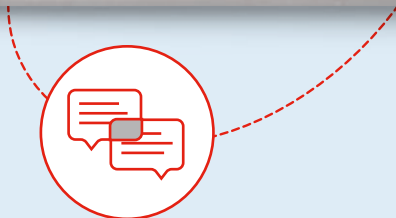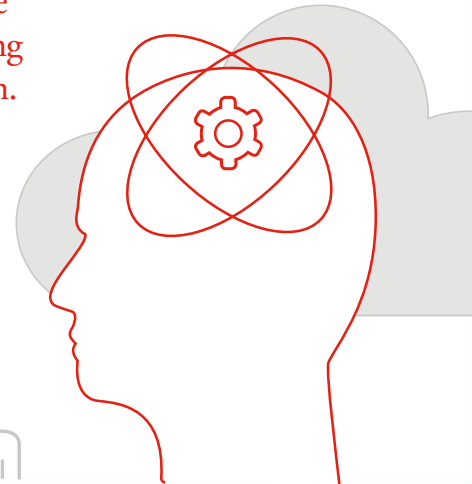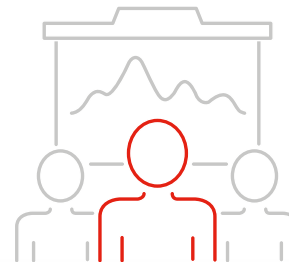**LOGICALIS**

Business and technology working as one

Agents of Innovation:

Significant, wide-ranging – and long overdue – change in the role of the CIO has put them at the heart of the action. They are more successful at balancing operational and strategic priorities, and taking a leading role in driving new, distributed approaches to innovation.

Logicalis Global CIO Survey 2018-2019

A research paper from Logicalis based on a global study of CIO pressures and priorities

logicalis.com/ciosurvey2018

Introduction.

This report details key findings from the sixth Logicalis Global CIO Survey, which seeks to assess the evolving role of CIOs and IT departments as digital technologies transform the business landscape.

For the 2018-2019 report, we draw on a survey of 841 CIOs in 24 countries to assess CIOs' success in balancing often conflicting pressures – for instance; managing information security as digitisation and cloud adoption extends the IT footprint far beyond organisations' physical boundaries.

Equally we look at CIOs' success in balancing unrelenting cost pressure with the need to drive, or at least enable, innovation – and whether working with trusted third parties is helping to strike that delicate balance.

Finally, this report includes three 'In Focus' features, looking at:

- The extent to which business intelligence and analytics are being employed to drive business benefits in areas ranging from leadership and finance to information security

- The rate of adoption, utility and impact of still emerging technologies – in this case Internet of Things (IoT) and Artificial Intelligence (AI)

- The pace with which CIOs are moving from a 'defence-only' information security footing to a more holistic 'prevent, respond and recover' footing, which we refer to as 'cyber resilience' – as well as the cost of GDPR preparedness and subsequent issues.
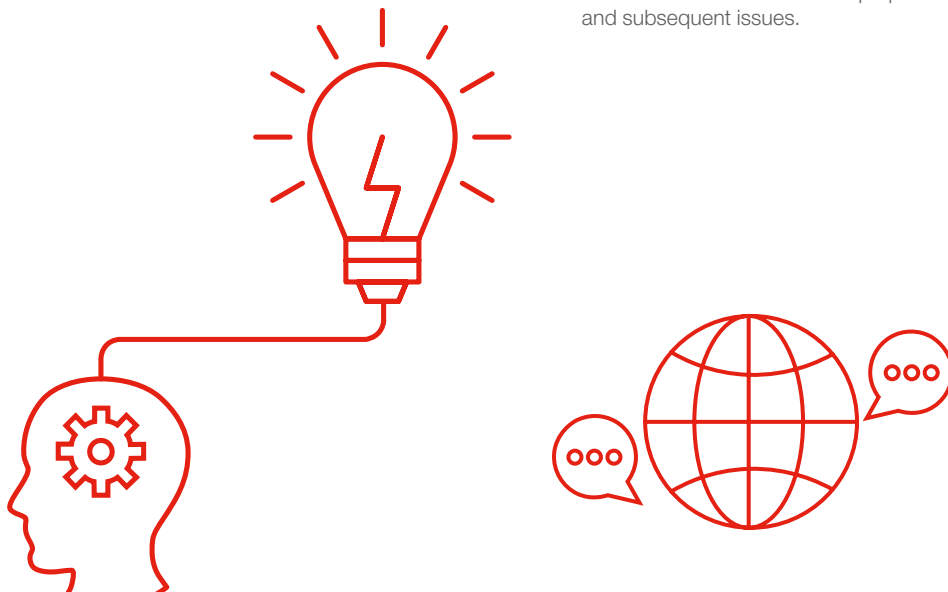
This year's survey highlights significant change, with CIOs finally enjoying real success in taking on a more strategic role – as day to day IT is increasingly handed over to third parties, and once distant threats and opportunities loom large.
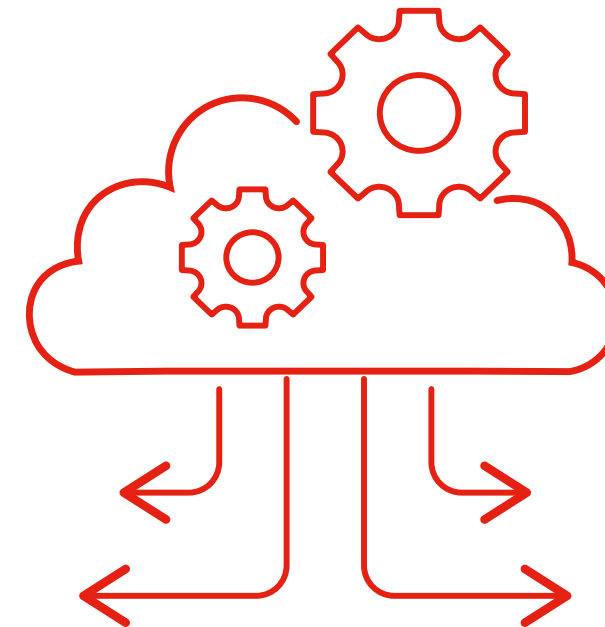
In Summary.

The 6th annual Logicalis Global CIO Report is the most compelling yet. It finds significant, wide-ranging, and long overdue, change in the role of the CIO.

At the most fundamental level, the role of the CIO is shifting dramatically away from day to day activity – keeping the lights on – and towards CIOs' long desired strategic focus.

Today, just over half (54%) now spend 50% of their time or more on 'keeping the lights on', and the majority report dedicating 40-60% of their time to managing legacy IT. That is in stark contrast with 12 months ago, when more than three quarters (78%) were spending 50% of their time or more on day to day IT management.

Based on that, we can fairly assume that, today, strategic activity makes up around half of the CIO role globally. Crucially, that shift in itself has further consequences for the CIO, the IT department and the way organisations consume and manage IT.

Strategy to the Fore

As the commentary on pages 5-7 makes clear, CIOs are more focused on service innovation than ever before and are measured on their success in this area.

Today, for instance, 38% of CIOs spent at least 30% of their time on innovation, and 54% spend at least 30% of their time on information security – another strategic priority given the nature of the

threat landscape and the consequences should something go wrong. This suggests that, for the average CIO, the balance between innovation and operations is approaching parity.

Further weight is given to the view that CIOs are more focused on strategic activity by the way performance is now measured. Half (50%) are now measured according to their ability to deliver service innovation, and more than a third (35%) are expected to make a direct contribution to revenue growth.

Why Now?

Clearly, it is important to understand how CIOs have managed to effect this change and 'why now?'. This report seeks to answer these questions on pages 9-10, where we explore CIO responses around the 'anatomy' of the IT estate and the drivers behind increased use of external IT providers.

We find that the IT estate continues to rapidly expand beyond organisations' physical footprint as the march to the cloud continues, and the use of external providers to manage day to day IT increases.

For instance, 'the core' (IT hosted and managed internally) now accounts for less than two thirds of the overall IT estate, while 22% of IT is now

managed by external suppliers and 24% sits entirely outside of the corporate footprint.

Crucially, a significant proportion point to the externalisation of IT as a means of freeing up time to focus on innovation and business outcomes.

Agents of Innovation

Perhaps the most telling findings in this year's report are those that explore the nature of innovation, and how CIOs contribute to it. This is explored on page 12.

We find CIOs are no longer sidelined, but at the heart of the action – with 83% either leading (32%) or enabling (51%) innovation.

Crucially too, approaches to innovation are changing. The large scale projects that once dominated remain in 23% of organisations. Instead, small scale, everyday experimentation leads the way – 34% of CIOs agreed this is the approach to innovation in their organisations.

Given that technology now pervades innovation – either delivering it or enabling it – it is easy to see how this distributed approach has either been enabled by, or driven, CIOs shift to a more strategic role.

In Focus: Analytics and BI, Information Security and Emerging Technologies

Finally, this report looks at the effect of CIOs' shifting role in three key areas – pages 14-18.

It finds that progress has been made in deriving benefit from analytics and business intelligence (BI). On average around a third of CIOs rate their success at four or five out of ten across a range of business functions.

However, given that distributed innovation must be guided by a single core principle, for instance defined customer or market need, analytics and insight must play a key guiding role, so there remains much to do.

The expansion of the IT footprint and the ever evolving threat landscape have clear implications for information security. Indeed, most CIOs signal that they are moving away from a purely defensive footing to one of cyber resilience, which brings together defense with detection and recovery. More than a third (37%) of CIOs say their organisation now adopts a resilience-based information security footing.

Alongside this, there is greater focus on the human element of information security with, for instance, more than half (56%) now citing lack of staff awareness and mistakes as key cyber risks. This shines another bright light on the need for more progress when it comes to analytics and BI, as user behaviour intelligence can play a key role in targeting high risk users for awareness training.

Finally, the changing role of the CIO is having an impact when it comes to emerging technology adoption. Their responses suggest accelerated IoT and AI adoption, though greater practical experience of these technologies is driving a higher degree of circumspection as to their success to date in realising business outcomes from them.

For instance, 46% now say their organisation is using IoT, up from 24% 12 months ago, but CIOs are roughly half as likely to ascribe specific business benefits to these deployments.

Overall we can conclude that CIOs have made great progress in carving out a more strategic role, but these are early days. The true value of the new role will be measured in business outcomes and success in driving innovation – something that will only become clear over the months and years to come.

Read on to explore the findings from Logicalis Global CIO Survey 2018-19 in detail.

The Role of the CIO: Change at Last.

- **CIOs now balancing strategic and operational priorities**
- **A day in the life – balancing acts and key areas of focus**
- **What success looks like – how are CIOs measured?**

Strategy to the Fore. How the Role of the CIO is Changing.

Over the last five years, Logicalis CIO Surveys have consistently identified a desire amongst CIOs to take on more strategic roles – a desire that has been frustrated by the demands of everyday IT management.

Indeed, in our 2013 survey most suggested they would like to spend 70% of their time on strategic activities. But even this time last year, most remained clearly preoccupied with 'keeping the lights on', and were only fleetingly able to engage with the digital transformation that promises to unlock huge benefits for organisations of all shapes and sizes.

One year on, the picture has changed dramatically.

The CIOs surveyed last year were still very much focused on the day to day. More than three quarters (78%) were spending 50% of their time or more on day to day IT management, with the majority admitting that tactical IT management accounted for 60-80% of their time.

Today, however, the demands of day to day are significantly reduced. Just over half (54%) now spend 50% of their time or more on 'keeping the lights on', and a majority report dedicating 40-60% of their time on this day to day IT management.
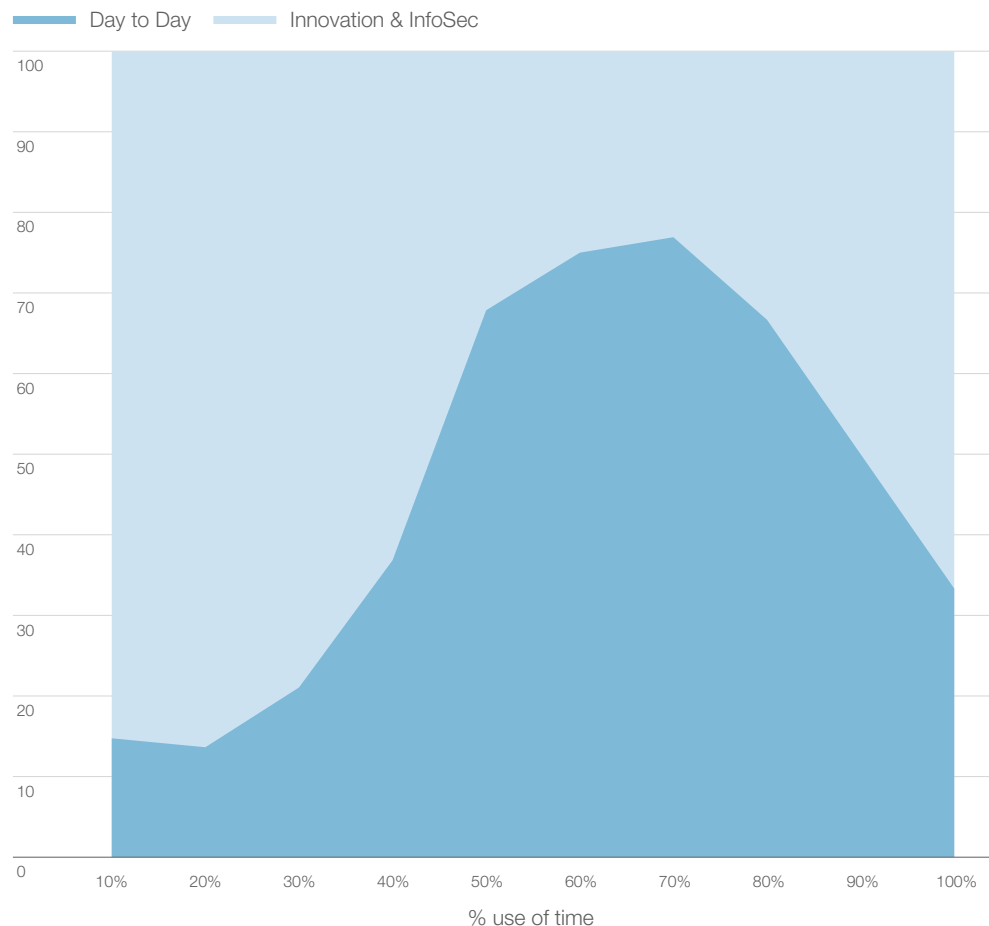
Based on that, we can fairly assume that strategic activity makes up around half of the CIO role globally.

70%

Desired time spent on strategic activities in 2013.

Figure 1: CIOs use of time (Normalised)

— Day to Day   — Innovation & InfoSec

% use of time

A Day in the Life: Innovation and Information Security.

Are CIOs *really* more focused on strategy? A look at how their time is spent suggests they are – but, within that, they must still balance innovation with more pressing strategic priorities like information security.

To assess this, we asked CIOs how much time they typically devote to two activities that fall in these two camps – we asked how much time is dedicated to 'innovation' and how much is dedicated to information security – which should be a clear strategic priority for all organisations.

Their responses paint a clear picture.

Both are vitally important, but CIOs are now much more effective in striking a balance between these kinds of priorities:

94%

Today 94% of CIOs spend between 10% and 50% of their time on innovation – and 38% spend at least 30% of their time on it.

93%

Similarly, 93% of CIOs say they devote between 10% and 50% of their time to information security – with 54% spending at least 30% of their time on it.

Clearly CIO time is not wholly dedicated to these two activities, but their near universal importance amongst our respondents suggests that the move to a more strategic role is a genuine one.

We can look beyond this snapshot, to delve further into CIOs' delicate balancing act, by assessing how CIO performance is measured – which, in turn, tells us a lot more about their priorities.
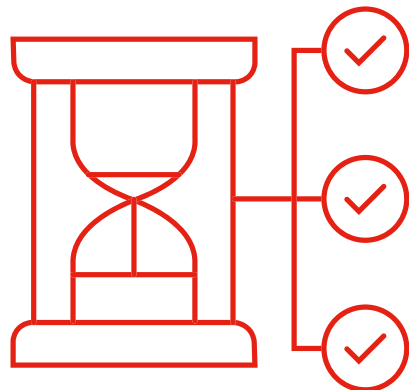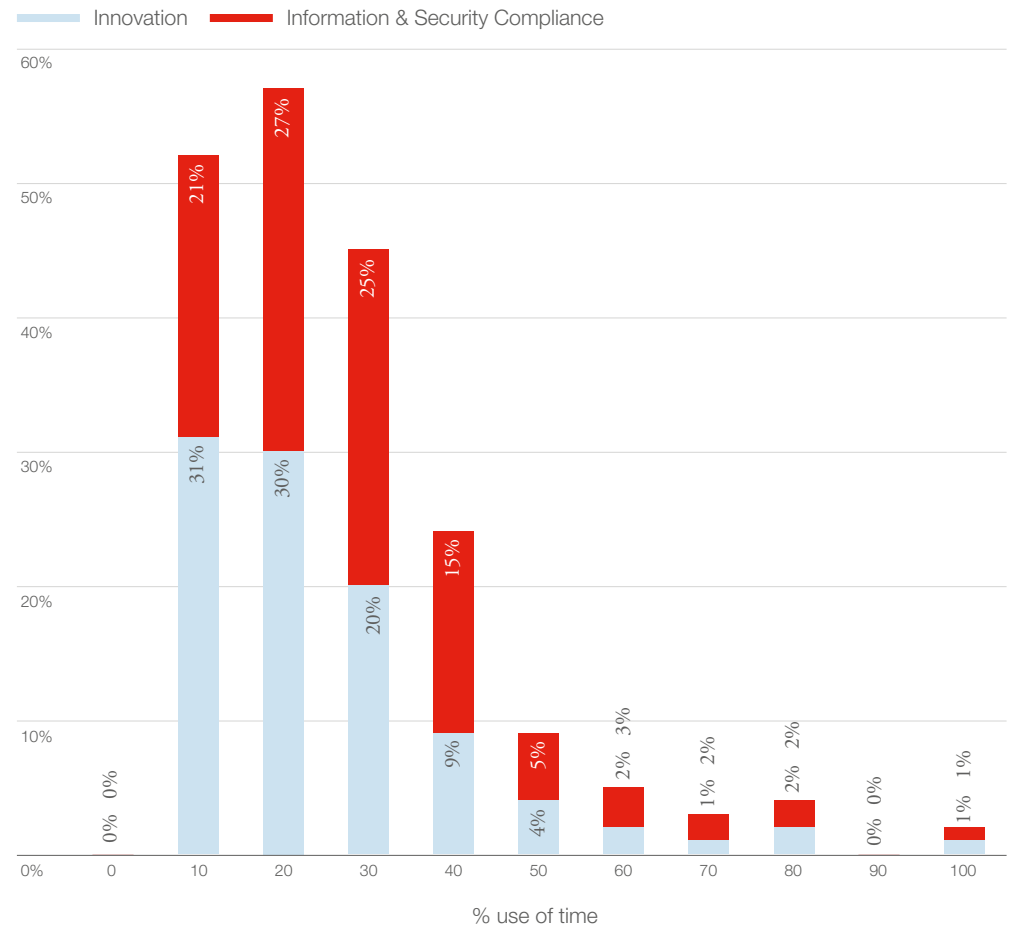
Figure 2: Breakdown of strategic activities

Legend: Innovation / Information & Security Compliance

% use of time

What Success Looks Like. How Are CIOs Measured?

Is the budget squeeze over?
Today, less than two thirds of CIOs (62%) are measured on their success in reducing the cost of IT. On the other hand, 50% are measured on their ability to deliver service innovation. Does this signal that the days of belt tightening in the IT department are coming to an end?

The suggestion that CIOs are now enjoying more wide-ranging roles – and striking a balance between innovation and operations – is confirmed by the range of activities on which their performance is measured.

Operational, day to day, activities are still important.

Not surprisingly, 73% still point to system availability as a key priority, while a potentially conflicting focus on cost reduction is a performance metric for 62% of CIOs. Similarly, compliance is a key focus for 49% of our respondents.

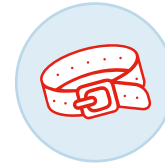**But strategic priorities also feature heavily.**

Today, half (50%) are measured according to their ability to deliver service innovation and, interestingly, more than a third (35%) are expected to make a direct contribution to revenue growth – perhaps through digital transformation and by enabling product and service innovation through digital technology.

We can use this insight to build a picture of the average CIO role – *see figure 3*.

This further reinforces the view that strategic goals are increasingly living side by side with operational priorities. Innovation and revenue growth now account for 25% of the job overall (more on this later on page 12), but conflicting issues like availability and cost reduction (40%), as well as priorities like risk mitigation (60%) and compliance (33%), are very important.

Overall, however, it is clear there is a bigger focus on business outcomes. CIOs have indeed changed, clearly in reaction to a changing world – and it is not simply a case of the world changing around them.
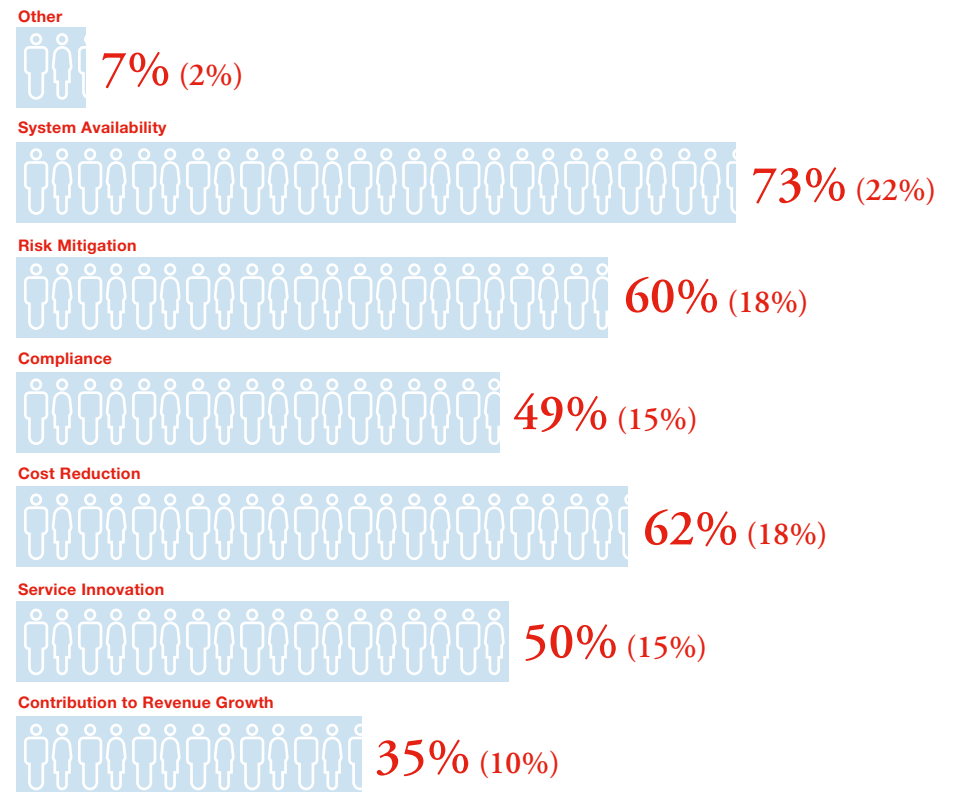
The questions now are 'how? And 'why now?' How have CIOs finally managed to effect this change, and take on this long desired strategic role, and what has prompted such a dramatic shift? These are questions we will answer in the following section.

Figure 3: How CIOs are Measured (Responses and Share of Responses)

Other
7% (2%)

System Availability
73% (22%)

Risk Mitigation
60% (18%)

Compliance
49% (15%)

Cost Reduction
62% (18%)

Service Innovation
50% (15%)

Contribution to Revenue Growth
35% (10%)

Blurred Lines: The Expanding IT Footprint.

- **The anatomy of the IT estate: The inner core, outer core, core cloud and pure cloud**

- **What drives external services uptake?**

- **Still huge opportunities for managed services and third-party IT provision**

The Anatomy of the IT Estate.
The Shrinking Core.

22%

The headline here is that, overall, 22% of IT is now managed by external suppliers, and 24% is outside the corporate footprint.

As figure 4 demonstrates, overall the core now accounts for less than two thirds (64%) of the IT estate.

The Shift

Last year's survey took a slightly different approach to the question of external services, but the shift is clear:

- Last year 25% said more than half of IT provision and management was outsourced
- This year 36% report the use of totally externally hosted (24%) and/or totally externally managed (22%) services.

In more detail:

- The vast majority of technology remains on site (76%). 24% is in the cloud
- Of that on-site technology, 84% is managed internally, 16% by service providers
- Overall 77% is managed internally – of which 18% sits in a cloud environment
- 10% is completely outside of core or 'pure cloud' – cloud provisioned and third party managed.

Of course, the picture changes when individual technologies are assessed – as some are clearly easier to externalise, in part because external solutions are mature.

For instance:

- 15% of email services and email security is pure cloud (outside of core), compared with 3% for file and print and 4% for network security
- 38% of email services and email security are cloud based, with 14% and 16% completely passed on to third parties and sitting outside of core.

Clearly, that is the extreme end of the scale, but other technologies and services are following suit:

- CRM – 25% cloud based, 11% handed off to external suppliers
- Communication and collaboration technologies – 28% cloud based, 11% managed externally
- Even data centre capacity is edging away from core. While 78% remains on site, 19% overall is externally managed and 9% is completely handed off.

There can be no doubt that the world is changing fast, driven by changes in the way organisations provision, manage and consume technology.

In this changing world, the rise of cloud and, side by side with that, an increased willingness to 'export' IT to external providers, is proving something of a double-edged sword for CIOs.

In short, IT has changed, and CIOs have been forced to change with it. For instance, information security is clearly more of an issue in this distributed world, which may explain why CIOs now spend so much time dealing with it, and why it is now seen as a strategic, not operational activity.
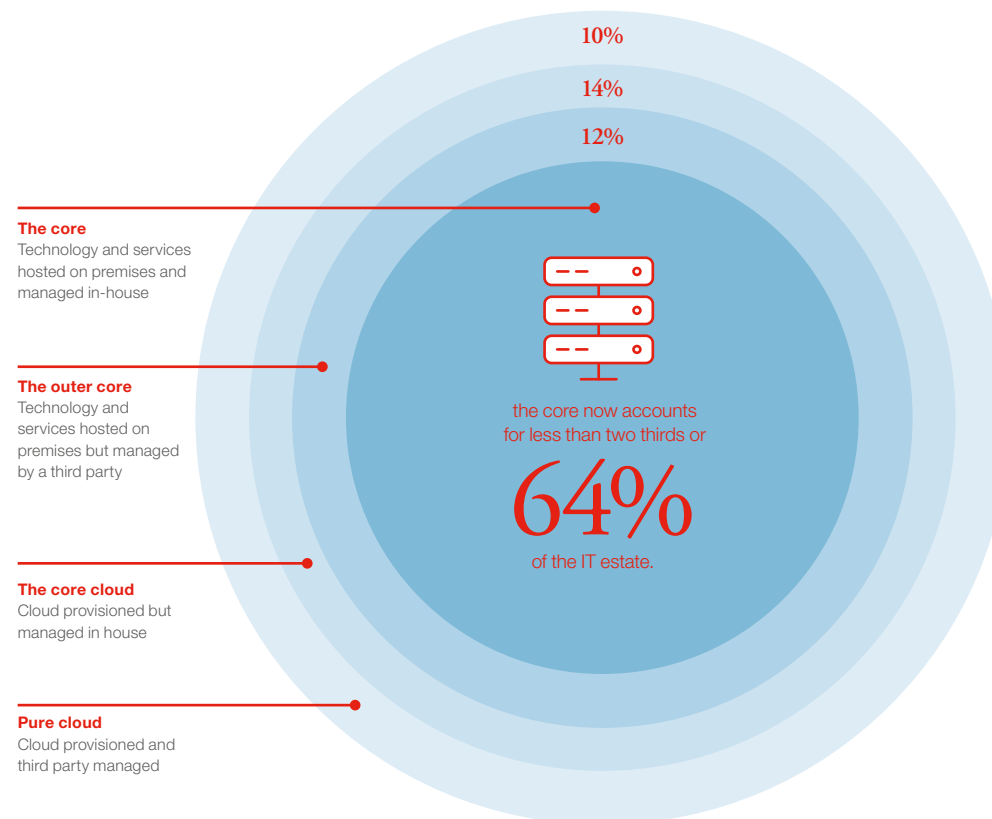
But with that change has come opportunity, as handing off day to day technology management to third parties has finally given CIOs the time they need to focus on strategic activity.

To assess the extent to which IT has changed, we asked CIOs to indicate just how much of the IT they are responsible for now falls outside of the once all-encompassing core. We asked them about a series of technologies, and where they sit in an IT environment that now comprises four layers and reaches far beyond the physical boundaries of the organisation. Those layers are:

Figure 4: The anatomy of the IT estate

10%

14%

12%

The core
Technology and services hosted on premises and managed in-house

The outer core
Technology and services hosted on premises but managed by a third party

the core now accounts for less than two thirds or

64%

of the IT estate.

The core cloud
Cloud provisioned but managed in house

Pure cloud
Cloud provisioned and third party managed

Trusted Third Parties: What's Driving the Rush to Export IT?

CIOs' responses around why more and more IT is being exported to third parties, and outside of the core, are instructive. They once again cement the view that CIOs are actively off-loading day to day IT tasks in order to focus on innovation and business outcomes:
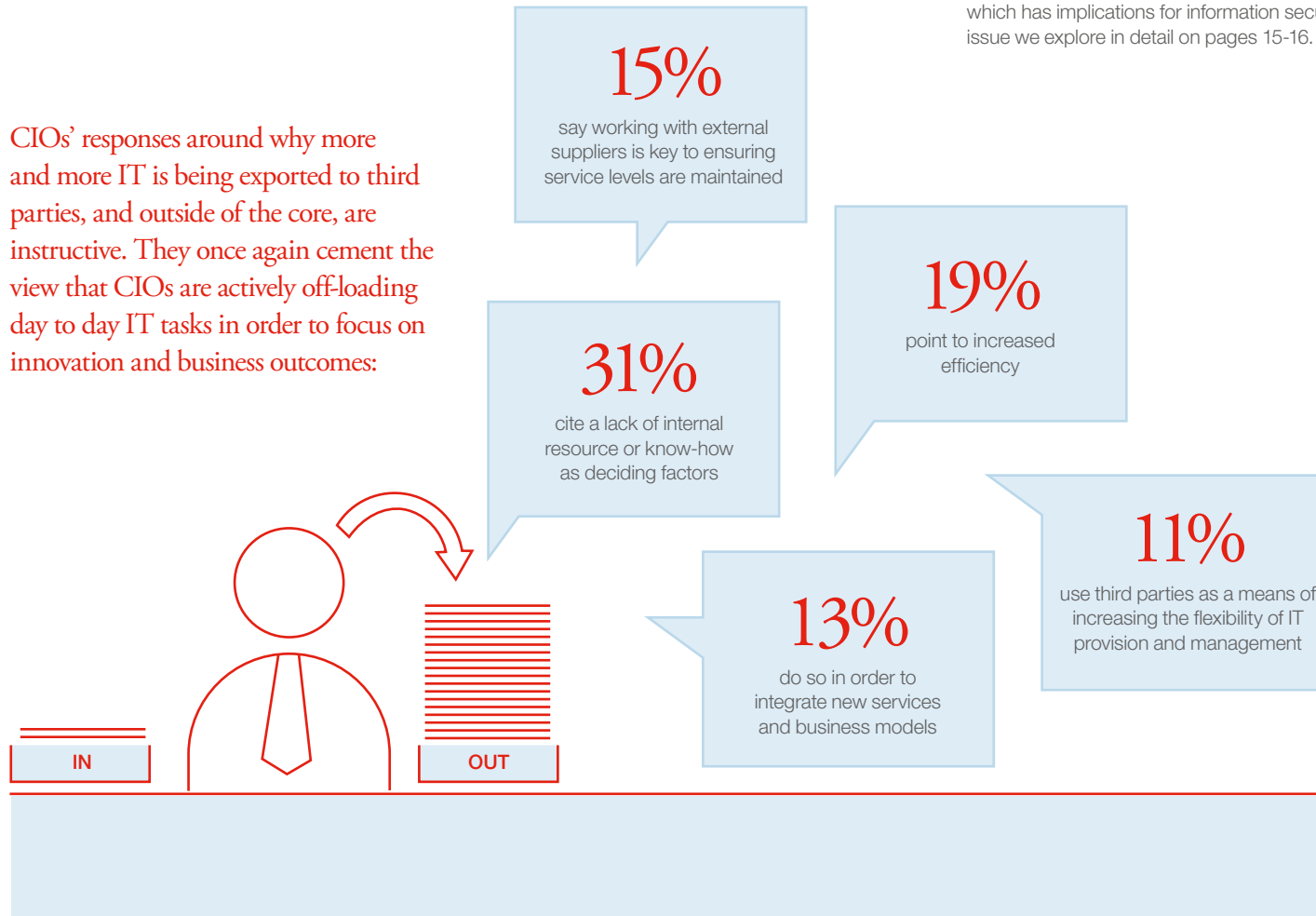
These drivers are broadly in line with the main aspects of the CIO role as it stands now – and to striking that balance between innovation and operations.

Working with trusted third parties to deliver and manage IT outside of the core is about making day to day management more efficient while maintaining service agility. But it is also about finding the time and flexibility to devote more time to innovation and to activities that contribute to revenue growth.

As we noted above, however, the flip side here is that more and more tech is outside the corporate footprint, which has implications for information security – an issue we explore in detail on pages 15-16.

The question is 'What will drive the next wave of outsourcing?'

The opportunity for managed services and cloud providers remains significant

The fact is we remain a long way from a 'cloud first' world – and the scope to involve more external suppliers and managed services remains. At present, still less than a quarter of technology is managed by third parties.

The question is 'What will drive the next wave of outsourcing?'. It might seem counter-intuitive, but it's likely that security will be next as organisations seek out specialist cloud solutions to secure technologies and services that have already been migrated to the cloud. That would allow CIOs to create multi-layered security, without the complexity of managing it all on site.

Email security offers a case in point. Cloud email services come with security features 'in the box', but none can defend against the sheer array of email-borne threats on its own. In response, some organisations are already looking for cloud solutions that integrate seamlessly with core cloud email services, while strengthening security and continuity.

Indeed, it is easy to understand the benefits of replacing the manual effort of maintaining email gateway security, for instance, with a solution that does it better, without requiring any ongoing input from the IT department.

But whatever comes next, it is clear that the march to the cloud continues apace, which will only further erode the on premise, core estate – and further change the role of the CIO.

15%
say working with external suppliers is key to ensuring service levels are maintained

31%
cite a lack of internal resource or know-how as deciding factors

19%
point to increased efficiency

11%
use third parties as a means of increasing the flexibility of IT provision and management

13%
do so in order to integrate new services and business models

IN

OUT

Big Ideas: CIOs as Agents of Innovation.

- Organisational approaches to innovation are changing
- A culture of experimentation is replacing large scale projects
- CIOs and IT taking centre stage – either driving or enabling innovation

Experiment or Die? The Nature of Innovation is Changing.

Agents of Innovation. CIOs are at the Heart of the Action.

The nature of the IT estate is not the only significant change in the world of the CIO. But in this case, they are as much driving change as reacting to it.

As we will see on the following pages, there are very good reasons why CIOs now spend more time on innovation – quite apart from the fact that business outcomes like service innovation are now key performance measures.

The first is organisational. That is, the way organisations think about innovation is changing, with strategies for innovation now most commonly about enabling small scale, everyday experimentation.

Over a third (34%) of organisations now take that approach, with the large-scale projects that once dominated now accounting for less than a quarter (23%).

Once the preserve of digital pioneers like Amazon, a distributed approach to innovation – if guided by a common principle like responding to clear customer or market need – is far more effective than the old, 'monolithic' approach.

It's agile and focused, adding pace and adaptability to the innovation process. It naturally demands more input and involvement from CIOs and IT.

The only question is 'what kind of role CIOs play?', which the following section seeks to answer.

We know that CIOs *ARE* more closely and extensively involved in innovation, as would be expected with a shift to smaller scale experimentation. After all, most small-scale innovations will require technology support to some degree.

As we saw on page 6, 94% of CIOs spend between 10% and 50% of their time on innovation and 38% spend at least 30% of their time on this strategic activity. Similarly, innovation now accounts for around 25% of the average CIO role.

The burning question, of course, is 'who is driving? Are CIOs reacting to need or driving the change?'.

Responses to the Logicalis Global CIO Survey offer a hint at the answer.

When asked what role they play in organisation-wide innovation, 32% said they played a leading role, while a further 51% pointed to a supporting role. That means that 83% of CIOs are directly involved in innovation – be that driving it or enabling it.

On the flip side, just 4% play no role in innovation and 13% play a peripheral role.

The suggestion inherent in those numbers is that CIOs are agents of innovation. Their much-increased direct involvement helps change the face of innovation – either through choice or as day to day pressures continue to move towards trusted third parties.

In truth, it doesn't matter where it started. What matters is what happens next. Those CIOs most engaged with innovation are likely to become increasingly involved more quickly as the devolution of IT increases.

In turn, that greater involvement can only extend an organisation's capacity for small scale experimentation. So, what we have, in effect, is a virtuous circle where innovation drives business outcomes, and business outcomes enable innovation – with the CIO at the heart of the action.

The End of Shadow IT?

Does this culture of experimentation, enabled by CIOs, herald the beginning of the end of shadow IT? Will we soon come full circle? Given CIOs' role in driving and enabling 'distributed innovation', are CIOs increasingly taking on a role at the heart of enabling line of business innovation, rather than trying to contain it?

32%
of CIOs said they played a leading role in organisation-wide innovation

51%
of CIOs pointed to a supporting role in organisation-wide innovation

In Focus.

- **Business Intelligence & Analytics**
- **Information Security & GDPR**
- **Emerging Technology Adoption**

In Focus: Business Intelligence and Analytics.

CIOs report some success in deriving business benefit from business intelligence (BI) and analytics, but much more could be done.

Around a third of respondents scored their organisations a four or more out of five in rating their success in using BI and analytics to deliver positive business outcomes in a variety of line of business areas.

Not surprisingly, the IT department's own use of BI and analytics came out on top. Over a third (36%) of CIOs scored their success in this area at least four out of five, and 11% awarded themselves a five. Equally, a third (36%) gave themselves a score of one or two out of five, or did not know whether BI and analytics were delivering business benefits in IT.

As figures 5 shows, this picture changes depending on whether BI is applied to strategic or purely operational tasks – our BI success league table opposite:

There is clearly still much to do, and it's especially worrying that up to a quarter of CIOs simply do not know whether benefits are being accrued from BI and analytics. This, of course, could be down to a lack of involvement, but it could also reflect a lack of visibility around the expected benefits. That is, maybe some CIOs are involved in delivering BI and analytics, without fully understanding how they will be used. Not surprising given last year's survey showed 41% of CIOs citing "no clear brief from the business" as a barrier to analytics and BI advancement.

That would be a concern, given that BI and analytics are crucial in almost every area in which CIOs are involved – both innovation and operations.

For instance, effective experimentation and innovation in areas like customer service and product development are vital to a customer or market-centric approach – feedback through analytics and other research are crucial to ensuring all innovation is focused on the end user, guided by genuine need or clear pain points in the customer experience. And yet, CIOs are less effective at accruing benefits from BI in these areas.

Similarly, analytics is key to effective information security – particularly in creating a 'human firewall' through user awareness and training. To be truly effective, that training cannot be solely a computer-based training (CBT) approach, important as it is. It must also be dynamic, targeted, role specific and memorable – for instance using BI to identify high risk users based on behaviour.

The question for CIOs is whether it is time to move away from large scale, monolithic BI.

Maybe it should be as distributed as the overall IT and innovation culture – after all, the pace of insight defines the pace of innovation – so agility throughout is essential.

"The pace of insight defines the pace of innovation."

Figure 5: BI and analytics league tables

Business area		Scored 4 or 5	Scored 5/5	Don't know
	IT department	36%	11%	15%
	Finance & operations	30%	9%	21%
	Marketing & sales	29%	8%	24%
	Customer service	29%	10%	21%
	Information security & compliance	29%	8%	20%
	Product & service innovation	23%	6%	24%

In Focus: Information Security and GDPR.

The key finding here is that information security strategies are evolving in response to an ever-changing threat landscape.

In particular CIOs are more focused on internal threats than before. This may be in response to the extended IT footprint we identified on pages 8-10 and because organisations are realising that a technology-based defence alone will never be enough – they can never win the arms race with cyber criminals.

Indeed, CIOs are far more focused on the human dimension of cyber risk than before; accepting that people are often the weakest link in any security framework.

Last year the focus was clearly on external threats – 72% pointed to ransomware as the main threat facing the business, 60% identified hacks and other exploits, and 58% said social engineering.

This year, while ransomware, crypto-jacking and the wider malware family remains very much on the radar for 68% of CIOs, lack of staff awareness and mistakes are also in the cross hairs for more than half (56%) of CIOs, while 39% are concerned about malicious insiders (see figure 6).

Cyber Resilience

The question is whether this increased focus on the human denominator in cyber threats, alongside traditional technology based 'defend and protect' strategies, is reflective of wider approaches to information security. The answer appears to be 'yes'.
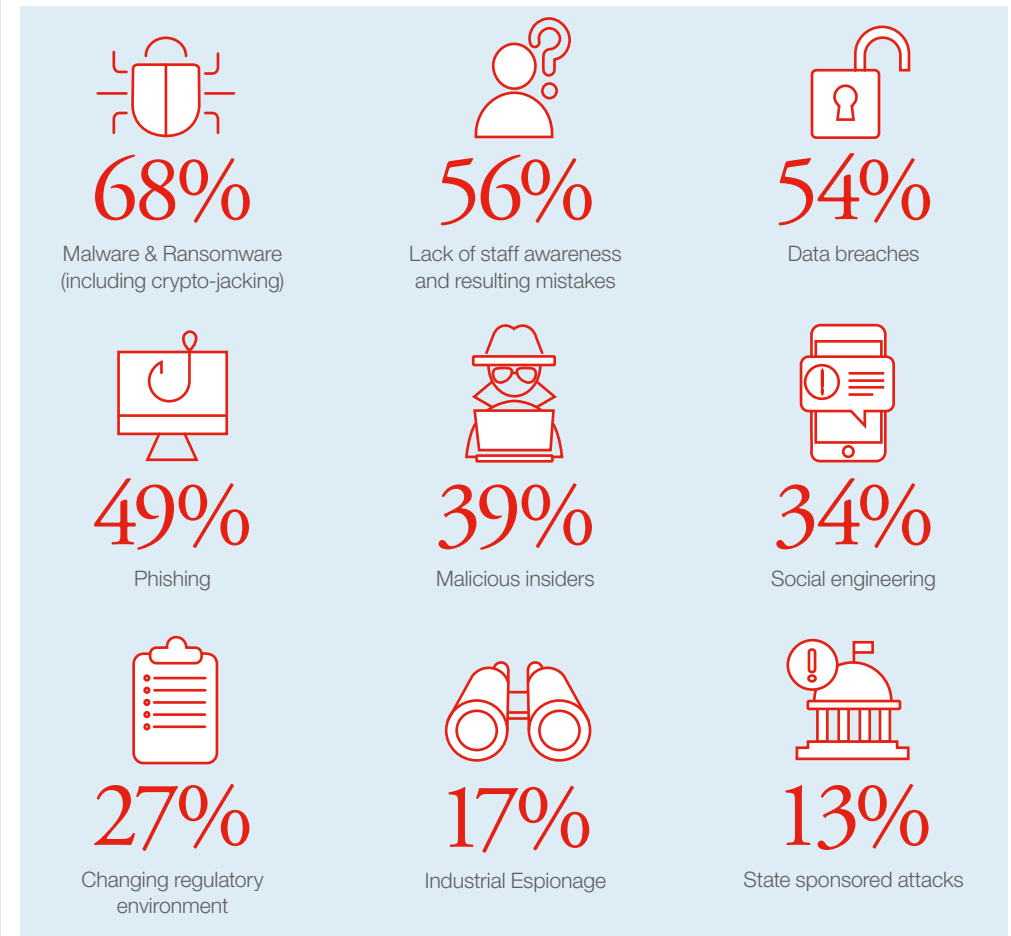
CIOs seem to be accepting that 'defence only' approaches to information security are no longer enough. True cyber risk management requires a human firewall as well as a virtual one.

Hand in hand with that is a refocus on security footings. CIOs clearly indicate they are moving to a cyber resilience footing rather than a purely defensive posture.

Over a third (36%) now agree their security footing is one of cyber resilience – combining defence with detection and recovery. In essence that's born out of an acceptance that it is impossible to keep everything out. Containing, for instance, zero-hour attacks that get past defences while maintaining business as usual is just as important.

In addition, a further 10% are currently reassessing their security footing, perhaps with a view to moving to a cyber resilience footing in the future.

Figure 6: CIO Security Threats

68%
Malware & Ransomware (including crypto-jacking)

56%
Lack of staff awareness and resulting mistakes

54%
Data breaches

49%
Phishing

39%
Malicious insiders

34%
Social engineering

27%
Changing regulatory environment

17%
Industrial Espionage

13%
State sponsored attacks

In Focus:
Information Security and GDPR (continued.)

Inconsistent and disjointed

While that change of focus might be cause for cautious optimism, the current state of information security is a clear cause for concern.

Knowledge of security frameworks, standards and the focus of investments is patchy among CIOs. This may well be due to evolving approaches to information security and the emergence of specialist roles like the chief information security officer (CISO).

- 28% do not know what security standard they adhere to

- 14% adhere to no standard at all.

Those that do know, and adhere to a standard, point to a world of competing standards, with no one approach taking the lead:

- 38% adhere to ISO 27000 series

- 18% to a level of CIS standard

- 16% adhere to the COBIT standard.

Meanwhile, 10% do not know which security technologies make up their frameworks, while those that do tend to characterise frameworks that are still mainly focused on defence:

- 73% say network security is an element

- 66% point to access control and detection.

Conversely, only 58% carry out end user awareness training, which – although it's up from 46% 12 months ago, still leaves almost half not addressing arguably their most important vulnerability; people and human error.

What next for security?

Given the focus on the human dimension of cyber-security, and the shift towards a resilience footing, it is likely a number of changes will happen relatively soon.

We should expect investments in user awareness training to increase – ideally drawing on analytics, as we discussed on page 14, to ensure training is delivered when, where and how it is most likely to be memorable and effective.

Equally, a cyber resilience footing should see the usual investments in defence matched with further investment in breach management, continuity, and recovery support and solutions.

As we noted on page 10, it seems inevitable that this is one reason why we will see CIOs' reliance on trusted third-party specialists increase.

Figure 7: Effects of GDPR
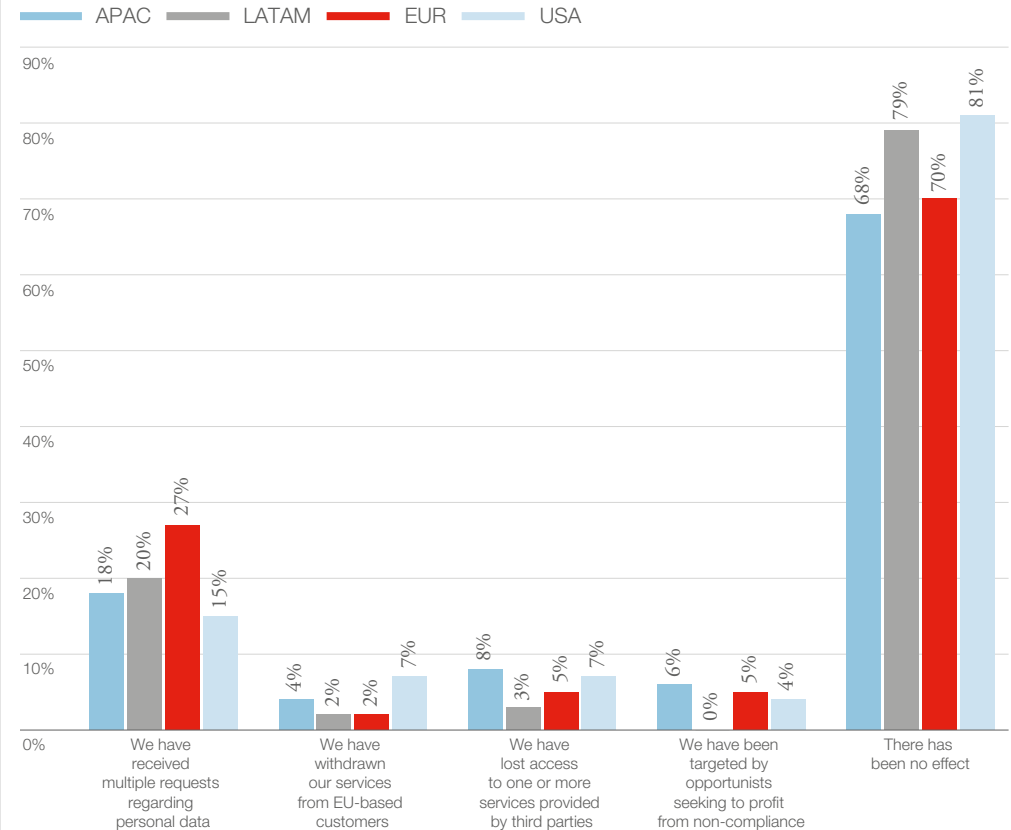
GDPR: After the Hype

The figures here speak for themselves. According to our CIO sample, the impact of GDPR has fallen far short of the dire predictions.

Nearly three quarters (71%) said GDPR passing into law has had no impact on their organisation at all, while a fifth (21%) have seen multiple subject access requests and 6% have been targeted by opportunists seeking to profit from non-compliance.

It would be wrong to suggest that GDPR in, and of itself, had no effect. Rather that most organisations did a great job of implementation, as those with longer memories will recall from Y2K.

The Logicalis Global CIO Survey also assessed the cost of GDPR compliance and, again, the reality fell well short of the hype. Though the average investment of up to £25,000 is not insignificant, it suggests that the process was well and efficiently handled.

- 52% of CIOs said GDPR preparation cost £25,000 or less

- 22% said between £25,000 and £100,000

- 15% said £100,000 to £500,000

- 3% said between £500,000 and £1,000,000

- 7% said more than £1,000,000.

In Focus:
Emerging Technologies.

25%
of CIOs are delivering business outcomes through IoT

66%
of CEO's are saying AI will be in use within their organisation within three years.

19%
(Nearly a fifth) of CIOs claim their organisations are already using AI.

One measure of the level of innovation being delivered by CIOs is the pace with which they are embracing emerging technologies.

In this year's report, we look at Internet of Things (IoT), comparing responses to those gathered 12 months ago, as well as Artificial Intelligence (AI) and Machine Learning, both of which have organisation-wide potential applications.

Connected World: Internet of Things Adoption Continues Apace

Looking first at IoT, the figures indicate that adoption has accelerated over the last 12 months. Almost half (46%) of CIOs say their organisations are already using IoT, up from 24% last year. That's ahead of last year's projections, when 41% of CIOs suggested they would be using IoT within the next 12 months.

That said, opinions around its utility are far more circumspect, perhaps as the challenges associated with useful deployment come into sharper focus than the theory. In fact, CIOs were roughly half as likely to ascribe specific business benefits to IoT use compared to 12 months ago, even though the rates of adoption roughly doubled over the same period.

All the same, the fact remains that at the very least 25% of CIOs are delivering business outcomes through IoT and many more plan to, which once again speaks to their increased ability to dedicate time to service innovation.
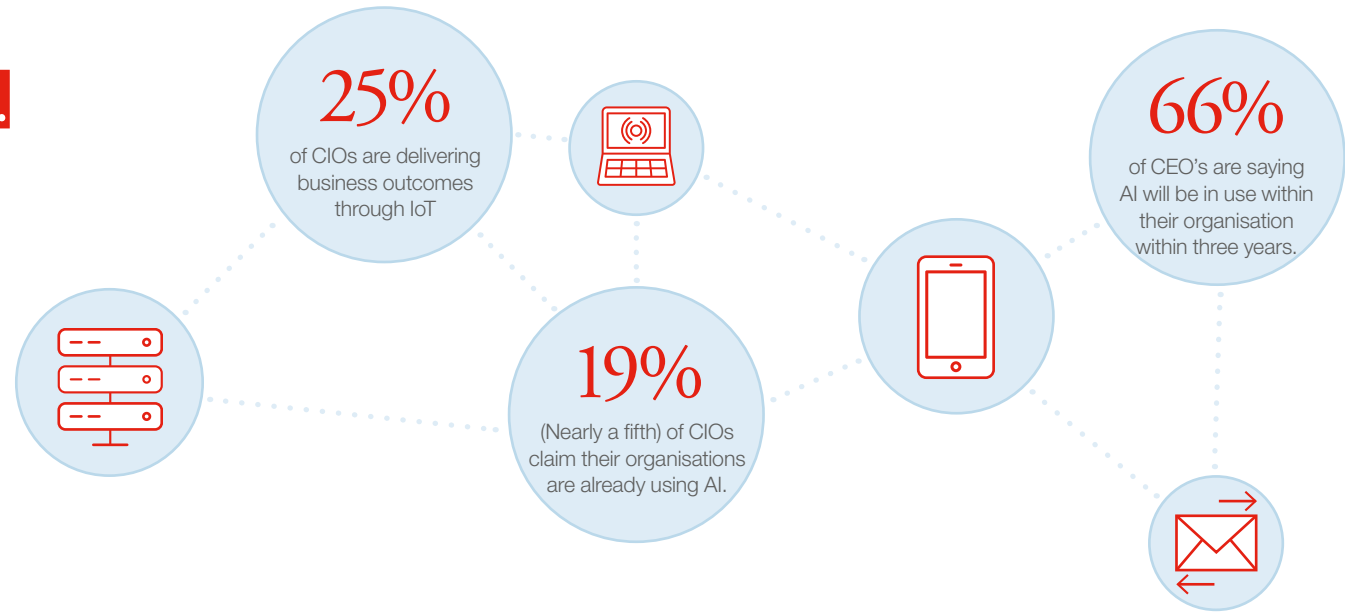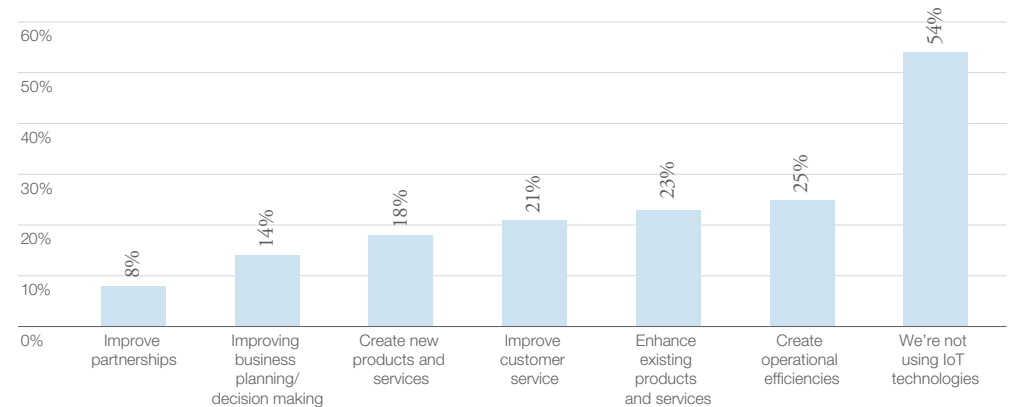
The Rise of the Machines: Artificial Intelligence Adoption is Already Widespread

Artificial Intelligence (AI) and Machine Learning, meanwhile, appear to be in an earlier phase of the hype cycle – possibly where IoT was 12 months ago.

Current adoption appears, at a first glance, to be robust. Nearly a fifth (19%) of CIOs claim their organisations are already using AI. That adoption seems likely to continue at pace, with 66% saying AI will be in use within their organisations within three years.

Figure 8: Use of IoT Technologies

Category	Value
Improve partnerships	8%
Improving business planning/decision making	14%
Create new products and services	18%
Improve customer service	21%
Enhance existing products and services	23%
Create operational efficiencies	25%
We're not using IoT technologies	54%

In Focus:
Emerging Technologies
(continued).

We should, however, sound a note of caution, or two.

First, it is unclear how AI is understood. Do CIOs perceive AI simply as autonomous automated services and interfaces essentially guided by complex manually created rules? Or do they see it in its purest form, as technology that is not just autonomous and automated, but also able to learn and adapt independently based on context?

Second, it's worth noting that, outside of the IT department, the business area most likely to use AI is customer service (17% say it is in use here). The extent to which this extends beyond often clunky chat bots, however, we cannot say.
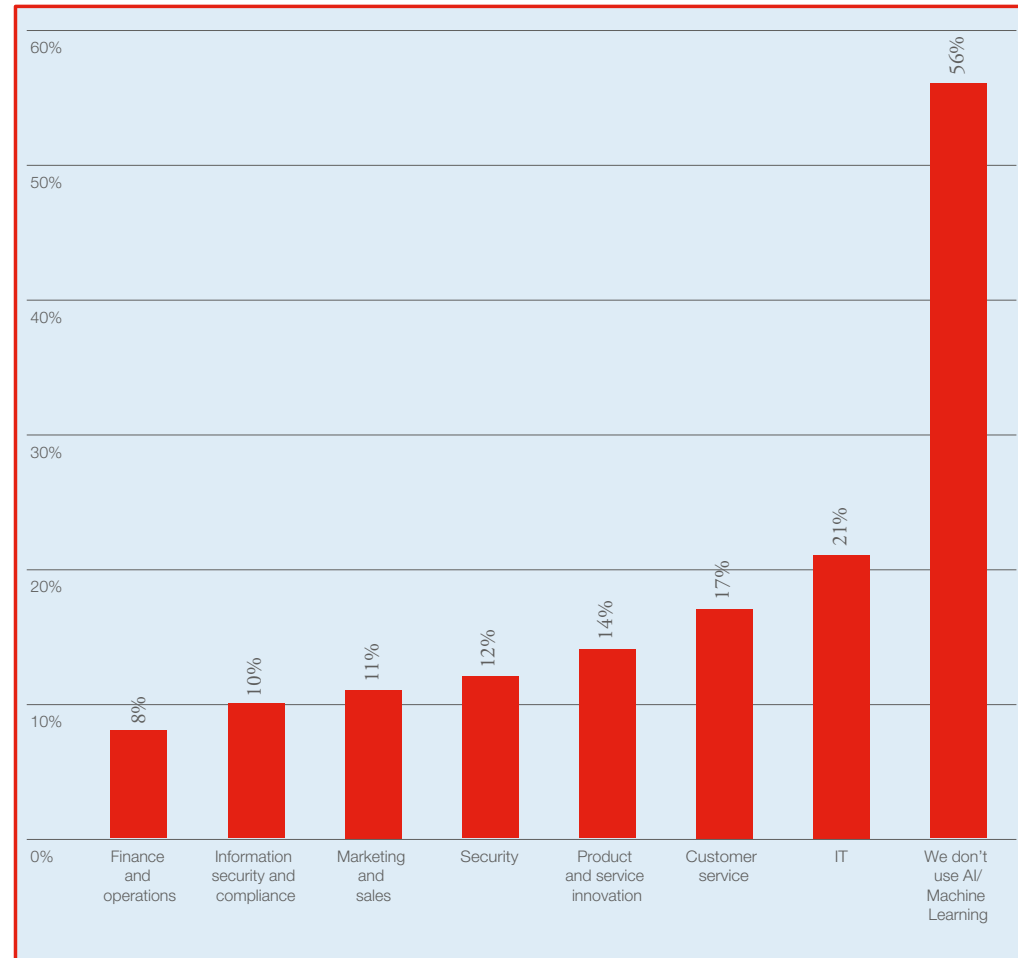
Even so, it is again encouraging to see CIOs so bullish about their ability to engage with AI. This, more than anything, will be vital if organisations are to derive true value from AI.

At present, rates of use across various business departments are low, see figure 9, which suggests operational, fringe and test cases.

However, we can be optimistic that use will grow quickly in a culture of experimentation, led or enabled by organisations' technology leadership – and small-scale deployments driven by clear customer or market need will help ensure many deliver real business value.

The only question remaining is 'How much and how fast will the march of the machines change the face of business over the next three years?'

Figure 9: AI by function

Finance and operations	8%
Information security and compliance	10%
Marketing and sales	11%
Security	12%
Product and service innovation	14%
Customer service	17%
IT	21%
We don't use AI/ Machine Learning	56%

The Last Word.

I'd like to start by offering my sincere thanks to each of the 841 CIOs and IT leaders who took the time to contribute to this report. Their willingness to share their thoughts and experiences with us is vital to gathering the insight that gives the Logicalis Global CIO Survey its solid grounding in the real world.

After six years of surveys, with input from thousands of CIOs, we know very well how precious their time is, especially during a period of profound change – for the relationship between business and IT and, consequently, for the role of the CIO.

The pressure on CIOs has been unrelenting, with the ever present need to balance vital day to day IT management with strategic priorities and innovation, made all the more complex by the need to cut costs.

With that in mind, I am delighted to see CIOs this year finally enjoying success in taking on a long-desired more strategic role – no doubt helped by their increasing reliance on trusted third parties to take on more of the heavy lifting associated with day to day activities.

Most importantly, this shift seems to have enabled CIOs to take central roles in innovation. To my mind, this is essential given that digital technology now sits at the heart of innovation, not just enabling better service delivery, communication or collaboration, but defining entirely new business propositions.

There is still a long way to go if organisations are to realise the full benefits of digital transformation. But the fact that CIOs and technology leaders are central to this innovation – rather than struggling to keep up – can only give us real optimism for the future.

Naturally, at Logicalis we are committed to helping CIOs effect these changes and to innovate in forging a new, closer relationship between business and technology. Over the last five years we have invested heavily in acquiring the capabilities, services and expertise we believe can be pivotal in enabling CIOs to both adopt a new, more strategic role and thrive in it.

For instance, we have grown our capabilities in the IoT technology market. We have delivered projects across the Americas, Europe and Asia in a wide range of industry sectors. But in particular, the manufacturing, retail and public sectors, delivering, for example, pilot projects for fleet management and smart cities.

On the security front we have invested in regional security advisors. They are working with our clients to develop their security strategies, compliance status and technology configuration. Equally, security analysts in our state-of-the-art security operations centres in Europe, Latin America and Asia deliver cloud-based managed security services to our clients around the globe.

We have leveraged our big data skills in the Latin American operation to extend to Spain and the UK to deploy and manage big data platforms for our customers. Spain and the UK have also developed AI capability and some new specialist partnerships.

"These are exciting times and where CIOs are the agents of innovation, we are committed to being the architects of change."

**Mark Rogers,
Chief Executive Officer,
Logicalis Group**