



National Audit Office

Report

by the Comptroller
and Auditor General

Cross-government

Challenges in using data across government

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Report by the Comptroller and Auditor General

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Gareth Davies
Comptroller and Auditor General
National Audit Office

19 June 2019

This report draws together our experience of government's use of data. It reports what we see as the challenges and barriers which have limited government in making the progress it expected from previous attempts to improve the use of data.

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Foreword

The safe and appropriate use of data is an increasingly important challenge for government. Greater use of technology, the proliferation of data and analytical techniques, and better awareness of their risks, have led to a widespread debate over how to manage data in the modern world. Many organisations in the UK are now contributing to better understanding the legal or ethical implications of using data, and this is a critical requirement for establishing public trust.

But the challenge for government's use of data goes beyond concerns about trust and security. Getting the right data in the right place at the right time is a fundamental driver of value for money in government: making services work for the people who use them, improving government's systems and processes, and supporting better decisions. And the steps government needs to take to use data effectively are as much about good management, governance and planning within its existing activities, as they are about learning to work with new technologies. The current focus on the legal and ethical obligations of using data is also an important opportunity for government to tackle these longstanding challenges in how it manages information.

The National Audit Office has reported time and again on the importance of well-informed decisions in government programmes and services. For example, the quality and availability of data in informing decisions has been an issue identified in our recent work on Windrush and Carer's Allowance.^{1,2}

This report sets out what government needs to do with its data to improve services for citizens, the way systems operate and support better decisions. It draws on our previous work, and the main issues that we believe will help government to use and exchange data and information safely and effectively.

Some aspects of data and technology are widely discussed, including the role of open data, new opportunities such as artificial intelligence (AI) and the challenges of protecting information and privacy. But outside of departments' data experts there is insufficient recognition of the importance of data.

1 Comptroller and Auditor General, *Handling of the Windrush situation*, Session 2017–2019, HC 1622, National Audit Office, December 2018.

2 Comptroller and Auditor General, *Investigation into overpayments of Carer's Allowance*, Session 2017–2019, HC 2103, National Audit Office, April 2019.

There are three substantive issues:

- **Data is not always seen as a priority.** Our report on planning and spending across government highlighted the challenges for government in making long-term cross-government investments, and the quality and sharing of data is a clear example of a neglected and poorly planned activity. If government is serious about data being one of its most important assets, it is long overdue a balance sheet review.³
- **The quality of data is not well understood.** Government has pursued the benefits of better use of data but new initiatives often expose the poor quality of the data itself. Good data is not a 'free good' and government needs a structured approach to investing in improving and using data.
- **There is a culture of tolerating and working around poor-quality data.** Evidence-based decision-making is a necessary condition for achieving value for money in public spending. And government needs to develop the capability, leadership and culture to support sustained improvement in the quality of information available.

This report aims to support efforts so far, and those working to make data in government better.

³ Comptroller and Auditor General, *Improving government's planning and spending framework*, Session 2017–2019, HC 1679, National Audit Office, November 2018.

Summary

1 Data is crucial to the way government delivers services for citizens, improves its own systems and processes, and makes decisions. Our work has repeatedly highlighted the importance of evidence-based decision-making at all levels of government activity, and the problems that arise when data is inadequate (**Figure 1**).

2 Government recognises the value of using data more effectively, and the importance of ensuring security and public trust in how it is used. In its 2017 digital strategy, it stated that it would “...take the actions needed to make the UK a world-leading data-driven economy, where data fuels economic and social opportunities for everyone, and where people can trust that their data is being used appropriately”. It plans to produce a new national data strategy in 2020 to position “the UK as a global leader on data, working collaboratively and openly across government”.

3 To achieve its ambitions government will need to resolve fundamental challenges around how to use and share data safely and appropriately, and how to balance competing demands on public resources in a way that allows for sustained but proportionate investment in data. The future national data strategy provides the government with an opportunity to do this, building on the renewed interest and focus on the use of data within government and beyond.

Our report

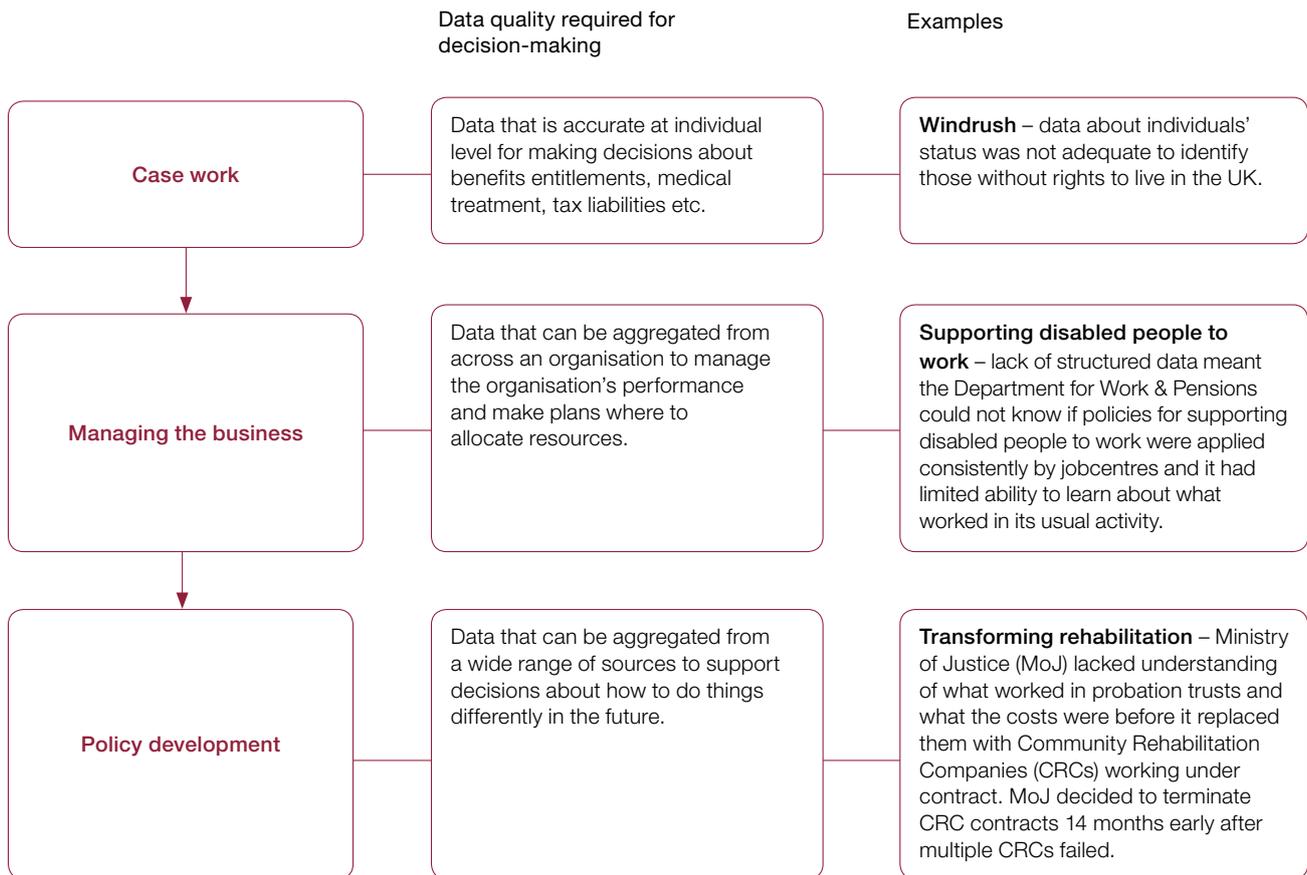
4 This report sets out the National Audit Office’s experience of data across government, including initial efforts to start to address the issues. From our past work we have identified three areas where government needs to establish the pre-conditions for success: clear strategy and leadership; a coherent infrastructure for managing data; and broader enablers to safeguard and support the better use of data (**Figure 2** on page 8). In this report we consider:

- the current data landscape across government (Part One);
- how government needs a clear plan and leadership to improve its use of data (Part Two);
- the quality, standards and systems needed to use data effectively (Part Three); and
- wider conditions and enablers for success (Part Four).

Figure 1

Decision-making and data quality

Problems arise when data is not adequate



Source: Comptroller and Auditor General, *Handling of the Windrush situation*, Session 2017–2019, HC 1622, National Audit Office, December 2018. Comptroller and Auditor General, *Supporting disabled people to work*, Session 2017–2019, HC 1991, National Audit Office, March 2019. Comptroller and Auditor General, *Transforming Rehabilitation*, Session 2015–16, HC 951, National Audit Office, April 2016

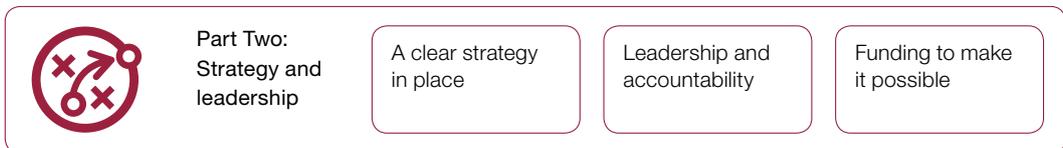
Figure 2

Principles for government and its service providers for successful use of data

1 Understand the current landscape



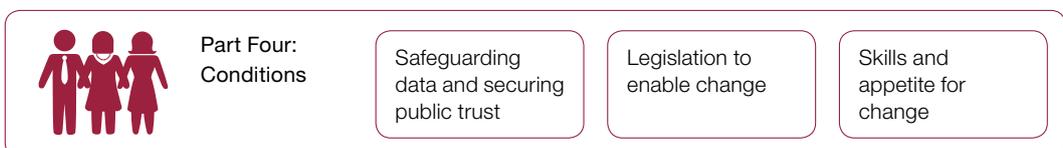
2 Have a clear understanding of what it is trying to achieve



3 Have the infrastructure in place to make it work



4 Have the conditions in place to make it work



5 We have focused our review on the use of data to support delivery of public services, but many of our findings are equally relevant to data to support decision-making and improve performance, including through research and thematic analysis. Within this context, it is important to ensure that data is used safely, sensitively and appropriately, with proper ethical considerations.

Challenges and barriers

Strategy and leadership

6 Government does not treat data as a strategic asset. The Department for Digital, Culture, Media & Sport (DCMS) is the only department that refers to data as a strategic asset in its 2018 single departmental plan. Five departments of the seven we examined in detail have data strategies, and these were of varying maturity. By contrast, for government property there are long-term funding plans, with publicly available strategies for the whole of government collectively and individual departments (paragraphs 2.2, 2.3 and Appendix 2).

7 There has been a lack of leadership across government. Responsibility for data policy and data ethics sits within DCMS, but it has not made the progress it expected in establishing its leadership or developing the national data strategy, largely because staff were diverted to EU Exit work. The Government Digital Service (GDS) and the Office for National Statistics also have an interest in data policies and provide support to departments. In 2017, the government committed to appointing a new chief data officer for government by 2020. It has not done this yet. The two cross-government groups on data have not met regularly in 2019 (paragraphs 1.7, 1.8, 2.4 to 2.9, Figure 5 and Appendix 3).

8 Funding pressures can inhibit progress on data projects. Data projects have sometimes been set aside when funding is under pressure. There are examples of the government funding projects to automate data feeds, for example the Department for Work & Pensions using HM Revenue & Customs real-time information to support benefit payments. This has the potential to provide benefits, but this has often been driven by new policies rather than fixing ongoing problems (paragraphs 2.3, 2.12 to 2.16, Figure 8 and Appendix 2).

Data, systems and processes

9 Data quality is often inadequate. We commonly find that the effectiveness of programmes is compromised because data quality is poor. For example, the Windrush situation demonstrated the effect of decisions based on poor data. It takes manual effort to make the data usable and to extract the relevant information. This limits the benefits of new policies or systems unless the underlying data quality is improved (paragraphs 3.2, 3.3, 3.6 and Figure 9).

10 A lack of standards across government has led to inconsistent ways of recording the same data. We found more than 20 ways of identifying individuals and businesses across 10 departments and agencies, with no standard format for recording data such as name, address and date of birth. The problem is replicated in local areas where information is recorded differently across local and constitutional boundaries. This makes it difficult for government to maximise its data asset, for example by allowing thematic analysis across different sectors to help understand economic challenges or systemic problems (paragraphs 3.4, 3.13, 3.14 and Figure 10).

11 Legacy systems often only work for the policy they were built for.

Departments have historically developed IT to support specific policy objectives. Even within the same department, data cannot be extracted or shared easily. A lack of common data models and standards within and between departments makes it difficult and costly to combine different sources of data. Some government departments have not always prioritised replacing older technology, but until they do so there will be ongoing costs and inefficiencies in decision-making (paragraphs 3.6 and 3.8 to 3.12).

Conditions

12 The General Data Protection Regulation (GDPR) has heightened citizens' interest on how their data is being used. Government's use of data is shaped by the need to keep it secure. Digital ways of working and risks of criminal attacks on organisations' data mean that keeping data secure has become more important. Data must be handled according to data protection laws and with an appropriate legal basis for sharing. Well-publicised misuse of data has increased concerns and undermined efforts to communicate benefits. Departments' concerns about retaining public trust can discourage them from looking for legal solutions to use data to maximise its potential (paragraphs 1.6, 4.2 to 4.10 and Figure 12).

13 Government has put in place the legislation to make effective and appropriate use of data easier. The Digital Economy Act 2017 provides a legal framework for establishing data-sharing arrangements to support delivery of public services and to help deal with debt and fraud. The Information Commissioner's Office has been consulted by the government to ensure that the codes of practice for the Digital Economy Act comply with GDPR. DCMS has provided support to departments on how to use the Digital Economy Act to support public services, but departments still lack confidence (paragraphs 4.11 to 4.13, 4.20 and Figure 13).

14 Silo working can inhibit progress. There are boundaries between civil servants as well as systems. The Data Advisory Board found that return on investment for a department can often be difficult to justify in data projects because the benefits might be seen elsewhere in government. Sharing data is difficult and may be expensive and ultimately unsuccessful unless organisations understand each other's data needs before they start commissioning technical solutions (paragraphs 4.14, 4.15 and Figure 14).

Concluding remarks

15 Past examples such as Windrush and Carer's Allowance show how important good-quality data is, and the consequences if not used well. Without accurate, timely and proportionate data, government will not be able get the best use out of public money or take the next step towards more sophisticated approaches to using data that can reap real rewards.

16 But despite years of effort and many well-documented failures, government has lacked clear and sustained strategic leadership on data. This has led to departments under-prioritising their own efforts to manage and improve data. There are some early signs that the situation is improving, but unless government uses the data strategy to push a sea change in strategy and leadership, it will not get the right processes, systems and conditions in place to succeed, and this strategy will be yet another missed opportunity.

Recommendations

17 We direct these recommendations at DCMS and the Cabinet Office, who are responsible for drafting the data strategy and for cross-government leadership and coordination. The departments should:

- a Use the data strategy to identify and address the barriers to better use of data.** It should include a clearly articulated plan of work to overcome these barriers. This should provide an assessment of fundamental data issues, including safeguarding data and public trust, and plans for improving the communication of government's approach, and potential benefits of using data more effectively.
- b Set up clear cross-government accountability, governance and funding for data to support delivery of the data strategy.** Joint working and cross-government groups need to have clearly assigned responsibilities that are aligned with the levers available including funding, controls and operational resources. These arrangements should be clearly communicated across government to alleviate confusion of where responsibilities lie.
- c Develop cross-government rules, standards and common ways to collect, store, record and manage data.** Where multiple standards are used, government should develop a consistent approach to balancing competing demands between standardisation and local requirements, including implications for future decision-making and costs. This should include a regular review of departments to ensure that they are applying these standards and principles to their data collection.
- d Identify datasets that are critical to government functions,** look at how to share them easily and examine how they can be enhanced by process improvement and automation. This should include an analysis of the processes, systems and data flows so their use is fully understood.

18 We direct the following recommendations at departments, recognising they are at different levels of maturity. Within this context, departments should:

- e Put in place governance for data,** including improving executive team understanding of the issues associated with their underlying data and the benefits of improving their data.
- f Set out data requirements in business cases.** This should include an assessment of the current state of the data, implications for confidence in spending decisions, and the improvements or new data that are needed to support implementation of the project. These assessments should have an explicit consideration of the ethics and safe use of the data under discussion.
- g Implement guidance for front-line staff for handling data.** This needs to recognise the effort and resource required to fully and consistently adopt the policy and principles created by government into the working practices of the department, including standardisation, data ethics and quality.

Part One

Introduction

1.1 In this part we set out the current landscape for data in government. We discuss:

- benefits of using data across government;
- current responsibilities; and
- previous initiatives.

1 Understand the current landscape



Part One:
Introduction

Benefits of using data well

Current responsibilities

Previous initiatives

2 Have a clear understanding of what it is trying to achieve



Part Two:
Strategy and leadership

A clear strategy in place

Leadership and accountability

Funding to make it possible

3 Have the infrastructure in place to make it work



Part Three:
Data, systems and processes

High-quality data

Data standards to improve consistency

Systems and tools which talk to each other

4 Have the conditions in place to make it work



Part Four:
Conditions

Safeguarding data and securing public trust

Legislation to enable change

Skills and appetite for change

Benefits of using data across government

1.2 Getting the right data in the right place at the right time is crucial for government. It considers data to be one of its most important assets. Government needs accurate and useful data to underpin its policies, programmes and activities, and to make evidence-based decisions. As it carries out these activities, it must ensure data is safeguarded and public trust is maintained.

1.3 Successive governments have discussed the extensive benefits that they could achieve by using data to make services more efficient and joined-up (**Figure 3**). Joined-up working can save money for government, for example by removing duplication of effort and preventing illicit activities, such as fraud.

1.4 In June 2018 the government announced that it had asked the Department for Digital, Culture, Media & Sport (DCMS) to produce a national data strategy “to unlock the power of data in the UK economy and government, while building public confidence in its use”. The government plans to publish the strategy in 2020. It aims to produce a strategy that “positions the UK as a global leader on data, working collaboratively and openly across government”.

1.5 The government uses data to make millions of decisions every day, from checking border crossings to paying benefits and pensions. Approximately three billion transactions take place each year with government receiving or paying out at least £900 billion through these interactions. Across a lifetime an individual will interact with several different government functions. In many cases people are required to give the same information several times over (**Figure 4** on page 16).

1.6 Government’s use of data is shaped by the need to keep it secure. It also must demonstrate that it is being reasonable and ethical in the way it uses data, which is especially pertinent for data about individuals. Departments and public bodies are responsible for safeguarding their own information, but each department makes its own decision on what data is most important and how to prioritise protection of those assets. Since 2010, government has decided that it needed centrally driven cyber strategies and programmes to ensure that the UK manages its exposure to these risks. Our recent report *Progress of the 2016–2021 National Cyber Security Programme* found that the programme “was established with inadequate baselines for allocating resources, deciding on priorities or measuring progress effectively”.⁴

4 Comptroller and Auditor General, *Progress of the 2016–2021 National Cyber Security programme*, Session 2017–2019, HC 1988, National Audit Office, March 2019.

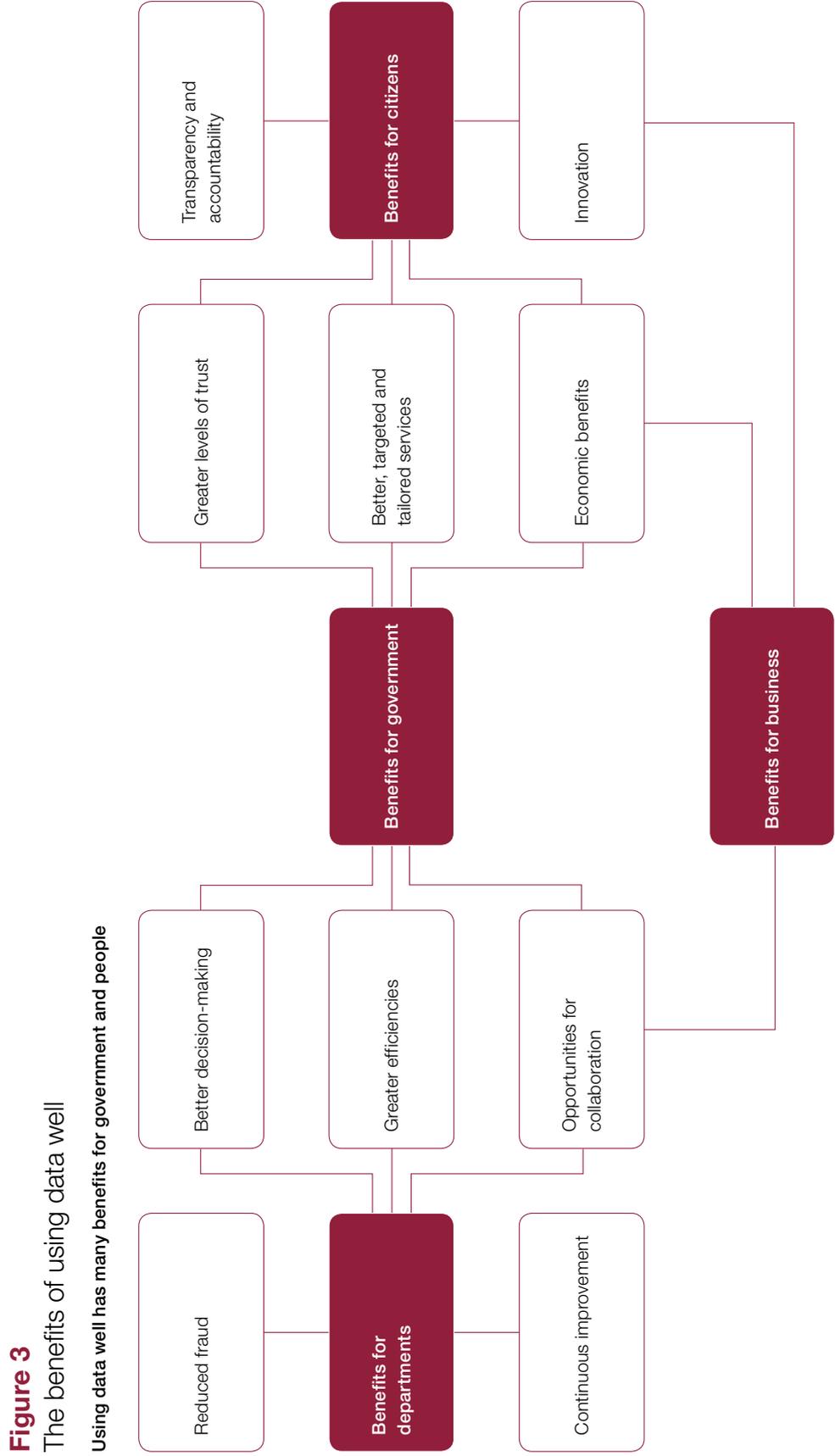
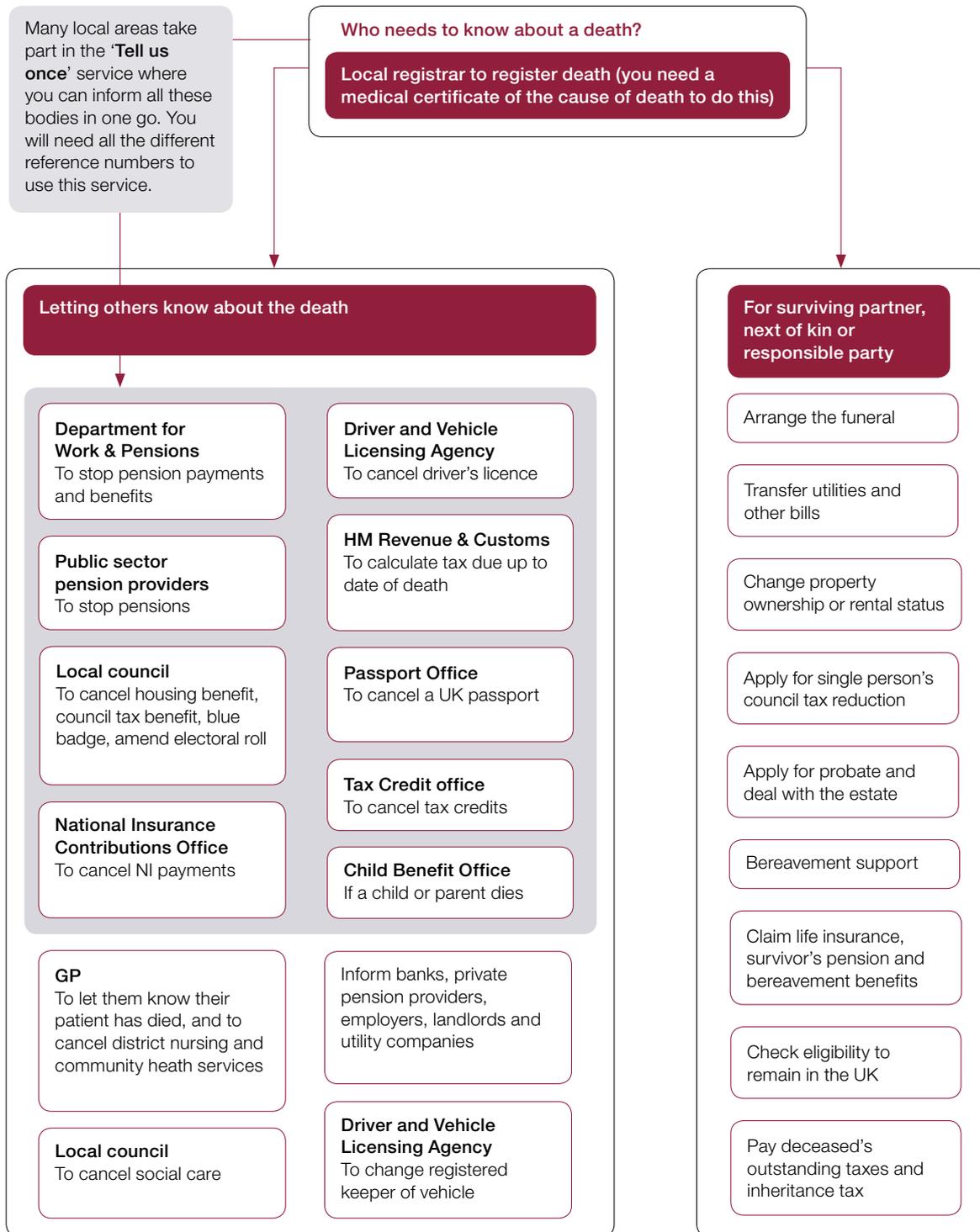


Figure 4

Examples of contacts required following the death of a loved one



Current responsibilities

1.7 DCMS has the main responsibility for data and for use and development of the Digital Economy Act 2017.⁵ It will also develop the national data strategy for the government. In April 2018, it took responsibility for data-sharing, data ethics and data governance from the Government Digital Service (GDS), part of the Cabinet Office. GDS retained responsibility for supporting the digital, data and technology profession. There are several other departments with some responsibility for data (**Figure 5** overleaf).

1.8 In addition, there are two cross-government groups. The Data Advisory Board is chaired by the chief executive of the civil service, with membership of permanent secretaries and chief data officers. Its role is to drive better use of data in government. The Data Leaders Network is chaired and managed by DCMS, with representatives (mostly deputy directors) from the most data-rich departments.

⁵ The Digital Economy Act 2017 covers permission to share data between public authorities in order to improve public services. The Act also covers disclosing data for the prevention of fraud and the recovery of debts owed to the public sector.

Figure 5
Roles and responsibilities for data across government

Policy	Guidance	Advice, use and/or incident response	Regulation
<p>Department for Digital, Culture, Media & Sport Responsible for the national data strategy, data ethics, data policy and the Digital Economy Act</p>			
<p>Government Digital Service Responsible for data standards (at a strategic level) and data skills</p>			
<p>UK Statistics Authority/Office for Statistics Regulation/Office for National Statistics Oversight, advice, regulation, production and publication of official statistics. Continued interest in data policies, advice, standards, quality and infrastructure</p>			
		<p>Centre for Data Ethics and Innovation Advisers for how to maximise the benefits of data-enabled technologies</p>	
<p>The National Archives Responsible for policy on the reuse of public sector information and the management of Crown copyright and database rights. Guiding and supervising departments' actions to safeguard and preserve the public record, including where comprised of data</p>			
<p>Government Chief Security Officer Information security policy, advice and guidance</p>			
	<p>National Cyber Security Centre Cyber security guidance</p>		
		<p>Information Commissioner's Office Responsible for upholding information rights</p>	
		<p>National Data Guardian for Health & Social Care Responsible for advising and challenging the health and care system to help ensure information is safeguarded</p>	

Note

1 The cross-government Data Advisory Board and Data Leaders Network cut across these roles and responsibilities (paragraph 1.8).

Source: National Audit Office review of roles and responsibilities for data

Previous initiatives

1.9 Over the past 20 years government has published reports and announced initiatives to aim to tackle the challenges of data and data-sharing (**Figure 6** on pages 20 and 21).

Our report

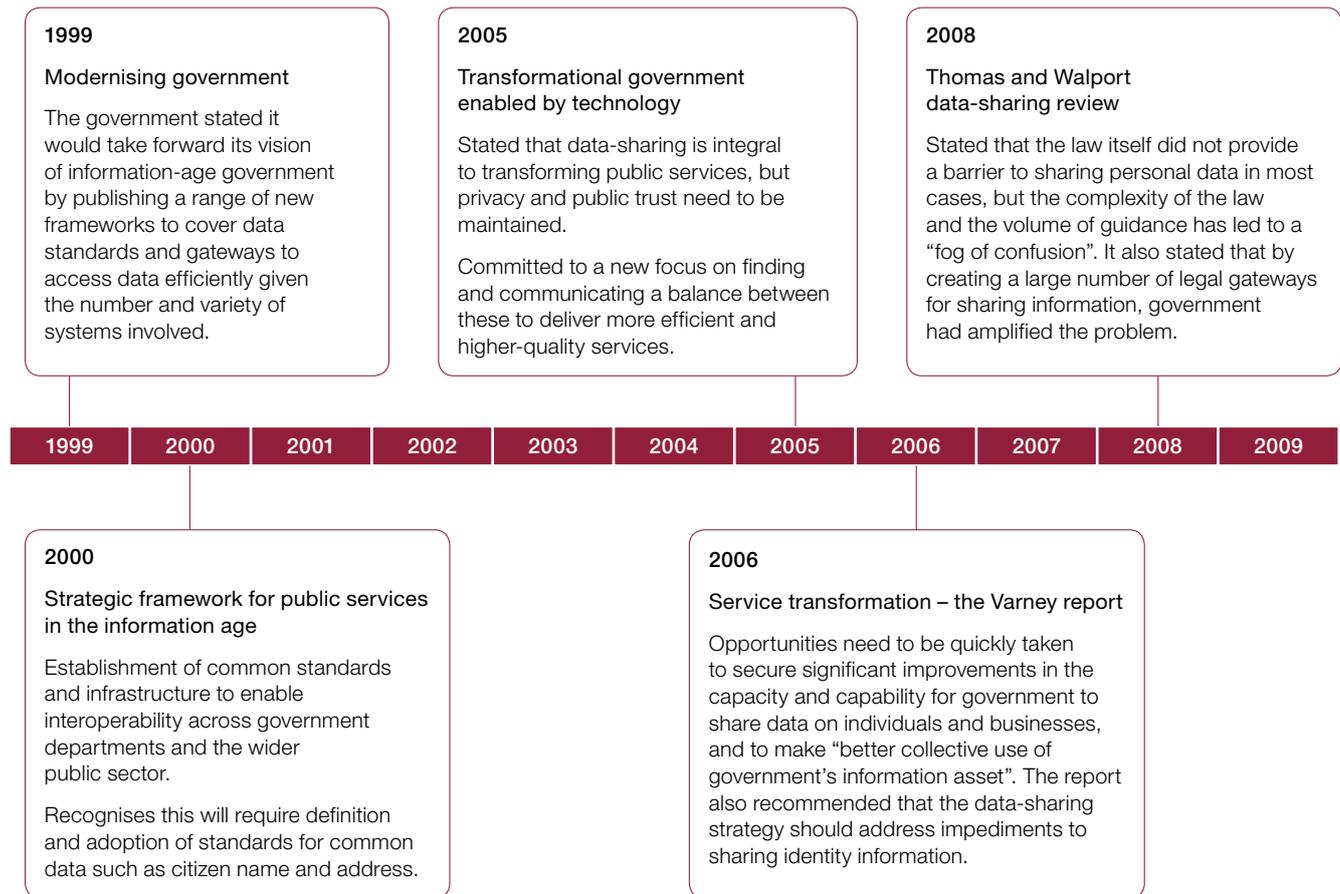
1.10 We have regularly reported on government's use of data and its limitations. Against our principles (Figure 2) we have set out what we see as the challenges and barriers to government improving its use of data.

- Part Two sets out government's need for a clear strategy and leadership to improve its use of data.
- Part Three discusses the quality, standards and systems needed to share data effectively.
- Part Four sets out the conditions that are needed to maximise the value of data.

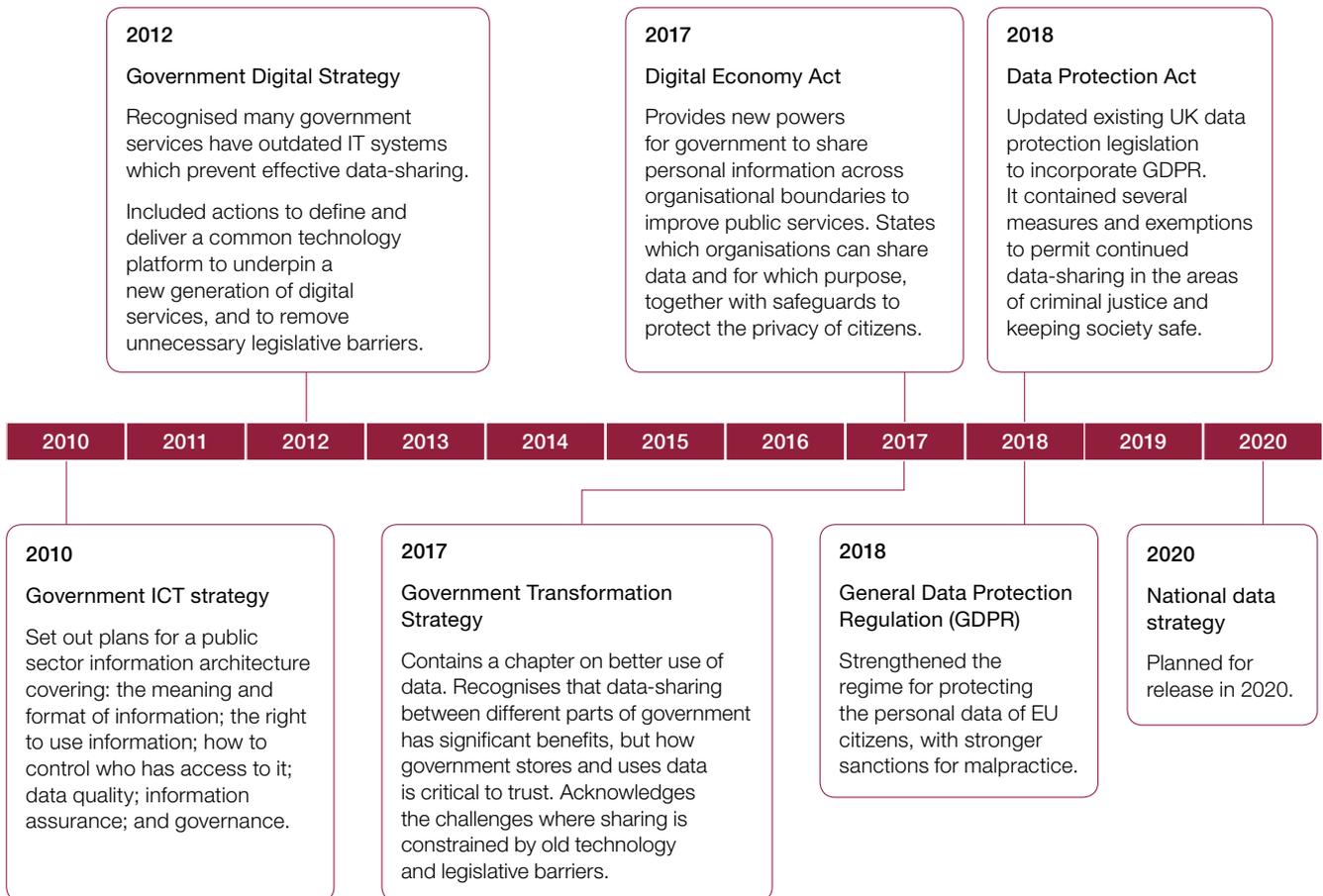
Figure 6

The history of government strategies and reports on using data across government

The government has introduced many initiatives and reviews over the past 20 years



Source: National Audit Office analysis of government initiatives to improve data



Part Two

Strategy and leadership

2.1 In this part we cover:

- strategic use of data;
- leadership, governance and accountability; and
- funding.

1 Understand the current landscape



Part One:
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Part Four:
Conditions

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Skills and appetite for change

Strategic use of data

2.2 The government says data is an important asset. In its 2017 digital strategy it stated that: “We must ensure data is used to its maximum potential within government to provide more efficient and responsive public services... Data is fundamental to what we do and vast quantities of data are collected, analysed and used every day”.⁶ However, government is not managing its data in a strategic way, as it does for other important assets. For example, the government has set up the Government Property Agency to support efforts to manage central government property strategically. Each department produces its own publicly available property strategy, in addition to the overarching strategy for government.⁷

2.3 Developing data strategies has not been a priority for departments. The Department for Digital, Culture, Media & Sport (DCMS) is the only department that specifically referred to data as a strategic asset in its single departmental plan.⁸ Five of the seven large customer-facing departments have their own data strategies, but these vary in their maturity. For example, in one department the strategy has been approved but no additional funding has been agreed to implement it. In some departments data strategies are still under development, or elements of data are incorporated into other strategies (Appendix Two).

Leadership, governance and accountability

Cross-government responsibility

2.4 While DCMS has the main responsibility for data, there are a range of other bodies involved. DCMS has responsibility for data policy and ethics and will produce the national data strategy. The Government Digital Service (GDS) has retained responsibility for data standards and leads on data skills and the digital, data and technology profession. The Office for National Statistics has retained its independent role in producing national and official statistics (Figure 5). In 2017, the government committed that by 2020 it would appoint a new chief data officer for government to lead on use of data.⁹ It has not done this yet.

6 UK Government, *UK Digital Strategy 2017*, March 2017. Available at: www.gov.uk/government/publications/uk-digital-strategy/uk-digital-strategy (accessed 12 June 2019).

7 Cabinet Office, *Departmental strategic asset management plan summaries*, February 2018. Available at: www.gov.uk/government/publications/departmental-strategic-asset-management-plan-summaries (accessed 12 June 2019).
Cabinet Office, *Government Estate Strategy 2018*, July 2018. Available at www.gov.uk/government/publications/government-estate-strategy-2018 (accessed 18 June 2019).

8 Cabinet Office, *Building a country that works for everyone: the government's plan*. Available at: www.gov.uk/government/collections/a-country-that-works-for-everyone-the-governments-plan (accessed 17 June 2019).

9 UK Government, *Government Transformation Strategy*, February 2017. Available at: www.gov.uk/government/publications/government-transformation-strategy-2017-to-2020/government-transformation-strategy (accessed 5 June 2019).

2.5 Some departments expressed concern about a lack of overarching leadership in government. They were uncertain if DCMS has the authority or mandate as a policy department to secure change. DCMS recognises these problems and acknowledges that the current situation is confusing. It acknowledges that it has not made the progress it expected in establishing its leadership or developing the national data strategy, largely because staff were diverted to EU Exit work. It wants to develop stronger, more coordinated governance, particularly on government use of data.

2.6 There are two cross-government groups on data – the Data Advisory Board and the Data Leaders Network.^{10,11} DCMS provides the secretariat function for these groups. The Data Advisory Board revised its Terms of Reference in January 2019 to include responsibility for the national data strategy, which includes promoting best practice and supporting development of cross-government policies and standards. It is also overseeing a cross-government project to improve data quality and accessibility, increase data use and improve public trust.

2.7 The Data Advisory Board has also commissioned a series of projects to look at the benefits of sharing data. It has projects looking at: cross-government eligibility (for example, eligibility for residency or free school meals); identification of vulnerable people; fraud, error and debt; and demand management (**Figure 7**).

2.8 It is too early to assess the impact or effectiveness of these boards, but we have previously commented that cross-government groups can often lack traction, authority or influence to change departments' ways of working (Appendix Three).

2.9 There is no central body with cross-government accountability for identifying datasets that are critical for government as a whole. In our report *Digital transformation in government*, we reported that, while the centre has concentrated on developing 'registers' (lists of how to write out and record features such as countries or local authority areas), there was little strategic overview of the data needs of departments.¹² Previous attempts to map the data landscape had stalled because of its fragmented nature and the burden of detail.

10 The Data Advisory Board is chaired by the chief executive of the civil service, with membership of permanent secretaries and chief data officers. The minutes show that permanent secretaries have sent representatives rather than attend in person. It last met in September 2018 with papers circulated for correspondence, including agreeing the revised Terms of Reference, in January 2019.

11 The Data Leaders Network is chaired and managed by DCMS, with representatives (mainly deputy directors) from the most data-rich departments. The Data Leaders Network aims to meet quarterly, although it did not meet between November 2018 and June 2019.

12 Comptroller and Auditor General, *Digital transformation in government*, Session 2016-17, HC 1059, National Audit Office, March 2017.

Figure 7**Data Advisory Board – Data-enabled change accelerator projects**

The Data Advisory Board commissioned a number of projects aimed at using data better

Area	Project title and purpose
Fraud, error and debt	<p>London Counter Fraud Hub To share data and analytics across London boroughs to detect and prevent fraud against councils.</p>
	<p>Cross-border debt To use Home Office data to help locate people who have left the country in debt to the Student Loans Company.</p>
	<p>Insolvency analytics Analytics to drive departmental improvements in tackling debt insolvency.</p>
Risk management	<p>Prison Stability To provide near real-time data about prisoners to front-line staff in prisons.</p>
	<p>Vulnerability Opportunity To improve prevention of human trafficking, by pooling data across criminal justice, social care and education, at the border.</p>
Demand management	<p>Office for National Statistics Business Data Spine To create a business data index and statistical business register for research purposes.</p>
	<p>Business Growth and Small and Medium-Sized Enterprises To use public and private data to predict which firms have high growth potential and connect those businesses to targeted support.</p>
	<p>Churchill data tool for digital skills To target provision for local industry needs and drive economic growth, including monitoring the efficacy of individual initiatives.</p>
	<p>Patient Flows To help policy-makers and local NHS decision-makers understand demands on accident and emergency departments and manage resources.</p>
Cross-government eligibility	<p>Home Office Automated Eligibility To develop a digital application process for the EU Exit Settlement Scheme – using HM Revenue & Customs and Department for Work & Pensions (DWP) data to establish the applicant's residence in the UK.</p>
	<p>Prescription Eligibility To enable pharmacies to check entitlement to free prescriptions with DWP data in real time.</p>
	<p>NHS Residency Eligibility To check entitlement to free NHS care using Home Office residency data.</p>
	<p>Tell Us About A Death To enable data related to a deceased person to be shared by health and social care providers with other government departments and service providers prior to formal death registration.</p>

Notes

- 1 These projects are at exploratory or pilot stages apart from London Counter Fraud Hub and Prison Stability which are more advanced.
- 2 Home Office Automated Eligibility has been live since 30 March 2019.

Source: National Audit Office analysis of Data Advisory Board papers

Responsibility, ownership and governance within departments

2.10 Departments have not historically considered data at board level. However, there are signs of improvement. Some departments have recognised that data needs more consideration at senior levels and have appointed chief data officers. The seven departments we reviewed all had a data governance board which provides direction and oversight of a department's data projects and data decisions. Chief data officers and those with equivalent responsibilities are establishing and refining data governance boards so that departments understand the data they have and create department-wide data rules and standards.

2.11 Most departments have not integrated data governance with their existing investment decision-making controls. For example, business cases do not need to include data availability or quality of data to assess performance, or the costs involved in cleaning data into a usable format for analysis. Some departments are making progress. For example, at the Home Office business cases over a certain value must include information on how it will deal with data to pass through the 'technical design authority', one of its gateways to funding. HM Revenue & Customs' technical governance ensures new projects adhere to its internal data standards. HM Treasury has refreshed its business case guidance to consider availability of data.

Funding

2.12 Data projects are sometimes set aside when funding is under pressure. Schemes to provide basic data improvements do not always receive sustained priority for investment. For example, while the Department for Business, Energy & Industrial Strategy has produced a business-wide data strategy, it has not received additional funding to help make it possible.

2.13 It can be difficult to make the case for funding stand-alone data projects, for example to build a departmental data model, define data standards, or improve the quality of data as it comes into a department. These types of data 'plumbing' projects are likely to require longer-term planning, and the benefits may only be seen in future activities.

2.14 A lack of understanding of the current costs involved in cleaning, combining and improving data exacerbates the challenge. People do not monitor the time or costs involved in sorting poor-quality, disorganised data. Some departments suggested they spent between 60% and 80% percent of their time cleansing data. One department suggested it used 300 people to combine and clean data from across the country to be able to carry out a large, national-level analysis.

2.15 Current civil service funding and performance-monitoring arrangements hold government departments to account individually. This means they do not support cross-departmental working, where one or more departments need to contribute resources to support another department to achieve its objectives. The costs and benefits of cleaning up or matching data may sit with different organisations. It is encouraging that HM Treasury has said it will support cross-departmental funding bids for the next Spending Review. The Data Advisory Board (paragraph 2.6) is planning to submit a cross-government bid to coordinate action on data across departments.

2.16 High-profile policy proposals can provide the impetus to get good data-sharing arrangements in place. For example, HM Revenue & Customs (HMRC) shares real-time PAYE information (known as RTI) with the Department for Work & Pensions (DWP) (**Figure 8**) so that DWP can calculate entitlement to Universal Credit. This was a complex project, with data architects from HMRC working with DWP for several years to make the data systems compatible. This shows how policy imperatives, collaborative working and continued commitment despite the difficulties and complexities, can achieve results.

Figure 8

Case example: Real Time Information (RTI)

Policy imperatives, collaborative working, continued resourcing and commitment to continuing despite the difficulties and complexities, can result in a positive outcome

Main departments: Department for Work & Pensions (DWP) and HM Revenue & Customs (HMRC).

Description: HMRC shares RTI with DWP for administration of Universal Credit.

Objectives:

- HMRC – a PAYE system using real-time information fit for a more flexible labour force to reduce the need for tax adjustments after the year end; and reducing errors in tax credits.
- DWP – a new dynamic benefits system (Universal Credit) making it easier to adjust benefit entitlement as people move into work; reducing form-filling and designing-out fraud and error.

Customers: HMRC and DWP.

What happened

Since 2012, the departments have worked closely together, with staff embedded in each other's teams. HMRC temporarily moved some of its RTI data architects to DWP. It took several years to build and mature the system.

DWP uses RTI to refer to the raw data it receives from HMRC, and RTE (real-time earnings) as the processed version to meet DWP's needs. For example, occasionally an employer may make a duplicate RTI submission. This is not time-critical for HMRC as it can sort out the data later, but it is important for DWP as it affects a claimant's entitlement. DWP performs checks to identify and disregard duplicate submissions.

Outcome

DWP uses RTE within Universal Credit to automatically calculate benefits. At this stage, RTE meets DWP's needs, although it is yet to formally measure fraud and error through this system. Initially DWP's focus was on getting the data for Universal Credit. DWP has also started to use RTI data to check information provided by benefit claimants on other means-tested benefits, for example Carer's Allowance.

Why this is important

Using RTI has the potential to reduce errors in payments of Universal Credit. Underpayments and recovery of overpayments cause hardship to claimants. Overpayments result in loss of public funds and take time to recover.

Source: National Audit Office analysis of interviews and documents from Department for Work & Pensions and HM Revenue & Customs

Part Three

Data, processes and technology

3.1 In this part we examine:

- data quality;
- data standards; and
- departments' IT systems.

1 Understand the current landscape



Part One: Introduction

Benefits of using data well

Current responsibilities

Previous initiatives

2 Have a clear understanding of what it is trying to achieve



Part Two: Strategy and leadership

A clear strategy in place

Leadership and accountability

Funding to make it possible

3 Have the infrastructure in place to make it work



Part Three: Data, systems and processes

High-quality data

Data standards to improve consistency

Systems and tools which talk to each other

4 Have the conditions in place to make it work



Part Four: Conditions

Safeguarding data and securing public trust

Legislation to enable change

Skills and appetite for change

Data quality

3.2 High-quality data provides government with opportunities to deliver policies effectively and efficiently. However, perfect data is both impossible to achieve and is very costly, so departments must ensure that the data they hold is ‘good enough’ for the purpose required, which will vary depending on its use and potential re-use. Data quality can diminish over time as systems age, so departments need to regularly assess if quality is retained. The Windrush situation gives an example of the potential consequences of poor-quality data (**Figure 9** overleaf). The Home Office undertook elements of data-sharing activities without fully assessing the impact of the quality of the underlying data. Separately from Windrush, since summer 2017 the Home Office has been developing a data quality management model for its Borders, Immigration and Citizenship System.

3.3 In our work, we commonly find that departments cannot assess their effectiveness because of inadequate data.¹³ For example, we have found that the Department for Education did not collect any data from academies and maintained schools apart from annual financial information.¹⁴ In our report on *Supporting disabled people to work* we found the Department of Work & Pensions’ (DWP’s) approach to designing management information meant there were gaps in its understanding of how its jobcentres were providing services to disabled people.¹⁵ We also found that the Ministry of Justice (MoJ) made changes to the way probation services were delivered without adequate data (on the previously existing probation services’ methods and costs).¹⁶

¹³ By inadequate data we mean data which may be of low quality or where data does not exist to allow departments to make informed decisions.

¹⁴ Comptroller and Auditor General, *Academies and maintained schools: Oversight and intervention*, Session 2014-15, HC 721, National Audit Office, October 2014.

¹⁵ Comptroller and Auditor General, *Supporting disabled people to work*, Session 2017–2019, HC 1991, National Audit Office, March 2019.

¹⁶ Comptroller and Auditor General, *Transforming Rehabilitation*, Session 2015-16, HC 951, National Audit Office, April 2016.

Figure 9

Case example: Windrush

Using poor-quality data can have consequences

Main departments: Home Office.

Description: The Home Office shared with other departments and organisations data on individuals it considered to be in the country illegally. The other organisations matched data against their own records to deny or restrict access to services.

Objectives: Enforcement of the ‘compliant environment’ (formerly known as ‘hostile environment’) immigration policy.

What happened

Our report into the experience of the Windrush generation considered whether the quality of the Home Office’s data was a factor in people being wrongfully detained, removed or denied access to services. A number of external reviews and inspections had raised concerns that the Home Office did not take enough care to ensure the information on which action was based was correct. For example:

- 16 out of 57 records reviewed were wrongly counted towards removal statistics. These errors also resulted in some people who had complied fully with immigration legislation being misidentified as overstayers;
- 17 out of 169 cases where a search of the ‘Cifas’ counter-fraud database by a financial institution for a prospective customer had resulted in a match on the list of ‘disqualified persons’ should never have been listed, or should have been removed from the list; and
- a small number of individuals were wrongly flagged to the Driver and Vehicle Licensing Agency as present in the UK without leave, exposing them to the risk of having their driving licences incorrectly revoked.

Outcome

Parts of data-sharing were suspended. The Joint Committee on Human Rights expressed concerns that lessons should be learned so that EU citizens who hold, but are unable to demonstrate, legal entitlement to remain in the UK following EU Exit are not subject to similar experiences.

The Committee of Public Accounts recommended that in its design and roll-out of its new case management system, the Department should prioritise improving the quality of its data.

Why this is important

Policy was developed and implemented without understanding the limitations of the data it depended on. The Committee of Public Accounts concluded that the Home Office was “making life-changing decisions on people’s rights, based on incorrect data from systems that are not fit for purpose.”

Source: Comptroller and Auditor General, *Handling of the Windrush situation*, Session 2017–2019, HC 1622, National Audit Office, December 2018. HC Committee of Public Accounts, *Windrush generation and the Home Office*, Eighty-Second Report of Session 2017–2019, HC 1518, March 2019

Data standards

3.4 While most departments have set their own standards, it is important that data is presented in a consistent way, so that an individual, organisation, event or location can be linked across system and organisational boundaries if or when it is legally and legitimately required. Without a consistent customer record identifier, data on individuals cannot be easily merged when necessary (**Figure 10** overleaf). Across just 10 government bodies we found more than 20 different identifiers being used. This included several different ways of identifying businesses used across HM Revenue & Customs, the Office for National Statistics (ONS) and the Department for Business, Energy & Industrial Strategy. There are no standards in place for storing name, date of birth and address. An individual can be recorded differently in each government system. For example, Sam Jackson on one department's system may be Samantha Jackson on another.¹⁷

3.5 The challenge that departments and government face in implementing standardised ways of recording information is balancing the benefits and drawbacks of their introduction. Introducing consistent ways of recording standard customer information will take time to embed and will require effort to assure compliance. There is also a trade-off between organising data for maximum value, and the burden it places on the information provider adhering to a stricter format.

3.6 An understanding of the costs and time spent on working around discrepancies in systems could provide some valuable information for government on how and where to focus resources. For example, where names vary across systems, where National Insurance numbers may not match or where data is recorded differently in differing local systems. In our discussions departments have suggested that between 60% and 80% of time is spent cleaning and merging data. In some areas this can equate to several hundred analysts' time.

3.7 ONS has started to develop data standards, although these focus more on data management than on underlying data fields. The standards aim to ensure that ONS adopts a consistent, rule-based approach to data management and complies with its data and statistical policies. The Government Digital Service is also focusing on developing standards to support data exchange, but not on how to store data in the underlying systems.

¹⁷ Similar challenges come from comparing addresses, where minor differences from one file to the next may fail to match an individual's records. However, a solution is available. Some local authorities use the Unique Property Reference Number (UPRN) as their source for addresses, to provide a strict standard to collection of address information. The government is looking at opening geospatial identifiers such as the UPRN (jointly owned by the Local Government Association and Ordnance Survey) to expand their adoption and utility in both public and private sectors.

Figure 10

Selected examples of identifiers used for citizens and businesses

There are more than 20 identifiers for people and businesses

Department	Customer record identifier
Identifiers for individuals and addresses	
Local government – registers of births	Name, date and place of birth, parents' names and occupations
Local government – electoral roll	Name, address, date of birth
Local government – council tax	Council tax reference number
Department for Work & Pensions	National Insurance number Benefit number (which differs for each benefit)
Department of Health & Social Care	NHS number Hospital number (each hospital has own record system) Medical Certification of Cause of Death register (not the same as the local authorities' registers of deaths)
HM Revenue & Customs	National Insurance number Unique taxpayer reference
Department for Education	Unique learner identifier Education provider identifier
Ministry of Justice	Her Majesty's Prison & Probation Service unique offender identifier Parties' names
Home Office	Passport number/biometrics Police National Computer identifier/biometrics Criminal Records Office identifier
Office for National Statistics – census	Address, names, dates of birth
Cross-government	Gov.uk Verify identifier Government gateway identifier
Driver & Vehicle Licensing Agency	Driver's licence number Vehicle registration number
Identifiers for Businesses	
HM Revenue & Customs	Business trading names VAT registration numbers Economic operator registration and identification number (imports/exports) Other tax- and duty-specific registration numbers (different for each tax or duty)
Companies House	Company registration number
Office for National Statistics – business register	VAT or PAYE numbers

Source: National Audit Office analysis of key government datasets

Departments' IT systems

Data in legacy systems

3.8 Most of government's data resides in its legacy systems.¹⁸ In our report *Managing the risks of legacy ICT to public service delivery*, we reported that some legacy systems can be inflexible. This can lead to poorly organised data, such as the lack of a single view of a customer.¹⁹ For example, NHS England has mandated the use of the NHS number as the health service's common patient identifier; however, many hospitals have had to persist with their own hospital record number because some software systems are unable to accommodate the longer number of digits in the NHS number.

3.9 In our report on *Carer's Allowance* we commented that while the DWP used data-matching tools to help detect incorrect payments of Carer's Allowance, some of the systems that they matched against required manual intervention.²⁰ The newer systems provide more timely and accurate data matches, but the underlying data does not provide all the information that DWP needs, such as length of employment or allowable expenses. Officials looking at these matches therefore need to validate the carer's circumstances manually and a shortage of staff to do this led to significant backlogs of cases.

3.10 Often departments have produced a new customer interface, for example rolling out the online application for the state pension, without fundamentally reconsidering what data their department needs and whether the current data remains fit-for-purpose. In our report *Digital transformation in government*, we reported that 17 of the government's 'Exemplar' programmes largely redesigned the user interface online and linked it to a pre-existing system.^{21,22}

3.11 Government has invested in technology and new analytic tools, but this does not guarantee that data in the systems is of good enough quality. Government is exploring the use of new technology, such as robotic process automation and artificial intelligence in developing public services. These have the potential to achieve large-scale efficiencies longer-term through delivering accurate and tailored services to individual customers. However, layering new technology on top of existing data carries a significant risk of magnifying rather than overcoming the problems associated with data quality, for example if calculations cannot be adequately tested.

18 We define these as systems and applications that have been operationally embedded within a business function but have been overtaken by newer technologies or no longer meet changed business needs.

19 Comptroller and Auditor General, *Managing the risks of legacy ICT to public service delivery*, Session 2013-14, HC 539, National Audit Office, September 2013.

20 Comptroller and Auditor General, *Investigation into overpayments of Carer's Allowance*, Session 2017-2019, HC 2103, National Audit Office, April 2019.

21 Comptroller and Auditor General, *Digital transformation in government*, Session 2016-17, HC 1059, National Audit Office, March 2017.

22 As part of the 2012 Government Digital Strategy the Cabinet Office and departments identified 25 high-volume transactional services for end-to-end service redesign. These services were known as the Exemplar Programme and were expected to be made available to the public by March 2015.

Policy-based systems

3.12 Departments have historically developed IT systems to support specific policy objectives. They do not consider wider data needs when setting up new policies. Systems within a single department have been designed separately without building in ways that they could merge data easily. As government has sought to move to ‘customer-centred’ services, the lack of common data models, taxonomies and standards within and across departments makes it difficult and costly to maximise the value of their data.

3.13 The problem is replicated across government. For example, the different criminal justice bodies (police, prosecutors, courts, prisons and probation) each collect and organise data in different ways due to differing constitutional boundaries. This makes it difficult to assess the effectiveness of different interventions on, for example, reoffending because an individual cannot be linked easily across systems.

3.14 MoJ has been working to ‘join up’ the criminal justice system for many years. It aims to produce a ‘common platform’ to standardise data across the criminal justice system. However, this relies on around 60% of the data coming from individual police forces, which have inconsistent standards for data capture and quality. It is difficult to see how such initiatives can succeed unless government sets standards for consistency, such as how to record dates, places, and individuals’ and organisations’ names across government.

Using application programming interfaces

3.15 The Government Digital Service recommends that, wherever possible, departments use application programming interfaces (APIs) as simple and effective ways of sharing data across multiple sources. An API is a set of rules and specifications (similar to a short computer program) that enables different systems to communicate with each other.

3.16 Departments can use APIs to extract information from legacy systems, which helps to improve exchange of information and enable data-sharing. However, APIs will not on their own resolve all the issues without proper standards and a clear data model being in place. Furthermore, while it may be technically possible to introduce APIs into a legacy environment, some departments have found that it can be a difficult and expensive process (**Figure 11**).

Figure 11

Using application programming interfaces (APIs)

The Department for Business, Energy & Industrial Strategy's 'Joined-Up Business Information' project team assessed the practicality of using published APIs in an automated way to simultaneously access a number of databases

Benefits

Avoids the need for duplication.

Links directly to source in real time.

Reduces the costs of maintaining records.

Challenges

APIs may struggle under load, particularly where there is high throughput.

High error rates, particularly where data tables are not correctly indexed or not optimised.

Lessons for consideration

The team drew on an 'Accountability hackathon' event in 2015, which explored the potential opportunities for using data more effectively via existing public APIs. The learning points were:

- a 'top down' approach is needed in conjunction with a 'bottom up' approach to define data models, templates and standards. This ensures a clear vision of the end state, consistent approaches to building data solutions and improved interoperability of data;
- technical requirements (performance, stability, security) should be defined before the build to ensure solutions are fit-for-purpose, scalable and secure; and
- data quality is a large problem and will take time to fix.

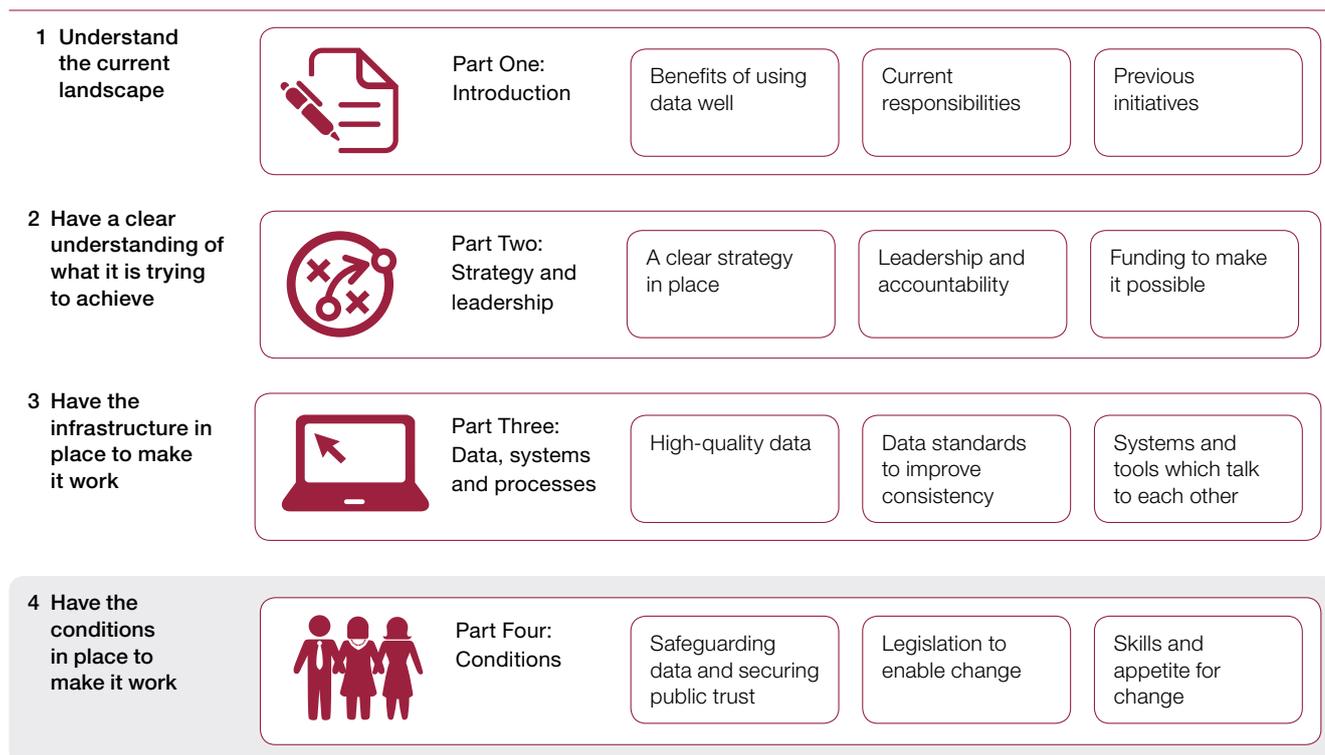
Source: National Audit Office analysis of documents provided by the Department for Business, Energy & Industrial Strategy

Part Four

Conditions

4.1 In this part we examine:

- safeguarding data and securing public trust;
- legislation to enable change; and
- skills and appetite for change.



Safeguarding data and securing public trust

4.2 Government's use of data is shaped by the need to keep it secure. It also must demonstrate that it is being reasonable and ethical in the way it uses data, which is especially pertinent for data about individuals. Digital ways of working and risks of criminal attacks on organisations' data means that keeping data secure has become ever more important.

4.3 Departments and public bodies are responsible for safeguarding their own information, but each department makes its own decision on what data they think is most important and how they prioritise protection of those assets. Since 2010, government has decided that it needs centrally driven cyber strategies to ensure the UK effectively manages its exposure to these risks. Our recent report on *Progress of the 2016–2021 National Cyber Security Programme* found that government established the programme with inadequate baselines for allocating resources, deciding on priorities or measuring progress effectively.²³

4.4 Departments are accountable for keeping their own data secure in accordance with cyber security rules and the General Data Protection Regulation (GDPR). Some departments expressed concern about the safety of their data if they share it with others, especially if they cannot confirm the security arrangements in other organisations. While understandable and right, this can discourage opportunities to use data to its full potential.

4.5 In our report on *Mental health in prisons* we found that concerns about confidentiality can restrict healthcare teams from sharing information with prison staff on a prisoner's mental health needs. This makes it difficult for prison officers to respond.²⁴ We reported that staff at one prison addressed this problem by asking patients to consent to their information being shared with prison staff.

²³ Comptroller and Auditor General, *Progress of the 2016–2021 National Cyber Security programme*, Session 2017–2019, HC 1988, National Audit Office, March 2019.

²⁴ Comptroller and Auditor General, *Mental health in prisons*, Session 2017–2019, HC 42, National Audit Office, June 2017.

Public trust

4.6 GDPR came into force in May 2018 and the government updated the Data Protection Act 2018 accordingly. GDPR alters how businesses and public sector organisations handle the information of their customers. It boosts the rights of individuals and gives them more control over their information. The public sector has invested significant time and resources to adapt and change their policies, processes and practices to comply with GDPR.

4.7 GDPR has heightened citizens' interest and understanding of their rights to privacy. Well-publicised reports of misuse of data, such as those surrounding Facebook's sharing of data with private companies, have increased concerns about how information may be used, shared and exploited. For example, at the initial stages of the 'care.data' programme, there was insufficient focus on how to gain patient acceptance to share their data. NHS England eventually cancelled care.data following opposition from GPs as well as patients (**Figure 12**).

4.8 Legitimate sharing of data can have significant benefits. There are efforts to alleviate citizens' concerns by increasing communication and understanding of how data might be used by others. The Department of Health & Social Care has supported an independent initiative led by the Wellcome Trust called 'Understanding Patient Data'. The purpose is to enable conversations with the public about how and why data can be used for care and research, for example explaining how this can support the development of new treatments, what is allowed and what is not, and how personal information is kept safe.

4.9 If data-sharing initiatives are to be trusted and supported by the public, it is important that communication is not just about trying to persuade people of the benefits, without addressing the risks and being responsive to their concerns. For example, Understanding Patient Data undertakes and collates research into public views and perceptions about health data use and feeds these into policy and governance decision-making discussions, to help create more trustworthy systems for using data.

4.10 Transparency, communication and clarity about the way in which data is used are necessary for building public trust, and for providing the confidence to share data legitimately. For example, HM Revenue & Customs publishes its data-sharing arrangements. This has benefits on several levels: for its staff, to know whether it is safe and legal to respond to a data request; for other organisations, to know if an agreement is already in place; and citizens, to understand who else may see their tax data.

Figure 12

Case example: Care.data

A data-sharing initiative did not give enough consideration to trustworthiness issues**Main departments:** NHS England, NHS Digital.**Description:** Joining up general practice (GP) medical records with hospital records.**Objectives:** To connect patient information across all NHS-funded services and make it available to those who plan and seek to improve those services, including clinicians, researchers, medical charities and commercial organisations.**What happened**

The programme initially focused on establishing a national GP dataset and linking it to Hospital Episode Statistics.¹ Patients were given the right to opt out of (i) sharing personal data held in their GP record with the Health and Social Care Information Centre (HSCIC, now known as NHS Digital), and (ii) sharing any information on them held by HSCIC from which they could be identified.

The programme paused in early 2014 after being criticised for failing to adequately communicate to patients how their data would be used and their rights to opt out. Around the same time, the HSCIC itself came under scrutiny over releases of personally identifiable data by its predecessor organisation. A review concluded that there had been lapses in the strict arrangements in place to ensure that people's personal data would never be used improperly. The report stated that to earn the public's trust in future, HSCIC must show that its controls were "meticulous, fool-proof and solid as a rock".

Against this background, in September 2015 the National Data Guardian for Health and Social Care undertook a review of security, consent and opt-outs. The proposed new opt-out model went further than the arrangements that had been proposed for care.data. The report recommended that government should consider the future of the care.data programme.

Outcome

Following publication of the report, NHS England took the decision to close the programme.

Why this is important

Information is essential to maintain and improve the quality of care for the whole community. It helps the NHS and social care organisations to provide the right care in the right places and it enables research to develop better care and treatment. Using information for these purposes depends on patients' trust.

Note

1 Hospital Episode Statistics contain details of all admissions, outpatient appointments and accident and emergency attendances at NHS hospitals in England.

Sources: Sir Nick Partridge, *Review of data releases by the NHS Information Centre*, June 2014. National Data Guardian for Health and Social Care, Dame Fiona Caldicott, *Review of Data Security, Consent and Opt-Outs*, July 2016

Legislation to enable change

4.11 Many people in government believe legislative barriers limit their ability to use and share data in the public sector. Government sought to overcome some of these barriers by changing the law. In April 2017 it passed the Digital Economy Act (the Act), which changed the legislation to make sharing of data possible.²⁵ This includes enabling the sharing of personal data between public authorities to improve how public services are delivered to improve the well-being of individuals and households. The Act also covers the disclosure and exchange of personal data for the prevention of fraud and the recovery of debts owed to the public sector.

4.12 The Information Commissioner's Office advises government on sharing data confidently and legitimately. The government consulted the Information Commissioner's Office regarding the consistency of the codes of practice issued under the Act and GDPR. However, the codes are necessarily at a high level because they apply across a wide range of public bodies. Some departments have therefore mistakenly believed they cannot apply the rules to their own circumstances.

4.13 The time taken to establish information-sharing agreements under the various powers within Part 5 of the Act will vary. Some information-sharing agreements can take several months to come to fruition. There is a public service Delivery Review Board which considers proposals for new usage of the public service delivery power.²⁶ Once the board has accepted the proposal, it provides advice to the minister, who must ultimately agree or disagree to the proposal (**Figure 13**). This is a lengthy process, which could act as a disincentive to pursuing data-sharing opportunities.

²⁵ The information-sharing powers within Part 5 of the Act became fully operational in July 2018 when the codes of practice associated with them were approved by Parliament and published. They enable the sharing of information between specified organisations for specific purposes.

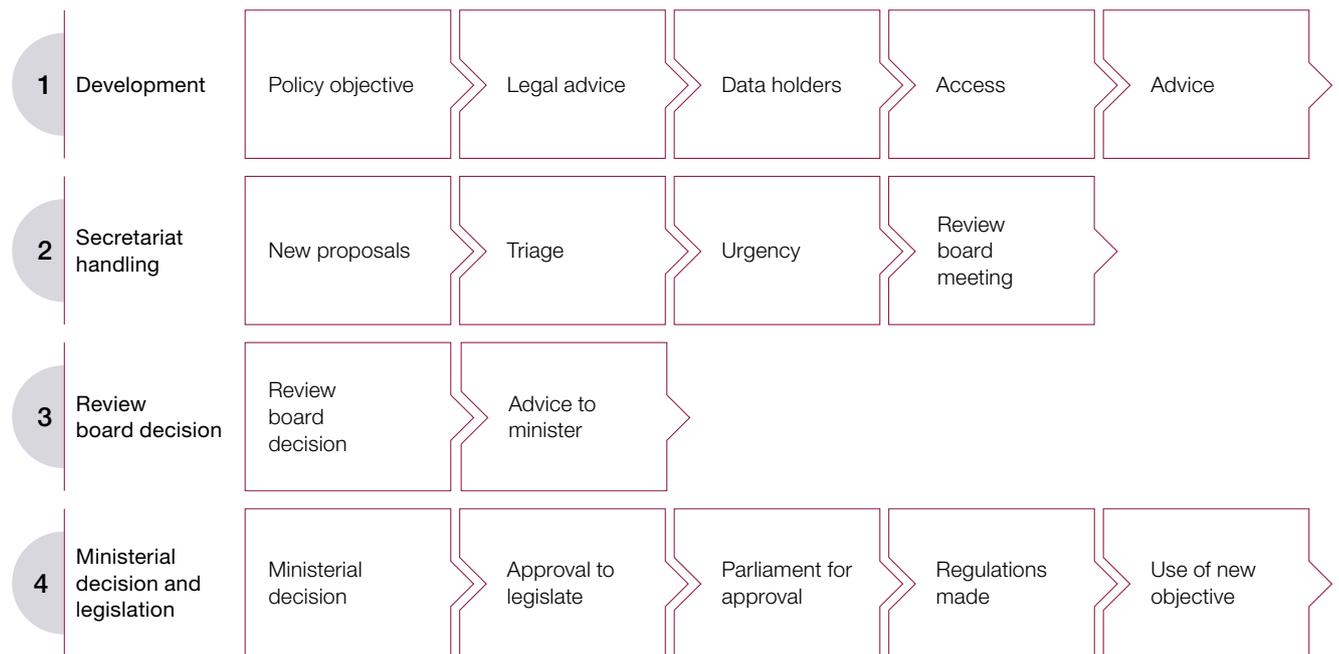
²⁶ Each area of the Digital Economy Act has its own review board to consider proposals for data-sharing under the powers of the Act.

Figure 13

The process for creating a new objective for sharing information under the public service delivery power (chapter one of Part 5 of the Digital Economy Act)

There are a number of steps to creating a new objective for information-sharing

Process overview



Source: Department for Digital, Culture, Media & Sport

Skills and appetite for change

Ways of working

4.14 Sharing data is difficult and may be expensive and ultimately unsuccessful unless organisations understand one another before they start commissioning technological solutions. One example of a challenge that impacts on individual and business support is historic ways of working (**Figure 14**).

4.15 Similarly, the Data Advisory Board (paragraph 2.6 and Figure 7) noted that data initiatives with a positive return on investment for government would not necessarily provide a return on investment for the department investing in the resourcing and infrastructure. We know from our work that civil servants are used to working within departmental boundaries, which is an extra hurdle to setting up and maintaining cross-departmental initiatives, including data-sharing.²⁷

Figure 14

Case example: Centre of Excellence for Information Sharing

One of the greatest challenges impacting on both individual and business support was historic ways of working

Main departments: Initiative jointly funded by the Department for Education, Department of Health, Department for Work & Pensions, Home Office and Department for Business, Innovation & Skills.

Description: An initiative to encourage and explore how to overcome barriers to data-sharing at local level.

Objectives: The Centre was set up in 2014 to work with local and central government departments to investigate, challenge and overcome cultural barriers to information-sharing.

What happened

The Centre drew on research to show that focusing only on data-sharing can lead to confusing assumptions about the nature of what is being shared, for what purpose and with what intent. The Centre's work showed that existence of an information-sharing agreement or protocol is not on its own enough to resolve all information-sharing issues. Taking a technological approach as the starting point is also rarely successful; and being sensitive to the cultural issues is a more fruitful way of approaching the situation. The Centre found that one of the greatest challenges impacting on both individual and business support was historic ways of working. Working with partners, building relationships, consulting, communicating and developing trust are all required to make information flow. The Centre published numerous case studies on its website to illustrate these points.

Outcome

Funding was not maintained, and the Centre closed in June 2018.

Why this is important

Sharing data is difficult and may be expensive and ultimately unsuccessful unless organisations understand each other before they start commissioning technological solutions. Partners may have different priorities; different legal constraints; data that is quite different as it is used for different purposes; different systems in which the data is held and secured; and different arrangements and costs for extracting data. Jointly exploring and resolving these issues builds the trust and confidence needed to share data.

Source: Centre of Excellence for Information Sharing, 2019. Available at: <http://informationsharing.org.uk/> (accessed 12 June 2019)

²⁷ Comptroller and Auditor General, *Building capability in the Senior Civil Service to meet today's challenges*, Session 2013-14, HC 129, National Audit Office, June 2013.

4.16 The Office for National Statistics (ONS) has worked to make it as easy as possible for local authorities to work together to provide council tax data for the 2021 census. ONS identified that three companies provide the revenue and benefits systems for all but two of the 380 local authorities that collect council tax. ONS worked with these companies to develop software to automatically extract the data each month. ONS will provide this software to local authorities for free. It has also developed a secure transfer system; a standard data protection impact assessment; and a data-sharing agreement for local authorities to use if they wish. More than 100 local authorities have signed up to provide the data so far. Others are yet to reply or are seeking further clarification from the ONS. Only 21 have refused.

Improving skills, capability and understanding

4.17 Departments need to have skills at several levels: to understand how to use legislation appropriately for legitimate data-sharing; to know the limitations of the data they hold; and what is needed to fix the problems. Those at senior levels need to understand the implications of poor data to help provide the influence at higher levels and gain traction for improvements.

4.18 Departments may also find it beneficial to enhance the skills and understanding of executive board members to raise their awareness of the importance of good-quality data to their business. For example, the Ministry of Housing, Communities & Local Government has provided training for chief executives and political leaders in local authorities to help support better use of digital services across local areas.

4.19 Some departments have previously struggled to understand how to share data effectively for research, but departments are starting to understand how best to support the needs of others. For example, the Department for Education previously shared around 500 different versions of the national pupil database with several hundred different organisations (for research, statistics and policy development). Its new chief data officer recognised the risk and placed the national pupil database in a secure environment with access limited to accredited parties.

4.20 The Digital Economy Act has so far not given departments the reassurance they need to be confident about sharing data legally. Our discussions with departments have shown us that they would welcome more support on how to use the Act appropriately to support data-sharing. The Department for Digital, Culture, Media & Sport is undertaking a series of roadshows to help support people to use the Act and understand where it might be appropriate. This will include case examples which can be helpful for users. It is also developing a data processing and sharing framework to help departments.

Appendix One

Our audit approach

Scope

1 This report draws together our experience of government's use of data. It reports what we see as the challenges and barriers which have limited government in making the progress it expected from previous attempts to improve the use of data. We have set out our thinking on what is needed to improve using data across government so that data is used effectively to improve services and make better decisions.

We have examined if:

- there is strategy and leadership in place within and across departments to support better use of data;
- the infrastructure is in place to support successful use of data; and
- the conditions are in place to support successful use of data.

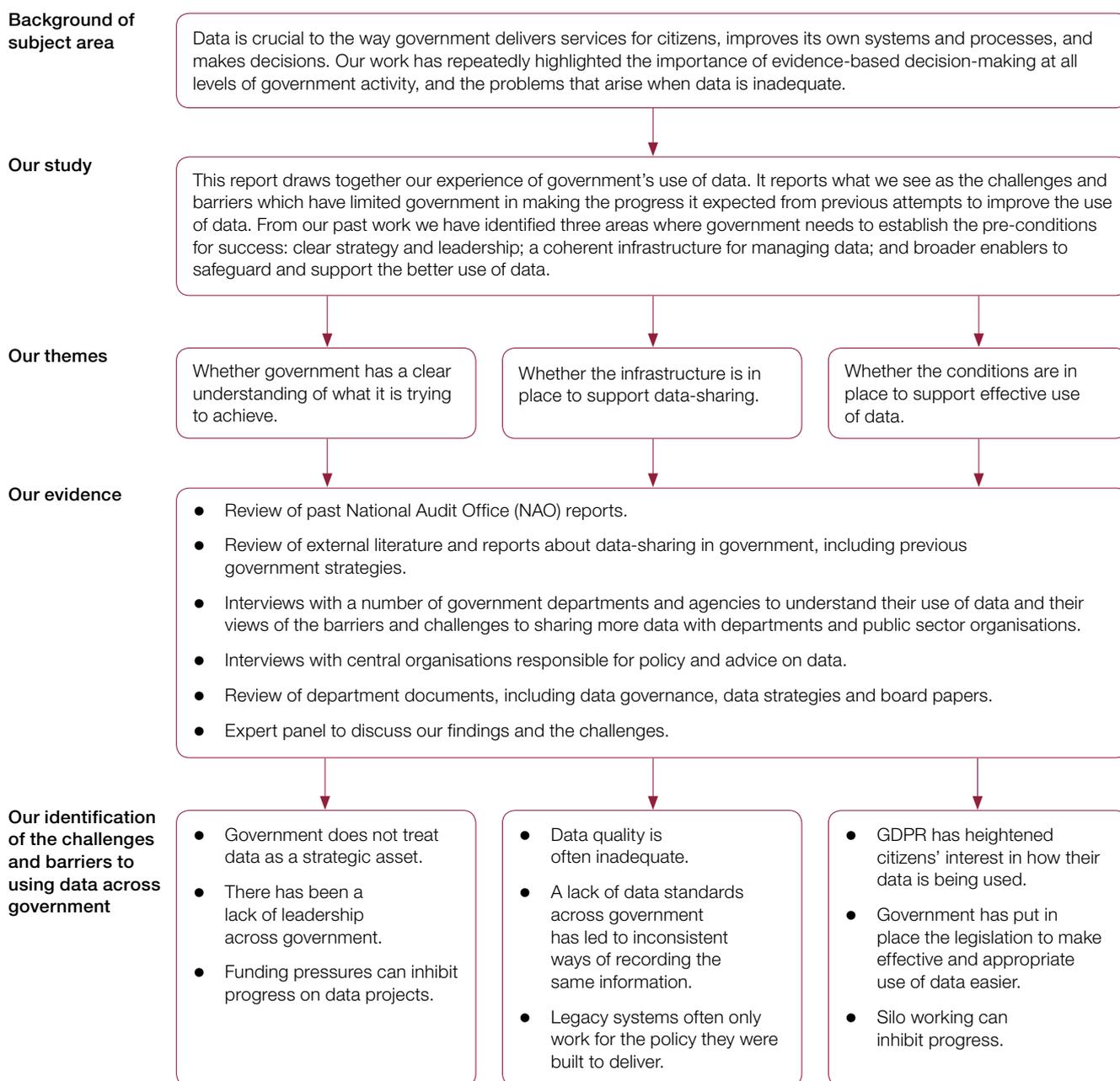
2 Our approach to our landscape review is shown in **Figure 15**.

Methods

3 We have based our analysis primarily on a review of our published reports and supplemented this review with interviews and documents from across government organisations. We undertook our fieldwork between January and April 2019.

Figure 15

Our landscape approach



4 We interviewed relevant officials responsible for central coordination of data or funding, including:

- Department for Digital, Culture, Media & Sport
- Government Digital Service
- HM Treasury
- Information Commissioner's Office
- Office for National Statistics.

These interviews were designed to help us understand the role of the centre of government in coordinating efforts to improve data use across government and arrangements in place to support departments.

5 We interviewed officials at chief data officer level or similar with responsibilities for data from the following departments, agencies and organisations with public or business-facing roles:

- Department for Business, Energy & Industrial Strategy
- Department for Education
- Department of Health & Social Care
- Department for Work & Pensions
- Driver and Vehicle Licensing Agency
- HM Passport Office
- HM Revenue & Customs
- Home Office
- Local Government Association
- Ministry of Housing, Communities & Local Government
- Ministry of Justice
- NHS Digital
- NHS England.

These interviews were designed to help us understand what departments do to understand and manage their own data needs and how they can work with other departments to improve services and standards.

6 We reviewed relevant documents at seven central government departments and executive agencies that members of the public interact with. The documents included data strategies, data governance arrangements and board papers to assess the importance that departments place on their data to run their business. We assessed these documents against a standard NAO framework looking at: strategy; business alignment; and governance.

7 We held an expert panel discussion on 1 May 2019 with 19 organisations from inside and outside government. We used the discussion to test our emerging views of the challenges and barriers faced by government.

8 We reviewed relevant external literature and reports relating to data-sharing.

9 From our reviews and discussions with departments and agencies we identified case examples which demonstrate the challenges faced or successes achieved through departments' attempts to share data.

Appendix Two

Analysis of departmental data strategies and documentation

Figure 16

Analysis of departmental data strategies and documentation

	Department A	Department B	Department C
Strategy			
The organisation has an enterprise-wide data strategy	Yes	Yes	Yes
The strategy is consistent with the organisation's overall objectives	Yes	Yes	Yes
The strategy has active business ownership and commitment	Yes	Need is recognised for a very senior champion to reduce risk of de-prioritisation	Yes
There is a road map for data improvements	Yes	Under development	Under development
Ongoing and development costs of data services are understood	Yes	Not currently in place but need to do so is acknowledged	Unable to determine based on information provided
Data changes and migration activities are planned and costed into business cases	Yes	Business case templates recently updated to include alignment with the overall data strategy	Under development
The burden on front-line staff and service users to capture quality data is recognised and managed	Yes	Not currently in place but need to do so is acknowledged	Unable to determine based on information provided
The cost of poor-quality data has been quantified	Unable to determine based on information provided	Not currently in place but need to do so is acknowledged	Some work undertaken in real-time information and Child Benefit areas

Department D	Department E	Department F	Department G
Under development	No overall strategy but emerging in some business areas	Yes	Yes, although high level
Yes, at a high level	No overall strategy but emerging in some business areas	Unable to determine based on information provided	Yes, explicitly linked to core services
Unable to determine based on information provided	No overall strategy but emerging in some business areas	Strategy has senior buy-in from permanent secretary but no additional funding provided	Unable to determine based on information provided
Not in document set provided, although there is a reference to a five-year plan under development	Being developed in one business area	A draft work plan was prepared that has only been partially delivered due to limited funding for the project	Unable to determine based on information provided
Unable to determine based on information provided	Unable to determine based on information provided	Costings provided for specific activities set out in the strategy	Unable to determine based on information provided
Unable to determine based on information provided	The need is recognised in one of the business areas	Unable to determine based on information provided	Unable to determine based on information provided
Not currently in place but need to do so is acknowledged	Recognised in one of the business areas	Under development in some areas	Unable to determine based on information provided
Metrics not currently tracked – being addressed as part of data strategy and strategic architecture	Not currently measured department-wide although some areas track data	Yes, explicitly quantified in terms of cost and lost productivity	Unable to determine based on information provided

Figure 16 *continued*

Analysis of departmental data strategies and documentation

	Department A	Department B	Department C
Business alignment			
Data is treated as a strategic asset	Yes	Commitment to investing in data is subject to costs and benefits analysis	Data is treated as a strategic asset in only some business areas
Information flows easily to where it is needed to support business activities	Yes	No	Partly
There is a shared data model across the organisation	Yes – enterprise data model exists	Model under development that has potential to be organisation-wide	Yes – enterprise data model exists
The data model is recognised and supported by all business areas	Yes – as a target structure for new data storage systems	Some indications of divergence	In progress
Governance			
The organisation has a data architecture	Yes	Model under development that has potential to be organisation-wide	Under development
The data architecture is integrated into the wider enterprise architecture	Yes	The need to do so is recognised	Under development
There are clear data governance rules, accountability and ownership of datasets	Yes	Some business areas are more advanced than others	Yes
Data quality is monitored and assessed against suitable metrics	Yes	Work in progress; currently at an early stage	For some business areas
The organisation understands and manages its legal obligations relating to data protection and sharing	Yes	Yes	Yes
Governance arrangements provide strong and effective oversight	Yes – data governance board provides oversight and escalates to the executive team	Overarching data governance for the department is mapped out and well understood. Governance is stronger in some business areas than others	Under development

Source: National Audit Office analysis of documents from seven main central government departments and executive agencies that provide public services

Department D	Department E	Department F	Department G
Data is treated as a strategic asset in only some business areas	Unable to determine based on information provided	Difficult to identify what data is held across the departmental family	Data is treated as a strategic asset in only some business areas
Current data is segregated and cannot currently create a single authoritative view of all interactions with an individual citizen	Recognised as a gap	Lack of central repository and silo-based culture is recognised	Need is acknowledged to break out of silos and bring data together in one place
This is being developed at a good level of detail	Single model across the departmental family not currently regarded as cost-effective.	Ambition to have in place	Need for common data standards is recognised and is work in progress. Some specific datasets do have well-defined standards
Understood and intention to implement	Individual business areas have their own standards	Aim to ensure incoming data is supplied in common and consistent formats to agreed standards and levels of quality	Work is being harmonised as part of developing data governance across the department
Under development	No central view of data architecture and a reluctance to invest in one without modernising the legacy technology	Ambition to have in place	Yes, but acknowledged to be unnecessarily complex
Under development	Various references to architecture in the documentation provided but no explicit mention of data	Ambition to have in place	No evidence in the documentation provided
Understood and intention to implement	Yes, in the individual business areas	Ambition to have in place	Need for better governance acknowledged. New arrangements still bedding down
Understood and intention to implement	Good examples of metrics provided in some business areas	Ambition to have in place	No but intention to develop
Yes	Yes	Acknowledgement of unnecessary self-imposed restrictions limiting ability to share more widely	Strong understanding and relevant minutes show active consideration of relevant issues
Under development	No overall governance board; governance arrangements exist in different business areas. Information Assurance Leads Committee has oversight of whole department	Governance board now in place	Need to strengthen arrangements is acknowledged

Appendix Three

Analysis of previous National Audit Office reports examining central government coordination

Figure 17

Our previous reports on central government coordination

National Audit Office report	Relevant findings
<p><i>The centre of government</i></p> <p>June 2014</p>	<p>Poor or inconsistent central engagement with departments, which hindered effective government working.</p> <p>Lack of clarity in the roles of the centre and departments.</p> <p>Overlapping functions of central departments, leading to confusing or inconsistent central requirements to line departments.</p> <p>Difficulties getting departmental buy-in for some central initiatives.</p> <p>Missed opportunities to encourage departments to work more collaboratively or take a long-term perspective (eg through financial incentives provided by funding and spending mechanisms).</p>
<p><i>The centre of government: an update</i></p> <p>March 2015</p>	<p>The centre did not always do all it could to understand the activities and priorities of departments, so the support and challenge offered were sometimes inappropriate for the circumstances.</p> <p>Some parts of the centre did not have the capacity or capability to give all the support promised.</p>
<p><i>Digital transformation in government</i></p> <p>March 2017</p>	<p>There is little strategic overview of the data needs of departments and no common view of how best to assess privacy concerns, consent and security.</p> <p>Many important and difficult aspects of data use still need to be addressed.</p> <p>Departments would welcome central support for their underlying data problems and use of data for new services.</p>
<p><i>Progress on the government estate strategy</i></p> <p>April 2017</p>	<p>The government has yet to achieve strong commitments from most departments to making its estates initiatives work.</p> <p>There are similarities with other recent government attempts to implement shared services, which failed because too many stakeholders saw it as against their interest to make them work.</p>

Sources: Comptroller and Auditor General, *The centre of government*, Session 2014-15, HC 171, National Audit Office, June 2014; Comptroller and Auditor General, *The centre of government: an update*, Session 2014-15, HC 1031, National Audit Office, March 2015; Comptroller and Auditor General, *Digital transformation in government*, Session 2016-17, HC 1059, National Audit Office, March 2017; and Comptroller and Auditor General, *Progress on the government estate strategy*, Session 2016-17, HC 1131, National Audit Office, April 2017

Appendix Four

Practical steps for government to improve use of data

1 See **Figure 18** on pages 54 and 55.

Figure 18
Practical steps for government to improve use of data

Principles	Have a clear understanding of what you are trying to achieve			Have the infrastructure in place to make it work
<p>Challenges</p> <p>Positive steps across government</p>	<p>A clear strategy in place</p> <p>The potential of better use of data was included in the government’s 2017 Digital Strategy.</p> <p>DCMS is tasked with producing a UK data strategy (to encompass business and third sector as well as public sector data).</p>	<p>Leadership and accountability</p> <p>Chief executive of the civil service committed to using data better.</p> <p>DCMS taking steps to establish its role as data policy lead.</p> <p>Departments have set up data governance boards.</p> <p>Home Office data board reports to executive committee.</p>	<p>Funding to make it possible</p> <p>Data Advisory Board has investigated barriers to funding data projects.</p> <p>RTI/RTE is an example of better use of data where departments each committed resources.</p>	<p>High-quality data</p> <p>Departments are developing APIs and other automated data transfer systems to reduce manual input, which is inherently prone to error (and is less efficient).</p> <p>Home Office has developed a data quality management model for its work on the Border, Immigration and Citizenship system.</p>
<p>Practical steps for government and departments to enable change</p>	<p>A situational analysis – what the position is now, and why previous initiatives to improve government’s use of data have failed. This is a first step to developing an achievable strategy.</p>	<p>An understanding of how departments use data, and which will benefit most from change – this could lead on to identifying which departments have the most incentives for leading, along with recognising those on which burdens will fall and which will need the most support.</p>	<p>A mechanism for funding cross-government working where there is a good return on investment for government as a whole in the long term even though some departments that are crucial to success may have less to gain.</p> <p>An assessment by key departments of the scale of their current effort compensating for poor-quality, disorganised data.</p>	<p>Identify key government datasets.</p> <p>Assess the state of that data.</p> <p>Is it fit for current/new purposes?</p> <p>What changes are needed and when?</p>

Note

1 DCMS = Department for Digital, Culture, Media & Sport; HMRC = HM Revenue & Customs; DWP = Department for Work & Pensions; ONS = Office for National Statistics; MHCLG = Ministry of Housing, Communities & Local Government; RTI = Real-time information; RTE = Real-time earnings; API = Application programming interface.

Have the infrastructure in place to make it work *continued***Data standards to improve consistency**

Government Digital Service (GDS) has developed some data standards to facilitate data exchange.

Cross-departmental forum on data standards set up.

HMRC, DWP and ONS have each developed data standards.

HMRC's technical governance ensures new projects adhere to its internal data standards.

MHCLG's digital land programme is working to fix underlying data and digital infrastructure across housing and planning to enable the creation of digital and analytical products by others.

Systems and tools which talk to each other

HMRC is introducing a single tax management platform to replace its legacy systems, which have a separate system for each tax.

Home Office is developing a data model which has the potential to be organisation-wide.

ONS has developed the secure research service to allow researchers to analyse (anonymised) linked data in a secure environment.

Driver and Vehicle Licensing Agency re-uses photographs from passports (with the driver's consent) to enable customers to complete applications online.

Have the conditions in place to make it work**Safeguarding data and securing public trust**

National Cyber Security programme set up.

The government has invested significant time and resources to comply with General Data Protection Regulation (GDPR).

Some departments are open with service users regarding GDPR compliance.

Legislation to enable change

MHCLG has made a start to bringing data together for its troubled families programme. But it took a lot of effort to match people across local and central government records.

Skills and appetite for change

HMRC online guidance on data-sharing.

MHCLG training for local authority chief executives and members.

Cross-government consensus on key data fields for government as a whole.

Set data standards for all key fields. These should be consistent across all datasets and should be used for all new systems which come on board. It may not be feasible to retrofit standards to legacy systems.

Promote compliance with GDPR.

Departments asking for data from others to take time to understand the data providers' needs and limitations.

The Digital Economy Act (DEA) has only been up and running with codes of practice and review boards in place for a short time.

Departments to try using the DEA. Organisations will develop familiarity and expertise the more they use the Act.

Improved training for data protection officers.

DCMS to consider whether it is feasible to restart the Centre of Excellence for Information Sharing or create something similar to continue its work.

Specific guidance for each organisation on when/how to share data appropriately and safely – to build a culture of using and reusing data efficiently and effectively. This should include advice on considering meaningful public engagement to ensure transparency in data use.

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