White Paper N°21.

Cloud: Unlocking transformation across the UK's public sector

Executive summary

Many attempts have been made to transform and modernise IT across the UK public sector, each usually ending in ever larger outsourced contracts. Six years on from the establishment of the Government Digital Service (GDS) and its mission to accelerate the UK public sector's move to digital technologies, we are reaching a tipping point in the penetration and pace of cloud adoption across the sector. 'Going to the cloud' was once seen as a radical move in the public sector, adopted by those brave enough to exit from long-established legacy contracts provided by a select group of huge IT firms. Those early champions recognised from the get-go that the only way to deliver the scale and pace of transformation they required was to re-think how the public sector used and consumed IT, and use commodity cloud-based services to test out, enable and accelerate that change. We can confidently state that cloud is now a central part of a rapidly changing UK public sector IT estate.

The take-up of cloud computing within the public sector has been a story of steady growth with the adoption rate more than doubling over the last seven years. This has been in large part driven by the innovative G-Cloud procurement framework which launched in 2012. This proved to be a game-changing disruptor, unlocking access to thousands of new Cloud Service Providers (CSPs) and innovative services. These initiatives enabled the public sector to first imagine a different way of buying and consuming technology, then provided access to the specialist cloud capabilities needed to help them to implement and exploit these technologies. Cloud is now a standard part of the sector's IT toolkit, with 82% of public sector organisations having deployed at least one cloud service.

Reassuringly, we see that cloud computing is delivering on its promises to bring a variety of benefits to the public sector, at a time when it is under increasing pressure to do more with less. The most highly reported benefits generally fall into three categories – cost effectiveness, agility, and internal functioning. Cloud users in the sector routinely report that cloud has delivered healthy cost savings, faster access to technology, and more flexible access to technology. Meanwhile, over a third found that it is helping them to work more efficiently, with reports of improved employee satisfaction, collaboration, and less time spent troubleshooting.

Some significant concerns continue to act as a brake on speedy adoption. The public sector shares the private sector's enduring anxieties around data privacy and security in the cloud, which is unsurprising considering the sensitivity of the data that these organisations often hold. Legacy systems and contracts can also be obstacles to cloud adoption. It can be particularly difficult to set aside existing investment in legacy systems or overcome restrictions inherent in current contractual relationships. These factors tend to inhibit transformation and migration to cloud. This is likely a factor in one of the greatest inhibitors to moving more apps and infrastructure to the cloud – lack of budget. IT departments find that with legacy systems, typically they are either locked in to out-of-date architectures or tied in to long-term, bespoke support contracts or both. This increases the time, cost and difficulty inherent in any transformation or migration project.

Perhaps one of the greatest threats on the horizon, however, is a widening gap between the public and private sector in terms of their access to the skillsets required to effectively adopt and deploy cloud technology. Whilst almost 25% of public sector organisations found this to be an inhibiting factor, only 14% of private organisations found the same – suggesting that many public sector organisations are struggling to access the specialist cloud talent that they need to take full advantage of the technology. This is an area that must be addressed as a priority if the public sector is to successfully fulfil its cloud aspirations. CSPs have a huge role to play here, to continuously find ways to make their services as friction-free as possible, and seeking approaches that support the public sector in their efforts to build the internal skills and capacities needed to design, build, and run a disaggregated multi-sourced supplier environment. Industry must respond to the challenges by constantly looking for ways to improve their understanding of the UK public sector's cloud computing requirements, and to better match their services to current and future needs.

Despite these obstacles, cloud technology is steadily taking its place as a key component in the digital transformation of the public sector, with 90% of public sector organisations who have either already started their digital transformation strategy or looking to develop one stating that cloud is important to this strategy.

This White Paper outlines how far the UK public sector has progressed on the path to cloud adoption and the challenges that it will face along the way. We acknowledge that in this research we do not distinguish between the different segments within the public sector, such as health, education and central and local government. Our intention is to commission further research to help us to better understand the specific issues and differences within these segments.

In our conclusion, we look at some of the key challenges and what CIF is doing to help the public sector to address these, so that industry can best support the safe and confident progress towards a cloud-native public sector. of the delivery model.

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Methodology and definitions

Methodology and sampling

In the first half of 2017, Vanson Bourne conducted the seventh major body of research on behalf of CIF to determine the level of cloud adoption among participants and to gain insights into attitudes, experiences and trends across the UK end user community. The research polled 250 senior IT and business decision-makers in large enterprises, small to medium-sized businesses (SMBs) and public sector organisations. The organisations represented all had UK-based operations.

This report examines the responses of the public sector respondents, which were drawn from both central and local government and the health and education sectors, and, at times, contrasts them with the responses offered by the private sector.

Definitions:

Cloud computing

There have been many definitions of cloud computing since the term was first coined in the 1990s. It has, to an extent, become a catch-all term for hosted IT services of any type, including, but not limited to, multi-tenanted services accessed via the internet. However, for the purposes of this report, we have used the National Institute of Standards and Technology's (NIST) definition of cloud, which is as follows:

Cloud computing is a term that relates to the IT infrastructure and environment required to develop/host/run IT services and applications on demand, with consumption-based pricing, as a resilient service. Communicating over the internet and requiring little or no client end components, it provides resources and services to store data and run applications, from many devices, anytime, anywhere, as-a-service. The services can, in turn, be scaled up and down as needed to meet a customer's variable operational needs, ensuring maximum cost efficiency.

Digital transformation

Digital transformation is about more than just turning analogue processes into digital ones; it relates to the ground-up critical examination of an organisation to look at how it does things and reimagine how it interacts and engages with its employees, partners and customers. As the name suggests, technology is central to digital transformation, but it is first and foremost about business change and how businesses can reorient themselves to take advantage of digital technologies.

The research polled 250 senior IT and business decision-makers in large enterprises, small to medium-sized businesses (SMBs) and public sector organisations
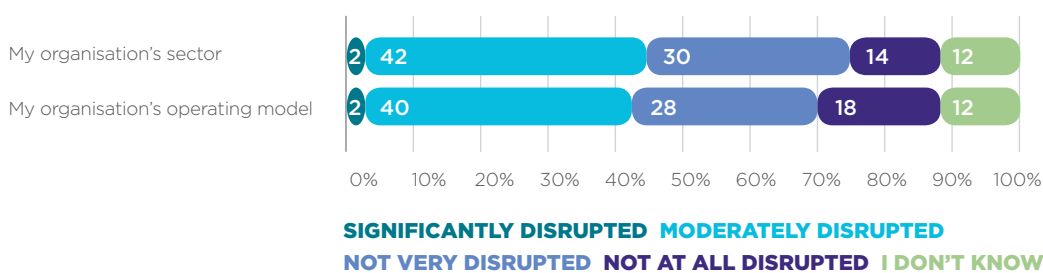
1. Cloud and digital transformation

The public sector is not insulated from the winds of digital disruption and whilst the imperatives for change are not the same as those in the private sector, lasting transformative change is needed. The use of digital and cloud technologies is enabling much of that change, encouraging public sector bodies to re-examine the way they deliver services, and helping them to access, and make better use of data to make them more connected and open. A key challenge for the public sector keeping pace with citizens' expectations about how they interact with public bodies and provide public sector staff with the same levels of functionality in the IT they use at work as they enjoy in their personal lives.

This change has not gone unnoticed among our respondents, many of which expect their organisation's sectors and operating models to be disrupted by digital transformation over the next two years.
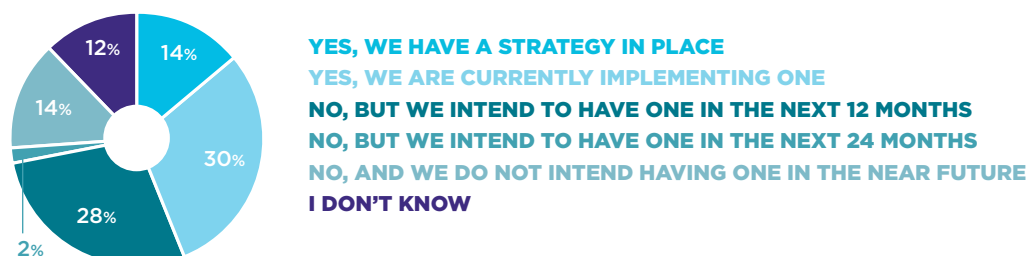
Many expect their organisation's sectors and operating models to be disrupted by digital transformation over the next two years

To what extent do you think that your organisation's sector and operating model will be disrupted by digital transformation in the next two years?

My organisation's sector	2	42	30	14	12
My organisation's operating model	2	40	28	18	12

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

SIGNIFICANTLY DISRUPTED   MODERATELY DISRUPTED
NOT VERY DISRUPTED   NOT AT ALL DISRUPTED   I DON'T KNOW

The need to up the pace of change appears to be encouraging a rise in digital transformation strategies in the sector. When asked about their digital transformation strategies in 2016, 38% stated that they had a strategy in place or were in the process of implementing one. Today, that figure has risen to 44% and within the next year, roughly 72% expect to have rolled out a digital transformation strategy.

Does your organisation have a digital transformation strategy?

YES, WE HAVE A STRATEGY IN PLACE
YES, WE ARE CURRENTLY IMPLEMENTING ONE
NO, BUT WE INTEND TO HAVE ONE IN THE NEXT 12 MONTHS
NO, BUT WE INTEND TO HAVE ONE IN THE NEXT 24 MONTHS
NO, AND WE DO NOT INTEND HAVING ONE IN THE NEAR FUTURE
I DON'T KNOW

Respondents have high hopes for these strategies. Roughly eight in ten plan to deploy their digital transformation strategies to make better use of technology within their organisations, around half hope to achieve better use of data and analytics and a similar proportion want to improve business agility. These aspirations present CSPs with potential huge opportunities, and they will need to be able to respond and find affordable solutions for their customers.
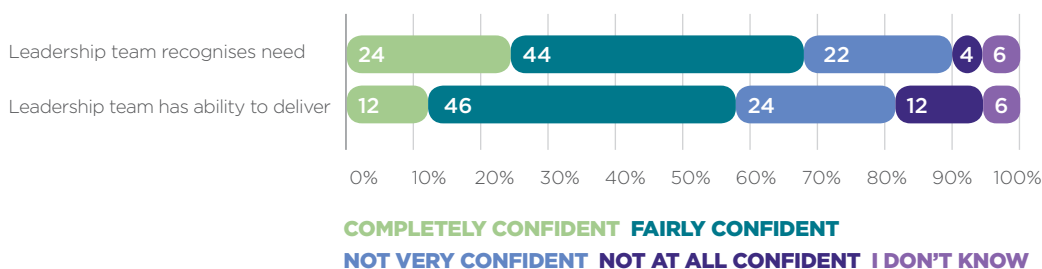
What are the key objectives for your organisation's digital transformation strategy?

Objective	%
Make better use of technology	78
Achieve better use of data and analytics	49
Improve our business agility	46
Improve our ability to innovate	41
Empower employees	41
Build a strategic direction of how we should be using technology over the next ten years	35
Attract younger staff, with the skill-sets to make the most of future technologies	22
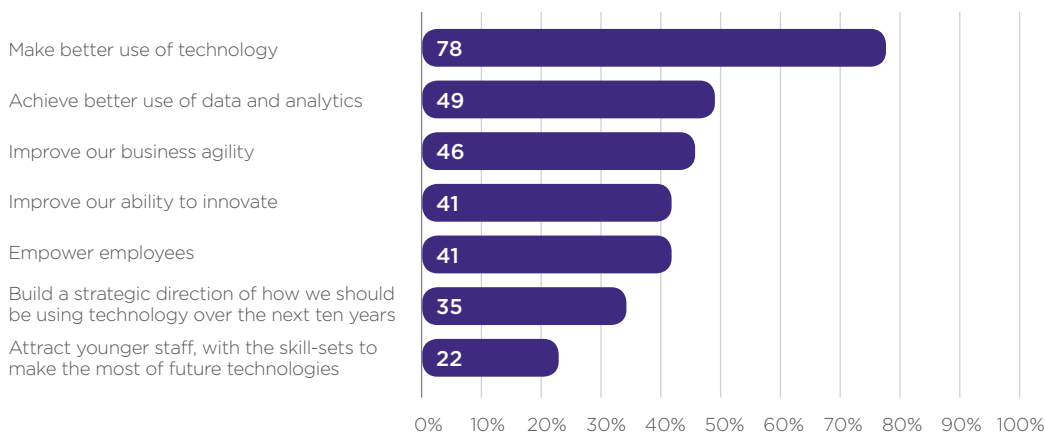
How successfully the public sector is able to deploy strategies will, however, be contingent on a number of factors, chief among them continued easy access to a vibrant market of digital and cloud-based services, and the ability to build the leadership and skills needed to implement these.

Whilst public sector respondents were generally confident that the leadership team within their organisations recognised the need for digital transformation, they expressed less confidence in their ability to successfully deliver it. There appears to be room for improvement on both counts, with just a quarter (24%) stating that they were completely confident that leadership recognises the need for transformation and just 12% completely confident that they were up to the task of delivering it.

How confident are you that your leadership team recognises the need, and has the ability to deliver, digital transformation?

	Completely confident	Fairly confident	Not very confident	Not at all confident	I don't know
Leadership team recognises need	24	44	22	4	6
Leadership team has ability to deliver	12	46	24	12	6

COMPLETELY CONFIDENT FAIRLY CONFIDENT NOT VERY CONFIDENT NOT AT ALL CONFIDENT I DON'T KNOW

Respondents were generally confident that the leadership team within their organisations recognised the need for digital transformation, they expressed less confidence in their ability to successfully deliver it

Access to the right skills is another key concern. Only around half (52%) believe that they have the necessary skills in place within their organisations to adapt to digital transformation, and whilst 12% are actively recruiting to fill these gaps, 28% have no plans to do so.

Managing a mixed economy of legacy and cloud-based digital technologies requires a distinctly different skill set than that historically held by IT teams. A failure to recognise and address that change will see organisations left behind in the race towards digital and left unable to fully exploit the new technologies at their disposal.
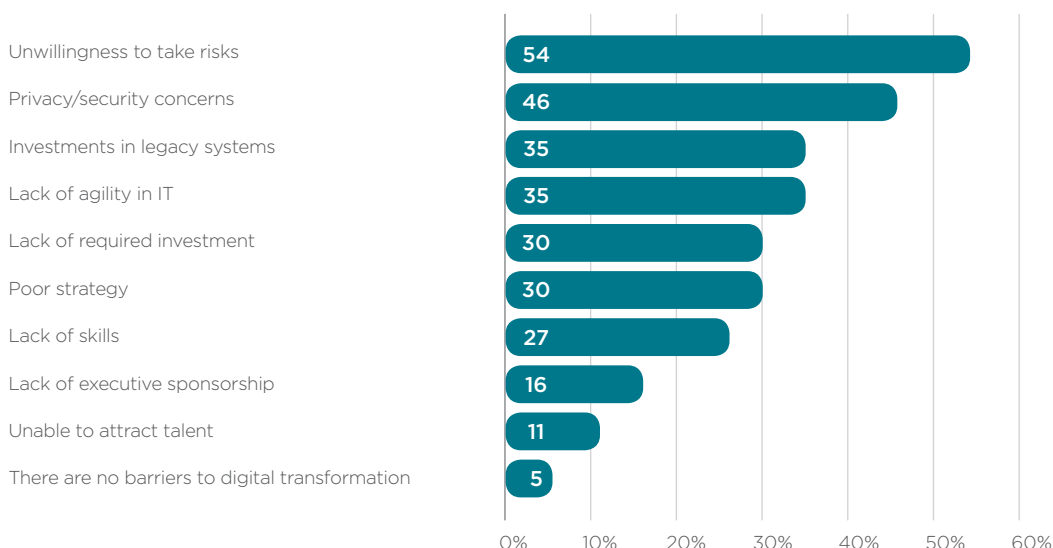
Does your organisation have the right skills in place to adapt to digital transformation?
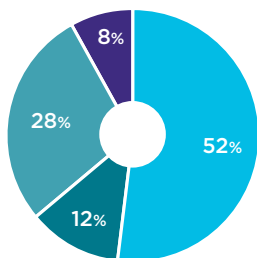
YES
NO — BUT WE ARE ACTIVELY RECRUITING
NO — AND WE ARE NOT RECRUITING
I DON'T KNOW

A failure to recognise and address the need for change will see organisations left behind in the race towards digital and left unable to fully exploit the new technologies at their disposal

What are the top three barriers to your organisation's digital transformation?

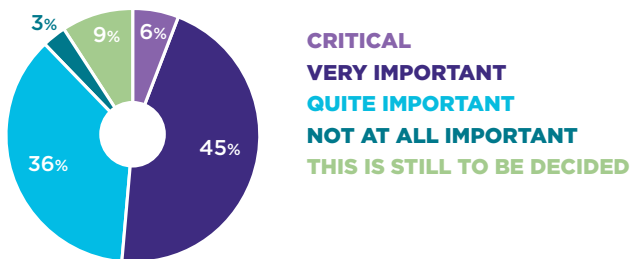| Barrier	Value
Unwillingness to take risks	54
Privacy/security concerns	46
Investments in legacy systems	35
Lack of agility in IT	35
Lack of required investment	30
Poor strategy	30
Lack of skills	27
Lack of executive sponsorship	16
Unable to attract talent	11
There are no barriers to digital transformation	5

Cloud and digital transformation

Flexibility and agility are the orders of the day in a time of austerity, and that applies as much to people and process as it does to technology. Cloud computing, which enables organisations to procure their IT on-demand and as-a-service, scaling up and down as required, is a natural fit here.

At its simplest level, cloud is all about enabling business transformation and efficiency by delivering core IT capabilities as a service, without having to own or maintain them. In doing so, internal IT teams are able to focus on delivering value to their organisations and can experiment with new initiatives without having to make big upfront capital investments.

It should come as little surprise, then, that the majority of respondents in this research project believe that cloud-based technologies are core to their digital transformation efforts. Some 89% state that cloud is important to their organisation's digital transformation strategy, with 51% believing it to be very important or critical.

To what extent is cloud important to your organisation's digital transformation strategy?

3%
9%
6%
45%
36%

CRITICAL
VERY IMPORTANT
QUITE IMPORTANT
NOT AT ALL IMPORTANT
THIS IS STILL TO BE DECIDED

Internal IT teams are able to focus on delivering value to their organisations and can experiment with new initiatives without having to make big upfront capital investments

With that in mind, in the upcoming sections we examine how UK public sector bodies are using cloud-based services, the benefits they are achieving as a result, and the barriers they face, as they transition into new business and delivery models.

2. Cloud adoption trends in the public sector

The percentage of respondents' organisations using cloud-based services in the UK public sector has more than doubled since the Cloud Industry Forum started researching attitudes to cloud amongst UK organisations back in 2010. Apart from a blip in 2016, the adoption rate has climbed year-on-year, from 38% in 2010 to 82% today, demonstrating how rapidly the sector has come to see cloud as an acceptable and, indeed, essential IT delivery model.

Based on our research, public sector adoption has consistently trailed that of the private sector, which holds true for the overall rate of adoption but also for the depth of penetration of cloud services within organisations. Over a third of public sector respondents have only deployed one cloud service, and just a quarter of cloud users in the sector have deployed three or more, compared to 36% of private sector respondents. Whilst this gap is narrowing, we must acknowledge that this is an incomplete picture and more research is needed to examine in more depth the penetration in the different sub-sectors of the public sector.

Cloud adoption levels in the public and private sectors
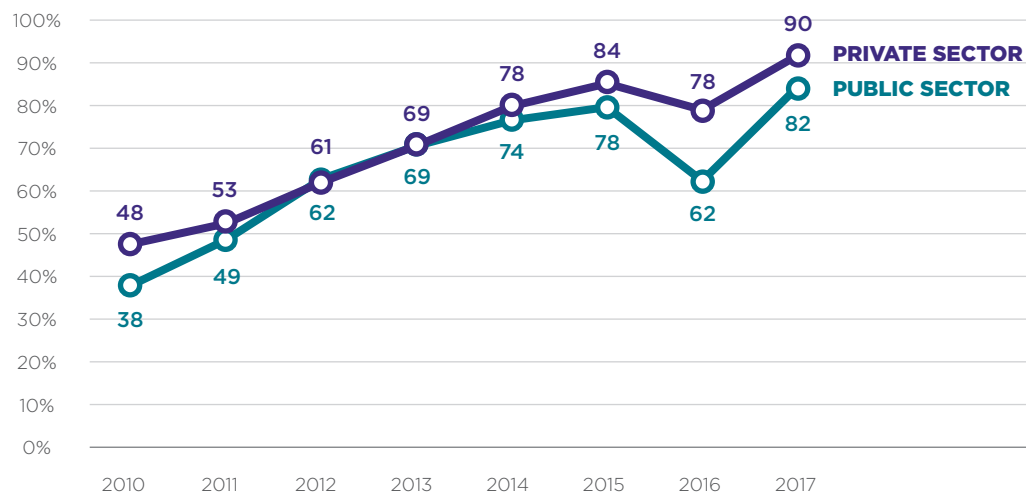
The sector has come to see cloud as an acceptable and, indeed, essential IT delivery model

How many different cloud-based services does your organisation use today?

ONE TWO THREE FOUR FIVE OR MORE I DON'T KNOW
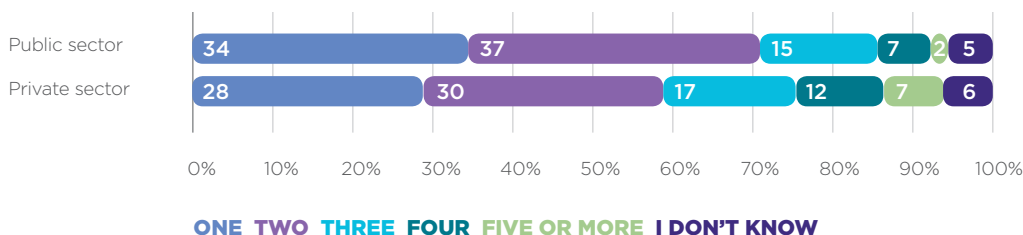
Looking at the application level, there are some clear leaders which are most likely to be cloud-based today in the public sector, such as webhosting (63%), data storage (49%) and communication and collaboration services (45%). However, we are seeing a positive picture of usage across a much broader range of applications, with respondents expecting their usage to change considerably over the next three years in some areas. Platform as a service is set for considerable growth, as too are eCommerce services (where these are used) and CRM.

Does your organisation use cloud-based services for the following applications?

Application	We use cloud	Next year	Next two years	Next three years
Webhosting	63	7	7	13
Data storage services	49	14	7	
Communications and collaboration services	45	15	9	3
Platform-as-a-Service	44	16	32	4
Office productivity tools	44	15	5	
CRM	41	18	5	14
eCommerce	38	19	25	
Data backup/disaster recovery services	32	18	5	5
Infrastructure	31	10	7	7
Accounting and finance applications	30	9	15	
Video conferencing	29	21	21	
IT security services	27	9	9	12
Mobile working	26	15	7	11
Development environment	25	33	4	8
Networking, domain control and security	25	13	6	9
Big Data/business intelligence	24	20	20	
Personnel and payroll	24	16	5	11
Unified communication/VOIP	15	7	30	15

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

WE USE CLOUD FOR THIS APPLICATION
WE PLAN TO USE CLOUD IN THE NEXT YEAR
WE PLAN TO USE CLOUD IN THE NEXT TWO YEARS
**WE PLAN TO USE CLOUD IN THE NEXT THREE YEARS**

We are seeing a positive picture of usage across a much broader range of applications

There are certain applications of lower priority, where respondents are less likely to be planning a transition to cloud-based services. 45% of respondents, for example, state that they are likely to keep their payroll and finance applications on-premise for the foreseeable future.

With organisations taking an application-by-application approach to transition, it is not surprising that a slim majority now accept that a hybrid model is likely to offer the most pragmatic approach, balancing the need to run down legacy assets, whilst taking advantage of a move to the cloud as services develop and mature in different application sectors. An encouraging sign is the near halving in only two years of the percentage of public sector respondents stating that their primary approach to IT is on-premise. Whilst the proportion stating that their primary approach is cloud-based has declined a little since 2016, this can be accounted for by the rise in hybrid IT infrastructures.

Would you describe your organisation's primary approach to IT as being:
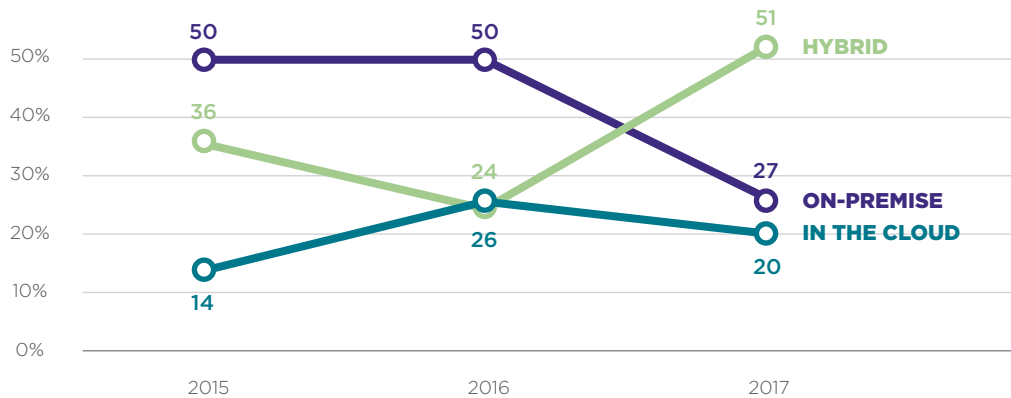
An encouraging sign is the near halving in only two years of the percentage of public sector respondents stating that their primary approach to IT is on-premise

Looking ahead, adoption rates of cloud-based services are expected to gather pace across the UK public sector, with 73% of respondents in the public sector expecting to increase their usage of during the year, compared to just 66% from the private sector. Moreover, a quarter of public sector organisations not currently using cloud services expect to do so over the next two years, which will likely push the overall adoption rate further ahead.

Do you expect your organisation's adoption of cloud services to increase over the next 12 months?

YES
NO
I DON'T KNOW
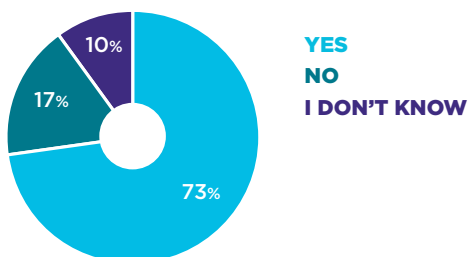
An all-cloud future is believed to be within the grasp of over half of surveyed public sector organisations, suggesting they are comfortable that regulation and data protection requirements are not absolute barriers to the adoption of certain cloud services. 16% are expecting to move everything to the cloud as soon as is practical, with a further 38% planning to do so as part of their operational strategy and as perceived industry readiness matures.

Do you foresee that you will ever move your organisation's entire IT estate to remotely hosted cloud services?
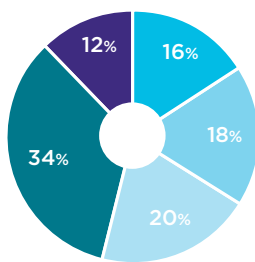
YES, AS SOON AS PRACTICAL

YES, BASED ON THE OPERATIONAL REFRESH OF SERVERS AND APPLICATIONS

YES: ALTHOUGH THE CLOUD PROPOSITION IS NOT READY FOR US TO MAKE THIS MOVE YET

NO: WE INTEND TO KEEP SPECIFIC APPLICATIONS AND SERVICES ON-PREMISE

I DON'T KNOW

How quickly the transition to an all-cloud future is realised will depend on a number of factors. Many organisations still hold doubts about the security and reliability of cloud-based services, and lack the skills and leadership needed to make the transition a success (detailed later in this report). However, taking an open approach to sharing cloud successes, and encouraging feedback and dialogue between buyers and suppliers, will help de-risk and build confidence in the delivery model. The net result is that the majority of organisations in the public sector will need to maintain hybrid IT environments for some time, with some pathfinding innovators helping to take adoption to the next level as they embrace a cloud-native reality.

Many organisations still hold doubts about the security and reliability of cloud-based services, and lack the skills and leadership needed to make the transition a success
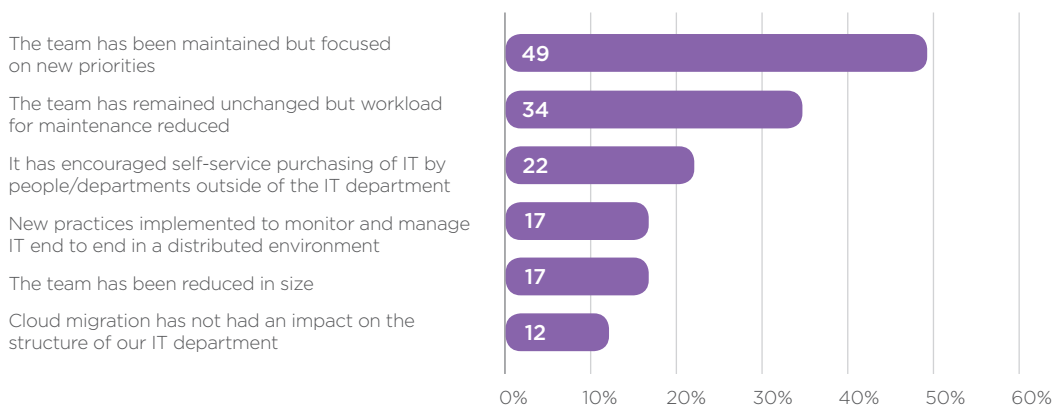
Impact on the IT department

The adoption of a cloud service model is showing notable impacts on IT departments in the public sector, with 88% of respondents experiencing a change of some sort. A source of early resistance from some IT professionals to cloud adoption were fears of loss of control and of "downsizing" IT teams. In reality, just 17% of respondents report that their IT team has been reduced in size, with the majority concentrating on more positive changes, from the ability to refocus on new priorities to the reduction of routine maintenance and operational workloads.
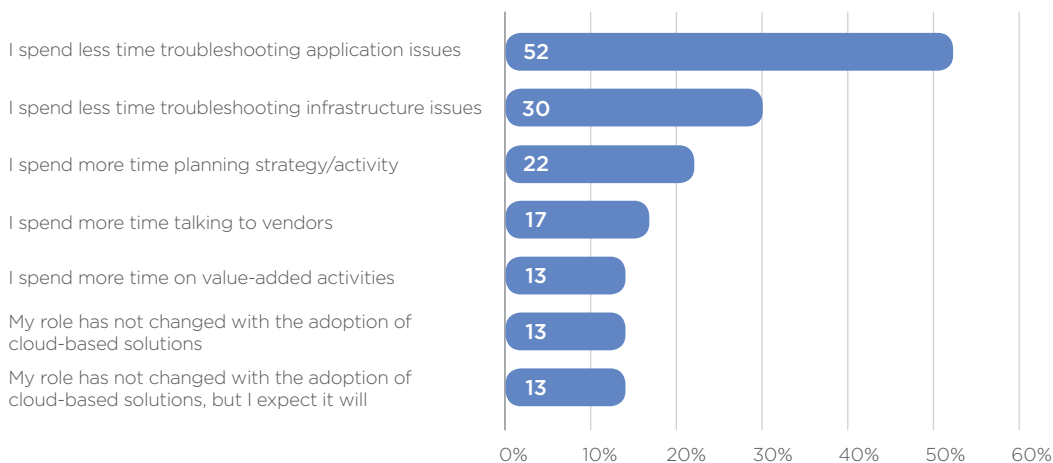
In short, migration to a cloud model is generating opportunities for public sector IT teams, freeing up time to focus on driving innovation and wider digital transformation, and making improvements to the user experience.

A source of early resistance from some IT professionals to cloud adoption were fears of loss of control and of "downsizing" IT teams, although these fears appear to be largely unfounded

What impact has cloud migration had on the structure of the IT department in your organisation?

Response	%
The team has been maintained but focused on new priorities	49
The team has remained unchanged but workload for maintenance reduced	34
It has encouraged self-service purchasing of IT by people/departments outside of the IT department	22
New practices implemented to monitor and manage IT end to end in a distributed environment	17
The team has been reduced in size	17
Cloud migration has not had an impact on the structure of our IT department	12

Has your role changed with the adoption of cloud-based solutions in your organisation?

Response	%
I spend less time troubleshooting application issues	52
I spend less time troubleshooting infrastructure issues	30
I spend more time planning strategy/activity	22
I spend more time talking to vendors	17
I spend more time on value-added activities	13
My role has not changed with the adoption of cloud-based solutions	13
My role has not changed with the adoption of cloud-based solutions, but I expect it will	13

Cloud migration

Some of the difficulties of cloud migration are, for many public sector organisations, more marked when compared to the private sector. The need to provide services across the breadth and complexity of statutory duties is likely to be a factor here, with 95% reporting challenges of some sort. Complexity of migration, for example, presented challenges for over half of public sector respondents, 41% came up against internal skills shortages (considerably higher than the 30% of private sector respondents that reported the same issue), and almost four in ten struggled with data sovereignty issues when migrating.

Which of the following difficulties did your organisation experience when migrating to the cloud?

	Public sector	Private sector
Complexity of migration	54%	40%
Lack of internal skills/knowledge	41%	30%
Data sovereignty concerns	37%	24%
Dependency on internet access	32%	31%
Confidence in the clarity of charges	32%	22%
Actual cost was more than originally envisaged/been quoted	29%	14%
Vendor lock in	27%	20%
Contractual issues such as liability	24%	20%
It took longer than we had allocated time for/been quoted	24%	17%
Lack of business case to need cloud services	22%	22%
Lack of confidence in vendor/channel partner	12%	12%
We did not experience any difficulties	5%	9%

Complexity of migration presented challenges for over half of public sector respondents

What are the impacts of these difficulties? Respondents report that 45% faced a loss of employee productivity; 21% had a delay in product/service development; and one in ten feels that they lost consumer confidence. These potentially serious downsides could cause some to take a more cautious approach, and more effort is needed to anticipate and avoid this level of operational disruption.

Complexity of migration has been a source of dissatisfaction for the public sector when it comes to the use of cloud services. Almost three in ten (29%) cited migration problems as a reason why they were not entirely satisfied with their use of cloud, compared to just 17% of private sector organisations. A lack of in-house skills was also highlighted as a pressure point during the migration process and a cause of dissatisfaction (24% compared to just 12% in the private sector).
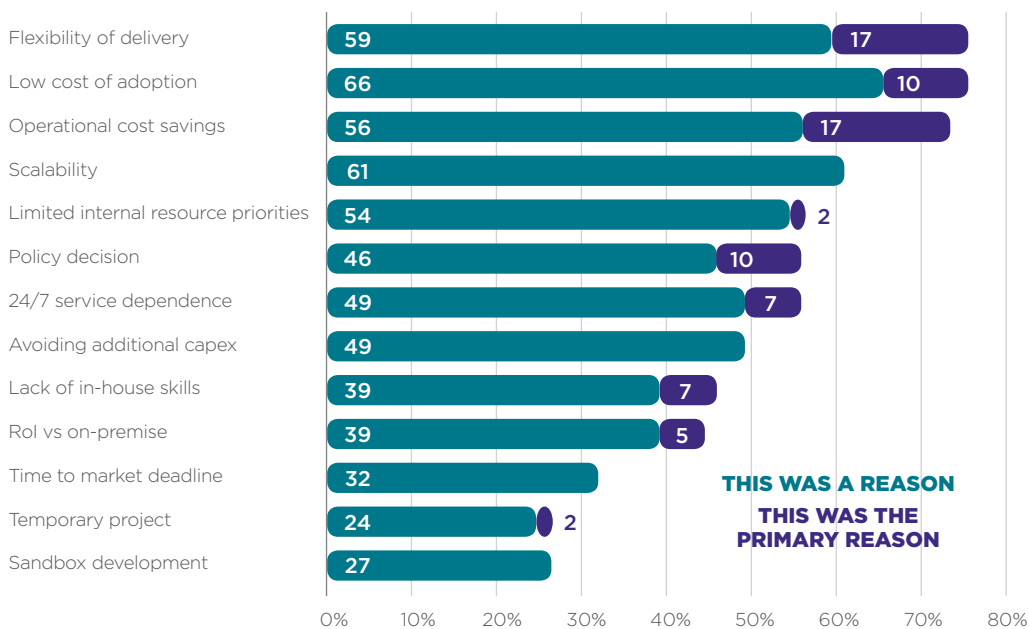
This is an area of concern, with more in-depth research needed to understand these difficulties as clearly public sector organisations could do with greater assistance to make their journey to the cloud as friction-free as possible. CSPs have a key role to play here, and must ensure that they are providing adequate levels of support during the migration process. Equally important is for public sector organisations to address staff and skills shortages and to take steps to understand the implications of the end-to-end transition journeys before entering into cloud service contracts, so that they can more safely and confidently make the transition.

CSPs must ensure that they provide adequate levels of support during the migration process

3. Drivers and benefits of cloud

The low cost of adoption and the flexibility of the delivery model stand as the most popular reasons for the initial adoption of cloud services. However, it is the flexibility of the delivery model that stands as the number one primary reason for cloud adoption.

Which of these were reasons for initially adopting cloud-based services in your organisation?

Reason	This was a reason	This was the primary reason
Flexibility of delivery	59	17
Low cost of adoption	66	10
Operational cost savings	56	17
Scalability	61	
Limited internal resource priorities	54	2
Policy decision	46	10
24/7 service dependence	49	7
Avoiding additional capex	49	
Lack of in-house skills	39	7
RoI vs on-premise	39	5
Time to market deadline	32	
Temporary project	24	2
Sandbox development	27	

THIS WAS A REASON

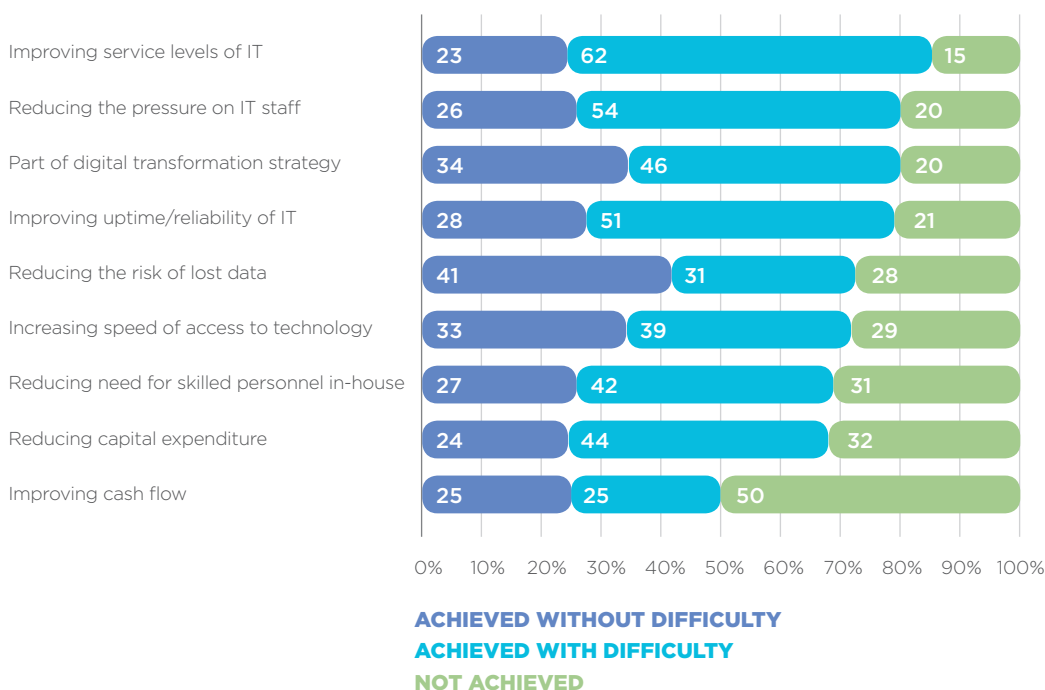**THIS WAS THE PRIMARY REASON**

Cloud offers the opportunity to adopt more flexible, agile and cost-effective models, and with it the promise of better value for money services for taxpayers

Costs, and the promise of cost savings, remain a high priority for the public sector, so it is perhaps unsurprising that they should factor so highly in the decision to move to cloud. Significant pressures on operational and IT budgets have created new imperatives to find efficiencies and more innovative ways of working. The combination of lower adoption costs, delivery flexibility and consumption-based pricing, provide public sector organisations with the opportunity to deliver better, more responsive services for less, than might have been achievable under large and typically-inflexible legacy contracts. Cloud offers the opportunity to adopt more flexible, agile and cost-effective models, and with it the promise of better value for money services for taxpayers.

Migration objectives

Cloud migration projects seem to be by and large delivering against their promises for many public sector organisations, with 85% reporting the achievement of improved IT service levels and 79% in the reliability and uptime, whilst 80% were able to reduce pressure within their IT teams. Relatively less successful were the achievement of reductions for in-house skills with 69% reporting this during their migration, and 66% achieving reduced capital expenditure.

Which of the following business objectives were achieved in your organisation when migrating to the cloud?

Objective	Achieved without difficulty	Achieved with difficulty	Not achieved
Improving service levels of IT	23	62	15
Reducing the pressure on IT staff	26	54	20
Part of digital transformation strategy	34	46	20
Improving uptime/reliability of IT	28	51	21
Reducing the risk of lost data	41	31	28
Increasing speed of access to technology	33	39	29
Reducing need for skilled personnel in-house	27	42	31
Reducing capital expenditure	24	44	32
Improving cash flow	25	25	50

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

ACHIEVED WITHOUT DIFFICULTY
ACHIEVED WITH DIFFICULTY
NOT ACHIEVED

96% of respondents report achieving a tangible benefit of some kind, the most common being faster and more flexible access to technology and cost savings

A further positive sign is the realisation of a wide range of tangible and intangible benefits as a result of respondents' use of cloud services. Almost all (96%) report achieving a tangible benefit of some kind, the most common being faster and more flexible access to technology and cost savings over on-premise solutions (all at 43%).

As the public sector presses ahead with its digital transformation and finds new ways to provide better digital services for citizens, this new-found agility will prove invaluable.

Which of the following tangible benefits of cloud services deployment has your organisation achieved, or expects to achieve?
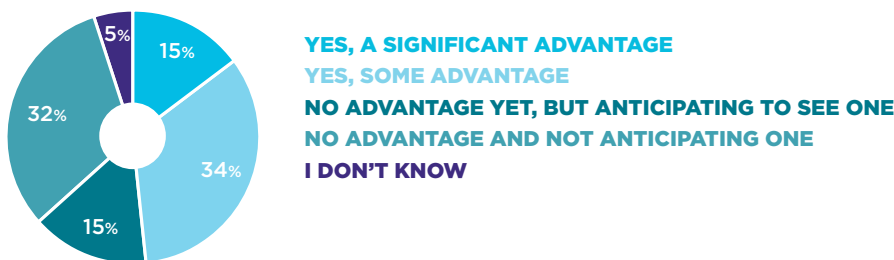
Benefit	%
Cost savings over on-premise solutions	43
Faster access to technology	43
More flexible access to technology	43
Reduced risk of lost data or service by hosting externally	36
Reduction in capital expenditure	31
Reduces the pressure on IT staff within the organisation	29
Higher availability through fault tolerant solutions	24
Higher service level achievement for IT	24
Faster design and testing of new products	21
An on-demand/predictable cost	17
Reduces need for number of skilled personnel in-house	17
Improved cash flow	14
Enhanced productivity	12
Reduction of energy costs	12
Ability to reach new market opportunities	5

Almost three in ten cloud users in the public sector report having improved employee satisfaction

Intangible benefits, which are by nature harder to measure, are also being widely reported. Almost three in ten cloud users in the public sector report having improved employee satisfaction, 36% report improved collaboration and 38% state that using cloud services has improved communication between departments.

Moreover, roughly half (49%) of public sector respondents state that their use of cloud services has furnished them with a competitive advantage, and a further 15% expect to realise some sort of competitive advantage at some point. Whilst competitive advantage takes on a different meaning in the public sector, when compared to the private, these statistics come as further proof that public sector respondents are realising value from their use of cloud-based services.

Has utilising cloud services given your organisation a competitive advantage?

YES, A SIGNIFICANT ADVANTAGE
YES, SOME ADVANTAGE
NO ADVANTAGE YET, BUT ANTICIPATING TO SEE ONE
NO ADVANTAGE AND NOT ANTICIPATING ONE
I DON'T KNOW

Cost savings

Whilst the true value of cloud services lies, in the opinion of the Cloud Industry Forum, in their ability to enable business transformation, cost savings are an important priority. Cost savings do often materialise, although they are by no means guaranteed. Unless public sector organisations re-think the way that they provide and consume IT services, and understand the impacts and opportunities of a cloud-based model, they may struggle to realise any significant, and lasting cost savings. Public sector respondents currently assess their cost savings to be about 17.5% from their use of cloud services, a shade ahead of the figure reported in the private sector.

With many public sector organisations expected to deliver operational savings of 30% or more during the current spending period, it is not surprising that respondents expect these savings to deepen over the next five years as the initial costs of migration subside and cloud services become more integrated within their operations. Again, the public sector is marginally more optimistic about cloud's ability to drive cost savings than the private, expecting to save 32% by 2022 compared to 30%.

Public sector respondents currently assess their cost savings to be about 17.5% from their use of cloud services

What cost savings is your organisation experiencing from its use of cloud services?

PUBLIC SECTOR
PRIVATE SECTOR
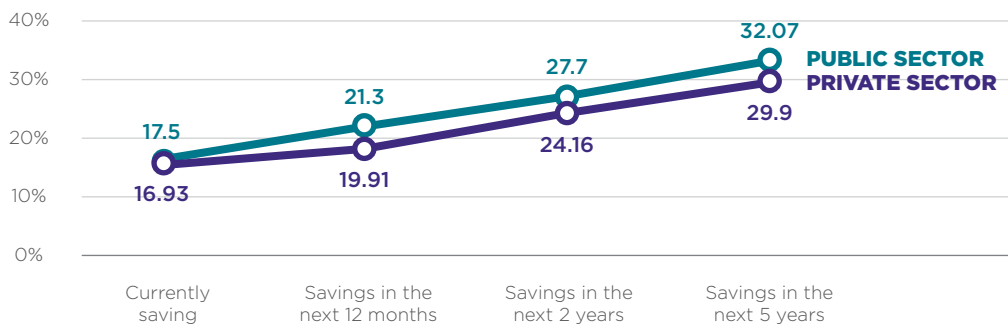
4. Cloud concerns and inhibitors

Concerns about the use of cloud are likely to be holding back adoption rates within some organisations. As per previous years, it is data privacy and security that feature at the top of the list, with the public and private sectors expressing similar levels of concern. However, there are several key differences. Public sector organisations, for example, are considerably more likely to report concerns about legacy technology restrictions, the transparency of providers services and the protection of intellectual property.

It is interesting that only 2% reported contractual liability for services if SLAs are missed as a concern, compared to 13% of private sector respondents. This, it seems, is an area that has largely been overlooked to date.

What concerns do you have about your organisation's use of cloud-based services?

	Public sector	Private sector
Data privacy	67%	61%
Security concerns	40%	45%
Fear of loss of control/manageability	40%	39%
Regulatory constraints	33%	26%
Data sovereignty/jurisdiction	31%	33%
Cost of change/migration	31%	23%
Transparency of providers services	24%	13%
Protection of intellectual property	24%	13%
Dependency upon Internet access	22%	34%
Legacy technology restrictions	22%	12%
Contract lock-in	20%	26%
Retention of key skills	20%	10%
Confidence in the clarity of charges	16%	10%
Investments already made in on-premise	13%	15%
Proprietary technology	13%	10%
Lack of clarity/impact of cloud services on business processes	13%	9%
Confidence in the reliability of the vendors	11%	17%
Unable to reach a consensus about how the services are used	9%	5%
No concerns with my organisation using either service	7%	6%
Contractual liability for services if SLAs are missed	2%	13%

A range of factors are potentially slowing the pace at which the public sector adopts cloud services. Worryingly, the lack of budget features as significant barrier, with 40% identifying this as one of their biggest inhibitors, and not surprisingly exiting from legacy contracts and systems are another source of operational blockers, with 30% citing integration challenges with legacy systems, and 28% reporting existing investments in legacy systems. Skills shortages again feature, with roughly a quarter stating that they were constrained by a lack of appropriate skills.

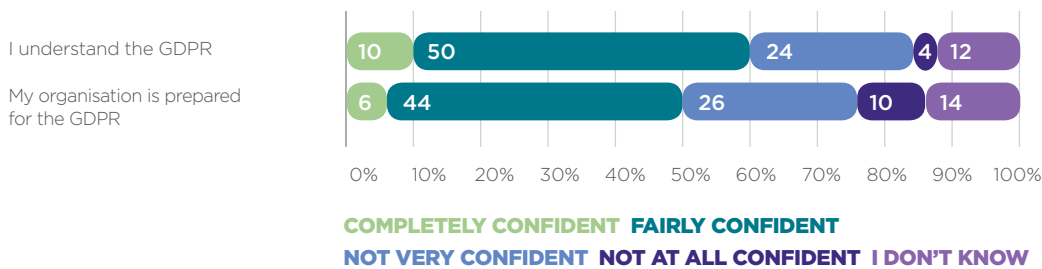This skills point is significant. Just 14% of private sector respondents identified this as an inhibitor, suggesting that the public sector is falling behind because they are unable to secure members of staff with the skills needed to thrive in the new digital economy.

What have been the biggest inhibitors to moving more apps and/or infrastructure to the cloud for your organisation?

	Public sector	Private sector
Lack of budget	40%	34%
Integration challenges with legacy systems	30%	29%
Business security and privacy concerns	28%	31%
Existing investments in on-premise/legacy systems	28%	27%
Regulation or other legal constraints	26%	17%
Constrained by lack of appropriate skills	24%	14%
Limited customisation	24%	6%
Lack of strategy or business case	22%	22%
Lack of control	18%	12%
Lack of sponsorship or leadership	16%	17%
Available low-risk service providers/product immaturity	12%	8%
No inhibitors to moving more apps/infrastructure to the cloud	4%	9%

Public sector is falling behind because they are unable to secure members of staff with the skills needed to thrive in the new digital economy

The General Data Protection Regulation

The European Union's General Data Protection Regulation (GDPR) is almost upon us and time is rapidly running out before the implementation deadline of 25 May 2018. But despite this, levels of confidence in the public sector and its ability to meet the GDPR's requirements are not where they should be.

Whilst around half stated that they were confident to some extent that they understood what the GDPR meant for their organisation and that their organisation was prepared for implementation, only a small minority could say that they were completely confident.

How confident are you in relation to the GDPR in terms of the following?

I understand the GDPR

| 10 | 50 | 24 | 4 | 12 |

My organisation is prepared for the GDPR

| 6 | 44 | 26 | 10 | 14 |

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

COMPLETELY CONFIDENT **FAIRLY CONFIDENT**
NOT VERY CONFIDENT **NOT AT ALL CONFIDENT** **I DON'T KNOW**

The GDPR is a high stakes game and the potentially huge fines that it will bring for non-compliance mean that anything short of complete confidence is too little, so this is clearly an area that needs considerably more attention over the coming months.

It is with this in mind that CIF recently updated its Code of Practice for Cloud Services Providers (CSPs) to address key requirements of the GDPR. CSPs who certify to the Code of Practice have the skills and knowledge to ensure their organisation is on the right track for compliance with GDPR, and are therefore well-placed to help their customers comply with the regulation.

Today, CIF continues to operate the only certified Code of Practice for Cloud Service Providers, and this has now been formally recognised by the European Union Agency for Network and Information Security (ENISA). The CIF Code of Practice exists as an independent benchmark of best practice and key credentials that credible CSPs should be able to measure up to and be able to provide sufficient assurance about their transparency, capability and accountability of their offering to the market.

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Conclusion

Our research clearly suggests that it is no longer a case of if the UK public sector will move to the cloud, but when. The sector is making rapid progress towards an IT estate with cloud services at its heart, using innovation as it finds ways to radically improve its services for citizens in the face of significant budgetary pressures. The UK public sector is therefore increasingly relying on cloud technologies provided across a diverse supply chain. This has been driven by the realisation that these provide the essential agility needed to build the infrastructure for digital transformation, whilst offering better returns on taxpayers' money.

The UK government's launch of the innovative G-Cloud procurement framework and use of cloud services has attracted the attention and envy of other countries. These initiatives have helped propel the UK to top the table in the 2016 United Nations e-Government rankings. Without access to the wide range of innovative cloud-based services – and providers – underpinned by the easy buying process provided through G-Cloud and the Digital Marketplace, this early progress in cloud adoption would not have been possible. This has been a game-changer for public sector IT which is bringing a wide variety of significant benefits to public sector organisations and that will enable further progress and benefits to come.

Critically, these are not confined to technical benefits, such as the capacity to flexibly deploy different cloud services when they are required. Cloud is also fundamentally changing the way public sector IT teams function, enabling them to spend less time on mundane maintenance and troubleshooting tasks and to focus more on strategic priorities. Moreover, many respondents found that their ability to collaborate effectively – whether internally within their own organisations, or with other public sector organisations, or even with private sector organisations – was boosted by the cloud services that they are consuming.

Obstacles

There is, however, evidence from our research that adopting cloud in the public sector is often a more complex challenge than in the private sector, with public sector organisations approximately a third more likely to report facing issues when migrating applications to the cloud than private sector organisations. Long-standing and heavy investments in legacy technology can be obstacles to rapid adoption, although tools are quickly evolving to make the transition to cloud technologies far smoother. Containers, for example, used to be Linux-only, but they are now available for everything from Windows to zOS. Moreover, the usability of tools is also improving, with many no longer requiring coding skills.

Our data suggests that public sector organisations are more likely to run into issues in their relationships with CSPs than in the private sector, with transparency of services, pricing and intellectual property sometimes presenting difficulties. The role played by CSPs and the readiness and quality of their services are crucial factors here. Industry must make every effort to understand these complexities and the potential ripple effects that these may cause, such as loss of confidence in certain applications, and an overly cautious approach to cloud adoption. These are likely holding back faster migration and CIF calls for all sides to seek more fruitful and ambitious opportunities to collaborate and share, so that they can learn from and build on success stories and good practice.

The lack of appropriate funding and a shortage of people with the right skills are fundamental challenges that are acting as a significant brake on progress, with organisations finding that their internal skillsets and organisational culture aren't well suited to dealing with the new complexities brought by multi-sourced, multi-cloud environments. These obstacles must be navigated and addressed as a priority, if the public sector is to progress and make a lasting break with old ways of working.

The future

These combined factors potentially slow the pace of adoption and the data suggests that many of the migrations seen to date target the so-called low hanging fruit – applications that can simply be shifted into the cloud. This approach can only go so far. To unlock the potential of cloud and digital transformation, organisations must tackle the complexity inherent in many processes and breach departmental silos. In many areas this will require them to rethink the way that services are delivered and truly embrace a cloud-native approach. Until this is a norm in the public sector, the central message from GDS of using technology to transform the way government as a whole works will remain out of reach – and result in greater cost and complexity, without the expected benefits. Only about 10% of central government workloads have moved to cloud (and in parts of the health sector or local government that can be as low as 2%). Arguably the biggest gains will be made when more complicated workloads and applications are migrated and it is here that public sector organisations will need greater assistance and support from industry.

It is with these challenges in mind that CIF has created a Special Interest Group (SIG) dedicated to helping CSPs better align with the needs of the public sector within the G-Cloud procurement framework and the Digital Marketplace. The current political and economic climate of Brexit, continued austerity, and a new government risk endangering the momentum of government's success in transforming its digital services. The SIG will help build an effective bridge between CSPs and the public sector, identifying and removing barriers to cloud-based and other digital solutions.

If we are to see rapid progress not only in the adoption of cloud, but also in closing the gap between attitudes and reality, CSPs and the CIF SIG need to rise to the challenge of enabling public sector organisations to go beyond simple digitisation and realise the benefits of real digital transformation. These efforts combined will help UK government's transformation vision to become a reality, radically changing how the public sector functions. Hopefully when we come to reveal next year's research findings, we will see impressive progress along this path.

The Cloud Industry Forum (CIF) was established in direct response to the evolving supply models for the delivery of software and IT services. Our aim is to provide much needed clarity for end users when assessing and selecting Cloud Service Providers based upon the clear, consistent and relevant provision of key information about the organisation/s, their capabilities and operational commitments.

We achieve this through a process of self-certification of vendors to a Cloud Service Provider Code of Practice requiring executive commitment and operational actions to ensure the provision of critical information through the contracting process. This Code of Practice, and the use of the related Certification Mark on participant's websites, is intended to provide comfort and promote trust to businesses and individuals wishing to leverage the commercial, financial and agile operations capabilities that the Cloud-based and hosted solutions can cover.

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UKCloud provides a true public cloud for the exclusive use of UK Public Sector organisations. We are dedicated to helping our customers gain value from the agility and cost savings of using a sovereign, assured cloud platform.

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This White Paper was produced in collaboration with UKCloud.