we are now facing. They reflect the best of what we have learned to adapt to, without forgetting what we have lost and need to regain.

The imperatives reflect the view that we have the opportunity to enter a new era that is marked by:

- A move from technology exploitation to **technology mastery**.
- An understanding of the potential of **new frictionless ways of working**.
- The need to rethink how we define, derive and exchange **business value and data equity**.
- The critical importance of establishing business models that are **sustainable by purpose**.

We explain here what we mean by each of these statements, why we think they are of such significance and how they influence the four imperatives we have identified. It is important to emphasize that these imperatives are not mutually exclusive, nor do they reflect a sequential transformation path. Some of their constituent elements may seem quite obvious, however the experience of the pandemic has revealed that in many cases, the obvious is not always widely embraced. Now is the time to undertake a considered review of where historical weaknesses in digital strategies need to be addressed.



Technology mastery

Master the technology before it masters you



Frictionless working

Encourage, enhance and equip new ways of working



Build data equity

Extend your trusted data ecosystems



Sustainable by purpose

Invest in the future



The responses made by industries at large will likely be the key determining factor in the long-term recovery process. Reactive measures can shape the new norms - with positive or negative outcomes depending on how they are taken forward.



Technology mastery

It is hard to imagine what the pandemic experience would have been like without the digital technologies that we so often take for granted.

Without online shopping and banking, homeworking tools, mobile track and trace, data analytics, livestreams, video meetings, etc. our individual and collective experiences during periods of lockdown would be orders of magnitude more difficult. But we have seen clear evidence of the impact of differences in terms of digital maturity both at an individual and an enterprise level. **So, our first imperative is one that we call “technology mastery.” By this we mean ensuring that technology is something that we control and shape to enhance our lives, rather than something which controls and shapes us. Technology should work for us, not the other way around.** Democratization of technology must apply to everyone and not just experts, front-runners and the fortunate few.

It has been clear during the pandemic that those enterprises who started from a solid foundation of well-integrated digital capabilities were those most able to ride the necessary waves of change successfully. They were the ones who could easily make the shift to home and remote working (indeed for some this was already the norm). They were able to scale up their operations, flex their processes and supply chains, and continue to engage with consumers despite the imperative of physical social distancing.

As an example, the video-conferencing business, Zoom, saw its customer numbers grow by more than 500% compared to the previous year – it has gone from being an also-ran technology company to a household name with a market valuation greater than GM and Ford in a couple of months. This was not just because its functionality met a vital and urgent need, but because its cloud-based architecture, intuitive interface and freemium SaaS license model allowed scaling and adoption at the speed of digital. However, concerns remain over the underlying security of its platform after hackers were able to intrude on private calls. Will its success be sustainable if functionality and convenience cannot be complemented by security and trust?

While digital technologies became essential enablers during these unprecedented times, they also encouraged a sobering increase in digital threats. Knee-jerk reactions to implementing new tools and processes, a hunger for the latest information from

governments and health services, and the need to register for new benefits and testing systems opened the door to scammers, hackers and other cybercriminals.

Nine out of ten coronavirus internet domains are reportedly scams, and hundreds of thousands of video conferencing accounts are up for sale on the dark web¹¹. Brute force attacks are up by more than 400%, and fake news articles and misinformation have become more viral than the virus itself.

There is a double-edged risk that businesses are negatively impacted either through ignorance of cyber-related vulnerabilities or through an overly cautious approach to digital solution adoption. Viable long-term solutions must holistically address the opportunities AND challenges of digital. Businesses and society alike must achieve mastery of technology through ensuring that it adds demonstrable operational value rather than allowing it to become a constraining millstone that is only ever perceived as a cost.

“One example of such anticipation is that of quantum computing. Businesses should already be identifying currently unsolvable problems that will become addressable as quantum technologies mature.”

Enterprises should take the opportunity to address inherent technical debt within their IT and OT operations. Although market figures show wide variations, many analysts report that large enterprises and government departments typically spend between 60% and 70% of their IT budgets on operating and maintaining legacy systems. This can be a significant constraint to agility and innovation, and in many cases can also present a disproportionate cybersecurity risk. Re-evaluating buy-vs-build strategies is a key part of resolving the technical debt challenge – focus on investing in your own capability where it is fundamentally important to your enterprise’s value proposition and buy the rest as evergreen services. The anticipated 27% growth in the 2021 demand for public cloud infrastructure services compared to 2020 (48% compared to 2019)¹² would suggest a growing acceptance of the value proposition of as-a-service IT delivery models – particularly where they support flexible operational models and remote working. Businesses should

pursue supply chain resilience through hybrid technology sourcing strategies that provide independence and flexibility, particularly in commodity services like cloud infrastructure.

Technical debt often arises when businesses fail to properly transform their processes when implementing new technologies:

- New systems are added on top of old – adding cost and complexity
- Inefficient processes are automated – making them faster, but still inefficient
- Innovation often has an introspective view – focusing on “How can parochial improvements be made?” rather than “What wider and more disruptive potential do digital solutions offer?”. Businesses must always treat digital as a means to an end, not an end in itself.

In these rapidly changing times, it is important to be aware of technology developments and the constantly emerging potential of digital solutions. However, techno-solutionism should be avoided. Augmented reality, blockchain and AI may offer game-changing opportunities, but they need to be applied appropriately. Employees need both the space and the permission to contemplate new possibilities, learning from and co-innovating with technology partners.

Technology mastery is not a one-time fix – new digital potential will continue to emerge and today’s impossibilities become tomorrow’s market disruptors. One example of such anticipation is that of quantum computing. Businesses should already be identifying currently unsolvable problems that will become addressable as quantum technologies mature. Quantum simulation is a low-risk and cost-effective first step.

Digital strategy and business strategy must be fully aligned. It is all too easy for there to be a disconnect between business users and IT departments – when this happens there is a real risk that digital solutions cease to be an enterprise asset, and the imperative of technology mastery is lost.

¹¹ Source: ZDNet

¹² Source: <https://www.gartner.com/en/newsroom/press-releases/2020-11-17-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-grow-18-percent-in-2021>



Technology mastery is not a one-time fix - new digital potential will continue to emerge and today's impossibilities become tomorrow's market disruptors.



Frictionless working

There have been some remarkable changes in our ways of working during the pandemic. Enforced homeworking and social distancing have led to the rapid adoption of new digital toolsets and processes in a way that many would have otherwise thought to be impossible.

The changes are a testament to our adaptability and resilience in times of compelling need, but the cracks are beginning to show. Already we are seeing employee burnout because of the additional workload - whether that be from dealing with repeated surges of frontline healthcare demands, managing home-schooling responsibilities, or maintaining a work-life balance when confronted with relentless 12+ hour days in front of a computer. While many companies have reported improvements in employee productivity as a result of working from home - there is an open question as to whether this may be driven by people working more hours a day.

Since the 1970s, observations have been made that the growth in technology implementation does not necessarily lead to a corresponding growth in productivity (The Solow or productivity paradox). It would appear that, in some areas of business, this paradox has

once again been brought to the fore by the experiences of the pandemic. This is probably because it has exposed a tipping point in those businesses that have resisted technology adoption, or whose processes have not been appropriately or holistically transformed when technology point solutions have been overlaid on legacy processes. This is clearly an unsustainable situation.

Even before the pandemic emerged, a McKinsey survey identified that within many global corporations, only a small fraction of activities and offerings were described as digitalized; less than a third of core operations were automated or digitalized, and less than a third of products and services were digitalized. This situation has been only too evident in hospitals and clinics where, despite significant investment in workflow digitalization, clinicians still need to spend appreciable amounts of time in front of their computers. The irony is that the

technologies we embrace and value so much in our personal lives are often far more user friendly and intuitive (frictionless) than those that are expected to be used in a corporate context.

Business can no longer afford to lag behind in the appropriate exploitation of digital technologies. However, as previously commented, this is not just about adopting technology for its own sake but leading to an era of **frictionless working** - almost getting to the point where the underlying technology is so seamlessly integrated into our ways of working that it becomes invisible. This enables modes of operation that are capable of adapting and scaling up on-demand; that offer the potential of optimal productivity without the burden of additional overheads; and that simplify communication, collaboration and knowledge sharing.

The marks of frictionless working are those of excellent user/employee experience and will include:

Being able to securely and seamlessly work from anywhere without having to wrestle with and work around constraining IT policies (although there remain employment law and regulation considerations to comply with).

Ready access to the necessary tools, information and expertise to carry out a given task at the optimal time. The internet provides insights into almost any topic imaginable within a couple of mouse clicks. Is your business information just as accessible?

Access to virtual knowledge networks that ensure experiential knowledge is effectively diffused across the organization.

Ubiquitous virtual agents and chatbots that help explain and automatically deal with contextual and complex queries - capitalizing on collective intelligence captured through machine learning.

Business processes with integrated and orchestrated flows that, wherever possible, allow automated straight-through-processing. Automated processes should be optimized - merely automating legacy processes "as-is" may speed them up but will not necessarily improve their effectiveness and efficiency (or sustainability).

Digital toolsets should be simplified and consolidated where possible. Adding more and more layers of technology without removing others will only add to productivity inertia and the risk of process failure.

Flexible organization structures (and commercial models) should encourage collaborative working, creativity and agile ways of working.

Appropriate delegation of responsibility and decision making, using digital tools to facilitate action while ensuring traceability and accountability. This could include the additional dimension of harnessing collective wisdom through e.g. democratic surveys.

Provision of the means and motivation for continuous learning and improvement.

Technology-enabled conversations that are close to real-life experiences. The need for engaging communication is key in remote working scenarios; both within the organization and with customers. This will encourage team building, client engagement, creativity and consistent company culture.

To a large extent, we have individually learned to adapt to new ways of working and collaborating - businesses need to embrace the potential this affords by adapting underlying operating models not only to align with this new paradigm, but also address the areas of weakness that it has exposed. These include:

- Ensuring an appropriate work-life balance for those who are struggling with the cultural shift of constantly working from home.
- Finding new ways to encourage the kind of creative discussions that previously happened serendipitously at the water cooler.
- Avoiding office presenteeism turning into online presenteeism.
- Reviewing performance targets and progress monitoring tools. Thinking about new ways of maintaining employee engagement.
- Ensuring sufficient space for discharging productive responsibilities as opposed to constantly participating in online meetings.
- Embracing technology in a way that encourages inclusion, accessibility and efficiency, through a focus on employee experience and ease of use.



Data equity

As our lives become increasingly influenced by the use of digital technologies, it is imperative that enterprises consider carefully their approach to data and its inherent value.

Although digital technologies have already shown their value in terms of providing otherwise hidden insights through data analytics and artificial intelligence, it is often the case that such insights only represent certain pieces of a much larger picture. It is rare for a single entity to hold all the necessary puzzle, but there remains a strongly held view in many enterprises that there is differentiating value in the pieces that they do hold, and so there is a reluctance to openly share data without a very defined route to its monetization. Add to this the dynamic of personal data protection regulations, and the challenge of collaborative data exploitation is clear. There is also the dilemma that it is not always possible to fully determine the value of collaborative data sharing until that sharing takes place. However, waiting for all the regulations, standards and governance models to slot into place will only result in falling behind the competition. The key is to start working with existing best practices, establish trusted data ecosystems, and refine as you learn.

The pandemic experience has clearly demonstrated the value of sharing data, whether that be at an individual level in terms of willingness to participate in widespread test-and-trace programs, or at an enterprise level in terms of global collaboration in vaccine development¹³. The benefits that such openness has brought in a time of crisis will almost inevitably bring a longer-term change in attitude to data ownership and sharing. We anticipate that value chains will undergo a major evolutionary step, away from fragility and quasi monopolistic structures toward a more resilient network/value mesh, where the failure of one supplier/consumer will not shut down the whole chain.

While the pre-COVID-19 digital era tended to be characterized by somewhat siloed approaches to data exploitation, we believe that the post-COVID-19 digital era needs to be defined by the concept of “**data equity**.” We use the word equity very deliberately for its double meaning: equity as a mark of having a **shareholding** in a valuable asset, and equity as a term that implies **fairness** of value realization. As new collaborative and

shared-data ecosystems are created, applying and ensuring principles of data equity will be of paramount importance to their success. But more than that, digital technology can further drive data-enabled equity as derived knowledge and insights are applied for wider social good.

We are already seeing European initiatives such as GAIA-X¹⁴ and International Data Spaces¹⁵ rapidly gaining momentum in terms of establishing principles and standards for data exchange and sharing. There is also the promise of several billion euros of investment to kick-start specific industry data-sharing initiatives. The largely European foundation and focus of these initiatives may be seen by some as protectionism and a reaction to US hyperscaler dominance in respect to cloud data storage, however we see the primary objective as one of respecting data sovereignty, privacy and value – protecting the rights to fairly derive value from one’s own data rather than shutting down the possibility for others to participate in value exchanges. Such an attitude moves data to a level where industry consortia can meaningfully establish shareholder interests in their collective data equity.

The level of industry engagement being generated by platform ecosystem initiatives clearly demonstrates that businesses are recognizing that significant and sustainable growth will only come from a more collaborative mindset when it comes to exploitation of data value. Research shows that digital ecosystems could account for more than \$60 trillion in revenue by 2025, or more than 30% of global corporate revenue¹⁶. The main challenge to be addressed by individual business entities relates to the role they play within such ecosystems – should they be the provider of a digital platform that formalizes data exchange relationships, or should they look to participate in others’ established platforms?

As mentioned previously, we use the term “data equity” not only to reflect the importance of data shareholding, but also to ensure that data value is exchanged fairly and securely. In this regard it is important to respect the relevant standards and accepted

best practices, not just from a data protection perspective but also with regards to the ethical use of data and related systems. There are a number of industry groups, academic institutions and open communities looking at the challenge of ethical best practices, standards and certification, but the impact of these will only emerge over time. **It is critically important for industry to ensure that any standards that do emerge are well-balanced and implemented in a way that engenders trusted relationships between ecosystem partners.**

There are some notes of caution that need to be highlighted:

- First, not all geographies will adopt the same attitudes to data equity – a careful balance must be struck between respecting data sovereignty and resisting protectionist approaches.
- Second, the data ecosystem approach represents a significant cultural and strategic shift for many businesses. In many cases, new commercial and operational models will need to be established in order to take full advantage of this new paradigm.
- Third, establishing and maintaining trust within a data ecosystem demands a level of transparency and independence that cannot be delivered by entities who may be seen as competitors by other ecosystem participants. It may well be that independent platform operators are required to establish the necessary levels of trust.
- And finally, data and its derivatives must always be used appropriately. Experiences during the pandemic have shown us what can happen when data-driven algorithms do not work as anticipated, e.g. grade prediction in the UK, for students who were unable to physically sit their exams, where inappropriate biases led to significant disruption and upset, eventually causing government intervention to change the approach to grading.

¹³ <https://www.medicalnewstoday.com/articles/how-did-we-develop-a-covid-19-vaccine-so-quickly#Worldwide-collaboration>

¹⁴ <https://www.data-infrastructure.eu/GAIA-X/Navigation/EN/Home/home.html>

¹⁵ <https://www.internationaldataspaces.org/>

¹⁶ Source: McKinsey



Research shows that digital ecosystems could account for more than \$60 trillion in revenue by 2025, or more than 30% of global corporate revenue



Sustainable by purpose

The experience of the pandemic has reminded us (if we needed reminding) of the fragility of the natural world. There is a growing acknowledgment that all transactions and actions bring associated externalities that range in scale of impact from personal to planetary.

The wider consequences of business models, technology choices and the growing digital divide (economic and accessibility) must not be ignored if we are to ensure the preservation of the world's resources for future generations. Recognizing this imperative, there have been calls from a number of quarters that rebounding from the COVID-19 crisis must be done in a sustainable way, and that the more developed countries must take a lead in this. The global societal agenda is shifting away from economic development at all costs toward health, wellbeing, diversity and security.

The past few months have taught us that we can take dramatic, substantive and collective action when there is a clear imperative to do so, and that the general public will support even the most significant of disruptions if the evidence for them is clear and if there is transparency and trust in the means of execution. However, the converse is also true, where there is miscommunication or lack of trust and transparency, the necessary engagement and commitment will be lacking or even actively resisted. Sustainability, trust and collective action must go hand in hand. That is why we refer to our fourth imperative as "Sustainable by purpose."

The significance of the word "purpose" is that actions that drive sustainable behaviors must be coherent and intentional. The UN's 17 Sustainable Development Goals¹⁷ are a great starting framework for describing a world-changing vision, but it is interesting to observe that technology only gets an occasional explicit mention. Where it does appear, it tends to be presented as a challenge to be addressed. While, of course, technology is a draw on natural resources and can be used in damagingly inappropriate ways, it can also be used to pay back those deficits and even help deal with others. We see digital technologies as a part of the solution and not just a part of the problem. Digital technologies may be

responsible for an estimated 4% of the total global CO2 emissions, but digital technologies also have the potential to decrease CO2 emissions by 15% to 20%. We would highlight the following areas for consideration as companies plan for a rebound that is **sustainable by purpose**:

Decarbonization

The overall impact of the COVID-19 pandemic must not be understated. However, in planning a route to recovery, we also cannot ignore the further reaching threat of catastrophic climate change.

Consensus is building that if we can act decisively, intentionally and collectively over the next 15 years, there is real cause for optimism that atmospheric greenhouse

gases can be reduced to a level that will begin to reverse the seemingly relentless rise in global surface temperatures. To realize this imperative, we must address the throwaway mentality that has been driven by relentless pressure for consumer revenues. Historically, the success of producer organizations was linked to the quantity of their product that could be sold. Even after reaching market saturation, consumers had to be encouraged to keep buying. Built-in obsolescence meant that out-of-date products were discarded in favor of purchasing the latest more desirable version. In a sense, our ability to consume materials and then throw them away faster and more efficiently became a measure of success.

This is clearly unsustainable, and we must align future product development and distribution strategies with the circular economy principles of "re-use, repurpose and re-cycle" – as some leading companies are already doing. For example, Schneider Electric uses recycled content and recyclable materials in its products, prolongs product lifespan through leasing and pay-per-use, and has built take-back programs into its supply chain. Circular activities account

for more than 12% of its revenues, saving around 100,000 tons of primary resources each year.

Digital technology is a key enabler of this, particularly as more and more product functionality is software driven. Tesla is a good example of how physical products (cars) can be given new innovative features and enhancements simply by downloading software updates (as opposed to buying a whole new car). Digital technologies can bring transparency and trust in supply chains, enable platforms for establishing circular ecosystems, and can provide sustainable KPIs with the same rigor that we currently use to report on more financially oriented measures.

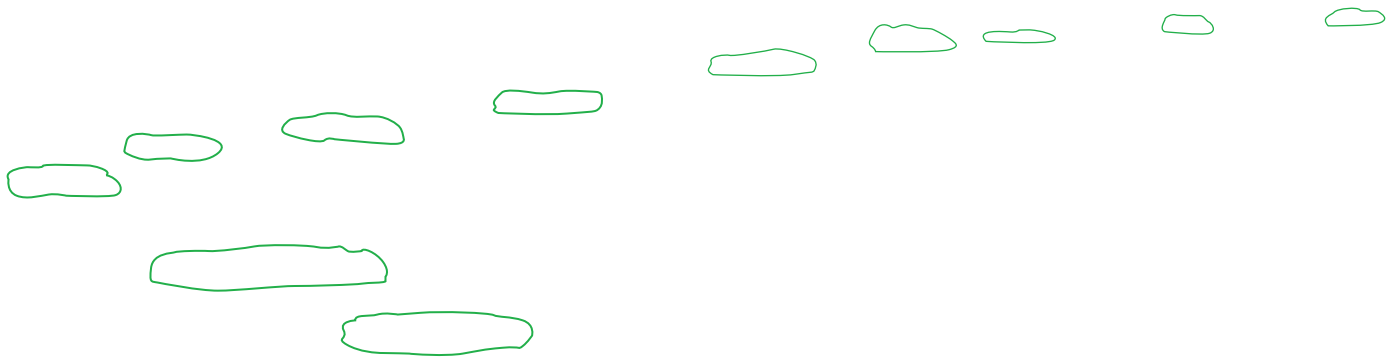
Wellbeing

Employee wellbeing has been a significant area of focus for businesses during the pandemic. It remains to be seen what the long-term physical and psychological ramifications of lockdown working will be, whether that be for those isolated at home or those having to hold the fort as key workers. However, **as we prepare for the rebound, we must not defocus wellbeing from being a priority topic**.

In some ways there has been a tendency to over-generalize perspectives on wellbeing. "Homeworking is a good thing because you don't waste time travelling, you spend less on clothes and food, you can flex the way you work ... However, this fails to recognize that not everyone has the luxury of a quiet home-office, adequate network connectivity, or the ability to easily switch off and unwind. Wellbeing policies need to be flexible enough to create tailored environments where all employees have the opportunity to flourish at work.

Businesses should be prepared to invest in homeworking facilities if their employees are going to be expected to use them long term. Shopify was an early mover in giving

¹⁷ <https://sdgs.un.org/goals>



employees a \$1000 stipend to buy necessary office supplies such as lamps, chairs and desks. But investment in wellbeing needs to go further than physical equipment. Businesses will also need to consider how company culture, leadership and people management will need to change.

It may not be enough simply to delegate the responsibility of maintaining a healthy work-life balance to employees themselves. Business leaders may need to find new creative ways of being positive wellbeing role-models that foster healthy working practices. This might be through: building teams where members actively and intentionally support and look after each other; ensuring a culture of open and honest communication; or moving from authoritative and pacesetter leadership styles to more coaching affiliative ones.

Of course, there is no panacea for wellbeing, and each business will have to determine the most appropriate model for itself, but it should be clear that employee wellbeing drives employee engagement, which in turn drives business performance.

Diversity and inclusion

Nature has a lot to teach us, not least in the area of diversity. The survival of animals, plants, fish and even micro-organisms depends upon the diversity of their bio-ecosystems. When an imbalance arises, entire ecologies can be weakened or even wiped out. Lack of diversity within a given species also leads to weakness: Banana crops faced their own pandemic during 2020 as the TR4 fungus was able to spread unchecked through banana plantations that had concentrated on growing a single variety of banana.

In a business and societal context, diversity is a source of resilience, creativity, strength and balance. Enterprises must strive to nurture diversity through their direct workforce and

through the supply chain and partner networks they engage. Monopolistic dominance must give way to symbiotic relationships, and destructive competition must be tempered by value-adding cooperation.

The good news is that when appropriately implemented, digital technologies can be both a great leveler and an enabler of diversity. The democratization of digital through the internet, cloud, open-source and accessible technologies all mean that the barriers to entrepreneurship are lowered for more individuals and organizations than ever before. However, failure to embrace new sustainable business models puts the opportunity at risk.

Our rebound must include action to preserve diversity in the natural world and to build diversity and inclusion within our businesses and societies. Only then will we have the strength and resilience to deal with future global challenges.

Security and trust

As already articulated, security and trust are key ingredients of being **sustainable by purpose**. It should go without saying that this is particularly important in the area of digital technologies. However, the pandemic has exposed just how vulnerable businesses and society can be to things like misinformation and fake news, data breaches and online scams. It seems that even family video calls are not safe from those who would seek to disrupt them, regardless of whether there is a material gain to be had. And the explosion of remote working and online shopping only serves to increase the potential attack vectors.

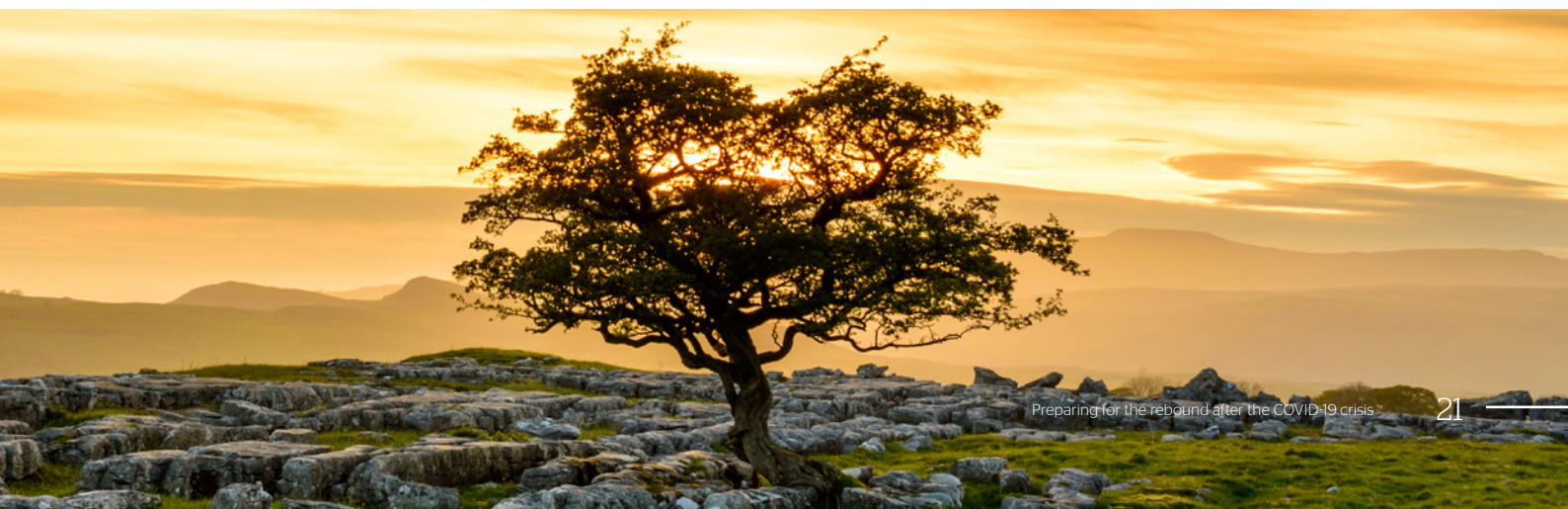
The annual cost of cybercrime exceeded \$1 trillion in 2020, partly influenced by the massive rise in homeworking. The COVID pandemic has been mirrored by a cybersecurity pandemic, with even bodies like the World Health Organization experiencing a five-fold increase in

cyberattacks. With hospitals facing new waves of ransomware attacks and food supply chains under threat, resilient cybersecurity is genuinely a matter of life and death. **The imperative of responding to urgent health crises cannot relegate digital security to second priority.**

If we want to sustain the trend toward an ever more connected world that places increasing value on data and its insights, we must expand our perspectives on digital security and trust. Yes, we have to address the technical security debt of the accelerated digital deployments triggered by the pandemic, but we also have to build trust in their continued use. From a data perspective, trust implies transparency and traceability in the way data is processed and shared; explainability of AI algorithms; and demonstrable provenance of information.

Information validity will be established by a consensus of truth across a number of reputable sources of information. Blockchain technologies are expected to be increasingly employed to facilitate this. As we observe only too often, trusted reputations can be hard-won and easily lost, particularly in terms of digital ethics. Similar to the way we have referred to data equity (as a measure of shared value and fairness), we would use the term trust equity as a measure of an enterprise's reputation capital.

It is our strongly held view that as we rebound from the COVID-19 crisis there will be close attention paid to what an enterprise's corporate balance sheet says about its attitude toward sustainability and long-term shareholder value. Businesses that are able to demonstrate sustainability by purpose will be those that find it easier to engender trust within collaborative ecosystems and attract the next generation of creative talent and digital skills. Success will be achieved when it is more profitable to do good things than bad ones.





When written in Chinese, the word crisis is composed of two characters -- one represents danger, and the other represents opportunity.

John F. Kennedy



Conclusion

We owe it to those who have tragically lost their lives, been bereaved, or had their lives otherwise disrupted, to rebound and emerge from the COVID-19 crisis stronger, wiser and more purposeful than when we entered it. **We have proved that it is possible to work differently, adopt and adapt technologies in ways that were previously thought to be too difficult, and collaborate for the greater good.**

It is critically important that we do not just try to restore previously held views of normality, but instead take the opportunity to rethink what we strive for in pursuit of value and purpose. This will include rebalancing our perspectives on how and why we use technology - ensuring that we embrace technology mastery rather than techno-solutionism. Many businesses will have to deal with the technical debt of legacy solutions that are holding them back from realizing the full potential of digital. **Collectively we must deal with the technical debt of digital technologies being a part of the sustainability challenge, when they should be a key part of the solution.** We must also deal proactively with the future problems that will arise if we fail to have absolute focus on the ethical use of digital technologies.

Data has been too often treated as a commodity to be hoarded and jealously guarded. To realize its full value, we need to move to an era of **data equity**, where new sources of value can be realized through trusted ecosystems of data sharing. Enabling technology and business models for such ecosystems must fully respect data shareholder rights and handle all exchanges and routes to monetization in an equitable and secure manner. If we can overcome the inertia of parochialism, we should expect to see the emergence of collaborative data-driven communities at an industry, national and even international level.

We must embrace the opportunity to establish a more sustainable work-life balance - one that is characterized by frictionless working enabled by digital transformations that holistically address efficiency, effectiveness and employee experience. Future ways of working must support meaningful virtual personal interactions that optimize teamwork, innovation and collaboration. In doing so they will help re-energize and even redefine corporate culture.

Finally, we must seize the opportunity to align to new business models and measures of success where positive business outcomes are characterized by sustainability, wellbeing and transparency, while still driving stakeholder value and fair returns on investment.

About Atos

Atos is a global leader in digital transformation with 110,000 employees and annual revenue of € 12 billion. European number one in cybersecurity, cloud and high performance computing, the group provides tailored end-to-end solutions for all industries in 73 countries. A pioneer in decarbonization services and products, Atos is committed to a secure and decarbonized digital for its clients. Atos operates under the brands Atos and Atos|Syntel. Atos is a SE (Societas Europaea), listed on the CAC40 Paris stock index.

The purpose of Atos is to help design the future of the information space. Its expertise and services support the development of knowledge, education and research in a multicultural approach and contribute to the development of scientific and technological excellence. Across the world, the group enables its customers and employees, and members of societies at large to live, work and develop sustainably, in a safe and secure information space.

The Atos Scientific Community crafts the Group's vision for the future of technology in business, and anticipates the upcoming trends and technologies that will shape businesses and society in the years ahead.

Find out more about us

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Let's start a discussion together

