State of digital government review

A review of technology and data in the public sector: successes, challenges and root causes

January 2025

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Presented to Parliament
by the Secretary of State for Science, Innovation and Technology
by Command of His Majesty

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Executive summary

The UK public sector has enormous digital resources: it spends over £26 billion annually on digital technology, employs a workforce of nearly 100,000 digital and data professionals, and delivers millions of online transactions every day. Millions of people across the country rely on digital services from their local authority, their hospital, their school and all parts of the public sector to help them in their daily lives.

When these resources are deployed effectively, they can deliver outstanding results. The NHS app, delivered in a time of crisis, is the most widely used app in the UK. GOV.UK combines government digital services in a way which is emulated worldwide. This report is full of examples where digital teams across the public sector have used their ingenuity and expertise to improve services and keep them running.

Yet these successes are too often achieved despite the system rather than because of it. They rely on the dedication of experts doing their best with limited resources, navigating processes which were not designed for a digital age, and implementing policies which were not designed to be digital first. As we move into a new era of opportunities created by artificial intelligence (AI) and other technology innovations, we must take a realistic and unflinching view of how much more we have to do to create a modern digital government and reform public services.

This report presents key findings on the state of digital government, including where we can build on success, where we must improve, and identifies five root causes for the challenges we face.

Users expect more. In the past decade, satisfaction with public services in the UK has dropped from 79% to 68%.[1] Satisfaction with 70% of the Top 75 services is below private sector benchmarks. Even where the public sector provides great digital services, users must join them up across disparate offerings. Someone moving home needs to contact 10 separate organisations. Managing a long-term condition or disability requires interaction with more than 40 services across nine different organisations. The average UK adult citizen spends a week and a half dealing with government bureaucracy every single year.

Services are under-digitised. 47% of central government and 45% of NHS services still lack a digital pathway, and very few services avoid manual processing altogether. For instance, HMRC handles approximately 100,000 calls each day, the DVLA processes around 45,000 letters daily, and Defra still manages over 500 paper form-based services.

Digital delivery creates policy success. When public sector policy is developed without involvement of digital teams or consideration for digital delivery, opportunities are missed. By contrast, when digital, operational, and policy teams work collaboratively, they can deliver rapid impact. The Home Office's EU Settlement Scheme, for example, showed how a digital-first approach, with collaboration across HMRC and DWP digital and policy teams, could automate residency verification for over 6 million people at record pace.

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1   BCG (2024), Digital Government Citizen Survey

Public sector productivity has fallen.[2] Analysis shows that over £45 billion per year of unrealised savings and productivity benefits, 4-7% of public sector spend, could be achieved through full potential digitisation of public sector services. This makes digitisation the most powerful lever available to drive public sector and service reform. Opportunities are based predominantly on process simplification, AI-driven automation of manual tasks, greater availability, adoption of low-cost digital channels and reduced fraud through compliance automation.

Public sector technology is fragmented and duplicative. Most organisations implement their own solutions, even for common needs. For example, in 2021, there were 44 different accounts and ways to prove who you are. Where sharing happens, it has great impact: the West Midlands Police Force, for example, has integrated AI to respond to non-urgent 101 (non-emergency) calls and shared their approach with other forces. However, this is the exception rather than the rule.

Data is fragmented and underused. This holds back AI, machine learning, and advanced analytics. Only 27% of survey respondents believe their current data infrastructure enables a comprehensive view of operations or transactions. 70% say their data landscape is not well co-ordinated, interoperable, and does not provide a unified source of truth. Despite these limitations, the ingenuity of public servants has led to some noteworthy results such as DfE using supplier-held data to overcome the friction of sharing between schools and enable real-time attendance visibility.

Critical services depend on decades-old legacy technology. The scale of legacy varies by organisation and is not consistently measured, but it is estimated to comprise 28% of systems in central government departments in 2024, an increase from 26% in 2023. Levels of legacy technology in police forces and NHS trusts varies widely, ranging from 10% to 60-70%, depending on the organisation. While some central government departments such as MOD, Home Office and MOJ classify and track their legacy assets, most public sector organisations do not have comprehensive registers or quantification of the legacy risk they carry.

Service reliability is too low. Over 2024, 25% of survey respondents suffered critical outages, 123 in NHS England alone. Many systems do not have adequate plans in place for how to manage incidents and even where they do they are not exercised frequently enough.

Cyber risk to the public sector is critically high. We have seen a number of high-profile incidents across the public sector that have had real world impacts on citizens' lives and incurred new costs to repair the damage done.

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2   House of Lords Library (2024), Public service productivity in focus
     (**https://lordslibrary.parliament.uk/public-service-productivity/**)

The public sector spends less on technology than peers. In 2023, the public sector spent around £26 billion on technology, around 30% below benchmark comparisons.[3] Current budgets and funding practices make it difficult to maintain the existing technology estate, respond to legislative change, and keep up with evolving cyber threats. 28% of red-rated legacy systems lack remediation funding. All organisations profiled in this study cited not having enough appropriate funding to manage legacy technology and technical debt. Most mentioned budgets that prioritise new programmes at the expense of continuous improvement.

Funding models do not reflect modern digital practice. In the last 15 to 20 years, technology has shifted from a capital-intensive business, based on the acquisition and creation of hardware and software assets, to a revenue intensive business based on continuous improvement and subscription services.[4] In central government, RDEL (resource or operating funds) accounted for less than half of total digital and data funding in Spending Review 2021 versus 78% for peer-set benchmark.[5,6] Many have highlighted that it is easier to get CDEL (capital funds) than RDEL, and only 1 in 5 survey respondents felt the current funding model enabled effective investment in and running of digital services. Existing governance and controls processes are not seen as well suited to digital programmes as they prioritise predictable returns over longer-term resilience and continuous improvement, and do not allow for the flexible nature of digital delivery.

Cloud adoption is concentrated in central government. The cloud-first policy defined in 2013, accelerated by dedicated cloud transformation budgets, means that around 55% of central government organisations reported that over 60% of their estate is now on the cloud, although most of these migrations entail replicating systems in the cloud with minimal reengineering. Despite this progress in central government, other areas of the public sector, such as local authorities, policing and the NHS, are less advanced in cloud adoption, with remaining on-premises estates.

The public sector is dependent on external resources for core skills. The public sector depends heavily on third parties to augment digital and data teams. Of the £26 billion public sector digital and data spend in 2023, less than 20% (around £5 billion) was on permanent public sector staff while 55% (£14.5 billion) was spent on contractors, managed services providers, and IT consultants. Headcount restrictions have made it easier to hire more costly third-party resources than permanent staff, with the average contractor in the central government costing three times as much per year as the average civil servant. In the public sector, contractors account for approximately 18% headcount but around 40% headcount cost. Use of temporary staff also hinders retention of institutional knowledge.

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3   Public sector digital and data spend as % RDEL is 5.9% vs. average 8% technology spend as a % OPEX for peer set based on composite Gartner benchmark, weighted by spend (third party tech spend based on Tussell data for 1,000+ orgs and Gartner spend buckets ranging from £250 million to £10 billion+) and org type (central government – national/international government benchmark, local government and education – state government benchmark, NHS – private and public healthcare providers benchmark); public sector digital and data spend as % TOTEX similarly 28% lower than composite Gartner benchmark.

4   Deloitte (2024), 'Beyond products: Paving the way to Everything-as-a-Service McKinsey (2017), 'Subscription myth busters: What it takes to shift to a recurring-revenue model for hardware and software'

5   Spending Review 2021

6   Gartner (2023), IT key metrics data, national and international government

There are not enough digital and data people in the right roles. The proportion of the workforce in digital and data roles varies across the public sector and has doubled across central government and agencies from 3% in 2021 to around 6% today. Despite this significant growth, the largest operational departments (MOD, HMRC, Home Office, DWP) average 5% vs. benchmarks of 6% for central governments and 8-12% in regulated private sector industries. Most other operational organisations are in-line with benchmarks, and many agencies, arm's length bodies (ALBs) and non-departmental public bodies (NDPBs) have a greater share of digital and data staff than benchmarks. In local government, digital and data roles are only 2% of headcount, against benchmarks of 4%, in the NHS, workforce proportion roughly matches a comparable 3% benchmark. The mix of digital and data roles is also skewed. The digital and data workforce has an oversupply of project managers and other non-technical digital and data functions relative to technical roles (such as software developers). High-performing private sector organisations achieve a ratio of 4:1 technical to non-technical roles in their permanent staff. In the Civil Service, the current ratio is closer to 2:1.

The public sector struggles to consistently attract and retain top digital and data talent. Compensation is below the private sector; for example a typical central government cyber specialist earns 35% less than private sector peers, while civil service CISOs earn on average 40% less than their private sector counterparts.[7] While the Digital, Data and Technology pay framework attempts to close this gap, it is not universally or consistently adopted, encouraging skilled talent to move within the sector to earn more.

Digital leadership is not a consistent priority. In contrast to the private sector where digital leaders are routinely part of executive committees, public sector digital leaders are not well represented at executive level and often report lower in their organisations, relative to policy, operational delivery, and finance colleagues. Digital capabilities are not seen as essential for policy formulation or operational delivery and are regarded as lower prestige. Most non-digital leaders have insufficient technical expertise and lack the digital orientation and training to implement tech-enabled programmes, in contrast to best practice in the private sector where digital and technical expertise are increasingly seen as essential general management skills.

The public sector does not realise the value of its buying power. The public sector does not have a cohesive digital sourcing strategy: organisational silos, the challenges of sharing services, and the lack of collective buying drive fragmented purchasing. Each of the NHS's 209 secondary care entities negotiates and buys its own infrastructure. Over 320 local councils negotiate their own agreements. Commercial teams often have insufficient category expertise to drive optimal terms, and digital teams commonly lack the capability to properly manage vendors. Only 28% of survey respondents believe their organisation has sufficient internal capabilities to monitor, track and drive supplier performance. Work by the Crown Commercial Service (CCS), the Government Commercial Function (GCF) and Central Digital and Data Office (CDDO) has created common frameworks and constructs which consolidate the buying power of central government, but these are not mandatory or universally adopted.

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7   Hays (2024), UK Salary and Recruiting Trends 2024

Central digital capabilities have had some success but limited cross-sector reform.
Government Digital Service (GDS) created GOV.UK, a single publishing platform replacing more than 1,800 separate websites, and continues to refine One Login to simplify access to central government services. CDDO has driven a critical focus on service usability and efficiency through the Top 75 Services Programme. However, a lack of sustained senior sponsorship, uneven funding and a focus on central government departments rather than the full public sector have limited the ability of central teams to drive deep, cross-sector reforms which address the challenges described in this report.

This review has identified five root causes:

1. Leadership

There is little reward for prioritising an agenda of service digitisation, reliability, or risk mitigation. Organisational leaders are not paid, promoted, or valued for doing so. Digital does not shape and drive the organisational agenda.

2. Structure

Fragmentation is a feature of the system. Public sector organisations are independent bodies with limited mechanisms to contract services from each other. Most choose to build and maintain their own technology estate, inhibiting standardisation, interoperability and reuse, and constraining the ability to benefit from scale. Architectural design, product management, operations, and development are inconsistent between organisations. The public is presented with fragmented services and expected to make sense of them.

3. Measurement

The public sector does not have consistent metrics of digital performance. Aggregate data about service quality, user experience, cost and risk exposure is not available without dedicated, periodic effort such as the production of this report.

4. Talent

Compensation and career path progression are uncompetitive with the private sector, especially for senior leaders. A lack of integrated cross-government workforce strategy limits recognition of specialist skill needs and prevents realisation of efficiencies longer term. Headcount restrictions intended to constrain spend have shifted cost and talent to third-party contractors, managed services and IT consultants, also degrading institutional knowledge.

5. Funding

Spend is biased towards new programmes with insufficient prioritisation of the effective operation and maintenance of existing systems, especially legacy assets. New or urgent legislation often comes without additional funding, forcing re-prioritisation of previously allocated budgets. This presents an acute challenge for digital and data projects as funding has shifted from capital purchase towards subscription-based, increasing the reliance on committed ongoing funding.

Introduction

The Secretary of State for Science, Innovation and Technology has commissioned this rapid review to assess how effectively the public sector uses digital technology to deliver services to people, communities and businesses. The review evaluates the technology base that supports these services and the readiness of public sector organisations, including central government departments, arm's length bodies, executive agencies, the NHS, police and local government, to meet the government's digital ambitions.

The State of Digital Government Review is grounded on a fact base covering perspectives from over 500 technical and non-technical leaders across 120 public organisations (listed in Annex 1). This is the first time a survey of this magnitude has been completed across the public sector. The fact base has been further bolstered by 17 supplementary data returns representing inputs from 100+ organisations, and discussions with over 65 public, private, and third sector stakeholders. The conduct of this survey has highlighted that, outside of this report, this data represented is not consistently tracked and managed. For example, there is no comprehensive record of the scale of legacy IT across central government, let alone the entire public sector. We would like to extend our thanks to the many organisations and individuals that have contributed to this review.

Context

Historically, the UK has been a leader in digital government, ranking third in the Organisation for Economic Co-operation and Development (OECD) Digital Government Index (2023)[8] and first in the UN E-Government Development Index (2016).[9] Standout initiatives, such as the NHS App, GOV.UK One Login, the EU Settlement Scheme and Universal Credit, have set high standards for digital public service delivery. Recent investment has further increased spending on digital and data by 11%[10] over the past five years and raised headcount by 31%.

However, despite successes, the digital foundations are creaking and services have not kept pace with other countries or the private sector. Under-digitisation, institutional fragmentation, technical debt, outdated strategies, untapped data and lack of capabilities present headwinds to modernisation, exacerbated further by changing policy mandates.

While the challenges are considerable, so too is the opportunity. The UK has the scale, commercial power and political mandate to deliver more to taxpayers through technology. Digital transformation as a central lever for public service reform has the potential to improve services, save money, make public sector roles more productive and unlock the power of innovations such as AI. With strategic focus, the UK can reaffirm its leadership in digital government and set a new standard for service delivery in the digital age.

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8   OECD (2023) Digital Government Index
     (www.oecd.org/en/publications/2023-oecd-digital-government-index_1a89ed5e-en.html)
9   UN E-Government Development Index, 2016 (accessed November 2024)
     (https://publicadministration.un.org/egovkb/en-us/reports/un-e-government-survey-2016)
10   Compound annual growth rate for 2019-23 based on Tussell and CDDO workforce spend data;
     nominal figure not adjusted for inflation

Key facts

£26 billion

Spent annually on digital and data in 2023 across the public sector, including both third party and employee spend

47%

Services offered by central government[11] which still rely on non-digital methods like phone calls and paper forms

97,000

Digital and data permanent employees and contractors across the public sector

9%	Major tech programmes (in Government Major Projects Portfolio) assessed as 'Green' (successful delivery highly likely); tech programmes are 60% more likely to be assessed as 'Red' (successful delivery highly at risk) than non-tech projects[12]
3 million+	Accounts created through GOV.UK One Login, to access an initial set of 50 central government services, as at October 2024
50%	Digital and data recruitment campaigns which failed in 2024; a decline in performance from 22% in 2019
35%	Pay gap (%) between public and private sector for technical architects; equivalent to £30,000 per year
3x	Average cost of a digital or data contractor relative to a permanent employee

11   Excludes the NHS, police and local government

12   Assessment referred to is the IPA's confidence assessment in the GMPP Annual Report from March 2023; major tech programmes referred to are GMPP programmes deemed to have at least a significant digital and/or technology component

Key assessment areas

Services

The UK is under-digitised: only half of UK public services have a digital channel

Every day in the UK, 2.7 million people complete a transaction with a central government service,[13] 1.3 million people interact with the NHS,[14] and local authorities provide over 800 services at the frontline of service delivery. The UK has pioneered digital solutions to make services more efficient and accessible at both the national and local level. National examples include the NHS App, GOV.UK One Login, the EU Settlement Scheme and Universal Credit. At a local level, innovations such as Cambridge University Hospitals NHS Foundation Trust's 'virtual ward' save over 1,000 'bed days' a month by providing remote care. Local authorities are also making it easier for residents to access services and engage with their council online by adopting one-stop online portals such as 'MyAccount'.

People expect that public services are available digitally. This expectation is largely set by private sector norms where services such as remote banking (online, mobile, telephone) are used by 86% of adults.[15] While digital channels and services are not optimal for every user and situation, approximately half of central government and NHS services still do not offer a digital pathway.[16] The UK lags behind global leaders such as Estonia, which offers an online option for 99% of its services. Many UK public services still rely on phone calls, emails, letters, and in-person visits. HMRC, for example, handles 100,000 daily calls, DVLA processes 45,000 letters every day, and Defra manages over 500 services accessed via paper-based forms.

> **Over 80% of services are online with 95 million digital transactions and 4 billion API hits each year. Despite high levels of digitisation, we still process 45,000 mail items each day.**
>
> **Senior leader, DVLA**

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13 GOV.UK Performance data, March 2021 (archived, accessed November 2024) **(https://webarchive.nationalarchives.gov.uk/ukgwa/20210315084926/https://www.gov.uk/performance)** [1.03 billion transactions converted to daily figure]

14 NHS in numbers, 2023 (accessed November 2024) **(www.england.nhs.uk/nhsbirthday/about-the-nhs-birthday/nhs-in-numbers-today/)**

15 UK Finance, Payments Market Report 2022 **(www.ukfinance.org.uk/news-and-insight/press-release/half-all-payments-now-made-using-debit-cards)**

16 Central government: 53% of around 780 services hosted on GOV.UK services page, have a digital pathway, excluding pages classified as 'read-only' by LLM analysis; NHS: 45% of secondary care providers have a digital patient portal

> **70% of services are digitally enabled although 37 million calls and 17 million letters are still processed per year; key challenges experienced are with supporting citizen understanding and reassurance.**
>
> Senior leader, HMRC

> **83% of our services are form based … there are more than 500 forms involved in our services.**
>
> Senior leader, Defra

Beyond just offering a digital channel, public services also need to offer sufficient 'depth' of digitisation, embedding digital through every step and 'pathway' of the service. Many services in the public sector have a 'digital veneer' with a modern frontend but rely on inefficient and costly manual operations. Services like applying for Pension Credit have an online application but require case workers to re-enter information into multiple separate legacy systems. Others involve time-consuming data entry that mirrors paper forms. Defra, for example, estimates that 60% of their contact centre calls are due to broken / unclear digital pathways.

Digital services are not keeping pace with expectations of the UK public and businesses

People expect public services to be easy to use, reliable, and accessible. The UK public sector has multiple success stories in which improving the quality (ease of use, reliability, accessibility) of a digital service has improved the user experience. HMRC introduced an AI-assisted tool to simplify over 900 pages of tax guidance which improved accessibility and is expected to reduce related calls by 30%. MOJ offers a digital service to calculate the release date of prisoners which has saved time for thousands of frontline staff.

Despite successes, overall satisfaction with UK public digital services has fallen from 79% to 68% over the past decade.[17] This is lower than central government's target of 78% satisfaction for 'Great' services, and below the 90% benchmark of regulated industries such as the banking sector. Poor digital services also impact vulnerable user accessibility and digital inclusion, increasing costs of failure demand and support resources. This is particularly relevant at the local government level. Twenty four of the 'Top 75' government services failed to meet basic accessibility standards in Q1 2024.

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17   BCG Digital Government Citizen Survey, 2014 to 2024

Institutionalised fragmentation duplicates efforts for users

The UK has led efforts to remove complexity across public organisations. Within three years of GOV.UK being introduced (in 2012), it replaced 1,882 organisational websites.[18] The NHS is also in the process of combining 450 websites into one. Southwark Council, with support from Guys' and St Thomas' NHS Foundation Trust and Lambeth Council, developed an app to provide a joined-up cost-effective approach to falls management to prevent injury for elderly residents, which led to a 25-30% reduction in falls and £300,000 per year savings in ambulance and care costs.[19]

Despite continued efforts towards simplification, though, the fragmented structures of public sector organisations still lead to duplication of services and systems. People and businesses are often required to navigate the gaps between multiple public services and organisations to administer basic life events such as moving house, having a baby, or reporting a death. Managing a long-term condition or disability for example requires interaction with more than 40 services across nine different organisations. This means that people waste time navigating services and risk missing the support they need because they may struggle to find the right service. It is often the most vulnerable individuals who experience the greatest friction.

UK policy imposes constraints on achieving digital benefits

In many cases, outdated legal requirements, such as the need for physical signatures or in-person interactions, prevent digital solutions. For example, registering a death is a legal requirement and typically involves an in-person interaction and businesses applying for a new vehicle operating licence must place a physical advert in a local newspaper.

Where used effectively, digital solutions can enhance the effectiveness of UK policy. For example, Slough Borough Council is using funding from Defra to plant a Digital Urban Forest, which involves installing environmental sensors among newly planted trees across 31 urban sites. The sensors will enhance environmental policy outcomes by measuring local environmental health, contributing to an open-source environmental research database, and providing educational opportunities for local schools.[20]

However, many UK policies fail to take advantage of digital opportunities to deliver policy more effectively. The longstanding policy that people must post a separate paper form to claim some elements of tax relief means that many people, either unaware or unable, do not claim the benefit they are entitled to. This is not just a technical issue but also a cultural one. Digital and Policy teams reported that there was a cultural gap between the functions with both sides not working effectively with the other.

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18   GOV.UK: a journey in scaling agile. Government Digital Service blog.
     (via Platformland book by Richard Pope) (accessed November 2024)
     (https://gds.blog.gov.uk/2018/04/26/gov-uk-a-journey-in-scaling-agile/)
19   Local.GOV.UK, Preventing falls in the community with the Safe Steps mobile app
     (accessed November 2024)
     (www.local.gov.uk/case-studies/preventing-falls-community-safe-steps-mobile-app)
20   Slough's Digital Urban Forest, Slough Borough Council (accessed November 2024)
     (www.slough.gov.uk/environment/trees-hedges-1/9)

Missed opportunities for digitised services have a cost for people, businesses, and the UK economy

Efficient, connected digital services can help transform the UK economy and support the government's goal of driving economic growth. Analysis indicates that over £45 billion per year, representing 4-7% of public sector spend, in unrealised savings and productivity benefits could be achieved through full potential digitisation of public sector services. The vast majority of these benefits come from reducing manual processes for public servants, with additional savings generated by shifting service transactions to more cost-effective digital channels, for example via greater digital inclusion, and minimising losses from fraud and error through automated compliance.

Beyond savings for the public sector, better digital services would enhance living standards. Currently, the average person in the UK public spends a week and a half each year on government bureaucracy. By streamlining services, the public sector can free up valuable time for individuals, enabling them to focus more on work, leisure and family. Improved digital processes would also allow doctors to dedicate more time to patient care, support vulnerable populations in accessing essential resources, and enable police and local authorities to prioritise community issues more effectively.

Spotlight on local government

Local authorities experience the challenges described in this report, but also have specific features which digital reform must address:

- **Market concentration**: common systems, such as those supporting child social care and electoral systems, are highly concentrated with a small number of suppliers, increasing both the importance and challenge of ensuring high performance and value for money from those suppliers.

- **Digital resourcing**: local government has the lowest proportion of digital data professionals in the workforce across the public sector, at 2%, below the NHS and central government departments.

- **Supply chain dependency**: due to the lower proportion of digital and data professionals in local government, there is a higher reliance on outsourcing, increasing dependency on a concentrated supply chain. This also results in challenges for councils to drive compliance assurance with data protection laws, the public sector equality duty, council's preferred security controls and accessibility legislation.

- **Cloud adoption**: a lack of internal teams and capacity to drive migration means cloud adoption is lower in local government than central government departments, increasing the overhead of managing infrastructure, and dependence on sub-scale data centre facilities. Funding structures are also a constraint on adoption.

- **Sector fragmentation**: despite having similar needs, and the work of the Local Government Association (LGA) to connect and address these needs, the inherent structure of local government increases fragmentation of talent, buying and systems.

- **Citizen proximity and digital inclusion**: because local government services feature so prominently in citizens' lives, there is a particular need to ensure that services are inclusive: the LGA and authorities are working together to pioneer approaches to inclusion.
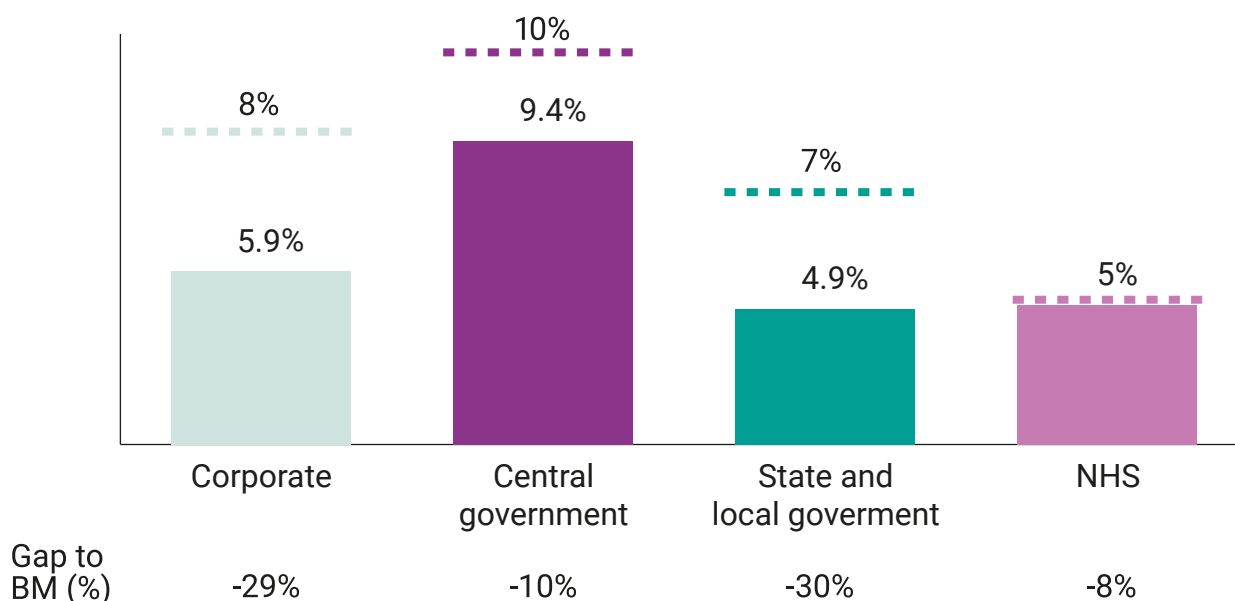
Technology

The public sector spent £26 billion on technology in 2023, below peer benchmarks

Technology forms the backbone of digital public services, ensuring national security, meeting public and business needs, and supporting essential operations. The public sector spent approximately £26 billion on technology in 2023,[21] roughly 5.9% of total RDEL (resource or operating funds).[22] While funding is not the only factor affecting performance, it is around 30% lower than peer benchmarks.[23] Digital and data spending per full-time equivalent (FTE) is 78% lower than peer-set benchmarks, especially in local government, where funding shortfalls are most pronounced.

Underinvestment in technology increases long-term costs and total costs of ownership, with maintenance of legacy systems costing often three to four times that of modern alternatives, as demonstrated by HMRC's contracts for maintenance of COBOL systems. It also limits opportunities for innovation. AI and emerging technologies will continue to be underutilised due to cautious cost/benefit-driven funding approaches applied for nascent technologies, missing automation, productivity and service delivery opportunities.

The UK public sector followed by (D&D) spend versus peer benchmarks (BM)[24] (2023 D&D spend as % of RDEL)

	Corporate	Central government	State and local goverment	NHS
Gap to BM (%)	-29%	-10%	-30%	-8%

Chart values: Corporate 5.9% (BM 8%), Central government 9.4% (BM 10%), State and local government 4.9% (BM 7%), NHS 5% (BM 5%)

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21 Representative benchmark constructed from Gartner IT key metrics data for national/international government, local government and healthcare providers

22 HMT supplementary estimates 2023/24 (accessed November 2024) **(www.gov.uk/government/publications/supplementary-estimates-2023-24)**

23 Public sector digital and data spend as % RDEL is 5.9% vs. average 8% technology spend as a % OPEX for peer set based on composite Gartner benchmark, weighted by spend ((third party tech spend based on Tussell data for 1,000+ orgs and Gartner spend buckets ranging from £250 million to £10 billion+) and org type (central government – national/international government benchmark, local government and education – state government benchmark, NHS – private and public healthcare providers benchmark); public sector digital and data spend as % TOTEX similarly 28% lower than composite Gartner benchmark.

24 State and local government refers to local authorities, police, education and other spend outside of central government and NHS

Institutionalised fragmentation drives duplication

The government's technology landscape is highly fragmented and duplicative, creating inefficiencies across and within organisations. Most public sector organisations have developed unique, non-reusable solutions. For instance, NHS England alone uses around 50 CRM platforms, and a 2021 review found 190 different authorisation services and 44 accounts used across government.

Many organisations lack standardised integration frameworks, resulting in systems that cannot easily work with each other and require bespoke point-to-point integration. This issue is widespread in the NHS, where individual trusts manage separate technology estates, and in the police, where forces operate independently with hundreds of distinct software solutions.

Fragmentation is also driven by an appetite for building new systems, rather than enhancing existing systems. Defra, for example, has four digital services for agricultural foods trade with nearly identical functions due to slightly differing policy requirements.

The large number of systems and high levels of duplication create a broader attack surface, which increases vulnerability to cyber threats. Central government executives have noted that such fragmentation leads to 'slow change' and greater security risks.

Legacy technology imposes unsustainable risk and cost

Public services and products must be fit for purpose and sufficiently reliable to meet the needs of users, yet much of the public sector's current technology estate is based on high risk legacy technology. CDDO defines a system as legacy if it is based on an end-of-life product, out of support from the supplier, impossible to update, no longer cost-effective, or considered to be otherwise above the acceptable risk threshold. This is a narrower definition of legacy than used in most private sector organisations, who would consider the proportion of legacy technology used by government to be even higher.

Based on survey responses, an average of around 28% (ranging from 10-60%) of central government organisations' technology estates are classified as legacy, with around 10-70% across police forces and around 10-50% across NHS trusts. Interviews and survey responses indicate that legacy risk is not effectively managed across the public sector and impacts service delivery in an unsustainable manner.

The lack of consolidated data on the public sector's digital and data assets and the scale of legacy presents a challenge to effectively identifying and mitigating risk. Departments such as the MOD, Home Office and the MOJ have classified their legacy assets, but most public sector organisations are in early stages of developing comprehensive registers and understanding the risk they carry. NHS England, for example, is pioneering a federated configuration management database (CMDB) to better document their digital assets.

Where data exists, it is typically based on estimates rather than exhaustive reviews. Around 15% of survey respondents could not even estimate the size of their legacy estate.

To assess the severity of potential impact from legacy systems within central government, the CDDO has defined 'red-rated' systems as having both high likelihood and high impact in terms of potential risks. In an annual assessment, legacy systems increased by 26% from 2023. Of these, 22% were considered red-rated, an increase of 16%. This is due to a combination of known security vulnerabilities, lack of support and inability to meet business requirements.

While central visibility is incomplete, the CDDO legacy IT assessment identified several systems having a very high or high impact on national security, including threats to health, personal safety, or even loss of human life in the event of a failure. Such risks increase the likelihood of system issues according to technology leaders:

> **Fundamentally the biggest hindrance I'm experiencing from legacy is stability. Resiliency of the system. This is why we're reaching the press so often.**
>
> **CDIO, central government department**

> **Many of them [core networks] are so chronically obsolescent that they cannot satisfy basic cyber [security] or functionality requirements.**
>
> **CIO, central government department**

Half of survey respondents indicated that when there is a budget for legacy system remediation, it frequently gets reallocated to other initiatives. For instance, DVLA had to reallocate funds to meet electric vehicle policy updates, delaying modernisation and innovation projects. This practice creates a compounding effect: as remediation efforts are deferred, more legacy systems accrue, making future remediation increasingly complex and expensive, thereby requiring even more funding.

Many organisations, such as DWP and NHS England, spend as much as 70-85% of their technology budgets on upkeep[25] instead of modernisation or innovation, relative to 67-70% among heavily regulated private sector industries and closer to 60% among digital leaders. HMRC, for example, relies heavily on costly third-party services to maintain outdated systems, while others, like Cabinet Office, struggled to cover critical upgrades due to scaled-back funding.

Service failures are disrupting people's lives, and the public sector is not sufficiently prepared to manage disruptions

There is no consistent measure of service reliability across the public sector, but in 2024 there have been several critical outages that impacted everyday processes, causing reduced quality of care in hospitals, delays at border control e-gates and disruption to emergency calls. One hundred and twenty-three outages impacted NHS England, often forcing staff to fall back onto manual, paper-based processes. During October 2024, NHS Northamptonshire and Leicestershire had one major network incident every week. An NHS technology executive said, 'Response plans are so regularly tested because we've had so many incidents'.

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25   Refers to spend categorised as 'run' or 'tech debt' (vs. change, grow, or innovate)

The magnitude and impact of incidents across the public sector are not centrally captured. However, several recent incidents impacting citizens have created headlines that underline the urgency to bolster reliability and incident management capabilities:

- **NHS hospital trusts (May 2024)**: NHS computer issues linked to patient harm, BBC[26]
- **HMRC (May 2024)**: Half a million left without Child Benefit payment, BBC[27]
- **Home Office (May 2024)**: E-gates back online after chaos at Heathrow and other UK airports, The Guardian[28]
- **Emergency Services (June 2023)**: Public Emergency Call Service disruption, Sunday 25 June 2023, GOV.UK[29]
- **HMRC (December 2022)**: HMRC missed 100,000 phone calls from taxpayers during IT outage, The Telegraph[30]

Without robust and regularly tested management response plans, systems that serve individuals and businesses are at risk. Yet many organisations fall short of effectively ensuring adequate business continuity.

Cyber risk to the government is critically high, yet public organisations are underprepared for current and evolving cyber threats

The National Cyber Security Centre (NCSC), a part of Government Communications Headquarters (GCHQ), has warned today's cyber threat landscape is growing ever more complex, amplified by heightened geopolitical competition and intensified by the use of AI.[31] In 2024, the NCSC responded to 50% more nationally significant incidents compared to last year, with a 3x increase in incident severity. In the private sector, cyber remains a critical priority, with 50% of businesses reporting breaches over the past year and 75% prioritising cybersecurity at the senior management level, according to the 2024 UK Cyber security breaches survey.

Over the years, the public sector has been the victim of several high-profile attacks. One notable example is the cyber-attack on the British Library in October 2023. The attack led to the encryption and destruction of much of the library's server estate, resulting in the exfiltration and auction of around 600GB of user and staff data on the dark web. The library's infrastructure rebuild and service restoration efforts have been extensive, with ongoing service disruptions.

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26   NHS computer issues linked to patient harm **(www.bbc.co.uk/news/articles/c4nn0vl2e78o)**

27   Half a million left without Child Benefit payment **(www.bbc.co.uk/news/articles/ceqqv249gn6o)**

28   E-gates back online after chaos at Heathrow and other UK airports **(www.theguardian.com/world/article/2024/may/07/chaos-at-heathrow-gatwick-stansted-edinburgh-manchester-uk-airports-e-gate-technical-problems)**

29   Public Emergency Call Service disruption, Sunday 25 June 2023: post-incident review **(www.gov.uk/government/publications/public-emergency-call-service-disruption-sunday-25-june-2023-post-incident-review/public-emergency-call-service-disruption-sunday-25-june-2023-post-incident-review)**

30   HMRC missed 100,000 phone calls from taxpayers during IT outage **(www.telegraph.co.uk/money/tax/news/taxman-missed-100000-phone-calls-four-day-outage/)**

31   National Cyber Security Centre – Heightened cyber threat **(www.ncsc.gov.uk/section/keep-up-to-date/heightened-threat)**

In addition, over the last two years, the NCSC has seen a growing number of instances where advanced persistent threat actors have targeted the commodity technologies relied upon by public systems. In most cases, proper cyber security and data protection measures would mitigate attacks. Additionally, results from the State of Digital Government technical leadership survey indicate that only 50% of respondents are confident about having a low risk of experiencing a cyber security breach or incident.

While there are pockets of co-ordinated efforts, there is currently no cross-government or wider public sector focused capability for managing emerging technology, horizon scanning and response, making it more difficult to co-ordinate on cross-cutting issues. A pertinent example of this emerging technology is post-quantum cryptography which threatens the security of public information and poses a risk to national and economic security.

GSG is currently working across the public sector to develop plans for the rapid acceleration of cyber transformation. Central intervention has proven to dramatically improve public sector cyber security across Canada, USA and Australia, and enabled a more agile and effective response. The NCSC supports the need for intervention to rapidly increase cyber resilience across the public sector. A strong interventionist model would accelerate the pace of cyber transformation.

Cloud adoption has accelerated, but there are barriers to full potential
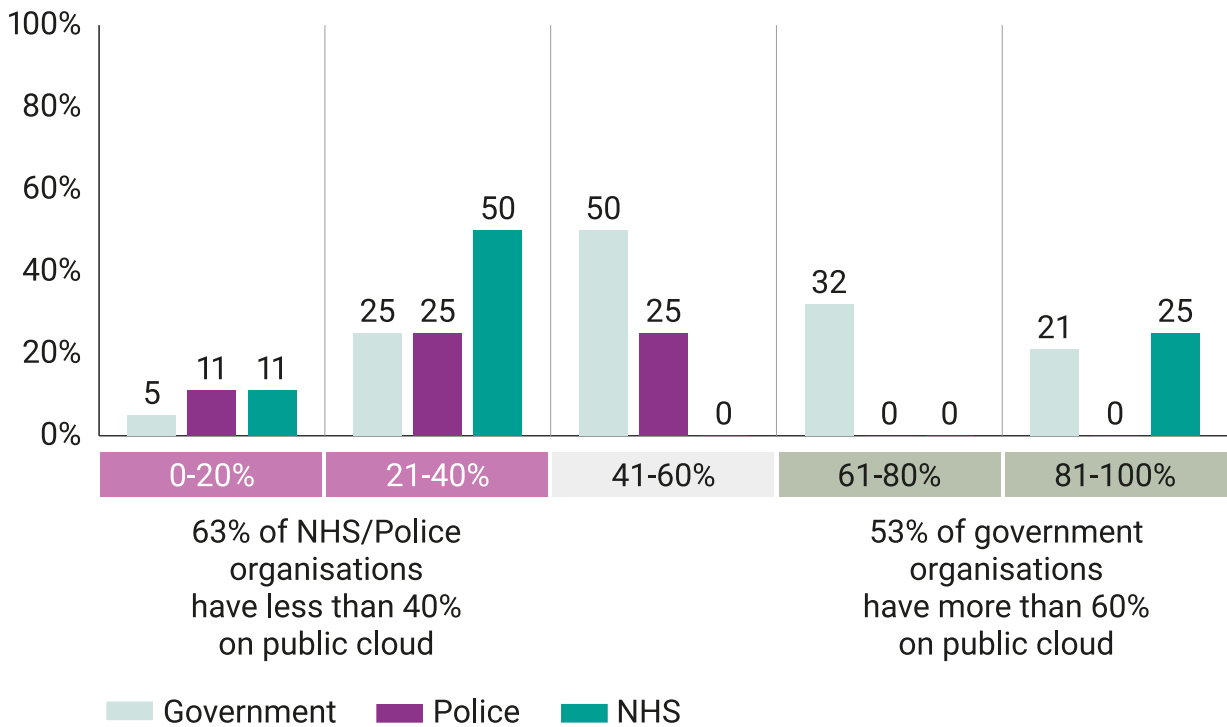
Cloud adoption has been accelerated through dedicated budgets (equating to £1.3 billion), a cloud-first policy, and NCSC cloud security guidance. When done right, the value created from the cloud can be dramatic including increased agility, scalability and faster innovation. A focus on cost and value optimisation has also been shown to yield a reduction in cloud total cost of ownership by 20-30% in private sector examples.[32]

46% of SDG survey responses reported that more than 60% of their estate is on the cloud, although most of these migrations have not included full refactoring. However, cloud adoption across the public sector is inconsistent. For example, around 63% of the Home Office estate is on public cloud, while a large proportion of local government workloads and data remains on premise and NHS Cambridge has around 95% of its estate on-premises. Public organisations typically source their own cloud provisions. There are opportunities to further reduce cloud costs through contract consolidation to benefit from economies of scale.

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32   2023 Bain research ('Harnessing the Value of Cloud')
     (www.bain.com/insights/harnessing-the-value-of-cloud/)

SDG survey responses denoting share of services hosted on public-cloud

What share of systems in your estate are hosted on public cloud? (%)

63% of NHS/Police
organisations
have less than 40%
on public cloud

53% of government
organisations
have more than 60%
on public cloud

Legend: Government — Police — NHS

All survey respondents reported using one of two leading cloud providers, often relying on default deployment settings including deployment regions, concentrating workload in specific locations. This creates increased concentration risk when viewed across the public sector. This concentration means that a regional outage could cascade across public sector services, amplifying disruption. The centre of government has begun to track this risk, but it will require strong co-ordination and collaboration with providers to address fully.

GMPP digital, data, and technology programmes continue to underperform

The Government's Major Projects Portfolio (GMPP) contains 244 programmes with a baseline whole life cost of around £460 billion (including non-government costs).[33] Of the around 140 programmes scheduled for completion after Q2 2025, 32 are primarily focused on digital and data at a cost of around £60 billion.[34]

33   GMPP Government Major Projects Portfolio Annual Report Data March 2023
34   GMPP Government Major Projects Portfolio Annual Report Data March 2023; programmes primarily focused on digital and data defined based on mapping exercise (includes programmes with at least a significant digital / technology component)

Digital and data projects are 60% more likely to be reporting 'Red' than the wider GMPP portfolio with only 9% reporting a 'Green' status.[35] Current Infrastructure and Projects Authority (IPA) governance and assurance processes lack real-time insights and have been unable to consistently resolve the issues required to return challenging projects back to health.

Leaders' experience of and preparation for delivering large scale digital projects varies. Many are from policy or non-technology operational backgrounds, and transformation roles are often 'double-hatted' alongside services delivery. Recruiting and retaining the right capabilities is a challenge partly driven by the lower pay relative to the private sector; one Senior Responsible Owner (SRO) stated, "I took a 2/3 pay cut [coming from the private sector] to do this job". Existing training initiatives, like the Major Projects Leadership Academy, aim to support leaders but do not focus on specific digital delivery needs.

A public sector-wide reliance on third parties extends to major programme delivery. Poorly defined responsibilities can lead to a loss of control over outcomes and delivery of technology which cannot move to 'run' without significant ongoing support.

Although improvements have been made, digital and data programme delivery approaches endorsed by the IPA are more suited to large, non-tech infrastructure delivery and lack the adaptability that a more agile approach offers. Detailed specifications are required up front with limited scope to fund pilots and proof of concepts. This is a particular challenge where the build requirements are not fully known, as has been the case for the NHS federated data platform build.

Data and AI

Fragmented data hampers ability to analyse and draw meaningful insights

Only 27% of survey respondents believe their current data infrastructure enables a comprehensive view of operations or transactions. 70% say their data landscape is not well co-ordinated, interoperable, or enables a unified source of truth. In a separate recent digital maturity survey completed by 76 local authorities, using and managing data was scored as the lowest maturity area with the median response neither agreeing nor disagreeing that they had a mature approach to using data.

Fragmented data is an issue both within and across organisations. For instance, Cabinet Office's 'Better data for a better Cabinet Office' strategy highlights the need for integration, yet legacy systems and skill gaps hinder effective data use and quality control. Defra faces similar problems from fragmented data having to manage overlapping digital services and data for imports, exports and fisheries, which have similar functions but are maintained separately due to differences in policy. These issues are recognised externally: Citizen's Advice, for example, highlighted specific opportunities to better harness fragmented data held across charities and the public sector to better predict and prevent public detriment, such as using one-off discretionary housing payments as a predictor of homelessness.

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35 GMPP Government Major Projects Portfolio Annual Report Data March 2023; level of delivery risk based on the IPA's confidence assessment ('Green' – successful delivery highly likely, 'Red' – successful delivery unlikely)

Given the breadth of services that councils provide to every citizen in the UK, councils hold a wealth of data on each resident. However, it is challenging for councils to ensure that systems and data are interoperable due to barriers by legacy suppliers and/or the high costs of APIs which significantly hinder digital transformation.[36]

Despite these limitations, the ingenuity of public servants has led to noteworthy results such as DfE using supplier-held data to overcome the friction of sharing between schools and enable real-time attendance visibility. Data harmonisation efforts have also delivered successes. The NHS Federated Data Platform, adopted by Northamptonshire University Hospitals, has improved theatre scheduling, and at Chelsea and Westminster Hospital, has helped to track cancer patient workflows. Home Office and DVLA developed a 'Photo at the Roadside' API service used by 41 police forces to confirm driver identity by retrieving the photo from drivers' licences on a handheld device, meaning roadside checks are up to 66% faster and saving over 500,000 police hours. The MOJ has developed an open-source data matching product called Splink, which can link a million records a minute for justice use cases (e.g. identifying pathway of offenders), and has been adopted by public and private sector organisations around the world.

Like broader technology fragmentation, data fragmentation results from a combination of technical limitations, risk-averse cultures, unclear regulations, and different governance standards. Legacy systems can also pose a major challenge to real-time data sharing, such as COBOL systems in HMRC, which require additional software to share data via APIs.

A strong sense of data ownership and reluctance to aggregate personal data further inhibit sharing. Departments such as Defra report resistance from ALBs that view their data as proprietary, creating silos even within the organisation. In extreme cases, data provided by one organisation will not even be 'shared back with them'. These issues are often tied to concerns over data accuracy, limited capability to manage data appropriately, and fears of reputational damage if shared data results in errors. Organisations are also concerned that aggregating large, sensitive datasets, such as salary information from DWP, immigration status from Home Office, and address data from the Ministry of Housing, Communities and Local Government, could increase fraud risks and lead to disputes over responsibility for detection.

Legislative frameworks such as the Digital Economy Act 2017 and the Data Protection Act, have tried to overcome barriers. However, data sharing agreements and access point APIs are often laboriously agreed, and there is also limited ability to enforce them. The ONS Integrated Data Service programme aims to improve accessibility of official data, and is accredited under the DEA 2017, but has yet to fully launch its service.

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36   UKAuthority (2019) APIs for the public good
       (www.ukauthority.com/media/7599/apis-for-the-public-good)

Data is underutilised for AI

Targeted use of AI has the potential for large-scale public sector benefits, with over 140 use-cases already identified across central government. For example, tools to automate drafting of policy documentation can reduce administrative burden and target up to 40% time saving. DWP has already demonstrated that cost savings and an improved user experience can be achieved with AI integration into bereavement notifications and the direct payments after death process. Hillingdon Council became the first UK local authority to use voice automation and AI at scale, creating an AI-driven citizen contact system that reduced the cost per call by 5% and immediately provided the capacity of 25 to 30 full time employees, successfully delivering a cost saving of £5 for every pound spent and allowing citizens to phone the council 24 hours a day.[37] Despite these examples, public sector data remains underutilised, holding back AI, machine learning and advanced analytics potential.

CDDO AI common use cases

Use case	Value
Digital assistance	27
Draft writing	13
Search	12
Prediction	11
Fraud detection	7
Case triage	7
Case summaries	7
Automation	7
Image processing	6
Form processing	6
Document processing	6
Text translation	5
Large AI programmes	5
Data analysis	5
Language translation	4
Code generation	4
Skill improvement	2
Data matching	2
Account analysis	2
Transcription	1
Test data generation	1
Scoring	1
Pattern identification	1

Legend: DWP, HMRC, HO, MOJ

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37   PwC and Hillingdon leading the way on AI for residents, The MJ (accessed November 2024) **(www.themj.co.uk/pwc-hillingdon-leading-ai-residents)**

In addition to the challenges of fragmentation, data accessibility and quality were highlighted as significant obstacles in CDDO's 'Analysis of AI adoption planning across Public Sector' report from July 2024. Data quality issues can lead to poor quality or inaccurate AI-generated results and potential exposure of sensitive data to the wrong users.

Funding and the ability to prove benefits are also barriers. HM Treasury requires clear cost-benefit justifications for AI or machine learning (ML) adoption, however, only 8% of AI projects show measurable benefits and only 16% show forecast costs, making it difficult to assess these against a cost-benefits analysis.

Spotlight on health

The unique needs and opportunities of the NHS mean that it has features which need specific treatment, or which should be taken as examples of good practice for the rest of the sector:

- **Pioneering AI**: the NHS has a combination of data, expertise and needs that can make a direct difference to patients' wellbeing and clinical outcomes, and is trialling approaches which the rest of the public sector can learn from.

- **Common platforms**: despite earlier challenges, the NHS is making progress in building common platforms, such as the shared set of systems which comprise the NHS Spine, and the Federated Data Platform.

- **App adoption**: the use of the NHS app to provide COVID passports during the pandemic has driven high levels of take up, making it one of the most used apps in the country.

- **Talent**: the NHS has a slightly lower proportion of digital and data professionals than benchmark comparators.

- **Risk**: the diverse set of technology, of varying ages and level of support, across the various parts of the NHS mean that it is particularly exposed to failure and cyber attack and has experienced high levels of incidents.

- **Sector fragmentation**: as with local government, the structure of the NHS drives fragmentation, constraining buying power, shared capabilities and the ability to manage talent.

Central and shared capabilities

Central and shared digital capabilities have not yet had sector wide impact

Various attempts have been made to drive digital transformation through central teams and shared capability. While these efforts have had impact, they have been focused within specific areas of the sector rather than on broader public service reform.

Government Digital Service (GDS) is a centralised function responsible for creating cross-government digital services such as GOV.UK, a single online platform for public information and services. GDS has also developed GOV.UK One Login for simplified user authentication. One Login aims to consolidate 19 different account setups and 44 unique sign-in methods into a single, unified login system.

It has reduced duplication and streamlined administrative processes, leading to cost savings and efficiency improvements, with an investment of approximately £305 million expected to yield around £1.75 billion in monetised benefits over five years. Government Standards and Guidelines have begun to be used by the wider public sector. In a recent digital maturity survey completed by 76 local authorities, 61% said their council referred to the government development lifecycle for the delivery of their digital services.

Government Security Group (GSG) is the central co-ordinating body for protective security across central government and their ALBs. GSG works closely with the National Cyber Security Centre (NCSC), the National Protective Security Authority (NPSA) to develop and implement security policies, standards and guidance for all government organisations. It also offers shared security services across the public sector, helping to streamline practices and improve threat resilience.

Unlike GDS and GSG, which were created explicitly to be a centralised capability, Integrated Corporate Services (ICS) was developed by BEIS successor departments (DESNZ, DSIT and DBT) to provide commodity computing resources such as Office 365 and cloud hosting to itself. ICS' approach of using configurable commercial-off-the-shelf, cloud first applications to develop solutions successfully cut costs, driving down end-user costs by 10% from a £2,000 baseline, with the potential for further reductions from further scaling. ICS has expanded to support 13 central government organisations, with plans to expand further still. ICS shows the potential for departmental-led initiatives to be built and scaled to provide value across the public sector.

The Central Digital and Data Office (CDDO) was created in 2021 out of parts of GDS to lead the Government Digital and Data function. Its remit includes defining and implementing a coherent digital strategy across government and assuring investment through spend controls. It takes responsibility for the professional leadership and development of capability across government to define skills, roles and career paths; technology and data leadership and technical engagement with the market. CDDO developed the 2022 to 2025 roadmap for digital and data, Transforming for a Digital Future, collectively with senior leaders across government. It included key commitments such as, to transform 50 of the Top 75 government services to a 'Great' standard and grow the size of the Government Digital and Data profession to 6% of total Civil Service headcount. The roadmap laid important foundations and progress has been made in a number of areas including identifying Essential Shared Data Assets and creating guidance on the use of Generative AI.

However, there are also a number of areas where CDDO have not been able to make enough sustained progress on some of the broader systemic change that is needed such as legacy IT and technology risk management.

Similar examples of centralised and shared capability exist outside of central government. NHS England provides cyber security services across the NHS to maximise reusability and ensure compliance with higher security standards and independent security audits. The Police Digital Service (PDS) provides national services to police forces on behalf of National Police Chiefs' Council' (NPCC), including the delivery and management of UK policing cyber security and information risk management, DDAT standards, technology blueprints and live operational applications and tools. Additionally, the NPCC facilitates best practices sharing between police services.[38] While adherence to tech standards across policing has improved, for example accompanying the adoption of Microsoft 365, coverage of many standards remains limited with participation at the discretion of individual police forces.

The need for a co-ordinated and sector-wide solution to the local government's digital ambitions is also well recognised and has gained momentum towards implementation. In a recent paper, the Local Government Association (LGA) called for a 'Local Government Centre for Digital Technology' to develop shared solutions and standards across local councils to meet national priorities.

People, leadership and skills

Digital leadership is not a consistent priority

Survey responses and interviews with senior leaders across the public sector have consistently highlighted that many non-digital public sector leaders with sizable delivery responsibilities have insufficient technical expertise or training, lack the digital orientation to implement tech-enabled programmes, or don't fully understand mission-critical technology dependencies and high-priority opportunities such as AI. Skills programmes exist but are not consistently implemented; only around 20% of Civil Service SCS have verified themselves as 'digitally upskilled' relative to the digital and data essentials framework.

There is a culture gap between the policy profession and the digital and data profession: interviewees reported that each profession did not understand the priorities or work of the other, and that the formation of true cross-functional teams, founded on mutual respect, was rare.

Digital leaders are not well represented at executive level across the public sector. Executive CDIO roles are not the norm across public sector organisations with only four central government departments having a digital leader on their executive committee.[39] This contrasts with the private sector, where the typical FTSE 100 COO has either led digital transformations or has acted in technology-centric roles such as CIO. In the private sector, CIO's, CTO's and CDIO's commonly sit on the executive committee and report directly to the CEO.

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38   Policing Productivity Review, October 2023
      **(https://assets.publishing.service.gov.uk/media/655784fa544aea000dfb2f9a/Policing_Productivity_
      Review)**
39   GOV.UK departmental governance webpages, accessed November 2024

Presence of named CDIOs, CIOs, CTOs or service transformation leads on organisation's Exco (non-exhaustive)

Organisation	CTO, CIO,CDIO or Service Transformation leader on ExCo
NHSE	No
HMT	No
DBT	No
MHCLG	No
CO	No
DHSC	No
DFE	No
DCMS	No
HO	No
DFT	No
DESNZ	No
DEFRA	No
FCDO	No
MOD	No
DSIT	Yes
MOJ	Yes
DWP	Yes
HMRC	Yes
HSBC	Yes
John Lewis	Yes
BT	Yes
Virgin media	Yes
TESCO	Yes
bp	Yes

In the NHS, over 80% of trusts have a named CDIO, though only 50% of these CDIOs had a seat on the trust board.

Public sector leaders and organisations do not consistently integrate digital colleagues into their operating model alongside policy and operational teams. This prevents true collaboration and innovation.

> **Digital and data teams are seen by policy teams as stakeholders to manage rather than part of the team needed to help look at options for how to achieve a shared goal'.**
>
> **Home Office survey response**

> **If you look across the different professions – digital and data, policy, operational delivery, project delivery, they each have their own world view and standards as to how things should be done…**
> **Operational people don't want to change, policy people don't understand delivery and digital people don't understand either of those two things – they all just disregard each other. It is structurally baked into the way the Civil Service is organised, both in terms of professions and organisational structures.**
>
> **Senior leader, Defra**

There are not enough digital and data people in the right roles

Public sector technology is delivered by a digital workforce of around 80,000 permanent government employees, around 20,000 contractors, plus an additional tens of thousands of private sector resources contracted through managed services and IT consultancy agreements.

Overall Civil Service (including agencies, ALBs and NDPBs) internal headcount equates to a proportion of around 5% digital and data employees. This represents under-resourcing relative to benchmarks of 6% for other governments and 8-12% in regulated private sector industries.[40]

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40   Utilities, Telecommunications, and Financial Services, respectively

There is significant variation in the proportion of digital and data employees across organisations. In the Met Office and the ONS, proportions are as high as 15% or greater – above comparator private sector industries. In local government, digital and data roles are only 2% of headcount, against benchmarks of 4%; for the NHS, these roles account for 2.8% against benchmarks of 3%.[41]

There is an inefficient mix of 'role types' in the Civil Service. The digital and data workforce has an oversupply of project managers and other non-technical digital and data functions relative to the supply of technical roles (such as software developers). High-performing private sector organisations achieve a ratio of 4:1 technical to non-technical roles. In the Civil Service, the current ratio is closer to 2:1.

Skills shortages also adds to the effective use of data and AI adoption. DWP's newly established AI directorate has successfully launched projects such as Whitemail Vulnerability Scanning, which processes physical mail to identify vulnerable citizens. DWP is also developing DWP Ask, a conversational question and response tool to help DWP Work Coaches find information. However, strong reliance on external vendor support to achieve this reveals a lack of cohesive infrastructure to manage and integrate data internally. For example, Defra does not have a standing team for AI and data science capabilities so needs to outsource AI development and struggles to operationalise AI use cases.


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41   Gartner, IT key metrics data report, 2023; Excludes MSPs, contractors, consultants and any other non-permanent staff headcount. DFE core department includes Education and Skills Funding Agency, Standards and Testing Agency, Teaching Regulation Agency; FCDO Core Department includes RSO; HMRC includes VOA; DBT includes ex-DIT and ex-BEIS headcount; IPA, ICS, SLC, IPO, UKRI, DE&S, Ofqual, ONS overall headcount estimated from online research – ONS headcount from 2022. Homes England data excluded; employees only.Ofqual, ONS overall headcount estimated from online research – ONS headcount from 2022. Homes England data excluded; employees only

The public sector is not seen by many digital and data professionals as an attractive place to work

Despite offering varied roles of critical national importance, the public sector struggles to consistently recruit and develop top digital and data talent. The proportion of advertised roles filled via a recruitment campaign have been in decline since 2019, dropping from a high of around 80% in 2020 to an average of around 50% in 2024.

Civil Service digital and data recruitment success rates, HEO-SCS % (2019 to 2024)[42]
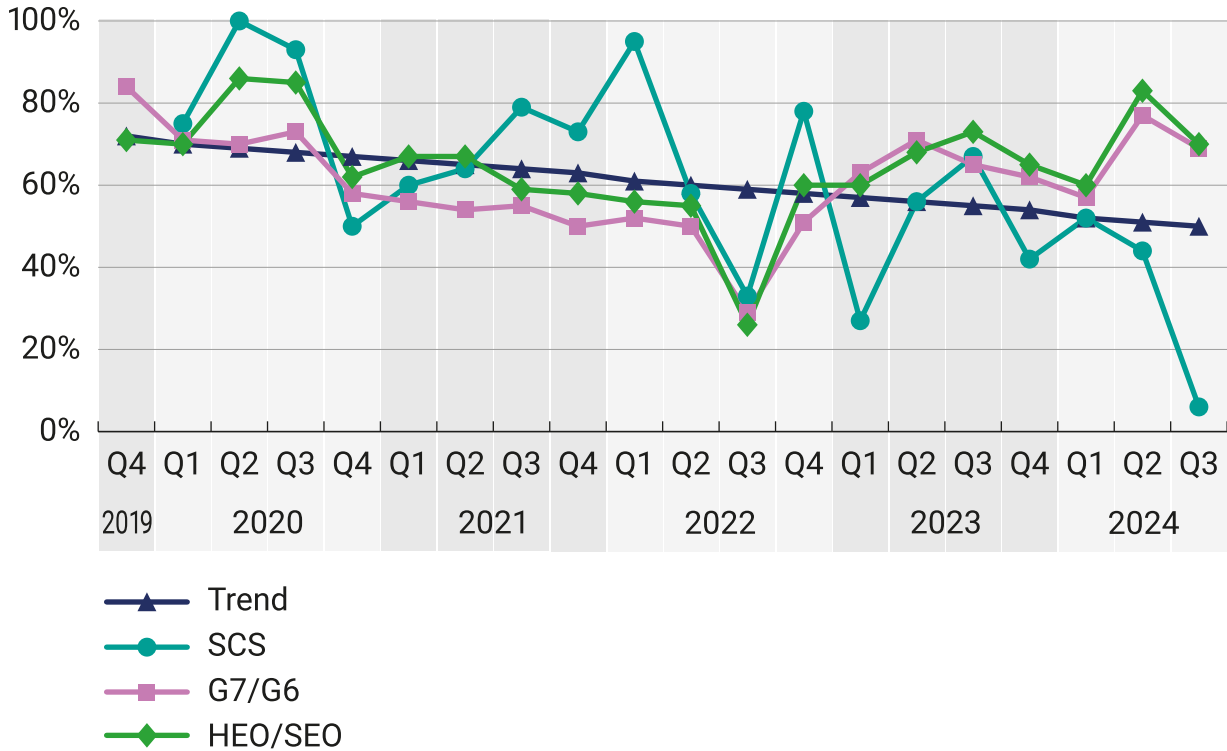
Analysis from Glassdoor, a website that enables users to publicly rate their experience of working for organisations across the public and private sector, suggests a mixed picture for the Civil Service. Recruitment issues are primarily driven by uncompetitively low pay relative to the private sector. Pay satisfaction is significantly below private sector benchmarks across departments, job roles and seniority levels. While the public sector pension and work-life balance offerings remain a draw, they do not attract enough individuals to resolve the recruiting challenges.[43]

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42   HEO: Higher Executive Officer; SEO: Senior Executive Officer; G7/G6: Grade 7/Grade 6; SCS: Senior Civil Servant

43   Glassdoor analysis, October 2023

Glassdoor analysis (online experience rating platform) by role. Gap to private sector benchmark (2022 to 2024)

Role D&D teams %Δ from benchmark		Compensation and benefits	Senior leadership	Career opportunities	Culture and values	Work-life balance
Digital (Other)	n=25	-30%	-19%	-13%	-19%	-5%
Engineering Roles	n=19	-18%	-12%	-3%	0%	-11%
Business and Strategy	n=47	-16%	6%	8%	0%	5%
IT and Security	n=127	-16%	0%	-3%	0%	3%
Data	n=121	-20%	-3%	0%	-3%	5%
Design and UX	n=19	-3%	17%	11%	0%	5%
Project Management	n=9	-14%	3%	3%	26%	-8%

Private sector digital and data pay is universally higher than public sector across all roles (and the wider public sector is 5% below central government).[44] In the NHS, mapping digital and data roles to the Agenda for Change pay bands and career paths has introduced further challenge in both uncompetitive pay and progression based on a very different clinical model.

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44   Hays UK Salary and Recruiting Trends 2024; Data averaged across UK regions.

Digital and data pay by role type, public and private sector (£), averaged across UK regions

Legend:
- Private Sector (teal diamond)
- Civil Service (dark green ellipse)
- Local Authority (navy square)
- NHS (pink circle)
- Police (green triangle)

Civil Service pay difference versus the private sector

Role	Pay difference	%
Cyber	-£23,000	-35%
Software Developer	-£5,000	-10%
Business Analyst	-£24,000	-37%
Product Manager	-£25,000	-35%
Infrastructure Engineering	-£5,000	-9%
Development Operations (DevOps)	-£25,000	-35%
Technical Architect	-£30,000	-36%
Test Engineer	-£15,000	-27%

While digital and data talent is attracted to the potential flexibility and impact offered by public service, such as the opportunity to move between departments or the sense of mission from working for the public good, these benefits are not sufficient to retain top talent. Around 45% of Civil Service, 55% of agency and ALB, and 53% of local authority respondents thought that career progression pathways were poorly defined.

Performance management frameworks are underused with very few individuals identified as underperformers (only 3% observed in one central department), and only around 4% of digital and data SCS on Performance Improvement Plans. As a result, poor performers remain within the workforce and true high performers are not differentiated. This is a likely contributor to low attrition rates, with an average of 6-15% across the Civil Service (with a proportion of these leavers moving to other public sector organisations).

Long tenure, low churn, low forced attrition and limited options to reward great performance such as larger bonuses or differentiated promotion opportunities, may be driving top performers to leave the public sector entirely.

"
We constantly lose highly talented people to the private sector as we can't compete with salary and flexible working, which digital professionals expect in the modern world.

Senior leader, central government department

Digital supply chain

Public sector digital and data spend in 2023 was estimated to be around £26 billion of which around £5 billion was employee costs and £21 billion was third party costs including contractors.[45] By organisation type: £11 billion was spent by central government, £8 billion by the NHS,[46] £5 billion by local government, £1 billion by police and £1 billion by rail, devolved transport and fire services and charitable organisations.[47]

Public sector usage and management of third parties has not adapted to reflect the shifts in the technology market

In the last 15 to 20 years the technology market has shifted, impacting how sourcing and supplier management is carried out. The model of outsourcing technology development and owning hardware in-house has shifted towards building internal development teams and buying platform services. The upfront capital purchase model has shifted to a subscription-based model in line with the move away from on-premises and owned technology and towards services such as SaaS and cloud. System integrators have also shifted from being the dominant service providers to acting as resellers for major platforms. The technology supply chain has consolidated over time as platform providers take on the role of hardware provider, data centre provider, database vendor, etc.

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45   Tussell third party invoicing data for 2023 calendar year
46   NHS spend elevated in 2023 due to investment for EPR (electronic patient record) systems
47   Tussell third party invoicing data for 2023 calendar year

These shifts have changed the way in which companies choose to leverage, negotiate with and manage third parties in the technology market. The government's procurement and supplier management processes have not adapted to this market shift, impacting the performance and value for money achieved from the newly shaped supply chain. Government sourcing decisions should more actively incorporate these market drivers and conditions as well as requirements and preferences of the contracting organisation.

The public sector does not have a co-ordinated digital sourcing strategy across organisations

Some digital sourcing strategies exist at the organisational level, although only 4% of leaders 'completely agree' these strategies are clear. Across the public sector, organisational silos and challenges associated with providing shared services have caused digital and data spending to evolve organically. As a result, opportunities have been missed to benefit from the public sector's scale. For example, seven resellers were identified to have provided Google products (services, software and licenses) across 12 departments with 10% in missed volume discounts; the government was also exposed to VMware's pricing increases following a Broadcom acquisition due to lack of a cross-government commercial agreement.

This challenge is further exacerbated across the NHS and local government: each of the NHS's 209 secondary care entities negotiates and buys its own infrastructure (including cloud, networking, end user computing), and each of the 320 councils largely negotiates their own technology agreements outside of buying groups. Local councils also often exist in markets where they are locked into vendors, with limited options and low opportunity to diversify from large-scale suppliers. For example, the children's social care market is highly concentrated: local governments procure from three main providers who have little incentive to improve their product, despite councils using each system for a median 10-year period.

Approaches to co-ordinate and drive scale benefits have been introduced across multiple parts of central government including the Crown Commercial Service (CCS), Government Commercial Function (GCF) and Central Digital and Digital Office (CDDO). GCF provides commercial expertise and oversees procurement policy across departments, supporting departments with complex digital and data procurements. CCS is the main centralised procurement body for the UK government, providing frameworks, commercial agreements, and procurement guidance, often tailored to digital and data needs. CDDO provides guidance, oversight and standards which shape how departments approach and manage digital and data procurement. Work by these teams has created common frameworks and constructs which consolidate the buying power of the public sector. CCS, GCF and CDDO recently secured a landmark five-year agreement with a major global provider with better commercial terms for a range of eligible public organisations.[48] Despite proven successes, no approach is sufficiently widely adopted, frameworks are not mandatory and scale benefits and duplicated buying are still a challenge. Today, less than 50% of public sector digital spend with third parties is covered by CCS frameworks.[49]

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48   CCS, October 2023
      (www.crowncommercial.gov.uk/news/crown-commercial-service-signs-memorandum-understanding-microsoft-uk-spa24)
49   Tussell third party contracts data, cut by supplier

Commercial teams have insufficient digital expertise and digital teams have limited commercial skills

It is common practice in large private sector organisations to have category-specific buying operating models supported with specialist capabilities, yet the public sector largely relies on a generalist model. While pockets of digital and data procurement expertise exist such as specialist teams in CCS, GCF and CDDO, buying is typically performed by generalists with limited use of more strategic approaches such as category management. As one GCF leader noted: "We need 250 more [digital specialists]".

Only 28% of leaders believe there are sufficient internal capabilities to effectively monitor, track and drive supplier performance, with only 40% of leaders stating that third parties perform in line with expectations. Once contracts are signed, aggregate supplier performance is not consistently or rigorously managed across the public sector. This impacts service quality, timing and the final cost of service delivery – 'actual' digital spend with managed service providers exceeded contract value by over 50% in 2023. Scope changes, contract variations, and other non-commercial factors also contribute to these performance issues.

The UK government relies on costly external providers to augment internal digital and data capability

The public sector depends heavily on costly third parties to augment internal digital and data capability. Of the £26 billion public sector digital and data spend in 2023, less than 20% (around £5 billion) was on permanent public sector staff while 55% (£14.5 billion) was spent on contractors, managed services providers, and IT consultants (12%, 25% and 19% respectively). Less than a third of leaders believe this current balance of internal resources and external support is cost effective or efficient.

The reliance on third parties is driven by a combination of factors; lack of cohesive capability sourcing strategy, headcount constraints, technical skills gaps and uncompetitive reward that constrains the ability to bring in external talent as permanent staff. The issue is further exacerbated as gaining approval to secure third party spend as third parties can be wrapped into capital funding budgets which are typically 'easier' to secure versus budget to hire permanent staff.

> **The mix is unbalanced due to restrictions on bringing in internal public sector resource. This leads to having to spend huge amounts on external resources where the funding constraints allow.**
>
> **Senior leader, large central government department**

For contractors specifically, overall public sector digital spend is 10 to 25 percentage points[50] more than public and private sector benchmarks.[51] The average contractor costs 3x their public servant counterparts (£182,000 vs £61,000 per year), accounting for around 40% of the overall cost yet only around 18% of the total headcount of the two groups.

Organisations within government have explored alternative capability and resourcing models. Starting in 2015 DVLA developed a primarily insourced model with focus on internal digital skills and talent development. The DVLA Centre of Digital Excellence now covers 15 programmes with academic qualifications, professional certifications through to apprenticeships. 13% of the digital and technology organisation are either on the talent pipeline, or graduates of it with all junior software engineers, cloud engineers, software development engineering in test and business analysts coming through the programmes.

Headcount and cost of contractors relative to permanent staff in public sector

Headcount and cost of digital and data permanent staff and contractor resources in public sector (2023, # thousand and £ billion)
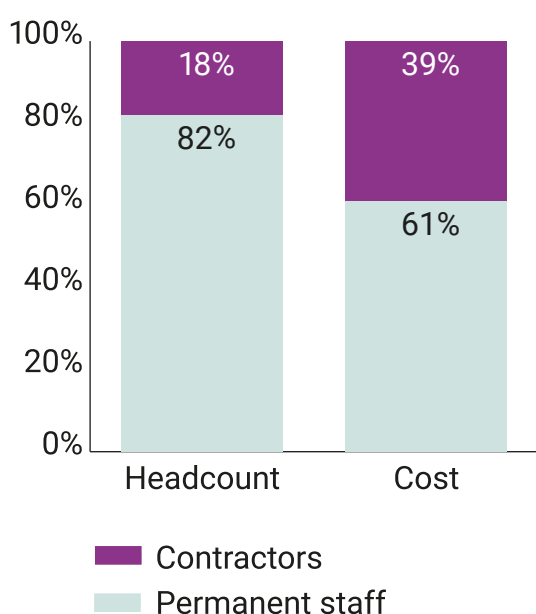
Average annual cost of public sector digital and data permanent staff and contractors (2023, £ thousand)

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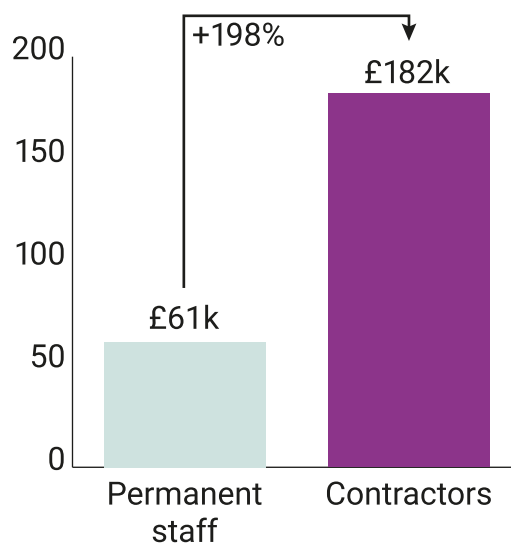
50   Contractor spend was analysed as a percentage of total contractor and permanent staff spend combined and compared to benchmarks on this basis; contractor share of spend is around 10pp above public sector and up to around 25pp above regulated private sector peers

51   Gartner IT key metrics data, National and International Government, December 2023

Investment prioritisation and controls

Funding of continuous improvement of the technology estate is under-prioritised versus new policy programmes

Digital services require ongoing funding of persistent teams that build new functionality alongside driving continuous improvement to their technology estate. Unlike this modern product model, the current public sector funding model is geared towards financing new policy programmes and discrete projects. Even when sufficient ongoing funding is secured, 'top-slicing' of budgets in favour of policy-linked demands leads to underinvestment over time, contributing to increasing operational risks and higher levels of technical debt. As an example, the DVLA remediation for the red-rated Vehicle Systems Software tool was delayed as funding was re-allocated to an urgent legislative change. around 65% of digital and data leaders do not believe the funding model is adequately designed to allow their organisation to invest in and run existing digital services effectively. In a separate recent digital maturity survey completed by 76 local authorities, only 39% of councils reported a dedicated budget specifically for the introduction of new digital systems.

> "
> **Every year there is at least one, sometimes two and occasionally three reprioritisation exercises, and they always end up deprioritising the 'fix the stack' work rather than the work the ministers want, regardless of type or flavour of government.**
>
> Senior leader, NHS

> "
> **We are struggling with execution as the funding model and current priorities do not fully align. We are not focusing enough resource on service improvement, legacy modernisation, and infrastructure upgrades.**
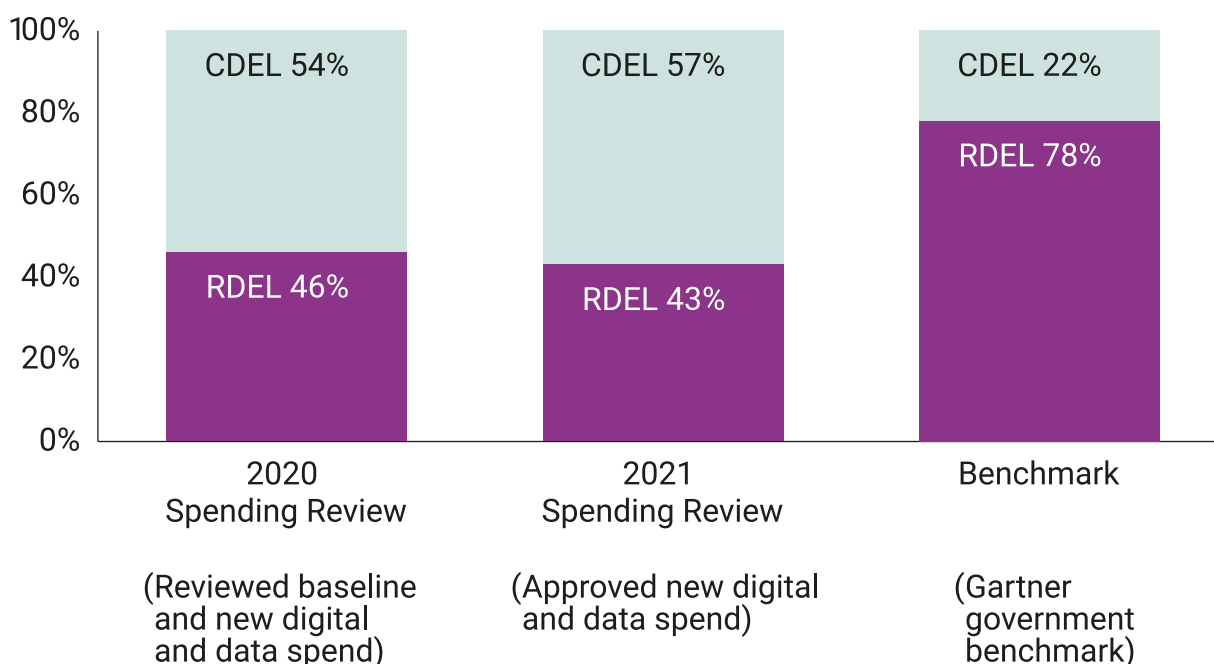>
> Senior leader, public agency
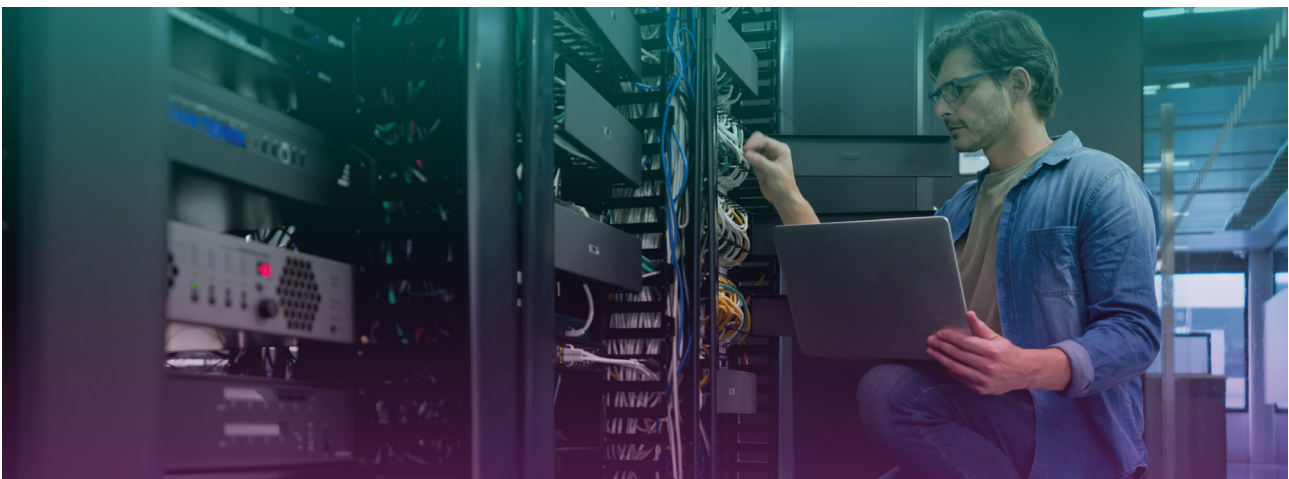
Funding has not adapted to new technology market norms

Technology has shifted from a capital-intensive business, based on the acquisition and creation of hardware and software assets, to a revenue intensive business based on subscription services such as SaaS and cloud. This market wide shift has increased the need across the public sector for ongoing 'run' funding over upfront investments.[52]

In contrast the government's current funding model biases allocation to investment projects and capital grants (termed CDEL spending) over funding to day-to-day expenditure (termed RDEL) – less than half (43-46%) of new departmental digital and data spending reviewed by CDDO (in the 2020 and 2021 Spending Reviews)[53] was RDEL, significantly below Gartner's 78% public sector benchmark.[54] This limits organisations' ability to reliably secure funding for 'as a service' products, commit to modernisation and remediation as well as driving inefficient buying behaviours such as end of year purchasing decisions. According to the NAO's February 2024 report, this results in a focus on short-term solutions, further increases risks associated with legacy systems and results in missed innovations and opportunities.[55] It also increases the government's reliance on third parties such as resellers and delivery partners at the expense of building in-house capabilities, as fees can more easily be treated as CDEL spend.

Spending review allocation of CDEL and RDEL spend, versus Gartner benchmark (2020 and 2021 Spending Review)

2020 Spending Review	2021 Spending Review	Benchmark
(Reviewed baseline and new digital and data spend)	(Approved new digital and data spend)	(Gartner government benchmark)

CDEL 54% / RDEL 46% — CDEL 57% / RDEL 43% — CDEL 22% / RDEL 78%

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52   Deloitte 'Beyond products: Paving the way to Everything-as-a-Service'; McKinsey 'Subscription myth busters: What it takes to shift to a recurring-revenue model for hardware and software'

53   Available spending review bids data covers up to 40% of total spend

54   Gartner IT key metrics data, National & International Government, December 2023

55   NAO 'Digital transformation in government: A guide for senior leaders and audit and risk committees', February 2024

> ❝ **Challenges exist around the evolution of IT to a more revenue-based funding requirement – which doesn't match up to the existing capital model. Lack of revenue funding limits our ability to modernise.**
>
> **Senior leader, county council**

> ❝ **The funding approval model needs to become more agile and reflect a higher ongoing cost.**
>
> **Senior leader, public agency**

Existing governance and controls processes are not suited to digital programmes

Spending reviews typically have a one to three year outlook and HM Treasury also typically considers a five year scorecard period. Recent changes have standardised spending reviews to occur every two years. As a result, funding decisions typically prioritise programmes with short-term, predictable returns, often at the expense of longer-term resilience and security. The current interpretation and application of HM Treasury guidance fails to adequately account for the risks of underfunded legacy systems and the potential long-term productivity gains from investments in data and emerging technologies such as AI.

Many organisations find the funding governance process overly complex, time-consuming, and ineffective for digital and data initiatives. The application of existing Green Book processes drives up the costs of developing business cases as well as the time taken to secure approval. This can make initial assumptions irrelevant by the time projects are delivered, given the rapid pace of technological change. The cost of complex processes is especially disproportionate for low risk, low value business cases: for example, a business case to renew Microsoft licences which cost £500,000 and processes requiring a £90 licence approval to be submitted to the digital and technology assurance board.

Funding is typically allocated to fixed multi-year business cases instead of persistent outcome-based funding which allows for agile, test-and-learn approaches. Leaders are required to outline full costing and requirements for digital and data programmes to secure approval. This introduces challenges in accurately estimating and incorporating all life cycle costs early in the process given the need for upfront discovery, pilots and proof of concepts more typical of digital delivery. This is particularly true for more innovative projects, such as the introduction of AI, which have lower levels of certainty and limited prior examples.

The lack of flexibility in the funding model can lead to challenges when programmes encounter unforeseen issues. For example, the Emergency Services Mobile Communication Programme lost their key supplier mid-way through the programme. As a result the funding was lost and a new business case was required, even though the case for the programme had already been made.

> **The approach to funding does not work for digital services. It makes decisions too strongly too early and does not promote the iterative funding required for modern services.**
>
> Senior leader, large central government department

> **We need the ability to be able to fail fast, how do we agree simple variations or changes? How do we have adaptability that doesn't cause us going back to the start?**
>
> Senior leader, public agency

Root causes

This review has identified five fundamental root causes of the current state of digital government:

1. Leadership

There is little reward for prioritising an agenda of service digitisation, reliability, or risk mitigation. Organisational leaders are not paid, promoted, or valued for doing so. Digital does not shape and drive the organisational agenda.

2. Structure

Fragmentation is a feature of the system. Public sector organisations are independent bodies with limited mechanisms to contract services from each other. Most choose to build and maintain their own technology estate, inhibiting standardisation, interoperability and reuse, and constraining the ability to benefit from scale. Architectural design, product management, operations, and development are inconsistent between organisations. The public is presented with fragmented services and expected to make sense of them.

3. Measurement

The public sector does not have consistent metrics of digital performance. Aggregate data about service quality, user experience, cost and risk exposure is not available without dedicated, periodic effort such as the production of this report.

4. Talent

Compensation and career path progression are uncompetitive with the private sector, especially for senior leaders. A lack of integrated cross-government workforce strategy limits recognition of specialist skill needs and prevents realisation of efficiencies longer term. Headcount restrictions intended to constrain spend have shifted cost and talent to third-party contractors, managed services and IT consultants, also degrading institutional knowledge.

5. Funding

Spend is biased towards new programmes with insufficient prioritisation of the effective operation and maintenance of existing systems, especially legacy assets. New or urgent legislation often comes without additional funding, forcing re-prioritisation of previously allocated budgets. This presents an acute challenge for digital and data projects as funding has shifted from capital purchase towards subscription-based, increasing the reliance on committed ongoing funding.

Conclusion

Digital is one of the most powerful forces for public service reform, and when it is successful, it changes lives and the public experience of government.

Examples abound across the sector: in central government, where GOV.UK replacing over 1,800 separate websites; in local government, with Hillingdon Council harnessed AI to provide residents with 24/7 contact while saving £5 for every £1 spent; and in health, where Cambridge NHS Trust introduced 'virtual wards' to treat patients in their homes, and save over 1,000 bed days of hospital capacity each month.

Those surveyed for this report shared the sense of mission they felt from working on critical issues that make a difference. The commitment and tenacity of the public sector digital workforce, with the support of the contractors, consultants, and managed services providers that carry a lot of the load, is tangible.

However, our approaches to leadership, structure, measurement, talent and funding do not yet do justice to this potential: it is time to transform and reform the way we do digital.

Annex 1

Public sector organisations which engaged with our call for input

Active Travel England

Advisory Conciliation and Arbitration Service

Animal and Plant Health Agency

Barnsley Metropolitan Borough Council

Bracknell Forest Council

Brentwood Borough Council

British Transport Police Authority

Cabinet Office

Cambridgeshire County Council

Cambridge University Hospitals NHS Foundation Trust

Central Bedfordshire Council

Centre for Environment Fisheries and Aquaculture Science

Cheltenham Borough Council

Cheshire Constabulary

Citizens Advice

City of Bradford Metropolitan District Council

Companies House

Cornwall Council

Coventry City Council

Crown Commercial Service

Crown Prosecution Services

Cumberland Council

Cumbria Constabulary

Defence Digital (MOD)

Department for Business and Trade

Department for Digital Culture, Media and Sport

Department for Education

Department for Energy Security and Net Zero

Department for Environment Food and Rural Affairs

Department for Science Innovation and Technology

Department for Transport

Department for Work and Pensions

Department of Health and Social Care

Derbyshire Constabulary

Disclosure and Barring Service

Dorset Council

Driver and Vehicle Licensing Agency

Driver and Vehicle Standards Agency

Dyfed Powys Police

East Devon District Council

East Riding of Yorkshire Council

Enfield Council

Environment Agency

Essex County Council

Forestry England

Gangmasters and Labour Abuse Authority

Government Actuary's Department

Government Internal Audit Agency

Government Security Group

Government Legal Department

Greater London Authority

Greater Manchester Combined Authority

Greater Manchester Police

Hartlepool Borough Council

HM Courts and Tribunal Service

HM Land Registry

HM Revenue and Customs

HM Treasury

Home Office

Humberside Police

Independent Office for Police Conduct

Integrated Corporate Services (ICS)

Kirklees Council

Leeds City Council

Leicestershire Constabulary

Local Government Association

London Borough of Barnet

London Borough of Camden

London Borough of Hammersmith and Fulham

London Borough of Haringey

London Borough of Hillingdon

London Borough of Hounslow

London Borough of Islington

London Borough of Waltham Forest

London Fire Brigade

Luton Borough Council

Manchester City Council

Marine Management Organisation

Maritime and Coastguard Agency

Medicines and Healthcare Products Regulatory Agency

Metropolitan Police

Mid Suffolk District Council

Ministry of Defence

Ministry of Housing, Communities, and Local Government

Ministry of Justice

Money and Pensions Service

National Cyber Security Centre

National Institute for Health and Care Excellence

National Savings and Investments

NHS Blood and Transplant

NHS Business Services Authority

NHS England

NHS Resolution

Norfolk County Council

North East Lincolnshire Council

North Hertfordshire District Council

North Yorkshire Council

North Yorkshire Police

Northamptonshire Healthcare NHS Foundation Trust

Nottinghamshire County Council

Office for National Statistics

Office of Qualifications and Examinations Regulation

Pensions Ombudsman

Planning Inspectorate

Plymouth City Council

Redcar and Cleveland Council

Royal Borough of Greenwich

Royal Borough of Kingston upon Thames

Salford City Council

Security Industry Authority

Somerset Council

Southend City Council

St Helens Council

Stevenage Borough Council

Strategic Command (MOD)

Suffolk County Council

Sunderland City Council

Thames Valley Police

The Competition and Markets Authority

The Insolvency Service

The Law Commission

The National Archives

Transport for London

UK Export Finance

UK Health Security Agency

UK Infrastructure Bank Limited

Uttlesford District Council

Wealden District Council

West Midlands Police

West Yorkshire Police

Westminster City Council

Wiltshire Council

Wiltshire Police

Wokingham Borough Council

Worthing Borough Council