HARVEY NASH / KPMG **CIO SURVEY 2020**

EVERYTHING CHANGED. OR DID IT?

Everything changed. Or did it?

Over its 22-year history the CIO Survey is not unfamiliar with rapid disruption, or what in finance might be called a 'black swan event'. Not long after the survey launched, we charted the bursting of the dot.com bubble. In 2008 we witnessed what we thought would be the world's greatest recession in living memory.

And then a little over a decade later, this happened. A flock of black swans landed on our lawn, and everything changed. The economy changed. Technology changed. Even the concept of 'location' changed.

Or did it? As we piece together the new normal, we will undoubtedly find a lot of the old normal still there.

Before Covid-19, people valued face-to-face conversation. Now, the prospect of meeting in person without asking 'Are you on mute?' has never been more appealing. Before, we were at the beginning of a revolution in data, artificial intelligence (AI) and connectivity. Today, we still are. Before the pandemic, understanding the customer was core to business success. Now it is more necessary than ever.

To say these are unprecedented times is an overused phrase, and yet with so much of a yawning gap between what we know and what we need to know, there is not a more appropriate phrase. These are indeed unprecedented times.

So, it is with this backdrop we bring you the 2020 CIO Survey. With over 4,200 responses recording the before, the onset and the ongoing effects of the pandemic as they occurred across the world, this year's CIO Survey gives you unique, essential insights into the nature of technology today.

We hope the report helps you steer yourself and your organisation to success in 2021 and beyond.

Bev White
CEO, Harvey Nash Group

Steve Bates
Global Leader, CIO Advisory Center of Excellence, KPMG International
🐦 @stevebatescio

5 THINGS TO DO WITH THIS REPORT

Rethink your budget
Read 5 things to consider when budgeting, or re-budgeting. Page 10.

See the future
Find out what emerging tech is attracting the most investment. Page 15.

Hear from your peers
What's keeping fellow tech leaders awake at night? Page 20.

Promote mental wellness
Read 5 tips for supporting the mental health of your team. Page 30.

Compare your sector
Read our sector / location league tables on page 40.

Contents

About the survey

$¼ trillion
combined IT budget*

3 million
data points**

4,219
respondents

83
countries

22
years of data

*Combined IT budget of this year's respondents
**From 22 years

A note about the data in this survey
We launched the first iteration of this survey in late December 2019 before Covid-19 was an issue outside mainland China. In March 2020 we paused the survey after collecting 2,791 responses and then launched a new survey that included questions relating to the pandemic, which received a further 1,428 responses running from May to August. In this report you will see references to both surveys – Pre-Covid 2020 and Covid 2020 – and together they give us a unique insight into the before, the onset and the ongoing effects of the pandemic. If no specific data source is quoted in this report, it means the data is taken from the second survey, Covid 2020.

CIO Survey 2020 – 8 things you need to know

An investment surge and budget headaches

Global IT leaders reported a median additional spend of 5% of IT budget to deal with the Covid-19 crisis. This represents around US$15bn per week during the first three months of the crisis, as organisations pivoted their customer strategies, invested in security, and moved a significant part of their workforce to remote working. The unexpected and unplanned-for spend in both capital (CapEx) and operating expenditure (OpEx) has left many organisations with a headache. CIOs and CFOs are shining a bright light on existing spend, keen to prove return on investment or to make savings.

Each industry sector is following its own path

Unlike previous recessions, where largely sectors 'rose or fell' with the tide, sector has played a significant and divisive role in how organisations have fared during the crisis. Some organisations are faced with the challenge of finding a viable business model; for others, the challenge is to deal with a surge of demand. Power & Utilities, Government, Healthcare and Technology are investing heavily; Leisure, Non-profit, Education and Manufacturing are reining back. Regardless, six in ten feel it will take at least three months before they can accurately forecast the future. Boards will need to get used to the discomfort of uncertainty.

A growing digital divide

While few organisations would have planned for something as significant as this pandemic, some entered the crisis in much better shape than others. These digital leaders, the three in ten organisations with the most successful digital business strategies, already had much of the infrastructure in place to deal with the crisis and were further down the line with implementing emerging technologies. When the crisis hit, digital leaders continued to invest while their peers cut back, and over time we are likely to see a growing divide over digital and business performance.

A wave of cyber-crime targeted at remote workers

Covid-19 caused the mass relocation IT workers from the safety of their corporate network to studies, bedrooms and kitchen tables all over the world – and the attack surface of organisations expanded exponentially. Our research shows that in addition to cyber-crime challenges faced before the crisis, more than four in ten (41 per cent) have experienced additional cyber-security incidents, mainly from spear phishing and malware attacks. This challenge has caused security to become the top technology investment priority, and for the first time in this survey's history cyber-security expertise has become the most in-demand skill set.

A new deal for employees

With 43 per cent of technology leaders expecting more than half their staff to remain working predominantly from home, organisations are beginning to realise how different a world without location is. In recruitment, their potential talent pool is worldwide. Ensuring that people are engaged, rewarded and productive in a world where physical presence plays less of a role will be a key factor. Mental health is an issue; 84 per cent of technology leaders report they are concerned about their team. Encouragingly, our research shows that programmes are being put in place to manage this.

More proof that business needs diversity

Participation of women in technology leadership remains stubbornly low, although some headway appears to be happening in Latin America which is benefiting from specific programmes designed to get women into the world of technology. Looking at diversity more widely, our research adds further proof that diverse teams promote better business performance. More than two-thirds of organisations feel that being diverse has improved trust and collaboration in the technology team. The survey also hints that the flexible nature of remote working may promote greater inclusion, but only time will tell..

The new technology leader

At the centre of all this lies the technology leader. Many of them emerge from this exhausted, but excited, by the challenges and opportunities of what has become a technology-centric crisis. Over six in ten report feeling more influential as a result of the crisis. This is not reflected in board membership, which for CIOs is down from 71 per cent in 2017 to 61 per cent now. This decline does not seem to be a concern; what technology leaders want most of all is influence, and this crisis has helped them achieve that, at least for the moment. The smart ones will not let that opportunity pass.

Everything changed. Or did it?

There is no doubting the pandemic's dramatic effect on almost every aspect of business and life. But key fundamentals remain. The top priorities for boards did not change with the onset of Covid-19: operational efficiency and customer engagement, both long-standing priorities of the technology leader. While some organisations will have required a radical change in direction, for most it has served to accelerate what was already in place. For some this has actually been useful: "More innovation happened in the last six months than in the last ten years," remarked one respondent.

Download our extensive infographic of findings at: **www.hnkpmgciosurvey.com**

Findings

1. Board Priorities and Investment

5%
median additional IT spend to cope with crisis

Technology leaders expecting budget increase

52%	51%	43%
2019	2020 Pre-Covid	2020 Covid

Top sector for budget increases:
Power & Utilities

Technology leaders expecting headcount increase

43%	55%	45%
2019	2020 Pre-Covid	2020 Covid

Bottom sector for budget increases:
Leisure

Over the last 12 months has your IT budget increased? Yes

43% 47% 42% 36% 25% 28% 39% 43% 42% 46% 44% 45% 46% 49% 55% 55%

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

A surge of investment

Over the last 22 years, the CIO Survey has proven to be accurate at predicting technology trends. But even we could not predict what was in store for us as we launched the survey in late 2019.

Entering 2020, investment in technology had remained at an all-time high; 55 per cent of technology leaders had received a budget increase, driven by the need for operational efficiencies, customer engagement and developing new products and services. With the advent of the pandemic, the attention rapidly pivoted from these medium/longer-term aims to dealing with the immediate demands of the crisis. Technology leaders experienced a significant surge in technology investment, and many had an open cheque book for whatever they needed in expenditure, especially with investment in the cloud and workforce enablement.

Our research shows that during this three-month period, technology spend grew at a greater rate than at any point in history. Technology leaders reported a median additional spend of 5 per cent to deal with the Covid-19 crisis. Data from Forrester[1] shows that global IT spending reached US$3.5trillion in 2019, suggesting this spend uplift amounted to US$15bn spent per week in order to support the sudden move to remote working.

Given this unexpected surge in near-term investment, it is perhaps then not surprising that budget and headcount growth expectations for the next 12 months have dropped. Pre-Covid, 51 per cent of respondents expected budget increases and 55 per cent were planning on growing headcount. Now, budget increases are expected for 43 per cent and headcount increases for 45 per cent. On balance, this still represents a net growth, and remains significantly higher than in 2009 after the financial crisis. This suggests that, from a technology perspective at least, the nature of this crisis is very different from previous ones.

1. https://go.forrester.com/blogs/new-forrester-forecast-shows-global-tech-market-growth-will-slip-to-3-in-2020-and-2021/

Is it sustainable? Taking stock in the new reality

Covid-19 has brought about an amazing leap forward in the use of technology, a 'ratchet' moment with probably the biggest rush in investment ever seen. Budgets will inevitably get reined back over time, but the recognition for its huge importance will remain.

The unprecedented scale and speed of the pandemic necessitated organisations to invest heavily in the short term, both on capital (CapEx) and operational expenditure (OpEx). Now there are questions over how these costs will be carried forward and how organisations will architect themselves for the future. Many will need to find a way of rationalising and taking out old costs to support a more digitally connected, seamless and intelligent world. In the post-pandemic reality, CFOs will shine a light on CapEx and OpEx and look for a more rapid return on incremental investments.

Smaller organisations invest more

Our research shows that small organisations are anticipating the biggest percentage increases in headcount and budgets over the next 12 months. Larger organisations have more capacity to absorb shocks and distribute them across the enterprise, but for smaller organisations big changes demand more relative change to budgets and headcount.

Smaller companies needed to invest more

- Expect to increase IT spend next year
- Expect to increase headcount next year

Large
IT spend > $250m
30% 37%

Medium
$50m - $250m
36% 37%

Smaller
IT spend < $50m
46% 47%

Budget increase expectations by sector

Expecting budget increase in the next 12 months

Sector	%
Leisure	26%
Charity / Non profit	32%
Manufacturing / Automotive	38%
Education	40%
Global Av	43%
Construction / Engineering	43%
Telecommunications	44%
Business / Professional services	44%
Retail	44%
Financial Services	44%
Technology	46%
Healthcare	49%
Government	51%
Power & Utilities	52%

Unlike in previous years, where largely all sectors 'rose or fell' with the tide, sector now plays a significant role in how budgets will be affected in the future. The pandemic has carved out a variety of recovery patterns for each sector, country and organisation. Technology spend will be a function of how they respond to the economic forces shaping their recovery. Some may never recover, others must fundamentally transform, some will modify what they are already doing, and others will experience hyper-growth.

The necessity of remote working has made people reassess their business model. It is both positive and negative. In primary healthcare, for instance, the mass adoption of video conferencing and telemedicine has introduced an efficient way to initially consult with patients. Doctors have long clamoured for this as a channel – the pandemic duly delivered. While in universities the delivery of their services through a screen has made people reassess the value of what they are consuming. Without the lecture halls, the library

and the bar, consumer expectations are changing, and universities are revisiting their value proposition though not necessarily lowering their tuition fees.

Power & Utilities is the most optimistic sector about future budget increases, presumably because the demand for its services remains little changed. At the other end of the scale is the Leisure sector, including tourism, which has been significantly adversely affected. Every sector is following its own path.

Forecasting is proving hard

How long before an accurate view of the future?

30% Already happening

11% 0–3 months

28% 4–6 months

23% 7–12 months

6% 13–24 months

2% longer

Almost six in ten (59 per cent) of respondents feel that they will be unable to accurately forecast for long-term planning decisions for at least three months and almost one in ten think it will take a year or more. Business hates uncertainty, and yet that is all that can be guaranteed right now. Technology leaders tell us that instead of long-term plans, organisations are focusing on 'getting their house in order' by optimising their estate, reducing technology debts and putting building blocks in place for their future.

That said, almost a third of respondents (30%) will be forging ahead as they already feel that they have an accurate view of the future.

How long before an accurate view of the future? Already happening / 0-3 months

Power & Utilities	57%
UK organisations	47%
Large organisations	44%
Global Average	41%

Larger organisations, leaders based in the UK and respondents from the Power & Utilities sector are the most likely to feel able to see the direction of travel in the short term. This picture is likely to be driven by larger organisations being more fixed on their strategic paths and lacking the agility to change direction, as well as being in a sector where demand is more predictable. Everyone needs light and heat, even in these unpredictable times.

Remote working becomes a business imperative

Top three business issues

Pre–Covid
1. Improving operational efficiency
2. Improving customer engagement
3. Developing new products and services

Post–Covid
1. Improving operational efficiency
2. Improving customer engagement
3. Enabling the workforce

Unsurprisingly, workforce enablement has become a top three priority for the board, jumping from eighth place in our Pre-Covid survey. Technology teams have played a key role in getting their organisations working remotely and providing the tools to keep employees across a multitude of different roles and professions engaged and productive.

Operational efficiency and customer engagement keep their top positions, but when speaking with technology leaders our sense is that the purpose of these has changed in the light of Covid-19. Customer engagement seems to be more focused on developing new channels to market, understanding consumer behaviour, and enabling customers to engage in a literal sense when not in person, as well as creating more and better relationships and digital experiences. Operational efficiency may also be defined in a whole new light as organisations seek to offset disruption or resource constraints with automation and lean governance models.

5 things to consider when setting strategy and budgets

1 If you have budget headaches, be assured you are not alone. Almost everyone's budget was affected in some way during the onset of the crisis.

2 Your strategy will largely be affected by how the crisis has affected your sector; are you having to reinvent your business model, or is your challenge dealing with a surge in demand? Understanding what is happening to your sector is key.

3 While so much of the world has changed, the role of technology has not. The chances are many of your technology plans you had before the crisis still stand, especially around the development of emerging technologies.

4 The customer is the answer. While the onset of the crisis has forced many technology leaders to look inward as they mobilised workforces, the real opportunities lie outward, with the customer. How has their world changed?

5 Don't lose sight of your people. Strategies are only successful if there are the people there to deliver them. For many 2020 will be marked as the most exhausting year of their life.
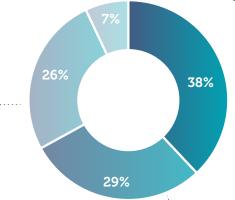
Responding to the crisis – four models

Hard reset mode

Organisations that struggle to recover due to 'permanently' lowered demand for their offerings, insufficient capital to ride out extended recession, and/or poor digital transformation execution. Recovery will take a long time after long-term economic damage. Example: Hotels were one of the first industries impacted by the pandemic when travel came to a halt; it is not expected that travel will return to pre-Covid levels.

Transform to re-emerge mode

Organisations whose business model has changed along with how their customers want to interact with them. They will recover along a protracted path, requiring capital reserves to transform operating models and keep up with new consumer expectations. Example: Retail stores going online – products remain the same, but they are issued via different channels.

7%

26%

38%

29%

Which of the following best describes the overall focus of your organisation's business technology strategy?

Modified business-as-usual mode

Organisations seen as daily essentials that will suffer during the consumer slowdown but recover more quickly as consumer demand rebounds. Example: Utility companies will still deliver electricity in the same manner, but digital technologies will bring in new levels of performance as well as impact customer interactions such as the ability to view real-time and historical usage, outage alert notifications, automated online payment, etc.

Surge mode

Organisations that scale rapidly because consumer behaviour changed permanently during the Covid-19 era. These organisations will need to protect the gains that they have made during the pandemic and decide on elasticity of what they have gained. Those that can keep the momentum gained from Covid-19 will prove to be the most opportunistic and agile. Example: Communications technology companies such as Zoom, MS Teams and Skype that offer digital collaboration tools that are integral to support remote teamwork.

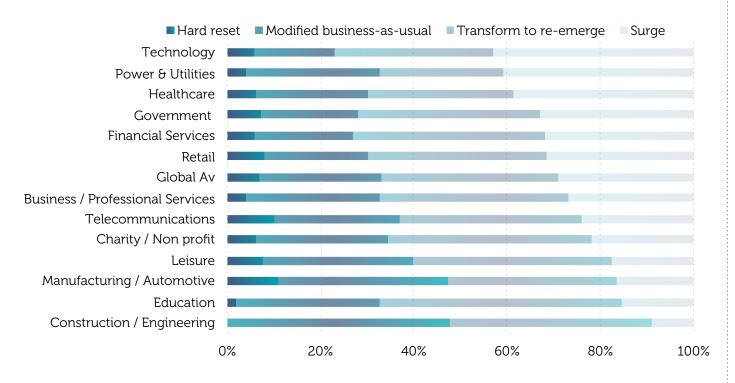Which of the following best describes the overall focus of your organisation's business technology strategy?

Legend: Hard reset · Modified business-as-usual · Transform to re-emerge · Surge

Categories (top to bottom): Technology, Power & Utilities, Healthcare, Government, Financial Services, Retail, Global Av, Business / Professional Services, Telecommunications, Charity / Non profit, Leisure, Manufacturing / Automotive, Education, Construction / Engineering

X-axis: 0% 20% 40% 60% 80% 100%

A unique journey for every organisation

Organisations throughout each sector find themselves in different recovery modes when it comes to executing their business technology strategy. More than two-thirds of organisations are expecting a significant transformation or modification to their current business model. Twenty-nine per cent report that there has been a surge within their business and require scale and new ways of working to capitalise on the gains they have made, particularly in the Technology, Power & Utilities and Healthcare sectors.

A smaller portion of organisations are experiencing a hard reset, in sectors like Telecommunications and Manufacturing / Automotive. It is important to note that most organisations will not fit into only one recovery pattern, with most experiencing multiple different patterns depending upon their mix of products and services.

Transforming 'transformation'

Our survey shows that, overall, expectations for transformation have become more conservative since Covid-19, perhaps a surprising conclusion given how 'transformative' the crisis has been with many companies experiencing more change in the past six months than in the past several years. It could be that we are witnessing the 'shifting sands' of what transformation really is. In fact, in our Pre-Covid survey 82 per cent of organisations believed that transformation was simply a part of business as usual. One thing is for sure, there is still plenty of change. Nearly all technology leaders (97 per cent) are making changes, and 34 per cent are planning to make major or radical changes.

To what extent, if at all, do you believe your organisation's primary business activity will transform over the next three years?

Radical transformation – e.g. entirely new revenue model, such as transitioning from goods-based to service-based offering
- 6%
- 7%
- 4%

Major changes – e.g. new products/services introduced which are equal to or more dominant than existing ones
- 38%
- 35%
- 30%

Some changes – e.g. new products/services introduced, existing ones still dominant
- 42%
- 42%
- 49%

Minor changes – e.g. existing products/services evolving
- 12%
- 12%
- 13%

No change at all
- 3%
- 3%
- 3%

● 2019 ● Pre-Covid 2020 ● Covid 2020

A massive surge in tech investment

Covid-19 has caused an unprecedented investment in technology. Three-quarters of respondents report additional technology expenditure as a result of the pandemic, with a median additional spend of 5 per cent.

How much additional technology expenditure has there been to deal with the Covid-19 crisis during 2020 (as a percentage of total IT / Technology budget)

- None: 24%
- 1 to 5%: 37%
- 6 to 10%: 18%
- 11 to 20%: 14%
- 21 to 50%: 7%
- More than 50%: 1%

2. Managing Technology

In light of the new reality, what are your top three most important technology investments?

Security and privacy	47%
Customer experience and engagement	44%
Infrastructure / cloud	35%
Automation	29%
Systems of insight (e.g. business intelligence)	25%
Technology development and Management and operations	22%
Office productivity and internal communications	20%
Operations and production	19%
Marketing and sales	14%
Employee engagement and HR	10%
Supply chain and logistics	9%
Systems of record	9%
Finance and accounting	8%

Trust is the currency of the new reality

Almost half of respondents (47 per cent) say the pandemic has permanently accelerated digital transformation and the adoption of emergent technologies.

There are pressures on managing OpEx and businesses need to become leaner and more efficient in their operations. Technology is the key enabler; however, it is also introducing a vastly increased attack surface through the rapid scaling of cloud-based software, remote access from personal devices, and the management of vast amounts of data and documents across a complex technology environment. Therefore, it is no surprise that security and privacy is the most important investment in the new reality.

With so many companies experiencing changes in how their customers want to engage with them, customer experience investments are also a top priority, followed by upgrades to the cloud which acts as the digital backbone and the infrastructure they will ride upon.
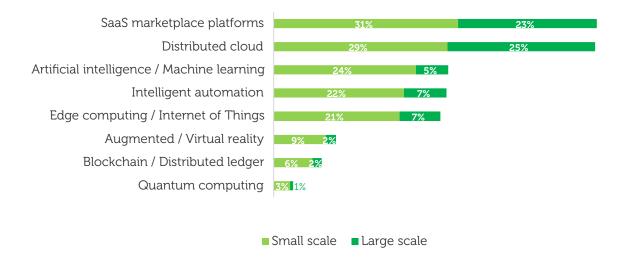
Emerging tech investments

Software as a service (SaaS) marketplace platforms are the big winner compared to 2019, with large-scale implementations reported at 23 per cent, up from 7 per cent last year. One in six organisations put one in place in the last 12 months. Enterprise-wide SaaS is exploding, and it is making a step change to back-office systems as organisations turn to software with well-defined risk boundaries and turnkey solutions. The big players (Oracle, Salesforce, Workday, Microsoft) are cashing in and firmly entering surge mode during this global crisis.
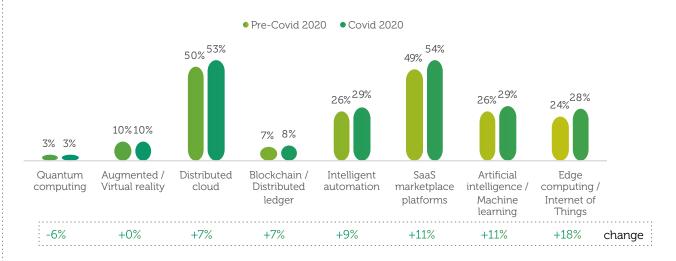
More investment in edge computing and cloud

When looking at how investments have changed in the short period between pre-Covid and current, Edge computing / Internet of Things, AI and SaaS marketplace platforms have seen significant increases in small and large implementations over a few short months. With the numerous and diverse data sets collected by mobile devices especially with contact tracing and hotspot identification, Internet of Things can have many more applications during a pandemic. Distributed cloud changes appear modest but in fact the changes come from a large initial base pre-Covid and therefore remain remarkable considering their time frame. Quantum computing, something we started tracking in last year's survey, dropped but this is from a very low absolute base.

Emerging technology implementations

	Small scale	Large scale
SaaS marketplace platforms	31%	23%
Distributed cloud	29%	25%
Artificial intelligence / Machine learning	24%	5%
Intelligent automation	22%	7%
Edge computing / Internet of Things	21%	7%
Augmented / Virtual reality	9%	2%
Blockchain / Distributed ledger	6%	2%
Quantum computing	3%	1%

Change in technology usage with onset of Covid-19

● Pre-Covid 2020   ● Covid 2020

	Pre-Covid 2020	Covid 2020
Quantum computing	3%	3%
Augmented / Virtual reality	10%	10%
Distributed cloud	50%	53%
Blockchain / Distributed ledger	7%	8%
Intelligent automation	26%	29%
SaaS marketplace platforms	49%	54%
Artificial intelligence / Machine learning	26%	29%
Edge computing / Internet of Things	24%	28%

change	-6%	+0%	+7%	+7%	+9%	+11%	+11%	+18%

Data represents small + large scale implementations
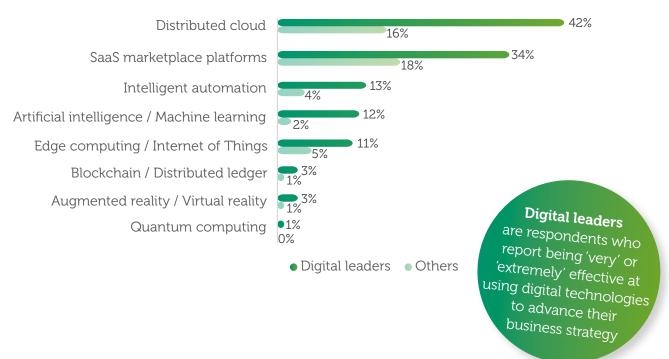
A growing digital divide

The pandemic has forced technology leaders to look hard at their emerging technology investments. If prior to Covid-19 organisations were seeing returns, the pandemic has seen them increasing that investment. If the technology is unproven, projects have been pulled back and the money invested elsewhere. In this regard, digital leaders have had an advantage. Almost half of digital leaders (49 per cent) report being 'very' or 'extremely' effective at scaling good ideas and stopping poor ones quickly, compared to just a quarter of all respondents. Digital leaders entered the pandemic much further down the line with emerging technology investment and are already seeing returns. They are much more likely to put their foot on the accelerator when it comes to investing further.

We are likely to see a divide grow, with digital leaders better positioned to pivot and scale into new opportunities, leaving behind organisations that resist, or are unable to invest in, their innovation journey.
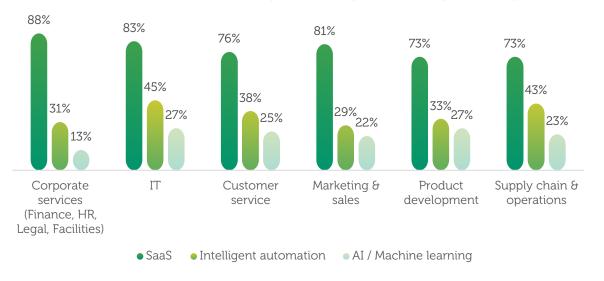
Emerging tech across the organisation

We looked in more detail at how three specific types of technology are deployed across key departments. Unsurprisingly, cloud was highly prevalent, particularly in corporate services and IT. Enterprise SaaS, especially cloud-based enterprise resource planning (ERP), is dominating the transformation agenda as the front-, middle- and back-office functions are rapidly modernising to drive more efficient and intelligent operations. The application of intelligent automation, AI and machine learning (ML) is gaining traction across the enterprise, with a particular surge in core operations where AI and ML is being paired with Internet of Things to increase efficiency, productivity and quality.

Large-scale implementations of emerging tech

Technology	Digital leaders	Others
Distributed cloud	42%	16%
SaaS marketplace platforms	34%	18%
Intelligent automation	13%	4%
Artificial intelligence / Machine learning	12%	2%
Edge computing / Internet of Things	11%	5%
Blockchain / Distributed ledger	3%	1%
Augmented reality / Virtual reality	3%	1%
Quantum computing	1%	0%

● Digital leaders ● Others

Digital leaders are respondents who report being 'very' or 'extremely' effective at using digital technologies to advance their business strategy

Please indicate in what business areas you are using the following technologies?

Business area	SaaS	Intelligent automation	AI / Machine learning
Corporate services (Finance, HR, Legal, Facilities)	88%	31%	13%
IT	83%	45%	27%
Customer service	76%	38%	25%
Marketing & sales	81%	29%	22%
Product development	73%	33%	27%
Supply chain & operations	73%	43%	23%

● SaaS ● Intelligent automation ● AI / Machine learning

Replaced by robots?

It is hard to tell the true impact of AI on human jobs, especially as we enter a period of increased unemployment. Our research shows that respondents are less confident that new roles will be found to replace lost jobs than they were before the pandemic. However, many factors are at play and while automation will continue to grow in importance, we have yet to feel a dramatic impact on the employment landscape.

Agree/Disagree: New roles will replace ones lost to automation over the next five years.

Disagree **31%** 2019 **69%** Agree

Disagree **27%** 2020 Pre-Covid **73%** Agree

Disagree **34%** 2020 Covid **66%** Agree

Looking forward it is likely that lower-paid, entry-level jobs will disappear through automation. But information workers too will be affected; for example, Microsoft is replacing dozens of contract journalists with AI systems, in a move to save money and streamline content curation.

Our view is that changes will be incremental with the increased atomisation of roles into tasks. It will be tasks, rather than whole jobs, that will disappear. Over time organisations will become increasingly peppered with roles that are partially automated, and when someone leaves their role, the opportunity will arise to merge it with another role. This is the hidden side of automation that does not grab the headlines but is happening here and now. We are already living in an automated world.
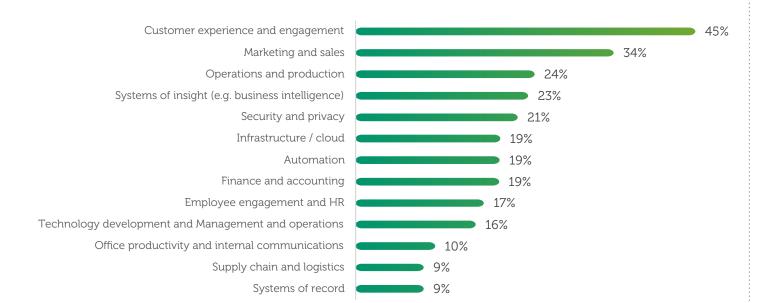
Exotic new roles being created

Our respondents state that most roles being created to support digital transformation in the post-pandemic reality are in the realm of data analytics and automation, but there are also some more colourful roles being created...

What new roles are you seeing created?

Technology Trust Builder
Feelgood Manager
Conversation Specialist
Chat Whisperer
Happiness Officer
Omniskilled Technocrat
Data Curator Robot Overlord
Growth Hacker
Robot Shepherd
Chatbot Manager
Livecycle Manager

Areas attracting most business-managed IT investment

Area	Percentage
Customer experience and engagement	45%
Marketing and sales	34%
Operations and production	24%
Systems of insight (e.g. business intelligence)	23%
Security and privacy	21%
Infrastructure / cloud	19%
Automation	19%
Finance and accounting	19%
Employee engagement and HR	17%
Technology development and Management and operations	16%
Office productivity and internal communications	10%
Supply chain and logistics	9%
Systems of record	9%

Technology investment still in the shadows

This year's research shows that technology leaders' approach to encouraging or discouraging business-managed IT spend is broadly similar to last year and digital leaders remain twice as likely to encourage it, especially in the front office. Seventeen per cent have no spend controlled outside the technology department and 23 per cent have more than a quarter of spend managed outside the IT function.
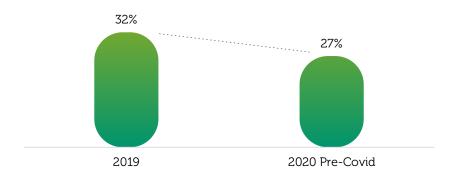
When it comes to the IT department's influence on decisions around business-managed IT spending, just over half (57 per cent) have significant influence and are formally part of the sign-off process; this increases to 67 per cent of digital leaders. Just over a third of all technology leaders (37 per cent) have influence but not direct sign-off, and 6 per cent have no influence over it at all.

While for many organisations business-managed IT is a difficult area to manage, what we are seeing in digital leaders is their positive approach; business-managed IT is helping their organisations make the right decisions and source the right skills to fulfil them. IT and business functions recognise that they can greatly improve customer and business outcomes, lower risk and innovate faster if they work together. This is significant given that our research shows that almost one in three (29 per cent) believe that the pandemic has permanently increased investment in business-managed IT.

Cyber-security: the attack surface now includes the kitchen table

This survey has tracked the rise of cyber-crime for many years and it worries both us and you. Last year we reported rare positive news that as the board's attention to cyber-crime grew and investment increased, cyber-attacks had topped out and started to decrease. In responses collated before the pandemic, major attacks had fallen yet again.

Major cyber-attacks in the last two years
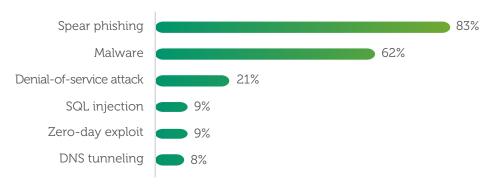
32%
27%

2019
2020 Pre-Covid

Unfortunately, no amount of board attention could have predicted, or compensated for, the unexpected mass relocation of office workers from the safe shores of their corporate network to studies, bedrooms and kitchen tables all over the world. Eighty-six per cent of respondents moved a significant percentage of their workforce to remote working. The attack surface of organisations has therefore expanded exponentially.

It is therefore unsurprising that on top of the existing challenges technology leaders face with cyber-crime, our research shows that more than four in ten (41 per cent) have experienced an additional increase in cyber-security incidents due to remote working. It is worth noting that this figure could be much higher if all employees were admitting to or even recognised every breach, and technology leaders were not just self-reporting. Organisations have rushed to adopt new systems that they may have had little experience in using and without the necessary in-house skills. It is no surprise that cyber-security expertise has become the most in-demand skill set of 2020, and with cyber risks increasing, companies will increasingly turn to outsourced or managed services to help keep their systems robust against attacks.
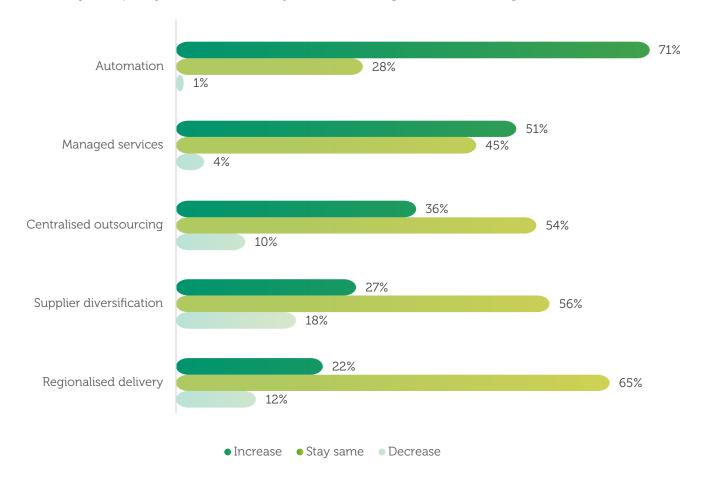
Spear phishing on the rise

Areas where cyber-attacks have increased as a result of Covid-19

Attack type	Percentage
Spear phishing	83%
Malware	62%
Denial-of-service attack	21%
SQL injection	9%
Zero-day exploit	9%
DNS tunneling	8%

Three-quarters of respondents have indicated that the attack surface and importance of cyber-security has increased as a result of Covid-19. But how has the attack surface changed? Judging by the big jump in spear phishing and malware attacks, it appears that the growth in risk has come mainly through insider threats against newly remote-working employees. This implies that the focus need not be on technically securing the perimeter but instead on educating people inside the organisation.

How do you expect your service delivery model to change for the following activities?

Automation
- 71% (Increase)
- 28% (Stay same)
- 1% (Decrease)

Managed services
- 51% (Increase)
- 45% (Stay same)
- 4% (Decrease)

Centralised outsourcing
- 36% (Increase)
- 54% (Stay same)
- 10% (Decrease)

Supplier diversification
- 27% (Increase)
- 56% (Stay same)
- 18% (Decrease)

Regionalised delivery
- 22% (Increase)
- 65% (Stay same)
- 12% (Decrease)

● Increase ● Stay same ● Decrease

Automation: the solution to efficiency?

Five years ago, automation was barely considered as part of the service delivery model. Today, it appears to be the answer to many things with 71 per cent of respondents anticipating its increase. Technology leaders appear to be farming out where possible and then automating as much as they can of what they control in-house. Technology leaders want to make their supply chain frictionless, increase velocity and lower cost. Automation is a key enabler of that.

The pandemic placed a huge strain on supply chains and supplier ecosystems. Organisations have realised these ecosystems were so broad that they became weakened under the strain. Our respondents tell us that they are changing their mix of suppliers and are now focusing on improvements through centralised outsourcing, which may be a win for big company suppliers with their multi-fit and risk-bound propositions.

Interestingly, digital leaders – those organisations that feel their digital strategy is 'very' or 'extremely' effective – are more likely to be increasing their supplier diversification (31 per cent) compared to the global average (26 per cent). Organisations will put a lot of effort into bolstering business continuity to reduce the impact of future disruption in supply chains. Advanced analytics in real time will be important in highlighting what is coming in and whether it is being shipped out.

Technology Leader Viewpoints

Victoria Higgin
Group Chief Information Officer, Highways England

Xiaojun Tu
EVP, China Union Pay

Baron Unbehagen
CIO, Encino Energy

Linda Davidson
Global Transformation Director, GroupM Data & Technology

Nathan Marsh
Chief Digital Officer, Costain Group Plc

Jingyao Li
CIO, China Resources Vanguard

What's keeping you awake at night?

Apart from the obvious (cyber-security!), ensuring the team and I are always adding early value and putting user experience at the centre of everything we do; if you make it hard, people won't use it or they'll work around it causing other issues for us to deal with.

Victoria Higgin

Apart from my husband's snoring? What's keeping me awake is how we ensure that the use of AI and ML is ethical and inclusive. I have just finished reading 'Invisible Women: Exposing Data Bias in a World Designed by Men' by Caroline Criado Perez and 'Automating Inequality' by Virginia Eubanks. Both fascinating reads.

Linda Davidson

Firstly, I am anxious that the work we are doing really does help secure and optimise increasingly digitally connected UK national infrastructure assets against attacks, breaches and interoperability risks. I realise operational performance and affordability are vital factors, but these can often come a sudden second if the asset, scheme or project can be interdicted, bringing immediate losses and also slower re-adoption post-breach.

Secondly, we are working hard to develop and use consistently applied standards for data structure, use, interoperability, visualisation and valuation. The full picture that data can bring us helps to get the best from infrastructure delivery and optimised operations. With no shortage of data, we need to make time to ensure it brings accuracy and helps us pre-emptively manage risks and leverage future opportunities.

Lastly, the need to find the balance between increasingly prolific digitisation and ethics. As AI helps software make, or offer, more choices for us, then we have to ensure we are happy the underlying code is free from bias and does not steer the system or network's user interface to offer choices that can discriminate or restrict inclusion from, say, accessing a service or access to national infrastructure. This helps us drive social value and inclusive growth from the delivery and use of national infrastructure.

Nathan Marsh

Where do you see the biggest opportunity with technology?

The launch of 5G and the impact it will have on industry. I am excited about the possibilities, what a dream team 5G and supercomputing will be.

Linda Davidson

In my opinion, the deep integration of organisation culture reform, business process re-engineering and technology innovation and development is the guarantee for the efficiency and effectiveness of enterprise digital transformation.

Jingyao Li

Cloud has become the most mature foundational technology. At the same time, the cloud itself is constantly evolving, both in the technical aspects of high resiliency and availability, as well as the non-technical aspects such as the complexity of the cloud services and varied cloud operating models.

Xiaojun Tu

There is a massive opportunity to really drive system and network scale autonomy. This 'autonomy at scale' helps support human-led decision making, but leverages the advanced processing and analytics power of AI and quantum combined, including connecting robots to the cloud, giving them wider access to data sets to help newly autonomous systems assess options for project delivery and infrastructure asset optimisation. We are working with many of our clients through our digital PMO [project management office] services to get the mix right here, and this mix can bring increased delivery and operational confidence as systems run and improve themselves and the assets they oversee.

Nathan Marsh

What has been the most important thing to you in responding to the Covid-19 crisis?

When the executive team asked me if we could move the workforce to 100% remote operations by Monday, I told them that we already had the capability because everything was in the cloud.

Baron Unbehagen

From a people perspective, it was about understanding that it's not 'normal' working from home, everyone had a situation going on in the background; from children being at home, worrying about dependants, illness, job loss or loneliness, all while trying to put a game face on and work where possible. It was my job to keep the business running with the technology needed in the best most frictionless way possible.

Victoria Higgin

Without sounding like a 70s self-help book, compassion, forgiveness and assuming positive intent. There have been some intense moments for sure, both at home and with colleagues. Hanging onto those three principles has been really helpful.

Linda Davidson

The sudden Covid-19 in 2020 not only accelerated the progress of digital transformation of traditional retail industry, but also predicted that digital transformation is the key battle for the survival of traditional retail industry in the future!

Jingyao Li

What advice would you give your younger self?

Prioritise and focus, you can have it all, but you don't have to do it all.

Victoria Higgin

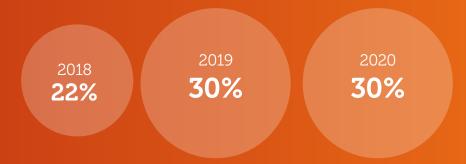You're not an imposter waiting to be found out, the negative voices are the imposter.

Linda Davidson

This is a piece of advice I learnt in my sporting and military career and it applies equally today – make sure that every person you speak with knows they are the most important thing in your day at that time. They get the very best of you, and you get the very best of them – just a brilliant combination.
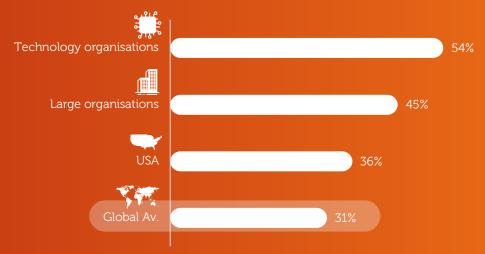
Nathan Marsh

3. Driving Business Performance through Technology

Respondents that identify as digital leaders

2018
22%

2019
30%

2020
30%

Where are the digital leaders?

Technology organisations	54%
Large organisations	45%
USA	36%
Global Av.	31%

Overall, how effective has your organisation been in using digital technologies to advance its business strategy? Very effective or Extremely effective

Digital leadership is a moving target

Digital leaders are those organisations that are 'very' or 'extremely' effective at using digital technologies to advance their business strategy. After an initial jump from 2018 to 2019, the proportion of respondents identifying as digital leaders has stayed the same as last year.

As technologies change, being a digital leader is a moving goal. This year's digital leaders may look relatively stagnant unless they are leveraging the latest technology and responding with agility. Effective digital leaders outperform in every one of five meaningful business measures. They think about technology differently and correlate business performance to it.

Currently, how does your organisation perform relative to its competitors on the following metrics? Significantly better

- Customer trust — Digital leaders 24%, Others 12%
- Employee experience — Digital leaders 16%, Others 5%
- Customer experience — Digital leaders 21%, Others 7%
- Time to market for new product or service offerings — Digital leaders 16%, Others 3%
- Operational efficiency — Digital leaders 16%, Others 4%

● Digital leaders   ● Others

Thinking about your most successful digital offering to customers in the last 12 months, how effective was it at the following? Very / Extremely effective
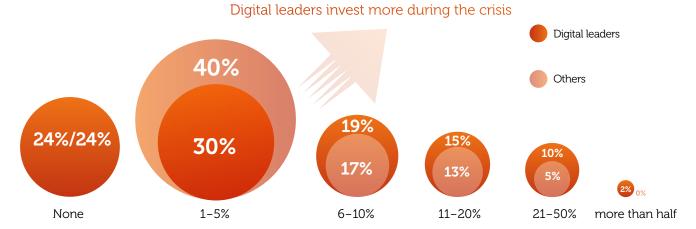

- Improving satisfaction/experience — Digital leaders 73%, Others 34%
- Enhancing your brand — Digital leaders 66%, Others 32%
- Collecting valuable data — Digital leaders 64%, Others 33%
- Improving customer loyalty — Digital leaders 60%, Others 26%
- Increasing revenues — Digital leaders 56%, Others 16%
- Increasing profits — Digital leaders 51%, Others 15%
- Increasing the worth of the company (e.g. stock price) — Digital leaders 51%, Others 16%

● Digital leaders   ● Others

Digital leaders perform better

Their specialised lens on technology ensures that their digital offerings to their customers bring dramatically improved business benefits to their organisations.

Half of digital leaders report being 'very' or 'extremely' effective at bringing a long-term product mindset to technology implementation compared to just 16 per cent of their peers. They are also significantly better at tailoring the IT operating model to run at the right pace for all stakeholders.
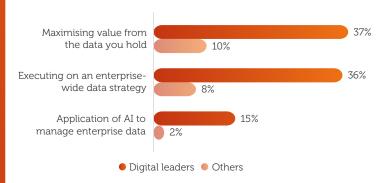
A growing digital divide

Digital leaders invest more during the crisis

- Digital leaders
- Others

24%/24% None

40% / **30%** 1–5%

19% / **17%** 6–10%

15% / **13%** 11–20%

10% / **5%** 21–50%

2% 0% more than half

How much additional technology expenditure has there been to deal with the Covid-19 crisis during 2020?

During the pandemic digital leaders are more likely than others to have increased their IT spend by more than their peers, but what are they going to be spending it on? Digital leaders are often characterised as connected enterprises: organisations that truly integrate their front-, middle- and back-office functions through technology. Digital leaders are focused on acting like a world-

class technology company, even if they are not one. By reading the signals of change in the market and embedding emerging technologies before their peers, they are more agile, robust, and able to release products and services at market speed. Digital leaders will surely be looking to get themselves grounded in the new reality faster than everyone else and capitalise on their advantage.

Digital leaders are nearly four times as likely to maximise the value of their data effectively than others and while many organisations have a data strategy, digital leaders are four and a half times more effective at executing against it. This digital divide is bound to grow. But how are they doing it?

Digital leaders are committed to managing data as a critical asset, one of the strategic crown jewels of the organisation. We have found that they have clearly established data accountabilities across the C-suite and have clarity on what answers they are seeking. They also understand that data must be available to anyone within the context of their role and are world-class at engineering data marketplaces and leveraging APIs. Those who have already started to make scale investments in advancing technologies such as AI will continue to do so. Those who are yet to begin may now be unable to with capital constraints. There will be clear winners and losers.
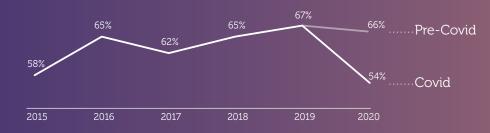
How effective is your organisation in each of the following? Very effective + Extremely effective

Maximising value from the data you hold
- 37%
- 10%

Executing on an enterprise-wide data strategy
- 36%
- 8%

Application of AI to manage enterprise data
- 15%
- 2%

● Digital leaders ● Others

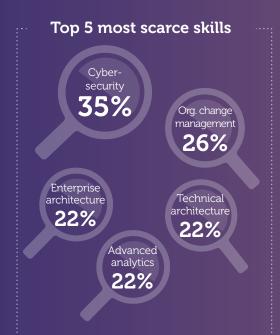# Cyber-security at the heart of customer trust

Technology leaders have the important and wide remit to keep their organisations secure and compliant, but with the unprecedented shifts and change resulting from Covid-19 around business models, digital strategy and ways of working, cyber-security can sometimes become a secondary priority. However, technology executives need to look no further than the board priorities in this survey to see that security and privacy remains the number one priority investment area.

Digital leaders excel at delivering customer trust, being more than twice as likely to embed risk, security and assurance management activities across the IT life cycle. For example, just over half (52 per cent) of digital leaders report being 'very' or 'extremely' effective at embedding risk and security into the front end of the IT project life cycle compared to only 22 per cent of other technology leaders. The result is increased quality, reduced incidents, heightened customer satisfaction and strengthened brand integrity.

4. Resourcing the Technology Team

Organisations where a skills shortage is holding them back

58% — 2015
65% — 2016
62% — 2017
65% — 2018
67% — 2019
66% ······ Pre-Covid
54% ······ Covid — 2020

| 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |

Top 5 most scarce skills

Cyber-security
35%

Org. change management
26%

Enterprise architecture
22%

Technical architecture
22%

Advanced analytics
22%

Top factors in engaging / retaining talent

1
Strong culture & leadership

2
Good remuneration

3
Career progression opportunities

4
Work location and remote work

5
Training, development & reskilling opportunities
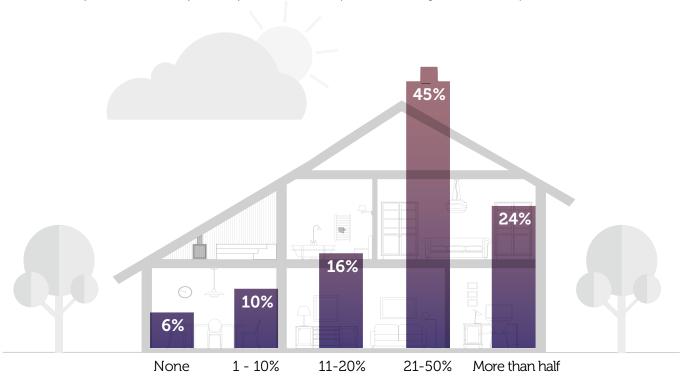
Perennial shortages even in a pandemic

Pre-Covid, skills shortages reported in our 2020 research remained close to an all-time high. Subsequently, we have seen shortages drop, but unlike in the 2008 recession not by a great amount. If there is a lesson to be learnt from the pandemic, it is that demand for technology and its practitioners has remained robust. The roles are permanent ones, with less than a quarter of respondents (24 per cent) using more flexible labour as a result of the crisis, although a quarter of technology leaders who outsource, offshore or use managed services do so to plug the skills gap.

Cyber-security skills remain the most sought-after skill for technology leaders, especially in the cloud and data security space. Prior to the pandemic, only 19 per cent of technology leaders reported that they were 'very' or 'extremely' effective at ensuring that non-IT staff have the right technology skills and, while we did not ask the question in our 2020 Covid survey, it would be interesting to see if this metric has seen a dramatic upswing. Businesses are asking themselves whether they have the right teams and mix of skills for this new way of working. This goes all the way to the top, including 'Do we have the right CIO?'.

In this new reality, organisational shifts and new ways of working have changed so dramatically it is unsurprising that organisational change management skills are now prized in second place. Prior to the pandemic, organisations struggled to carry the cost of change management.

A massive surge in home working

Proportion of enterprise expected to work predominantly from home post Covid-19

None	1 - 10%	11-20%	21-50%	More than half
6%	10%	16%	45%	24%

Eighty-six per cent of our respondents have moved their workforce to remote working and many people are likely to work largely from home for at least the next six to nine months. For most workers, homeworking has been thrust upon them for the first time. In the UK, data from the Office for National Statistics shows that just 5 per cent of the active 32.6 million UK workers considered their home as their main place of work in 2019. Seventy per cent of workers had zero experience of working from home prior to social isolation measures. According to recent Gallup research,[2] 62 per cent of employed Americans currently say they are working from home during the crisis.

Managing a remote team is a wholly different prospect to working together in-house. How do technology leaders track performance metrics and measure their teams' contribution when they are out of immediate sight and sound? Productivity spiked initially through working-from-home, but when speaking with technology leaders, there is a sense that this has begun to wane.

Just 6 per cent of our respondents anticipate that they will have no staff working from home after the pandemic. Almost a quarter of respondents think that the majority of the workforce will predominantly be working remotely post-Covid. People will generally return to offices when it is safe to do so, but there seems little doubt that nearly all of us will spend more time than before working remotely, especially in roles where there has been no loss in productivity for doing so. In time, it is likely that the term 'remote' will be dropped altogether. 'Remote' suggests there is a place to be remote from: a hub, an HQ, a centre. But rather like the migration of our technology to the cloud, the migration of people away from the office has removed that sense of location – possibly for ever.

2. https://news.gallup.com/poll/311375/reviewing-remote-work-covid.aspx

Making a new deal with employees

In a crisis, people will naturally look for guidance and security from their line management. It perhaps is not surprising then that strong culture and leadership is the top factor in engaging and retaining technology talent – more important than good remuneration.

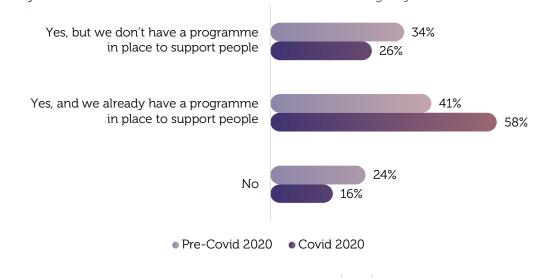| 1 Strong culture & leadership | 2 Good remuneration | 3 Career progression opportunities | 4 Work location and remote work | 5 Training, development & reskilling opportunities |

Top factors in engaging / retaining talent.

With remote working proving more successful than many anticipated, companies are beginning to open their eyes to the idea that any location is possible, that their potential talent pool is worldwide. But in a world where physical location matters less, organisations increasingly need to differentiate themselves in new ways. It requires a different mindset and approach to recruit, retain and develop staff in a world where a physical office – with its grand buildings, free lunches, table football and (for the energetic few) running tracks – are not a major attraction of the role. It is no surprise that we report how culture has become more important.

Millennials also require something different to attract them to an organisation. Are digital leaders engaging in the right way with this target audience? They appear to be focusing on the here and now of remote and flexible working more than on the promise of future career progression opportunities.
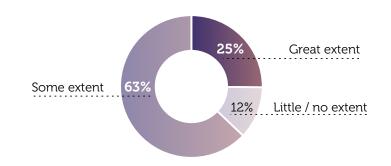
Taking care of the team

Covid-19 has had a dramatic effect on everyone's mental well-being. Those who have continued in their roles have experienced a wave of pressure both from the job and its changing demands on them and externally through personal, emotional or financial consequences of the pandemic. In a recent KPMG study of the American worker, research found that 25 per cent of respondents feel that they are undervalued, which creates negative consequences for employers, including reduced productivity, loyalty and collaboration. Furloughed staff will be suffering a plethora of consequences from their enforced inactivity. Technology teams have been working flat out to keep their organisations running and creating new support mechanisms for the workforce but probably have not been looked after themselves. Technology leaders are under pressure to provide more pastoral support for their teams as well as looking after the changing operational needs of the business.

Are you concerned with the mental health and well-being of your team?

Yes, but we don't have a programme in place to support people
- 34%
- 26%

Yes, and we already have a programme in place to support people
- 41%
- 58%

No
- 24%
- 16%

● Pre-Covid 2020   ● Covid 2020

To what extent do your current ways of working promote a healthy, sustainable environment – both physically and mentally – for your workforce?

- 25% Great extent
- 12% Little / no extent
- 63% Some extent

The mental health challenge

Unlike previous recessions, this crisis is both business and personal in nature and the cause of stress can come from almost anywhere. Moreover, it is harder to detect. A smiling face on a video call can hide many things that would have been picked up during an informal chat at the watercooler. Unsurprisingly, 84 per cent of technology leaders report they were concerned with the mental health of their team. Encouragingly, during the pandemic more leaders report that they have put in place programmes to support their people. Perhaps even more encouragingly, in the knowledge that everyone has faced some kind of challenge in the last few months, the simple act of asking 'How are you?' has become more widespread. Over the years, mental health has been a growing concern in technology teams, but it may be one of the few positives of this crisis that it could now be getting more of the attention it deserves.
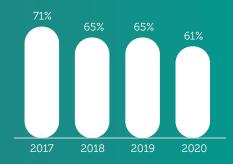
Rethinking what is important

In recent years, the narrative has been the increasing importance of innovation, outward-facing and business-focused teams. This has often been at the expense of inward-facing teams focused on infrastructure. In many ways the crisis has served to flip this, albeit possibly temporarily. Those people focused on supporting and enabling the workforce, from setting up services on cloud through to getting people at home set up for the first time with a laptop, have almost taken on the status of 'key workers'. Many hours, and nights, have been worked. Many organisations have been surprised by how smoothly the process happened.
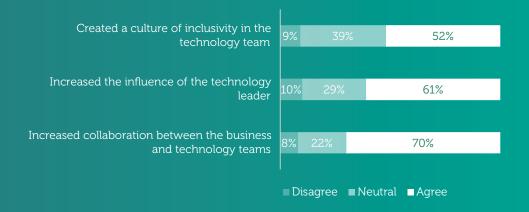
Right now, we are not fully in the post-pandemic reality. People will eventually return in part to their physical offices, schools will open, clubs will welcome their members back and life will inch back towards normality. This is necessary and important, but we must not lose all the good things this new way of working has opened up to us. As we attempt to stamp out the virus, we must also stamp out the harmful working practices that have held back so many people in the past. What must start and what must stop? This is the time to make a step change in corporate cultures.

5. Being a Technology Leader

Executive team membership for CIOs

- 2017: 71%
- 2018: 65%
- 2019: 65%
- 2020: 61%

To what extent do you agree / disagree with the following statements? The Covid-19 crisis has permanently resulted in the following:

Statement	Disagree	Neutral	Agree
Created a culture of inclusivity in the technology team	9%	39%	52%
Increased the influence of the technology leader	10%	29%	61%
Increased collaboration between the business and technology teams	8%	22%	70%

■ Disagree ■ Neutral ■ Agree

Thank you to all the leaders

There is no denying that the pandemic has opened everyone's eyes to the fundamental importance of technology: the people who have enabled remote working, those who have opened online channels, the video conferencing, the analytics of Covid-19 facts, social media support groups, distance learning, telemedicine, test analytics and shopping delivery slots. Less visible outside the business, but pivotal and juggling them all, is the technology leader. In our lifetime there have never been more high-pressure, high-profile roles for technology teams. Strong leadership is now cited as more important than money for engaging and retaining key technology talent. More than half of our respondents (57 per cent) feel that their CEO is highly committed to promoting the potential of technology within their organisations.

If you are a CIO, IT director or any other 'traditional' technology leader, you may look at the chart opposite and be a little concerned. While the downward trend for actual board membership of our CIO respondents appears to continue, almost two-thirds of CIOs, three-quarters of CTOs and 63 per cent of CDOs still represent technology at the main board. We also report that technology leaders are reporting a surge in influence, as we will see shortly. Worryingly, in one in ten organisations, technology is not being represented at board level at all.

One thing is for sure: technology is more important than ever and an integral part of the core strategy of the enterprise. However, the ownership of technology is becoming more distributed. CMOs own technology, COOs own technology and MDs own technology. In fact, if you added all of this ownership together you would have one of the most important roles in the organisation! The power comes from the distribution.

5 things to consider for the mental health of your team

1 Recognise its importance. Right now as many as one-quarter of your team are having mental health challenges beyond just having a 'bad day', and it may be affecting their personal and work life.

2 Mental health is not an 'initiative'. It needs to be embedded in the nuts and bolts of how your business operates on a day-to-day basis. A good place to start is in your own communication with your direct reports. Start small, and grow.

3 Talk about it. By encouraging people to open up, and by opening up yourself, you will be making discussions about mental health much more 'normal'; just as they should be. The current crisis has affected just about everyone and this is an excellent chance to get everyone talking about their experiences.

4 Use the free tools available. There are some excellent tools on the web, many published by charities, or supported as government initiatives. Review these and make it easy for your people to find the best and most relevant ones.

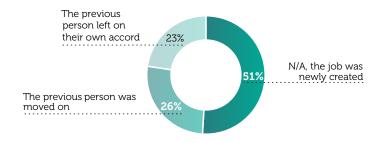**5** Never underestimate the importance, or effectiveness, of simply asking 'How are you?'

An influential role

There appears to be a significant jump in perception of the importance of technology leaders. They are the ones who are facilitating the rest of the business to be able to work in any capacity at all. Sixty-one per cent of our respondents agree or strongly agree that the pandemic has increased the influence of the technology leader. This is in direct contrast to the 2008 recession, where the influence of the technology leader dropped.

During the crisis, the value of the technology leader has been driven by them leaning on their traditional role of delivering the networks and the infrastructure. Over recent years this has been the more 'unfashionable' end of the role. It will be interesting to see just how much of this increased importance will remain when the world gets back to the post-pandemic reality.

Technology leaders are being consulted more than ever before. They may have traded position for influence, and many are flourishing as a result. The question is, after the elevated importance that has come from the crisis, can they keep it?

How did your current position become available?

The previous person left on their own accord — 23%

The previous person was moved on — 26%

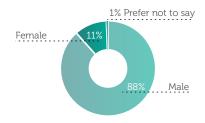N/A, the job was newly created — 51%

It can be tough at the top

In responses completed before Covid-19, more than half of our respondents stated that their role was newly created (51 per cent). This is true for a third of CIOs and two-thirds of CTOs. Twenty-six per cent of technology leader roles were created because the previous person had been moved on, a greater figure than those who left on their own accord. It is tough being a technology leader.

Bringing out the best in people

While the crisis has created physical remoteness, it has had a positive effect on team cohesion, collaboration and inclusivity. Of our respondents, 70 per cent agreed or strongly agreed that it has increased the collaboration between the technology team and the business, and more than half (52 per cent) say it has created a culture of inclusivity within their teams. Face-to-face networking, both formal and informal, has disappeared and the connection and relationship benefits these supported with it. Bars, clubs and social 'offline' discussions have been replaced with Zoom, WebEx and Teams.
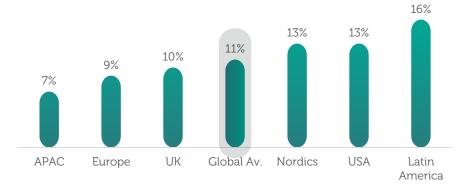
The world needs female leaders

Participation in the survey by gender

1% Prefer not to say
Female 11%
88% Male

The diversity of technology leaders broadly remains unchanged from last year's survey although there are some interesting regional differences. In Latin America 16 per cent of technology leaders are female compared to only 10 per cent in the UK. Presumably, this is the reward for being a growing hub for female STEM entrepreneurs and actively running multiple programmes to get women into the world of technology.

Female participation by region

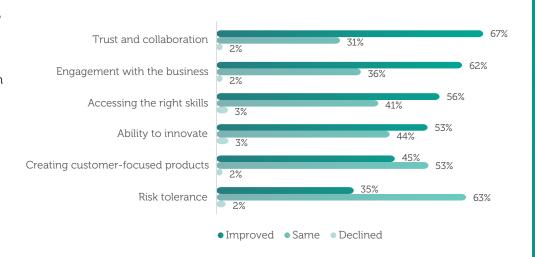| APAC	Europe	UK	Global Av.	Nordics	USA	Latin America
7%	9%	10%	11%	13%	13%	16%

Women are as likely as their male peers to be a member of the board but they are less likely to report to the CEO, one in three women compared to two-fifths of men. The scarcity of female technology leaders is a symptom of wider problems with how leaders are selected, promoted and mentored. If technologies such as AI are to be effective, then they must eradicate biases including gender. If we cannot do this ourselves, how do we teach machines? Only 24 per cent of our respondents feel that their organisations are very successful at promoting diversity and inclusion within the technology team.

Research has long since hailed the promotion of diversity as a good thing and our research this year adds further proof to diversity driving improvements in a number of soft metrics. Sixty-seven per cent of respondents feel that being successful at promoting diversity has improved trust and collaboration in the technology team and improves access to the right skills. Diversity has had a beneficial effect on all markers but to a lesser extent on risk tolerance and creating customer-focused products. This is interesting given that diverse teams are expected to have more insight and empathise with the customers in terms of values and culture. Are organisations making the best use of the insights available from their teams?

Promoting diversity delivers benefit

As an organisation that is 'very successful' at promoting diversity, what effect has this had on these aspects of your technology team?

	Improved	Same	Declined
Trust and collaboration	67%	31%	2%
Engagement with the business	62%	36%	2%
Accessing the right skills	56%	41%	3%
Ability to innovate	53%	44%	3%
Creating customer-focused products	45%	53%	2%
Risk tolerance	35%	63%	2%

● Improved ● Same ● Declined

While diversity is about far more than gender, the crisis should act as a catalyst for more equal opportunity and tolerance for people with childcaring responsibilities. Women, in the main, have frequently been held back in their careers by family and caring duties and their negative connotations. The pandemic has shown that while it remains difficult to juggle both work and caring from home, flexible workers can be highly productive – and having a child or pet invade a video conference has become an amusing hint at the real life of people, rather than the embarrassment it might have been in the more formal world before the pandemic.

At least some good things have come from this crisis!

KPMG Special Report
IT in the New Reality

KPMG

Not long ago, technology leaders everywhere were scrambling to keep pace with the accelerating speed of digital business transformation. Then, Covid-19 came along and everything changed…or did it?
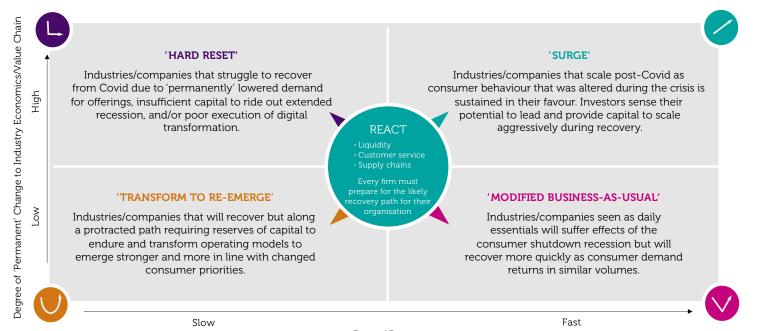
During the height of Covid-19, the drivers of IT were clearly reordered: often, it was simply about helping the business survive.

Now, many of the 'old' imperatives have returned, with a list of priorities that was also mirrored in the latest KPMG Global CEO Outlook survey: efficiency, security, innovation, insights, enabling new ways of working. But the landscape is vastly more complex – and accelerated – than before.

Steve Bates, Principal at KPMG in the US and Global Lead at KPMG's CIO Center of Excellence, says: "IT in the new reality is likely to be shaped by economic recovery patterns unique to each sector, country and company. For the foreseeable future, the Future of IT is not a one-size-fits-all story. However, one thing does remain consistent – the urgency to act decisively."

Organisations fall into four main recovery patterns. However, it is quite possible for enterprises with multiple geographies or lines of business to find themselves in more than one simultaneously: a mark of the complexity of the legacy of Covid-19.

Four economic recovery patterns

Degree of 'Permanent' Change to Industry Economics/Value Chain

High / Low

'HARD RESET'
Industries/companies that struggle to recover from Covid due to 'permanently' lowered demand for offerings, insufficient capital to ride out extended recession, and/or poor execution of digital transformation.

'SURGE'
Industries/companies that scale post-Covid as consumer behaviour that was altered during the crisis is sustained in their favour. Investors sense their potential to lead and provide capital to scale aggressively during recovery.

REACT
• Liquidity
• Customer service
• Supply chains

Every firm must prepare for the likely recovery path for their organisation

'TRANSFORM TO RE-EMERGE'
Industries/companies that will recover but along a protracted path requiring reserves of capital to endure and transform operating models to emerge stronger and more in line with changed consumer priorities.

'MODIFIED BUSINESS-AS-USUAL'
Industries/companies seen as daily essentials will suffer effects of the consumer shutdown recession but will recover more quickly as consumer demand returns in similar volumes.

Slow — Fast
Pace of Recovery

1

"The concept of seeing business and digital strategy as two different things has become old fashioned."
Dominic Wheeler, CIO, Swire Coca-Cola

Hard Reset

Hard Reset companies are in for a protracted challenge, and may need cash and new strategies to reposition for the new reality. Companies in this quadrant – many of whom will be in the real estate, leisure, hospitality and transport / travel sectors - may struggle to recover from COVID-19 due to permanently lowered demand for offerings, insufficient capital to ride out an extended recession, or poor execution of previous digital transformation attempts. Hard Reset firms may not have the right mix of skills and capabilities to emerge successfully into the future and, according to KPMG research amongst HR leaders globally, 35 per cent of employers are looking to transform learning and upskill the workforce accordingly. Without a clear strategy that emphasises reduction in cost and elimination of inefficiency, Hard Reset firms will likely struggle to remain viable.

CIO actions:

- For the IT organisation, the immediate primary driver will be the need to survive through cost cutting and removing fixed capacity, requiring significant changes to the business and IT operating models.

- Beyond this immediate focus, building a tangible, executable plan to create sustained cost optimisation is essential. It is about understanding what is 'keepable' and may return versus what needs to be cut or scaled back permanently.

- Hard choices may also need to be made around workforce shaping – what are the optimal roles to retain, what can be automated, and what is best served through outsourcing or buying as a managed service? IT leaders must assess the capabilities of current staff to ensure the right mix of skills exists within the organisation.

Transform to Re-emerge

This is undoubtedly the majority recovery pattern, applying to a mass of businesses across sectors and geographies. The nature of their business model is still sound – but the way that customers want to engage with them has changed. There is a renewed urgency to transform their operating models accordingly, with a redefinition of expectations in how customers will engage, buy and consume their products and services. Already, 80 per cent of CEOs in KPMG's Global CEO Outlook survey said that more digital acceleration had occurred within the last few months than in the previous few years. Significant investment is likely to be needed in enabling technologies such as AI, payments, integrated platforms, and automation. The road to the new reality is likely to be a prolonged journey requiring reserves of capital and committed focus.

CIO actions:

- Initiatives need to be prioritised according to critical business and customer outcomes. The IT transformation programme should be tuned to connecting the enterprise end-to-end and avoid sub-optimised or incremental investments.

- Creating a modern digital backbone and technical capabilities should be key, utilising cloud and emerging enabling technologies. Only in this way can it be possible to modernise customer channels, supply chains and mid-office systems.

- Service operations must be cost-effective, frictionless and digital-native. But many organisations are chained to highly customised or legacy IT Ops tools. Modernising the applications stack using low/no code platforms and modern APIs is essential.

Modified Business-as-Usual

While no sector, company or region has been left untouched by Covid-19, for some there has been a less dramatic impact. Organisations within Modified Business as Usual are commonly 'essential' businesses such as government, utilities or financial services, certainly suffering the effects of the consumer shutdown, but which should recover more quickly as consumer demand returns. Like others, they have seen shifts in how customers want to interact with them and as a result will need to accelerate their digital transformation. Many in this space have already been aggressive in their transformation agendas – the challenge now is not to fall back.

CIO actions:

- The accelerated shift to new channel strategies has driven an explosion in new front-office applications, analytics solutions and cloud platforms – but with little thought to sustainability, supportability, cost and integration. It is key to understand what are 'good costs' that position the organisation for future growth, and legacy investments where hard choices need to be made to pivot into new propositions.

- Understanding changing consumer preferences is critical. But internal data sets alone will not suffice – mastering data across the ecosystem is an imperative. External-facing tools using machine learning and natural language processing are needed to accelerate and augment decisions that drive profitable growth.

- To be responsive to customer expectations and run at market speed, IT needs to mature much faster than in the past with modern delivery solutions, shifting from projects to products, scaling agile ways of working, and committing to automating core IT processes across the technology life cycle.

Surge

Some organisations have been fortunate enough to see an expansion in consumer demand as a result of Covid-19. However, even as they have benefited, Surge companies also need to sustain their growth or risk losing momentum. One significant challenge is rapidly scaling to meet expanding demand while staying in touch with evolving customer preferences and market conditions. To help do this, KPMG's CEO Outlook research also shows that 70 per cent of CEOs are getting personally involved in expediting technology investment decisions. For IT, this means accelerating digital business transformation by delivering the capability to continuously understand consumer preferences and patterns via advanced analytics, automate and remove friction from the supply chain, quickly industrialise modern ways of working, and automate large portions of both IT and the business.

CIO actions:

- Scaling AI capabilities is essential in order to accelerate strategies for intelligent automation, cost management, growth, customer engagement, and risk and regulatory policy.

- Decision rights and governance surrounding technology investment need to be streamlined and elevated in order to expedite the process. Frequent, focused reviews of the demand pipeline and investment portfolio should catch poorly performing projects and services early.

- Sudden growth can be a problem. Inundated with customer and employee service requests, a spike in major incidents, and increased change and enhancement volumes, IT operations are struggling to keep pace. Sophisticated service management capabilities are needed that deliver enterprise-ready solutions.

"After pulling off what most considered the impossible, IT is now turning its eyes from the triage and stabilisation of the disrupted enterprise towards recovery and enabling a new reality. In what promises to be a much more economically challenged, but digitally connected world, the CIO is facing a dilemma of how to deliver digitally native capabilities, while containing costs, skilling up and running lean.
Steve Bates, *Global Lead, KPMG CIO Center of Excellence*

"Data as an asset must become part of your corporate culture. Mastering your data, defining ongoing data ownership and increasing everyone's data literacy are critical when trying to take advantage of things like automation and AI."

Baron Unbehagen,
CIO, Encino Energy

Rising to the challenge

The critical task is to focus ruthlessly on what really matters to business performance and assess how IT can facilitate and enable it. In every scenario, CIOs are faced with tough decisions on how to balance managing cost with increasing performance.

Those with mature tech capabilities – digital leaders – will naturally be in a stronger position and indeed one of the effects of the crisis will be a widening gap between these leader organisations and the rest.

Steve Bates says: "Those who have not yet started to meaningfully invest in automation and AI proof of concepts may now not be able to, while leaders forge ahead – an 'intelligence and automation chasm' forms."

Tech has never been more important to organisations' ability to survive and thrive. The good news is that while the urgency has changed, many of the CIO imperatives have not and understanding your organisation's specific pathway to recovery is key to emerging more competitive into the New Reality.

MIT CISR Special Report
How to get more value from digital

Stephanie L. Woerner
Research Scientist, MIT Sloan School of Management's Center for Information Systems Research

Peter Weill
Chairman and Senior Research Scientist, MIT Sloan School of Management's Center for Information Systems Research

Massachusetts Institute of Technology Center for Information Systems Research is one of the world's leading IT research organisations.

Many companies are trying to boost their performance using digital technologies and approaches. Getting business value from digital is a challenge – it is doable but requires vision and change across the enterprise. We collaborated with Harvey Nash to better understand value creation from digital, analysing data from 3,048 companies globally.

We found that the top quartile of companies on getting value from their 'most successful digital offering' were 74 per cent effective on getting hard (financial) value and 78 per cent effective on getting soft value. However, companies in the bottom quartile were only 16 per cent and 30 per cent effective at getting the hard and soft value. And some industries were better than others. For example, Technology, Advertising, and Telecommunications companies topped our measures of achieving hard benefits from digital, while Education, Construction/Engineering, and Manufacturing companies were the laggards. What are the top performers doing differently?

Value from a digital offering is a combination of hard (financial) and soft (improvements that are much harder to assess in dollars) gains. We asked leaders to think about their enterprise's most successful digital offering and describe the soft and hard benefits. The hard benefits were the sum of how the offering impacted three measures: increased revenues, increased profits, and increased worth of the company (e.g. stock price). The soft benefits were the sum of how the offering impacted four measures: improving customer satisfaction and experience, improving customer loyalty, collecting valuable data, and enhancing brand. On average, companies rated themselves as being more effective at achieving soft measures at 56 per cent than hard measures at 45 per cent. Soft value is an important future indicator of hard value – they are strongly correlated (r=0.67).

Two factors enabled getting value from digital: the 'extent to which the CEO and board are committed to promoting the potential of technology in the organisation' and 'the amount of influence IT has over the business-managed decisions around digital and IT spending'. Companies high on both factors were the most effective at getting value - see figure on page 37. CEOs and boards help set the environment for innovation in a company and send strong signals about what outcomes and behaviours will be valued. IT units with more influence do not necessarily control all of the IT and digital spending but do help identify what is possible and provide the enabling technologies and capabilities. Companies with more influential IT units have more of the spending on IT and digital in the IT budget (approximately 83 per cent) with the rest in the business unit budgets.

So how do the best IT units, based on this analysis, help their companies get value from digital? They:

1. Assist the business units to scale the good ideas and stop the poor ideas. Since this analysis is based on the enterprises' most successful offerings, other offerings will have lower value creation and likely should be culled earlier in the process. While soft value is important to companies – it's important to keep customers engaged and returning – companies need to figure out how to transition that soft value to hard value. The business area investment with the strongest relationship to hard value is marketing and sales.

2. Help educate their boards and executive committees on what is possible with digital and illustrate how senior executives and board members can support the company to create business value.

3. Govern new digital investments to identify likely successes and the associated technical and organisational challenges, while also providing enabling services.

4. Provide real-time dashboards to keep track of a project's hard and soft value creation, and identify poor-performing projects early. It is easy to claim customer stickiness and much harder to attribute revenues and profits.

5. Curate enterprise data. The real-time economy requires companies to change the way they make decisions: becoming faster, more automated and more evidence-based with built-in learning, and this requires a single source of truth across the enterprise.

Companies and investors are expecting to see more value from digital initiatives and IT units have an important role helping the company generate that value. Make sure your IT unit is up to the task!

IT's influence and commitment at the top help drive business value from digital

	IT Influence on Busines-managed IT & Digital Spending		
IT signoff required	Hard Value 40% Soft Value 52% 23% of companies	Hard Value 52% Soft Value 62% 34% of companies
No influence or advice only	Hard Value 36% Soft Value 47% 25% of companies	Hard Value 50% Soft Value 59% 18% of companies
	Minor extent	Great extent

Source: Harvey Nash / KPMG 2020 CIO Survey, Pre-COVID (N=3048). Differences among quadrants are statistically significant.

NashTech Special Report
Creating a 'talent cloud' supported by automation and data quality

NashTech is the Technology Services division of Harvey Nash Group.

The shift to remote working has been one of the defining features of the Covid-19 pandemic for businesses everywhere. It has changed the corporate landscape and, as this year's survey reveals, is no mere temporary blip. In one form or another, it is here to stay.

With this transformation, the location of people becomes much less important than before. Organisations will be able to draw from a wide – even global - talent pool, assembling virtual teams best suited for a task. Powered by connectivity and shared tools, team members will be able to collaborate seamlessly no matter where they are. The mix will be dynamic and elastic – permanent and contractor, onshore and offshore – breaking down traditional silos to tackle the challenges ahead.

After all, we are used to putting our IT systems in the cloud – so why not also build an agile 'talent cloud' of people?

However, this cloud won't consist only of human beings – robotics will be an increasingly important part of the talent array too. In this year's survey, more than seven in ten tech leaders expect automation to grow as organisations seek to optimise speed, efficiency and cost.

The use of robotics and AI is often presented as 'human versus machine' – in other words, as a threat to human roles and functions. But in fact, the best talent clouds will be the ones in which robotics and AI enhance what people can do – a collaboration, rather than a competition. As this year's report observes, AI is likely to replace specific tasks rather than complete roles – opening the way for a more effective partnership between person and machine.

Paul Hunt, Director at NashTech, says: "Technology is best used to support people, not replace them. A simple analogy is a self-driving car. The AI algorithms direct the car and make numerous decisions on an individual's behalf – but we want the human to be able to step in and take certain crucial decisions when needed."

In particular, AI can help the talent cloud by scanning and sifting through the vast stores of data that organisations now routinely generate and collect, presenting specific findings back to humans for informed decision making.

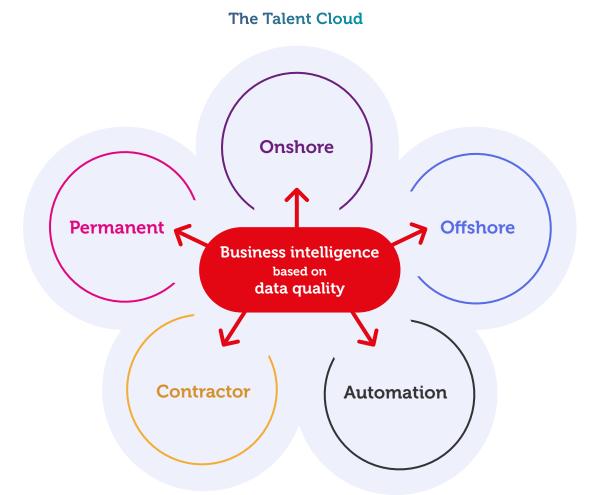This is only likely to become more important in the post-Covid era. Nearly half (47 per cent) of respondents believe that the Covid-19 crisis has permanently resulted in accelerated digital transformation and adoption of emerging tech (AI, ML, blockchain, automation). Seven in ten (71 per cent) plan to increase their use of automation for their service delivery model.

As we live and work more remotely from each other than before, our increased digital interactions will leave even more data trails behind them. The challenge for businesses is to extract the business intelligence from that data and use it for competitive advantage.

To do this, the quality of data is critically important.

Paul Hunt says: "You can't make good decisions based on bad data. An organisation may have a data lake that looks pristine from a distance – but if there is pollution under the surface, the data may not be usable."

It is no accident that the digital leaders identified in this year's report regard data as a critical asset and are four times more likely than others to maximise the value of their data effectively. This can only happen if an organisation has the right application solutions, cloud configurations, business processes and analytics capabilities in place.

The Talent Cloud

Many smart organisations create a virtuous circle where they use AI to help them manage data quality, running in the background and fixing errors and anomalies that it finds. This in turn provides the foundation for the business to leverage AI more effectively elsewhere in the enterprise.

Data quality is not only about machines, however. Big data may be too massive for humans to process and absorb, but individuals can play a small but important role in maintaining data quality. By capturing and entering it fully into systems, updating and curating it over time, people can have an effect. Every business needs a culture of data quality.

This report itself is in fact a collection of validated data points – by reading and consuming it, and sharing the findings or actions with your teams, you will be contributing to your own post-Covid 'talent cloud' and helping push forward better business intelligence based on data quality.

Welcome to the future!

NashTech is the Technology Services division of Harvey Nash Group.

www.nashtechglobal.com.

Key data points from across the world

Increased influence of the technology leader as a permanent result of Covid-19

Region	
South America	74%
Asia	66%
North America	66%
Australasia	62%
Global average	61%
Europe	56%

Expecting a budget increase in next 12 months

Region	
Asia	55%
North America	53%
South America	44%
Global average	43%
Australasia	41%
Europe	38%

Increase in cyber-attacks since remote working

Region	
South America	47%
Asia	45%
North America	45%
Global average	41%
Australasia	39%
Europe	38%

Over half of workforce will remain predominantly working from home post Covid-19

Region	
South America	56%
Australasia	51%
Europe	44%
Global average	43%
North America	42%
Asia	26%

Increased investment in business-managed IT as a permanent result of Covid-19

Region	
South America	55%
Asia	46%
North America	31%
Global average	29%
Australasia	22%
Europe	21%

Believe new roles created will more than compensate for old roles being lost through AI/automation over the next 1-2 years

Region	
South America	80%
North America	72%
Australasia	67%
Global average	65%
Asia	64%
Europe	62%

Concerned about team's mental health well-being

Region	
South America	89%
North America	88%
Australasia	88%
Global average	84%
Europe	83%
Asia	76%

Expecting an increase in IT/ tech headcount

Region	
Asia	57%
South America	52%
Global average	45%
North America	44%
Australasia	43%
Europe	42%

Sector league tables

Increased influence of the technology leader as a permanent result of Covid-19

Sector	
Education	69%
Transport / Logistics	66%
Healthcare	65%
Leisure	65%
Technology	64%
Business / Professional Services	63%
Government	62%
Financial Services	61%
Global average	61%
Oil & Gas	60%
Power & Utilities	59%
Retail	59%
Telecommunications	58%
Manufacturing / Automotive	57%
Charity / Non profit	56%
Construction / Engineering	45%

Expecting a budget increase in next 12 months

Sector	
Power & Utilities	52%
Government	51%
Healthcare	49%
Technology	46%
Business / Professional Services	44%
Financial Services	44%
Retail	44%
Telecommunications	44%
Construction / Engineering	43%
Global average	43%
Education	40%
Manufacturing / Automotive	38%
Oil & Gas	38%
Charity / Non profit	32%
Leisure	26%
Transport / Logistics	24%

Increase in cyber-attacks since remote working

Sector	
Power & Utilities	51%
Manufacturing / Automotive	47%
Technology	46%
Government	45%
Leisure	44%
Transport / Logistics	44%
Charity / Non profit	42%
Construction / Engineering	42%
Oil & Gas	42%
Global average	41%
Business / Professional Services	40%
Education	40%
Retail	38%
Financial Services	35%
Healthcare	35%
Telecommunications	31%

Over half of workforce will remain predominantly working from home post Covid-19

Sector	
Technology	62%
Business / Professional Services	55%
Telecommunications	54%
Charity / Non profit	47%
Financial Services	46%
Power & Utilities	46%
Education	43%
Leisure	43%
Global average	43%
Government	36%
Oil & Gas	36%
Retail	36%
Transport / Logistics	35%
Healthcare	30%
Manufacturing / Automotive	26%
Construction / Engineering	14%

Increased investment in business-managed IT as a permanent result of Covid-19

Sector	
Technology	39%
Business / Professional Services	36%
Healthcare	34%
Oil & Gas	33%
Financial Services	31%
Telecommunications	31%
Global average	29%
Transport / Logistics	27%
Leisure	25%
Government	23%
Charity / Non profit	22%
Manufacturing / Automotive	20%
Retail	20%
Education	17%
Construction / Engineering	16%
Power & Utilities	16%

Concerned about team's mental health well-being

Sector	
Charity / Non profit	100%
Oil & Gas	97%
Power & Utilities	96%
Education	92%
Healthcare	90%
Telecommunications	90%
Transport / Logistics	90%
Business / Professional Services	85%
Construction / Engineering	84%
Financial Services	84%
Global average	84%
Leisure	82%
Government	81%
Retail	81%
Technology	80%
Manufacturing / Automotive	78%

Believe new roles created will more than compensate for old roles being lost through AI/automation over the next 1-2 years

Sector	
Education	78%
Oil & Gas	76%
Telecommunications	74%
Technology	72%
Business / Professional Services	69%
Power & Utilities	68%
Financial Services	67%
Government	67%
Retail	65%
Global average	65%
Healthcare	61%
Manufacturing / Automotive	60%
Leisure	59%
Transport / Logistics	59%
Charity / Non profit	50%
Construction / Engineering	39%

Expecting an increase in IT/tech headcount

Sector	
Healthcare	54%
Retail	51%
Technology	49%
Business / Professional Services	47%
Charity / Non profit	47%
Telecommunications	46%
Education	45%
Global average	45%
Financial Services	44%
Government	44%
Oil & Gas	43%
Construction / Engineering	40%
Manufacturing / Automotive	40%
Power & Utilities	40%
Leisure	39%
Transport / Logistics	38%