Government Digital Service

Department for Science, Innovation & Technology

Digital and Data Benefits Framework

Government Digital Service (GDS) Guidance

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1 INTRODUCTION

1.1 How to use this guidance

This guidance:

- Provides evidence and analytical methodologies to make the case for investment in Digital and Data for use in Business Cases and other associated products
- Should be used in conjunction with the HMT Green Book - this guidance supports evidencing the benefits in the economic case.

The guidance can be used to support the appraisal process through encouraging more developed benefits realisation for Digital and Data projects. It is likely to be most useful at the project stage particularly in options development and evaluation. It may also be useful at the research stage to scope out indicative benefits.

The scope of this guidance is Digital and Data benefit articulation and monetisation only; it is not a stand alone business case guidance. It does not make recommendations on how to track and monitor benefits throughout the lifetime of a project, it solely focuses on creating a strong economic case for Digital and Data benefits. Existing HMT appraisal guidance should be followed in the scoping and creation of Digital and Data business cases, and this guidance used to complement stages of the business case process.

1.2 Who this guidance is aimed at

This guidance is aimed at multiple users. Primarily it is aimed at those writing business cases and can support decision makers to identify how a programme provides its value for money. A combination of resources from each section within this guidance, which focus on different Digital and Data thematic areas, can be used to build a representative business case for specific projects and programmes.

Teams must ensure that benefits identified in one theme are not double counted in other areas. Benefits in Digital and Data may arise downstream and hence consideration should be given to ensuring no double counting occurs. This can be achieved by ensuring one team of analysts has ownership of the programme's benefits case. Benefits of the programme can be considered in the scoping phase of the project and led by a small cohesive team. This helps to prevent overlap in any benefits identified from different areas of the programme.

1.3 Uncertainty and sensitivity analysis

Sensitivity analysis is essential for ensuring the robustness of benefit estimates. Many assumptions - such as user adoption rates, productivity gains, and cost savings - carry uncertainty, and testing different scenarios helps prevent optimism bias, improve decision-making, and strengthen business cases. Whilst this guidance recommends methodologies

and evidence that departments can use in bids, modelling will still carry uncertainties, and therefore key assumptions should be tested using sensitivity analysis:

- **Identify key assumptions:** Focus on digital uptake rates, cost-per-transaction reductions, and efficiency savings from automation or data sharing.
- **Test different scenarios:** Model best-case, base-case, and worst-case outcomes by adjusting adoption rates (e.g., 70% vs. 90% digital shift) and efficiency gains (e.g., AI reducing time spent on a specific task by 15% vs. 30%).

1.4 Summary of benefits

Table 1 summarises the most common benefit streams across digital and data themes. Each of these benefit streams are discussed in further detail in the following sections of this guidance and can be achieved through various digital interventions. Suggested methodologies for quantification of these benefit streams are provided.

Table 1: Summary of key benefit streams

Benefit	Description
Productivity gains	Time savings from automating or augmenting routine tasks, freeing staff for higher-value work
Improve user experience	Increase the speed of delivery, reducing the time taken for users to access Government services and in turn increasing user satisfaction
Channel shift	Reduce the cost of service delivery by moving transactions from costly offline channels to online channels.
Reduce failure demand	Reduce the number of people who drop out of online channels and have to contact call centres or other support routes.
Reduce the processing of inbound and outbound paper	Automate the inbound management of documents from citizens and input of data or reduce the sending of paper document to citizens
Reduced contractor spend	Shift away from a reliance on costly contractors by building internal capability and increasing the proportion of full time Civil Services
Improved effectiveness via Training	Training reduces risks and generates more effective and efficient employees, with better understanding and use of digital resources
Reduced cost to respond to cyber attacks	Avoided economic losses from cyber attacks by external agents, including direct financial losses and minimising service disruptions

2 AI

2.1 Introduction and context

AI has the potential to transform government operations by improving policy implementation, enhancing data-driven decision-making, and enabling more personalised public services. It can automate routine tasks, freeing up civil servants for higher-value tasks; improve service accessibility through 24/7 automation; and support critical areas like healthcare diagnostics, fraud detection, and crisis response. While some benefits are harder to quantify, tracking KPIs and case studies can help build a strong evidence base for AI adoption.

2.2. Size of the prize

Recent analysis by GDS found £6.3bn in potential annual savings, including £1.1bn of potential cost reductions (5.3% of estimated salary spend) and £5.2bn in productivity gains (equating to 5.2m working hours). This analysis used an LLM to analyse 200,000 job descriptions for Civil Service posts, identifying over 1.5m individual job tasks and providing a score of each task's potential for augmentation or automation by current AI tools. The potential benefits are more significant in departments which have a high proportion of operational staff.

Beyond the Civil Service, previous analysis by GDS estimates the total impact of AI and automation on the wider public sector at £23.7bn:

- In health: £13.6bn by automating 25% of tasks
- In education: £7.5bn by automating around a third of tasks
- In the police: £2.6bn by automating 29% of tasks

We are already seeing the potential benefits of AI tools across Government. GDS conducted the world's largest trial of general-purpose AI tools, where 20,000 Civil Servants used Microsoft Copilot to support their daily work. Staff saved an average of 26 minutes per day: equivalent to nearly 2 working weeks per person per year, with results consistent across grades and professions [1]. In this trial cohort, this is the equivalent of giving 1,130 people a full year back - every year - to focus on higher-value tasks, innovation or public service impact, rather than admin-based work - with the potential for this to rise significantly if used across the entire civil service, transforming productivity and public service delivery at scale. Over 70% of users spent less time searching for information, performing mundane tasks, and increased time spent on more strategic activities.

[1] Microsoft 365 Copilot Experiment: Cross-Government Findings Report

2.3. Benefits quantification

2.3.1. Productivity

One of the main benefits of AI tools is the ability to augment job roles. Automating routine tasks can enable Civil Servants to spend more time on high value tasks that require a deeper level of human cognition.

To quantify the benefits of AI in productivity terms, a structured approach can be taken:

- Identify the job roles that will be impacted by the AI intervention.
- Assess the tasks within these roles that AI is likely to influence, focusing on automation or augmentation.
- Estimate the time currently spent on these tasks using sources such as the ONS Time Use Survey [2], departmental surveys, or reasonable approximations.
- Calculate the potential value of time saved by applying average salary data to estimate cost savings or productivity gains.
- In extreme cases, this productivity gain could be considered instead as FTE reductions, for example if the introduction of an automated chat bot meant the closure of a call centre.

For more in depth analysis, GDS has designed an end-to-end 'plug and play' methodology, which is available on GitHub and can be used by departments to create their own version of the size of the prize analysis. This analysis uses an LLM to assess job descriptions. It evaluates the extent of AI exposure across different job roles and analyses the relationship between AI exposure and the required skill types. This analysis can be used to compare different types of job roles, and highlight both the types of roles and types of specific tasks that are highly exposed to AI. This should provide departments with evidence on which types of AI tools and interventions are likely to have the biggest impact across their workforce.

The analysis is divided into two main sections:

- **AI exposure analysis:** Uses an LLM to assess each individual task outlined in a job description and assign each task a score of between 0 and 1 to represent the level of exposure to AI. This analysis produces an exposure score for each individual task, and an average exposure score for each role. Departments can use this information to highlight the types of roles and tasks that are most exposed to AI.
- **Skills analysis:** The O*NET database lists a total of 35 key skills that are used across different occupations. This analysis uses an LLM to assess both the full list of tasks and skills outlined in a job description and assign a score between 0 and 1 to each skill depending on its level of importance. This analysis uses a regression analysis to show the relationship between AI exposure and skills required, and shows how the types of skill required varies across job grades.

[2] ONS Time Use Survey

2.3.2. Other benefits

Beyond the analytical methodology created by GDS, this section details the potential monetisable benefits of AI interventions. There is no expectation that each benefit listed will be applicable to every product. This list focuses on common benefits for automation; for each benefit we have listed an example and potential methodologies.

Table 2: Potential benefits of AI

Monetisable benefit and Example	Potential Methodology
1. **Reduced human error** Repetitive data entry tasks such as re-keying can lead to human error. This can occur within HR processes, such as onboarding. Another example of AI improving decision making is Cancer screenings. AI systems have been evidenced to be more accurate then radiologists[3]	1. Assessing the cost of having to process/ assess then re-process. The recommended equation is: (Average numbers of errors pre automation - Average number of errors post automation) X Average cost of re processing each error. 2. Assess the impacts human errors have on end users, this would have to be considered by service teams using case study evidence of the effect past human error has had. The recommended equation is: (Average number of errors Per Automation- Average number of errors post automation) X Average effect of error on end user.
2. Reduced waiting times Automating processes often increases the speed of delivery. Benefits come from people getting access to a government service sooner. An example of this is approval of passport photos, allowing people to gain access to a passport more quickly.	This value of this could be assessed by considering the value of accessing the government service and the reduced waiting time. Following on from past example, getting a passport sooner might reduce stress about needing a passport for holiday, or allow citizens to complete an application (with the passport serving as a tool for identification). The recommended equation is: Daily value of access to government service (i.e passport) X (Average wait time pre automation - Average wait time post automation)
3. New services Automation often enables new government services to be offered. An example of this is GOV.UK Notify which allows improved government to citizen communication.	The benefits narrative for new services will be based on the value the new services supply to end users. This is often based on user research or market value for services.

[3] AI 'outperforms' doctors diagnosing breast cancer

4. Access to service at all times rather than just office hours Automated elements often mean that access to services can be offered on a 24/7 basis rather than only during office hours where staff can respond.	This value of this could be accessed by considering the avoided cost to end users when having to reorganise around services that are only available during office hours. Understanding this cost could involve surveying users. The recommended equation is: Average avoided cost for users when accessing services outside of office hours x number of users accessing services outside of office hours
5. Reduction in incorrect rejection / acceptance rate Automated elements can sometimes make more correct decisions than FTE. A reduction in incorrect rejection/ acceptance rate is a key area in which this effective design making can be evidenced. These will be referred to as **incorrect decisions.** This reduction in incorrect decisions isn't guaranteed and in some cases automated decision making tools may increase incorrect decisions.	1. Assessing the cost of having to process/ assess then re-process. Baselining would be key for this approach. The recommended equation is: (Average numbers of incorrect decisions pre automation - Average number of incorrect decisions post automation) X Average cost of re processing incorrect decisions. 2. Assess the impacts human errors have on end users, this would have to be considered by service teams using case study evidence of the effect past incorrect decisions have had. The recommended equation is: (Average number of incorrect decisions pre automation- Average number of incorrect decisions post automation) X Average effect of error on the end user.

2.4. Case studies

AI powered customer support tools (such as chatbots) can respond to customer queries faster and outside of office hours and support staff to handle complex queries. High take up of such tools could enable cost savings through FTE reduction or reallocation. GDS analysis suggests a potential benefit of up to £1bn annually by automating customer service based tasks. Examples of successful AI support tools include:

- Telford and Wrekin Council implemented a 24/7 AI chatbot that has led to a 35% drop in call volumes, with 32% of queries being addressed outside of traditional working hours. [4]
- Derby City Council implemented a phone-based AI solution which handles 45% of all inbound calls and can direct calls to over 40 different departments. [5]
- Citizens Advice Scotland, implemented an AI-driven system which reduced annual costs from £500,000 to under £30,000. The solution reduced wait times from 24 hours to under a minute and reduced the need for staffing, allowing advisors to be redeployed from the contact centre to the frontline. [6]

[4] ICS.AI - Telford and Wrekin Case Study
[5] ICS.AI - Derby City Council Case Study
[6] Digital Leaders 2023

Trials have proven the significant productivity gains that AI can make across a range of tasks by automating repetitive tasks, reducing workloads, and improving decision-making. Evidence from trials in areas such as customer support, document drafting, programming, and information retrieval show the potential for organisations to save time, enhance accuracy, and improve service delivery.

- Customer support – Customer Support: A recent study found that agents using an AI tool handled 14% more inquiries per hour than those without AI assistance. The impact fluctuated depending on the skill level of the agents - low-skilled workers saw a 34% increase, with higher skilled workers seeing a minimal increase. Research also suggests a small increase in the quality of work, finding a 1.3% increase in chat resolution rates.[7]
- Drafting Documents: A recent study found that using ChatGPT reduces the time taken to write business documents, reducing time taken by 37%. Those who used ChatGPT to draft documents took 17 minutes on average, compared to 27 minutes for those without AI support. The research also found that the quality of document increased with AI support [8]
- Programming and Coding: A recent study found that programmers using the GitHub Copilot AI tool completed work much 55% faster. Those who used the AI completed a given task in 1.2 hours on average, compared to 2.7 hours for those who did not use AI. Less experienced programmers benefited the most from using AI. [9]
- Information retrieval: Workers using Copilot retrieved info from documents and emails 27% faster. [10]

The report *"Assessing the Burden of Clinical Documentation,"* [11] highlights the administrative demands placed on NHS healthcare professionals in England. It reveals that clinicians dedicate nearly **one-third of their working hours** to documentation, reducing time for direct patient care. To combat this challenge, the report advocates for **AI-powered digital solutions** to streamline documentation, improve workflow efficiency, and ultimately free clinicians to focus on **higher-quality patient interactions**. By leveraging these innovations, healthcare systems can enhance productivity, reduce administrative strain, and improve overall patient care.

Research highlights potential time savings and productivity benefits that could be realised:

- 3.5 hours per week spent on clinical documentation.
- 62 minutes per day spent searching for information.
- 3.2 hours per week spent out-of-hours on clinical documentation.
- 68% feel it's likely or very likely their notes would be more complete with more time.

[7] Generative AI at Work, 2023;
[8] Experimental Evidence on the Productivity Effects of Generative AI, 2023;
[9] The Impact of AI on Developer Productivity: Evidence from GitHub Copilot, 2023;
[10] Measuring the Impact of AI on Information Worker Productivity, 2023

[11] Nuance - Assessing the burden of clinical documentation

3 Service transformation

3.1 Introduction and context

User expectations are changing. Users are increasingly expecting delivery which rivals that offered by the private sector, and they want to spend as little time as possible interacting with the Government. In an international survey of service users, completing the service journey in less than 15 minutes and automatically issuing and renewing documents were the most requested improvements [1211]. Improving user journeys and increasing user satisfaction is closely linked to efficient service delivery - recent research by KPMG suggests that lower user satisfaction could increase public sector cost bases by up to 10x.

Estimating the benefits of service transformation in government is essential for ensuring that improvements lead to both cost savings and better user experiences. The "State of Digital Government review" highlights the need for modernisation of digital services to improve the user journey and to enhance the efficiency, integration and accessibility of services. To assess the economic impact of these improvements, it is crucial to first establish a baseline cost of delivery accounting for operational expenses, digital infrastructure and customer support. Transforming services - such as shifting transactions to digital channels and automating manual processes - can reduce costs, streamline operations, and enhance user satisfaction.

3.2. Size of the prize

Offline transactions are much more costly for Government than online ones. Increasing the proportion of transactions that are fully completed online can generate significant cost savings. Across Government there are more than 7,100 services. Analysis of these service webpages suggests:

- 68% of services identified are ‘publication’ services, where a user must download and post a form. Whilst the majority of these services likely have very low volumes, the sheer volume of these types of services makes for a complicated user experience
- Of the non-publication services, only 53% provide an online channel. In many cases, users can only complete services offline and in person, or they are redirected, for example to another GOV.UK service or to a local authority.

Using this analysis, GDS estimates that full digitisation of all government services could deliver savings of £1.5bn by significantly reducing the use of offline channels. This estimate is based on a Monte Carlo simulation, which uses existing data on digital take-up and cost per transaction across a subset of services to simulate the potential savings across all 7,000+ services.

There will always be users who cannot or choose not to transact through online channels. The size of the prize estimate assumes maximum digital uptake of government services of 90%. This is in line with recent case studies: the 2021 census achieved an 88.9%

[12] Global Services Handbook

completion rate [13], whilst the ONS estimates that 10% adults are internet non-users [14]. . Raising the maximum digital uptake to 100% would increase the annual size of the prize by £166m, with an estimated marginal benefit of £17m per 1% increase in maximum digital uptake. Recent research by the Good Things Foundation suggests this is conservative, estimating benefits to government from increasing digital inclusion of:

- A maximum annual benefit of £222m in 2032
- £1.4bn across 10 years (2023-2032)
- Average annual marginal benefit of £21m

The report also estimates wider benefits of digital inclusion, including time savings and additional earnings. Across all benefit streams, the research suggests a return of £9.48 for every £1 invested in digital skills.

3.3 Benefits quantification

3.3.1. Channel shift

The analysis above attempts to quantify the potential channel shift benefit that can be achieved across all services. This can be simplified and applied on an individual service basis. Benefits should be quantified as a reduction in the cost of service delivery, using the baseline figures for total service cost and cost per transaction. Teams should consider the cost of delivering service outcomes via each channel, and calculate the delta difference between online channels and offline. The table below shows a worked example of calculating the channel shift benefit for a service with 100,000 users.

Table 3: Channel shift worked example

Methodology	Worked example
Total transactions	All channels: 100,000
Estimate current channel uptake	Online: 60% of users Phone: 20% of users Postal: 20% of users
Estimate current cost per transaction for each channel	Online: 25p Phone: £4 Postal: £8
Assumption on proportion of users shifted online	50% of phone users (10,000), and 50% of postal users (10,000)
Calculate benefit using transaction costs	10,000 * (£4 - £0.25) + 10,000 * (£8 - £0.25) = £37,500 + £77,500 = £115,000

[13] ONS, 2021
[14] ONS, 2019

This analysis relies on a calculation of current cost per transaction across each channel for the service. The following is intended to provide guidance on the types of costs to include or exclude to ensure consistency in the calculation of CPT across services. However, exact costs will depend on the circumstances of the service.

To include in cost per transaction calculations:

- Operational FTE: caseworkers, administrators doing manual processing
- Digital team FTE: service owner, developers, designers
- Platform & infrastructure FTE
- Software & hardware: license, platform, desktops, etc.
- Hosting
- Post/stationery costs
- Contractor/vendor costs
- L&D budget for upskilling team
- Customer support: call centre agents
- Administrative overheads: e.g., Mail Opening Unit, identity verification
- Continuous improvement

To not include in cost per transaction calculations:

- Corporate overheads: e.g., HR, CEO, Finance
- Office/building costs
- Subsidies for other services
- Fees/cost of appeal/awards
- Cost of transformation (i.e. included costs should be steady state)
- IT costs not directly proportional to transactions: e.g. Document repository management

3.2.2. Other benefits

Beyond increasing use of online channels and thereby reducing the cost of service delivery, service transformation can have wider benefits. Departments should in particular consider the potential benefits to users, and the extent to which users could reduce the time they spend interacting with services.

Table 4: Potential benefits from service transformation

Monetisable benefit and Example	Evidence
1. Reduce failure demand	Failure demand means the overall size of the prize is likely to be an underestimate of the total cost of service delivery. There are significant

Make journey improvements to reduce the number of users unable to complete the journey without help.	costs associated with users dropping out of online routes and seeking support: ● Central government awarded contracts totalling £682m for spending related to contact centres in 2023 [15] ● Local councils spend an estimated £340m on over 12,000 contact centre agents [16] Benefits quantification should consider the volume and length of calls to contact centres, and estimate the potential reduction in call volume from service transformation. In highly transformative programmes, potential FTE reductions may be possible.
2. Reduce user journey time Making services simpler and less burdensome on the user, saving time every time a user interacts with a Government service	Research by Nortal suggests that the average service user spends 12 hours per year engaging with government services, equivalent to 75,000 years in total annually, with a value of over £4bn. Existing literature attempts to break the time spent down into specific themes - estimating that the average person spends 2.2 minutes per day on income and tax admin, or 5.1 minutes per day on health admin [17]. Analysis by GDS of 231 services found that 21% of services ask for applicants' NI number and 39% require documentation such as a case reference number, unique taxpayer reference or VAT number.
3. Reduce the processing of inbound and outbound paper Automate the inbound management of documents from citizens and input of data or reduce the sending of paper document to citizens	Analysis of FOI requests by local councils suggests that e-billing solutions are 51% than posting physical letters [18].

[15] Contracts taken from GOV.UK Contracts Finder and is the aggregate of all contracts with keywords related to contact centres;
[16] 94 councils responded to FOI requests on number of contact centre staff - we have used population data to scale this up to cover all councils. We have also assumed a salary of £20,000 and added overheads
[17] Everyday administrative burdens and inequality
[18] 18 councils responded to FOI requests on total spend on postage; 10 councils on requests for total spend on e-Billing.

3.4 Case studies

Channel shift

The Local Government Association (LGA) provided £300,000 funding for 21 projects across 23 local councils with the aim to encourage users to self-serve. These projects achieved estimated benefits of £1.5m, representing a 5:1 return on investment. If scaled up to all 317 local councils, estimated benefits would exceed £25m. Three main benefits streams were identified as a result of these programs [19]

- Staff reductions or redeployment: benefits of £280,000 achieved, scaled up to £4.7m across all 317 local councils
- Automation of backend processes: benefits of £375,000 achieved, scaled up to £6.3m
- Reduced costs from less face-to-face or phone transactions: benefits of £375,000 achieved, scaled up to £6.3m

Reduced manual processing

The NHS' Electronic Prescription Service (EPS) achieved **£130m of savings between 2013 and 2016,** by allowing GP surgeries to send prescriptions directly to pharmacies rather than using a paper copy. GP practices achieved the most significant time savings, including: 80 minutes per day by signing electronic repeat prescriptions compared to paper versions and 43 minutes per day by not having to locate paper prescriptions within the practice.[20]

Reduced customer contact

- **Improved website design** can make information easier to find and reduce the volume of customers who contact the support centre. LocalGov Drupal provide local councils with a shared pool of code to build and improve the content design of websites [21], with specific benefits including:
    - Cumbria Council: total call volumes reduced by 21%, with the average time a user spends on the website also reduced by 25%.
    - Waltham Forest: total calls to the resolution centre are 10%-15% lower, with user satisfaction improving by 25%.

[19] GDS analysis of case studies, LGA, 2019
[20] NHS 2017
[21] LocalGov Drupal

4 Data

4.1 Introduction and context

Estimating the value of data assets in government is crucial for understanding the economic and operational benefits of data transformation. The valuation process can be approached through commercial valuation methods—such as market, income, and cost-based approaches— while economic valuation considers broader societal and governmental benefits, including efficiency gains, improved policymaking, and enhanced public trust. The below guidance focuses on the economic benefits and approach. By standardising, sharing, and ethically managing data, government can unlock significant economic value, drive innovation, and improve service delivery for citizens and businesses alike.

4.2 Size of the prize

Analysis by GDS estimates that 20 million working days annually are spent on data-related tasks, with this time valued at £3.1bn. This analysis suggests that 11% of civil servants are in data intensive roles (meaning they spend more than 50% of their time on data-related tasks).

This analysis used an LLM to assess a proportionate sample of 10,000 job descriptions and estimate the proportion of time the role holder would likely spend on 5 data related tasks:

- **Data entry:** inputting data from various sources into systems or databases
- **Data cleaning:** removing errors and inconsistencies from data to ensure its quality
- **Database management:** maintaining and updating databases to ensure they are accurate and run efficiently
- **Data analysis/data science:** examining and interpreting data to uncover patterns, trends, and insights or building models
- **Data visualization:** creating visual representations of data, such as charts and graphs, to facilitate understanding
- **Non-data activities:** any tasks unrelated to data, including meetings, administrative tasks, management etc.

Human validation of 500 job descriptions and LLM scores suggests the model used has a 90% accuracy rate. Similar research further highlights the duplicative time spent on data related tasks, reinforcing the findings from GDS' LLM analysis. The ONS Public Sector Time Use Survey finds that every civil servant spends at least 34 minutes per day on average on 3 different data-related tasks [22]:

- 4.9 minutes on data entry

[22] ONS Time Use Survey

- 15.8 minutes on updating records
- 13.7 minutes on analysis

This assessment gives the proportion of time each role spends on each data task and on non-data activities. We then group each profession into high, medium and low intensity, depending on the proportion of roles that spend time on data tasks using the following thresholds:

Table 5: GDS Data Size of the Prize Analysis

Data Intensity Grouping	Threshold	Example Professions
High	More than 50% of roles spend more than half their time on data tasks	5 professions - including the 4 main analytical professions (GSS, GES, GORS and GSR) and Intelligence Analysis.
Medium	Between 10% and 50% of roles spend more than half their time on data tasks	12 professions - including Digital and Data; Tax Profession and Government Finance. These professions typically include a large range of different job roles
Low	Less than 10% of roles spend more than half their time on data tasks	12 professions - Including Policy Profession and Operational Delivery. These roles typically focus more on delivery and strategic thinking.

4.3 Benefits quantification

Data transformation generates value by reducing time-consuming manual tasks, automating workflows and enhancing data accessibility across departments. Annex 1 provides GDS' full estimates of the proportion of time each Civil Service profession spends on data-related tasks. Departments can use these estimates, combined with average salary data, to quantify the total time spent on data related tasks. To estimate the benefit of improving access to data, departments could apply a minor percentage productivity gain, with potentially a more significant gain for those in high intensity roles.

Due to the diverse range of outcomes from data, benefits are likely to be highly bespoke. When assessing the economic value of data, it can be useful to consider the following key questions to inform the initial scoping of economic benefits:

- What are the current problems facing organisations, departments or target markets that could benefit from this data?
- How might this data be able to help resolve the problems identified?
- What impacts will be directly attributable to the programme or project?
- Are there further indirect impacts and spillover effects in the wider economy?

Open data initiatives can generate wider macroeconomic benefits. The economic rationale is grounded in the well-documented effects of open data on market expansion, productivity,

and innovation. When datasets become freely or affordably available, firms reduce their costs of data acquisition and processing, reallocating resources to higher-value activities such as R&D and business development. Moreover, previous case studies, such as the Met Office's estimated £49.8bn in benefits over 10 years [23], indicate that open data initiatives can generate substantial long-term value. The degree of impact depends on uptake, industry demand, and spillover effects, where greater usage leads to broader economic efficiencies, network effects, and market-wide innovations.

4.4 Case studies

Improving the availability of data and making it easier to access can achieve time savings for both data owners (lower administrative time burden of managing data) and data users (reduced time requesting or searching for data, as well as completing data-driven tasks quicker). Examples of time savings include:

- The National Underground Asset Register is a digital map of underground pipes and cables used to improve the safety of underground work. The use of the register as a central digital platform achieves time savings of an estimated £91m per year for project planners and data managers. (NUAR, 2022)
- DVLA and HO's 'Photo at the Roadside' service saved over 200,000 police hours in the first 3 years, valued at £3.5m (calculated using average wage for an incident response officer). This service allows officers to access the photograph held on DVLA's driver database through their police issued mobile devices to confirm the identity of a driver almost instantly - this process would previously take up to 16 minutes. (DVLA, 2022)
- TfL open data adds £130m to the London economy each year. An estimated £70m-£95m per year of this is a time saving for commuters from improved journey planning. Estimates suggest that over 600 apps use TfL's open data and that over 40% of Londoners use those apps (TfL, 2017)

Cost savings for HMG

Data sharing between departments and public sector organisations can reduce duplication, fraud and error. Examples of cost savings to HMG include:

- DWP's 'Tell us Once' service saves over £20m a year by sharing data with non-DWP organisations, including local government. This prevents overpayment as payments can be stopped or reallocated quickly. [24]
- NHS Digital has created an API which enables pharmacies to check a patient's active prescription status, resulting in exemptions being applied correctly prior to medication being dispensed. This is expected to reduce the over £200m worth of NHS prescription fraud that currently occurs per year. [25]

[23] Met Office
[24] DWP, 2020
[25] NHS Digital

5 Capability

5.1 Introduction and context

This guidance is specific to Digital and Data Capability and realising the impact of this on Digital and Data and non-Digital and Data projects. While there are many other areas which involve capability as a general concept, this guidance may not be directly applicable to them. Digital and Data roles are wide ranging and include areas that may not intuitively fall within the Digital and Data space. Therefore, it is vital that a comprehensive understanding of the Digital and Data profession is in place before approaching a business case. Bids should refer closely to the Digital and Data Profession Capability Framework to ensure that the right roles are represented.[26]

5.2 Size of the prize

The State of Digital Government review published in January 2025 highlights the challenges the public sector faces in relation to digital capability and the use of contingent labour [27]. The public sector depends heavily on third parties: of the £26 billion public sector digital and data spend in 2023, less than 20% (around £5 billion) was on permanent public sector staff while 55% (£14.5 billion) was spent on contractors, managed services providers, and IT consultants. The average contractor in the central government costs three times as much per year as the average civil servant. In the public sector, contractors account for approximately 18% headcount but around 40% headcount cost.

Alongside this, there are not enough digital and data people in the right roles. The proportion of the workforce in digital and data roles varies across the public sector and has doubled across central government and agencies from 3% in 2021 to around 6% today. Despite this, the largest operational departments average 5% vs. benchmarks of 6% for central governments and 8-12% in regulated private sector industries - although some organisations (including ALBs) do have a greater share of digital and data staff than benchmarks. In local government, digital and data roles are only 2% of headcount, against benchmarks of 4%, in the NHS, workforce proportion roughly matches a comparable 3% benchmark.

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

5.3 Benefits quantification

Capability is linked to many elements of digital and data delivery. This creates difficulties for appraisers in avoiding double counting of benefits and challenges around monetising benefits realised at different stages of an intervention's value chain. The primary benefit of digital capability is enabling and enhancing delivery and supporting other initiatives, including

[26] Capability Framework
[27] State of Digital Government

AI, data, technology, and services, by equipping individuals and organisations with the skills, tools, and processes needed to adopt digtal solutions.

The table below illustrates other benefits that can arise from investing in digital and data capability.

Table 6: Potential penefits from digital capability

Benefit	Rationale
Reduced Contractor Spend	Contractors are in general more costly than permanent civil servants, so reducing contra replacing with permanent staff can reduce costs. At the most basic level, these costs could be estimated by “Cost of Contractors - Cost to Contractors”
Reduced Failure Rate	Having stronger digital and data capability decreases the risk of a digital project failing o issues. An example methodology for this could be “Cost per project * Reduction in Failure Failur
Improved Effectiveness via Training	Training reduces risks and generates more effective and efficient employees, with better and use of digital resources and improved communication between specialists and non-
Reduced Reputational Risk and Increased Trust	A higher skilled workforce has an increased knowledge and skills base, meaning they ar projects and products with less chance for error and therefore reducing the reputational department. Similarly, products that work effectively increase the trust of the public in future products effectively. This improves their trust in government as a whole as an effective provider o
Enables other areas	Capability unlocks the benefits of all other themes provided, and is instrumental in ensur are successful.

5.4 Case studies

Companies House: Using the Digital, Data and Technology Capability Framework to improve staff engagement and reduce turnover

In 2016, Companies House faced difficulties in attracting the right Digital and Data professional skills, competing with other recruitment campaigns in the same aream and reversing a sharp rise in staff turnover. Often civil servants will move between organisations to achieve higher pay, where Digital and Data roles are being advertised at different salaries in different departments.

With the introduction of the Capability Framework, the biggest success for Companies House has been the normalisation of the turnover rate from an average of 30% during 2016/17 to less than 5%, alongside increased People Survey engagement scores. Use of the Capability Framework has also helped to target specific learning and development for specialist roles.

Ministry of Justice Digital and Technology: How communities of practice support implementation of the Digital and Data Profession Capability Framework

The Challenge

MOJ Digital and Technology was formed from various teams across the department, meaning the unit was an amalgamation of organisational cultures and designs. This led to their experiencing difficulties in embedding a user-centred design approach and an agile culture, and attracting and growing digital capability and talent. Scott Colfer, Head of Product Management, explains: “Two things caused us all sorts of issues until 2016/17: There was not a clear career path for people and we were contractor heavy”.

The framework has made MOJ Digital and Technology a more attractive place to work, according to Matthew Salmon. “The Digital and Data Capability Framework is also a useful tool in performance management. It’s made things much clearer in terms of how we want to develop our people and the career progression we offer, too.”

6 Technology, cyber and interoperability

6.1 Introduction and Context

Effective technology, interoperability and cybersecurity are fundamental to government efficiency, service delivery and resilience. Interoperability ensures seamless communication and data-sharing across teams, departments, and locations, reducing administrative burdens and improving productivity. It enables civil servants to collaborate effectively, whether in-office or remotely, while also eliminating redundant systems and duplicated data. This leads to cost savings, streamlined processes, and improved policy outcomes.

The benefits of interoperability extend beyond monetary savings, fostering higher productivity, staff satisfaction, and better public services. Through enhanced data access and sharing, government agencies can make better-informed decisions, resulting in improved policy making and service delivery.

However, as government services become increasingly digital and interconnected, cybersecurity risks and outdated legacy IT systems pose significant threats. Legacy systems are costly to maintain, prone to security vulnerabilities, and hinder the adoption of modern, efficient digital solutions. Cyber threats further amplify these risks, as outdated systems are more susceptible to attacks, making investment in modernisation technology and IT systems essential.

Beyond direct costs, cybersecurity failures can cause widespread economic harm. By quantifying security risks through likelihood and impact assessments, departments can strengthen their business case, illustrating how robust cybersecurity safeguards against financial losses, service disruption, and broader societal consequences.

6.2 Size of the prize

GDS analysis of contract data suggests that departments spent an estimated £1.2bn on legacy IT in the last 12 months, and there are 72 assets across central government with a risk rating of “red.” The likelihood of issues or failures is therefore significant, and there are also savings that can be made by reducing the costs of maintaining these systems.

Government’s digital procurement is highly fragmented, creating inefficiencies and impacting user experience. By streamlining procurement and standardising devices, costs could be reduced by 12-44%, while also lowering environmental impact and enhancing productivity. Currently, government spending on laptops and mobile phones totals an estimated £140 million.

6.3 Benefits quantification

Better interoperability, cybersecurity and technology resilience delivers multiple economic benefits by reducing inefficiencies, preventing service failures, and enhancing productivity. The key benefits include:

Table 7: Potential benefits from better technology

Benefit	Rationale	Methodology
Saved time	Saved time arises across the three dimensions of interoperability: data, people, and technology. Tech: Connecting to systems, like Wi-Fi, is automatic across Civil Service buildings, reducing login time. Standardized productivity tools prevent redundant downloads, streamlining work. People: Staff transitions are smoother with quick data transfers, such as security clearances, aiding career progression and retention. Data: APIs enable faster access without lengthy clearance checks. Eliminating data duplication reduces manual processing, improving efficiency and data accuracy.	Cost saving = Saved time x value of working time x number of users affected
Avoided duplicative data/tech	Interoperability enables users to access a common system or data meaning that they reuse something already existing. Therefore, interoperability means that a project can avoid: procurement, installation, training, security and maintenance costs and avoids the costs of duplicating data sets. The move to a common solution and a bulk contract can lead to a lower average cost for a piece of technology.	For improvements to access to a data set, the cost saving can be calculated by the cost of rebuilding and maintaining the data set. This could be the cost that was involved to create the original data set or an estimate based on the number of hours to create the data set and the value of working time. For avoiding duplicative technology, the cost saving is the potential cost to procure, install and maintain another equivalent contract for the technology. This alternative equivalent is likely to be more expensive due to the loss of economies of scale in bulk buying the technology.
Reduced cost to respond to cyber attacks	Reducing the risk of cyber attacks yields substantial economic benefits. These include preventing direct financial losses, minimising service disruptions, safeguarding public trust, enhancing productivity, and reducing the risk of ransom-related demands. The National Cyber Security Centre classed 89 cyber attacks reported in 2024 as being of “national significance.” The estimated costs to the British Library of the 2023 cyber attack was estimated to cost £7m.	Appraise direct economic costs associated with a cyberattack (e.g., system recovery, ransom payments, legal fees) and multiply by the likelihood of the prevented attack. Case studies can be used to appraise the potential economic costs of a cyber attack. For example, analysis conducted by the Financial Times estimated that the cyber attack on the British Library resulted in costs of £7m to the organisation. Expected Loss=financial impact*likelihood

To quantify security risk you need to be able to estimate two variables: Likelihood and Impact.

A structured approach involves defining minor, medium, and complete breach scenarios, each with different probabilities and consequences, including financial loss, service downtime, and reputational harm. For instance, a complete breach could require full system replacement and months-long outages (20% likelihood), while a minor breach may have minimal impact (95% likelihood).

6.4 Case Studies

COVID-19
Civil servants have been able to rapidly adapt to working from home, sharing knowledge and data. GDS built the Shielded Vulnerable People Service that allowed vulnerable people to be a priority for supermarket deliveries. Users' details were validated against the NHS Shielded Patients List to ensure they are eligible for support, using an API to access and share data held by a different department. The validation via an API means that the process does not have to be done manually, thus saving time. It also saves time for the user, resulting in a better quality service.

NHS Prescription Check
This has saved the NHS over £250m. Previously, a patient would come to the pharmacist with a request for a free prescription. The pharmacist could not verify this in real time and instead would give the prescription out for free. The pharmacist would later send the paper copy to the NHS who processes it and sends all claimants to DWP. DWP then verifies who is eligible for a free prescription, sending data back to the NHS. The NHS is then responsible for chasing those who are ineligible for a free prescription, asking them to return the funds and otherwise writing off the debt.

The NHS Prescription Check has sought to improve this and prevent back and forth between departments. Now, when the patient arrives at the pharmacy, the pharmacist can conduct a real time check for a free prescription. The NHS uses the DWP API which returns a “yes/no” response. If eligible, the patient gets a free prescription and no further work is required by the patient, pharmacist, NHS and DWP. This enables NHS and DWP staff to work on greater value activities as opposed to spending time sharing data.

DCMS Document Checking Service
In 2020, DCMS in partnership with GDS and HMPO launched the Document Checking Service (DCS) pilot to offer a secure method for commercial entities to have access to data held by the UK government. When the user signs up for a service they may provide their passport information as proof of identity. The pilot provides the ability to verify this via an API, checking the document with records held by government agencies. The DCS also limits the amount of data shared about the document, returning only a “yes” or “no” result. This pilot is able to raise revenue for government, charging commercial entities a fee to check against the system.

Synnovis ransomware attack[28]

In June 2024, Synnovis, a pathology services provider for several NHS hospitals in London, suffered a ransomware attack. The breach led to significant disruptions, including the cancellation or delay of thousands of operations and appointments. The attack resulted in estimated costs of £32.7 million and led to significant service interruptions across several NHS Trusts in London. Thousands of operations and appointments were delayed or canceled due to the inability to process blood tests and other diagnostics.

[28] Ransomware costs at NHS provider Synnovis far outstrip profits Financial Times - Article

Redcar[29]

Redcar County Council was the target of a cyber attack in February 2020 which took out several key digital services, including: online bookings, planning documents and social care advice. Online services to 135,000 locals were taken offline for over a week. The cost of the attack has been conservatively estimated at £10.4m, with £3.4m in costs to individual departments and £2.4m for recovery and replacement work to the IT infrastructure. NB, £10.4m is only the direct financial cost and the true economic impact of all disruption will be much higher. After 3 months, 90% of the systems had been restored, but during the disruption many house sales fell through as land registry could not be completed.

Wannacry

The Wannacry attack was a global cybersecurity incident. Among the victims there were 80 NHS trusts. The attack prevented users from accessing computers unless they paid a ransom. As a consequence 6,900 NHS appointments, including operations, were directly cancelled with up to 19,000 more estimated to be cancelled as an indirect consequence.

A conservative estimate[30] puts the cost at £107m: £35m from lost output and a further £72m on restoring systems. Again, these estimates do not include the economic consequences of cancelled appointments and operations.

[29] Redcard Ransomware BBC News - Article
[30] NPJ Digital Medicine - A retrospective impact analysis of WaanaCry cyberattack on the NHS - Link

APPENDICES

Annex 1 - Data intensity

GDS Data Size of the Prize analysis returns the following estimates for time spent by each profession on data activities. These can be used to estimate the value of total time spent on data activities, and estimate the value of a marginal increase in productivity by increasing access to data through data sharing initiatives.

Table 8 - Full list of time spent on data related tasks, according to GDS Size of the Prize Analysis

Profession	% of Time Spent on Data Activities	Data Intensity
Government Statistical Service	71%	High
Government Social Research	63%	High
Government Economic Service	57%	High
Government Operational Research Service	56%	High
Intelligence Analysis	51%	High
Counter Fraud Professions	21%	Medium
Planning Profession	19%	Medium
Government Science and Engineering	17%	Medium
Government Digital and Data Profession	15%	Medium
Knowledge & Information Management	14%	Medium
Government Property Profession	13%	Medium
Government Finance	13%	Medium
Government Corporate Finance	12%	Medium
Tax Profession	11%	Medium
Commercial	11%	Medium
Other	11%	Medium
Human Resources	10%	Medium
Security Profession	9%	Low
Government Project Delivery Profession	9%	Low
Government Communication Service	7%	Low
Policy Profession	7%	Low
Operational Delivery Profession	7%	Low

Government Legal Service	2%	Low
Psychology Profession	0%	Low
Medical Profession	0%	Low
International Trade Profession	0%	Low
Internal Audit	0%	Low
Government Veterinary Profession	0%	Low
Planning Inspectors	0%	Low

Annex 2 - Optimism bias

Optimism bias should be applied to project costs and benefits to remediate the tendency for appraisers to be overly optimistic. Green Book guidance outlines methods for calculating and applying optimism bias to projects based on a number of generic categories.

The level of optimism bias should be calculated based on real data from past or similar projects. In the absence of robust data, the standard Green Book adjustment rate[31] can be used for DDaT projects. If necessary, teams can speak to HMT about the level of optimism bias to use. The Green Book provides generic upper bounds for optimism bias to be applied for different types of projects. DDaT projects fall into the "Equipment/Development" category. This category is defined for projects that involve the "provision of equipment and/or development of software and systems". It provides an upper bound of 54% for benefits and 200% for costs. This means that benefits should be reduced by 54% initially and costs increased by 200% initially to account for optimism bias.

Table 9: Standard Optimism Bias in DDaT projects

	Benefits	Costs
Upper Bound OB %	***54***	***200***

Optimism bias should be reduced from the upper bound in line with how well contributory factors have been identified and managed. Contributory factors are: procurement related, project specific, client specific, environmental and external factors. If measures are taken to reduce risk in these contributory factors, the level of optimism bias to apply will fall. These costs of risk avoidance or mitigation must be factored into the project as a cost.

Specific characteristics of DDaT projects such as a reliance on contractors and uncertainty created by the use of new approaches and technology as well as agile delivery methods should be considered when allocating risk factors and mitigations weightings.

2.1 Applying Optimism Bias

1. **Start with the upper bound**: use the value identified in the table above as a starting value for calculating the optimism bias level. Start with 54% for benefits and 200% for costs.

2. **Assign weightings to each contributory factor identified**: Contributory factors should be weighted based on their estimated contribution to the total project risk (these weightings should add to 100%).

3. **Consider whether the optimism bias factor can be reduced**: reduce the OB level according to how well contributory factors have been managed. This is reflected in a mitigation factor (each has a value between 0 and 1, where 0 indicates no contributory factors have been mitigated and 1 indicates they have been fully mitigated).

[31] Green Book Optimism Bias Supplementary Guidance

4. **Apply the optimism bias factor**: multiply the present value of the capital costs by the optimism bias factor. This can then be added to the NPV of the whole project cost.

2.2 Worked example for optimism bias

A template Optimism Bias calculator is included in the resource pack.

We start with an optimism bias of 54% for benefits and 200% for costs. We are able to reduce this down to 7% for benefits and 28.6% for costs. The upper bound is affected by 5 contributory factors and so these factors must form 100% of the upper bound. The Green Book provides suggested contributory factors to the upper bound and an explanation on what they are and how they arise. For example, the “Degree of Innovation” forms 20% of the upper bound whilst “Government Guidelines” form 0% of the upper bound.

The next stage is to apply a risk mitigation factor and justify it. For example, we can apply a risk mitigation factor of 0.8 on “Poor Contractor Capabilities”. This helps to reduce the upper bound. The greater the risk mitigation factor, the greater the reduction in risk and thus the upper bound is reduced. As these risk mitigation factors are applied, the upper bound falls to 7% for benefits and 28.6% for costs. Benefits should be reduced by 7% for each year and costs increased by 28.6% for each year. We have attached the above model that can be used to calculate the optimism bias.

2.3 Contributory factors

Table 10: Contributory Factors

Area	Contributory Factor	Examples/ Mitigations
Procurement	Complexity of Contract Structure	- Previous experience (eg contracts are pre-existing) - Assistance from specialists eg a complex transactions team - Contracts have been commercially scoped
	Late Contractor Involvement in Design	- Plans to include any contractors required at the start of the programme
	Poor Contractor Capabilities	- Evidence that contractors are SMEs - Assessment of market supply
	Government Guidelines	- Precedent/ guidelines for project
	Dispute and Claims Occurred	- Disputes over payment or scope of project
	Information management	-
	Other (specify)	-
Project Specific	Design Complexity	-
	Degree of Innovation	- Extent to which costs are predictable (eg majority staff costs)
	Environmental Impact	- Includes contamination, impact on wildlife (likely to be null for digital projects)

	Other (specify)	-
Client Specific	Inadequacy of the Business Case	- If the majority of costs have been identified and monetised
	Large Number of Stakeholders	- Complexity of approvals process for project decisions - Diversity in stakeholder needs/ requirements
	Funding Availability	- Difficulty accessing funding later in project if scope changes
	Project Management Team	-
	Poor Project Intelligence	- Is specialist knowledge required to complete the project
	Other (specify)	-
Environment	Public Relations	-
	Site Characteristics	-
	Permits/Consents/Approvals	-
	Other (specify)	-
External Influences	Political	-
	Economic	-
	Legislation/Regulations	-
	Technology	- Complexity of technology involved
	Other (specify)	-

Annex 3 - Links to useful documents that may be required

State of digital government review:
State of digital government review – January 2025

AI Playbook for the UK Government:
AI Playbook for the UK Government - GOV.UK

Digital and Data Capability Framework:
Government Digital and Data Profession Capability Framework

HMT Green Book Guidance:
The Green Book: appraisal and evaluation in central government - GOV.UK

Government Digital Service About Us:
Government Digital Service - GOV.UK

Government Digital and Data Profession:
Government Digital and Data profession – Hub | Civil Service Careers