



National Audit Office




REPORT

# Digital transformation in government: addressing the barriers to efficiency

Cabinet Office

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HC 1171



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National Audit Office

# Digital transformation in government: addressing the barriers to efficiency

**Cabinet Office**

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## **Report by the Comptroller and Auditor General**

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**Gareth Davies**  
**Comptroller and Auditor General**  
**National Audit Office**

**3 March 2023**

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## Key facts

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**£456bn**

estimate of day-to-day operational costs of central government public services, grants and administration in 2020-21

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**£8bn**

HM Treasury's 2021 Spending Review commitment to invest in digital, data and technology transformation by 2025

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**37%**

proportion of government digital, data and technology recruitment campaigns that are unsuccessful

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- 4%** of civil servants that are digital professionals, compared with between 8% and 12% industry average
- 11** cross-government digital strategies launched over the past 25 years, all seeking to address usability, efficiency and legacy systems
- 1974** year of introduction of the Police National Computer, the main database of criminal records still in use by all front-line police forces
- 20%** reduction in digital, data and technology apprenticeships from 800 in October 2021 to 637 in December 2022
- 7%** increase in government digital, data and technology vacancies from 3,900 in April 2022 to 4,100 in October 2022

# Summary

## Introduction

- 1** One of government's main challenges is achieving efficiency savings. The civil service employs over half a million people in the UK and runs diverse operations and services, from collecting taxes and processing benefits claims to granting a rod fishing licence. In 2020-21, central government departments expected to spend £456 billion on the day-to-day running costs of public services, grants and administration.
- 2** Digital transformation and modernisation of its services and data are instrumental in achieving efficiencies, with huge gains to be achieved if all government services were modernised. However, there are many challenges, and these will take many years to overcome.
- 3** Government's existing operational landscape is complex. It has evolved over time as new service developments have been built on top of what already exists. Across government, outdated IT systems and its ageing data are a key source of inefficiency and create a major constraint to improving and modernising government services. Many of these ageing systems were built several decades ago and are commonly referred to as 'legacy' systems (**Figure 1** overleaf). Their limitations and poor-quality data increase the cost of services.
- 4** Tackling legacy services is costly and complex but continuing to use them is risky and commits government to even higher future costs and risks. Failure to modernise legacy systems exposes organisations to possible service disruption, operational failure and cyber-attacks. The increasing costs of maintaining legacy systems and loss of associated specialist skills is unsustainable in the long term.
- 5** Government lacks data on the hidden costs in its existing services. Many of these costs arise from the unknown numbers of people and processes needed to support older services and make them work in the way government wants them to. These hidden costs include those arising from:
  - additional business processes, often manual, to compensate for missing functionality in the legacy systems;
  - increased complexity caused by additional interfaces with other systems; and
  - costs associated with third-party agreements for support services.

**Figure 1**

## Examples of legacy systems in government

The government continues to rely on legacy systems to perform critical functions

Department and system	Purpose	Year of introduction
<b>Department for Work &amp; Pensions</b>		
Pension Services Computer System (PSCS)	Manages records of people in receipt of state pension and/or pension credit. Annual state pension payments around £104 billion and pension credit around £5 billion	1988
<b>Home Office</b>		
Police National Computer (PNC)	Main database of criminal records used by all front-line police forces; around 150 million searches and updates carried out annually	1974
Warnings Index	Stores and presents watchlist information for Border Force staff to check people arriving in the UK	1994
<b>Driver and Vehicle Licensing Agency</b>		
Drivers 90 (D90)	Holds records of all drivers	1990

**Note**

1 Government defines systems as being legacy if out of support, not cost-effective, hard to maintain, above an acceptable risk threshold or an end-of-life product.

Source: National Audit Office analysis of published reports

**6** Government's 11 digital strategies launched over the past 25 years, all seeking to address usability, efficiency and legacy systems, show that digital transformation is a difficult and complex undertaking. Previous attempts have often prioritised developing the citizen-facing elements of a service over tackling the more complex underlying issues posed by legacy systems and poor data quality. The government's own analysis in 2022 found simple online citizen transactions have been prioritised for transformation and more complicated services have been left behind. In developing digital 'front-ends', changes to legacy systems and processes that could reduce costs are often overlooked.<sup>1</sup>

**7** Our work over the past decade has shown that, across government, attempts at digital transformation have had little lasting success. Government cannot achieve real transformation without reshaping the business of government and understanding the challenges presented by legacy systems and data. Transformation is not simply implementing new systems and software. Government must modernise its existing ageing systems and their associated business processes to make significant and sustainable reductions in overall running costs.

1 The 'front-end' is the part of a system that the user interacts with directly.



**8** In our 2021 report, *The challenges in implementing digital change*, we identified challenges that government must address before starting major digital programmes.<sup>2</sup> This report highlighted serious issues and constraints around government's data and services and its efforts to improve them, which are poorly conceived owing to business leaders' lack of digital capability. Digital leaders in government have a good understanding of the challenges the government faces and bring much needed expertise to the public sector. However, they often struggle to get the attention, understanding and support needed from senior decision-makers.

**9** The technology community in government is often expected to drive transformation on behalf of business leaders. However, most digital change decisions are made by the business leaders – such as permanent secretaries, chief executives, chief operating officers and directors general. They make decisions on digital matters such as funding and investment, the scope of programmes and how procurement should be undertaken. The success of these decisions is dependent on these leaders having the digital fluency to make the best choices and fully understand the consequences of their decisions for digital transformation.

**10** Government accepts that, although there have been some technological improvements, its previous attempts at large-scale digital change have had little success and is now trying to address the underlying problems. In January 2021, the Cabinet Office created the Central Digital & Data Office (CDDO) to lead the digital, data and technology function across government. In June 2022, CDDO published *Transforming for a digital future: 2022 to 2025 roadmap for digital and data* (which we refer to as 'the Roadmap') which seeks to address some of the underlying digital problems, including those highlighted in our report.<sup>3</sup> The Roadmap is not intended as a programme. Instead, it sets out activities to address root causes, establish key data about services and make progress towards government's long-term ambition for a "transformed, more efficient digital government". Departments are at different levels of maturity and, in some cases, the Roadmap builds on activities which were already planned or under way. Departments are to undertake the activities set out in the Roadmap within the current Spending Review period and CDDO has deliberately designed them to be realistic given the starting point, resources and timeframe.

<sup>2</sup> Comptroller and Auditor General, *The challenges in implementing digital change*, Session 2021-22, HC 515, National Audit Office, July 2021.

<sup>3</sup> Central Digital & Data Office, *Transforming for a digital future: 2022 to 2025 roadmap for digital and data*, June 2022 (available at: [www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025](http://www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025), link accessed 3 March 2023).

## Scope of this report

**11** This report evaluates government's approach to addressing the underlying issues of why past attempts at digital transformation have run into problems. We focus on the approach to transforming government, how CDDO, its Roadmap and departmental leaders will support and promote this, and whether senior business leaders across government have a suitable level of digital capability.

**12** The report is in three parts:

- **Part One** sets out the current landscape, drivers for change and government's new approach;
- **Part Two** examines how government is undertaking its new approach; and
- **Part Three** assesses how the Roadmap is addressing key challenges to digital transformation.

## Key findings

Government is renewing its attempts to create digital change

**13 Government has created a stronger central function to lead digital transformation.** The Digital Economy Council's report *Organising for Digital Delivery* in September 2020 recommended a separate, smaller but more capable central function be established and the Government Digital Service (GDS), which previously led on digital transformation, be refocused as a product delivery organisation.<sup>4</sup> In response, Cabinet Office created the CDDO in January 2021 to lead the digital, data and technology function across government. CDDO's Chief Executive reports directly to the civil service Chief Operating Officer who is also Permanent Secretary of the Cabinet Office (paragraphs 1.11 to 1.13).

**14 CDDO has taken a new approach to digital change to address previous systemic failings across government.** We welcome CDDO's efforts to work more collaboratively with departments to identify problem areas that need to be tackled to create, test and refine a set of realistic commitments. Chief digital and information officers said they also welcome this new approach and believe this central support is helping to create conditions for change in their departments (paragraph 2.4).

<sup>4</sup> Cabinet Office, *Organising for digital delivery – Report from the Digital Economy Council*, September 2020 (available at: [www.gov.uk/government/publications/organising-for-digital-delivery](http://www.gov.uk/government/publications/organising-for-digital-delivery), link accessed 3 March 2023).

**15 CDDO has been realistic about what can be achieved based on an understanding of the scale of the challenge.** The Roadmap sets out activities and commitments grouped into six ‘missions’ to be started within the current Spending Review period. Addressing systemic issues in government is complex and takes time. Four of the six missions involve detailed data-gathering from departments, to provide an in-depth analysis of the scale of the task and the resources required before implementation activities begin. The Roadmap’s activities all have completion dates in this Spending Review period. However, improvement and reform is a long process, and will continue into the next Spending Review period (paragraph 2.5).

**16 CDDO worked with HM Treasury to secure £8 billion for investment in digital change over the period 2022-23 to 2024-25.** CDDO provided training and advice for HM Treasury officials, developed a framework for assessing the scale of legacy issues in departments, and reviewed departments’ Spending Review bids. Of the £8 billion, £2.7 billion is for departments to invest in cyber and legacy IT across government.<sup>5</sup> CDDO has funding to deliver the Roadmap’s central elements. Departments took account of their own funding when determining what they could commit to within the timeframe of the Roadmap. Initial proposals were refined with departments to balance ambition against feasibility and gain a strong commitment to delivery from departments. However, there is no additional funding for inflationary pressures. Departments must absorb this within existing budgets and funding for the missions within the Roadmap will therefore have to compete against other departmental priorities (paragraph 2.2).

### Leading the Roadmap

**17 CDDO has led the development of the Roadmap but is dependent on departments’ business leaders to deliver the Roadmap’s missions.** As a relatively small central specialist function, CDDO cannot deliver on behalf of departments and so the success of the Roadmap depends on the engagement of senior departmental officials who have the required authority. To mitigate this, CDDO has involved departments in the Roadmap’s development and setting of commitments from the outset. The Digital, Data and Technology Functional Leadership Group (DDaT FLG), which comprises directors general or equivalent with accountability for the digital function in departments and key arm’s-length bodies, steered the direction of the Roadmap, and it was signed off at permanent secretary and ministerial level. Each of the Roadmap’s six missions has a senior departmental sponsor at permanent secretary level, to encourage involvement from across the business (paragraphs 2.6, 2.9, 2.11 and 2.12).

<sup>5</sup> The government announced it is investing £2.6 billion in cyber and legacy IT over the 2021 Spending Review period in the Autumn 2021 Budget. The actual figure was £2,661 million.

**18 CDDO has created a board of permanent secretaries to support digital engagement and leadership.** The Digital and Data Board was established in July 2021 as a formal sub-board of the Civil Service Board to provide senior leadership, business ownership and steering for government's digital transformation aspirations. It is jointly chaired by the CDDO Chair and the Permanent Secretary of HM Revenue & Customs. It monitors and assesses the health of government's major digital and data programmes to improve public services. It agrees and enforces cross-government digital and technology standards and identifies areas for capability improvement (paragraphs 2.6, 2.7 and 2.12).

**19 CDDO has established several mechanisms for monitoring progress towards the Roadmap's objectives.** CDDO holds quarterly business reviews with all departments to agree performance targets and discuss progress towards the Roadmap commitments. The DDaT FLG regularly reviews progress against agreed metrics and reports progress to the Digital and Data Board twice annually so momentum is maintained. CDDO expects the reporting arrangements to evolve as the scale of the task becomes clearer (paragraphs 2.13 to 2.15).

Progress on the Roadmap missions

**20 CDDO reported to the Digital and Data Board in December 2022 that early milestones had been met but that existing risks have become more acute.** CDDO tracks progress on the six missions using aggregated data from the quarterly business reviews and performance data against agreed metrics (**Figure 2** on pages 11 and 12). It reports progress against key internal milestones to the Digital and Data Board. All those due by December 2022 were reported as achieved. CDDO has identified two significant risks to further progress. First, the existing skills gap is getting worse and CDDO is concerned that digital teams in departments will not have the skills and expertise necessary to implement the Roadmap. Second, service transformation requires the support of senior leaders beyond the digital function and there is a high risk that this support will not be sustained without continued and proactive involvement from permanent secretaries in departments (paragraph 2.17).

**Figure 2**

## The six missions of the Central Digital &amp; Data Office (CDDO) Roadmap

We have identified several systemic challenges and risks

Mission number, name and aim	Systemic challenges to be addressed	Current activities	Risks we identify
<b>One – Transformed public services</b>			
Digital services should be efficient and help people access the services they need	Every service has a different starting point for improvement and to establish robust baselines, data not previously collected or quantified is needed. Services are entrenched into existing organisational structures which need to change to give end-to-end service ownership.	Detailed templates have been developed for baselining services and analysis of the first 15 services has been completed.	Departments need to collect data across digital, operations and other areas for a complete view. This is onerous for some services and may not be given the necessary priority. Funding to complete the activities could be at risk from competing budgetary pressures.
<b>Two – GOV.UK One Login</b>			
Make it easy and secure for people to prove who they are and log in to government services	The GOV.UK One Login programme is working to overcome the issues that beset GOV.UK Verify, mainly its inability to work for all its intended users. It is collaborating with departments to understand the full range of user needs while balancing security and privacy concerns.	A core element of the system is operational. The first few government services are now live, with more scheduled for 2023.	Agreement in principle must result in continued implementation and departments may not prioritise integrating the One Login service into their existing services.
<b>Three – Better data to power decision-making</b>			
Make it easier to share and use data consistently across government	Technical and cultural barriers need to be overcome, including data quality and accessibility where information is held in siloed legacy systems.	Underpinning frameworks and definitions are being agreed.	This is a complex area with no shortcuts and competing priorities. There is a risk momentum may not be sustained due to the intrinsic difficulty of the task.
<b>Four – Efficient, secure and sustainable technology</b>			
Government should use modern technology that runs more efficiently and at lower cost	The extent of legacy systems across government is huge and departments are finding defining and identifying them a challenge. Historic neglect and lack of asset management and maintenance has added to the difficulty.	A framework developed for legacy system assessments in departments has been piloted and is being rolled out.	Knowledge of some vulnerable systems resides mostly with suppliers and will need significant investigation. Departments may not prioritise this activity due to the resources required.

**Figure 2** *continued*

The six missions of the Central Digital &amp; Data Office (CDDO) Roadmap

Mission number, name and aim	Systemic challenges to be addressed	Current activities	Risks we identify
<b>Five – Digital skills at scale</b>			
Government should have the right skills for the digital future	The success of transformation depends on equipping senior business leaders to make informed decisions and acquiring and keeping enough skilled specialists on board.	A range of training has been developed for digital, data and technology professionals and for the senior civil service.	There may be insufficient levers for gaining the attention and participation of very senior non-digital leaders and to embed this further down their organisations. Uptake of training so far is slow.
<b>Six – A system that unlocks digital transformation</b>			
Put the right funding and delivery models in place	This mission is about getting the government finance, commercial and policy professions to understand the need to improve the way funding and delivery models are working in departments for digital change programmes.	CDDO is working with HM Treasury to reassess the way funding arrangements work for digital business-as-usual and change.	There are different legitimate perspectives which must be reconciled in how current procedures and practices are interpreted.

Source: Central Digital & Data Office, *Transforming for a digital future: 2022-2025 roadmap for digital and data*, June 2022. National Audit Office analysis of Central Digital & Data Office quarterly reporting

**Mission one: transformed public services that achieve the right outcomes**

**21 CDDO has identified departments' existing operational structures as an impediment to achieving greater efficiencies.** Government's objective is to move at least 50 of the government's top 75 services to a 'great' standard.<sup>6</sup> To reach this standard, services must minimise unnecessary time, effort, and cost for both users and the departments providing them. Initial analysis by CDDO suggests that only 10% of services have reached this standard. CDDO told us that, by April 2023, it expects to have established key data for each of these services. Data on this has not been gathered previously, partly because there is often no end-to-end ownership of services: different people are responsible for the online front-end and back-office legacy processes. This is a major barrier to redesigning services (paragraphs 3.3 to 3.7).

6 'Great' is defined in terms of usability and efficiency. The top 75 services are listed in the Annex to the Roadmap itself.

**Mission two: One Login for government****22 The GOV.UK One Login programme is making steady progress but is yet to face the more difficult implementation challenges that have hampered previous attempts.**

It is challenging to join a new front-end authentication and identity verification system with multiple legacy citizen-facing services to make a seamless customer journey, as One Login's predecessor, GOV.UK Verify, demonstrated. Several departments, including the Department for Work & Pensions and HM Revenue & Customs, run their own verification systems to meet their specific needs. GDS intends to replace these with One Login's single entry point for users to prove and reuse their identity when accessing government services. Continued close collaboration and commitment between GDS and departments will be required (paragraphs 3.8 to 3.11).

**Mission three: better data to power decision-making****23 There are significant quality issues in operational data that hinder transformation within departments and sharing data between them.**

This mission focuses on how data can be used and shared more effectively across government. Most work has been on developing frameworks and definitions and other data initiatives, which are intended to be brought into use from 2023-24. CDDO will use the Government Data Maturity Assessment to provide a universal assessment of government's data management maturity. This will enable future benchmarking work and help departments better understand their data challenges and opportunities, and effectively plan targeted improvements. It is currently being trialled with 11 organisations and CDDO's aim is for all departments to be using it by March 2024. By 2025, CDDO is expecting to standardise the way key facts and data about critical datasets are captured to enable shared use (paragraphs 3.12 to 3.15).

**24 Despite some early steps to improve government's data, CDDO acknowledges significant technical and cultural barriers remain.**

CDDO raised a risk to the Digital and Data Board in December 2022 that sustained effort may fail to overcome the barriers to standardising definitions and sharing critical data assets. Government is starting from a low base given the condition of its existing data, and the scale of the task is huge (paragraph 3.16).

**Mission four: secure, efficient and sustainable technology****25 CDDO has developed a framework to assess legacy system risks across government, which departments have started using.**

Departments have insufficient information on their legacy services. Departments have also told us that it is easier to bid for capital funding for new developments than resource funding to maintain existing services and keep them up to date. CDDO has worked with six major departments to identify and map legacy systems and assess the risks they pose. The framework is being applied by other departments. It is an important opportunity to assess the operational costs, vulnerabilities and risks of continuing to use outdated legacy systems, prioritise their replacement, and support departments in making the case for continued investment in addressing legacy issues (paragraphs 3.17 to 3.21).

### **Mission five: digital skills at scale**

**26 Progress in improving the digital capability of senior decision-makers in government has been limited.** Only a small proportion of senior decision-makers in government have first-hand experience of digital business. Senior digital leaders in departments struggle to communicate their messages effectively because their wider leadership teams lack sufficient knowledge of digital issues. The current training and development for business leaders does not explicitly cover digital leadership in a legacy environment and more is needed to improve senior civil servants' digital capability. To date, only around 200 non-specialist executives have received digital awareness training against the target of 6,500 set in the Roadmap. More significantly, many of this group do not have the digital leadership skills to make informed decisions on digital issues. Since the Roadmap was published, CDDO has asked the Digital and Data Board to promote digital training for all senior civil servants in 2023-24. If government is serious about digital capability-building for senior business leaders, it needs to devote appropriate priority and focus (paragraphs 3.22 to 3.24).

**27 The activities set out in the Roadmap do not fully address the reality that government cannot easily fill its digital vacancies and skills gaps.** The scope of the Roadmap assumes that departments can strengthen their offer to existing and prospective digital recruits and reduce the average time taken to hire them. Government already has a specialist skills deficit and CDDO estimates that only 4% of civil servants are digital professionals, compared with an industry average of between 8% and 12%. There is a major digital skills shortage in the UK and skilled digital professionals command a premium in the market, making it hard for departments to recruit. CDDO reports that 37% of government recruitment campaigns have been unsuccessful. The number of government digital, data and technology vacancies rose by 7% from 3,900 in April 2022 to 4,100 in October 2022. The number of digital, data and technology apprentices has dropped 20% from 800 in October 2021 to 637 in December 2022 (paragraphs 3.25 to 3.27).



### **Mission six: a system that unlocks digital transformation**

**28 Progress on central reforms will depend on significant leadership to gain the support of other government professions, including policy, finance, commercial and the Infrastructure and Projects Authority (IPA).** This mission aims to ensure funding and guidelines from Cabinet Office functions work well for digital programmes. CDDO has an overall milestone that the barriers will be addressed by 2025. However, it recognises this is dependent on other parts of government, such as HM Treasury and the IPA. Digital change involves levels of complexity, uncertainty and risk which are often unique to each specific programme due to legacy systems, existing ways of operation and the difficulties of integrating something new. These differences must be reflected in business cases, funding and approvals processes, procurement of technology, audit and project review assurance and policy development. These reforms are very important to the success of the other missions. However planned progress is slow as the success of this mission is as much about influencing, tone and approach and a willingness for the other central functions to engage as it is about what CDDO does. CDDO recognises there is significant work to do and, given the complexity of the challenges, the National Audit Office is concerned that CDDO has insufficient resources to deliver this mission (paragraphs 3.28 and 3.29).

### **Conclusion**

**29** Government has established CDDO to provide fresh impetus to the digital transformation needed across government. CDDO has created its Roadmap as a framework to start addressing key systemic issues and encourage departments to take more urgent action to understand what will be required. Departments attempting to transform operational services and the associated legacy and data issues will be a major step in addressing the existing inefficiencies. CDDO has also created stronger levers for delivery, with permanent secretary-level sponsors and boards, compared with previous digital strategies.

**30** CDDO is laying good foundations but many of the critical and more challenging milestones lie in the future. CDDO's small budget and headcount are already affecting the intended reforms to government central functions' treatment of digital programmes. In addition, departments are finding that, in current market conditions, they cannot acquire sufficient digital skills and expertise in their teams. It is therefore too early to say if the aims of the Roadmap can be achieved. Many business leaders do not yet have the expertise required to comprehend and tackle the challenges the civil service faces in a digital age. Stronger digital expertise and capacity-building, sustained support from the centre of government and the continued goodwill of department senior business leaders are needed to maintain momentum. Without these, the Roadmap will peter out as its predecessors have done and government is unlikely to address the systemic issues and achieve the efficiencies the Roadmap has identified.

## Recommendations

**31** CDDO should:

- a** continue to enlist proactive engagement and involvement from permanent secretaries in securing the support of senior leaders beyond the digital function;
- b** increase its capability-building through formal training and mentoring support to help senior non-specialist business leaders develop their understanding of government's operating environment and the constraints posed by legacy data and systems;
- c** continue to push for central reforms in the way digital change is justified, funded and procured and work with policymakers, who often do not have the digital skills to understand how digital services work, to improve policy-making in this area;
- d** work with HM Treasury to address the balance between capital and resource in departments' spending requirements;
- e** review what departments can realistically achieve in terms of closing their skills gaps and keep the scope of Roadmap activities under continuous review to ensure it matches available resources, accepting that prioritisation may be necessary.

**32** Departments should:

- f** appoint at least one non-executive director with digital, data and technology expertise;
- g** ensure that membership of their most senior decision-making board includes at least one senior digital leader;
- h** appoint senior service owners for all major services with accountability for the full end-to-end service, decision-making authority to deliver all aspects and responsibility for developing, operating and continually improving the service;
- i** establish an approach to stop new services being built on the existing costly and inefficient legacy foundations.

# Part One

## Background and development of the Roadmap

**1.1** In this part we explain the background to and development of the government's Roadmap to transform government digital services. We set out the current landscape, drivers for change and how government's new approach is addressing the factors which have caused previous transformation attempts to falter.

### Why change is needed

**1.2** Government runs a vast number of services and operations for citizens and businesses. Many rely on systems and data which have remained fundamentally unreformed for years. They are costly and complex and continuing to use them is risky. Incremental changes over time mean these services consume disproportionate staff resources.

**1.3** Historically, government's attempts at improving these services have largely built automation on top of what already exists, reusing poor-quality and ageing data. This approach has not addressed the underlying causes of inefficiency caused by continuing to use systems designed and built for a previous business era, many of which still rely on obsolete paper-based processes. Digital transformation of services and operations is central to achieving efficiencies through reducing headcount and cost (**Figure 3** overleaf).

**1.4** Our 2021 publication *Improving government data: a guide for senior leaders* highlighted that around 70% of civil servants are employed in operational roles.<sup>7</sup> In 2012, the government's *Digital Efficiency Report* identified potential annual savings to government and service users from streamlining operations of between £1.7 billion and £1.8 billion.<sup>8</sup>

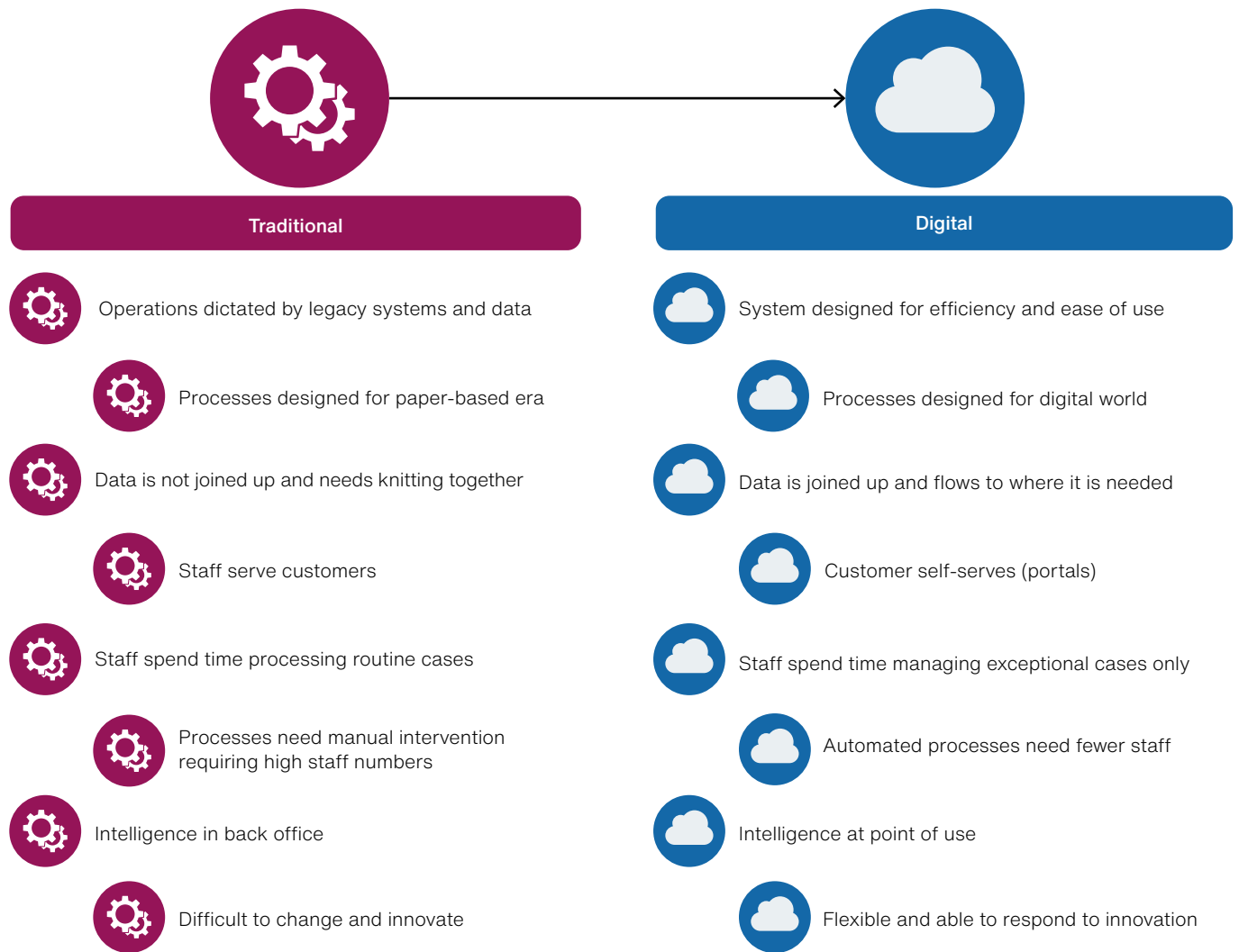
<sup>7</sup> National Audit Office, *Improving government data: A guide for senior leaders*, July 2022.

<sup>8</sup> Cabinet Office, *Digital Efficiency Report*, November 2012 (available at [www.gov.uk/government/publications/digital-efficiency-report](http://www.gov.uk/government/publications/digital-efficiency-report), link accessed 3 March 2023).

### Figure 3

#### The journey from a traditional to a digital service

Changing an established service to a digital service is far more complex than building a digital service from scratch



**Note**

1 The journey from left to right is not a linear one and is full of challenges for large existing organisations like government departments compared to newer start-ups like Amazon.

Source: National Audit Office analysis

**1.5** Government has poor data on the full costs of its existing services. It estimated that nearly half of all technology expenditure across government in 2019 was dedicated to “keeping the lights on activity on outdated legacy systems”. This does not include the full extent of hidden costs arising from the people and processes needed to make services work, or when poor decisions are made owing to a lack of data. We examined the Department for the Environment, Food & Rural Affairs’ (Defra’s) legacy system issues in our 2022 report, *Modernising ageing digital services*.<sup>9</sup> We recommended that Defra should develop a better understanding of the additional business and people costs of the continued use of unmodernised digital services, to help inform investment priorities.

**1.6** Digital transformation is not simply improving technology. The government must fundamentally rethink business operating models and processes from first principles rather than making small incremental changes to ways of working. This will require identifying and overcoming the barriers to transformation that have hindered previous attempts. We believe government does not yet fully understand the depth of change required for this.

**1.7** In 2020, 20 of our value for money reports and 21% of our total recommendations related to problems with government’s operational management capability. We found a lack of clarity around how services flow from end to end for their users in more than 80% of the organisations we visited. Our assessment of government’s operational management capability showed low levels of maturity (**Figure 4** overleaf), suggesting that government lacks an understanding of why an end-to-end view is necessary.

**1.8** The National Audit Office’s work over the past decade has shown that, although there have been some technological improvements, government’s attempts at digital transformation of services at scale have had limited success. In our 2021 report, *The challenges in implementing digital change*, we identified and reviewed 11 government strategies launched over the past 25 years, all seeking to address usability, efficiency and legacy systems.<sup>10</sup> The recurrence of common themes across them reflects successive governments’ lack of progress over that time despite well-intentioned aims. The government’s own analysis in 2022 found simple online citizen transactions have been prioritised for transformation, and more complicated services have been left behind. In developing digital front-ends, changes to legacy systems and processes that could reduce costs are often overlooked.

9 Comptroller and Auditor General, *Modernising ageing digital services*, Session 2022-23, HC 948, National Audit Office, December 2022.

10 Comptroller and Auditor General, *The challenges in implementing digital change*, Session 2021-22, HC 515, National Audit Office, July 2021.

**Figure 4**

Government’s operational management capability

Our aggregate assessments of organisations and services over a 10-year period show low levels of operational management maturity



Strategy
 Information
 People
 Process
 Improvement

- **Full maturity**  
 Good evidence against all criteria. Full maturity equals world-class operational management as detailed in each of the five areas
- **Partial maturity and improving**  
 Good evidence against a range of maturity criteria, and assurance that the organisation’s past and current activity is likely to move the organisation towards full maturity
- **Partial maturity**  
 Good evidence against a range of maturity criteria
- **No evidence of maturity**  
 Limited evidence against the maturity criteria for the question

**Notes**

- 1 We completed 40 assessments of operational management maturity in organisations between 2005 and 2015, including 115 assessments of individual services since 2010, judging the maturity of organisations or services against 40 questions.
- 2 The questions cover five interrelated areas of operational management: Strategy (using strategy to define and inform operational activity); Information (using information to manage and improve process performance); People (helping people manage and improve process performance); Process (ensuring the end-to-end process has the capacity and capability to meet demand); and Improvement (using continuous improvement to target areas of most benefit).
- 3 The table above builds on our 2015 publication ‘Managing business operations - what government needs to get right’, updating the analysis to include assessments through to 2020.

Source: National Audit Office, *Improving operational delivery in government: A good practice guide for senior leaders*, March 2021. Available at: [www.nao.org.uk/insights/improving-operational-delivery-in-government](http://www.nao.org.uk/insights/improving-operational-delivery-in-government)

## Why past attempts at digital transformation have faltered

**1.9** Digital transformation is difficult and complex. In our 2021 report, we examined the barriers to successfully implementing digital change and identified lessons government needed to learn before embarking on major digital programmes. We highlighted how those responsible for large-scale programmes must first understand the complexities presented by the existing environment and then establish the appropriate scale of ambition and the right conditions for successful delivery. Changing established and complex operational practices is difficult and requires the right skills, experience and cultural conditions.

**1.10** Previous attempts at digitalisation have frequently fallen short of true digital transformation. The government's digital exemplar programme, which ran from 2013 to 2015, aimed to show how new approaches could make it easier to access services online and remove unnecessary costs. However, in our 2017 report *Digital transformation in government*, we found only 15 of the 25 services selected were completed during the programme. In 10 cases, the costs of development outweighed the benefits.<sup>11</sup>

**1.11** In 2011, government established the Government Digital Service (GDS) with a remit to raise the profile of the digital, data and technology function across government, improve how departments deliver digital services and make interactions between the citizen and government 'digital by default'.

**1.12** In September 2020, the Digital Economy Council, a non-statutory advisory committee council of independent members set up to provide advice to the government, advised that GDS had gone through several different incarnations in its then nine-year history. As a result, there was confusion over its function, and it had "to some extent lost its way". The report recommended re-focusing and "adding teeth" to the centre of government's digital function.

**1.13** In response, the Cabinet Office created the Central Digital & Data Office (CDDO) in January 2021 as a stronger central function with a brief to lead on digital, data and technology across government. GDS was scaled back and refocused as a product delivery organisation. CDDO is now expected to play a key role in leading the major transformation required to improve digital operations and services in collaboration with departments. CDDO's Chief Executive reports directly to the civil service Chief Operating Officer who is also Permanent Secretary of the Cabinet Office.

<sup>11</sup> Comptroller and Auditor General, *Digital transformation in government*, Session 2016-17, HC 1059, National Audit Office, March 2017.

## The new digital Roadmap

**1.14** In June 2022, CDDO set out the government’s latest approach to improve the conditions for digital transformation in *Transforming for a digital future: 2022 to 2025 roadmap for digital and data* (which we refer to as “the Roadmap”).<sup>12</sup> It describes the early activities to be undertaken during the current Spending Review period to further longer-term government digital transformation. The Roadmap is a set of commitments covering six strategic areas, known as ‘missions’. Each mission has a senior departmental sponsor at permanent secretary level, one at HM Treasury. This recognises that delivery needs to involve senior leadership from all areas of a department’s business, including core operations, and not just the digital, data and technology function.

**1.15** Four of the missions involve early information-gathering activities, which have already started, including detailed enquiries to assess the scale of the task and the effort that will be required to achieve meaningful change. CDDO’s recognition of the importance of understanding the reality of government’s starting point is a significant departure from previous approaches. The Roadmap sets out activities to be completed by departments and others within the current Spending Review period to 2025 that will support the government’s long-term ambition for a “transformed, more efficient digital government”.

<sup>12</sup> Central Digital & Data Office, *Transforming for a digital future: 2022 to 2025 roadmap for digital and data*, June 2022 (available at: [www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025](https://www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025), link accessed 3 March 2023).



## Part Two

### Implementing the Roadmap

**2.1** In this part we set out how the Central Digital & Data Office (CDDO) has worked to maximise the chances of success by setting realistic ambitions and engaging senior leaders across government. We also describe how progress is being measured and the levers for maintaining momentum.

**2.2** CDDO has worked with HM Treasury to secure funding for departments of £8 billion for digital, data and technology investment for the period 2022-23 to 2024-25. It achieved this through providing training and advice for HM Treasury officials, developing a framework for assessing the scale of legacy issues in departments, and reviewing departments' Spending Review bids. This includes £2.7 billion for investment in cyber and legacy IT across government.<sup>13</sup> CDDO has funding to deliver its own activities and departments took account of the funding they had available when determining what they could commit to as part of the Roadmap's development. However, there is no additional funding for the recent growth in inflationary pressures. Departments must absorb these within existing budgets. This risks completion of activities proposed by the Roadmap as they will have to compete against other departmental priorities.

**2.3** CDDO has led the development of the Roadmap, but ultimately individual departments are accountable for delivery. This will require senior leadership from all areas of the department, including core operations, not just those responsible for digital, data and technology.

#### Setting realistic ambitions

**2.4** CDDO has involved departments extensively from the outset in the development and setting of commitments for the Roadmap. Early proposals were refined to balance ambition against feasibility and gain a strong commitment to delivery from departments. More digitally mature departments already had plans or activities under way that support the commitments and the Roadmap provides an 'overlay' to guide their completion. CDDO's collaborative approach to creating the commitments as well as the Roadmap itself has been welcomed by departmental chief digital and information officers (CDIOs).

<sup>13</sup> The government announced it is investing £2.6 billion in cyber and legacy IT over the 2021 Spending Review period in the Autumn 2021 Budget. The actual figure was £2,661 million.

**2.5** Addressing systemic issues in government is complex and takes time. CDDO has used the term ‘Roadmap’ deliberately. Previously, the government has launched digital strategies with an accompanying programme and plan to support its delivery. Instead, the Roadmap sets out a more manageable set of changes to existing practices and processes required now to resolve the most essential systemic issues within the current Spending Review period ending in 2025. The missions are not a ‘wish list’ of well-intentioned but undeliverable targets and therefore have a more realistic chance of success. Instead, it sets out a series of activities to address root causes, establish key data about services and make progress towards government’s long-term ambition for a “transformed, more efficient digital government”.

### **Engaging senior leaders across government**

**2.6** The Roadmap was developed with government’s most senior leaders and digital experts from across and outside government. CDDO reports to the civil service Chief Operating Officer and also seeks regular direction from two boards:

- The Digital and Data Board, a forum of permanent secretaries, established in July 2021 to provide overall governance for the strategy, review and report on progress every six months and monitor efficiency savings.
- The Digital Advisory Board, an external board to engage with experienced leaders from the commercial sector.

**2.7** The Digital and Data Board is a formal sub-board of the Civil Service Board. It is jointly chaired by the CDDO Chair and the Permanent Secretary of HM Revenue & Customs. It monitors and assesses the delivery of government’s major digital and data programmes to improve public services. It agrees and enforces cross-government digital and technology standards and identifies areas for capability improvement. CDDO provides six-monthly progress reports on the Roadmap, starting in December 2022, which include additional actions for the Board’s endorsement that are needed to maintain progress.

**2.8** CDDO has also created or reset communities of digital leaders across government to support this involvement. The Digital, Data and Technology Functional Leadership Group (DDaT FLG) of CDIOs across government is overseeing accountability for delivery. It reports to the Digital and Data Board and meets monthly. So far, it has succeeded in maintaining departments’ commitment to the Roadmap’s aims.

**2.9** The Roadmap commitments were developed and tested by departments at multiple levels through cross-government councils of chief data officers and chief technology officers and the network of chief operating officers to gain buy-in from a wider community beyond departments’ digital leaders. CDIOs steered the Roadmap and shaped commitments through the DDaT FLG. The Roadmap was reviewed and signed off by the permanent secretary-level Digital and Data Board and Civil Service Board. Ministerial approval gave top-level business buy-in and emphasised that this is not only a technology undertaking.

## **Leadership in departments**

**2.10** A range of other bodies have been created to bolster support for digital transformation. These provide specialist internal and external assurance to senior leaders, enable decision-making and are points of escalation for risks and issues (**Figure 5** overleaf). A new Government Transformation Steering Group brings together permanent secretaries to promote and drive transformation across government and share best practice. In addition, the Transformation Leaders Group of Directors General oversees transformation of government's top 75 services.

## **Responsibilities and accountabilities**

**2.11** As a relatively small central specialist function, CDDO cannot deliver on behalf of departments and so the success of the Roadmap depends on the engagement of senior departmental officials who have the required authority. However, departments' own service delivery priorities often take precedence over implementing the government's digital priorities. The Roadmap explicitly states that departments are accountable for its delivery, with CDDO and HM Treasury in an enabling role. This accountability should include business operations, and not just those responsible for the digital, data and technology function. The permanent secretaries we spoke to recognise the importance of their role in making this happen. There is no single point of accountability for cross-government change and the current approach is an attempt to address this by encouraging departments to include commitments in their own departmental strategies and plans.

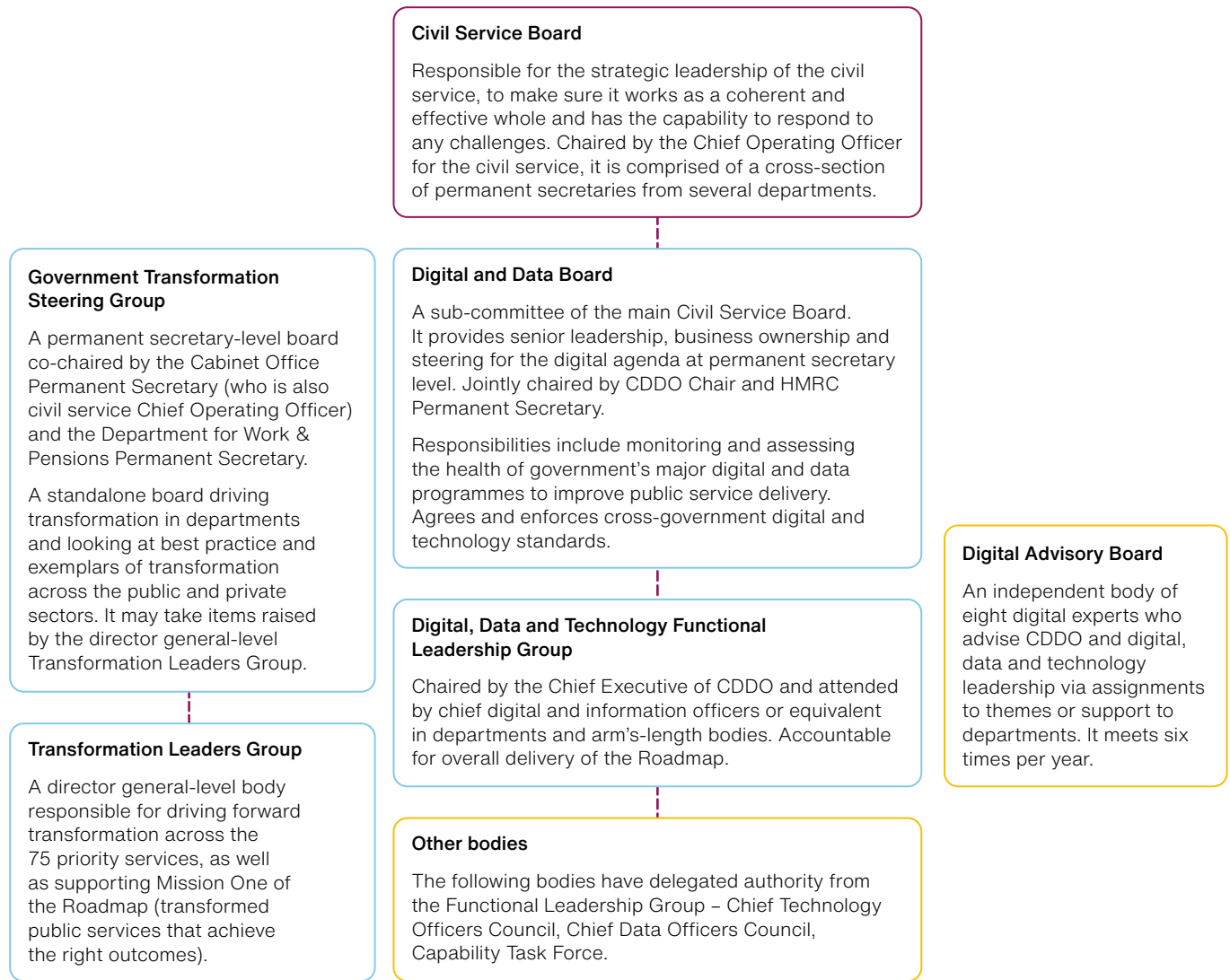
**2.12** The permanent secretary mission sponsors have an important role and recognise that they are much more than a figurehead. They understand the scale of the challenge in their missions and the need to influence other permanent secretaries who have the power and authority to create a digital knowledge 'ripple-down effect' in their own departments.

## **Measuring progress**

**2.13** CDDO has established a cycle of quarterly business reviews with departments to agree performance targets and discuss progress towards delivering the Roadmap commitments. These reviews, chaired by CDDO and HM Treasury, are conducted to understand progress and constraints. They use departmental data to track key performance and maturity indicators, including progress against efficiency savings.

**Figure 5**  
Leadership for the digital Roadmap

Government has established several bodies to steer the Roadmap towards its aims by 2025



- Strategic body
- Decision-making body
- Advisory body
- Oversight relationships between bodies

**Note**  
1 One Login has its own separate governance based in Government Digital Services with ministerial oversight.

**2.14** CDDO is using the review process to monitor progress towards the Roadmap's objectives. The DDaT FLG regularly reviews progress against agreed metrics and plans to report progress twice a year to the Digital and Data Board to ensure momentum is maintained. To date, the metrics collected from departments have been a combination of key figures and narrative information on their current positions. CDDO consolidates this into a view of progress against a set of milestones across the six missions. CDDO expects the reporting arrangements to evolve as the analysis of information provided by departments is completed and the scale of the task becomes clearer.

**2.15** Departments are still providing data on their current positions – for example, on how much work is needed to bring each government service to the 'great' standard. CDDO aims to complete its information-gathering on the government's top 75 services by April 2023. However, this is not straightforward. One major operational department reported in its quarterly business review that "large volumes of data that could help service improvement are not accessible due to legacy systems".

## **Levers and enforcement**

**2.16** The Roadmap's success relies on levers being in place to support implementation. CDDO's principal lever is the Digital and Data Board. It expects the Board to challenge departments to demonstrate they are making progress.

**2.17** CDDO's first progress update to the Digital and Data Board in December 2022 reported that early milestones had been met but that existing risks have become more acute. CDDO has identified two significant risks to further progress. First, the existing skills gap is getting worse and CDDO is concerned that digital teams in departments will not have the skills and expertise necessary to implement the Roadmap. Second, service transformation requires the support of senior leaders beyond the digital function and there is a high risk this support will not be sustained without continued and proactive involvement from permanent secretaries.

**2.18** To date, around 200 non-specialist executives have received digital awareness training, but the target set in the Roadmap is more than 6,500. More significantly, many in this target group do not have the digital leadership skills to make informed decisions on digital issues. CDDO has proposed that the Digital and Data Board ask all their senior civil servants to promote digital training in 2023-24.

**2.19** CDDO views spending controls as an important lever to ensure departments' digital activities align to the Roadmap. CDDO has established a 'red lines' project to define a smaller set of clearer mandatory requirements, with which digital developments must comply to receive funding. These are being developed through a pilot which began at the end of 2022 to test and refine the proposals.

## Part Three

### Progress so far and addressing the challenges

**3.1** In this part we discuss how the Roadmap is addressing the main challenges to digital transformation. We also summarise the progress on each of the six missions and areas of remaining risk. The missions are mostly designed to lay the foundations for more substantive work in the future.

**3.2** The Central Digital & Data Office (CDDO) is tracking progress of the six missions using data from the quarterly business reviews and performance data against agreed metrics. It consolidates this into a set of milestones for each mission and reports progress against a subset of key milestones to the Digital and Data Board. All those due by December 2022 were reported as achieved (**Figure 6**).

#### Figure 6

Central Digital & Data Office (CDDO) assessment of progress against internal milestones, December 2022

The CDDO reported that all of its internal milestones had been met so far

Mission	Total milestones	Due in 2022 (all met)	Due in 2023	Due in 2024	Due in 2025
One – transformed public services	12	4	4	2	2
Two – One Login	6	2	3	0	1
Three – better data	6	2	2	1	1
Four – secure, efficient and sustainable technology	38	9	14	8	7
Five – digital skills	27	8	8	6	5
Six – a system that unlocks digital transformation	11	1	5	3	2
<b>Total</b>	<b>100</b>	<b>26</b>	<b>36</b>	<b>20</b>	<b>18</b>

Source: Central Digital & Data Office progress report to Digital and Data Board, 8 December 2022

## **Mission one: transformed public services that achieve the right outcomes**

**3.3** To achieve efficiencies, government services must minimise unnecessary time, effort, and cost both for users and the departments providing them. CDDO's initial investigations have found that, for some services, even though nearly all interactions can begin online, there is little 'straight-through processing' in the rest of the system.<sup>14</sup>

**3.4** In 2020-21, central government departments expected to spend £456 billion on the day-to-day running costs of public services, grants, and administration. Digital transformation and modernisation of its services and data are instrumental in achieving efficiencies, with huge gains to be achieved if all government services were modernised. Departments are planning to spend 51% of the £8 billion funding for digital, data and technology in the 2021 Spending Review on service transformation projects, highlighting their importance.

**3.5** CDDO found, for half the services it has evaluated, there is no single senior individual who has ownership of the full service which encompasses both the online citizen-facing portals and the back-office systems that perform the other processing. Many different programme directors, operational leaders and digital leaders are involved in this service delivery. The absence of a single person with an overall view of the service from end to end makes it much more difficult to understand where there are gaps in cost and performance information. This is a major impediment to service redesign.

**3.6** A single director-level owner for each service, with accountability for its end-to-end operation and decision-making authority for continually improving the service, would enable departments to form a complete and joined-up view of their services and associated costs. It would highlight the need for involvement and co-operation of senior non-technical business leaders, not just the digital and technology community.

**3.7** CDDO expects to complete its assessment of the top 75 services by April 2023 and service improvement for an initial set of 20 services by October 2023. Several departments already have significant service transformation activities under way, including the Home Office and Department for Work & Pensions (DWP). However, CDDO has identified two significant risks to the accomplishment of this mission:

- Insufficient support from senior non-digital business leaders.
- Departmental teams lacking the capacity to prioritise the necessary work, exacerbated by potential further reductions in capacity arising from efficiency reviews.

<sup>14</sup> Straight-through processing entails the automation of straightforward administrative tasks thereby freeing up caseworkers to focus on activities requiring subjective judgement or human interaction.

## **Mission two: One Login for government**

**3.8** The government has been attempting to introduce a single login for government services since at least 2011 with its GOV.UK Verify programme, which is now being phased out.

**3.9** The new programme to provide a single login for all online government services is making steady progress but some of the more difficult aspects lie ahead. Departments such as DWP are working on verification systems to meet their specific needs. HM Revenue & Customs is building on work done to develop its Secure Credential Platform, which replaced the previous Government Gateway, where this work has value and minimal duplication with One Login. In isolation, these services appear to be working well for most of their users and will continue to be used until One Login is able to meet the departmental and user requirements. The Government Digital Service (GDS), which is responsible for the delivery of GOV.UK One Login, has also published its own roadmap showing the features available so far and those currently under development.

**3.10** It is challenging to join a new front-end authentication and identity verification system with multiple legacy citizen-facing services to provide a seamless customer journey, as One Login's predecessor GOV.UK Verify demonstrated. A core element of the GOV.UK One Login system is now operational, allowing users to create an account, log in and prove their identity through a web browser or smartphone app. The first government services are now live, with more scheduled in 2023 as One Login scales up and provides new features for users.<sup>15</sup>

**3.11** GDS told us it is collaborating extensively with departments to develop concrete migration plans for all central government services. It is also working with departments so GOV.UK One Login can draw on additional datasets held across government to improve the identity verification process.

## **Mission three: better data to power decision-making**

**3.12** Government acknowledges there are longstanding issues with the quality of its data. There can be real-life consequences for citizens: in 2021, DWP found it had underpaid an estimated 237,000 people (mainly women) an estimated £1.46 billion due to human error. We concluded some level of this human error was almost inevitable given the system's high degree of manual review and complex rules.<sup>16</sup>

<sup>15</sup> We have not looked at this programme in detail but expect to examine it in further detail at a suitable point in the future.

<sup>16</sup> Comptroller and Auditor General, *Investigation into the underpayment of State Pension*, Session 2021-22, HC 665, National Audit Office, September 2021. DWP has updated its estimates of the number and value of underpayments since we carried out our investigation.



**3.13** Good-quality data is required for providing day-to-day services to the public as well as for analysis, policy-making or research. However, the data function is not part of the digital function in all organisations. One department reported in its quarterly business review return that “the separation of data from the digital, data and technology function into the analysis function creates a risk to data maturity and join-up.” Legacy systems present another constraint. In our 2022 good practice guide *Improving government data: a guide for senior leaders*, we said that failure to appreciate and understand the legacy environment and the practical issues it creates for the flow of data is one of the biggest obstacles to the better use of data across government.<sup>17</sup>

**3.14** This mission focuses on how data can be used and shared more effectively across government. Government has established a Data Quality Hub based in the Office for National Statistics (ONS), which is also the mission sponsor. The Hub has published the Government Data Quality Framework and, in conjunction with the Data Standards Authority, developed a Government Data Maturity Assessment. This is expected to provide a universal assessment of government’s data management maturity for future benchmarking work. It is currently being trialled with 11 organisations and will be published in March 2023, with an aim for all departments to be using it by March 2024. CDDO has also been working on developing frameworks and definitions and other data initiatives that will be brought into use from 2023-24.

**3.15** Some progress has been made on establishing data standards across government but this is a major undertaking. By 2025, CDDO is expecting to standardise the way key facts and data about critical datasets are captured to enable shared use. CDDO and ONS recognise the importance of an overall data architecture for government.<sup>18</sup> As departments redesign services and move away from legacy systems it will be important to reach consensus on how data will be aligned and standardised across new systems and services. This is essential to overcome the siloed working that has hindered transformation within departments and interoperability between them.

**3.16** Despite some early steps to improve government’s data, CDDO’s latest progress assessment is that significant technical and cultural barriers remain. It highlighted a risk to the Digital and Data Board in December 2022 that sustained effort may fail to overcome the barriers to standardising definitions and sharing critical data assets. Our experience suggests that government is starting from a low base given the condition of its existing data, and the scale of the task is huge based on its own analysis.

<sup>17</sup> National Audit Office, *Improving government data: A guide for senior leaders*, July 2022.

<sup>18</sup> A data architecture describes how data is managed from collection through to transformation, distribution, and consumption. It sets the blueprint for data and the way it flows through systems and the design should be driven by business requirements.

### **Mission four: secure, efficient and sustainable technology**

**3.17** Across government, legacy systems are a key source of inefficiency and a major constraint to improving and modernising government services. Legacy systems are difficult and expensive to run and maintain and there are substantial hidden costs from additional business processes to overcome their limitations. Departments have also told us that it is easier to bid for capital funding for new developments than resource funding to maintain existing services and keep them up to date. This has been a major contributor to the existing condition of legacy in government. Cloud introduces new financial and operating models which move away from capital costs to more flexible models such as ‘pay as you go’, which transfer more costs to resource expenditure.

**3.18** CDDO has made a good start on developing its understanding of legacy systems across government but tackling them needs effective long-term leadership and resourcing. CDDO has worked with six departments to develop a framework for assessing legacy IT issues and this was completed in October 2022. It is now being rolled out. Departments evaluate the following factors, which are combined to produce an overall risk score and prioritisation:

- The criticality of a system, based on the impact if it were to become unavailable.
- The likelihood of failure, based on considerations of vendor support, scarcity of the necessary knowledge and skills, security vulnerabilities and the extent to which the system meets business needs, now or in the future.

**3.19** Departments often do not know the full business costs of operating their legacy services, including additional costs of front- and back-office staff required to support them. With the current pressures on resources, having this information would strengthen business cases and bids for resources against competing priorities. The framework is being expanded for use in all departments and is an important opportunity to assess the operational costs of continuing to use outdated legacy systems and prioritise their replacement across government.

**3.20** By using consistent criteria, the framework gives CDDO a view across government as well as within individual departments. This will help identify the overall priorities. The pilot exercise completed in November 2022 indicates the 20 systems with the highest level of risk are concentrated in just four departments. It further identifies that only around three-quarters of the highest risk systems have agreed funding to complete remediation work, and only just over half have plans to complete this activity by the end of 2025.

**3.21** By 2025, CDDO expects that remediation plans for all ‘red-rated’ legacy systems will have been drawn up and implementation started. CDDO told us that some remediation plans are already in place. Addressing legacy system issues will take time and such timescales realistically reflect an understanding of the scale of the challenge.

## Mission five: digital skills at scale

### Capability building for senior leaders

**3.22** Only a small proportion of senior decision-makers in government have first-hand experience of digital business and the Roadmap acknowledges that government leaders are not yet as skilled in digital leadership as they need to be. In our report, *The challenges in implementing digital change*, we said that senior business leaders make decisions that are unrealistically ambitious: they lack an understanding of the risks associated with leading-edge technology at scale and of the operating environment and constraints posed by legacy systems. Senior digital leaders in departments therefore often struggle to get their message across effectively to business leaders who do not sufficiently understand what it means to be a senior leader in a digital world and the opportunities, challenges and risk being described.

**3.23** The Roadmap commitment that “over 90% of senior civil servants will be upskilled on digital and data essentials, with learning embedded into performance and development standards” was agreed by departments at permanent secretary and ministerial level. Since the Roadmap was published, CDDO has asked the Digital and Data Board to promote digital training for all senior civil servants in 2023-24. CDDO delivers courses with digital content through Civil Service Learning, the Leadership College for Government and via external masterclasses (**Figure 7** overleaf). ‘Digital, data and technology essentials’ is a recent course for non-digital senior civil servants aimed at educating more than 90% of senior civil servants over time. However, digital training needs to be positioned within the government context and the current training does not include detailed coverage of government’s digital operating environment and the existing constraints and issues associated with legacy systems and data.

**3.24** The Leadership College for Government’s training and development for senior leaders is mainly designed to build awareness of generic digital and leadership issues. It does not explicitly include digital leadership and does not have the capacity to include this. The courses have not yet achieved widespread take-up and are not aimed at addressing the capability gap. If government is serious about digital capability-building for senior business leaders, it must devote appropriate priority and focus. In addition to formal training, other activities such as mentoring by senior experienced digital leaders, including non-executive directors, and additional recruitment of experienced digital operations leaders would help build business leadership capability.

**Figure 7**  
Digital training initiatives

Most digital training from the centre is provided by the digital, data and technology profession in the Central Digital & Data Office (CDDO)

Audience	Available training	
	Provider	Content
Senior civil servants	CDDO	Digital and Data Essentials for non-digital senior staff
	Government Skills and Curriculum Unit	Digital Excellence Programme
	CDDO	Masterclasses on each of Digital, Data and Innovation – to include ministers
Digital, data and technology profession	CDDO	A range of specialist training aligned to the Digital, Data and Technology Capability Framework
All civil servants	Civil Service Learning	A range of basic digital skills and awareness modules

**Note**

1 Many departments also provide their own training programmes.

Source: National Audit Office summary of government data provided by Cabinet Office

Recruiting to address the skills gap

**3.25** Government has found recruitment of digitally skilled people challenging. Some 37% of digital, data and technology recruitment campaigns are unsuccessful. There is an unprecedented level of private sector demand in all industrial nations and a major digital skills shortage in the UK. People with digital skills command a premium in the market. In the public sector, pay levels do not attract the talent required for the scale of transformation needed in the UK. Recruitment is also fragmented across government.

**3.26** In April 2022, the number of digital, data and technology vacancies was around 3,900. By October 2022, this had risen by 7% to 4,100. The number of digital, data and technology apprentices has dropped 20% from 800 in October 2021 to 637 in December 2022. CDDO aims for departments to use a common recruitment standard, including common branding and measures to reduce time to recruit. Government will therefore adapt its pay framework where possible. Cabinet Office appointed a new Chief People Officer in July 2022, and CDDO will modify how it describes digital roles to align more closely with industry-wide roles and aims to reduce digital vacancy rates to below 10% by 2025.

**3.27** The Roadmap's activities will not fully address the current skills gap or the government's inability to attract enough external specialists to the civil service. Many believe the talent is simply not available in the marketplace to achieve the degree of transformation the government needs. If the current skills shortages persist, government may need to review what activities it can realistically achieve, given the skills it has or can acquire.

### **Mission six: a system that unlocks digital transformation**

**3.28** Digital change requires specific ways of investing, funding and procuring digital services and requires upskilling and capability-building to introduce and adapt new approaches. CDDO recognises that processes which work for other programmes are not always well-suited for digital programmes. The mission aims to ensure funding and governance models enable modern, efficient, and user-centric digital investments and services. CDDO will work with HM Treasury, the Infrastructure and Projects Authority (IPA) and the finance, commercial and policy professions in government. It aims to address systemic barriers to digital transformation including financial processes and business cases.

**3.29** CDDO has an overall milestone that these barriers will be addressed by 2025. However, this is dependent on other government central functions. This mission is as much about influencing, tone and approach as specific actions. Digital change involves levels of complexity, uncertainty and risk that are often unique to each specific programme due to legacy systems, existing ways of operation and the difficulties of integrating something new. These differences must be reflected in business cases, funding and approvals processes, procurement of technology and skills, audit, project review and risk management mechanisms, and policy development. CDDO recognises there is significant work to do and, given the complexity of the challenges, the National Audit Office is concerned that CDDO has insufficient resources to deliver this mission.

# Appendix One

## Our evidence base

**1** This report evaluates government’s approach to addressing the underlying issues of why digital transformation is failing. We focus on the approach to transforming government, how the Central Digital & Data Office (CDDO), its Roadmap and departmental leaders will support and promote this, and whether senior business leaders across government have suitable levels of digital capability.

### **Interviews**

**2** We carried out more than 40 interviews with officials and non-executive directors across government representing the largest government departments and the sponsors of each of the six Roadmap missions. These interviews took place between May 2022 and January 2023 and were carried out online. We also met with digital supplier bodies and consultants. The topics we covered included the main challenges for government, how departments were responding to the Roadmap and its missions, and what more is needed for successful government transformation.

### **Document review**

**3** We reviewed a wide range of published and unpublished documents to inform our study. We reviewed the documents between June and December 2022. These included, but were not limited to, minutes of the Digital, Data and Technology Functional Leadership Group and Digital and Data Board meetings, CDDO quarterly progress reporting on departments and details of previous government digital strategies and approaches.

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