

in collaboration with:



Velocity: speed & direction



No-one needs to be told how important speed and agility is.

But speed alone does not get you to your destination. And as digital leaders begin to look beyond the pandemic many are realising that their destination, and direction of travel, have changed.

New products, new services, new ways to engage with customers, staff and suppliers have all become priorities, and for many organisations it is fundamentally changing the way they view technology. And who owns it.

So welcome to the Harvey Nash Group Digital Leadership Report, brought to you in collaboration with CIONET and contributed to by Massachusetts Institute of Technology Center for Information Systems Research.

Now in its 23rd year, and building on its heritage as the 'CIO Survey', this report brings you the widest-ranging insights into the world of digital leadership and everything that comes from it.

We hope it helps you find both speed, and direction.



Bev White
CEO
Harvey Nash Group

5 THINGS TO DO WITH THIS REPORT



Review your business aims

See what boards are looking for technology to address on page 7



Drive your organisation forward

Find out how businesses are excelling at digital on page 9



Get the best out of your tech team

Read about diversity and inclusion, and the impact of homeworking on page 15



Improve your sustainability

Learn 5 things to reduce digital pollution on page 21



Compare your sector

Read our sector/location league tables on page 28

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About the survey



2,120
respondents



3 million
data points*



87
countries



23
years of data

*From 23 years

About this Report

The 2021 Harvey Nash Group Digital Leadership Report is the world's largest and longest-running survey of senior technology decision makers. Launched in 1998 and previously called the CIO Survey, it has been an influential and respected indicator of major trends in technology and digital for over two decades. This year a survey of over 2,100 digital leaders took place between 8th July 2021 and 11th October 2021, across 87 countries.

Velocity: Speed and Direction – 8 things you need to know

1. Tech investment is up

Last year we saw unprecedented levels of unplanned spend on digital, particularly when it came to enabling remote working. This year we are seeing planned spend increasing at the highest levels in a decade. The main driver behind this is transformation at previously unseen rates.

2. An age of disruption

The pandemic has forced organisations to re-imagine the way they do business. Creating new products and services has become a top three board priority for the first time since our research began. Half of organisations have major plans for transformation in the next two to three years.

3. Remote working is a double-edged sword

Work/life balance has been improved massively and productivity with it, but mental wellbeing, staff engagement, collaboration and inclusivity have taken a big hit. Eight in ten employees are re-assessing their life priorities. Only one in three organisations have properly updated their employee offer.

4. Skills shortages remain on the rise

Shortages are the highest on record, particularly around cybersecurity, big data and architecture. Organisations are looking to cross-train their staff where possible and bring in outsiders to cover niche skill deficits.

5. Sustainability is being ignored

More than half of organisations recognise that technology is crucial to improve their carbon footprint, but greener and cleaner are placed second to last on the board's priorities for the technology teams. How much longer can businesses put this on the back burner?

6. Gender diversity progress very, very slow

Mandating shortlists and quotas are largely disregarded or not working. The successful strategies for improving the ratios are driven through policy and culture.

7. The fuzzy organisation

Businesses are emerging from the pandemic with their people in disparate locations, more technology embedded within the cloud and their supply chains diffused. This makes it harder to delineate the 'boundary' of an organisation and presents a new challenge for all digital leaders.

8. Security a perennial issue

Transformation may be the driving force behind digitisation, but creating change without securing the technology perimeter is pointless. Preventing and mitigating cyber attacks remains a key priority for digital leaders and unlike other tactical pressures it probably always will be.

VELOCITY

2,120
Digital Leaders responded

87
Countries

12%
Female

Key insights from the Digital Leadership Report

www.harveynashgroup.com/dlr

INVESTMENT AT AN ALL-TIME HIGH

60%

expect a budget increase

61%

expect a headcount increase

DIGITAL LEADERS CALLED TO TRANSFORM AND INNOVATE

50%

expect major or radical change to products and services

48%

expecting to transform and digitise the enterprise

47%

plan to unlock new value through digital

43%

tasked with supporting innovation

PRIORITIES FOR DIGITAL LEADERS

Top 3

1

Improving operational efficiency

2

Improving customer engagement

3

Developing new products and services

DIGITAL LEADERSHIP

65%

are a member of the operational board

57%

tasked with building new ways to realise potential

DIGITAL EXCELLENCE

41%

are using digital 'Very' or 'Extremely effectively' to advance their organisation's business strategy. **Almost doubled in 4 years**

Digitally Excellent leaders are:

4X more likely to use data insights to inform offering & generate revenue

3X more likely to pivot and scale digital channels to meet customer demands

SUSTAINABILITY

Only **9%**

have boards that prioritise improving sustainability with technology

51%

recognise that technology is crucial to improving carbon footprint

58%

use technology to reduce the need for travel

22%

are improving the carbon footprint of technology itself

SKILLS

All time high for skills shortages

67%

WANTED

Top 3

1

Cyber security experts

2

Big data analysts

3

Technical architects

Bridging the gap

51% plan to cross-train existing staff
38% plan to outsource

WORKING FROM HOME

58%

expect tech team to work from home for most of the week

60%

have seen work/life balance improve as a result

50%

have seen productivity increase

58%

have seen mental wellbeing decrease

43%

report decline in staff engagement

68%

have yet to change their employee offer to reflect hybrid working

TECHNOLOGY

60%

have 'all' or 'most' of their core applications in the cloud

26%

have more than one quarter of tech spend managed outside IT

Major attacks down year on year

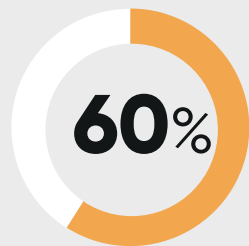
Cyber Security
perennial top priority



Only **1 in 10** feel unprepared for cyber attack

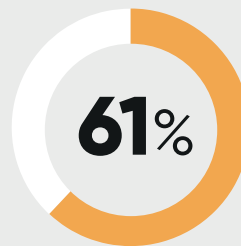
1. BOARD PRIORITIES AND INVESTMENT

Accelerating investment in technology and its people



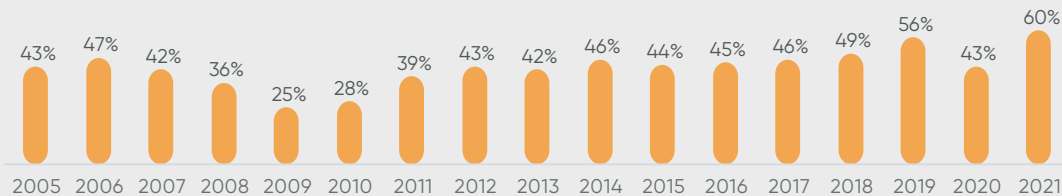
Tech budget

Orgs expecting increases in 2022



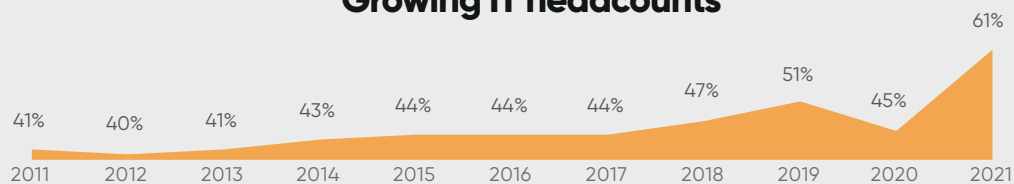
Tech headcount

More budget in 2022



Organisations expecting tech budget increases in next 12 months

Growing IT headcounts



Organisations expecting tech headcount increases in next 12 months

A surge of investment

Investment in digital continues to grow, both in technology and systems and the people needed to deliver the vision. Much of the planned future spend focuses on getting closer to the customer and transformation. Boards are reliant on digital leaders to drive this change and create the products and services of the future.

There can be no doubt that the emergence of Covid-19 dramatically increased pressure on leaders to fast-track digitisation. Last year's report clearly illustrated the big shift in speed and investment in response to the crisis. The widespread pivot to remote working was hugely significant but no less so the changes demanded in consumer interactions and new channels to market.

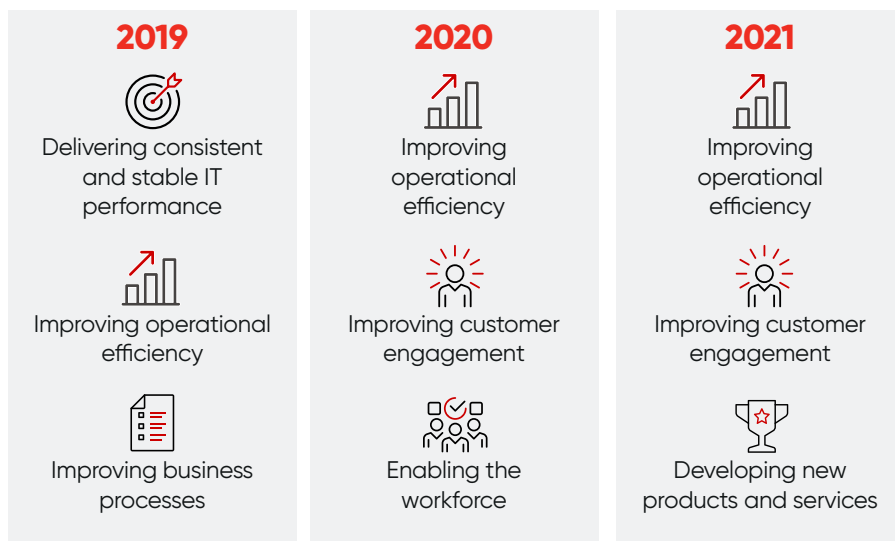
Worldwide spending in technology is predicted to grow steadily at just over 5 per cent for the next few years¹ and digital leaders will be expected to achieve even more from the 'magic of digital'. Every organisation has its starting point, and for many longer established and larger enterprises, overcoming the 'drag' of legacy systems will be a key factor in realising potential.

Last year we reported the biggest surge in technology spend we have ever recorded. Like the pandemic itself, this surge was unexpected and unplanned for, and – at the time – digital leaders were expecting their planned future expenditure to be cut back to compensate.

But as we come out of the pandemic, this reining back of investment has proven to be short-lived. As we enter 2022 digital leaders are reporting the highest ever levels of optimism for increasing budgets and headcount for the coming year. Those working in the Retail sector are among those most likely to be expecting an increase. As the sector opens its doors once more, all retailers have one thing in common: digital is now central to how they operate, from the supply chain through to the customer experience and how staff collaborates across the organisation.

1. <https://www.gartner.com/en/newsroom/press-releases/2021-04-07-gartner-forecasts-worldwide-it-spending-to-reach-4-trillion-in-2021>

Demand for new products and services



What are the top three business aims that your management board is looking for technology to address?

Prior to Covid-19, the top three priorities for digital leaders were rooted in 'traditional' technology aims: stability and efficiency. The pandemic shifted the focus to 'Enabling the workforce' and 'Improving customer engagement'. Our research shows that as organisations emerge from the pandemic, customers remain key, and – tied with this – there is a new emphasis on 'Developing new products and services'. In 2019, this factor was tenth on the list and now it is in the top three. This represents a truly ratchet moment for digital leaders.

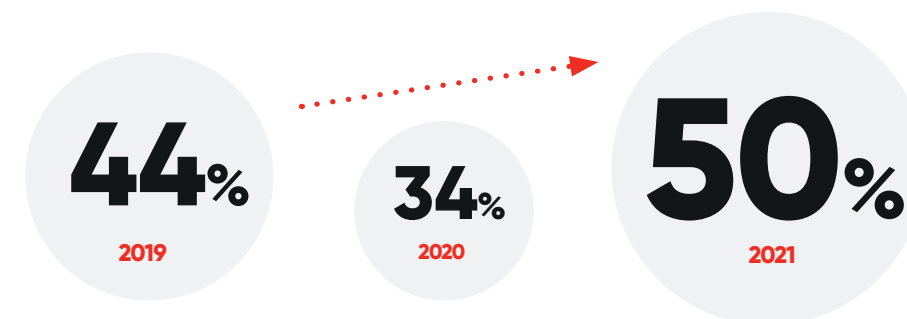
Importantly 'Delivering consistent and stable IT performance' has dropped out of the top priorities. Boards are now expecting this as a given, only gaining the board's attention when it isn't happening.

With so many dramatic changes happening in the last year, digital leaders are increasing their focus on finding new routes to market. It seems like a strategy that will pay off; looking back to the 2009 financial crisis, organisations that maintained their innovation focus, for example, emerged stronger, outperforming the market average by more than 30 per cent, and continued to deliver accelerated growth over the subsequent three to five years.² The sectors most tasked with developing new products and services are Broadcast/Media, Technology and Banking.

2. <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/innovation-in-a-crisis-why-it-is-more-critical-than-ever>

Unprecedented levels of transformation

Plans for major/radical transformation



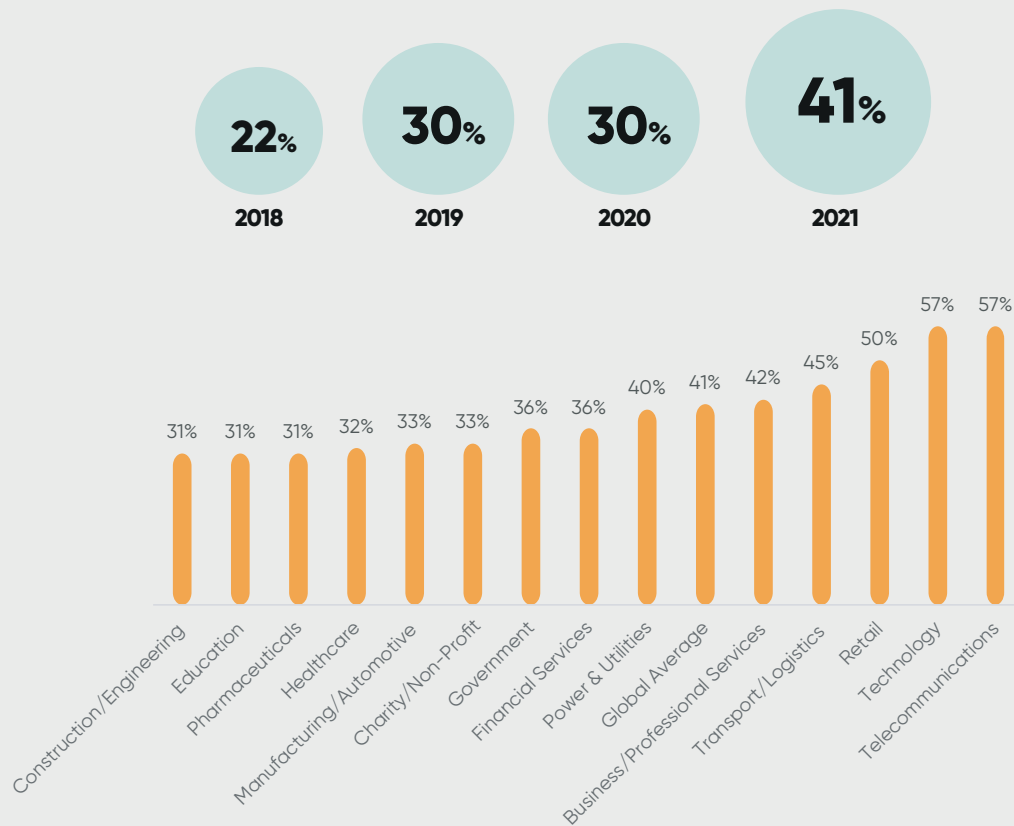
To what extent, if at all, do you believe your organisation's primary business activity will transform over the next three years? Major/radical change

During the pandemic there was a massive surge of unplanned tactical technology spend. Although some organisations were forced to pivot their business models, most were focused on workforce enablement. Consequently, we saw a dip in 2020 for those organisations transforming themselves. As we emerge from the crisis it appears that the focus is now firmly back on transformation: either through introducing significant new products and services or changing business models altogether.

During the pandemic, many organisations learnt to be much more nimble and agile with their technology, and these new-found skills are now being applied to customer-facing aims. The sectors most likely to be planning to transform in a significant way beyond that of their peers are Telecommunications, Technology and Pharmaceuticals.

2. DRIVING BUSINESS PERFORMANCE THROUGH TECHNOLOGY

Digital excellence



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

The goal of digital excellence

More organisations than ever before are reporting success with their digital strategy. These digitally 'excellent' organisations distinguish themselves by being close to their customer, having a strong ability to adapt quickly, and being able to use data to make informed decisions. Other organisations are struggling to make best use of the data they hold.

So are digital leaders delivering on their board's remit? The proportion of respondents who claim to be using digital 'Very effectively' or 'Extremely effectively' to advance their organisation's business strategy continues to grow, almost doubling in the last four years. It suggests organisations are becoming increasingly mature in their adoption of digital technologies. One contributory factor was a big jump during the pandemic year, when almost one in ten organisations moved themselves into the 'digital excellence' category.

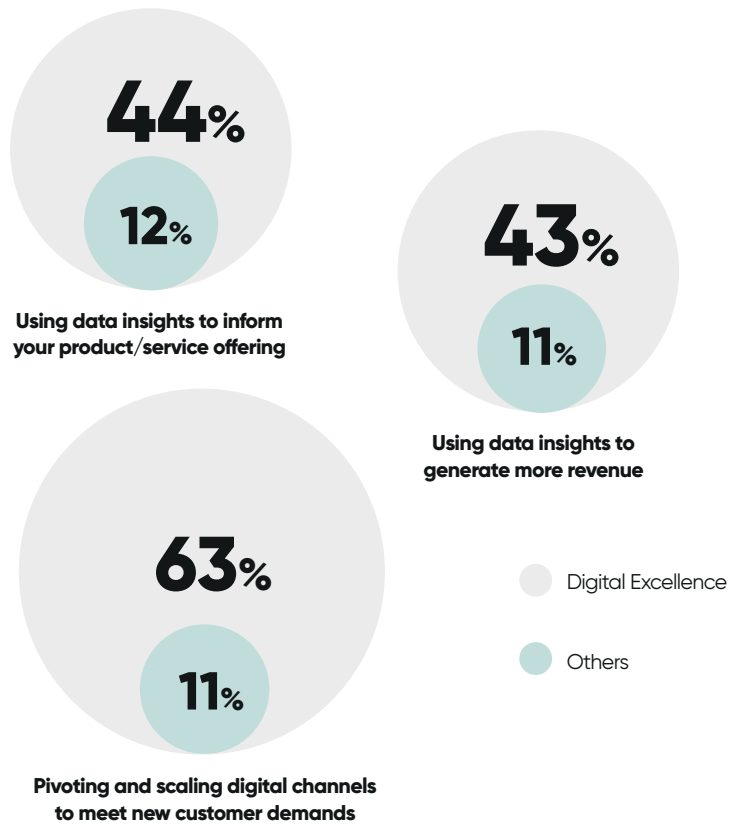
Of course, another factor may also be at play here. We are asking digital leaders to score themselves, and as digital becomes more pervasive and talked about, some may be more comfortable at marking themselves highly!

The sectors most likely to report excellence in supporting strategy with digital include Retail, which was arguably the most disrupted by the pandemic, and Technology, which played a pivotal role in delivering technology to make digital happen.

Excelling at digital

How do those digitally 'excellent' organisations differ from their peers? One big contributing factor is that they can pivot and scale their offering; indeed, they are more than three times as successful at doing this as their peers. This ability hasn't come by chance, it has come from a long chain of connected factors, like being close to the customer, having an agile platform, and having a culture that drives innovation.

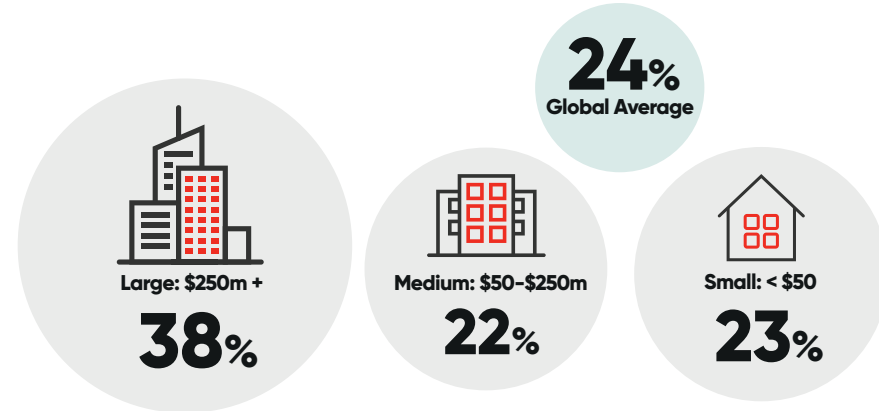
Digital excellence driven by agility and data



Digitally excellent organisations compared with others

Data is gold

Larger organisations use data more effectively



Overall, how effective has your organisation been in using data insights to generate more revenue? Very/Extremely effective, by technology budget size

Another factor where digitally excellent organisations distinguish themselves is their use of data. It has often been said that 'data is the new gold'. The analogy is particularly relevant: data insights are not only precious but they are also quite rare and both difficult and expensive to extract. As one digital leader said to us in our research, 'Don't talk to me about Big Data, I've got enough Small Data problems to sort out first!'

Digitally excellent organisations were much more likely to make good use of data, whether in revenue generation or developing new products. Data insights used correctly can be a unifying force touching every part of the business: workflow, workforce and workplace. A single source of truth is certainly an aspiration for digital leadership.

Larger organisations seem to be better at dealing with data than their smaller peers, with 38 per cent of those with tech budgets of \$250m rating themselves 'Very effective' or 'Extremely effective' at using data to generate revenue, compared to the global average of 24 per cent. It may be the case that larger organisations simply have more data to play with – but it's also the case that they are prepared to invest, and they are seeing those returns.

Overall, almost seven in ten organisations are finding it difficult to pivot and scale their digital channels as customer needs change. Last year's pandemic was a major global event that required many organisations to do just that. And many struggled.

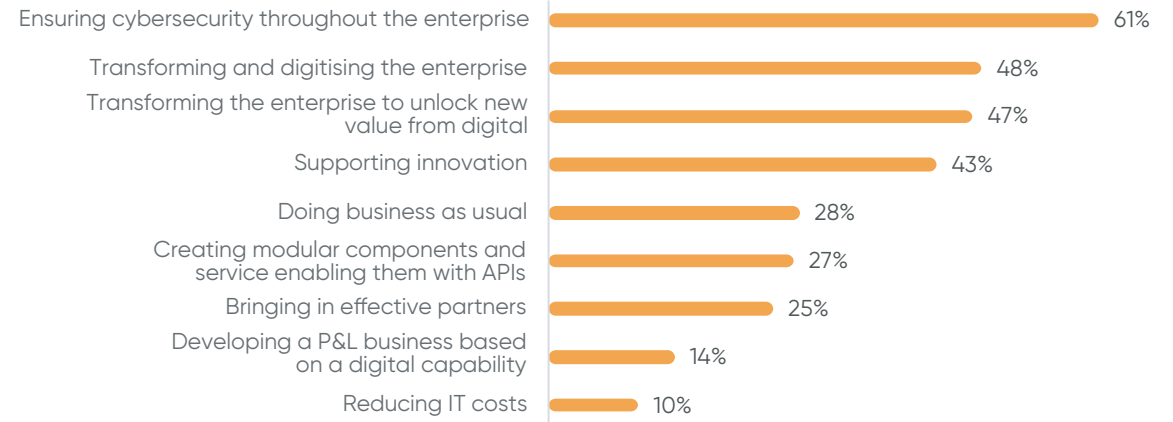
Driving innovation

During the pandemic, organisations got very used to agility, change and innovating to ensure their business continuity in the face of changed customer behaviours. As organisations become more forward-thinking as they emerge from the pandemic, innovation remains important. But what's important for innovation?

We asked digital leaders about the most important elements of their remit. Last year we reported that the mass relocation of workers to home offices had significantly enlarged the attack surface, and it's clear from our participants that ensuring their organisation is safe from cyber attack remains a prime aim. Few digital leaders would be credible pitching a new innovative idea to the board when the network is down from a denial-of-service attack.

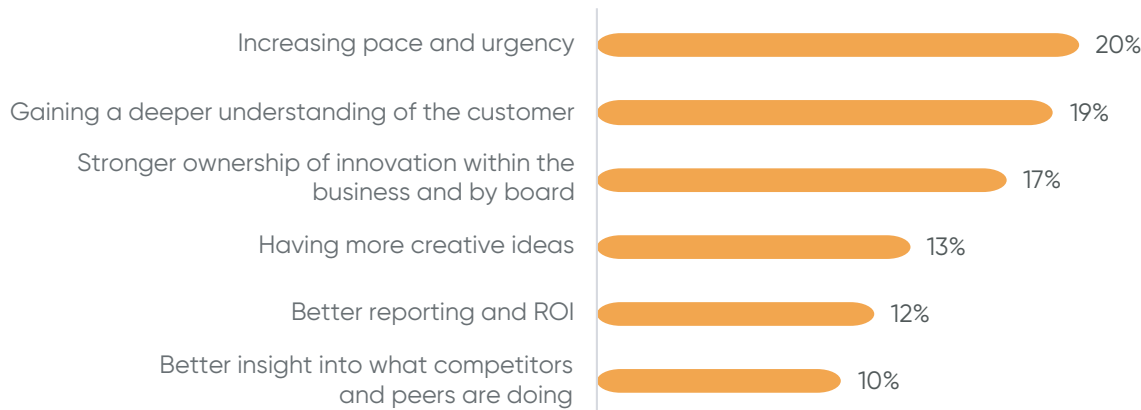
But importantly, the next three priorities relate to transformation, innovation and change – new ways of doing business.

Important in the role of Digital Leader



In your role as a digital leader, how important are the following activities? Very important

Key ways to improve innovation



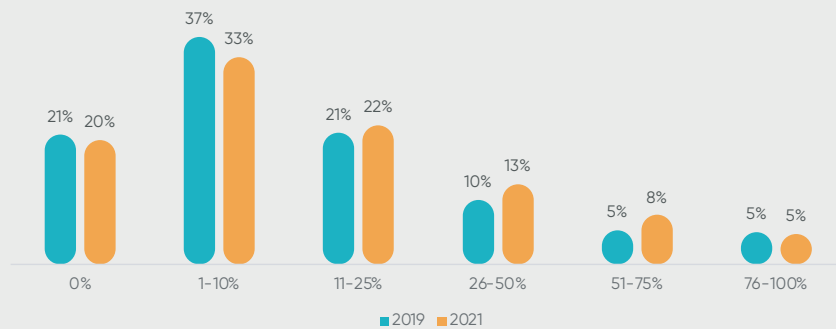
What are the key areas you wish to improve on innovation?

Practically overnight, digital transformation became a matter of survival during the Covid-19 pandemic. Organisations scrambled to enable remote working and serve customers in lockdown in order to keep their businesses afloat. As mentioned previously, half of all respondents report plans for major or radical transformation (up from 44 per cent in 2019) and it is more prevalent in larger organisations. This scale of transformation initiative broadly relates to the creation of new products and services or entirely new revenue models.

Virtually all real economic growth or societal progress is driven by disruption. Most organisations can expect their business model to change over time; organisations that don't innovate and change will fall behind. But how are organisations innovating? What works? What doesn't? Organisations reporting the strongest innovation are less concerned about generating specific ideas, and much more concerned about creating the right environment and culture for innovation to happen. The biggest single factor driving current innovation is having an agile platform that can scale and change in response to the changing environment.

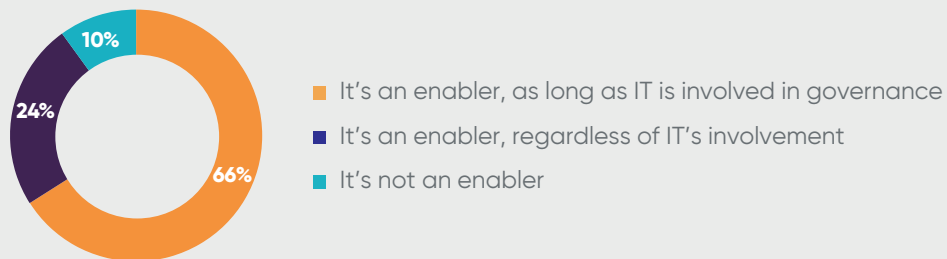
3. MANAGING TECHNOLOGY

Proportion of IT spend outside of IT department



What proportion of the overall spend on IT is controlled by/managed outside the IT organisation/department?

Business Managed IT



What best describes your view on business-managed IT for an organisation?

Technology diffusion across the business

The pandemic accelerated the direction of travel for cloud technologies and business-managed IT adoption, putting much more power in the hands of disparate areas of the business. We can also see big leaps in the adoption of the Internet of Things and Robotic Process Automation (RPA). However, few organisations are making the jump to large-scale implementations of Artificial Intelligence (AI), RPA and Big Data, where there may be some way to go on the scale of maturity.

Deploying technology without linking it deeply with the business strategy is a thing of the past. Today's successful digital leaders establish the connection between technology and business goals. Not only do they have a deep understanding of how a particular technology can support the business but they create a culture that will minimise the hierarchies and politics that can get in the way of positive change.

Once upon a time, there was the IT department where the mysterious and magical arts of hardware and software were practised by the chosen few. Today, digital is diffused widely across the organisation, and its technical capabilities are dispersed throughout.

The percentage of digital leaders who report more than a quarter of technology spend being controlled outside the tech department has risen from 20 per cent in 2019 to 26 per cent this year. Our research shows that business-managed IT is viewed as an enabler by the majority of digital leaders, as long as the IT department feels involved in its governance. The unstoppable march of business-managed IT and low code/no code platforms have put the power of technology into the hands of almost anyone, but steps are clearly needed to prevent a descent into chaos. Couple this with the democratisation of cutting-edge technology into cloud-based systems, and organisations simply have more digital power at their disposal than ever before.

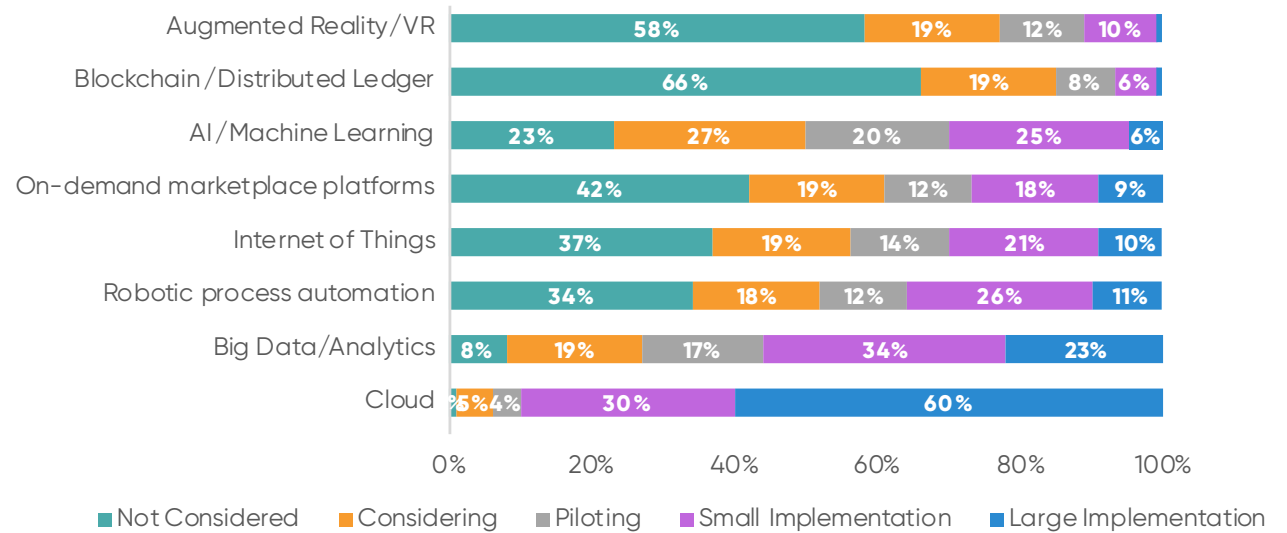
The technology maturity matrix

Mature technologies such as the cloud are almost ubiquitous, but even this saw a big jump during 2020, from 69 per cent with some kind of implementation to 90 per cent today. On average more than four in ten of our digital leaders have all or most of their core applications embedded within the cloud; for smaller organisations this rises to almost half.

Many digital leaders have reported how the pandemic, despite the challenges, has proven to be a useful change agent enabling legacy systems to be re-platformed, often into the cloud.

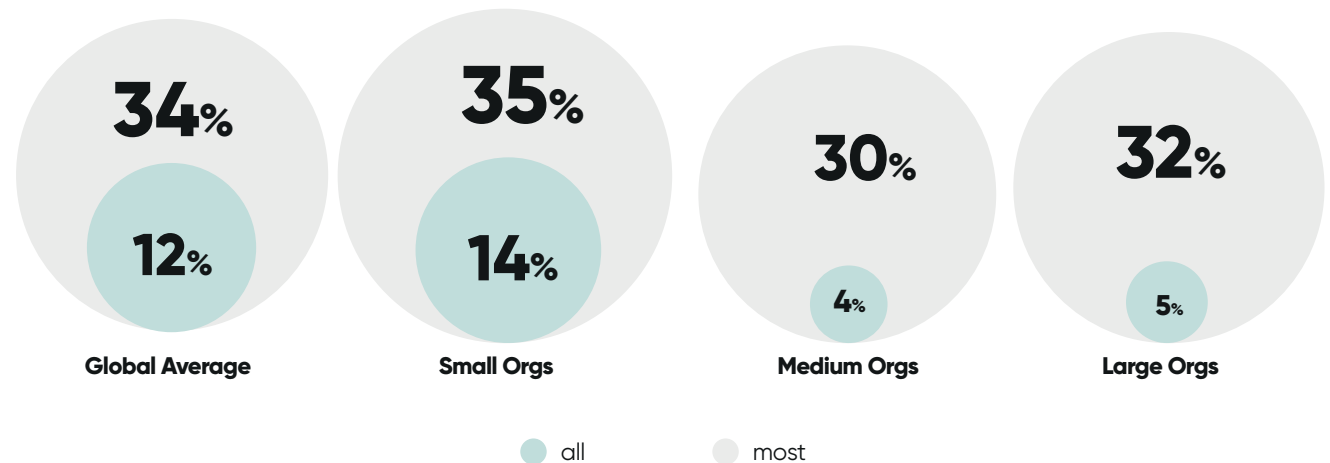
Even those on the bleeding edge of research, such as quantum computing, are gaining traction on a small scale, with implementations, including pilots, more than doubling, from 3 to 7 per cent, since our report in 2019. It is likely that many organisations may be using the latest advances in technology without even noticing, as it is embedded in user-friendly, cloud-based applications that are available to all. Emerging technologies open up entirely new opportunities and give rise to completely new customer expectations. Organisations with the resources and mindset to take the leap gain a competitive advantage, widening the gap between digitally excellent organisations and the rest.

Adoption of emerging technology



How would you characterise your organisation's usage of the following technologies?

Core applications in the cloud

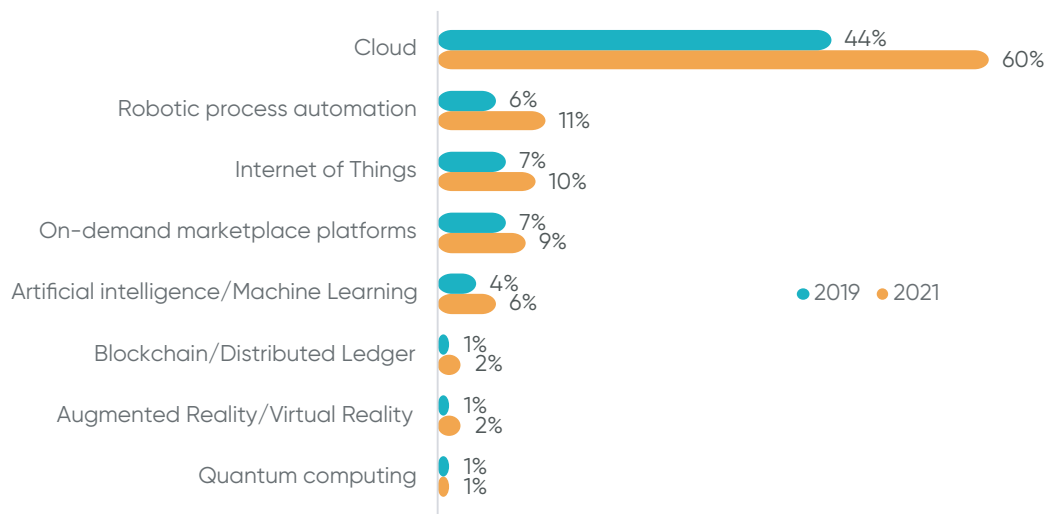


What proportion of your core applications are cloud-based?

Look further into the table on page 12 and you can see some interesting insights as you trace the evolution of technology from 'Not Considered' to 'Large Implementation'. Cloud has the profile of a mature technology; most organisations have a large implementation. Big Data/Analytics is more of a 'slow burner'; it has been around for some time, and most organisations have at least piloted implementations, but the bottleneck seems to be in taking small implementations to large ones.

For RPA and on-demand platforms the bottleneck is much earlier on in finding a business case to truly consider it as a viable technology. Decentralised finance, cryptocurrencies and blockchain are only just getting started, and there may yet be a revolution in the making. Every organisation will have its own journey in progressing emerging technology.

Large-scale implementations



How would you characterise your organisation's usage of the following technologies? Large-scale implementations

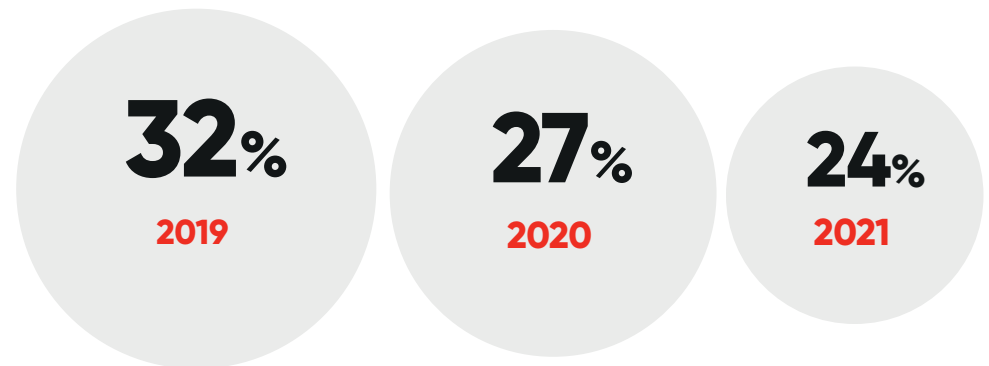
Pressure for security remains

The shift to remote working saw dramatic increases in low-level security attacks in 2020, but this year major breaches appear to be continuing to fall. Managing security remains a top issue for digital leaders, as it is both a priority for their boards reflecting increasingly punitive legislation and driven by a fear of 'death by a thousand cuts'. Where breaches occur, more money is being directed at the problem regardless of whether customer trust or data was affected.

Remote working certainly posed a significant challenge for digital leaders in 2020, and last year we reported a major increase in low-impact attacks, for example, an 83 per cent growth in spear phishing. That said, when looking at major attacks, our research this year shows that cybersecurity defences remain tight, with less than a quarter of our respondents reporting suffering a major attack in the last two years. The sector reporting the highest levels of attacks is Transport and Logistics, where major attacks have occurred for more than a third (37 per cent).

Last year saw a significant investment in cybersecurity, and as we report elsewhere in this study, cybersecurity is the top priority for digital leaders. This investment seems to be paying off.

Major attacks in last 2 years



Has your organisation been subjected to any major IT security or cyberattack in the last two years? Yes

Hybrid working and the ubiquity of cloud throughout organisations undoubtedly create a major issue for those charged with keeping their organisation's key assets secure. New ways of thinking need to be used to keep order in an increasingly disparate and distributed world of software and people. The penalties for losing control can be punitive in terms of both finances and consumer trust. Luckily, right now our research shows that digital leaders are on top of the situation, and the vast majority feel confident in their abilities to both identify and handle security breaches.

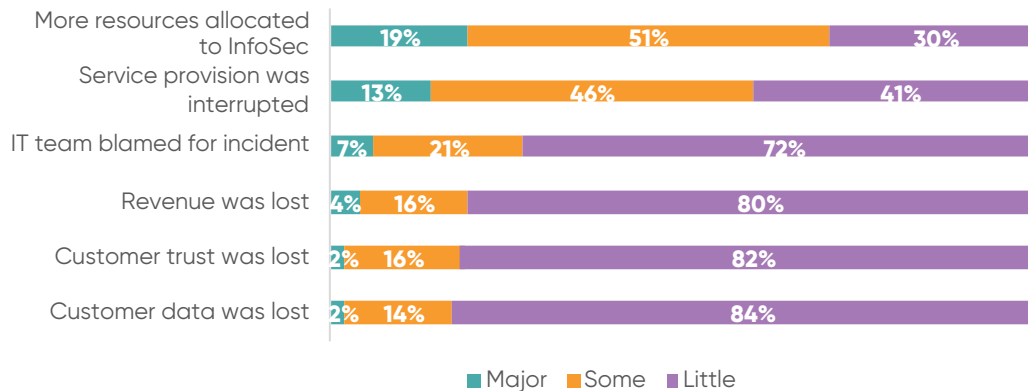
Will it last? Cybersecurity isn't a 'project', it's more like a never-ending game of cat and mouse. Cyber criminals are getting increasingly sophisticated, and each year the hurdle grows taller for organisations to ensure they are safe.

How well are you positioned for cybersecurity breaches?



To what extent do you feel your organisation is positioned to identify and deal with current and near future IT security/cyber attacks?

The results of cyber breaches

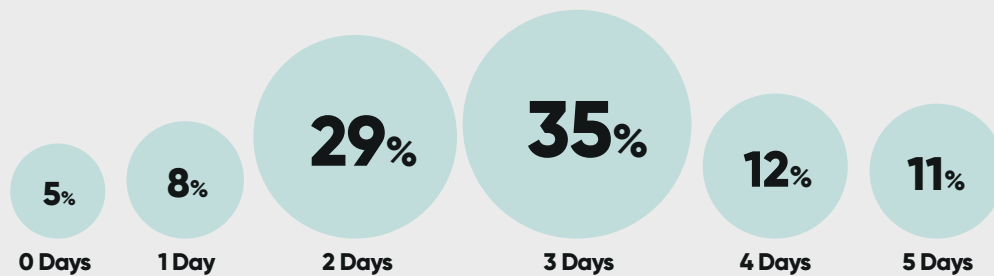


Few of our respondents that did experience a major attack reported a loss of customer data or trust. However, 59 per cent experienced an interruption to their service provision and just over seven in ten were given increased resources to deal with the problem.

Please indicate the extent to which the following happened as a result of cyber breaches in the last two years.

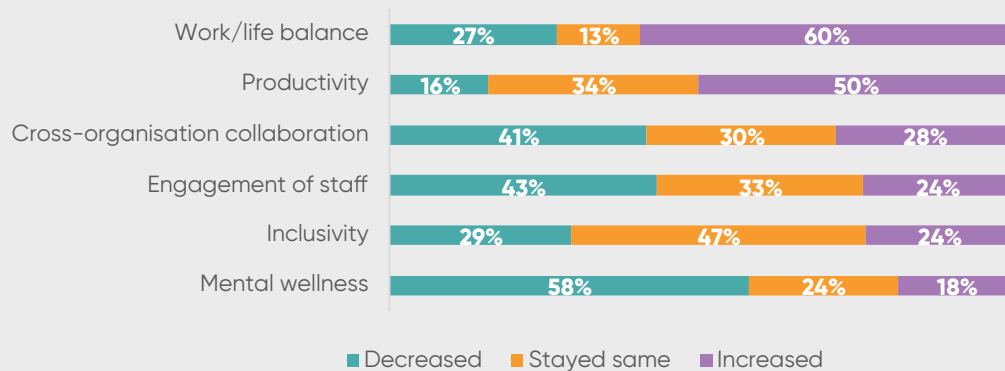
4. MANAGING THE TECH TEAM

Days expected to work from home



Thinking about your whole organisation, how many days per week are you expecting/planning staff to work from home?

Effects of working from home



How has the Covid-19 crisis and home working affected the following people factors in your team?

The implications of working from home

Homeworking and hybrid working are here to stay. This has driven a boost in productivity but also challenges collaboration, engagement and mental wellbeing. Redesigning the employee offer to maintain the positives and reduce the negatives will be key going forward, but few digital leaders have done it.

The pandemic has had a major effect on working practices, and despite many countries beginning to re-establish 'normality' there are some things that have changed forever. More than half (58 per cent) of organisations are asking staff to continue working from their home office (and dining room, bedroom and kitchen) for the majority of the week – three days or more. More than one in ten are expecting them to work full time away from the office, and for the most part their staff are happy with these arrangements.

Our research confirms that home working had a positive effect on work/life balance and productivity. Some part of this increase in output would undoubtedly be down to teams spending their commuting time engaged in work – effectively extending their working day.

One thing is clear, and that is mental wellness has suffered, with almost six in ten of our respondents reporting a decrease. Fear of the virus and lack of standard social lives will most certainly have their part to play; however, we are by nature social creatures and going into an office with its random interactions and structured hours is certainly something that tech teams will be missing, if not the expense and time spent on travelling to get there. Almost one in four of our digital leaders have increased their investment in health and wellbeing programmes to combat this worrying phenomenon.

The research also highlights a significant decrease in employee engagement and cross-organisation collaboration over the last tumultuous 18 months. Homeworking has significantly improved productivity and work-life balance, but it has significantly reduced engagement, mental health and collaboration. Inclusivity has marginally declined.

Many of the leaders we speak with, both in technology and HR, are still trying to work out how to make this all work. Some feel it's not sustainable. Remarkably, less than a third of digital leaders have redesigned their employee offering to reflect the new hybrid model of work, and this is significant given the slow but relentless rise in skills shortages.

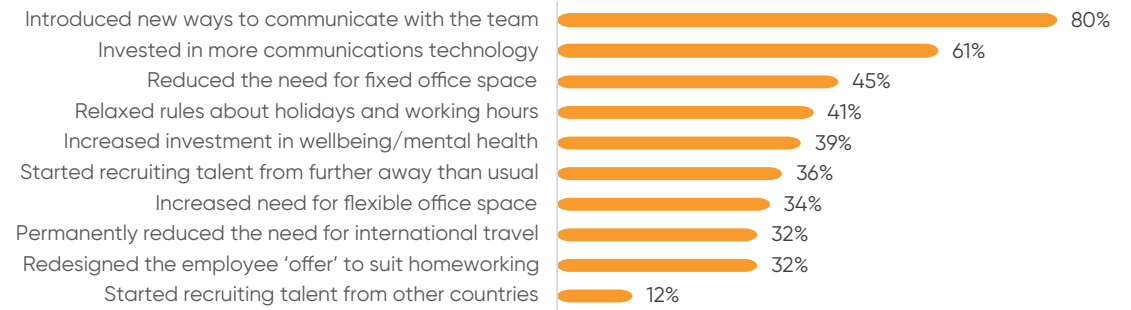
It is clear that the infrastructure and communications for facilitating hybrid working have been put in place: 80 per cent of respondents have updated their communication methods and 61 per cent have invested in the technology to support this. However, it could spell bad news for commercial landlords and surrounding hospitality and leisure businesses, as 45 per cent of digital leaders say that hybrid working has reduced their need for fixed office space.

No let-up in the war for talent

More than two-thirds of digital leaders report being unable to keep pace with change because of a lack of expertise, the highest it's been since our research began. This may present a greater challenge for those who are planning radical changes to their business model.

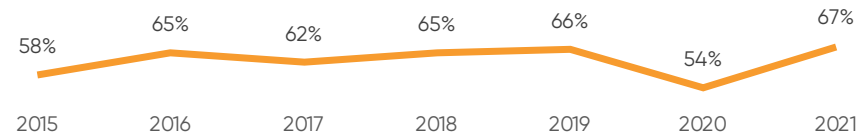
The top three skills being sought are: cybersecurity experts, big data analysts and technical architects. The latter has replaced AI skills as the third most sought after compared to 2019. Demand for developers has seen the biggest upswing compared with previous years, which matches our finding on the rising emphasis on creating new products and services.

Leadership responses to homeworking



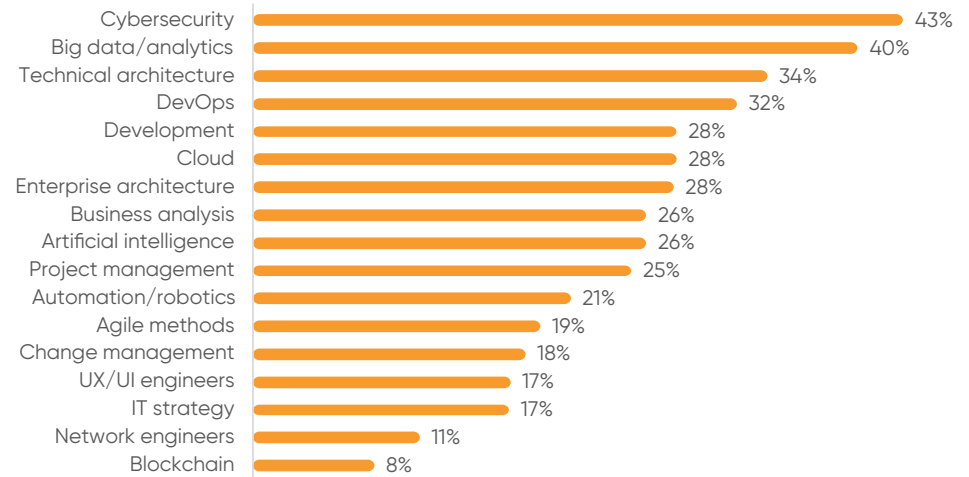
As a leader, what have been the most important ways you have responded to leading in a remote working environment?

Skills shortage prevents keeping pace with change



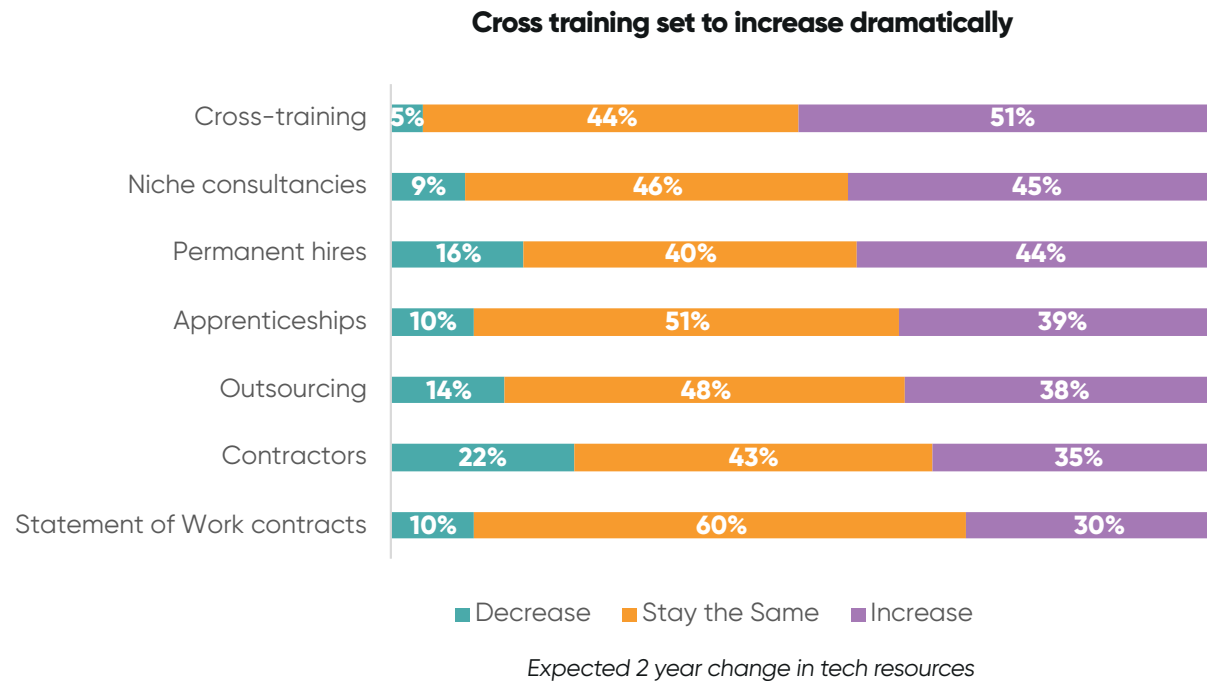
Does a skills shortage prevent your organisation from keeping up with the pace of change? Yes

Where are the skills shortages?



In what areas are you suffering a skills shortage? Tick all that apply

Bridging the skills gap



So how are digital leaders expecting to address the need for skills? It seems that tech teams may have to broaden their skillsets. More than half of our respondents plan to cross-train people in other parts of their organisation. Cross-training has long been a method of bringing people into the sector, but we were surprised just how prevalent it was.

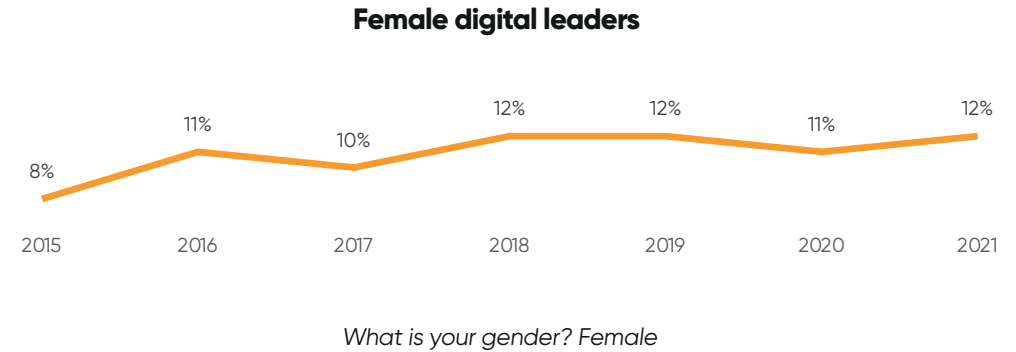
As technologies become more user-centric and less 'technical', the skills required to configure, support and develop them also change. This opens up more people to opportunities in the sector. The use of niche consultancies

to bridge the gap in specific expertise is also a preferred option and offering apprenticeships a popular choice.

Almost one in four are planning to increase their use of outsourced expertise, but with many solutions now cloud-based or packaged within commercial off-the-shelf products, it begs the question about what there will be to outsource in the future. More than a third of digital leaders have widened their geographical net when it comes to sourcing new talent, presumably supported by the hybrid home/office location model becoming a new normal.

Lacklustre drive for diversity

Looking specifically at gender diversity, slightly more of our digital leaders identify as female in this year's research – 12 per cent as the figures continue on their painfully slow journey upward. Respondents from the USA almost double this percentage. The average proportion of females within the tech team is just under a quarter, which shows promise for the leadership of the future.



Diversity approach improves quality of hires

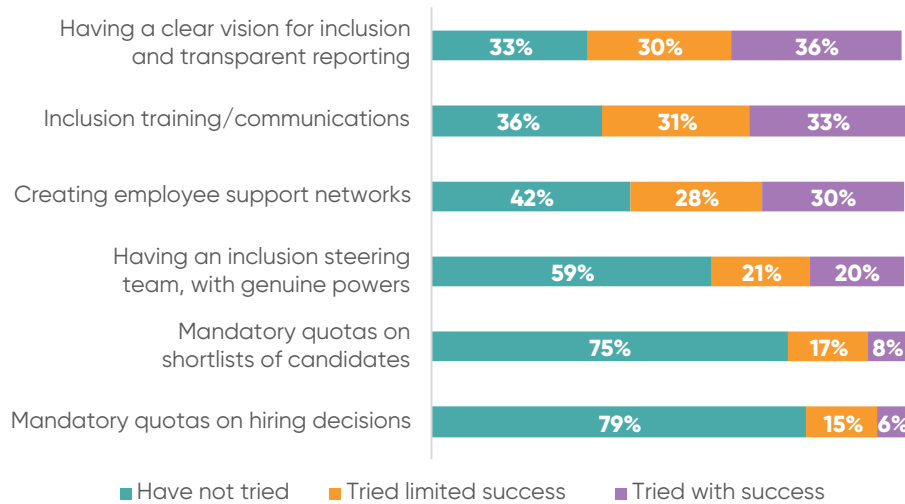


Overall, do you think your current diversity and inclusion approach is improving the quality of hires you are making? Yes

Looking at diversity in its wider sense, six out of ten respondents believe that their approach to diversity and inclusion is improving the quality of their hires. This still leaves four in ten feeling that diversity and inclusion (D&I) makes no difference to the quality of talent they have. There are plenty of other reasons to be inclusive (fairness, culture, governance... the list is long), but the most compelling is the quality of hire, and to have such a significant proportion of respondents not feeling they are getting this from inclusivity is a concern.

More than two-thirds of digitally excellent respondents (i.e. those that are 'Very effective' or 'Extremely effective' at using technology to drive business strategy) believe they are hiring better quality people through D&I initiatives.

Ways of improving D&I



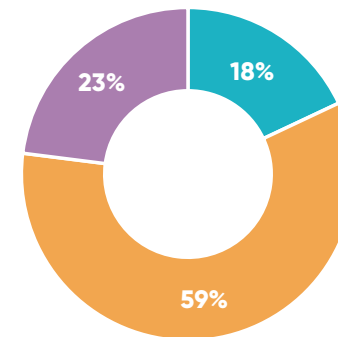
What active ways are you looking to improve diversity and inclusion in your team?

This year we asked digital leaders about what was or wasn't working with their D&I approach. What is clear is that training, communications and support networks are key and the most successful approach. Mandatory quotas have the lowest success rate and are much less used. Promoting D&I is about creating the right culture, not the right rules or mandates.

Finding the right people is one problem, keeping them is another. Eighty-two per cent of our respondents state that the pandemic has made their staff reconsider their life priorities and made the job of retention harder to some extent or worse. Increasingly, staff and potential hires will be looking at the purpose of an organisation when making their career decisions, and many organisations are revisiting what this is, and how it's communicated. In short, organisations without a clear, compelling purpose may suffer in the fight to attract top talent, especially Gen Z and millennials.

Just under four in ten digital leaders are hanging on to their key personnel for as long as they would ideally wish. Lured by more money is the most cited reason for losing them. Respondents from the Pharmaceutical and Charity sectors are more likely to be keeping their staff for as long as they need them, and Power & Utilities the least.

Have new life priorities made retention harder?



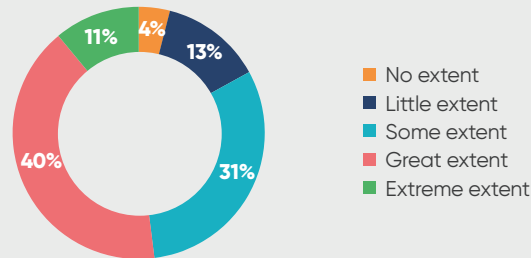
■ Little/no extent ■ Some extent ■ Great extent

To what extent has the crisis made your staff reconsider their life priorities and made retention harder?

5. TECHNOLOGY FOR A SUSTAINABLE FUTURE

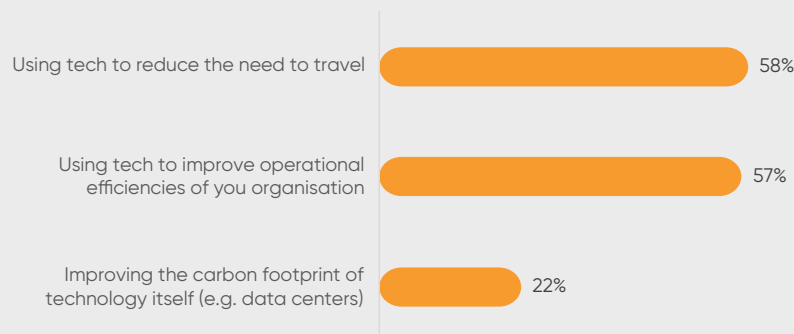
1 ZETTABYTE = 1 BILLION TERABYTES = 1 TRILLION GIGABYTES

Board recognition of technology/sustainability relationship



To what extent does the board value/recognise technology as crucial to improving your organisation's sustainability/carbon footprint?

How technology is being used to reduce carbon footprint



Power hungry tech

Without doubt, technology has an important role to play in improving carbon footprints. Driven by planned legislation and consumer demands, the board are increasingly asking questions around digital and sustainability. Despite this, sustainability is not high on the agenda of the digital leader, and few people are aware that tech is a bigger emitter of CO2 than the travel industry.

Technology in organisations is a massive consumer of power and has an enormous impact on global warming and the climate, greater even than that of air travel.³ The surge of video conferencing and streaming has fuelled concerns about the emissions they generate. Between February and April last year, at the peak of worldwide lockdowns, global internet traffic surged by nearly 40 per cent, and studies estimate that digital technologies already contribute up to as much as 5.9 per cent of global greenhouse emissions.⁴ For context, this is almost three times as much as global aviation.

Demand for data and digital services is expected to continue its exponential growth over the coming years, with global internet traffic expected to double by 2022 to 4.2 zettabytes per year.

3. <https://www.independent.co.uk/climate-change/ict-computers-climate-change-carbon-footprint-b1917767.html>

4. <https://www.iea.org/reports/data-centres-and-data-transmission-networks>

Reducing the carbon footprint

Worldwide, data centres consume an estimated 200 terawatt-hours per year. This represents both a challenge and an opportunity for the digital leaders. How can they reduce power consumption while translating sustainability into direct customer benefits? One simple solution could be to switch from data centres in locations where power generation is coal intensive, like India, to ones where the electrical grid runs on renewable power, such as Finland. This can reduce carbon emissions by a factor of between 10 and 100 times.⁵

Our group's research this year confirms that chairs and boards are increasingly talking about sustainability in the boardroom, but right now they are not asking digital leaders to put it particularly high on their agenda. Our view is that the tipping point is close, sustainability will soon become a priority for tech teams, and they will be asked to have it front and centre of future initiatives. Technology clearly has a really important role to play, and digital leaders will be able to make a real impact on their organisation's footprint.

The swelling tide of digital transformation planned by our respondents in the future will undoubtedly provide opportunities to positively affect the operational efficiencies necessary to create a more sustainable business, but digital leaders will need to embed the right energy and sustainability principles and policies to ensure that digitisation helps to tackle the climate crisis instead of making it worse.

5. <https://arxiv.org/abs/2104.10350>

"The time is shortly coming when all companies, including SMEs, will be held responsible for the impact that they have on their entire value chain. This responsibility will be for the value chain both up and downstream, and the implications are enormous. Businesses will not only have to demonstrate that they are aware of the risks but show that they are mitigating for those risks and, where they fall down, they will have to make reparations. If that isn't enough to get sustainability matters onto the boardroom agenda, I don't know what is."
Anna Lindstedt, Founding Partner, Ethos Evaluate

5 ways to reduce digital pollution

1) Assess your carbon footprint

Data analytics are increasingly helping organisations monitor and tackle their environmental impact across wide, and often complex, value chains. Understanding the problem is halfway to solving it.

2) Embrace technological advances

The Internet of Things, AI and Machine Learning will all allow you to harness digital innovations and accelerate change. Real-time feedback from intelligent assets, collateral and components can result in significant benefits, including increased efficiencies, reduced costs and waste, greater longevity for machinery and reduced maintenance.

3) Continue to commit to remote working

Using shared file drives, proxy networks, intelligent collaborative tools and video conferencing will decrease the need to travel. As long as homeworking emissions are considered, this can also help reduce carbon emissions.

4) Make the cloud green

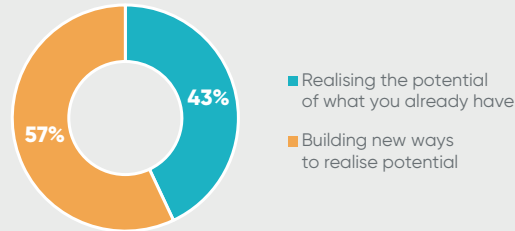
All digital leaders can follow the lead of the hyperscalers, large enterprises and government organisations, who demand that data centre operators create a sustainable infrastructure to earn their business.

5) Look after the small stuff

Increase device longevity, recycle responsibly, unsubscribe from unwanted emails and use a greener search engine. All the little things can add up to something bigger when practised throughout the organisation.

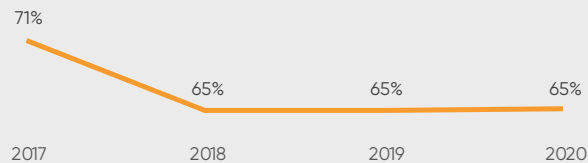
6. THE ROLE OF THE DIGITAL LEADER

The Technology Challenge



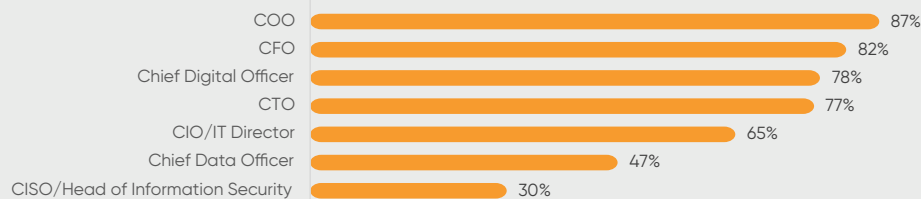
What would you say is your greatest technology challenge?

Member of the operational board/executive management team



Are you a member of the operational board/executive management team of your organisation? Yes, CIO/IT Director

Member of Executive Team



Are you a member of the operational board/executive management team of your organisation? Yes

Digital leaders need to hunt rather than farm

For boards, the promise of digital ultimately lies in being close to the customer, adapting and transforming products and services as the market evolves. While CIOs have traditionally provided the gateway to digitisation, they no longer have a monopoly. Other leaders are beginning to share the responsibility. The digital leader who delivers an agile environment driven by data insights will be the most valuable. But this is no easy task.

Our research clearly demonstrates that this is a time of unprecedented change and transformation of digital within the majority of organisations. The process may have started some years ago but was massively accelerated by the global pandemic as businesses scrambled to get to grips with remote working, changed customer behaviours and shifting supply chains. In response there was a median additional spend of 5 per cent of IT budgets last year. As a result, digital leaders have never been more front and centre as technology sits at the cutting edge of both revenue and purpose for their organisations. Boards and CEOs are looking at how best to both run their business effectively and change their business to get ahead of competition.

We investigated this 'run versus change' split by asking digital leaders a binary question about their overall business priority: was it to realise the potential of existing operations, or build new ways to realise potential?

More than half were focused on the new – a fact that reflects the wider transformation we have touched on elsewhere in this report. This focus on 'new' is a key thing.

A seat on the board

The CIO/IT Director has traditionally held the strongest grip on what is required to deliver on the board's digital aims, but our research tells us this grip is loosening. Operational board membership for CIOs is down from pre-pandemic, and where organisations have Chief Digital Officers or Chief Technology Officers, both roles are more likely to be part of the executive team.

Digital leadership is diffused through the business

Keeping the lights on has always been within the remit of the CIO, but digital leadership has become far broader than that. What our report highlights is that there is a diffusion of digital responsibility and leadership throughout the business, with COOs, CMOs, CTOs and CDOs each taking a share of the overall challenge.

	CIO	CTO	CEO/COO	CMO	CDO	Other
Ensuring stable and consistent technology infrastructure	60%	25%	6%	0%	3%	6%
Enabling the workforce to be more productive	34%	11%	36%	0%	4%	15%
Driving efficiencies and cost savings into the business	36%	14%	32%	1%	4%	13%
Driving stronger customer engagement	13%	5%	30%	25%	7%	19%
Creating new technology-based products and services	37%	25%	11%	4%	10%	13%
Gaining insights from data	35%	11%	15%	5%	12%	21%

Who in your organisation has the most responsibility for technology strategy for the following?

We asked respondents which senior role they felt was responsible for driving the strategy of a number of digital activities. Overall, the CIO role is seen as important to many of these activities, but looking specifically at the key activities of 'Driving stronger customer engagement', 'Creating new products and services' and 'Gaining insights from data', the vast majority of organisations place the leadership of the activities elsewhere. Some of these change-makers may take the limelight and glory, but the traditional CIO role is still invaluable for securing the perimeter, managing legacy and implementing SaaS across the enterprise.

The real questions the board are asking is who can get us close to the customer, who can make us agile and who can bring real insights from our data? They don't really care who delivers it, as long as it's delivered.

Digital leadership, whatever its title, is complex and involves serving one or more remits. Some digital leaders will be managing business as usual in time-honoured fashion,

focused fully on stability and efficiency through rationalisation and standardisation over a medium-term planning horizon. Others may be responsible for technology as the pathfinder for the business, understanding the potential of technology and shaping the future in an agile way unfettered by legacy and technology debt. Others still may be part of an organisation where technology is the business, where the value of technology is largely determined through business-managed implementations, where governance and a steady hand are the key requirements.

A more distributed, egoless model of digital leadership is happening, where the role migrates to whoever is best positioned to make decisions. Digital leaders will have to embrace this new world of multiple roles if they are to succeed as agents of change, even though it may well be uncomfortable at a personal level. We believe those leaders who manage to navigate this transition to a new world of digital velocity will truly be game changing.

Everything is changing. So everything needs to change.

CIONET Special report



Roger Camrass,
Global Research Director, CIONET



Established in 2005, CIONET is today, the largest private network of CIOs internationally. We have established leading communities of practice in 25 countries across Asia, Europe and the Americas. With the active support of our national advisory boards, we have built a flourishing community of 10,000 technology executives.

www.cionet.com

You don't have to look far into this report to see just how quickly things are changing in technology. It's something that is very much talked about in CIONET's events and discussions held with our 10,000 members in 25 countries.

Seeing change is the easy bit. Understanding its implications and responding to it is much harder. In this special report, CIONET looks at the themes coming out of this research, and how digital leaders are responding.

What has changed across the digital landscape?

Gone are the IT preoccupations with monolithic ERP systems and waterfall developments. Instead, attention is being focused on sprints, agile development and software as a service. Traditional outsourcing and offshoring relationships are being replaced by commodity products and global talent sourcing. Debates about 'bring your own everything' have evaporated in the new world of hybrid working. Divisions between business and IT are set to vanish as low code/no code takes over as the primary route to applications development.

Historic indicators of efficiency, quality and speed that once defined the performance of the IT organisation are now being replaced by contribution to business agility, value and opportunity. The boundaries between IT and business are crumbling fast where 'two pizzas' teams are becoming the norm. The traditional position of the CIO as 'master of enterprise services' is now being replaced by a new role of 'digital pathfinder'.

Implications for the role of the IT organisation

No longer is the talk within the 'C-suite' about 'doing digital'. Instead, it is all about 'being digital'. This varies, however, between sectors and organisations. Some sectors

such as Manufacturing and Utilities will continue to see IT as a means of streamlining supply chains and improving front office systems. Others in sectors such as Financial Services, Telecommunications and Media will come to consider IT as 'being the business' rather than as a business enabler.

This has profound implications for the IT organisation. At CIONET we have a clear view that the role of IT will continue to be central to any organisation in the forthcoming digital era, but should evolve to reflect the new environment that it is designed to serve. Here are some of the essential elements of the emerging IT organisation that is manifesting itself among our leading members:

- IT architects and runs the platforms necessary to support digital business. It guarantees security, connectivity and integration across all activities taking place within the platforms.
- IT maintains the technical community of practice that will become ever more widely dispersed across the business. It also provides technical education to everyone in the organisation, top to bottom.
- IT selects and helps apply the essential tooling that will be necessary to enable digital businesses to respond to rapidly changing external conditions. Such tools may include AI, RPA, big data, blockchain, augmented and virtual reality, and quantum computing.

In all these respects we envisage the development of the 'T'-shaped IT worker, where the vertical bar is about specialist technical content and the horizontal bar is about broader knowledge of the business. This should enable IT to work seamlessly across all areas of the business - back, middle and front office.

What is the future role of the CIO?

Interviewing over 50 IT executives in 2021, and publishing the *CIONET Cookbook* on successful recipes for digital leaders, CIONET observes a rapid elevation of the CIO from functional leadership to playing a more strategic role in the business at 'C-suite' level. No longer do we hear our members talking about a 'digital strategy for business'. Instead, they are talking about a 'business strategy for a digital future'. This implies a much deeper and more proactive understanding of the business context.

In this respect, we believe firmly that the road to competitive survival against the start-ups and digital natives will be about achieving simultaneous leadership in the three main value disciplines described in Wiersema and Treacy's book *The Discipline of Market Leaders*¹: operational excellence, product innovation and customer intimacy. IT will be the enabling tool in all these respects.

Tomorrow's CIO will be a business rather than a technology leader. They will need to fit comfortably within the 'C-suite' and be influential in strategic development as well as operational performance. The three possible future roles will be:



CIO as the pathfinder:

A digital leader able to assimilate and communicate the relevant technology-driven disruptive forces and associated opportunities



CIO as the business platform architect:

The orchestrator of platform development and operations that underpin front, middle and back office, including global shared services



CIO as the chief connecting officer:

Initiating and leading technology-driven transformations across an organisation that transcend functional and business boundaries

Dealing with the legacy

To enjoy the new freedoms as a genuine digital leader, CIOs must also be prepared to clean up the legacy landscape that haunts most organisations today. In this respect, the CIO must help to transform legacy cultures, skills, systems and processes. This will require investment and top-level support that is often missing in today's overcrowded board agenda. Technical debt has often been compared to pension shortfalls. It is a cost that must be built into budgets and strategic plans.

One of the routes forward is to adopt a 'cloud first' approach to modern IT and business architectures. Many organisations are re-platforming their core applications to run on the public cloud. However, some caution is required, as risk and complexity often negate the sought-for advantages of scale and agility that are associated with the public cloud. Many organisations are veering to a hybrid world of cloud and on-premises systems and applications.

A call for action

Our numerous country events and round tables suggest that the CIO community occupies a wide spectrum of maturity with respect to a digital future. CIO agendas are often overcrowded with today's tasks rather than tomorrow's possibilities. The Harvey Nash Group 2021 report provides an important platform on which to assess the effectiveness of current efforts and to recognise the gaps that may exist as we look towards the future. In this respect, the report is an essential read for all CIOs who aspire to become the digital leaders of tomorrow.

"We are witnessing acceleration in the rate of change"

Alvin Toffler, eminent 20th-century futurist and author of Future Shock

1. Wiersema and Treacy, *The Discipline of Market Leaders*

Building the responsive enterprise

MIT CISR Special Report



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.
cisr.mit.edu

The Covid-19 pandemic has reinforced the need for all enterprises to increase their business responsiveness. And who knows what new disruption or opportunity is just around the corner? Using the data from the Harvey Nash Group research we wanted to learn what the most effective firms in terms of business responsiveness do differently from the rest. In our statistical analyses we identified three factors that support business responsiveness:

- Commitment to becoming a digitally savvy company
- Innovation via modular agility
- Technologies that scale and support learning

Digitally savvy: Enterprises and their leaders that commit to becoming digitally savvy are not just using new technologies and creating new products and services but are also ready to scrutinise every part of the enterprise to see how technology can free up resources, create predictability, increase productivity, better engage customers, test new business models and develop digital partnerships. These enterprises and leaders look at the business model risk of not investing in technology as well as the direct benefits and costs of investments.

Committing to the potential of technology is about removing work barriers as well as enabling new ways of working, empowering a workforce to work collaboratively to solve complex problems. Developing and retaining key talent increases a company's responsiveness and agility, as these are the people that know the organisation's systems, processes and data best and can leverage them in decision-making.

Finally, managing the decision rights around technology – for example, who decides the digital spend, how spend is prioritised, who enforces standards and reuse – is an important part of committing to and realising the potential of technology. Interestingly, enterprises that manage more of the IT/digital budget through IT are typically better at these factors and better at business responsiveness.

Modular agility: Innovating via modular agility is to take your 'crown jewels' – what makes your enterprise great – and turn them into reliable, low-cost, standardised and reusable digital services. These services can then be combined and recombined, like Lego blocks, to optimise operations or to design and create new digital offerings. Take, for example, a bank that has a different onboarding process for every product. First, the bank must decide on the one best way to do the onboarding process and then standardise across the products – often a political activity rather than an operational or technical process. The biggest challenge for many firms is taking that standardised process and turning it into a service that is usable in all products and is also managed as an enterprise asset. Developing the modules and then reusing them throughout the enterprise is key to building responsiveness while controlling costs.

Technologies for scale and learning: Three technologies were linked to business responsiveness in our analysis, and all of them are platform-based and enable rapid learning throughout the enterprise, increasing responsiveness, especially to customers. A digitised platform is an integrated set of digitised business processes and the technologies, services modules, compliance checks and data to achieve

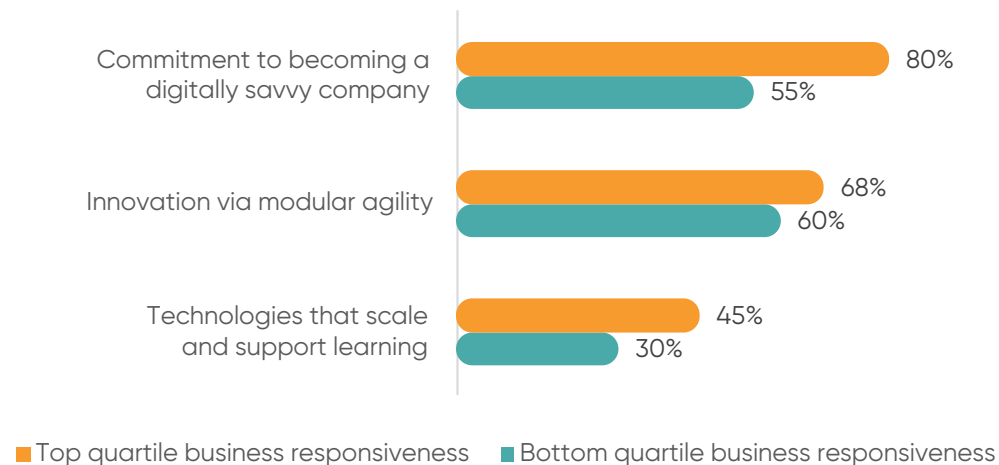
a specific purpose (like taking an order); it takes people out of the process, allowing an enterprise to redeploy the workforce toward higher-value activities. The first technology, machine learning and AI, helps an enterprise identify patterns in large sets of data and provides new insights for decision-making. For example, Ping An, a Chinese financial services company, uses AI on its customer and operations data to improve performance in areas such as customer service, marketing and risk management, driving down the time to serve customers.

The second technology, IoT, is a network of devices, sensors and software that connect to each other and share data. IoT moves the decision-making away from the centre of the enterprise and closer to the sensors and devices, allowing control of the devices to be more synchronised with the data being collected. Schneider Electric has built an energy and automation digital solution based on IoT to help companies, landlords and property owners focus on sustainability and energy efficiency.

The third technology is on-demand platforms that allow delivery of products and services to customers when and where they want them. The platforms go beyond delivery by varying the choices being offered by taking into account customer preferences and can, in some instances, adapt the products and services themselves. On-demand video and audio streaming services are instances of on-demand platforms – we predict more products and services will eventually be offered on these sorts of platforms in all sorts of industries.

Figure 1 compares enterprises scoring in the bottom quartile versus the top quartile of business responsiveness. Top quartile firms on business responsiveness were statistically significantly better at all three factors: digitally savvy, modular agility and technologies for scale and learning. Evaluate your enterprise on these three factors and assess if you are doing all you can to increase business responsiveness. The reward will be an increased ability to respond to an increasingly unpredictable business operating environment – both the opportunities and the threats.

Figure 1



Source: Harvey Nash Group 2021 Survey (N=1997). Factors were identified using regressions with Business Responsiveness as the dependent variable, with factors significant at the $p < .08$ level. Size of company is not significant for predicting business responsiveness nor is percentage of revenue spent on IT.

Weill, P., Woerner, S.L. and Shah, A. 'Does Your C-Suite Have Enough Digital Smarts?' MIT Sloan Management Review, Spring 2021, Reprint 62320

<https://www.theasianbanker.com/updates-and-articles/ping-an-bank-ensures-business-growth-through-digital-transformation-and-ai-integration>

Weill, P. and Woerner, S.L. *What's Your Digital Business Model? Six Questions to Help You Build the Next-Generation Enterprise*. Boston: Harvard Business Review Press. 2018

Sector league tables

Expecting a budget increase in next 12 months	
Sector	
Retail	69%
Technology	69%
Construction/Engineering	68%
Business/Professional Services	65%
Pharmaceuticals	63%
Charity/Non-Profit	62%
Manufacturing/Automotive	62%
Healthcare	60%
Global average	60%
Broadcast/Media	59%
Financial Services	59%
Government	58%
Transport/Logistics	56%
Power & Utilities	53%
Education	52%
Telecommunications	51%
Leisure	48%

Expecting an increase in IT/tech headcount	
Sector	
Retail	79%
Transport/Logistics	70%
Technology	69%
Leisure	65%
Government	64%
Pharmaceuticals	64%
Construction/Engineering	63%
Healthcare	63%
Broadcast/Media	62%
Global average	61%
Manufacturing/Automotive	58%
Financial Services	57%
Charity/Non-Profit	55%
Power & Utilities	55%
Business/Professional Services	54%
Telecommunications	54%
Education	53%

Using tech to reduce the need to travel	
Sector	
Manufacturing/Automotive	68%
Telecommunications	68%
Pharmaceuticals	64%
Technology	64%
Government	62%
Power & Utilities	62%
Business/Professional Services	59%
Construction/Engineering	58%
Global average	58%
Transport/Logistics	57%
Education	56%
Retail	54%
Broadcast/Media	53%
Charity/Non-Profit	53%
Financial Services	52%
Leisure	50%
Healthcare	49%

Undergoing major change of transformation	
Sector	
Broadcast/Media	73%
Telecommunications	68%
Technology	63%
Pharmaceuticals	60%
Retail	52%
Global average	50%
Transport/Logistics	49%
Business/Professional Services	48%
Manufacturing/Automotive	48%
Financial Services	47%
Government	47%
Leisure	44%
Healthcare	42%
Construction/Engineering	39%
Power & Utilities	36%
Charity/Non-Profit	34%
Education	34%

Retaining their best talent to a great extent

Sector	
Pharmaceuticals	50%
Charity/Non-Profit	47%
Business/Professional Services	45%
Government	43%
Healthcare	43%
Manufacturing/Automotive	40%
Technology	40%
Global average	40%
Transport/Logistics	39%
Financial Services	38%
Telecommunications	38%
Education	37%
Retail	36%
Leisure	35%
Broadcast/Media	34%
Construction/Engineering	34%
Power & Utilities	21%

Successful at promoting D&I in tech team

Sector	
Telecommunications	47%
Technology	37%
Power & Utilities	36%
Government	33%
Construction/Engineering	30%
Healthcare	30%
Global average	30%
Broadcast/Media	29%
Education	29%
Pharmaceuticals	29%
Business/Professional Services	28%
Financial Services	28%
Retail	27%
Charity/Non-Profit	25%
Transport/Logistics	25%
Manufacturing/Automotive	19%
Leisure	12%

Percentage of overall revenue spent on technology

Sector	
Technology	25%
Telecommunications	23%
Broadcast/Media	18%
Financial Services	16%
Government	14%
Healthcare	14%
Leisure	14%
Business/Professional Services	13%
Global average	13%
Transport/Logistics	10%
Charity/Non-Profit	9%
Education	8%
Pharmaceuticals	8%
Power & Utilities	8%
Retail	8%
Construction/Engineering	5%
Manufacturing/Automotive	5%

Better at innovating compared to peers in the last 2 years

Sector	
Leisure	68%
Retail	62%
Technology	62%
Healthcare	60%
Telecommunications	60%
Power & Utilities	57%
Transport/Logistics	57%
Government	56%
Manufacturing/Automotive	55%
Global average	55%
Business/Professional Services	54%
Charity/Non-Profit	54%
Construction/Engineering	53%
Education	52%
Broadcast/Media	50%
Financial Services	49%
Pharmaceuticals	43%

Regional league tables

Expecting a budget increase in next 12 months

Region	
Asia	69%
North America	61%
Europe	60%
Global average	60%
South America	49%
Australasia	47%

Expecting an increase in IT/tech headcount

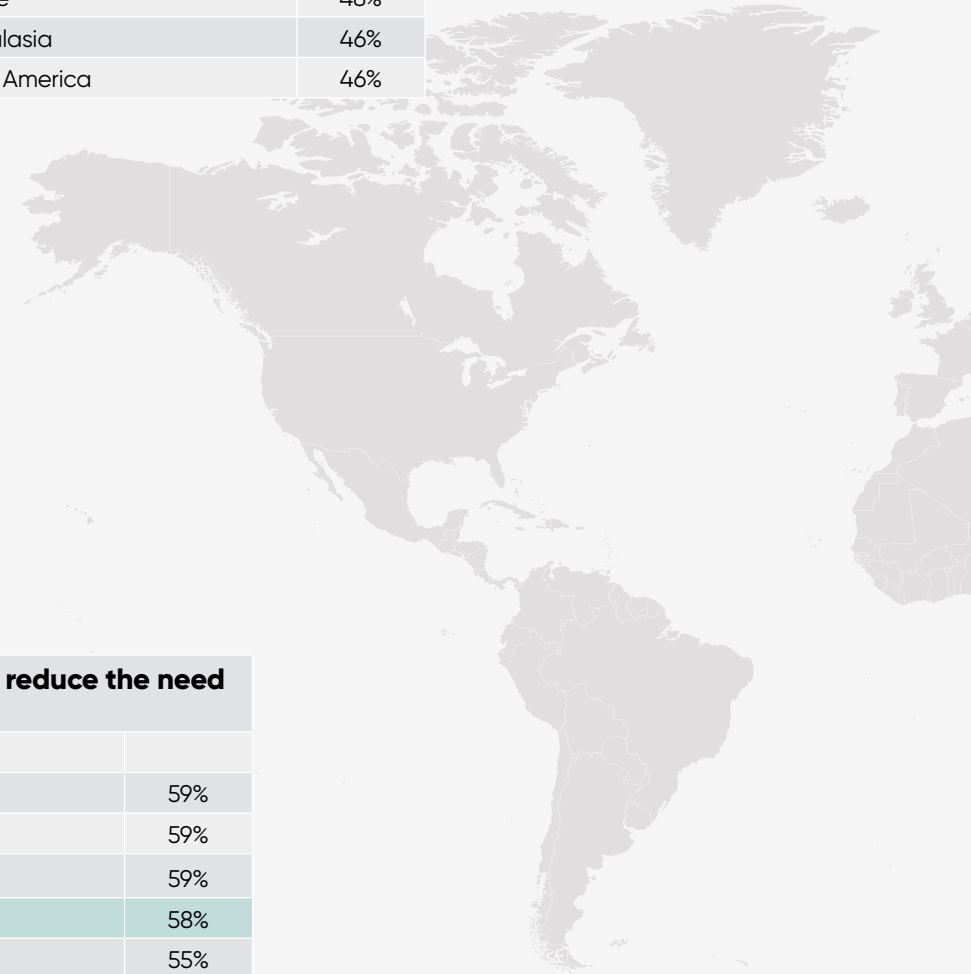
Region	
Asia	72%
Europe	62%
Global average	61%
North America	60%
South America	52%
Australasia	49%

Undergoing major change or transformation

Region	
Asia	58%
North America	51%
Global average	50%
Europe	48%
Australasia	46%
South America	46%

Using tech to reduce the need to travel

Region	
Asia	59%
Europe	59%
South America	59%
Global average	58%
North America	55%
Australasia	51%





Retaining their best talent to a great extent	
<i>Region</i>	
North America	47%
Australasia	42%
Global average	40%
Europe	39%
Asia	30%
South America	29%

Successful at promoting D&I in tech team	
<i>Region</i>	
North America	32%
Europe	30%
Global average	30%
Australasia	28%
Asia	25%

Percentage of overall revenue spent on technology	
<i>Region</i>	
Asia	14%
Europe	13%
Global average	13%
Australasia	11%
South America	11%
North America	10%

Better at innovating compared to peers in the last 2 years	
<i>Region</i>	
Asia	63%
South America	61%
North America	60%
Australasia	55%
Global average	55%
Europe	53%

Where talent meets technology

Harvey Nash Group is the leading global provider of talent and technology solutions.

We're equipped with a unique network, that realises the potential where people and technology meet.

For over three decades we've been helping clients solve broad and complex problems, building and scaling their technology and digital capability:

- We connect organisations with the very best global talent
- We apply technology expertise to solve complex problems
- We identify and develop the best global leaders
- We build your capabilities and technology capacity

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