DIGITAL TRANSFORMATION

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PERFORMANCE MEASUREMENT

Creating the conditions for digital success

Too many digital transformation efforts fail to deliver. With the acceleration brought on by the pandemic, it's time to recalibrate

Thomas Brown


Richard Drury via Getty Images

Digital transformations have become increasingly fashionable over the past 10 years, yet most still fail to deliver the benefits they promise.

Organisations have come to see the potential offered by new technologies and our hyper-connected, data-rich existence. There have been seismic shifts in consumer behaviour as digital and mobile technology becomes ever more pervasive in our lives. Disruption has been a reality for industry after industry, as new platforms, new business models and new entrants have seized upon the ubiquity and potency of digital technology to upend the status quo.

'Analogue age' businesses have had to adapt. This has become a boardroom priority. For some, it's a matter of survival.

So it's a troubling thought that, despite all the conferences, books, studies and expensive consultancy assignments devoted to digital transformation, most such initiatives are unsuccessful. Research published last year by the Boston Consulting Group (BCG) indicated that 70% of digital transformations have fallen short of their objectives.

These failures could be expensive. In 2020, market intelligence firm IDC forecast that worldwide spending on the digital transformation of business practices, products and organisations would reach $1.3tn (£950bn). The BCG study therefore implies that about $910bn worth of digital transformation investments last year would fall short of their expected returns. That doesn't account for the inevitable risks to revenue, profitability and cash flow for those that fail to adjust to a changing marketplace.

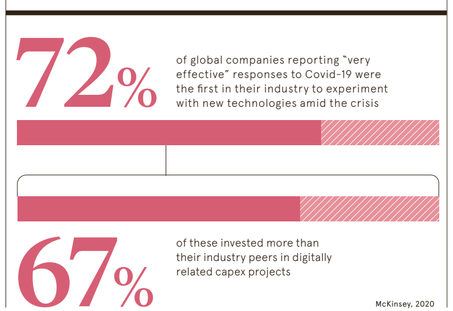
Then came Covid-19. Almost overnight, the world changed. We couldn't travel, shop, commute, work, communicate or socialise in the way we had the week before. Shops were shuttered, offices lay dormant and public transport hubs were virtually abandoned.

The flight to digital was profound. The UK saw the equivalent of more than 12 years of ecommerce growth in 12 months. According to McKinsey, three-quarters of US consumers have tried a "new shopping behaviour" during the pandemic, with 77% intending to continue with it once the Covid crisis ends.

Businesses have been forced to respond at pace. McKinsey found that the pandemic accelerated the digitisation of customer interactions in Europe by three years and the partial or total digitisation of products and services by seven years, compared with the average rates of adoption in 2017-19.

Rich Corbridge, CIO of Boots UK, observes that digital technology has historically encountered three key areas of doubt: its tangible benefit to a retail store estate, its speed and its costs. "These were quickly overcome as we saw a fundamental shift in mindset throughout the executive team and across the entire organisation," he says. "We learnt new behaviour and were given new permission to move faster and do more, because we had to support our customers, our patients and the NHS in new ways."

For the retail sector in particular, the need to adapt to the digital era and embrace new tech has been discussed with a seeming sense of urgency for the best part of two decades. "In many cases, this was really only lip service, but the pandemic made it all real," Corbridge says.



The Covid crisis has undoubtedly been an accelerating force, but there is a risk of complacency.

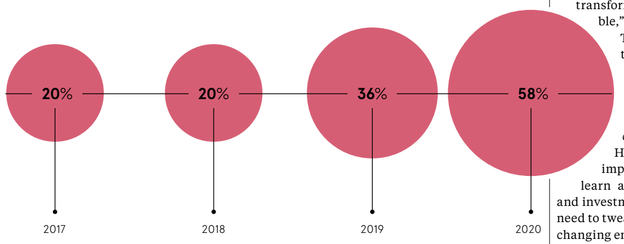
"Progress over the past 18 months has been born of necessity, not ambition," argues Daniel Rowles, programme director for digital transformation strategy at Imperial College Business School. "As we plan for a world beyond Covid-19, too many businesses are already looking to steady the ship, restore some calm and seek a return to normality and business as usual. This is the difference between responding to a crisis in the moment and committing to a genuine transformation in the long term."

Rowles's views highlight a common mischaracterisation: digitisation and digital transformation are not the same. We've seen a lot of digitisation during the course of the pandemic but not necessarily so much transformation.

Rowles contends that a successful digital transformation isn't about technology; it's about developing an organisation that can continue to change. At the heart of this lies culture, but "most organisations will have seen new behaviour and a cultural shift over the past 18 months that may prove to be temporary", he adds. "What we didn't

COVID-19 HAS ACCELERATED THE DIGITISATION OF CUSTOMER INTERACTIONS

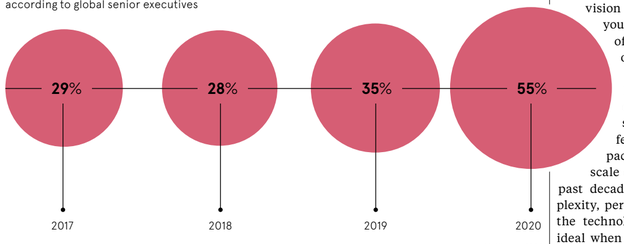
Average share of customer interactions that are digital, according to global senior executives



McKinsey, 2020

COVID-19 HAS ALSO BOOSTED THE RANGE OF DIGITAL OPTIONS FOR CUSTOMERS

Average share of products and/or services that are partially or totally digitised, according to global senior executives



McKinsey, 2020

do is set out to create purposeful cultures. These need to be intentional. They need to be engineered and they need to be reinforced. Otherwise, they won't endure."

Pandemic or not, one of the most crucial ingredients for a successful digital transformation is a clear corporate vision. It's a key starting point because of the uncertainties that characterise our digitally driven world.

The three- or five-year plans that have traditionally been used in business to establish objectives, set budgets, assign responsibilities and guide investments and corporate initiatives have quickly become outmoded. When it comes to digital transformation, an agile and fluid approach is needed, with a clear vision to guide efforts.

This is a development that executives can embrace. It can motivate and inspire employees, while instilling the confidence of investors. It can also build anticipation and engender trust among customers.

> **As we plan for a world beyond Covid-19, too many businesses are already looking to steady the ship, restore some calm and seek a return to normality and business as usual**

What's more, argues Rowles, it can help to overcome one of the biggest hurdles in securing commitment to a digital transformation: the corporate preoccupation with return on investment.

"Traditional business planning hinges on the return on investment, but this is where many organisations come unstuck. There will almost always be quick wins that can yield an in-year, attributable payback, but many investments – financial or otherwise – in digital transformation are unpredictable," he says.

There's a huge amount that we don't know about consumer behaviour, technology and the market, or about how quickly things can change, Rowles notes. He also points to the importance of a test-and-learn approach to innovation and investment, and the inevitable need to tweak plans in a constantly changing environment.

"Against a traditional plan and budget, pivoting might be considered a failure. But, if your executive team and wider organisation are truly aligned around a common vision and share conviction, you have the foundations of a culture of continuous change," he says.

For some, digital tech has become something of a dark art. Those outside the IT function can feel overwhelmed by the pace of development, the scale of innovation over the past decade alone and the complexity, perceived or otherwise, of the technology. This is far from ideal when they're being asked to commit to change.

Ash Roots is digital managing director of BT's consumer division, covering brands including BT, EE and Plusnet. For him, dispelling this potential confusion is key. He outlines a vision for change in three steps, the first of which he calls co-creation. As digital teams grow in size and status in an organisation, it's important that they don't become detached from the operations of the business and lose their connection with customers.

"Working together and involving people in defining problems, needs and an intended future destination can generate actionable insights and help to build 'buy-in'," he says. "If you want to take people on a journey, why not work on the destination with them?"

The second step is to work back from outcomes. Roots explains that it's easy for any aspect of digital transformation to focus on the technology or the work that will go into creating something. But this can be problematic when you're trying to work collaboratively and bring a breadth of thinking and experience into project teams.

"Not everyone will share a passion or enthusiasm for a widget, a bit of code or a step in a process," he says. "The technology isn't the goal; it's a means of delivering it."

But a shared objective has the power to galvanise all parties involved in a transformation, Roots stresses. "Focusing teams and/or entire strategies on outcomes and ensuring that these are rooted in customer value and/or business value helps to keep everyone aligned on why we're really doing what we're doing."

The third step is to aim for what Roots calls radical transparency. "Digital cannot operate as a black box. Inviting people into the process, communicating constantly and openly, and encouraging both participation and scrutiny is key to demystifying it."

A transformation is, by definition, a significant undertaking. The word implies something complex, expensive, fraught with risk and, probably, painful for some of those affected.

The term is possibly its own worst enemy. In most cases, a digital transformation is a project that's separate from the business. It's almost extracurricular in nature – most of the organisation continues as normal while a small minority battles to change this. It doesn't seem like a recipe for success.

For Roots, it's important to treat transformation as an unceasing endeavour, not a time-bound project or something that's separate from the core business.

"Transformation and business as usual need to become one and the same. Ongoing transformation is the priority for our business. We're modernising the organisation and seeking ways to create value for the organisation and its stakeholders," he says, adding that this should be every employee's daily mission.

Rowles offers a final nugget of advice for those leading such work. "If you want a digital transformation to succeed", he says, "do not call it a digital transformation."

Putting the customer front and centre

It's easy to espouse the importance of being customer-focused, but another thing altogether to make it a reality. **Rich Corbridge**, CIO of Boots UK, offers the retailer's perspective

In what ways are customers influencing your company's digital transformation?

"For us, it all started with the creation of what we call a single customer value proposition (CVP). It articulates the value and outcomes we want to unlock for our customers and patients consistently, across any interaction they have with Boots, be that physically or virtually.

"The CVP is rooted in our understanding of customers and patients, their needs (and unmet needs) and how we can support them. It drives everything we do, from changes in stores to our digital investments. And it has been key to putting the customer – not technology or any other internal priority – at the centre of our digital transformation."

What would you cite as the key factor in making this a reality rather than mere rhetoric?

"The relationship between our IT and marketing teams is crucial. It's probably the best and closest relationship between the two functions that I've seen in my 20 years as a CIO. Given the role of technology in delivering value for customers and patients, it's inevitable that a strong partnership is needed. The impact of Covid-19 has really crystallised this for us.

"The relationship between IT and marketing ensures that everything we do – all of our investments in digital tools and capability – is rooted in customers' needs. We couldn't achieve what we've managed so far by working in silos."

This is ongoing work, so what's your next priority?

"Omnichannel is an easy term to use, but most businesses still see the world through silos. We've blurred the lines on the front end enough to start delivering a more consistent experience for customers, but we need to break down the silos behind that. At that point, we can really start to unlock efficiency and find ways to create greater value through different customer journeys."

Critical questions for leaders

Whether you've already embarked on transformation or you're just about to start, there's real value to be found in pausing and recalibrating as a leadership team. **Ash Roots**, digital MD of BT's consumer division, recommends five important questions for senior teams to ask themselves

1 How are we enabling our people?
"The pandemic has accelerated a long-building change in how we interact and collaborate with our colleagues. It's important to ask ourselves whether we're providing people with the tools that they need in order to work in their best way as part of this transformation. It's also about practising what we preach."

2 What are the basic impediments we are facing?
"I love using the word 'impediment'. When I do, people really lean in and ask me: 'What do you mean by impediment?' It's a great way to stimulate a meaningful debate."

3 How do we create space for transformation?
"Few businesses are running on 50% capacity, just waiting to undertake a major transformation programme. If you're to introduce a new set of priorities and initiatives for the organisation, it's crucial to have a frank discussion about what needs to be postponed or even sacrificed to create the breathing room for people to apply themselves."

4 What are our top priorities?
"Transformation programmes can yield dozens, even hundreds of projects and initiatives. The critical question for executive teams is: 'what are we going to tackle this month or quarter, and in what sequence?' Taking the time to agree priorities as a team helps to ensure that tensions and/or missed expectations don't occur further down the line."

5 Are we still aligned on outcomes?
"A transformation is ongoing and never static. Although it's important to co-create a future destination and desired outcomes, it's just as important to review these regularly, because things can change – and working on assumptions alone will always carry a risk."

OPINION

'We must work together to ensure that no person or place gets left behind in the smarter state'

It is 10 years since the publication of the report that led to the founding of the Government Digital Service. The decade since then has witnessed both significant disruption and progression in public-sector transformation. As well as the establishment of the Government Digital Service, there has been the introduction of the cloud-first policy, the creation of the Digital Marketplace, *The Local Digital Declaration* and a new Local Digital Collaboration Unit. All of these have helped to build a smarter state.

It has been a year of extraordinary change for our public services – the past 18 months have shown what is possible with tech when you remove the culture of risk aversion. We must maintain and build on this innovation as we rethink what the future of our public services looks like. Having reached a critical juncture in public-sector digital transformation, we must now take stock and look to what comes next and what this means for people and society as we build back better and fairer for all.

What is certain is that citizens and user needs must be at the heart of the smarter state. Exploring how organisations can create the environment and culture that delivers a citizen-centric transformation – one that is inclusive and accessible to all – is a key theme at our flagship public services conference, Building the Smarter State.

For Liverpool's 5G testbed, the use of digital technology enabled the city's local authority to deliver high-quality health and social care services in the community, through new devices and applications connected to its community 5G network. Integrating tech into care has boosted customer experience and satisfaction, offering Liverpool's citizens the opportunity to live independently for longer.

Digital services also enable and empower citizens to be at the heart of decision-making. Waltham Forest's digitally driven Covid-19 Citizens' Panel is a good example of using digital platforms to regularly consult residents. The panel of 75 residents – representative of the borough's population in terms of ethnicity, gender, age, disability and socioeconomic status to ensure the responses were inclusive – directly informed the council's approach to the pandemic.

Effective collaboration and coordination across and between public- and private-sector bodies is crucial to the success of a smarter state. This forms part of what techUK calls local digital capital, the building blocks of strong technology ecosystems and of a digital, levelled-up economy. This concept was developed and iterated through a series of digital dialogues we held last year with stakeholders across the regions.

To enable the next wave of digital transformations, the government must commit to digital levelling up. That is why, on 9 September, we launched the Local Digital Capital Index in Birmingham with Andy Street, mayor of the West Midlands. The index is an econometric tool for local areas to use to help them understand their digital strengths, where they need to improve and where best practice can be found in other regions.

We have seen the rise of the chief digital officer, with the role increasingly having a place in the boardroom, while the past year has shown that digital is everyone's responsibility. In the smarter state, senior leaders can no longer say they don't 'get digital'. To foster meaningful digital collaboration, techUK calls for a regional chief digital officer forum, as well as a national forum, to be set up with public and private stakeholders to connect and identify where tech can solve common challenges and build on strengths.

Now is the time to be ambitious and have a vision for the future of our public services. As we build back better, digital will be the golden thread across all services and organisations, so let's work together to ensure that no person or place gets left behind in the smarter state.

Julian David
CEO,
TechUK

Commercial feature

How to steer your digital transformation to success

The shift to digital is upon us, but how you plan your IT transformation is the key to success

The Covid-19 pandemic has shifted the way we do business and sped up the pace of digital transformation. More than half of products and services are now digitised, according to industry analysis.

Businesses big and small are reckoning with the new normal – and the sudden arrival of the future now. But rather than leaping in, it's important to plan an IT transformation carefully. "If you're going to invest in external expertise, it's essential to get them in as early as possible," says Peter McMenemy, managing partner and head of transformation at Analysys Mason, global leaders in telecoms, media and technology (TMT) management consulting.

Digital transformation programmes can easily go awry because of decisions made in the first six months of the programme. McMenemy compares it to steering a huge ship on a transatlantic voyage without a map. "You get into situations because you haven't taken the time upfront to answer some of the really big questions," he says. "Too often, organisations simply try to replicate what they already have in a new system, rather than defining what they want to be in the future and working towards that."

And it's vital to do so. "As soon as you've finished the initial roadmap and design, any change in direction you want to make after that is twice or three times as expensive as if you'd made it earlier on in the programme planning phases," he says. "The old adage: 'design hard, build easy' is a really appropriate one. Most people don't do that."

Analysys Mason's Transformation practice is currently supporting one of the biggest telecoms firms in western Europe through their business support systems (BSS) transformation – a five-year, billion-euro upgrade programme. Yet they're equally adept at working with startups that have spun off from large telcos, and also work across financial services and utility companies. The process is similar, whatever the sector: you need to be clear on your goals before you set off – and take big decisions early to set up the programme with flexibility to cope with challenges and problems that can arise. "Businesses often focus only on the 'what' and 'when' in terms of systems and technology and don't put enough thought early on into the 'how'," says McMenemy.

McMenemy recommends trying to keep responsibility for transformation in-house as much as possible, rather than buying in expertise. "You want to have as many of your own permanent employees working on any transformation as possible," he says. "Ultimately, these are the people you want to be trained up and understanding how the system works. This way you can also manage the impact of the transformation on your people and their processes."

Outside vendors should be thought of as partners who can fill in gaps: McMenemy recommends setting up an outcomes-based contract with vendors where both parties are incentivised to work together fruitfully. "You're going to be spending years with these vendors putting in the lifeblood of your IT and software systems," he says. "Why on earth would you not want to treat them as a partner and also incentivise them to do a great job with potential financial upsides? You're going to be working with these companies for many years into the future."

By setting clear goals, and building strong relationships within and outside your company, it's possible to tackle even the trickiest challenges on your journey towards IT, digital or business transformations – and to avoid wrecking on the rocks along the way.

> **The old adage: 'design hard, build easy' is a really appropriate one**

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WORKFORCE

Are the robots coming for white-collar jobs as well?

Fears about job losses resulting from automation usually centre on blue-collar jobs, but clerical, professional and even leadership roles may not be immune

Suchandrika Chakrabarti


Alan Segrave via Gettyimages

Automation has long been viewed as a threat to many manual jobs. But, as the technology becomes increasingly sophisticated, white-collar workers from lawyers to CEOs could also feel its impact.

One of the common worries about digital transformation is that many people's jobs will be automated or replaced by technology in the quest for greater efficiency. Well over half (61%) of the people surveyed for PwC's recent *Upskilling Hopes and Fears 2021* research report were worried that automation was putting many jobs at risk, for instance, while 39% considered it likely that their jobs would be obsolete within five years. Last October, the World Economic Forum predicted that artificial intelligence systems could replace 85 million jobs by 2025.

In the past, the roles viewed as at particular risk were those requiring a high number of routine or repetitive tasks, often in occupations deemed 'low-skilled'. According to PwC, most jobs that will be lost to automation are routine (underwriting, for instance), repetitive (data entry) or dangerous (factory work).

But the reality is that many 'high-skilled' jobs will be affected to varying degrees if developments in IT continue on their current trajectory, according to Alexa Greaves, CEO of AAG IT Services.

Nurses, lawyers, legal secretaries, accountants, translators, marketing managers and estate agents may all be affected, she predicts, adding: "Professions and skills that are based on accrued knowledge and data-led decisions are all at risk from different levels of automation."

Given that law firms in the US invested $1.5bn (£1.1bn) in robotic process automation (RPA) between 2017 and 2019, the legal profession appears to be embracing the technology, but does this threaten lawyers' livelihoods?

"A robot may be able to write better legal documents than a human can manage," Greaves says. "But a lawyer who has experience in dealing with the subtle, social elements of a case is still a valuable asset."

Matt Abbott, president at recruitment firm The Sourcery, believes that legal professionals should stay positive. Thanks to automation, lawyers at all stages of their careers will take on less project management and spend more of their time on actual legal work.

"You might not need as many people for those jobs, but someone has to manage the whole process," he says. The RPA software cannot analyse its own flaws or fix itself, which means that, "once there's a problem with the system, someone has to unravel it completely".

Even the top job may not be immune. In April, Will Dunn, business editor of the *New Statesman*, wrote: "CEOs are hugely expensive – why not automate them?" His article noted that the High Pay Centre's latest annual survey of executive rewards in the FTSE 100 highlighted "quite significant potential for companies to safeguard jobs and incomes by asking higher-paid staff to make sacrifices".

So what is the future of the CEO? Victoria McLean, the founder and CEO of City CV, suggests that they will continue to be in demand, because the role is a complex combination of experience, intuition and human connection.

> **Professions and skills that are based on accrued knowledge and data-led decisions are all at risk from different levels of automation**

"Highly skilled and highly paid employees are more likely to perform roles that require creative decision-making skills and the ability to develop complex strategies, even if they use AI to help them solve problems," she says. "AI simply cannot handle these functions or mirror the workings of the human brain – right now, at least."

Innovations in automation might help us to reimagine what a CEO is, but there will always be a need for a human leader, Abbott argues.

"We may get rid of the CEO title, but there has to be someone who makes decisions," he says. "There is still a need for the human element that has to make the calls. I don't see too many high-level careers ending with digital transformations. "

So how should these high-powered workers prepare for a future in which their jobs remain, but are altered by automation?

These types of roles tend to emphasise the skills where humans always excel over the technology we have today or are likely to have in the near future. As Greaves observes, "diversifying your skills and focusing on so-called soft skills that are harder to automate, such as communication and teamwork, are likely to be good bets".

McLean adds: "While robots may be intelligent enough to perform routine tasks, they aren't generally intelligent in the way that humans are. Creatives such as musicians, inventors and marketers won't be replaced. It also means that the work of therapists, counsellors, carers – any job that requires a human connection – won't be replaced."

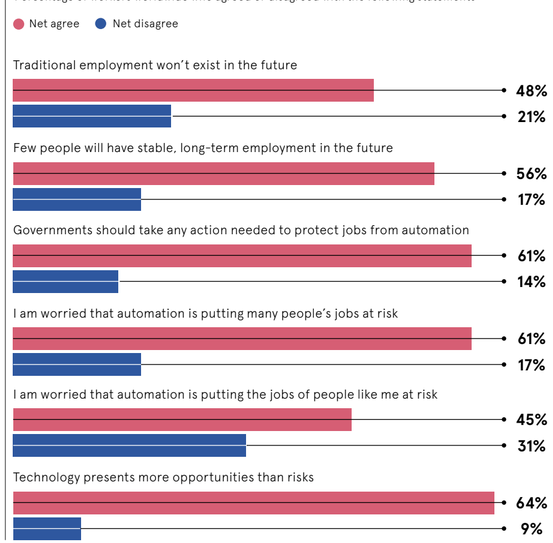
The reality is that the workplace and the workforce are continually evolving to incorporate new technologies and new ways of thinking. It's a challenge as old as our concepts of white-collar work.

"We know that 65% of children at primary school now will enter jobs that don't currently exist," McLean says. "We also know that new technologies have been changing the working landscape ever since the industrial revolution. We have gone through 250 years of change. Should we view AI any differently?"

Probably not. The workplace will always feel the impact of developing technology, but human beings are endlessly adaptable. Bringing automation into the office will make our working lives better, invent new jobs that fit the future workplace and save all of us some precious time.

WORRIES ABOUT JOBS ABOUND PwC, 2021

Percentage of workers worldwide who agreed or disagreed with the following statements



ETHICS

It's time for corporate digital responsibility

Digital and data management crises at the Post Office, TikTok and Facebook are fuelling the corporate digital responsibility movement

MaryLou Costa

Dozens of former subpostmasters who had been convicted of theft, fraud and false accounting because of the Post Office's defective Horizon accounting system finally had their names cleared by the Court of Appeal in April 2021

Tolga Akmen/AFP via Getty Images

When hundreds of Post Office workers were prosecuted for theft between 2000 and 2014, a huge miscarriage of justice and a shocking example of failed corporate governance ensued.

Dozens of subpostmasters were convicted and even imprisoned after Fujitsu's Horizon computer system had flagged up significant financial shortfalls at their branches. But the Court of Appeal ruled in April that the convictions should be overturned, because the system was found to have glitches that caused it to make regular errors.

Justice Peter Fraser criticised the Post Office's management team for ignoring evidence that the system was not fit for purpose and also for failing to enforce a robust data-auditing regime.

"The ensuing scandal highlights the danger of accepting data at face value and not having a thorough understanding of organisational systems," communications agency Allegory stated in its recent report, *Corporate Digital Responsibility: what you need to know right now*.

The Post Office episode sits right at the top of the report's litany of "high-profile failures related to poor management of data and the digital technologies deployed by organisations". Other cases include TikTok, which is being sued for selling children's personal data, and Facebook, which is being investigated for a possible breach of EU privacy law after the data of 533 million users was shared.

Such incidents have helped to make corporate digital responsibility (CDR) an important issue for companies and consumers alike. Indeed, the Allegory report cites statistics from Edelman indicating that the public are more concerned about risks to their cybersecurity than the prospect of getting infected with Covid-19.

As a burgeoning area of corporate practice, CDR has yet to obtain an official definition or guidelines. But a recent paper in the *Journal of Business Research* described it as a set of values covering technology and data capture; operations and decision-making; inspections and impact assessments; and refinements of technology and data.

Gazi Arif, visiting lecturer at the University of Law Business School, breaks the concept of CDR down into "digital ethics" concerning how data and technology should be used in an accountable manner and the decision-making processes associated with this.

> **Digital ethics deals with the complex nature of digital technologies and the many ethical issues that arise from them. They change the context and content of our interactions**

"Digital ethics deals with the complex nature of digital technologies and the many ethical issues that arise from them. They change the context and content of our interactions. Determining what to do and observing the likely results of our actions and who will be affected by them will have moral dimensions," he explains.

Given that there is an intrinsic link between digital transformations and socioeconomic developments, digital ethics strategies in CDR help organisations to handle the consequences of digital business processes, Arif adds. He cites the example of digital platforms unintentionally processing private information without proper consent as an area that should be governed by CDR.

"Recommendations generated by algorithms can optimise a process, but at the same time they classify and evaluate their users with far-reaching consequences, such as deciding whether or not to grant credit or insurance cover," Arif says. "The lack of transparency in such technologies leads to great uncertainty as long as we're lacking accepted ethical rules to build trust in the digital economy."

Since no standard rules on digital ethics have yet been agreed, every organisation needs to develop its own CDR guidelines based on its culture and values, he concludes.

It's an undoubtedly complex area, yet it represents an opportunity for companies to show leadership and make their strong CDR approach a feature that distinguishes them from the competition. So says Tim El-Sheik, co-founder and CEO of Nebuli, a provider of "robotic co-worker" technology.

He adds: "Enterprises can adopt their own CDR guidelines, which can be more relevant to their customers' needs and the company's technological framework. With a data strategy built on the principles of digital ethics, companies can show leadership in their markets by making their customers' ethical concerns a top service priority."

El-Sheik gives the example of Apple deciding to input user privacy protection as a core feature of its upcoming iOS update. It affects competitors' ability to access user data while scoring positive points with younger customers, he notes.

"Gen-Zers are redefining the meaning of brand loyalty and customer expectations by putting their focus on how ethical and sustainable a brand is. They want to see evidence of a company's efforts to deliver CDR and similar commitments that hold it accountable," El-Sheik says. "The typical Silicon Valley message of social progress doesn't fit with the fact that many of its companies are completely disregarding the importance of their users' data privacy. CDR now plays a primary role in maintaining a positive brand reputation."

Rachael Goodman has formed similar opinions in her role as chief digital officer at online babycare brand Mum & You. She believes that a solid CDR strategy that's executed well will shape the reputation of the business and improve the quality of both its products and its stakeholder relationships.

"In 2021, a simple nod to legal data compliance will not be enough to convince customers and other stakeholders of great CDR performance," she stresses.

This is about more than ensuring legal compliance and meeting GDPR standards when handling data, Goodman argues. It's also about how a firm commits to its digital transformation and enables CDR in everything it does.

"As a small firm that started up in 2017, Mum & You recognised the importance of CDR immediately. Unlike bigger organisations, which have had to review everything they do, we've had the opportunity to make this part of our DNA from the beginning," she says.

Growing quickly as a startup can sometimes come at the expense of good CDR practice, Goodman notes. From the start, "we've made a concerted effort to define how our digital products will affect people's lives, society and the environment in the longer term. Our customers and employees must have absolute trust in the way that we treat, hold and use data to innovate," she says.

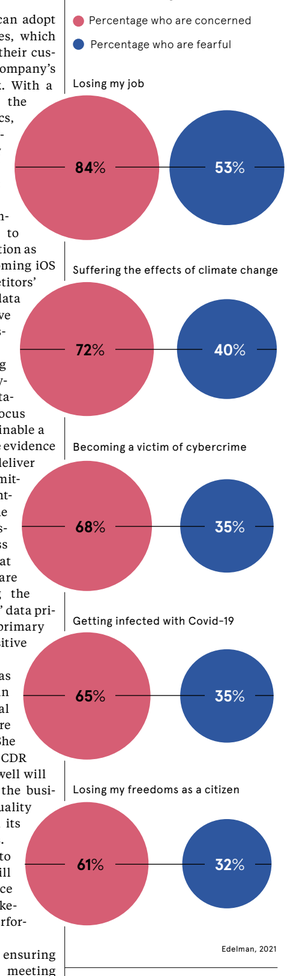
As the business grows, Goodman envisions a need to invest in more CDR expertise and resources. But she is optimistic that "a sensible blueprint" has been established.

Such a blueprint needs to take a "people-first" approach, El-Sheik advises. "This puts human needs and aspirations at the centre, as opposed to the more commonly used technology-led approach."

If only the Post Office had thought this way, rather than blindly putting its faith in technology. It could have avoided harming hundreds of innocent people who now must rebuild their lives – highlighting where CDR and digital ethics have real-world effects.

PUBLIC FEARS ABOUT THE DIGITAL WORLD ARE GROWING

Percentage of people worldwide who say that they are concerned or fearful about the following risks



Edelman, 2021

Sheryl Haislet, chief information officer at digital infrastructure provider Vertiv, cites the example of data centres' adoption of renewable energy, as well as uninterruptible power supply technologies and battery systems.

"These have a key role in the shifting energy landscape, through implementing grid-balancing services and the ability to store surplus renewable energy that can be used by the grid when overworked," she says. "There are also innovations in server technology that can help to ease the tension between data collection and sustainability, with examples including new compression techniques that store rich data with less energy, and ways of writing software programs that lead to a reduction in energy consumption."

But are these just remedies for symptoms rather than the cure? Companies need to focus on getting out of a 'big data' mindset and concentrate more on generating lower volumes of higher-quality data with greater relevance to their business, says Tim El-Sheik of Nebuli.

"We help companies to refocus their attention on a data strategy built on a core aspect of data quality: data ethics," he says. "Conversations about tech and digital transformation strategy aren't started until we discuss how data strategies can be built on clear CDR foundations."

CDR and data-driven carbon emissions

The carbon footprint of the world's digital devices, the internet and the infrastructure that supports both accounts for about 4% of global greenhouse gas emissions. The total is tipped to double by 2025, according to ClimateCare. Data-storage centres make up about a third of that figure – a proportion that shows no sign of diminishing, thanks to the growth of online content creation and consumption.

Against this backdrop, the growing adoption of corporate digital responsibility (CDR) is driving demand for more sustainable solutions.

Commercial feature

Standards, skills and sharing: building a 'smarter state' is easier than we might imagine

Better and quicker decisions enabled by data analysis, and supported by the right digital technologies, standards and skills, will catalyse a smarter state – and it's within our grasp

Imagine a loved one has just suffered a severe accident. You call an ambulance, knowing instinctively it is a matter of life or death and that every second counts. Thankfully, connected data enables the ambulance to arrive as quickly as possible using GPS-linked to roadworks databases and thereby avoiding traffic hot spots. While en-route, paramedics are pulling up cross-referenced, live, life-saving medical information on the casualty, allowing them to make rapid, well informed decisions and ensuring they make every crucial second count.

Imagine another scene: a police officer spots a person behaving oddly on the street. Now, a casual observation might suggest that the person is intoxicated. The police officer however checks her smartphone app which is connected to the local authority's social care system and immediately sees the person has some form of neurological condition. Armed with this knowledge, the officer approaches the confused person and can deal with the situation calmly, sensitively, and without aggravating the situation.

These hypothetical scenarios illustrate how, in an ideal world, public services of the near future will run and show how citizens could benefit from open and interconnected data. Encouragingly, we are not at all far from creating this 'smarter state'.

The government's National Data Strategy, launched last September, is the catalyst for the journey towards data-driven, digitally enabled public services of the future. The challenge, as the Strategy acknowledges, is that we are not, as a country, making the best use of data.

Reinforcing the foundations: standards, skills and sharing

Data is the foundation upon which public services must be built to deliver the best outcomes for citizens and communities. Data is a vital resource and one that we have in abundance. Untapped data is, at best, a wasted resource. At worst, it is unexploited potential to deliver real change for those who require it the most. It's important to stress that utilising data to its full potential is eminently achievable.

Encouragingly, there is an ever-growing list of case studies showing where robust, connected data is improving public services. In Greater Manchester, Civica has been working to develop a next-generation digital platform to support the transformation of public services and empower citizens to take control over their health, wellbeing and support.

The key to unleashing the transformative power of data lies in what we at Civica call the 'three Ss': Standards, Skills and Sharing. First, data standards provide confidence to those seeking to use quality datasets. By defining and applying watertight data standards, authorities can focus on understanding and interpreting data without constantly checking what it means or where it came from, saving time, effort and money.

Next comes skills. The Covid-19 pandemic proved the pivotal role that data plays in delivering public outcomes. The scale and speed of the UK's vaccination programme was made possible by high-quality data, but crucially, by trained experts with the skills and knowhow to manage and interpret that data. There exists a significant skills gap when it comes to data. To narrow this gap, we need to change data's 'image' – from one of spreadsheets and graphs to something that can improve, if not save, lives.

The last barrier to overcome is the sharing of data. Public bodies, from government departments, to local councils, have a vast amount of data that combined, could provide a unique in-the-round view of the needs of each citizen. By sharing their data transparently and securely, public service providers can better understand the needs of each citizen they serve and offer solutions that are tailored to individual circumstances.

Data-driven technologies have transformed how we live our lives. From online shopping to remote learning, to track and trace, our experiences and expectations as citizens would be completely alien to any previous generation. We are on the cusp of a fundamental transformation between citizen and state. The catalyst is data. With the right data standards, skills and sharing, this transformation will happen much sooner than we might imagine.

> **The key to unleashing the transformative power of data lies in... standards, skills and sharing**

For more information please visit civica.com

CIVICA ideas into action


Marko Geber via Getty Images

USER-CENTERED DESIGN

Digital transformation through user-centred design

Digital transformation is challenging, but involving users in the design process from the start helps to avert expensive mistakes

Emma Woollacott

Digital transformation projects are notoriously difficult to pull off, often with serious consequences. Could user-centred design (UCD) help?

According to the Boston Consulting Group (BCG), 70% of digital transformations fall short of their objectives. The reasons for failure are many, from a poor initial strategy to a failure to monitor results. But one widespread problem is an inability to get users fully on board with the process, with the BCG citing "the people dimension" as key to the success of a digital transformation.

For employees to buy into new working processes, these need to be easy, intuitive and aligned with users' needs. But from stunning websites that are impossible to read to confusing navigation tools, beautiful design isn't always good design. UCD – also known as user-driven development or human-centred design – aims to put that right.

As the name implies, UCD puts users at the heart of the product development cycle, involving them at every stage in an iterative process.

Its guiding principle is that technology should be designed to suit the user, rather than forcing the user to adapt to the product. Systems should be consistent, the language clear and navigation as simple as possible. Involving users right from the beginning can help to achieve these goals.

"It's fundamentally a way of doing strategy from the outside in," says Kalev Peekna, MD and chief strategist at digital agency One North. "The core difference between UCD and other approaches to digital transformation or design strategy is that it starts with the people who participate in an experience and builds a new strategy based on them. The whole idea is to deliver what users want, when it's needed and in the exact manner they prefer to engage with it. Benefits include increased user fulfilment, customer satisfaction, engagement, usability, retention, loyalty and revenue."

The method has been used widely, although it's less commonly applied to internal projects where the main users may be employees.

"Many people recognise that user adoption suffers because the end user either wasn't part of the decision-making process or was an afterthought. But the same thing can happen when employees aren't approached with the same consideration as users in their own right," Peekna says. "Including internal employees and stakeholders as users in a human-centred design effort is the foundation for building 'buy-in' from the start. This will be more organic if members of your organisation can see themselves in the future experience."

According to Dell Technologies, 80% of organisations globally have fast-tracked digital transformation programmes this year. Delivering digital experiences to employees is one of their highest priorities.

The pandemic has increased time pressures, so it could be tempting to dive straight into the technology and leave addressing user issues until later in the design process. But this can be an expensive move.

"The idea of prototyping and structured user testing is a core aspect of human-centred design. It should be done at multiple points along the way, from early concepts through to designs and even the first versions of a working prototype," Peeka says. "But, when teams are under pressure to deliver, they often skip or delay this step until after a significant investment has already been made. And that, of course, is when the sunk-cost fallacy can really take hold."

The National Health Service has been a keen adopter of UCD for some years now. Understanding users' needs is the primary goal for the NHS digital service standard. One project in progress is the transformation of children and young people's mental health services in Gloucestershire. The user-centred design and research process has been led by Mace & Menter, while Made Tech has done the implementation and platform integration.

The project first involved discussions with local community and school groups, then conducting user research cycles and testing prototypes to establish needs. For example, the project discovered a reliance on practitioners and trusted adults to signpost and access the various offers of mental health support, says Tim Clark, head of digital transformation at the NHS Gloucestershire Clinical Commissioning Group. This served to limit access to support, with children, young people and parents or carers of younger children feeling at times that there was no alternative route for them.

"Along with Mace & Menter and Made Tech, we designed, tested and then constructed a comprehensive support-finder that signposts relevant mental health services for users, based on a conversational series of questions," he says.

> **Investments in user-centred design practices reduce the risk of building the wrong thing in the first place**

The results can then be accessed by using an online step-by-step form, text messages or an online filterable list. They link out to the associated service or, wherever appropriate, to onward self-referral routes. The website also includes local information about the types of mental health conditions and support available in the county.

The system will now be rolled out in a private beta to a limited number of schools for more feedback, before the final launch.

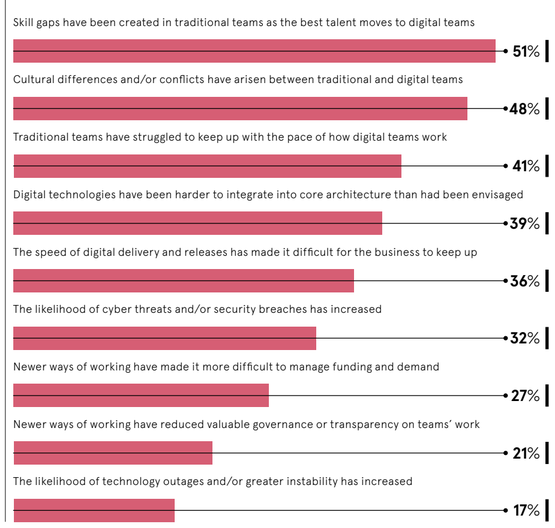
Clark believes that UCD should be a fundamental element of any digital transformation.

"We wouldn't release a piece of technology without testing it first to verify that it is functional and secure, as it's a big risk," he says. "But it's an equally big risk to spend time, money and energy on building something that isn't needed or that people wouldn't want to use. Investments in user-centred design practices reduce the risk of building the wrong thing in the first place." ●

COULD A UCD APPROACH HELP TO TACKLE TRANSFORMATION CHALLENGES?

Percentage of global senior executives who say the following are challenges encountered as a result of digital transformation

McKinsey, 2020



OPINION

'We have the chance to build an economy based on digitally enabled, high-growth SMEs'

During the pandemic, I moved from Canada to the UK. What immediately impressed me was the creativity and agility of this country's brilliant small and medium-sized businesses (SMBs), despite the unprecedented challenges of the Covid crisis. It's no exaggeration to say that they are on the precipice of great change.

The past 18 months have brought a seismic shift, digitising even the smallest of businesses. My local community has thrived thanks to its hub of small and micro-businesses that have turned to the technology. This is the case throughout the UK, where SMBs are using digital tech to solve problems and create efficiencies. More than half (52%) of SMBs in this country have used new technologies to stay connected with their customers, sell more and improve their operations.

Why does this matter? All economic recoveries are built on the back of SMB growth and job creation. Technology is a huge enabler for this. Business model disruption, the rise of flexible working and changing employee demands have made it more important than ever to help SMBs use the latest tools. Tech leaders and business owners all have a role to play here.

Sage has supported the Digital Leaders programme for several years and now it sits proudly on the board. This is focused on using technology to promote economic growth while increasing social wellbeing. Ultimately, it's about harnessing the transformative power of technology. It is just what this country needs right now to help boost the economy.

I have seen at first hand that, by making the most of technology, SMBs can work more productively and serve customers better. Tech adoption offers a great long-term prize: a high-growth, dynamic economy built on tech-enabled SMBs with innovative business models.

Business owners who operate with a digital-first mindset are well placed to reap far greater benefits than simply the task in hand. The use of even basic technology is proven to make businesses more agile, resilient and profitable. They know this themselves, with 80% of SMBs thinking digital adoption is critical for an enterprise-led recovery and job creation. But only 33% have the 'bandwidth' to invest in technology across key processes. So how can we get more businesses making the necessary investments?

The key here is to refocus business operations and reprioritise under a digital lens. How can digital investment, however small, benefit SMBs? Stop thinking about the processes and focus on the outcomes.

From speaking with businesses, I know the things that keep them up at night are operating cash flow, late payments, staff retention, regulatory compliance and, more recently, how to operate remotely. With the right digital investment, they can have access to remote payroll, real-time customer data and cash forecasting; greater employee satisfaction; a reduction in late payments; and a deeper understanding of their business's performance levers. It is the turn of a dial, not the flick of a switch, but starting the digital 'journey' is one of the most powerful steps a business owner can take.

Tech companies and the government need to keep listening to the needs of SMBs and work together to build skills, share information and encourage investment to enhance their digital journey. All of which will bring greater agility, resilience and productivity.

I believe we have the chance to build an economy based on digitally enabled, high-growth SMBs that use the latest tech to attract talent, serve customers and adopt productive business models. This is also at the heart of Digital Leaders' vision.

Lastly, the Digital Leaders 100 2021 awards shortlist is open for voting. Please visit digileaders100.com to show your support for the pioneering organisations and people who are seizing the opportunities offered by digital technology. ●

Paul Struthers
Managing Director of UKI for Sage

Commercial feature

Partnerships are crucial for successful cloud migration

Moving to the cloud can be a big decision, but with the right partners on board, IT teams are not only able to mitigate risks, but ultimately spend more time on innovation and strategy

Migrating to the cloud is a powerful solution with many recognised rewards, but there is still a great deal of inertia because it can be a meteoric change for many businesses. Shifting precious intellectual property, customer databases and operating systems to a computing infrastructure that a corporation doesn't own and is off its premises can be a challenge.

The cloud also alters the way IT teams have functioned for over a decade. It is that profound. Yet shifting to the cloud is no longer a question of 'if', it's 'when,' and 'how much of your business.' A vast number of organisations have embraced the cloud and are quickly reaping its benefits, whether that is agility in deploying new applications, supply chain visibility or better customer relationship management.

"Moving to the cloud is a big decision. Business leaders need to show that they understand the magnitude of the change and the impact it will have, not just on their IT department, but all employees," says Steve Murphy, CEO of Epicor, a global provider of industry-specific enterprise software, which has over 120,000 cloud users and 27,000 customers in 150 countries.

"The cloud is now table stakes. The value is in finding growth opportunities tied to cloud efficiencies. Switching to cloud offers organisations flexibility and resilience that keeps them ahead of the competition. It also clears the way for future growth because businesses can access the latest innovations at speed, as well as scale operations," Murphy adds.

Yet there are still many perceived obstacles to cloud adoption. In a recent survey, security and risk were cited as the biggest concern by 33% of businesses, total cost of ownership was a worry for 27%, and the time to implement and the ability to customise to specific business needs was cited by 26%.

"The concern that cloud is a bigger security risk than on-premise solutions are is still out there in some circles. That's why it's important for folks to know that, due to its scale, cloud technology leverages far greater financial and expert resources than a single organisation could feasibly provide alone. Take Microsoft Azure – more than $1bn is spent on cybersecurity annually, and its data centre security is so strict that it would be cost prohibitive for a single business to try to replicate this on their own premises," says Rich Murr, CIO of Epicor.

He adds, "Weighing up the business value of a cloud investment is also of concern. While there is an upfront cost with any new system, cloud can help save businesses money in the long run. The burden of deploying, running, and upgrading IT systems shifts to the cloud vendor. This allows IT personnel to become strategic shareholders. They can then focus on driving innovation."

For cloud migration to be successful, partnerships are crucial. One size doesn't fit all when it comes to adoption. It is not all or nothing, where everything is migrated off the premises in one go. For example, an application's back-end database can continue to run on the premises, while its front-end web servers run in the cloud.

"Successful migration requires dedicated support to negotiate myriad options. That's why organisations need a partner with deep industry experience who understands their business needs, offers customer-driven products and innovation, and can curate the right solution. Each business has nuance and specialties, and so should their technology," says Murphy.

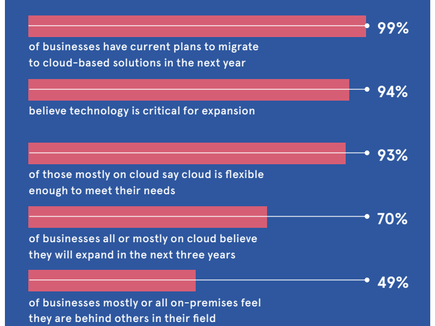
Many industries have specific challenges associated with their particular sector. Each industry uses the cloud to maximise its potential. At the same time, there can be choice paralysis. There are too many options when it comes to configuring business operations in the cloud, what to migrate and when. A lot of decisions are tied up in the strategic direction of the company and where it wants to be in the future.

Understanding a business is vital when it comes to cloud migration. That's why Epicor teams tour facilities, visit clients' retail locations, warehouses and offices. By engaging and collaborating with customers, Epicor is able to help them evolve and grow their businesses.

"At Epicor, we take our partnerships with customers seriously well beyond their purchase of a solution," Murphy says. "We stand side-by-side with our customers on the shop floor where many of us, including myself, have also spent time working. We engage, challenge, and collaborate with customers at a deep level to help them reimagine their business and reach their goals."

BUSINESS TRANSFORMATION IS FACILITATING A SHIFT TO CLOUD-BASED SOLUTIONS

Percentage of companies



Epicor, 2021

For more about your cloud migration, visit Epicor.com

EPICOR

SOFTWARE

Kubernetes: what it is and why you should care

An explainer for newcomers to the most powerful force in digital transformation

Charles Orton-Jones

There's a *Dilbert* cartoon strip in which the titular IT worker's pointy-haired manager is blurting out buzzwords. "You can't solve a problem just by saying techy things," Dilbert moans. His boss simply replies: "Kubernetes."

Kubernetes – it's a word that gets used a lot in digital transformation circles. VMWare estimates that 65% of large companies use Kubernetes in production, up from 59% in 2020. It's everywhere. But what is it?

Like blockchain, Kubernetes is not easy for the layperson to grasp. Practitioners often wander into esoteric territory when explaining it, as the humble listener's eyes glaze over. But its principles are straightforward and its role in the digital world is profound. It's therefore worth getting to grips with the concept.

First, the word: the pronunciation is koo-buh-*net*-eez. It's derived from the Greek word for helmsman, which is apt. It's sometimes written as K8s, with the '8' replacing eight letters.

Kubernetes is a software system that was created by Google in 2014 and is now maintained by a not-for-profit industry body called the Cloud Native Computing Foundation. In a nutshell, it manages small units of software known as containers. It automates container management, summoning new containers and deleting redundant ones when required. A common analogy is that Kubernetes is like the conductor in an orchestra.

The container is the key to understanding Kubernetes, as the two work together. A container is a subdivision of an application. Rather than being a monolithic entity, the application comprises a plethora of containers that run independently.

Simon Bennett, chief technical officer of Rackspace Technology in EMEA, does his best to explain containers to the newcomer.

"Containers are the units of software that form part of an application and enable it to run," he says. "Applications are usually made of multiple containers, all performing a specific function provided as a service to each other. For example, at an ATM, there would be one container used for consumers wanting to check their account balance and another for those wanting to withdraw cash."

All containers share an operating system kernel rather than requiring their own, which makes them phenomenally quick to spin up. Because they contain only software pieces and application logic, they can be deleted and recreated at any time, Bennett explains, without risking the loss of data or reducing the application's availability.

Kubernetes and containers offer what's known as self-healing software. If a container malfunctions, Kubernetes will notice, delete that unit and activate another. Human intervention isn't required.

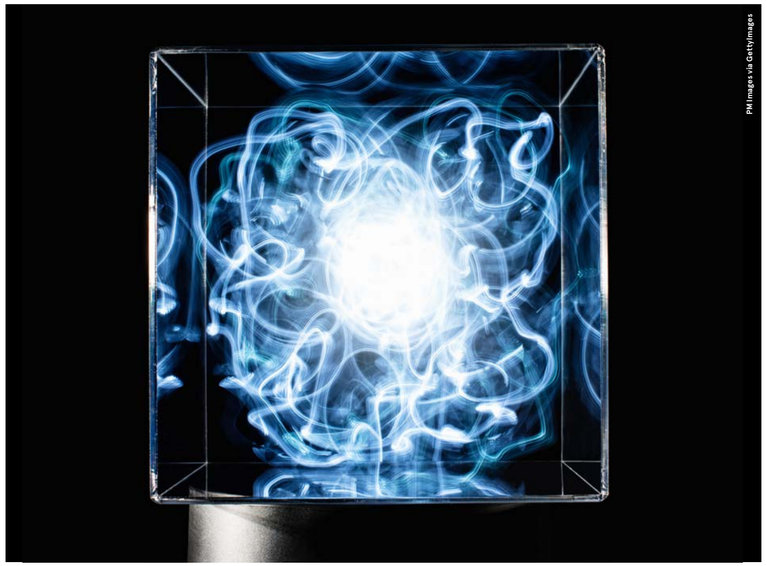
Containers run on any hardware equally well. This is vital – projects are often moved from one environment to another. If a piece of software works on only one system, it creates a nightmare for managers.

Containers were developed as part of the quest to abstract software from hardware. "It all started with virtual machines (VM)," explains Dr Anjali Subburaj, digital commerce chief architect at Mars. A VM is an abstraction of an entire computer, from the operating system all the way down to the memory and storage.

"But VM technology lacked portability and continued to suffer from the 'but it works on *my* machine' problem," she says. "Code developed in a specific computing environment, when transferred to a new location, often results in errors – for example, when a developer shifts code from a desktop computer to a VM or from a Linux operating system to a Windows one."

Containerisation eliminates this problem by bundling the application code together with the configuration files, libraries and dependencies it needs to run, Subburaj says.

"This single unit of software or 'container' is abstracted away from the host operating system," she adds. This means that "it stands alone and becomes portable – able to run across any platform or cloud, free of problems. Put simply, containerisation enables applications to be written once and run anywhere."



PM Images via Gettyimages

> **Put simply, containerisation enables applications to be written once and run anywhere**

They enable users to "scale up and down according to demand", adds Saunders, who also runs the London DevOps Meetup group, which has more than 7,000 members. He points to Black Friday, when internet traffic soars. An online brand may normally run on a few servers, then suddenly need a few hundred to cope with the increased load. Kubernetes spins up containers to handle this and then kills them when demand subsides. In a cloud environment, where you pay only for what you use, this is tremendously cost-effective.

Containers are commonly used with microservices. Whereas applications were once designed as a single large unit, it helps to break the application down into autonomous chunks, or microservices. These can sit on the cloud independently and communicate with each other easily, mimicking the monolith.

This approach enables software teams to work on smaller chunks more easily, making changes at their own pace. It particularly suits the devops approach to development, where changes can be made as often as dozens of times a day.

Overall, Kubernetes and containers are cheap and easy to scale up and down as needed. Applications can run on a variety of hardware, while errors are healed automatically.

Should all applications be rebuilt with Kubernetes and containers? Opinions vary. The consensus is that Kubernetes is the default. It's best to re-engineer on cloud-native principles to derive the biggest benefit.

"As Kubernetes and containers are abstraction layers made to aid the deployment of applications, all applications are fit to run on this technology," says Emmanuelle Demompion, Kubernetes product manager at Scaleway, an infrastructure-as-a-service provider. "But, when you're dealing with an application with only one big component, the investment and risk involved in moving towards a containerised architecture can be very high. Changing architecture such as critical legacy software can even go hand in hand with service availability issues and the exposure of bugs."

Nonetheless, she adds that the transition can be better managed by moving one chunk at a time.

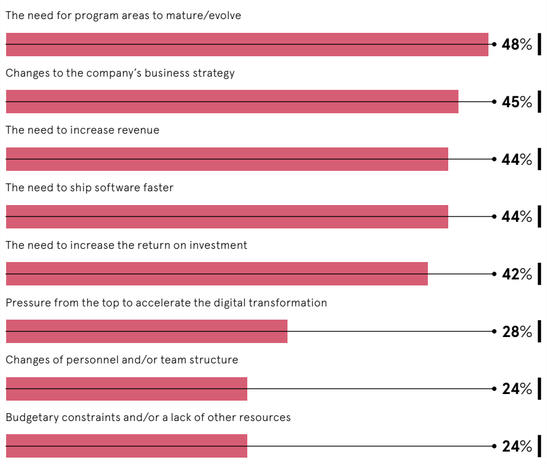
"Kubernetes is only on the rise," Demompion says. "Training your developers, architects, devops specialists and the rest of your tech team on containerisation and Kubernetes will never be a waste of time, since they are very likely to work on these in the near future."

Bluntly, it's a technology that you need to know about.

> So where does this approach really come into its own? Matt Saunders, head of software development and operations (devops) at app producer Adaptavist, notes that "containers and Kubernetes are great for short-running applications, especially ones where the load usage can fluctuate".

WHY USE KUBERNETES? Portworx, 2021

Percentage of worldwide IT professionals who said the following are among the top three reasons why their organisation is using Kubernetes



Commercial feature

'Secret sauce' of successful data-led transformation

Data holds the key to unlocking integrated public sector services, but it requires more than flicking the switch on new technology to make a difference

The phrase "data saves lives" is the rallying call of the NHS and organisations worldwide facing the greatest public health emergency for generations. The pandemic has cost many lives and wrecked livelihoods. Covid-19 is nothing less than a global catastrophe.

Yet if anything good has come from the continuing ravages of Covid, it is recognition of the value of public sector data.

"Beyond Covid, through integrated care systems, local government and policing, data can be used more efficiently and effectively in a host of applications," says Richard Walker, partner for data and insights at Agilisys, which works with the public sector to achieve data-led transformation of services.

Data helps answer difficult questions, he says. How do we deliver better care for an ageing population with changing needs? How do we predict and prevent threats to public safety? How do we move around the country more efficiently and effectively address the challenges of our net-zero objectives?

Yet to be successful, data must be seen as more than a tool to ask interesting research questions resulting in little beyond a knowing nod before returning to business as usual. If we are to impact the outcomes of individuals, we must ensure the insights that data creates are tied to a decision or action that changes them.

Walker, along with Agilisys data strategy and insight consultant Ben Scully, has helped deliver more than 100 successful data-led projects across the public sector, including development of a data strategy for the BLMK Partnership Integrated Care System for NHS teams in Bedfordshire, Luton and Milton Keynes.

Scully says: "Evaluation is at the heart of so much the integrated care system needs to have in place to achieve its objectives. First and foremost, evaluation helps us understand what actions are working and which interventions we need to change. Evaluation is necessary to prove the benefits to residents and to society of why we're doing all this: investing in data and technological transformation and new ways of working."

Identifying the desired outcome and then collecting the correct data is the best way to address a problem. He says: "Let's start with the 'why'; the rest is the 'how' and the 'what'. Let's design a way of embedding insight into action."

Walker adds: "Unless we actively use the insights from data, it's all but impossible to come up with effective and sustainable responses to complex challenges."

The technology sector has made great strides, spurred on by the growing adoption of cloud platforms, and the barriers to adopting tech have fallen. However, technology alone is not the solution.

"How you get more out of your data and use it to make better decisions for better outcomes does not start with technology," says Walker. "As we have said, before you start investing in technology, first understand what you want to get out of it.

"Then you need to put in place the additional foundations of leadership, culture and skills; technology will fail unless you apply the fundamentals – our secret sauce."

In particular, the role of leadership – someone willing to provide the mandate for system change – is crucially important in making this stick. "Leaders need to be visibly involved," says Walker. "The ability to talk passionately and compellingly, and then stand behind the project, is absolutely fundamental, along with having the necessary skills."

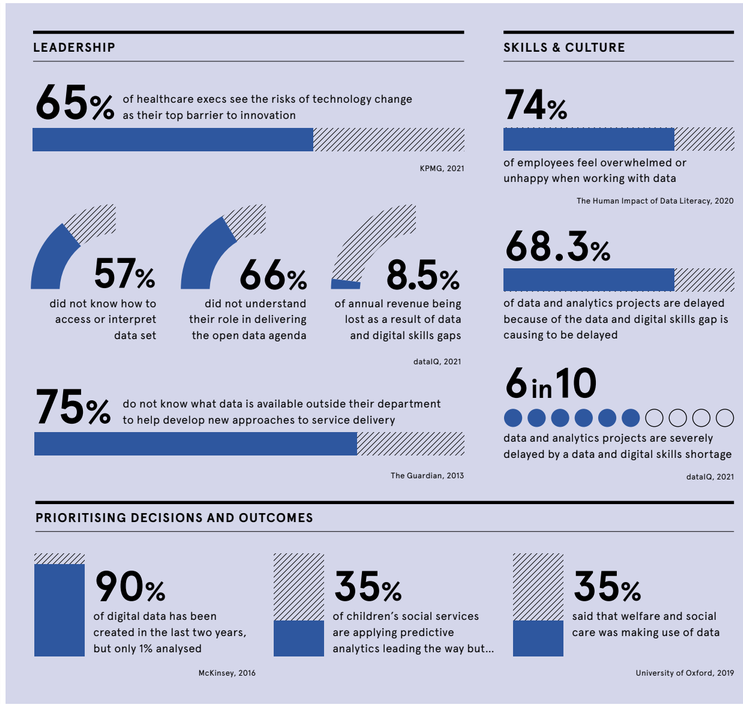
Similarly, it is about feeling comfortable committing to data transformation knowing returns will follow. "Instead, all too often, organisations struggle to prioritise the case for investment in collecting, managing and exploiting data, and the potential of their data remains untapped," he says.

"Yet we recognise budgets aren't limitless and the multi-million-pound cost of fixing all your data is rightly intimidating. This is why you need to be able to prioritise the data most valuable to you: the data that enables you to make the key decisions and the right interventions, with an organisation set up to turn those priorities into real change for citizens and staff on the frontline.

"Human resources, finance, estates and IT have been around for decades. So has data. Yet we are only just starting to see the emergence of dedicated data capabilities. Leaders must be in a position to drive this change in approach and perception to be able to benefit from the enticing promises of predictive analytics, artificial intelligence and machine learning we are now regularly hearing about."

However, Walker sounds a note of warning for the public sector, which may struggle to pay the high salaries commanded by data engineers and other specialists. "It is a supplier's market when it comes to the digital skills gap, but we cannot move beyond shiny pilots and early-stage transformation without these skills," he says.

> **You need to put in place the additional foundations of leadership, culture and skills; technology will fail unless you apply the fundamentals – our secret sauce**



"We are regularly working with clients to figure out the sustainable approach to skills that suits them, be it a transitioned managed service or operating model review to shared resources through multi-agency strategies with other public sector partners, the solutions are available and the prize too big to ignore."

Agilisys has worked for more than 20 years with healthcare, local government and other public sector organisations to unlock the potential of technology and transform the services that improve lives.

The Agilisys data and insight practice guides organisations through that journey, from plotting a path to data maturity to deploying and managing an end-to-end technology-enabled data platform.

"We can coach you through the common challenges facing data such as leadership, talent, governance, culture and capability to deliver a fundamental shift in the way you use insight to drive action," says Scully.

Walker concludes: "It is vital that in prepping yourself to cross the final hurdle and get your data programme funded, you don't overlook the power in the human outcomes you plan to drive: better care, safer communities and a cleaner environment.

"Get that right and you should have a winning formula."

For more information please visit agilisys.co.uk

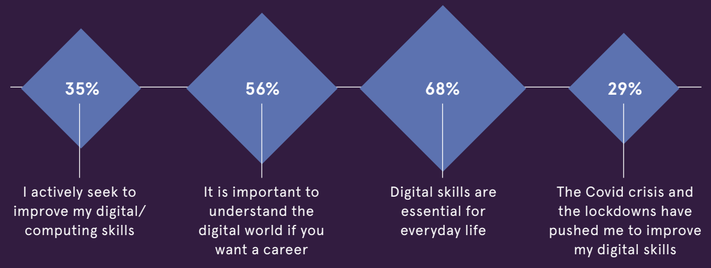
Agilisys

PIECING TOGETHER THE PUZZLE

The digital transformation of an organisation is achieved through the orchestrated development of various parts of the business and the adaptation of skills towards an increasingly digitised operation. To realise all of the promised benefits, businesses must be ready to put in place the many pieces that comprise the jigsaw of a successful long-term digital transformation strategy

01 Digital literacy

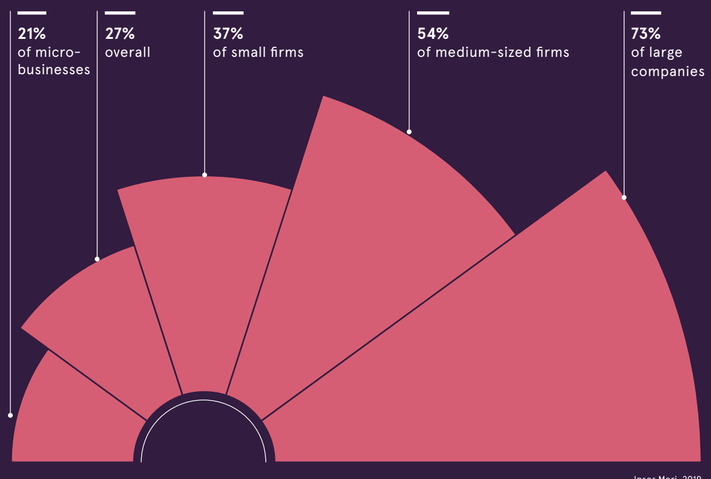
PERCENTAGE OF UK RESPONDENTS WHO AGREED WITH THE FOLLOWING STATEMENTS



Statista, 2020

02 Data and digital security

PERCENTAGE OF UK BUSINESSES CONDUCTING CYBERSECURITY TRAINING



Ipsos Mori, 2019

03 Digital marketing

TOP MARKETING PRIORITIES IN THE UK

Share of private-sector marketing professionals who identified the following actions as a high priority

79%
Building better customer-facing digital interfaces

52%
Improving data integration to allow for customer tracking

43%
Investing in automation technologies to improve virtual communications with customers

77%
of marketers identified an increase in "customer value placed on digital experiences" in 2020

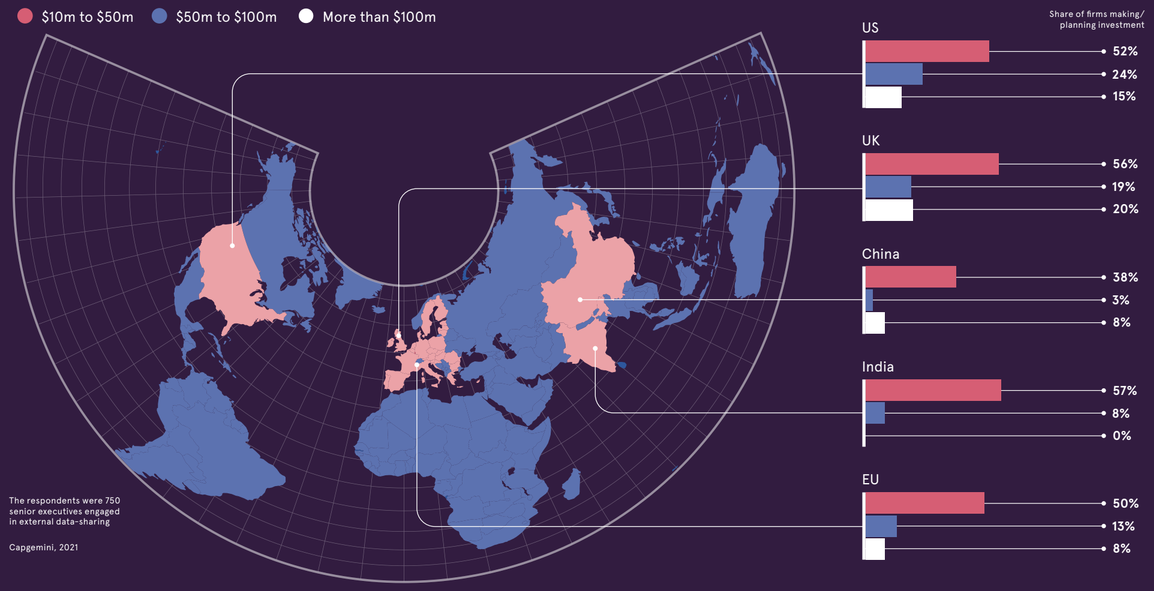
1/3
of marketing leaders stated that digital marketing had contributed very highly to the performance of their business

26%
the estimated average proportion of marketing budgets that will be spent on social media in five years' time

The CMO Survey, 2021

04 Data analysis

TOTAL ANNUAL INVESTMENTS MADE AND/OR PLANNED IN "DATA ECOSYSTEM INITIATIVES" IN 2021

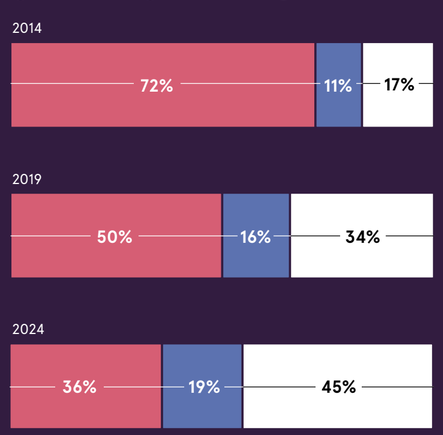


The respondents were 750 senior executives engaged in external data-sharing

Capgemini, 2021

05 Information storage and HR management

ACTUAL AND PROJECTED ENTERPRISE SPENDING ON IT INFRASTRUCTURE – A BREAKDOWN

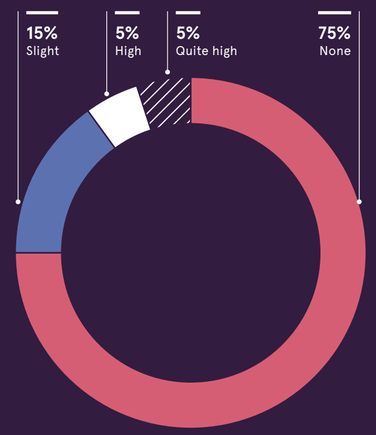


IDC, Statista, 2021

06 Machine learning and automation

FEARS OF JOB AUTOMATION

Responses to the question: "What do you think is the risk of a machine taking your job in the next 10 years?"



Find Out Now, 2019

UK JOBS AT HIGH RISK OF AUTOMATION

Estimated share of jobs with high potential for automation, by wave, from 2020 to 2030

30%
Autonomy wave (2030)

20%
Augmentation wave (2025)

2%
Algorithm wave (2020)

PwC, 2018

CYBERSECURITY

How to build cybersecurity into your digital transformation project

The lockdown-driven increase in remote working has given rise to cybersecurity blind spots. Should you reassess your digital transformation plan?

Davey Winder

Digital transformation projects assumed a whole new level of urgency in March 2020. Covid lockdowns forced businesses to establish remote working systems, often without much planning, which meant that some things fell through the cracks. In a worrying number of cases, cybersecurity was one of those things.

While cybersecurity was never excluded from the digital transformation process, of course, the accelerated implementation of remote working did mean that blind spots were created. With organisations increasingly using hybrid working models, such weaknesses must be addressed by the C-suite to ensure that cybersecurity is baked in.

In their haste, many firms made errors that Greg Day, CSO for Palo Alto Networks in EMEA, calls "time-based decisions that can be rectified with further time and reflection".

Although this might sound like a matter of semantics, it is an important point: organisations have had to compress several digital transformation projects that might normally have taken years into a matter of months. The sudden demand for remote working dictated that 'good enough' was sufficient for projects to get the green light.

Three common problems sum up the insecurity scenario: fragmented cloud adoption, virtual private network (VPN) bottlenecks and what Day calls the cyber-time paradox.

"The notion of moving to the cloud means the chance to rewrite the software to take advantage of doing things in new ways," he says. "Yet for many it was more of a cut-and-paste job, saving the rewrite for later when more time is available."

This led companies to use whatever cybersecurity was provided with their cloud offering or buy off the shelf without due diligence.

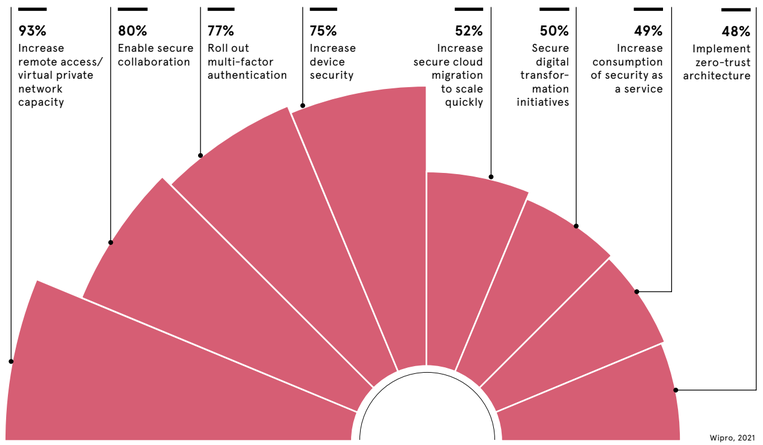
"This has created fragmented and non-scalable solutions," Day says. "Many firms have realised in hindsight that they have many different solutions. Most are using multiple cloud providers, with each having its own solution for ID verification."

Then there's the VPN situation: many firms had enough capacity to serve maybe a quarter of their workforce, but in the rush to transform they simply bought more secure 'tunnels' to connect back to base.

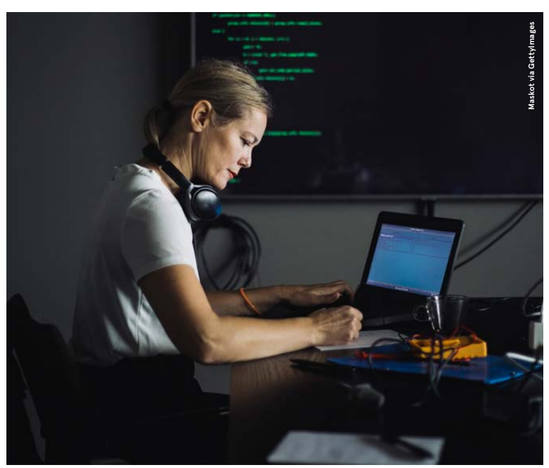
"Now that huge volumes of traffic are trying to get through, your business network has quickly become a bottleneck," says Day, who adds that such a "choke point" for a security goal simply isn't fit for purpose.

CYBERSECURITY PRIORITIES DURING THE COVID CRISIS

Percentage of global security leaders who say the following tasks were their top priorities in 2020



Wipro, 2021



Maskot via Gettyimages

For example, security requirements for video sessions are quite different from those for accessing confidential information.

That leads to the final element of this erroneous trio: thinking that the same old security set-up will cope with such a dramatic increase in workload – the cyber-time paradox. Having more digitised business processes means that there is more for the organisation to secure, producing more data to manage and so widening the attack surface. Simultaneously, what's considered an acceptable process downtime has been reduced to hours and often minutes. This can't be solved by throwing more people at the problem; it demands that firms assess what processes can be automated or outsourced, Day concludes.

How can you properly bake cybersecurity into your project? The basic maths of ensuring a secure digital transformation outcome remains straightforward enough: process + people + implementation = success.

Stephen Crow, head of security and compliance at independent technology company UKFast, likens the process to building a shed.

"You don't put the roof on first," he says. "You ensure that you have the right tools – and someone using them who is competent at building and is working to a plan."

You could still take the roof off to make changes after construction is complete, but it's obviously not ideal and would inevitably cost a lot more.

> **Later down the line you might end up in a situation where you're relying on old systems with exploitable vulnerabilities that have no patch**

If you haven't considered upgrade paths and end-of-life planning, you must do so sooner rather than later, he adds. "This is critical, because later down the line you might end up in a situation where you're relying on old systems with exploitable vulnerabilities that have no patch."

Similarly, if your initial roll-out has mistakenly equated a security information and event management (SIEM) system plus a firewall with 'sufficient cybersecurity', this decision will need revisiting.

"A SIEM and a firewall can protect you from only a tiny percentage of attack vectors," Crow warns. "Never put all your trust and effort into one set of tools alone."

Equally, your digital transformation security success can be hamstrung by introducing too many overly strict or fiddly procedures. "This is a surefire way to generate shadow IT usage that circumvents security," he says.

Mivy James, digital transformation director at BAE Systems Applied Intelligence, advises that equipping users with the knowledge to make the right decisions must go hand in hand with a digitally transformed culture.

"Infosecurity must not be seen as the thing that puts the brakes on digital change," she stresses. "The danger here is that cybersecurity has traditionally been seen as the department of 'no' and something that can slow down progress."

Digital literacy is rightly considered a vital attribute for business leaders. James views cybersecurity knowledge as a large part of that. For example, in the uptake of cloud-based services, cybersecurity can be either overlooked or treated as such a cause for concern "that cloud migration becomes impossible".

To ensure cyber literacy, firms need to normalise cross-functional teams where business leaders and security specialists make decisions together, according to James.

Business leaders need to listen to their security experts, because this is not a one-off exercise, Crow adds.

"Integrating security too late in the game will create huge complexities for your business," he warns. "Or, worse, missing it out completely leaves gaps that will be hard to fix in key technologies and processes."

How do people feel about the climate crisis?

There is an alarming gap between consumer's perception of the climate crisis and the reality, so what can be done to change this?

Epson has conducted a Climate Reality Barometer to capture the perceptions of climate change from 15,264 consumers across Europe, Asia, North America and South America. The results reveal a potentially damaging gap between climate reality and people's understanding of its catastrophic effects.

When questioned about their views on humanity's ability to avert a climate crisis within their lifetimes, close to half of respondents (46%) state they are "very" or "somewhat" optimistic. This significantly outweighs just 27% who express that they are very or somewhat pessimistic.

The most popular reasons supporting this optimism are growing public awareness of climate change (32%), the ability of science and technology to provide solutions (28%) and the move towards renewable energies (19%). The UK tops the list of European climate deniers, with more than one in 20 (6.1%) Britons not believing in a climate emergency.

As the Intergovernmental Panel on Climate Change (IPCC) reports that some human-driven climate change will take millennia to reverse , and given a litany of global events – including the warmest July ever recorded, wildfires in Europe, North America and Asia, and floods in China, Columbia and Germany – Epson's Climate Reality Barometer's findings suggest a triumph of optimism over evidence and a damaging Climate Reality Deficit.

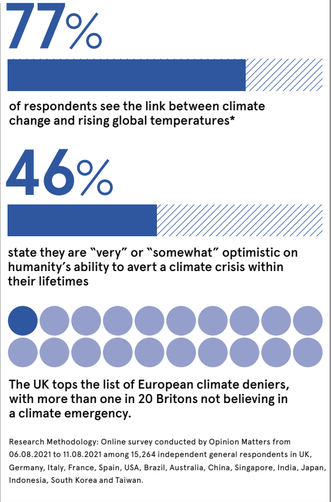
Henning Ohlsson, director of sustainability at Epson Europe, says: "As the climate emergency unfolds before our eyes, it's of real concern that so many people fail to recognise, or even actively deny, its existence. This is a wake-up call for everyone – governments, businesses and individuals – to work together so that COP 26 makes the decisions and inspires the actions needed to mitigate climate change."

The Barometer suggests that optimism may be the result of a failure to recognise climate change and, therefore, its scale.

Around three quarters of respondents see the link between climate change and rising global temperatures (77%), extreme weather (74%) and wildfires (73%). In contrast, awareness fell to just over half for events such as famine (57%), mass human migrations (55%) and insect outbreaks (51%).

Many see responsibility to tackle the emergency belonging to state and industry sectors. Of those surveyed, more than one in four (27%) identify governments, and 18% businesses, as the "most responsible". Close to 18% acknowledge personal responsibility. Encouragingly, the largest single number of respondents identify responsibility as collective (31%).

The UK records the lowest figure for business responsibility (16%) and tops the European list for those who believe in collective responsibility (34%) versus the lowest in Italy (23.6%). The Barometer shows that the top three actions Britons report that they are already doing include improving recycling habits (66.2%), reducing plastic use (62.8%), and walking or cycling more often (53.2%).



Research Methodology: Online survey conducted by Opinion Matters from 06.08.2021 to 11.08.2021 among 15,264 independent general respondents in UK, Germany, Italy, France, Spain, USA, Brazil, Australia, China, Singapore, India, Japan, Indonesia, South Korea and Taiwan.

While people are willing to make lifestyle changes to tackle the crisis, some are slow to act. The Barometer shows that 65% agree (already do or are planning) to reduce business and leisure travel – but only 40% have; 68% agree to move to electric vehicles – but only 16% have; and 58% agree to adopt a plant-based diet – but only 27% have. Even looking at relatively simple choices, such as boycotting unsustainable brands, while 63% agree, only 29% have already changed their shopping habits.

The Climate Reality Barometer suggests that, for many, the climate crisis remains something that happens to someone else. As the survey reveals that only 14% of respondents recognise big businesses as most responsible for tackling the climate emergency, and just 3% small companies (fewer than the 5% of climate change deniers), it also suggests that now is the time for companies of all sizes to play a bigger role.

Yasunori Ogawa, global president of Epson, commented: "The discovery of the Climate Reality Deficit shows that awareness, coupled with action, will be critical to tackling the emergency. Epson's goal is to bring this awareness and the technologies needed – by our company, other businesses and consumers – to make transformational change. Sustainability is central to our business plan and backed by significant resources – because while we know there is a long way to go, we believe we can build a better future."

In Epson's recently launched Turn Down the Heat campaign in partnership with National Geographic, it is found that the Arctic is warming twice as fast as the rest of the Earth. As its permafrost ice melts, powerful methane greenhouse gases are released into the atmosphere, which speeds up global warming in an increasingly destructive cycle.

Professor Katey Walter Anthony is an Arctic researcher and National Geographic Explorer, and her work has helped to reveal that Arctic lakes are emitting five times more methane than previously thought. As she explains, "the Arctic is literally melting before our eyes, and what happens in the Arctic does not stay in the Arctic. It affects the entire planet."

While this paints a grim picture, Walter Anthony emphasises that there are ways that businesses can minimise their impact on the environment. "Heat destroys permafrost, and when we choose to use heat-free technology, we lower our energy consumption which helps to reduce greenhouse gas emissions and slows permafrost thaw."

To make copies of maps and data from her field research, Walter Anthony uses Epson's innovative inkjet printers. Their heat-free technology saves as much as 80% of energy used, in comparison to traditional laser printers. They use less power as they don't require heat to warm up, which means that as well as saving energy consumption, they cost less to run too.

The environmental burden from manufacturing and recycling spare parts is also reduced, as heat-free technology uses fewer consumables and parts that need replacing.

As Walter Anthony says, "Our choices really do matter in work and in life. And when businesses make smart decisions about what technology they use, that will also make a positive difference for our environment."

If you'd like to know more about Walter Anthony's quest to understand climate change and how your business can make a difference by switching to Epson's heat-free technology, visit epson.co.uk/heat-free

EPSON

HR MANAGEMENT

Talent competition – the analogue key to a digital transformation

People, rather than technologies, drive successful change. It hinges on the skills, experience and personal qualities they bring to the mix

Alison Coleman

It has long been said that people are essential to the success of a digital transformation. Given the high failure rate of such projects, it's becoming clear that many companies aren't getting the right people involved.

Research indicates that the overwhelming majority of transformation projects either have failed to finish on time and/or on budget, or have simply missed their planned objectives. It's not hard to see why. Far from being a straightforward upgrade to a company's operating systems, a digital transformation entails a complete overhaul of its working methods.

What kinds of people can make this happen? Professor Christopher Tucci, director of Imperial College Business School's Centre for Digital Transformation, breaks the IT talent required down into people with digital skills and those who are adept in the ways of legacy systems.

"You need people with digital skills, including senior executives with an awareness of technology and a vision of where the digital transformation will take the organisation," he says. "But, when we talk about people being crucial to the success of a digital transformation, I think we are really referring to those with legacy skills."

What does this mean? One of the biggest challenges of digital transformation is convincing everyone in the organisation to engage. Many people are naturally resistant to change unless they can see that it's absolutely necessary. Some might worry that a digital transformation will lead to greater automation, putting their jobs at risk.

Legacy skills are key to bringing these people on board. Employees with such skills can readily identify with more familiar ways of working, helping to support others through the process.

"That's not an easy proposition, which is why it takes so long for companies to implement these things," says Tucci. "A lot of efforts have been unsuccessful because companies have been too focused on recruiting for digital skills."

Others argue that it is culture, rather than talent, that's key to the success of a digital transformation.

"Organisations have thrown a lot of money at the situation by hiring 'the best of the best', yet the dial on becomng more intrinsically digitally or data-driven hasn't shifted."

So says Emma Robertson, CEO at consultancy Engine Transformation, who believes that the organisational culture must empower people to drive progress.

A commitment to change, the authority to take calculated risks and a shared sense of purpose must emanate from the top and permeate the business, she adds. "Without it, a digital transformation will fail, regardless of the calibre of the people you might bring on board."

For some, the failure rate can be traced back to a single problem: the lack of genuine company-wide collaboration. All too often the task of implementing change falls to one isolated team or task force and falls flat as a result.

Dr Gero Decker, co-founder and CEO of software firm Signavio, cites the "Wikipedia effect" to illustrate why a successful digital transformation must engage everyone in the organisation. In the days of printed encyclopaedias, knowledge was curated by a few experts who determined which information was important. With Wikipedia, everyone can contribute, so the amount of knowledge-sharing has grown massively. It's no longer limited, outdated or unilateral.

"The same principle should be applied to a digital transformation. Involving everyone who can add value means that more ideas are generated and their implications can be more easily spotted and understood," he says.

But, even with a culture that supports organisational change and effective collaboration, having the right people with the right skills and attributes in the right roles for any given transformation project is key to a successful result. And, right now, people with good experience in digital transformations can be hard to find.

Pete Hanlon is chief technology officer at outsourced business communications provider Moneypenny. He believes that the best people to lead a digital transformation are those who are comfortable with change, operate well in a hectic environment and can make pragmatic decisions quickly.

"They will have excellent soft skills to help them communicate with senior stakeholders and the wider organisation, combined with a holistic understanding of the business: where it is today and needs to be in the future," Hanlon says. "They are also resilient, which is crucial given that digital transformations can take years and there will be many setbacks on the way."

Experience in supporting and leading change in more than one environment is essential, as is the ability to combine knowledge of all aspects of digital technology – for instance, robotic process automation, chatbots and machine learning – with an understanding of business processes and operations.

The recruitment criteria also depend on the seniority of the role. At board level, the ideal candidate won't necessarily have to be a digital native, but they will need to understand the importance of effective data use and the value of empowering skilled people to make decisions at the coalface of the transformational process.

But James Hallahan, director of Hays Technology in the UK and Ireland, advocates recruiting candidates based chiefly on their attitude, potential and willingness to learn. Focus on the essential skills and experiences needed over those that are merely desirable.

"Striking a balance between technical expertise and soft skills will stand potential staff in good stead to adapt to technological change, both now and in the future," says Hallahan, who adds that high-performing digital transformationalists require exceptional people skills – arguably one of the most important attributes. Much of their role will involve engaging with other people in the organisation, gathering crucial information from them on the progress of the project to inform any potential changes.

"Many businesses are still in the process of migrating from legacy systems to the cloud, managing large-scale change programmes, while others have an increased need for software developers and experts in cybersecurity," Hallahan says. "In short, the opportunities for IT professionals have probably never been better. Many may be tempted to move, meaning that competition for talent is high."

Amid the current skills shortages, employers need a compelling talent acquisition strategy. Clarity about values and culture is essential, along with an attractive package of benefits. Professionals are still motivated by pay, of course, but other elements can be important, such as flexible working arrangements, career development opportunities or a particularly interesting transformation project.

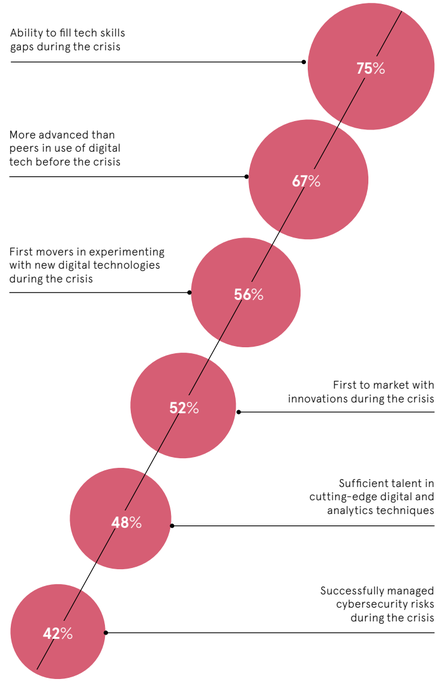
Hiring the right people will have a huge influence on a digital transformation's success. But, as Robertson points out, they must have the potential to deliver exciting change. These include digital leaders, tech architects and visionary data scientists – people who can amplify a company's assets, deploy the full breadth of skills available to them and mobilise teams with effective leadership or specialist expertise.

"Avoid hiring a rock-star CDO," she advises. "Instead, focus on catalytic talent and leadership – and a culture of transformation that operates as an 'integrated hive', rather than a top-down hierarchy."

> **Involving everyone who can add value means more ideas are generated and their implications can be more easily spotted and understood**

SUCCESSFUL ORGANISATIONS HAVE PRIORITISED TECH TALENT DURING THE COVID CRISIS

Percentage of global senior executives who agree that the following statements sum up why their organisation implemented highly effective responses to the pandemic



McKinsey, 2020

OPERATING MODELS

The promise and pitfalls of digital operating models

Digital operating models can provide a host of insights into your firm's performance – but be prepared to hear some home truths

Andy Jones

After the Covid crisis struck the UK, the bosses of one leading charity were, like all executives, wrestling with the challenges of managing a remote workforce. They felt that they were nurturing a positive and productive organisational culture, but, just to confirm their views, they brought in some digital help.

They began using Winningtemp, an anonymous feedback system that encouraged employees to say what they really thought about how their organisation worked. Almost immediately, the charity chiefs had seven instances of "negative or obstructive behaviour" to worry about. They had thought that they were leading a caring and considerate enterprise, so such problems caught them off guard.

When we're asked if everything's OK, we usually say it is, according to Carl Jacobsson, vice-president of customer success at Winningtemp. "But, given the opportunity to discuss things anonymously, people start opening up. AI provides that anonymous, intuitive platform for giving constructive feedback."

Implementing a digital operating model (DOM) such as Winningtemp to your business is like lifting the lid on a beehive. On the plus side, you can suddenly see what all the worker bees are doing and locate blockages in the workflow. But, if the colony doesn't work in unison or the blockages are allowed to remain, the hive will fail anyway.

DOMs are a set of enabling technologies that fuse feedback with AI and analytics to smooth the path for your company. They break down systems into smaller components, revealing how the bigger picture works. Such technology won't suit organisations that simply want to pick a digital product off the shelf and hope for big results.

Helen Ashton is the former CFO of Asos and now the founder and CEO of management consultancy Shape Beyond. She says that a DOM will succeed only if people are empowered to give useful feedback and make positive adjustments.

Asos maximised its digital success by marrying agile technology with proactive employees who all had a clear understanding of data, notes Ashton, who adds that the role of leaders within a DOM is to support and allocate, rather than to dictate.

"At Asos, instead of thinking that the digitalisation 'journey' is done, teams are continually thinking about what's next. How could the sourcing of fabrics be digitalised? How can AI or augmented reality affect consumers' shopping habits or improve delivery speeds? How could bots or avatars aid customer service? Those questions aren't driven down from the board; they come from the teams on the ground that are closest to the customer."

Delivering this kind of change with legacy technology is difficult, slow and costly. Before investing, executives should consider which products truly open the frontiers between customer and company.

Nikki Hesford, managing director of Hesford Media, helps SMEs to expand digitally. She says that, even if a company isn't a digitally facing business, small operational changes can be transformative.

"For instance, a beautician who used to waste 10 minutes filling in forms at the start of each appointment now has these sent beforehand using an online system," she says. "All this information is then stored securely online instead of in a filing cabinet."

One of Hesford's clients is The Honest Midwife, a business run by a midwife called Louise Broadbridge. Before the Covid crisis, appointments were made in person, but the enforced virtual switch has presented a number of opportunities for the business to grow. Now it teaches more than 2,000 expectant parents each week.

But, with so many firms stuck in first gear by endless digital logjams and web chats, a single digital system will not necessarily bring order to the chaos. Digital innovation can smooth processes, but bottlenecks caused by staff and management will not be magically resolved, only exposed, says Pete Hanlon, chief technology officer at Moneypenny.

"If you construct new IT solutions around ineffective processes or organisational structures, you're unlikely to see any benefits from them," he warns. "Implementing a DOM isn't just about the technology. This exercise will succeed only if your organisation's culture and people change at the same time. Alongside the technology, you need to challenge the status quo. Generate a sense of urgency, with clear goals and processes to measure success."

The key to DOM success is the open exposure of data and performance. Often a data warehouse is governed by a specific department, says Ashton. In such cases, there are barriers to extracting data. Leaders should therefore ask themselves some key questions in advance: do we want to make all of our data and processes transparent to each other? And are we prepared to support a new system, allow feedback and remove blockages – a problematic employee, for instance?

> **If you construct new IT solutions around ineffective processes or organisational structures, you're unlikely to see any benefits from them**

Next, you need to choose the right person to lead the charge, Ashton says. Someone lacking in effective leadership skills will struggle to generate the momentum required to deliver a successful programme.

"Commitment to the cause will undoubtedly ebb at some stage," he argues. "Emotional engagement to a greater cause will stand the test of a transformation in a way that the promise of lower costs or more returns for investors never will."

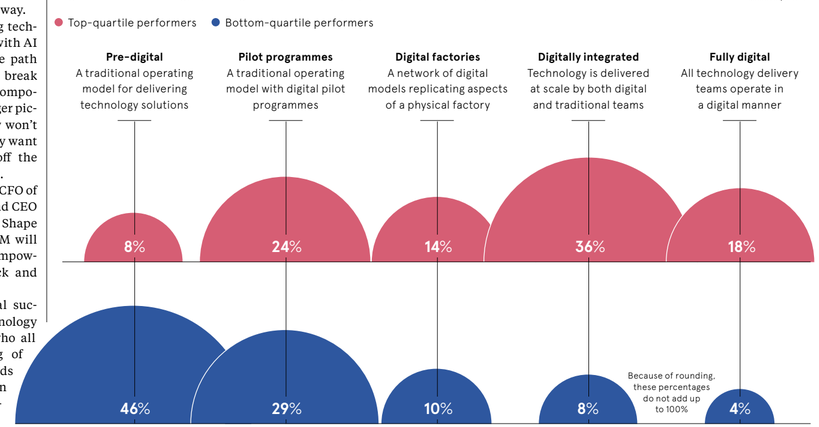
DOMs may not be for everyone, according to Sukhy Cheema, the founder and CEO of digital design agency Branding London. He thinks that operating models place too much importance on efficiency and risk management when we should appreciate that all companies are different and run in their own unique ways. As a result, some DOMs aren't dynamic enough.

Cheema concludes that "the focus should instead be on helping that company find out what it could be, while also moving forward and reducing risk".

DOES AN OPERATING MODEL HELP?

Organisations' technology operating models in 2020, by top- and bottom-quartile performers

McKinsey, 2021



Q&A

Restoring productivity in the hybrid working age

Enterprises are emerging from the pandemic with too many apps that aren't used or, worse, hold back workplace productivity, says **Amanda Grant**, chief product officer at Advanced

Q How has workplace productivity been impacted during the pandemic?

A We saw a couple of different phases. Initially there was the race to get employees the equipment they needed to work from home, and setting them up remotely on the company infrastructure. That was a drag on productivity, exacerbated by a shortage of laptops, but it quickly turned into the phase of embracing collaboration tools like Zoom and Teams which brought productivity back up to some degree. Amid all this, however, not a lot of businesses were realising that true productivity isn't just being able to talk on Teams.

Q How would you define 'true productivity'?

A It's about being able to do the invoicing, the customer calls, or understanding where you are against aged debt. For many businesses some of those kinds of tasks are still stuck on the same back-end systems. To deal with problems quickly, during the pandemic many organisations panic-bought new solutions without the usual considerations around integration and adoption. In our recent Workforce Trends Survey, 69% of employees said the number of business applications they use at work increased during the pandemic. Some organisations then invested in these applications but didn't really have a cohesive plan of how everything was going to work together, with the result being that many employees haven't adopted them. In fact, 17% of those we surveyed said that too many business apps have actually made their productivity worse.

Q Why is it important organisations have the right technology for hybrid working?

A If companies want to succeed in the hybrid working world, they need to develop a clear technology strategy – and not just to restore workplace productivity but also to attract and retain the best talent. The new generation of workers expect the applications they use, wherever they are working from, to match the user experience they are accustomed to in their personal lives. If they aren't offered a strong hybrid working experience with simple, easy-to-use technology, they are likely to take their talent elsewhere.

You've got to have technology that is on-demand, and the user experience has got to be as slick as Netflix but with the depth of functionality that you would expect from any good business software. The most proactive companies are realising this. Only recently, a new customer of our financial platform said a key driver for adopting it was to attract new younger talent into their business. People don't want to work for a business where getting anything done is an unnecessary headache because of poor, outdated, unconnected systems – and organisations must respond to this if they want to increase productivity, and win the war for talent.

> **The user experience has got to be as slick as Netflix but with the depth of functionality that you would expect from any good business software**

> **We're coming up to a really exciting time where hybrid will reshape the world of work**

Q What steps do organisations need to take to get technology choices right?

A They need to take stock of their application estate and think about how they can compose these systems together to drive the maximum productivity moving forward. That will mean some systems need to go and others must be brought in. Organisations should look at where their people are interacting with existing software and applications, and what can be deployed to bring everything together and ultimately drive adoption within the workforce. It's important to align technology choices with the requirements of the workforce. In our recent productivity report, 47% of employees said they had no influence over decisions to adopt new technology in their organisation. You have to ensure the apps you invest in fit with your workforce demands in the first place.

Q How is Advanced supporting companies for the hybrid era?

A We've developed a platform which unifies all business systems in one place, saving time on day-to-day tasks and giving employees the space to focus on bigger priorities. With one single sign-on, the MyWorkplace platform provides access to all the tools needed to maximise productivity. MyWorkplace is the composer of all the key applications that interact together in an enterprise. It lifts the tasks out of the core systems and brings them together. That not only works for our systems, like financial management software and human capital management, but also our partner systems, bringing them all together to generate productivity gains.

As part of our evolving platform strategy, we also now utilise a product insights platform in our software as a service (SaaS) portfolio. Not only does it allow in-app notifications and walk-through guides to improve the user experience, but it enables our development teams to understand product adoption and gather measurable feedback on developments. This is critical, along with our customer success managers, in ensuring employees adopt software in the right way.

Q So, is the key to productivity getting applications interacting?

A Partly, but as well as getting applications talking to each other, employees need a great user experience. Staff that simply want to raise a purchase order shouldn't need a degree in computer science. Give your people the tools they require to be able to do their job really easily and effectively, without having to run large numbers of different systems at once. Research from Meyer, Evans and Rubenstein found multitasking actually reduces productivity by up to 40%, so we should all stop encouraging it. MyWorkplace is the antidote to that. We don't want people spending hours in software trying to do basic tasks and run reports. Instead, they can just go into MyWorkplace, get the tasks done and then focus on the value-added things that matter.

Q Why are technology choices and hybrid working productivity so closely linked?

A We're coming up to a really exciting time where hybrid will reshape the world of work. To succeed, companies must invest in software that makes onerous day-to-day tasks simple, wherever their people are working. With the right technology, employees have more time and creative space to work on the big ideas that make a difference – to their organisation and its customers. Advanced can help businesses to embrace the possibilities of the hybrid era, and provides the software solutions to make them a reality.

SMES

Startups offer pandemic lessons for legacy names

While many established brands have struggled to adapt or even crumbled into administration during the Covid crisis, digital-native startups have thrived. What can the big players learn from this?

Tamlin Magee

Until recently, many of us have found the ubiquitous buzz phrase 'digital transformation' confusing, vague or even downright meaningless. But, just like so many other things that have changed during the past 18 months of the Covid crisis, people's perceptions of the term have altered.

With global lockdowns forcing companies to review their operations, the adage that digital transformation was 'do or die' suddenly came to pass. More than ever before, digital capabilities became integral to companies' day-to-day operations almost across the board.

Firms with outmoded mindsets and methods watched their digital-native rivals thrive. Big players that had already been lagging struggled even more, whereas startups were sufficiently agile and well equipped to improve their offerings.

So what can these spritely young businesses teach their lumbering elders? Here are six fundamental lessons to take away.

Flexible working

A world of hybrid working is on the horizon, with companies relying on a combination of in-office staff and remote workers, depending on their requirements. Downsizing on expensive office estate has a clear financial appeal, but it also offers true operational agility for a wide range of organisations.

Engine B is a startup that provides data systems to the professional services industry. It obtained £1.7m in funding in April 2020, soon after the initial Covid lockdown was imposed in the UK.

According to Engine B's CEO, Shamus Rae, the firm had a "big advantage over most of our larger counterparts" because it didn't have to run on any outdated systems.

"All of our systems were in the cloud and we were already using remote outsourced services for both finance and HR," he explains.

After a number of employees fell ill very early on in the pandemic, Engine B moved to remote working to minimise the risk of further infections even before the first lockdown restrictions took effect.

Rae says that the firm was lucky to be in a co-working space from which it could withdraw "at short notice and move to remote working without any continuing costs".

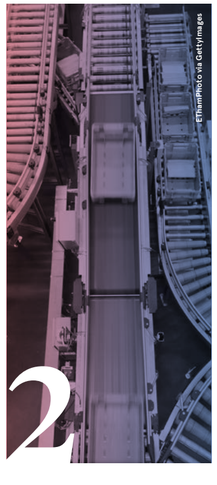
Firms in Silicon Valley have also been adopting remote or hybrid working arrangements in increasing numbers. This has set them up for the future of work and, in the process, expanded the pool of talent from which they can recruit.

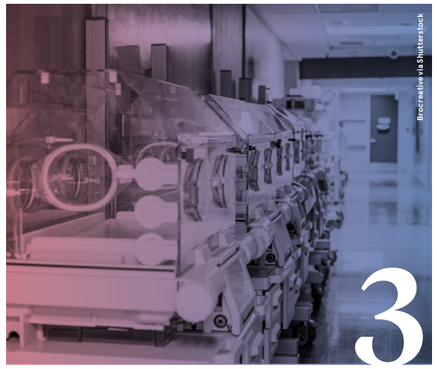
Automation

Martin Rehak is the co-founder and CEO of Resistant.ai, a security fintech company that started trading in 2019 and has grown throughout the pandemic. He believes that, for big firms to remain competitive, they must commit to automation in the same manner as their smaller, digital-native challengers.

Businesses have to take automation and digital transformation seriously. Otherwise, they will die, Rehak warns. The way forward can be illustrated by developments in chess over the years. Long ago, computers proved their chops against humans at the ancient game – a superiority that remains the case today in a one-on-one match. But economist and former youth chess champion Tyler Cowen notes that, if humans and computers work together against other computers, they make a practically unbeatable team.

"If you want to operate in the new world, you'll have fewer employees, they'll be better trained and they'll be experts," says Rehak, adding that organisations simply shouldn't ask people to do menial tasks that could have been automated a decade ago. "That is the big transformation."





Incubators

Enterprises have long found value in running corporate incubators, trying to bring something of a start-up's mindset to a well-established organisation that may have become hidebound by bureaucracy.

Incubators bring startups under the tutelage of the parent organisation, enabling them to keep operating autonomously but with access to resources and guidance that could otherwise be hard to come by.

The parent organisation, meanwhile, gains access to disruptive technology, innovation and an outsiders' perspective before the developing business is spun out.

It's clear that some large companies have long understood the value of dealing with startups and SMEs. But there's plenty for them to learn in a more general sense too, especially in this recent, strange period.

"I believe that the learning will continue and intensify after the pandemic," says Helena Nimmo, chief information officer at software development company Endava.

Several large companies have already established digital incubation units where they are testing a new digital layer on top of some of their heritage systems, Nimmo reports. For many firms, it's now OK to try and fail. This, she says, is "a huge shift in many mindsets".

Omnichannel

It's no secret that many tech firms flourished under the challenging circumstances of the pandemic. But it was another matter for retailers.

The brands of high-profile casualties such as Arcadia Group, which was forced into administration last November, were snapped up quickly by digital-first retailers such as Asos and Boohoo. The reliance on bricks-and-mortar stores meant businesses such as Topshop and Burton weren't considered viable just as they were.

The fact that huge ecommerce platforms absorbed them suggests a shifting requirement for genuine 'omnichannel' retail, where digital platforms are melded with physical assets but in a smarter way than merely occupying premium real estate in the best locations.

Perhaps nothing could have saved Arcadia from its fate, but there are lessons to be learnt all the same. Take the automotive sector, which initially felt the full brunt of the pandemic as economies around the world. After noticing a recovery in search queries towards the end of 2020, dealerships began to connect their offerings digitally. They altered the online buying experience based on customer need, merging digital channels with physical logistics.

Partnerships

Many of us have given cash transactions a wide berth during the Covid crisis, with most businesses favouring contactless payment. Santander, which had faced challenges from challenger banks such as Monzo, took the chance in 2020 to rethink its approach to all matters digital.

Santander partnered with fintech startup Personetics to develop the backbone of its new digital offering, My Money Manager. It launched the app in November, putting itself on digital terms with its neobank rivals.

This is a clear case of a bank turning to a fintech startup to deliver capabilities that it had lacked internally. Santander takes this seriously, viewing startup collaboration as a key element of its strategy. It's hoping to work with businesses that will emerge from its fintech venture capital arm, Mouro Capital, which spun out in 2020.

Sweating the assets

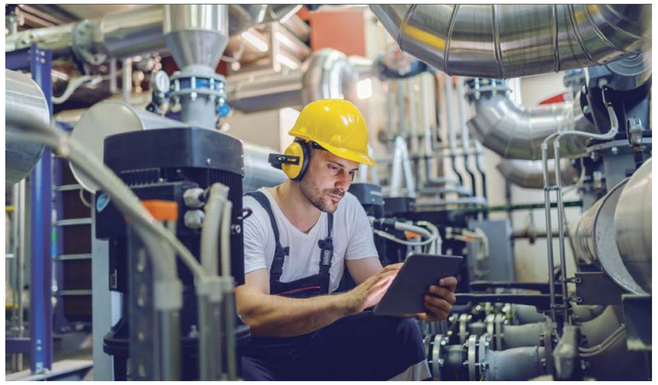
Many companies are failing to look forward far enough with their commercial strategies, according to Jaco Vermeulen, chief technology officer at consultancy BML Digital.

He notes that Skype, the remote communication application, has lingered on many of our computers since the release of its first software client back in 2003, yet it wasn't until the pandemic struck that many big companies felt obliged to use such products. But smaller businesses always have a stronger incentive to make maximum use of any tools they have paid for.

"Smaller organisations may face greater pressures, so they definitely consider what more they can do with their assets," Vermeulen says. "Since they are in a near-constant shaping phase, these firms will look at how certain assets need to be augmented or replaced when they don't meet the objectives set for the business."

He adds that, for a company to get the most out of its assets, it needs to adopt an outcome-focused mindset. Startups have long tended to prioritise results over processes, especially in the software industry. It's something that other enterprises would be well advised to consider doing before the next crisis comes along.

Commercial feature



Navigating the barriers to digital transformation

Digital transformation is key to thriving in business today but there are many barriers to success. Organisations must be prepared for them through close alignment between business and IT

The last decade has seen technology's role in organisations evolve from being contained in the back office to being everywhere, including in products as well as both customer and employee experiences, driving transformations as companies seek to adapt and thrive in the digital age.

While transformations are necessary, they are far from easy. KPMG's Global Transformation Study revealed that nine in 10 companies have completed a transformation in the last two years but, according to McKinsey analysis, 70% of digital transformations fail.

Digital transformation projects can be broadly split into two approaches. There are large-scale transformations in which a business commits to a clear and significant mandate for technology-led change over a period of three to five years. Then there are transformations which begin as small changes but snowball into much bigger programmes of change.

The latter has been accelerated by the growing rate at which line-of-business managers are adopting technology tools, without alignment with the IT department. This is particularly prevalent in sectors like retail, through the rise of ecommerce, and functions like marketing in which business managers regularly purchase digital tools to improve processes and optimise results. This trend is also influenced by the increasing role of digital technologies in smart products and services, which is bringing product development and technology teams closer together than ever before.

"Both approaches to digital transformation face roadblocks," says Ved Sen, digital evangelist at Tata Consultancy Services (TCS), an enterprise transformation partner. "With the large-scale transformations, companies quickly discover all the clever stuff they want to do is held back by legacy technology. We help clients move to the cloud with elastic architectures that enable flexibility.

"The snowball transformations, meanwhile, often break down when they want to scale, or they amount to a mishmash of technologies over time that create inefficiencies because they don't speak to each other. When you then want to start making crucial changes to your business model, these issues become blockers because they're not geared to change as effectively."

To overcome these challenges, the IT organisation must think of itself as not just an operational layer but also a governance layer, constructing a technology framework which any product, wherever it is deployed in the business, can be easily connected to. As long as a new solution or tool obeys the rules of the framework, which incorporates the likes of security, interoperability and modularity, then IT can keep a grip on integration and governance, making the transformation process easier and more effective.

To promote and facilitate this closer alignment between business and IT, TCS acts as a bridge between both groups while helping organisations create the necessary governance model. As a global IT services and consulting company that supports major business-critical operations including customer support in the utilities sector and back-end processes for banking and insurance firms, TCS is well positioned to help its clients manage their digital transformations.

The company's transformation credentials were put to the test internally during the pandemic when it transitioned 90% of its half a million employees, many of whom worked in highly secure environments, to remote working in a matter of weeks. The model, dubbed TCS' Secure Borderless Workspaces (SBWS), was so successful that TCS was able to offer it to its clients, all of whom are now considering which parts to retain as they continue to digitally transform in the years ahead.

"Most companies will be in a period of transformation for the next decade as long as they continue to digitally transform, they immediately think of TCS."

> Most companies will be in a period of transformation for the next decade

For more information, visit tcs.com

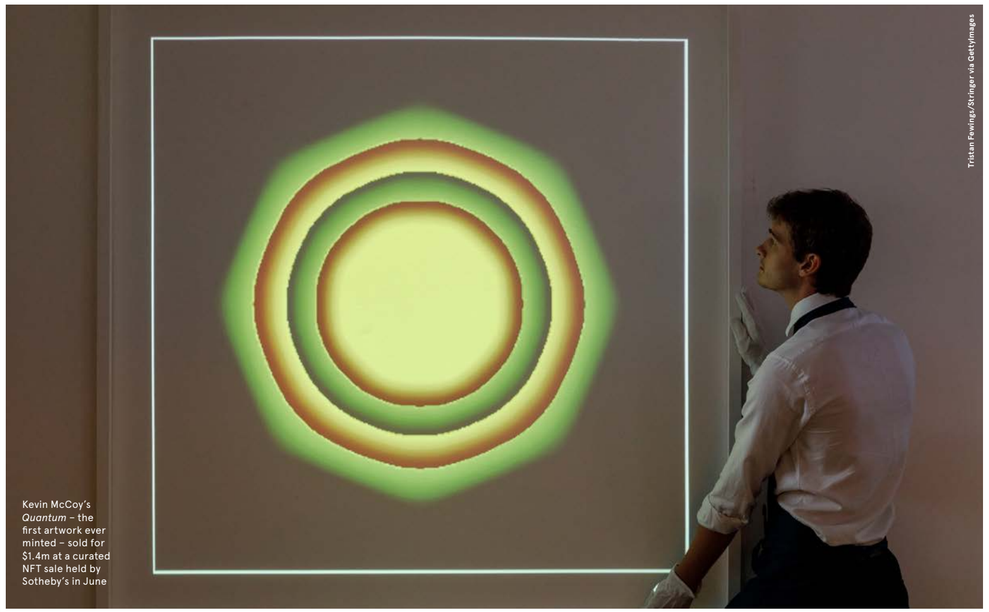
TCS TATA CONSULTANCY SERVICES

NON-FUNGIBLE TOKENS

NFT mania shakes up the artistic world

The adoption of non-fungible tokens in this traditionally slow-moving market has accelerated hugely, changing how works are created, valued and sold

Rose Stokes



Tristan Fewings/Stringer via Getty Images

Kevin McCoy's *Quantum* – the first artwork ever minted – sold for $1.4m at a curated NFT sale held by Sotheby's in June

At a New York hackathon in 2014, digital artist Kevin McCoy and tech entrepreneur Anil Dash had an idea. At a time when digital art was circulating freely online and being replicated all over the internet, they would use blockchain technology to enable people to take ownership of original digital works.

At the event, McCoy minted a GIF that he had created with his wife, Jennifer, and called it *Quantum*. He also made another work, *Cars*, which he registered in a Namecoin cryptocurrency wallet. Later that day, Dash gave McCoy the $4 he had in his own wallet to take ownership of *Cars* on stage at the event.

McCoy and Dash initially referred to *Quantum* and *Cars* as "monetised assets". *Quantum* would later be known as the first example of a non-fungible token (NFT), while the *Cars* transaction became the first in a dynamic global market that's now worth billions of dollars.

"I wanted to give power back to artists," McCoy explains.

During the early years of digital art, artists were able to establish their online presence in ways they could control, developing their own tools and technologies, he says. But this soon began to change.

"I saw that erode over time with the emergence of social media and these centralised platforms, along with the rise of the tech giants in their epic scale," he recalls.

But McCoy realised that other emerging technologies, such as bitcoin, could enable the creators of art to control their own value propositions. In essence, NFTs allow artists to cut out the middleman. Consumers can buy art directly from them and also gain a unique, traceable digital imprint that enables them to verify the work's authenticity. Moreover, as the art is bought and resold, the artist continues to benefit financially.

In June, *Quantum* was sold for $1.4m (£1m) at Sotheby's. "It was an interesting hybrid moment when the traditional art world was able to understand exactly what was going on in the NFT world," McCoy says.

In 2020, he'd tweeted that he was "way ahead of [his] time, but [he] was right". Looking at the NFT market today, where an estimated $2.5bn of sales took place in the first half of this year, it's impossible to disagree. An art collector who isn't clued up about NFTs is now more the exception than the rule.

> **You have people who've been dabbling in meme cryptocurrencies for the past few years buying an original Damien Hirst, purchasing digital land for games or buying digital horses to race**

At the end of August, *CryptoPunks* – one of the earliest examples of collectible generative artworks (created using a predetermined system that often includes an element of chance) – surpassed $1bn in total sales. In early September, Dolce & Gabbana announced its first NFT fashion collection. Dresses, jackets, suits, crowns and tiaras that can be worn by digital avatars are set to be sold as this report goes to press. Meanwhile, Anthony Hopkins is starring in *Zero Contact*, a film that has just been released on Vuele, the world's first NFT viewing platform.

In a traditionally slow-moving market, the pace of these changes cannot be overstated.

"Until the advent of NFTs, digital art had never really been able to enter the market in an effective way. It was largely the preserve of institutions," says Sebastian Fahey, managing director of Sotheby's in EMEA, which ran its first ever NFT-only auction in April. "I think that, over time, more traditional collectors will come to recognise the importance of digital art and NFTs as a growing movement with real staying power."

NFTs often hit the headlines for the eye-watering sums associated with the sale of pieces. But their impact on the art world extends far beyond the money that moves between digital wallets.

George Harrap is the co-founder of Step Finance, a so-called decentralised autonomous organisation that serves as a portfolio manager for assets such as NFTs. He believes that this digital revolution has cracked open the imposing doors that have traditionally guarded this rarefied world, making art more widely accessible.

"The NFT market caters to a completely new set of audiences that are more digitally native and value aspects that differ from what traditional art provides," he says.

While some think that NFT sales are cannibalising traditional art sales, Harrap argues that they are broadening the whole market.

"It just so happens that this art form is completely different from traditional art. So the experience it offers, the way that people value it and how they display it are completely different," he says.

Josh Sandhu is head of development at Grove Square Galleries in London and an avowed fan of NFTs. He believes that "a lot of people feel that art is inaccessible and that it's something that tends to be associated with big money. But, with this new digital world, it feels very different. You have people who've been dabbling in meme cryptocurrencies for the past few years buying an original Damien Hirst, purchasing digital land for games or buying digital horses to race. It's quite wild."

This democratisation of art is far beyond what McCoy had originally envisioned, but he feels positive about it. "There is this kind of third culture that I see coming together... [that is] natively online, natively on blockchain and natively decentralised in various ways," he says. "There is a real sense of energy in this kind of community."

McCoy is pleased by the increased diversity of the new market too. "It's not a single entity," he says. "Art has a new audience, new venues, new spaces, new money. It really is pretty exciting."

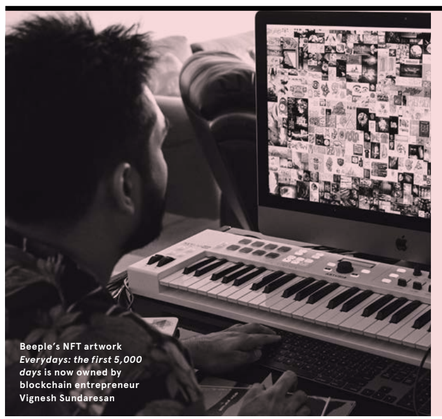
But there are, of course, some downsides. Sandhu points to the enormous amount of energy used by blockchain in general and its impact on the environment. This is a challenge "for the wider crypto market in general", he says, and one that "raises all sorts of ethical questions".

According to calculations by artist and computational engineer Memo Akten, a single NFT's carbon footprint is equivalent to one EU citizen's total electricity consumption for more than a month, with CO_2 emissions comparable to those produced by an airliner on a two-hour flight. Amid increasing efforts globally to reach 'net zero' – when total CO_2 emissions match those being removed from the atmosphere – it becomes harder to justify NFTs' existence.

Nonetheless, Sandhu is sanguine: "As blockchain technology develops, there will be less of an impact on energy consumption, with some specific projects having a net-zero footprint."

As the technology grows in popularity, he thinks, there will also be increased efforts to find sustainable solutions. "Ultimately, I suppose all of this hinges on whether major auction houses and galleries think this is here to stay and is going to grow," he says.

For Fahey, the future market for NFTs is clear: "We can expect to see a whole new appreciation for the medium in the coming months and years."



Beeple's NFT artwork *Everydays: the first 5,000 days* is now owned by blockchain entrepreneur Vignesh Sundaresan

NFTs and the rise of Beeple power

On 1 May 2007 and every day for the next 13-and-a-half years, Mike Winkelmann, a digital-first artist better known as Beeple, published a piece of art online from his home in South Carolina.

On 21 March 2021, a compendium artwork that brought all these images together – called *Everydays: the first 5,000 days* – was sold as an NFT in an auction facilitated by Christie's for $69,346,250. It remains the highest-value NFT sale to date.

As one of the most famous digital artists in the world, Beeple has amassed an incredible following online, particularly on picture-sharing social network Instagram, where he has 2.2 million followers (and rising).

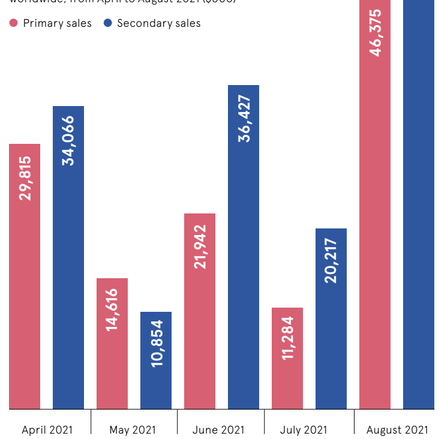
Over his years in the spotlight Beeple has participated in a number of high-profile collaborations with celebrities and brands. These have ranged from international fashion house Louis Vuitton to tennis star Andy Murray, as well as performing artists such as Childish Gambino and Katy Perry.

According to Noah Davis, a specialist in post-war and contemporary art for Christie's, acquiring Beeple's work was a "unique opportunity to own an entry in the blockchain itself, created by one of the world's leading digital artists".

THE GLOBAL MARKET FOR NFT ART

NonFungible, 2021

Total sales value involving non-fungible tokens in the art sector worldwide, from April to August 2021 ($000)



Commercial feature

Q&A with Nitin Rakesh

Nitin Rakesh's name is on the Mars Rover. His book won the 2021 International Business Book of the Year at the Business Book Awards 2021. And as CEO of Mphasis, he leads some of the biggest change projects in the world

Q Hi Nitin! What's changed in the way companies need to transform?

A The speed. The pandemic was a moment of reckoning for almost every CEO. There is a Lenin quote from the Russian Revolution, that nothing happens in decades and then decades happen in weeks. We are experiencing that phenomenon. Ecommerce in retail went from 16% to 32% of sales in six weeks. It made the same progress as the previous 15 years. So, the conversation is not about whether to transform, it's how fast.

Q Your book sets out eight methods to deliver transformation. Can big changes be systematised like this?

A Freehand creativity may work for Elon Musk or Steve Jobs, but there are proven methods which come with a framework and processes that deliver results. Netflix, remember, has a method to its madness, using algorithms to decide what movies to make and what content to show viewers. It's not chance. In the book we talk the reader through the best techniques. It begins with unblocking your mental model. Just half the companies that were on the Fortune 500 list in 2000 are still part of the rankings today because they could not react to disruption. Their mental model held them back. You need to rethink every assumption, including your business model and products. Adaptive Experimentation is vital. Pursue multiple approaches, adopt those that work, and iterate. At Google, experimentation is a mantra. The smallest product features are multivariate tested. And embrace Open Innovation by opening your problems to the outside world to solve. I give you a lot of options!

Q How does Open Innovation work?

A The best ideas may not always come from your own teams. Open your innovation processes and harness the wisdom of crowds. For example, NASA faced the problem of predicting solar storms. These can disrupt the earth's magnetic field and disable satellites. NASA could only predict with 50% accuracy, just two hours in advance. NASA issued a challenge on a crowdsourcing platform with a $30,000 reward. A retired cell phone engineer in rural New Hampshire built an algorithm with 75% accuracy up to eight hours in advance. Major corporations are using Open Innovation, including Apple, Procter & Gamble, Eli Lilly, and Lego. Research by a professor at the Copenhagen Business School shows 70% of successful challenges are won by individuals from outside the specific technical domain, and 75% already knew the solution. I personally contributed to an open challenge for NASA and my name was on a chip on the Mars Rover that landed on Mars this year.

Q Is there a guiding principle to transformation?

A Flip your focus from front to back. Companies usually begin by looking at their back-office technology. It's a mistake. Start with the consumer and put the customer at the centre of everything you do. Your benchmarks should be based on the world's most customer-centric companies such as Amazon, Netflix, and Google. Customers compare their digital experience across brands. Banks are compared to Amazon. Grocery stores to Netflix. Personalise like these brands. Amazon Prime isn't a free shipping system. It's the world's biggest personalisation engine. Netflix is a matching engine between consumers and content. You need to do the same. You'll know if you are succeeding, as consumers vote with their money.

Q How can Mphasis help?

A We have a phenomenal track record in large-scale transformation across multiple sectors. Our secret is that, at heart, we are a tech company. We are a company full of geeks. We believe that to succeed in today's world you need true technology skills and knowledge of how to harness that to address business growth – changing your business models by making the right use of data insights is how we help you start your journey. We are the company you should come to if you really want to embed technology in your transformation.

Transformation in Times of Crisis: Eight Principles for Creating Opportunities and Value in the Post-Pandemic World
By Nitin Rakesh & Jerry Wind, professor of marketing at Wharton Business School

Mphasis
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GEOPOLITICS

Mission-critical applications

It's no ordinary transformation project. The United Nations has set out to digitalise its global peacekeeping operations. The stakes are exceptionally high, but what are the odds of success?

Nick Easen

The business of warfare is not the same as it was even a few years ago. Today's conflict zones are awash with data. Satellites, drones, radar systems and long-range cameras provide instant intelligence, while warring factions clash in cyberspace with their campaigns of disinformation. This has fast become a concern for the United Nations, given that it devised its peacekeeping practices in an analogue world.

That's why its secretary-general, António Guterres, announced a new digital transformation strategy for the organisation's missions around the globe in August 2021. He acknowledged that the new technological aspects of conflict required the UN to change its peacekeeping culture in order to improve its responsiveness.

A transition of this nature in such a large enterprise clearly can't be achieved overnight. Indeed, the UN's Department of Peace Operations (DPO) – which is running 12 missions on which nearly 88,000 people are currently deployed – has given itself three years to put all the right systems in place. Its plan to make full use of cloud technology is crucial, but it has also identified the capabilities it will need to bring in and/or develop internally.

> **Any attempt to integrate data will have to maintain anonymity and be sensitive to context**

Mark Dalton is leading the implementation plan for the DPO's digital transformation. He notes that it is "inherently challenging to take on something like this. We are continuously seeking new ways to help us work more effectively. We're not only looking at technology; it's an integrated approach involving people and processes too."

He continues: "This is a question of how we can help peacekeepers to implement their complex and demanding mandates. A priority is to ensure that we have the right data and digital architecture in place."

This UN must manage the same kinds of problems that affect countless other digitally evolving organisations worldwide. These include complex management structures – the DPO relies on the support of myriad military, police and civilian organisations across its member states – and siloed data. It also has to deal with conflicting goals, since mandates from the UN Security Council do not always align with those of national or local governments in conflict zones.

Like many organisations wishing to transform themselves, the UN hopes that data will be the 'new glue'. If all of the material produced is collated, stored and processed on a single unified system, it can become a powerful analytical tool.

Javanak Mistry/Bloomberg via Getty Images

Big data centre: the UN's Secretariat Building in New York

Naomi Miyashita, leader of the policy planning team at the DPO, developed the digital transformation strategy. She points out that a peacekeeping mission will "receive and generate a huge amount of information. This all needs to be organised coherently, rationally and efficiently, so that we can have a common operational picture. Our new platform will enable us to adopt a much more data-rich and evidence-driven approach, deciding how we plan and execute our mandates and also how we report to the UN Security Council."

It will be no mean feat for the DPO to become a digitally advanced organisation that can, say, accurately predict trouble spots, give patrols early warnings of likely attacks and counter disinformation campaigns on a range of media, all while achieving consistency in record-keeping across its missions.

Jake Sherman is senior director of programmes at the International Peace Institute, an independent think-tank that works closely with the UN. He believes that the DPO can make some relatively straightforward changes – for example, ensuring that peacekeepers are well equipped with night-vision systems – that will prove highly effective.

But Sherman adds that other aspects, such as ensuring "basic digital fluency, which includes providing real-time incident reporting, will prove more difficult. The transformation required necessitates a long-term commitment to recruiting people with new skills and addressing gaps in capability among the various countries' contingents on deployment."

The UN is also keen to reduce the disparities among its peacekeeping units. Some, provided by developed nations, have sophisticated technology and data-rich capabilities at their disposal, which means that boots on the ground sometimes aren't even needed. On the other hand, staff in units provided by less wealthy nations have never even used an Excel spreadsheet before, keeping them very much in the analogue world of conflict resolution.

"We want to ensure that we are putting in a system whereby we have countries with the technology and capacity to train and support countries that don't," Miyashita says. "This should help to level the playing field."

A key factor that inevitably comes to the fore during digital transformations is that of data governance. The UN has its own principles on data protection and privacy, which define what constitutes best practice, but peacekeeping in a connected, data-rich world faces several new challenges in this respect.

Jane Esberg is a postdoctoral fellow working on the Empirical Studies of Conflict Project at Princeton University. She observes that, by their very nature, peacekeeping missions require the UN to work with extremely vulnerable people.

"Any attempt to integrate data will have to maintain anonymity and be sensitive to context. Protecting the populations that peacekeepers are there to serve will be vital," Esberg stresses.

Another risk for the UN to consider is that a newly centralised digital resource could become a target in its own right. One of its challenges will be to make the system open enough for data to be added and accessed by thousands of authorised personnel, while at the same time securing it against hackers.

"Digitalisation will increase the attack surface as more and more hardware and software is connected to the network," warns Dr Beyza Unal, deputy director of Chatham House's international security programme. "As the UN considers more data-driven applications, it should also consider the possibility of data poisoning by malicious actors."

As with any other digital transformation project, the human element can often be overlooked. The talent required for these kinds of projects is in short supply to the UN in most parts of the world, given that the private sector can generally pay higher salaries to attract the sharpest technical minds.

Despite this, Paul O'Neill, senior research fellow in military sciences at the Royal United Services Institute, believes that the DPO digitisation project could prove attractive to members of generation Z.

"This initiative provides meaning and purpose that could appeal to the expectations of younger workers with a strong social conscience," O'Neill says, although he admits that "whether it can attract enough for the ambitious agenda it has set is another question. I also think the schedule is too challenging. Many businesses that attempted digital transformations have noted that the barriers are often more cultural than technological."

The success of the UN's bold plan will depend on the support that member states lend its data-driven cause. Digital transformations are already shaping conflicts around the world. The hope is that they will shape peacekeeping as well. ●

> **Missions receive and generate a huge amount of information. This all needs to be organised coherently, rationally and efficiently**

87,814

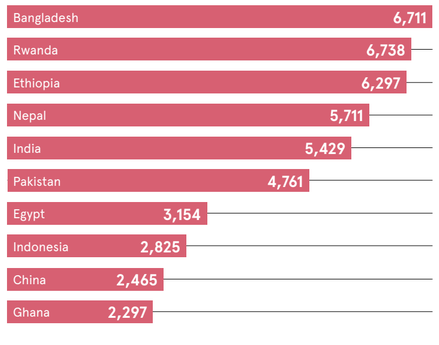
people are currently deployed on 12 UN peacekeeping missions

United Nations, 2021

TOP 10 UN PEACEKEEPERS

United Nations, 2021

The 10 countries contributing the largest numbers of personnel to UN peacekeeping missions as of January 2021



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