Response to the National Data Strategy

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1 Executive Summary

This document provides a response to the National Data Strategy (NDS). We have consulted widely with data practitioners across government to review the NDS. The NDS is welcomed, but in its current form it will not achieve what it should and is missing significant areas. As practitioners we value a high-level view that encapsulates breadth and direction of purpose and have adapted the NDS framework diagram accordingly, so that it reflects outcomes not organisations. Further discovery workshops to broaden the NDS would be a mistake, "*delivery is the strategy"* and moving to action with practitioners to resolve omissions and issues is the better mitigation.

Our summary recommendations are:

- The National Data Strategy (NDS) needs strong political backing for medium term investment, with a clear strategy for data across government and the wider public sector, and a framework which is outcome focussed and assigns delivery responsibilities.
- The NDS should be practitioner lead. User needs are the practical lens for directing action and focusing efforts to assure different data sharing initiatives drive value through to citizens.
- The newly appointed Government CDIO should become the Data Controller for all central government data[1], with each department becoming a Data Processor. The intention of this is to put in place a simple, central arbitration mechanism to resolve debates and unblock barriers to data sharing between departments. A similar arrangement should be put in place for Local Government data.
- Improvements in the Data Literacy (as opposed to Data Skills) of politicians and senior officials is essential to meet the needs of a modern digital economy. We recommend the development of collaborative data platforms for policy makers to guide and assure the use of data and to improve data literacy through sharing.
- Government should commit to move away from data silos, by developing cross-Government Data Infrastructure for citizen facing service delivery, assessing public sector IT spend from a data perspective and mandating all data is designed and prepared for re-use from the outset.
- The building blocks of interoperability are current blind spots in the NDS and should be addressed, including data infrastructure, data architecture and the significant omission of geospatial data.
- Implement the NAO report "Challenges in using data across government" June 2019 in full.
- Government should develop a single framework for Data Ethics and Data Transparency based on current working examples from within Government and remove siloes of activity in this area. Citizen user research should be undertaken on the public acceptability of personal data use

[1] The National Statistician should remain as the Data Controller for Statistics and Research data

across the public sector for operational systems, in policy development and for statistics and research purposes. Parallel citizen user research should be carried out to determine the public acceptability of business and commercial use of personal data.

- Legislative changes may be necessary to enable a fully functioning public and private sector data-enabled economy for the UK. We recommend that the reduction in siloed working for data should also applied to the policy space to ensure that future legislation draws on working examples of best practice with data (i.e. learn by doing).

The benefits of our recommendations, translate to time and money as follows:

- **Wider value to society, economy & the environment:** data is a national strategic asset worth many billions of pounds to the UK economy. Data is as important to our society and the economy as traditional physical infrastructure such as energy, water, waste, secure food supply or transport. Our response to the NDS offers an approach to take action and make progress now, rather than defer or repeat. Our recommendations enable NDS to drive sizable economic, social and environmental benefits to the UK with imminent effect and to avoid further delays in realising more value from data.
- **The cost of deferral:** NDS recognises multiple data strategies, omitting others. Until the NDS seizes the opportunity, lack of join-up remains a costly risk, caused by different organisations each continuing to develop their own data strategy in isolation. Multiple efforts and resources across government are being invested into vast, expensive data and technology silos. This is storing up data-legacy which will prove difficult and costly to unpick. Our recommendations enable the NDS to drive action now, to mitigate the expensive cost of any further deferral.

We are happy for this response to be mentioned in the published summary findings to this consultation.

Next steps: The lead authors of this document are happy to review and discuss this feedback. To co-ordinate involvement of our authors, please contact daniel.klein@zuhlke.com

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2 Introduction

We welcome the opportunity to respond to this consultation. Data is fundamental to our economy and society. Data is generated, collected, collated, governed, and used in many ways by industry and business, academia, the public sector, non-government organisations and individual citizens. When used effectively, data:

- can deliver huge value for society and the wider economy.
- is the fuel of innovation and coupled with analytics and digital services, can drive better decision-making to improve outcomes for everyone in the UK.

Framing a forward looking, holistic, National Data Strategy (NDS) is a challenge which can be approached in many ways. However structured, a National Data Strategy should serve and enable the following key dimensions, across all sectors of the economy:

- **Policy and Regulation:** The UK's data policy and regulatory regime including legal and ethical considerations.
- **Data supply and data use:** including security and infrastructure.
- **Social and economic value creation:** through outputs delivered by leveraging data whether for national security, to generate research outputs, to make public information available, to underpin business and economic growth or to improve public service delivery.

Moving on from 'more of the same'

We would like to see a National Data Strategy which focuses on practical outcomes and how they will be achieved setting out clear delivery ambitions alongside a government commitment to improving funding for data-related activities. The upcoming post-Covid economic environment will be extremely tough and investment to drive up service quality, deliver efficiencies and reduce costs through the better use of data could not be more critical; **this can only happen if strategy, policy, goals, targets and funding are fully aligned.**

Generally, we observe a 'more-of-the-same' approach in the NDS which misses the opportunity to learn from the past and feed this learning into a vision for the future. We suggest that the strategy should learn from and build on the many activities it references rather than simply propose to continue to action them all (NDS Annex A). We suggest that government should differentiate the current activities it has identified into three categories, which should be:

1. taken forward as-is.
2. rationalised for clarity and efficiency with a focus on dramatically improving partnership working on data.
3. discontinued.

To achieve this, we believe the strategy should take more direct evidence and learn lessons from activities at the coalface of digital and data across government and the wider public sector. This should include:

- **Best practice:** looking for examples of best practice and seeking ways to share the real-world improvements being made – to drive efficiencies and avoid 're-inventing the wheel'.
- **Policy:** focusing less on the somewhat esoteric policy challenges; for example, 'Who is going to regulate AI and Machine Learning algorithms?' in favour of facing up to urgent policy challenges such as, 'How can data services improve public sector delivery to citizens and the quality of analysis across government ?' Because this is where immediate and medium-term value will be generated.
- **Data literacy:** taking a long hard look at day-to-day use of data in the public sector, historically low levels data literacy and the problems associated with long-term under-investment.

We believe there is a risk that some people will interpret our consultation feedback as implementation detail ("these things will come later Minister") or, possibly even worse, the merit of our suggestions will result in more yet policy led 'data-discovery' workshops (" a broader review of the NDS Minister"). To avoid this outcome we stress that, quite simply, we would normally expect a strategy to set out *what* is to be delivered, *why* and *how*. We have failed to find this coherently articulated in the NDS.

We think it would be relatively easy to restructure the NDS into something which can realise the opportunities of data for Growth, Jobs, Public Services, Research and Society. Considering the principles of what, why and how might aid this, for instance:

- **What:**
  - facilitating a genuine cross-government approach to data, **in order to**
- **Why:**
  - deliver immediate, citizen-focused benefits from government data through improved service delivery **and thus**
  - realise the considerable spending efficiencies data can generate following suitable up-front investment **and also**
  - enable the wider data economy, and innovation **by**
- **How:**
  - being data practitioner led, with the real-world evidence feeding into policymaking and funding decisions.

Achievement of the things we outline is contingent on:

- **Ambition:** the political will to seek new clarity across data policy and data use activities.
- **Reality:** asking some of the more difficult questions, to spell out and face up to underlying challenges, including determining what public sector is spending on data, where and by whom.
- **Prioritisation:** thinking about the medium term and how to build for the future.
- **What already works:** considering the art-of-the-possible learning from the many good examples of data use across government and the wider public sector.

3 This document

Our response to the NDS consultation is structured as follows:

Section	Comment
4. Our Observations	In Our Observations we provide overarching feedback on the NDS. Much of this is high-level and comments on different aspects of data policy, data and data usage each of which are touched on to a greater or lesser extent in the NDS. It is easy to criticise a policy document without explaining the rationale behind the criticism. Therefore, in the subsequent section (Our Recommendations) we set out our thoughts, grounded in real-world examples of work with data across government and the wider public sector, to highlight the actual day-to-day challenges data practitioners are facing – which the NDS does not consider in detail. Based on this, we propose a different approach to the NDS which we believe can deliver genuine short-term value and also accelerate efficient build for the future.
5. Our Recommendations	In Our Recommendations we set out our thoughts for a differently framed National Data Strategy which drives from the data needs and opportunities out to the activities and actions across government, rather than the current framework which is designed around all the current data activities and actions.
Authors	The lead authors who collated findings and compiled this document
Annex A Formal consultation questions and responses	We answer the specific consultation questions as requested, referring to our earlier text or, where we have not covered the topics previously, with specific responses.
Annex B About Zühlke	A high-level overview of Zühlke.

4 Our Observations

4.1 The Governments role with and view of data

The government's role with data is complex and multi-faceted. The Government is the policymaker, the legislator, the regulator, an owner, a supplier, and a user of data in the United Kingdom.

As such the government's strategy for data is critical to the country, the work of government itself, and the delivery of public services. Given the breadth and depth of its role with and responsibility for UK data the Government's Data Strategy should acknowledge the need to manage all the political, social, economic, and environmental aspects of data use. Above all data should be clearly recognised as a strategic asset. We observe that there are more than one thousand, eight hundred words in the National Data Strategy (NDS) before data is recognised as or referred to as a strategic asset.

This view of government's role around data has caused us to make several observations and pose the following questions of the NDS:

No.	Headline Question	Potential implications
1	Why is there no strategic cross-government approach to data?	Should the government differentiate the current activities identified in the NDS into three categories, and triage these activities against the following criteria: 1. taken forward as-is. 2. rationalised for clarity and efficiency across government, focusing on dramatically improving partnership working on data. 3. discontinue.
2	Is this a national data strategy or multiple data strategies?	Should the National Data Strategy be a genuine single strategy or set of strategies for data which are designed to fit together? If the NDS is a cross-government endeavour why doesn't the current strategy set out clear strategic goals and responsibilities across the different areas, such as data policy and regulation, data supply (internal and external), data infrastructure, tools and security, and data usage?
3	Why is there no Geospatial Data Strategy?	Should the NDS chart the path forward for the UK's national location data infrastructure and also the actions the government will take to secure suitable satellite data for use in the UK?
4	Is there a single UK Data Ethics Strategy?	Should the Government develop a single, comprehensive set of principles and policies for data ethics to rationalise the different approaches across the data landscape?
5	Where is Local Government?	Should the NDS seek to ensure that both central and also local governments approach towards data is joined up?

6	Should the strategy set out the importance of data as National Information Infrastructure (in its own right)?	Does a modern digital economy need a strategic approach to National Information Infrastructure?
7	Where is the joined-up approach required to tackle data sharing across government?	If a joined-up approach across government is needed but not yet working, is it within the remit of the NDS to resolve this issue?
8	What is the strategic approach to the wider data economy, data supply and data suppliers?	Will the Government re-affirm its commitment to Open Data? Will the Government commit to examining its own role as data supplier and data consumer in the wider economy? What commitments does the Government make to ensuring that UK data markets operate effectively?
9	Does the government think that domain expertise and partnership working with the private sector technology companies is important?	Will the Government commit to developing policy which considers emerging data technologies, working in partnership with the academics and technology companies?
10	Should there be more in the NDS about Data Literacy, rather than Data Skills?	Should the NDS establish what data literacy is and how data literacy principles should be applied across government?
11	Can the government be clear about its regulatory policy for the digital/data economy?	Should the NDS set out a clear picture of the regulatory framework for data in the UK – including a roadmap for future regulation? If not, where should this information reside?
12	How will the new GCDIO role change things?	What will the remit of the GCDIO be and how will they work with: 1. Central government departments? 2. Arms' length bodies? 3. Local Government?

We have expanded on our observations below, which are based on our own experiences of working with data, in and around government and across the private sector and some deep discussions with data practitioners across government to understand their thoughts about the NDS.

4.2 Why is there no strategic cross-government approach to data?

Rather than taking an overall strategic approach to data the NDS's focus appears to be to try to include all the historic and currently siloed data policies and initiatives across government and to seek to perpetuate them all, **without considering whether or not they are coherent as a set, will deliver their intended outcomes, or are well-constructed for the future**, by which we mean the future of how the government wants to use, manage and govern data within the UK.

We find the NDS confusing and unwieldy. It does not set out a comprehensive approach to drive forward cross-government data sharing. The Missions, owned by DCMS, are high-level and appear to conflict with activities in other parts of government. The ownership of any strategic outcomes is unclear. We

find the multitude of actions and activities both in play and proposed inadequately explained in terms of the **tangible outcomes or benefits** sought and we suggest that there are too many actors here, working in a very disjointed way.

We find little explanation in the NDS of the potential benefits that the better use of data can deliver for society, the economy, or the environment. Equally, despite the UK being recognised as a leader in digital transformation, **a user-led approach is missing in the consideration of the potential benefits data can drive, for citizens, policymakers, analysts, regulators, and businesses**. Although SMEs are mentioned in various specific contexts around their ability to access and use data, **access to data for academics, charities, and NGOs, many of whose work underpins the delivery of government policy, is neglected.**

In our conversations with data practitioners across government prior to writing this response it has been disappointing to discover that the current NDS has little or no traction across the community. There is certainly no 'buzz' across the public sector digital/data practitioner community about the NDS. Several officials and practitioners have commented that since is it entirely policy led, they do not see it having any impact (good or bad) on the work they are doing in their organisations. If the NDS fails the community government is reliant on to implement the better use of data, we believe that it will fail.

We think this new strategy should learn more specifically from and build more strongly on the activities it references and from the many practitioners across government and the wider public sector who work with data. **We observe a 'more-of-the-same' approach to the NDS which misses the opportunity to learn from the past and feed this learning into a vision for the future**. We do not find evidence of detailed input into this strategy from data practitioners or sector experts. Overarching strategies to connect actors across the current data ecosystem are vague or missing, with few specific commitments to help anyone deliver better with or for data. Therefore, we propose a different approach in Our Recommendations section.

We also suggest that the government should differentiate the current activities identified in the NDS into three categories, and triage these activities against the following criteria:

1. taken forward as-is.
2. rationalised for clarity and efficiency across government, focusing on dramatically improving partnership working on data.
3. discontinued.

4.3 Is this a national data strategy or multiple data strategies?

A National Data Strategy should be the country's umbrella strategy for data. We question how the NDS pulls the various strategies it mentions together which, we believe, should be its primary intention. For example, the NDS quotes:

- *"The government believes that unlocking the value of data is key to driving growth both within the digital sector and across the economy. This will be part of our Digital Strategy, which will be published in the Autumn and will consider more broadly how we can support a digital drive for growth.*" The Digital Strategy is also referenced for other proposals including: a *"digital drive for growth"* (which we don't understand) the regulation of the wider digital and technology landscape, consideration of data protection laws, working with devolved administrations to support vibrant career pathways, and other skills measures including it being the proposed home for a National Skills Fund.

- *"The governments Future of Mobility strategy describes some of the actions being take to maximise the benefits of data use in the UK's transport sector."*

- *"NHSX is developing a Data Strategy for Health and Social Care in Autumn 2020,"* and *"Health and social care data will be covered in the upcoming Data Strategy for Health and Social Care."*

We can't find anywhere where the multiple data strategies, recognised within the NDS or omitted by the NDS fit together. In our conversations with practitioners across government we have uncovered **a critical universal truth – each department or organisation is developing its own data strategy – with little communication or collaboration.** This is a strong parallel here to the pre-Government Digital Service (GDS) days where each department built its own website. Multiple efforts and resources across government are being invested into vast, expensive data and technology silos. No matter how good each project is in its own right, this will **result in inefficient data infrastructure and is storing up data-legacy** which it will prove extremely difficult and costly for the public sector to unpick in the future.

It is unclear who is responsible for which aspects of data across government. The 2019 National Audit Office (NAO) report "Challenges in using data across government"[2] depicts (in its Figure 5) some of the overlapping roles and responsibilities for data across government and states that Government should use the NDS to *"push a sea change in strategy and leadership."* **We do not recognise the current NDS as having addressed this, or other NAO report, recommendations** – all of which we support.

Our observation is that the NDS should be a comprehensive, cross-government strategy which describes the Governments' overall programme of work to deliver its ambitions for data for the UK and which can be used to frame well-structured delivery focused programme across the strands of work, each of which should have individually identified responsibilities and outcomes, to avoid duplication and coordinate a drive toward common goals.

Question: *Should the National Data Strategy be a genuine single strategy or set of strategies for data which are designed to fit together? If the NDS is a cross-government endeavour why doesn't the current strategy set out clear strategic goals and responsibilities across the different areas, such as data policy and regulation, data supply (internal and external), data infrastructure, tools and security, and data usage?*

4.4 Why is there no Geospatial Data Strategy?

Our opinion is that **the biggest single omission in the NDS is the lack of reference or commitment to a Geospatial Data Strategy**.

Geospatial references are by far the most useful identifiers to understand the country we live in, how services are delivered at a local level, track environmental issues, and enable data linkage. The NDS is noticeably light in its approach to location data and geospatial referencing. It only considers this important topic through a couple of built environment case studies and makes no reference to the new

[2] https://www.nao.org.uk/report/challenges-in-using-data-across-government/

Public Sector Geospatial Agreement[3] (PSGA) or the Geospatial Strategy recently published by the Geospatial Commission[4] .

Following many years of campaigning and political debate the PSGA includes improved access to Ordnance Survey (OS) mapping data for public bodies across central and local government, including the NHS. The datasets available as OS Open Data are increasing steadily but slowly – for example it has taken two years from the announcement that Universal Property Reference Numbers (UPRNs) and Unique Street Reference Numbers (USRNs) would be made open to their becoming available.

Despite well-publicised success stories there are still restrictions on the use of much of the United Kingdom's mapping data, particularly for bodies at the 'edge' of the public sector including regulators, charities, and NGOs. As the Open Data Institute has reported OS Open Data products, *"Can only be used to build public-facing products and services and not as a means to support internal uses and analysis within an organisation. You can't use the APIs to develop internal applications, to support a customer service application. Or use them in back-office applications of machine-learning and AI. Or simply to improve internal management reporting and analysis"*. The ODI states that "***we feel a lot more work is needed to strengthen our national geospatial data infrastructure***". Despite recent improvement to the OS Open Data product suite there is not yet a full response to many calls to make UK address data open data. This data has an estimated value of £992m–£1.32bn each year to the UK economy, but was privatised in 2013 with Royal Mail.

At a recent event[5] the Geospatial Commission stated that it is now looking into issues around the ownership or perceived ownership of location data, also the ethics surrounding the use of location data. We welcome this work but wonder how long it will be until the Government realises that, because of the fundamental importance of geographical references and location frameworks (everything happens somewhere), it should **invest in its own National Mapping Agency properly and ensure that the UK has public ownership of its own address register**. And it is time to recognise that historical arguments about the privacy and security of location data are fairly redundant given the current availability of near real-time satellite data on everyday mobile devices.

Whilst the steps taken recently to open up and remove the friction in accessing national mapping data are welcome neither the NDS or the Geospatial Strategy set out a roadmap to establish the Government's longer-term intentions for national mapping or location data. This has two severe impacts on the wider data economy:

1. It generates **uncertainty** in the supply chain for location data and signals a lack of commitment to a full National Information Infrastructure.
2. It **undermines business confidence** in using national mapping data, particularly for small businesses.

Unless the government makes a strong clear commitment to national location data as a public good, many developers will continue to work with Google Maps or OpenStreetMap, perpetuating the current fragmentation of the national location data landscape and adding **unnecessary complexity to the UK**

[3] https://www.ordnancesurvey.co.uk/business-government/public-sector-geospatial-agreement
[4] https://www.gov.uk/government/publications/unlocking-the-power-of-locationthe-uks-geospatial-strategy/unlocking-the-power-of-location-the-uks-geospatial-strategy-2020-to-2025
[5] https://virtual.digileaders.com/talks/unlocking-the-power-of-location-the-uks-geospatial-strategy/

data economy with the ultimate economic value accruing to the alternate suppliers of UK location data.

It is incredible that the NDS makes no reference to satellite imagery as it is such a rich data source, not only for mapping applications, but also for many other forms of research and analysis. Although the Geospatial Strategy references a project using radar image data to identify the progress of construction projects in local authorities there is no reference in the NDS to the increasing use, across government (for example by Defra and ONS) of Earth Observation Data. We would expect the NDS to recognise the vast potential vested in the application and beneficial use of satellite imagery and to **commit to ensuring access to suitable sources and supplies of satellite data for the future.** We also understand that the current position regarding the UK's post-Brexit access to EU satellite data is unclear, which is a significant national risk.

Question: *Should the NDS chart the path forward for the UK's national location data infrastructure and also the actions the government will take to secure suitable satellite data for use in the UK?*

4.5 Is there a single UK Data Ethics Strategy?

The most poignant example of the need to rationalise the Government's approach to data in a systematic way is the treatment in the NDS of Data Ethics. Data ethics is vitally important to ensure that data is collected, held, and used in a way which is neither ethically nor morally wrong. Whether or not data use is ethical can be a complex, contextual judgement to make. From a government perspective ethics and security concerns are the determinants of the agreed balance between protecting sensitive data to the point where it cannot be accessed at all and allowing certain types or versions of sensitive data (for example linked, de-identified data) to be used for societal and/or economic benefit.

Clarity is important here as the EU General Data Protection Regulation (GDPR) and UK Data Protection Act (DPA) 2018 cover data privacy but do not cover data ethics. It is individual organisations codes of ethics and their practical implementation which are used to maintain public trust and to protect the privacy of a person or a group of people. Data ethics is strongly linked with **transparency**, letting people know what you are using data for, why and how and **one of the best and simplest ways to show that you are using data ethically is to open up your methods or algorithms for external scrutiny.**

As a consequence of the previously organic, siloed growth of government data initiatives, there are a plethora of organisations working on data ethics, including the:

- Centre for Data Ethics and Innovation (CDEI)
- Government Digital Service (GDS)
- Open Data Institute (ODI)
- Office for National Statistics (ONS)

Meanwhile the National Data Guardian oversees the practical use of citizen health data, primarily for historic reasons associated with the public reaction to the 2013 NHS patient data Information Sharing Scheme 'care.data' even though, had it been successful, the scheme would be likely to have resulted in improved service efficiencies and patient outcomes. With hindsight the care.data scandal was more about public reaction to the way the proposed scheme was communicated, than the actual scheme itself.

Furthermore, multiple organisations outside government, funded or part-funded with public funds and grants, including the Ada Lovelace Institute, the Alan Turing Institute (working in partnership with the Information Commissioners Office (ICO)), the Digital Catapult, the Open Data Institute, the Royal Society, the British Academy and others also have significant programmes of work on data ethics.

The NDS is peppered with references to data ethics and, under Mission 3: *"Transforming government's use of data"* to drive efficiency and improve public services, states that, *"we need a robust ethical framework of transparency, safeguards and assurance which builds and maintains public trust in the government's use of data*". However, we observe that the NDS does not offer any path forward in terms of organising the various strands of work on data ethics into a coherent framework. We believe that a comprehensive well aligned framework which builds on and brings together multiple cross-government initiatives – in this and other areas – is vital to the success of the NDS.

We also find the consultation questions on Data Ethics difficult to contextualise, and therefore difficult to answer:

- **Question 10** is very broad.

- **Question 11** we are not clear what the scope of the 'tech landscape' is? Does this mean across government and/or across specific industry sectors? Here, we would like the functions of the CDEI to be considered in the context of the wider landscape of actors in the Data Ethics space, described above.

- **Question 11a** "*How would a change to statutory status support the CDEI to deliver its remit?"* cannot be answered without clarity on the functions of the CDEI, explaining the rationale for putting the CDEI on a different statutory footing, explaining what the CDEI's new powers would be or providing us with an understanding of how this single action would improve the overall landscape of data ethics for the UK.

Question: *Should the Government develop a single, comprehensive set of principles and policies for data ethics to rationalise the different approaches across the data landscape?*

4.6 Where is Local Government?

The NDS says very little about Local Government with respect to data other than, *"as we move to implementation, we will work with partners to better understand the needs and barriers faced by local government in utilising data to its fullest potential. We will cut down on bureaucratic burdens, tackle risk aversion and strengthen the incentives to share data across the public sector*." It is not clear what this means in practice. The actions the NDS commits to for Local Government are to, *"Work to better support local government in maximising the benefits of data." and, "Through the National Skills Fund, to review the needs of local government in having the capabilities to manage, use and disseminate data".*

The NDS includes a couple of case studies grounded in local delivery for example: Data First and Food Hygiene Ratings. We think the NDS should explicitly recognise that **much of the most effective public sector use of data is carried out within and by Local Authorities**, despite the recognition (4.2) of a lack of resources for Local Authorities to deal with data issues. We also want to draw attention to the fact that most of the case studies involve partnership working.

Our view is that the NDS should set out strategies to further partnership working, especially with and across Local Government. An explicit goal of the NDS should be to **make it easy to share data between central and local government** since citizens expect government to be better joined up and it is the data from the front-line of local services which can be used to determine if central government policies are effective or not, and which should feed directly into policy evaluation and future policy-making.

Question: *Should the NDS seek to ensure that both central and also local governments approach towards data is joined up?*

4.7 Should the strategy set out the importance of data as National Information Infrastructure (in its own right)?

We think that **a National Information Infrastructure (NII) is as important to our society and the economy as traditional physical infrastructures such as energy, water, waste, secure food supply or transport**. The Covid-19 pandemic has demonstrated this in extremis with more public data than ever being shared across the organisations working together to help fight the virus, and more people than ever before have been working remotely with this data. The barriers in place to data sharing across the public sector (real and perceived) before the crisis simply melted away due to the severity of the situation.

The reality of dealing with data during the pandemic – albeit in crisis mode - is that the Office for National Statistics (ONS) Secure Research Service (SRS) which supplies de-identified data for research purposes has been in receipt of more data, given more easily than ever before, because of the level of political interest. To enable research with linked data, data in the SRS is linked as necessary, de-identified and delivered as a data service to accredited third party researchers[6] - in this case those helping to understand the Covid-19 pandemic. The relatively rapid response to Covid-19 was made possible because the ONS SRS service was in place well before the pandemic – with a **strong, open and transparent policy framework, effective governance mechanisms, solid business processes and suitable technology** already in place. Meanwhile, parts of the operational side of government had to hastily put data sharing in place. This happened quickly because of the level of political interest but, by necessity, has been a rather 'quick and dirty' activity rather than a robust data sharing process.

The Covid-19 data response has fully demonstrated the 'art-of-the -possible' – but the recent crisis-led data sharing across government will probably be viewed, with hindsight, as having been **far more onerous than it needed to be,** and in some instances less secure than it should have been. When the pandemic is over there will be a behind the scenes trail of **'data litter'** that needs to be cleaned up. Think of the debris following a storm – fallen trees and broken branches, the Covid-19 data equivalent will be scattered widely across systems.

With a robust National Information Infrastructure the response to Covid-19 would have been simpler, quicker, and more secure. The opponents of NII as a concept generally raise security issues as a barrier. However, if the NII is developed thoughtfully, security should not be an issue and, we argue, far more manageable and efficient than multiple systems holding multiple copies of the same data. A **NII would ensure better data quality and therefore increased data utility**. With a NII we argue that the **public sector would be better served by data, a better data custodian, data provider, more joined-up,**

[6] https://uksa.statisticsauthority.gov.uk/digitaleconomyact-research-statistics/research-accreditation-panel/

generally more efficient and more easily able to rise to the challenge of a crisis. Data access could be triaged on a per-use basis to ensure that data use was ethical and properly governed with firm control over who has access to what data, for what purposes.

The NDS does not recognise a National Information Infrastructure as a fundamental requirement of a modern society, nor set out the benefits it will underpin such as, better access to data, under better control, or improved data sharing between departments and other public sector bodies.

Question: *Does a modern digital economy need a strategic approach to National Information Infrastructure?*

4.8 Where is the joined-up approach required to tackle data sharing across government?

One of the Governments' key challenges (as for many large institutions) is effective internal data sharing. The Digital Economy Act 2017 despite its' legislative powers has not had the intended impact for several reasons. As the NDS points out these range from legal barriers (real and perceived) through to cultural blockers and risk aversion.

We reiterate that, in our opinion, the challenge of co-ordinating siloed data, enabling effective data sharing across the public sector and starting to deliver the many possible social and economic benefits data can deliver is **unlikely to be solved through multiple initiatives and work which itself continues to be disparate and siloed**.

Question: *If a joined-up approach across government is needed but not yet working, is it within the remit of the NDS to resolve this issue?*

4.9 What is the strategic approach to the wider data economy, data supply and data suppliers?

We observe that the NDS does not consider the wider data economy in any depth. Firstly, it does not make a commitment on the Government's role as a **trusted data supplier**. The Government has an external responsibility to maintain the supply of public information as Open Data and we would like to see the NDS reaffirming this commitment. It is not clear what outcome is sought by the stated plans to *"review open data publication and decision-making processes, together with the development of metrics to measure their impact (6.1.3)"*. The NDS highlights, *"issues with current licensing regulations […] as a key barrier to data availability (6)"*. We suggest that some of these issues are still around the availability of coherent national address data, currently provided under license by the Ordnance Survey. **We call for the government's position on the open availability of government-owned national addressing data to be clarified in the NDS.**

Equally, data supply chains are key pillars of a modern digital economy. We observe that the NDS barely comments on the broader UK data market, either as an industry in its own right or from the perspective that, currently, multiple Whitehall departments and other public bodies independently contract and pay (often the same) data suppliers for access to third-party data. These datasets are fundamental to work across the public sector in Data Science, Machine Learning and Artificial Intelligence.

We suggest the NDS might set out a general commitment to ensure **frictionless data supplies to and from government and the wider public sector** to deliver value for money from public spending and

drive innovation and growth. We observe no general commitment in the NDS that the Government will ensure **fair and competitive markets for the supply of data** across the UK.

Question: *Will the Government re-affirm its commitment to Open Data? Will the Government commit to examining its own role as data supplier and date consumer in the wider economy? What commitments does the Government make to ensuring that UK data markets operate effectively?*

4.10 Does the government think that domain expertise and partnership working with the private sector technology companies is important?

There is no reference in the NDS on the need for government to engage with external expertise or work with external partners. We have considered how government engages with the emerging technologies it needs to help shape current and future data policy and we observe that, in our opinion, too many central government data initiatives have engaged pure strategy and project management focused consultants rather than technologists. We suggest this is a contributory factor to the long list of data initiatives which have not delivered effectively over recent years.

The railway system of Great Britain was developed by private enterprise (although later nationalised and then privatised). Government cannot design and develop public data and technology infrastructure in isolation any more than it was able to design railways on its own. Similarly today, Government would not be expected to develop a Covid-19 vaccine on its own. All scientific and technical policy has to work with the technology of the day and the **Government cannot expect to design or implement a National Data Strategy without working extensively in partnership with those who have detailed domain, technology and delivery expertise**. Our opinion is that the NDS should actively look to build on best-practice and best available technology to support and drive further innovation with data rather than take an isolated policy approach.

Our opinion is that government should build closer relationships with technology companies, not on a one-off project basis to build yet another data silo but **strategic, forward-looking partnerships** where governments particular challenges with data can be factored into the research and development roadmaps of best in class data technologies. In particular, we would like to see more open partnerships with the private sector companies and academics working on data privacy and data security and data access solutions.

Question: *Will the Government commit to developing policy which considers emerging data technologies, working in partnership with the academics and technology companies?*

4.11 Should there be more in the NDS about Data Literacy, rather than Data Skills?

We observe that the NDS covers Data Skills, but it is silent on Data Literacy. We do not think senior civil servants need to be expert data practitioners themselves, moreover we do think that they need to be data literate in order to carry out their function competently. By data literacy we mean a working understanding of topics like:

- Being both quantitatively aware and also qualitatively aware.
- Understanding what data you need to design a policy and to manage a service.
- Understanding how data should and should not be used.
- Have the knowledge to know what data is able to tell you and how to avoid drawing false conclusions from data.

- The need to present options to ministers that are led by data, as opposed to being justified by data.
- Understand the importance of measurement error, where data sets often carry confidence bars to specify the uncertainty range that is being applied.
- Understand that when multiple data sets are joined, that measurement error becomes compounded and that a combination of uncertainty ranges needs to be managed.
- Awareness of when proxies are being used to infer something.
- Structural understanding around areas like Metadata.

Question: *Should the NDS establish what data literacy is and how data literacy principles should be applied across government?*

4.12 Can the government be clear about its regulatory policy for the digital/data economy?

Strongly associated with our view on the need to rationalise data ethics frameworks we believe the NDS should be clear about how government will approach its responsibility for effective data regulation.

The UK has two strong pieces of legislation in place concerning data. The General Data Protection Regulation (GDPR) is barely referenced in the NDS, other than the need to *"seek adequacy decisions from the EU prior to Brexit (6.3.2)"* and later, in a way we don't quite understand, as *"part of the security and resilience of UK infrastructure on which data relies (7.2.1)".*

The main driver for data regulation is to build and maintain privacy, to resolve tensions between the right to privacy and the economic, social and environmental benefits of using and combining data, for data used within government or by businesses or academics[7]

We observe that, aside from a reference to the Competition and Market Authority (CMAs) report into online platforms as part of Mission 1, the NDS provides **little insight into how the Government might chose to regulate data supply or data use either across government or the wider economy**.

Question: *Should the NDS set out a clear picture of the regulatory framework for data in the UK – including a roadmap for future regulation? If not, where should this information reside?*

4.13 How will the new GCDIO role change things?

We welcome the creation of the Government Chief Digital information Officer (GCDIO) role. However, we observe a lack of recognition in the NDS that the current responsibilities for data policy, data itself and data programs across government are widely dispersed and lack co-ordination.

We suggest that the GCDIO, located as is proposed within Cabinet Office, without significant resources, may be unable to solve the data challenges across the whole system of government, including not only central departments but arm's length bodies and local government.

Question: *What will the remit of the GCDIO be and how will they work with; a) Central government departments? b) Arms' length bodies? c) Local Government?*

[7] Whose data needs are barely mentioned in the NDS.

5 Our Recommendations

We believe we have a useful understanding of government's data challenges, gained through our collective experience of working with and for government, government agencies and arms-length public bodies on data-centred projects.

We have also discussed the National Data Strategy privately with many public sector data practitioners; the people struggling daily to make better use of data. Many of these conversations with those 'on the coalface' have been similar. Most practitioners find little evidence in the NDS that their challenges are fully understood and can't see how they will be resolved. These conversations have motivated us to deliver this comprehensive consultation response since, for cultural reasons, the people we have talked with cannot, or prefer not to, speak out individually.

In summary:

- Over the last few years many government innovations and one-off data initiatives to address individual policy challenges have resulted in an over complex, disconnected landscape of polices, bodies and responsibilities for data across government.

- We observe little evidence of the NDS proposing to learn from what has and hasn't worked across these.

- We don't think this strategy in its current form will result in a realistic and practical set of policies and practices to improve the UK's use of data.

- The themes the NDS has identified are broadly correct but the approach appears somewhat introspective and as we have found very little evidence of engagement with data practitioners in the broadest sense. We are concerned that they will continue to remain disengaged as the Government tries to solve the challenges ahead.

- To move forward and deliver the potential outcomes and benefits data can deliver, we believe the Government should take a step back, assess where it is now, the outcomes sought and fundamentally reframe its strategy with a focus on practical, collective cross-government working.

We have consulted with people we have worked with from across the data landscape and further expert input to help us determine how to move the NDS forward. Our recommendation to help engage the communities working with data better is that the NDS should be reframed as outcome focused, centred around four pillars. These are:

1. **Digitally enabled Government – driven by data**
2. **Data supply and Data maturity**
3. **Data Literacy**

4. Data Policy, Ethical and Regulatory Frameworks

We would therefore re-cast the NDS framework as shown in the diagram below into a cross-government framework which can be driven forward by the cross-cutting, practitioner-focused, actionable pillars we have identified. We think these four interrelated, actionable pillars can transform the use of data by government. We recommend they are considered in priority order:

- The first (Digitally enabled Government – driven by data) is driven by **user needs**
- The second (Data supply and Data maturity) tackles **sorting out data itself**
- The third (Data Literacy) is to **drive capability** and
- The fourth (Data Policy, Ethical and Regulatory Frameworks) is about building the **future governance regime** for data

Our recommendations below in each of these areas include feedback from others, and we include a number of case studies directly related to the points we are making.

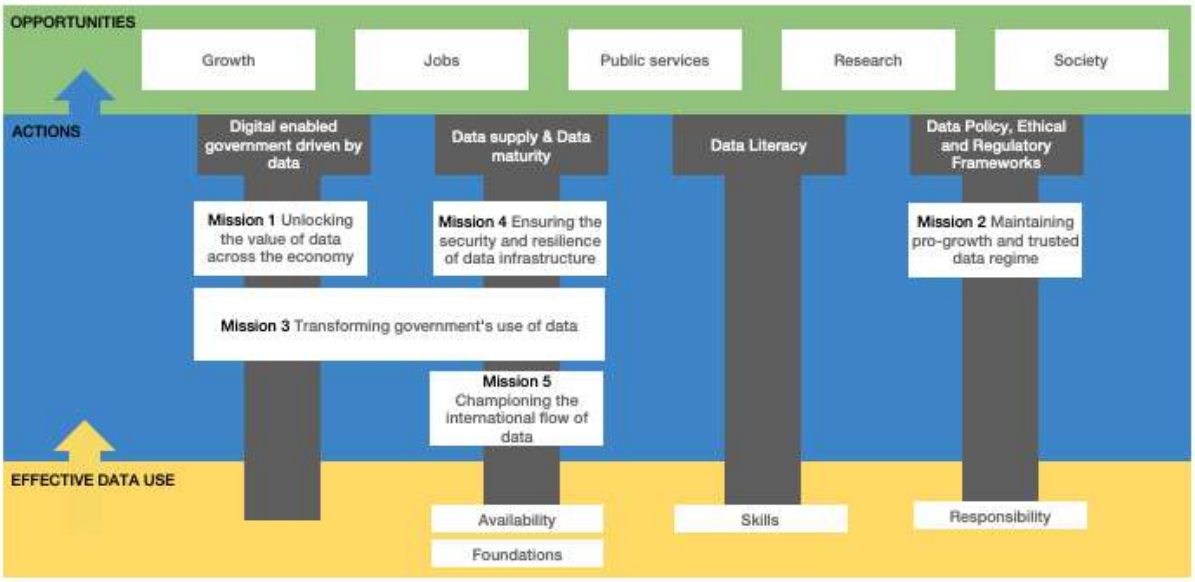

Figure 1: an evolution of the NDS strategy and pillars

Within the executive summary we outline our headline recommendations, in the table below we cross-reference these recommendations against more detailed implementation considerations that we outline throughout the rest of section 5:

No.	Recommendation	Implementation Consideration
1	The National Data Strategy (NDS) needs strong political backing for medium term investment, with a clear strategy for data across government and the wider public sector, and a framework which is outcome focussed and assigns delivery responsibilities.	**5.2 C)** The Government should set out a plan and ring-fence long-term funding (£bns) for the gradual development and delivery, over a number of years, of well architected, fully curated, virtualised data services across all government departments and public sector bodies.

2	The NDS should be practitioner lead. User needs are the practical lens for directing action and focusing efforts to assure different data sharing initiatives drive value through to citizens.	**5.1 A)** We recommend citizen user research, based on the best practice set by DfT Blue Badge, as a way of defining and communicating the proportionate use of data and information for operational and policy use. **5.2 F)** As a practical step to deliver data sharing the NDS should set out the various different top-level use cases for data sharing and identify the stakeholders who need to be involved as a precursor to working out what needs to be done to make data sharing easier and more effective.
3	The newly appointed Government CDIO should become the Data Controller for all central government data, with each department becoming a Data Processor. The intention of this is to put in place a simple, central arbitration mechanism to resolve debates and unblock barriers to data sharing between departments. A similar arrangement should be put in place for Local Government data.	**5.1 B)** We recommend that the NDS should rationalise the principles of Data Controller and Data Processor across government i.e. • Data Controller: central government moves to a single data controller model with control of all operational data vested in the newly appointed GCDIO as Data Controller. The intention of this is to put in place a simple, central arbitration mechanism to resolve debates and unblock barriers to data sharing between departments. • Data Processor: where each central department takes the role of Data Processor. • At a local level: where each of the 206 local authorities across the UK appoint a single local Data Controller and those operating within the area of the authority are considered Data Processors (to simplify data governance at the local level too). **5.1 C)** We also suggest that if the Local Government Association were to act as Data Controller for Local Government, it could hold the data sharing agreements with central government and Local Authorities would become designated Data Processors,

		operating to the same set of rules and guidance.
4	Improvements in the Data Literacy (as opposed to Data Skills) of politicians and senior officials is essential to meet the needs of a modern digital economy. We recommend the development of collaborative data platforms for policy makers to guide and assure the use of data and to improve data literacy through sharing.	**5.3 A)** We encourage more senior members of the government, civil service and public sector to become data literate, without the need for technical data skills, through shared learnings with colleagues. **5.3 B)** We recommend the use of collaborative platforms between policy makers to ensure the controlled use of data and to improve to data literacy through sharing.
5	Government should commit to move away from data silos, by developing cross-Government Data Infrastructure for citizen facing service delivery, assessing public sector IT spend from a data perspective and mandating all data is designed and prepared for re-use from the outset.	**5.2 A)** The NDS should put forward a broader set of proposals for cross-government data services, taking into account the requirements of different data users and stakeholder groups, rather than focusing on a single aspect of government data-sharing (the Integrated Data Platform for Analysts which happens to be the one which is already working quite well). **5.2 B)** The Government should make a full commitment to moving away from data silos through: • Spend controls which assess IT spend from a data perspective to assess whether proposals will add or detract from the overall public sector data estate and on the ability to share and re-use data effectively. • Mandating that all new data collected or purchased for a specific purpose is designed and prepared for re-use as part of its initial integration.
6	The building blocks of interoperability are current blind spots in the NDS and should be addressed, including data infrastructure, data architecture and the significant omission of geospatial data.	**5.2 D)** If the government is serious about achieving coherence across public sector data, improving interoperability and data sharing and moving towards real-time data feeds then specific, collaborative work across government on Data Infrastructure and Data Architecture is essential.

		5.2 E) We highlight that data security classifications, down the attribute level, are essential in Data Standards and Metadata definition. We recommend that government looks at the work ONS has done in this area to define and implement a risk-based approach to sharing data and linked data and builds on this to help open up data sharing across government. **5.2 G)** The government should assess what data is essential to public sector work with data and ensure that all such data is available across the public sector to those who need it. **5.2 H)** Third party data and data tooling should be procured centrally for the public sector rather than multiple times across multiple organisations or even multiple times within the same organisation.
7	Implement the NAO report "Challenges in using data across government" June 2019 in full.	
8	Government should develop a single framework for Data Ethics and Data Transparency based on current working examples from within Government and remove siloes of activity in this area. Citizen user research should be undertaken on the public acceptability of personal data use across the public sector for operational systems, in policy development and for statistics and research purposes. Parallel citizen user research should be carried out to determine the public acceptability of business and commercial use of personal data.	**5.4 A)** We find the data ethics space crowded and confusing and suggest there are too many actors, with overlapping remits, being separately supported and promoted by Government. **5.4 B)** We would like to see a single, overarching, principles-based framework for data ethics for the UK. **5.4 C)** We urge government to move on from discussions about the importance of ethics and the development of multiple, largely similar, sets of principles for data ethics to focus on putting data ethics into practice. **5.4 D)** We recommend the NDS should commit to a roadshow style consultation with society and citizens on the acceptable use of citizen records for operational and analytical purposes, both for citizen specific decisions and for sharing data to improve policy-making and public services at local, regional and national level. This should set out the

		potential benefits to society, citizens, and in national spending through enabling timely information and improved decision making.
9	Legislative changes may be necessary to enable a fully functioning public and private sector data-enabled economy for the UK. We recommend that the reduction in siloed working for data should also applied to the policy space to ensure that future legislation draws on working examples of best practice with data (i.e. learn by doing).	**5.4 E)** The government should formally review current data sharing legislation to make sure that it enables rather than hinders public sector operations (taking into account current examples of best practise in data-enabled service delivery, whilst considering the benefits data sharing can deliver in time and cost and recognising the need for improved data sharing for wider social, economic and environmental benefit). **5.4 F)** In addition to a review of data sharing legislation for operational purposes, to make sure that data can be shared effectively across public service boundaries and help more joined-up future service design. We believe a review of how operational data can be shared more effectively with analysts and researchers would also be useful.

5.1 Digitally enabled Government – driven by data

Data within Government has two primary uses in the delivery of public services:

1. **Understand, Inform and Measure:** The ability to understand the nature of society, the economy and the environment, inform the creation of political imperatives, define and design policy, assess the potential impact of new policies and then measure the effectiveness of policy implementation.

2. **Enable:** To facilitate the operation of and interactions between various citizen services. This includes enabling citizens to interact directly with digital services and to improve service agent (civil service or third-party engagement with citizens.

These two drivers for improving the use of data within Government, have distinct differences in terms of value creation.

We observe that Enablement of data within operational settings and for interactions between citizen services has the strongest link to direct value creation, in terms of improved department efficiencies and citizen services. On the other hand, using data across Government to Understand, Inform and Measure, whilst extremely important, has a less direct link to value creation – rather it provides the underpinning rationale for any potential changes that might be sought.

For example, current work towards a National Digital Twin, which needs long term investment, will realise benefits for planning, operations and maintenance in the physical environment. The act of

joining up operational data between departments should lead naturally to a higher availability of data for systemic cross-government data analysis and policy use, providing that data-sharing is fully enabled.

We believe that current Information Asset Registers should be built upon. To be meaningful they should be standardised, discoverable, with associated data catalogues included, auditing be more rigorous and presumed open should be applied.

As part of this response we have spoken with many data practitioners both within Government and in the private sector interfacing to Government. We wanted to take this opportunity to tell their 'coalface' stories, of what they have been trying to achieve, what challenges and successes they have had, and some of the lessons learnt along the way. Examples of good practice within Government should be shared and acted on much more widely than they are at the moment.

We have drawn some recommendations from this insight.

Three examples of good practice from data practitioners at the coalface are provided below to underpin our recommendations:

Summary	Data Commentary
The Environment Agency The Environment Agency (EA) have been opening up its data since 2012 with various programmes and it is to its credit that most of the sensor data the EA uses to measure flooding and pollution is now publicly available through APIs. EA has delivered this in-spite of an aging IT estate. This allows access to near real-time data on the state of our environment, which is to be celebrated as a mechanism to enable innovation and engage citizens with the climate change agenda.	<u>Open Data</u> The EA have had a goal of delivering better public information and to enable improvements to its environmental services and regulatory functions. EA is publicly credited for its strong delivery of Open Data – for example releasing Flood Data as Open Data, also for its use of Linked Data. As a result of individual business drivers bringing much needed funding, EA has been able to develop new data services and data explorer applications across much of its data – for both internal and external use. For example, to deliver against the 'Inspire' directives or the public look-up service on the quality of beach and bathing water in England. EA also has some great experience to share about improvements to environmental telemetry systems and is making progress towards real-time telemetry. EA reports that most of the hard work behind the scenes has been in integrating data from multiple internal stand-alone business systems - a common problem. Whilst many data challenges have been resolved using APIs and EA is a real public sector data success story it is important to recognise that EA could do more.

	The delivery of the improved services we can see from the outside should not mask that that whilst APIs can help bring data together from various legacy stove-pipe IT systems at some point a full transformation will be needed to remove this legacy. Also, better cross-government data interoperability is needed to drive real efficiencies. For example, a clean set of UK business identifiers would allow cross-government data on businesses to be shared and cross referenced it would be easier for EA to deliver a more risk-based approach to regulation. The new Data Standards Authority will help some of these historic challenges – which the data practitioners at the EA agree are all about getting the Data Architecture right.
The Department for Transport (DfT) The Blue Badge scheme provides 3 million disabled people across the UK with a parking permit, the DfT replaced the previous digital service with a new and improved service, with the goal of improving the scheme for citizens,	<u>Data exchange for scheme entitlement</u> The DfT Blue Badge team has created an environment that allows data sharing between departments and local councils to seamlessly share entitlement data (health, welfare etc) enabling fast, local decisions on citizen badge applications. When conducting user research (~4,500 in-depth citizen interviews) for Blue Badge, DfT discovered that the citizen has an expectation that there is more join up within local councils and between them and central government departments. In some senses this is the opposite of traditional GDPR permissions – citizens expect it – and therefore enabling GDPR citizen permissions across central and local Government would transform the citizen user experience The team had a variety of challenges across central and local government and was lucky in having good senior management support in pushing for change. The team took the opportunity to apply the GDS lifecycle not just to the delivery, but to the way it procured new services, to ensure the 'hold' exerted by the incumbent supplier was overcome. This has resulted in a single 'white label' service delivered for all 206 local authorities, with data sharing between DfT, local government and HM Passport Office, based on an open Government API. This delivered a significant

	improvement in citizen engagement and comfort with the service, subsequently signalled by a drop in the 'mailbag' of complaints about Blue Badge to local politicians. Seven million data records were transferred seamlessly from the incumbent into the new system, running on AWS, when the legacy contract came to an end. The improvements made by the team over a two-year period, engaging all 206 local councils every two weeks over a private YouTube channel, were widely recognised by the tech/digital sector, DfT and their Minister in 2019. However, little sharing of best practice to other Government departments has occurred subsequently. HM Passport Office should be highlighted here as a department that engaged proactively with DfT on the API to ensure badge applicants could access their passport photo for use on the badge. Other departments were less forthcoming in providing the entitlement data the Blue Badge team needed to integrate the new service.
Ofgem Over the last three years Ofgem upgraded their digital estate to provide a data platform that exchanges data between around 150 organisations and Ofgem, and then delivers this data as a service to policy makers, enabling Ofgem to be transparent about its policy decisions for RIIO[8] price settlement across the energy market, based on shared and timely data sharing.	<u>Data exchange between industry and regulator for transparent policy</u> In 2017 Ofgem found itself managing an £80bn energy market using a single Excel workbook: • with ~250 sheets • with ~1million lines of data per sheet. • which was being emailed around the ~900 staff without change control on the data or the underpinning mathematics (excel macros/pivot tables). In June 2019, Parliament went beyond the UK's existing commitment to an 80% reduction on 1990 emissions levels by legislating for a net zero greenhouse gas emissions target by 2050, creating an imperative to resolve the management of data in the energy sector. As a result, Ofgem has carried out pilot work with its data with the ambition of delivering collaborative data services to policymakers working in this area.

[8] RIIO (Revenue Incentives Innovation Outputs) a framework to ensure gas and electricity markets deliver value for money to consumers.

	After two years Ofgem have successfully delivered a secure data exchange between ~150 organisations involved in the energy sector and a data platform that enables the regulator to manage the data and methodologies used in policy analysis and control. This has allowed the policy teams at Ofgem and the energy companies to start to move away from Excel and to a more controlled data and method sharing environment. Senior management support at the beginning of the transformation was crucial in enabling the data to be brought together, so that value could be demonstrated to policy makers. However, the use of geospatial data was problematic as Ofgem falls outside the governments Public Sector Geospatial Agreement (PSGA – see 4.4). Subsequent uptake of the data services by policy makers within Ofgem has been hampered by cultural norms to stick to tried and tested, yet uncontrolled data sharing processes. However, the team have persevered and been able to demonstrate the benefits of sharing data across the transport and energy sectors – to gain cross sectoral insights rather than each area manipulating its own small pockets of information. Examples of what has been piloted include linking solar farms, to the characteristics of the sun, to the requirement for additional Generation capacity – the policy conclusion was that the density of solar farms are probably in less than optimal locations. There are many potential users and beneficiaries of these data services which improve understanding of the energy sector such as Government Departments including BEIS, DfT and MHCLG, Local Government, Innovate UK, also the UK Regulatory Networks and the Energy Industry itself but, as far as we know, this work has now been put to one side.

We observe that there are a number of factors that contribute to the lack of availability of timely data across government:

1. **Data sharing is not championed:** A lack of willingness to share data between Government departments or departments within a local council, often based on weak interpretations of the data protection legislation that leads to risk aversion by civil servants, other barriers such as aging IT from which data cannot be easily extracted and a lack of resources.

2. **The cases made to justify data shares are often weak:** The lack of joined up data infrastructure across the public sector means that an organisation whose data is requested by a third party faces significant resource challenges to prepare the data for sharing. Also, as the NDS points out, the benefits of sharing your data accrue to the receiving organisation rather than contributing to local goals and deliverables. Coupling these factors with general risk-aversion results in lack of cooperation between public sector organisations who should be working together.

   Until there is a genuine culture shift around data sharing, which needs to be driven from the top of government, projects needing data from other bodies across the public sector (and elsewhere) need to make an irrefutable case for why they need the data and the benefits that will be delivered.

   The DfT Blue Badge project made their case through citizen led justification by engaging with multiple user groups to fully demonstrate the value of the joined-up service to citizens. There is often pushback to data sharing, as in this case, on the grounds of privacy and security if the data sharing involves linking citizen records but channelling the demand from citizens often can counters these arguments.

	Implementation consideration
5.1 A	We recommend citizen user research, based on the best practice set by DfT Blue Badge, as a way of defining and communicating the proportionate use of data and information for operational and policy use

3. **Isolation by design:** A legacy IT estate that is designed for a single-department, often single-policy use only and to report on monthly or annual cycles, rather than provide data in a timely way for day to day decision-making.

4. **Operational processes with hidden fractures:** A traditionally paper and Excel spreadsheet-based development environment where policy makers take data in a static form to design policy working in small siloes without considering their impact on other areas of public service delivery, without data and methods under change control, lacking operational data feeds and with little transparency in their method of decision-making.

We know that some parts of Government understand this and are starting to address the data availability gap with good success, but these individual initiatives are few and far between and lack the wider support necessary to embed these new ways of working and of service delivery into mainstream policy design and delivery.

We observe that data comes into sharp focus for Government when there is an urgent political imperative i.e. Covid-19 or Grenfell. These imperatives continually highlight the lack of available data in a timely manner to make policy decisions or join citizen services together, for example where to send urgently required PPE/Ventilators or which buildings are at risk.

We further note that where central and local government have found ways to share data effectively, for example to deliver DfT's digitisation of Blue Badge applications, the leading department has to put

agreements in place with each of the 206 local authorities. We have previously proposed a simplified approach to public sector data governance (Summary recommendation 3.) which could be refined yet further for Local Government data.

	Implementation consideration
5.1 B	We recommend that the NDS should rationalise the principles of Data Controller and Data Processor across government i.e. • Data Controller: central government moves to a single data controller model with control of all operational data vested in the newly appointed GCDIO as Data Controller. The intention of this is to put in place a simple, central arbitration mechanism to resolve debates and unblock barriers to data sharing between departments. • Data Processor: where each central department takes the role of Data Processor. • At a local level: where each of the 206 local authorities across the UK appoint a single local Data Controller and those operating within the area of the authority are considered Data Processors (to simplify data governance at the local level too).
5.1 C	We also suggest that if the Local Government Association were to act as Data Controller for Local Government, it could hold the data sharing agreements with central government and Local Authorities would become designated Data Processors, operating to the same set of rules and guidance.

We believe these actions would remove the hesitancy and risk aversion by public servants to share data by creating a formal framework within which they could safely share data to improve digital services both for citizens and for their own staff.

Any concerns or disagreements about data sharing between different public sector bodies would immediately be escalated to the appropriate Data Controllers: the GCDIO; The National Statistician and the Local Government Data Controller whose high level discussions would circumvent multiple official to official discussions and debates, which have, over recent years, slowly been escalated to multiple Permanent Secretaries, one issue at a time.

We believe this new regime would unlock the pent-up frustration felt by many civil servants that policy design and implementation and the upgrading of digital services, is hampered by their inability to access data. We would expect this to then result in many more successful programmes delivering benefit through digitally enabled government, based on timely and relevant data.

5.2 Data supply and Data maturity

The need for high quality data and effective data sharing across the public sector has never been more obvious than during the current Covid-19 pandemic. The National Data Strategy commends the use of data to help fight Covid-19 but without detailing how this has sharing has taken place, acknowledging the major data infrastructure challenges facing departments and other public bodies, or setting out a plan for the future which will deliver data, in the right format, with the right security, to the right people across government so that they can do their jobs better.

Data to drive the Government's Covid-19 response

The recent Covid-19 pandemic has demonstrated what can be achieved by bringing data together in the public interest. This data analysis is essential to help the politicians and officials managing the pandemic make well informed near real-time decisions, at a local and national level.

Daily statistics on the number of new Covid-19 cases, hospitalisations, and excess deaths together with clear maps of the local areas worst or least hit by this terrible disease are a nightly feature of our national news. This is public information at its best.

Whilst the value of bringing data together in the public interest is clear, the effort it has taken to pull this information together is not obvious. The last 8 months have involved a heroic, exhausting, behind the scenes struggle with data across government and the wider public sector. One data practitioner we spoke to said it feels as though, *"I've had one endless working day without any rest since March 23rd this year."*

On the research side departments and the academics, they work with are making extensive use of the ONS's Secure Research Service (SRS). This environment i**ncludes practical processes to apply real-world ethics to data projects.** Accredited researchers[9] access government data in a strictly controlled environment under the UK Statistics Authority (uksa.statisticsauthority.gov.uk) 'Five Safes' framework: Safe People, Safe Projects, Safe Settings, Safe Outputs and Safe Data. Access to data is subject to users completing an **ethics self-assessment tool**[10]and working under the jurisdiction of the **National Statisticians Data Ethics Committee**[11]

Operational data sharing has been more challenging. Firstly, the legal barriers in place had to be overridden by politicians following some difficult conversations soon after the pandemic broke. Secondly, practical mechanisms are not in place to enable this data sharing. Due to a lack of robust processes and infrastructure to enable data sharing between public bodies some data has been shared rather informally.

In some cases, sensitive data has been emailed between government departments and agencies in spreadsheet format. This is the direct result of a historic lack of data sharing across departments and the multiple data siloes across government which prohibit routine, secure, well governed, data sharing.

5.2.1 Moving away from data silos

We welcome the commitment in the NDS to modernise "*the way we manage and share data across government"* (4.0) and recognise the issues raised in the call for evidence (4.1 and 4.2) around:

- **Lack of ownership:** of data leadership / cross-government alignment / data standards / metadata / APIs / skills in managing data.
- **Fragmentation:** of data management systems and surrounding resources which are stretched.
- **Differing:** data standards, complicated by legacy systems and different incompatible systems.

[9] https://uksa.statisticsauthority.gov.uk/digitaleconomyact-research-statistics/research-accreditation-panel/
[10] https://uksa.statisticsauthority.gov.uk/about-the-authority/committees/national-statisticians-data-ethics-advisory-committee/ethics-self-assessment-tool/
[11] https://uksa.statisticsauthority.gov.uk/about-the-authority/committees/national-statisticians-data-ethics-advisory-committee/

The change that needs to happen to resolve these issues, is to move from a philosophy of stand-alone government bodies with separate IT estates, to a philosophy of interoperability. Interoperability requires a cross-government data architecture with common data standards across all departments, arm's length bodies and local government.

The NDS should provide more information about how the proposed actions to manage and share data across government will work together, especially since they are spread across a number of delivery bodies, including Cabinet Office, GDS, ONS, MHCLG and FCDO.

Furthermore, the interoperability of data systems and services which are fit for purpose for future needs, demands either the replacement or uplift of legacy technology working to the agreed Data Architecture.

We welcome the NDS commitment to:

- resolving the long-running problems of legacy IT and broader data infrastructure.
- improving data quality and ensuring it is not fragmented, siloed or duplicated.
- developing an Integrated Data Platform (IDP) for government.

However, we think these recommendations need to come together to deliver wholesale change. We understand that the IDP will be based on ONS's successful Secure Research Service (SRS) and will deliver de-identified linked data for statistical and policy analysis purposes. We fully support this but question:

1. How this will improve data sharing for digitally enabled citizen-facing and other public services?
2. How this will improve data sharing between central and local government?
3. Whether the government will commit to sharing data between front-line services and the IDP to ensure that the analysis functions across government are always working with up-to-date data?

We also note that, for many of the well-known public sector data success stories, a theme lies behind their success. They are independent bodies related to but not within central government i.e. government agencies, or regulators. Successes include:

- Driver and Vehicle Standards Agency (DVSA) and Driver Vehicle Licencing Agency (DVLA)
- HM Land Registry digitalisation
- Office for National Statistics (ONS) digital and data transformation, including preparation for online Census 2021
- Hydrographic Office moving to digital maps

In other examples the public sector organisations which have transformed their internal use of data still lack the motivation, ability or resources to share their data widely with their peers because the motivation for transformation has been politically or policy driven rather than part of any holistic cross government transformation.

The government needs to recognise that successful public sector data transformation to-date has only been achieved when there is:

1. sufficient funding
2. a strong imperative or incentive to modernise

3. energetic and visionary leadership
4. within-organisation implementation of data and technology

Also, most of the government bodies who have achieved data transformation have statutory duty around public record keeping and public information and, in several cases, the organisations are fee generating.

Despite the success of some government data initiatives we note that **two systemic challenges** remain:

- Many data successes are data services, delivered via APIs[12], which continue to run across legacy technology.
- The organisations who have uplifted their technology estate still struggle to share their data (if appropriate to do so) with other government bodies due to a lack of common data architecture and data standards across government.

We have three implementation considerations in this area:

	Implementation consideration
5.2 A	The NDS should put forward a broader set of proposals for cross-government data services, taking into account the requirements of different data users and stakeholder groups, rather than focusing on a single aspect of government data-sharing (the Integrated Data Platform for Analysts which happens to be the one which is already working quite well).
5.2 B	The Government should make a full commitment to moving away from data silos through: • Spend controls which assess IT spend from a data perspective to assess whether proposals will add or detract from the overall public sector data estate and on the ability to share and re-use data effectively. • Mandating that all new data collected or purchased for a specific purpose is designed and prepared for re-use as part of its initial integration.
5.2 C	The Government should set out a plan and ring-fence long-term funding (£bns) for the gradual development and delivery, over a number of years, of well architected, fully curated, virtualised data services across all government departments and public sector bodies.

5.2.2 Data Standards and Data Architecture

Data Infrastructure and Data Architecture

The NDS mentions infrastructure quite often:

- "joined-up and interoperable data *infrastructure"*

- "the *infrastructure* on which data relies is a vital national asset that needs to be protected from security risks"

[12] APIs - Application programming interfaces hide complexity from developers, extend systems to partners, organize code, and make components reusable

- "data about systems and *infrastructure,* such as administrative records used to describe businesses and public services"

- "the *infrastructure* underpinning the storage of data"

- "predictive maintenance of [physical] i*nfrastructure"*

Amongst the references in the NDS to this multiplicity of "infrastructures" there is little consideration given to actual **Data Infrastructure**, (for clarity we could call this information infrastructure). There is mention in case study examples of "the *data infrastructure* that underpins the monitoring and reporting of online harms "(6.1.4) and the Data for the Built Environment case study it talks about, "an interoperable information exchange [to] create a *data infrastructure* for the built environment". But data infrastructure itself is not defined in the NDS Glossary, rather it is shoehorned into the general Infrastructure definition.

The NDS is also silent on **Data Architecture**, the discipline which describes how data is stored, processed and used within an information system by defining data requirements, data structures and control mechanisms (at a logical level). As the same data can be architected in many ways, to make multiple datasets easy to compare or to use together these data need to conform to a set of **Data Standards** including definitions for the Data Fields and Metadata (the data which describes the dataset and its contents).

Omitting Data Infrastructure and Data Architecture from the National Data Strategy is a fundamental oversight; we suggest as fundamental as a National Railway Strategy not mentioning tracks or rails.

Our implementation consideration is:

	Implementation consideration
5.2 D	If the government is serious about achieving coherence across public sector data, improving interoperability and data sharing and moving towards real-time data feeds then specific, collaborative work across government on Data Infrastructure and Data Architecture is essential.

The importance of unique Identifiers

Where vast quantities of data have already been collected or generated across multiple organisations Data Standards are costly and ineffective to retrofit as the data will need to be reorganised or even re-entered in a different format. This is where APIs come in to help connect different data together. However, **APIs only work effectively if identifiers can map different equivalent representations of the same thing** – like a location or an item – and cross-reference them between datasets.

In an ideal world the identifiers used to cross-reference data between systems are standard definitions, like the Registers the Government Digital Service (GDS) worked on for some time, or the Data Architecture the Office for National Statistics (ONS) uses to create statistics and information about the country; our society and out economy and for research purposes.

The fundamental identifiers for a National Information Infrastructure are people, organisations, places and things. The GDS Registers project compiled some lists of unique identifiers for government but hit cultural boundaries. It was quite easy to come up with the definitions but very difficult to find volunteers to own and manage a register for the whole of government. One of the main reasons 'custodians' didn't step forward was because they knew they would struggle to maintain consistency across all the systems in their own departments, let alone support a service for others – so this also comes back to legacy IT challenges.

ONS has many years of experience working to develop data infrastructure including developing address and business indexes for the Census and other statistical purposes. These identifiers, and ONS's Data Architecture experience is transferable across government and a cross-Government Data Architecture Group has been set up for best practice sharing.

We urge the NDS to commit to support and further this cross-government Data Architecture work including promoting the reference data management framework ONS is rolling out across the Government Statistical System.

Data Security Classification

The challenges of Data Privacy are treated by the NDS as a technology issue with a commitment to explore the role of privacy enhancing technologies. Whatever these technologies the government needs a policy for the categorisation of data so that suitable rules can be applied about who can use what types of data for which purposes.

Some of the practitioners we talked to highlighted data security concerns as a significant barrier to sharing data across government. **Frequently, whole datasets are prohibited from data sharing for security reasons when, within the data, only a couple of attributes genuinely need protecting.** A real-world barrier to data sharing between government bodies is that **there are no centrally agreed standards on data classification at the dataset or data attribute level**. If data is classified rigorously against agreed standards data, and combinations of different data, can be screened efficiently to understand who is accessing data and for what purposes to authorise permitted shares.

This problem has been tackled by the Office for National Statistics as part of their Data Transformation. A risk-based approach is applied across ONS data which is simple, scalable and suitable for automation.

	Implementation consideration
5.2 E	We highlight that data security classifications, down to the attribute level, are essential in Data Standards and Metadata definition. We recommend that government looks at the work ONS has done in this area to define and implement a risk-based approach to sharing data and linked data and builds on this to help open up data sharing across government.

5.2.3 Data Linking and Sharing

There are vast potential financial, resource and quality efficiencies to be gained by enabling departments to share data effectively, not least that the public sector would be working from a single source of the truth whether for improved public service delivery, policy development, management reporting or to inform the public.

Data linking

We welcome that the NDS recognises the importance of linking data with its reference to the Connected Health Cities project and the case study examples from: MOJ (Data First), ONS (Administrative Data and Domestic Abuse Statistics Tool) and MHCLG (Troubled Families).

We also welcome the commitment in the NDS to implement the recommendations of the ONS report 'Joined up data in government: the future of data linking methods'[13]. However, data linking is a specialist skill requiring deep expertise in data privacy and data quality. As such, we emphasise that although we believe there is a need for a more cohesive data linkage community across government, our view is that data should be linked by specialists and delivered as a service to those who need it (especially data services for operational delivery).

We reiterate the importance of common Data Architecture and Data Standards to underpin effective data linking.

Practical data sharing

The ONS (working under the Statistics and Research strand of the Digital Economy Act) has over the last four years carried out a full Data Transformation implementing strengthened data governance, secure-by-design data systems and business processes to share data for government analysts and external researchers.

As we have mentioned previously, some other parts of government have robust systems in place for data sharing but the reality of current 'data sharing 'elsewhere in government is that it remains common for text or Excel documents to be emailed around – within and outside organisations. Officials take these risks because they need to get a job done and the systems and processes that they have available to them are inadequate.

Data sharing barriers

As the NDS points out barriers to data sharing across government include:

- real and perceived legal and security risks.
- lack of incentives, skill or investment to drive effective governance and overhaul data infrastructure.
- lack of consistency in the standards and systems used across the government.

Data sharing use cases

Looking at user needs across public services, including the needs of government internally, there are many different use-cases for data sharing, including:

- across central government departments
- across local government
- between local and central government

[13] https://www.gov.uk/government/publications/joined-up-data-in-government-the-future-of-data-linking-methods/joined-up-data-in-government-the-future-of-data-linkage-methods

- with the private sector.

Data and its uses are invariably contextual as the same data can be used and re-used in different ways by different users. We observe that the data sharing debate tends to become oversimplified and a risk-averse approach often prevails in government.

The governance and management of data sharing and data shares does not have a one-size-fits-all solution. Data should only be shared on an as-needed basis, driven by the user need and the context. For example:

- a National Security incident to identify a threat actor can warrant the sharing of identifiable personal data.

whereas

- a front-line service across multiple departments will require an individual citizen record to be linked across multiple services to serve the citizen better.

and

- policy analysis and research can be carried out using linked de-identified data.

Data sharing between central and local government will take a different form to sharing between government and an external third-party, both legally and practically.

Whether data is ingested into local systems or accessed remotely via APIs will be different in different cases, the frequency of updates to shared data will vary too, from live feeds to annual updates.

As there are so many different scenarios for government data sharing, we suggest the following implementation consideration:

	Implementation consideration
5.2 F	As a practical step to deliver data sharing the NDS should set out the various different top-level use cases for data sharing and identify the stakeholders who need to be involved as a precursor to working out what needs to be done to make data sharing easier and more effective.

Data sharing governance

We believe the government should **separate enabling of data sharing** (i.e. by implementing data infrastructure, data architecture, data standards and secure but flexible systems) **from the governance of data sharing.**

Government and the wider public sector need a flexible, configurable suite of data services which allow data to be partitioned and delivered to different users for different purposes, under rigorous governance. We can envisage a future where a centrally controlled public sector data service would be in place to deal with the nuts and bolts of data, data linking, systems, security and access mechanisms.

If data is itself considered as infrastructure this would be the equivalent of the old telephone exchange where users picked up the phone and requested a connection. Using this analogy Data Processors would

be the modern equivalent of the operator who either connected you or not, working to a set of rules agreed with Data Controllers.

Another analogy is the road network where certain vehicles are allowed to travel on certain roads while others cannot. The point is that the infrastructure in place is governed by a series of rules, set out in data access policies, and not everything which is possible is allowed.

5.2.4 Data Sources and data tooling

Data sources

The Government needs to make sure that all data practitioners, in the public sector and working with the public sector, have access to the data they need. We have highlighted previously (4.2) that this includes data users inside central and local government, also those at the 'edge' of government**,** regulators, academics, charities, and NGOs.

We have particular concerns about:

1. The limitations of the Public Sector Geospatial Agreement[14] (PSGA) broadly with respect to national address data and particularly for regulators (highlighted in our Ofgem case study).

2. Securing sources of Geospatial/Earth Observation Data for public sector use.

3. Relationships with data suppliers outside government who can provide government with access to data which is of use for public benefit. The ONS, under the Statistics and Research strand of the Digital Economy Act (DEA) has the legal right to the supply of data from third parties, for example in finance and retail, for the production of Statistics. There are no equivalent powers for public sector service providers.

4. The general availability of Open Data – published by government itself and from other sources, for example large corporations who have a hold on data which hampers market entry and innovation by smaller businesses.

The NDS commits to *"creating an audit of data inventories"* (4.2.1) which we read to mean an inventory of government data. We question whether this commitment will reach out across all public sector data and suggest the following implementation consideration:

	Implementation consideration
5.2 G	The government should assess what data is essential to public sector work with data and ensure that all such data is available across the public sector to those who need it.

[14] https://www.ordnancesurvey.co.uk/business-government/public-sector-geospatial-agreement

Data tooling

Tools and applications for both analysis and also visualisation of data are currently procured individually by departments and other public sector bodies. Multiple individual purchases are made across multiple organisations or even multiple times within the same organisation (one of the practitioners we spoke to knew of at least 5 separate instances of a proprietary geospatial toolset within their organisation – all paid for and supported separately). Arrangements of this nature do not deliver value to the public purse. We suggest:

	Implementation consideration
5.2 H	Third party data and data tooling should be procured centrally for the public sector rather than multiple times across multiple organisations or even multiple times within the same organisation.

Specific data and resources for Data Science and advanced analytics

We note that neither data sources nor data tooling for Data Science, Data Analytics, Data Visualisation, or Artificial Intelligence is explicitly considered within the NDS

5.3 Data Literacy

We welcome the Government's approach to building skills in data across the UK. However, we caution that data skills are not the same as data literacy. The NDS does not address data literacy. By data literacy we mean a working understanding of topics like:

- Being both quantitatively aware and also qualitatively aware.
- Understanding what data you need to design a policy and to manage a service.
- Understanding how data should and should not be used.
- Have the knowledge to know what data is able to tell you and how to avoid drawing false conclusions from data.
- The need to present options to ministers that are led by data, as opposed to being justified by data.
- Understand the importance of measurement error, where data sets often carry confidence bars to specify the uncertainty range that is being applied.
- Understand that when multiple data sets are joined, to be aware that measurement error becomes compounded and that a combination of uncertainty ranges needs to be managed.
- Awareness of when proxies are being used to infer something.
- Structural understanding around areas like Metadata.

We believe there are five areas within data literacy as applied to the National Data Strategy that are relevant to improving our society:

1. The understanding by citizens of what data means to them and how best to use it and give permissions to others.

2. Data literacy as used by the private sector to improve business outcomes, both strategic and operational.
3. Data literacy among civil servants and how best to use it to improve Government services for citizens.
4. Data literacy among civil servants and how best to use it to create, support and refine general policy and political initiatives.
5. Data literacy among civil servants and politicians who seek to undertake policy and regulation of the data, data ethics and Artificial Intelligence.

We observe that these five areas are interlinked and support each other, whilst at the same time having different drivers of behaviour, from market forces on the one hand, to needing to protect society on the other.

In order to ensure that the benefits of a National Data Strategy provide for a competitive business environment, deliver efficient public services and ensure citizens are properly informed through well-defined policy and regulation, we recommend that the Government seeks to improve data literacy among civil servants.

Data literacy principles should be applied across government, drawing on learnings from the private sector to ensure that a common language and understanding is in place.

This can then provide the foundation for improving data literacy among policy makers more generally, based on internal experiences shared between different areas of government (i.e. policies in climate change, Covid-19, social welfare et al).

Policy makers can only design effective policy and regulation for data, data ethics and data use, for example in analysis or to drive Artificial Intelligence, if they are fully data literate with a good understanding and knowledge of best practice.

To deliver the greatest benefits from data, as quickly as possible, we recommend an initial focus on improving the data literacy of those civil servants involved in delivering citizen facing services.

We observe among civil servants that:

- Those delivering citizen services are hampered by a lack of understanding around data ownership, control and the implications of GDPR. This leads to an inability to join data up across departments to create seamless citizen services, even when citizens want and expect this to be the case.
- Those delivering policy, typically use the tool Excel in an un-controlled way, limiting themselves to two dimensional views of data to infer conclusions whilst at the same time over-relying on proxies and assumptions for areas where they don't have access to the data they need. This leads to uncontrolled measurement error, which in turn leads to policies that often lead to unintended consequences (for example: the 'bedroom tax' or the recent Covid-19 data column deletion error).

	Implementation consideration
5.3 A	We encourage more senior members of the government, civil service and public sector to become data literate, without the need for technical data skills, through shared learnings with colleagues.

The good news is there are pockets within specific civil service teams that are doing some excellent work to improve data skills and understanding, typically driven by a few individuals. However, the lack of collaboration and sharing of good practice hinders the wider adoption by the civil service. We believe that data literacy should become the norm.

Collaborative environments

The Energy Data Task Force Report (EDTF 2019) is considered by many to be an example of good practice, showing data literacy from the policy makers engaged by the authors. It succinctly raises data literacy. At the same time, it provides a framework for putting the data building blocks in place across the industry; this has subsequently been implemented in the Modernising Energy Data competitions (both the Data Access and also the Data Applications competitions which are being operated by Innovate UK 2019/20). The EDTF also successfully addresses the perennial problem of how to open up 'closed data' to ensure transparency by defining the triage mechanisms that need to be put in place.

The EDTF 2019 demonstrates that big ticket policies can be approached more effectively from a data literate perspective.

Policy development should move away from Word and .pdf publications and submissions, with Excel or .CSV files added as appendices, towards platforms:

- where digital engagement between policy makers and society can be fulfilled by collaborative environments.
- which enable controlled matching of data sources, peer review of data and methodologies used and common understanding of the conclusions drawn.

Some examples of good practice in collaboration environments that provide facilitated access to trusted data and methodologies are given below:

What	Purpose	Commentary
Dementias Platform UK https://www.dementiasplatform.uk	To enhance research into dementia and find effective treatment sooner.	The funding to create this has been greater than £50m over the last five years and provides a wonderful user experience and structure.
Zenodo https://zenodo.org	An Open Science provision, giving open access and open data access across a broad range of different research topics.	Provides a collaboration environment for 'shared learnings' across international and virtual collaborations. Good high-level search functionality; for example, searching for "coronavirus" gives a really interesting view across much more

		than just the datasets, with rapid drill-down capability.
ROOT from CERN https://root.cern.ch	An open source data analysis framework for those working in the field of high energy physics.	Provides a collaboration environment for 'shared learnings' across international and virtual collaborations. Has ~10,000 users and is an exemplar of international collaboration. Maintained by a dedicated team of ~10 staff. Provides high-level guides for "Getting Started", "Reference Guide", "Forum", and "Gallery".
UN Big Data Platform https://marketplace.officialstatistics.org/	A curation of trusted data, applications and services relevant to each of the United Nation's 17 Sustainable Development Goals.	This is a prototype collaborative data environment under the pillars of Trusted Data, Trusted Methods, Trusted Partners and Trusted Learning which was brought together by the UK Office for National Statistics on behalf of the UN to help make better use of data, particularly satellite and other 'Big Data' sources to help deliver and measure the 2030 Sustainable Development Goals (SDGs) by curating data sources, methodologies and projects. This excellent best practice should be widely celebrated, made available for reuse for UK internal purposes with the lessons learnt and good practice fed into other public sector areas.

These examples of good practice lead us to suggest:

	Implementation consideration
5.3 B	We recommend the use of collaborative platforms between policy makers to ensure the controlled use of data and to improve to data literacy through sharing.

What good Data Literacy looks like

The use data is put to, to create information and allow decisions is highly dependent on the context of and error in the underlying data. It is crucial to ensure that the systemic structures and weaknesses in data collection are understood, at the same time as decisions on policy and spend are being made.

Being transparent and open in a timely way will enable better evidenced policy making to happen and this will also improve the outcomes that can be achieved too. This is highlighted by the work the Education and Skills Funding Agency has undertaken with the Government's Apprenticeship Scheme.

Education & Skills Funding Agency – Apprenticeship Service

The Apprenticeship Service is a collection of websites and tools to support individuals, employers, training providers and end point assessment organisations, throughout the full lifecycle of finding and then undertaking an apprenticeship.

The service currently has 34,770 service accounts and expects to be supporting up to 150,000 employers of different sizes. All data within the service, is input by external end users and operated within coded rules.

The Apprenticeship Service consists eleven (11) microservices and nine (9) APIs that have been designed and implemented by data practitioners working alongside policy colleagues. The service connects potential apprentices with target companies and training providers, without the direct involvement of DfE officials or the department.

The Apprenticeship Service is one of the few government services to advertise itself, in order to make potential apprentices aware of and know how to apply for Apprenticeships. User design was thought through from the outset so DfE has delivered the platform as self-service.

The platform delivers a seamless service that is joined up and efficient. DfE officials can actively monitor the interactions between different types of user and the up take of apprenticeships and understand, on a day-to-day basis, how the underlying financial resources are being deployed.

Since the service understands how to many apprentices are coming through it and HMT have access to the data services, officials can effect policy changes in real-time and have a real-time understanding of the impact of different policy levers to drive the uptake of apprenticeships, on £2.5bn of coverall committed spend.

The key to this success is in understanding from the outset how you might want to use data, and therefore designing the data structures effectively with a system approach so that they can scale. Data registers have been critical to defining the data structures underpinning the Apprenticeship Service. Also, the data structure was delivered before committing to the technology underneath. The technology then connects the data journey, rather than designing the data around the technology.

Success has come about by focusing on designing for service consumption by users and groups of users and then working out how the data should be orchestrated to deliver the required outcomes.

DfE and HMT officials have collaborated effectively to deliver a cross-department solution and demonstrated a high level of data literacy in delivering this service, even though they have limited numbers of team members with data skills.

5.4 Data Policy, Ethical and Regulatory Frameworks

The Government has a wide remit as the policymaker, legislator and regulator of data for the United Kingdom. Data policy needs to span data collection, data supply, data use, data sharing, open data, security, privacy and ethics across both business and the public sector, taking into consideration the social and economic benefits data can deliver, and the costs associated with managing data properly.

Data literacy and technical skills need to be developed and nurtured to deliver a modern data-fit economy. Where new regulations are called for, then the financial and administrative burdens on

businesses and citizens must also be considered. The Government also has the responsibility of managing the UK's international data relationships.

We would like to see a comprehensive description of the Government's guiding principles with respect to data and information in the UK set out in the National Data Strategy. For example:

- How open do we want UK society to be?
- How much public sector data re-use should there be?
- A full commitment to make data a genuine driver of better joined-up public services?
- Putting the citizen user, citizen engagement and delivery of efficient citizen services at the heart of the strategy. How will the Government seek to communicate and engage with citizens over the level of acceptable operational use and inter-departmental sharing of citizens data?
- What level of public information does the Government seek to deliver to citizens?
- Is there a strong government commitment to data to help drive the digital economy forward?
- Does the Government support a thriving private sector data economy? What form should that take?
- What is the UK's overriding principles on data privacy and data security?
- What is the UK Government's position on data ownership?
- How will the UK use data for National Security purposes?
- Does the Government believe citizens should be able to supervise their 'own' data more easily?
- What is the Government's approach to the use of data in emerging sectors such as autonomous vehicles or Artificial Intelligence?
- How will the Government use data to fight climate change, poverty and tackle other sustainability issues?
- How does the Government plan to ensure that the academic community has access to the data it needs for research purpose?
- How will the Government assist UK charities and NGOs who suffer data gaps and data shortages?
- How does the Government plan to act internationally with respect to data and global regulatory issues?

5.4.1 Legislation about data

The UK has a strong legal regime for data protection and has implemented GDPR fully, regulated and enforced by the Information Commissioner's Office (ICO). In addition the Digital Economy Act 2017 delivers a legal framework that enables:

- information to be used and processed for the public benefit and includes other provisions such as, those to prevent spam email and nuisance calls unless you have given consent.

- age verification measures to protect children from viewing online pornography.

- new powers for Ofcom in respect of information allowing for greater access to information that matters to consumers.

These laws aside, although many other UK laws cover the provision and reporting of data (generally for regulatory implementation), there are few if any laws about data itself. This is primarily because the importance of data itself as an asset has only been recognised in recent years.

In the UK, there is no comprehensive framework to determine the ownership of data, which is not generally understood to be property. To ensure transparency, increase public confidence in the solutions adopted, and provide independent oversight, some have called for data ownership to be enshrined by way of primary legislation that would offer assurance about the privacy protections for any data collected.

We believe the government should seek to clarify data ownership. Whilst current legislation makes the creators of data responsible for its stewardship, in the case of agencies or intermediaries delivering a service to or for a citizen, it is not clear whether the transaction data is owned by the creator or the citizen, or jointly. Examples are banking transaction data or a holiday booking made through a travel service.

We also note that the inability of the legislative system to keep up with global technological developments and changing societal attitudes towards data and data use is likely to persist. The complexity of the data landscape and the current pace of change is so rapid that by the time any law can be agreed it is likely to be out-of-date. Governing data is therefore something the Government will need to continue to manage through frameworks and guidance, which must be reactive to changes in and across the data landscape.

5.4.2 Data Ethics

Our general thoughts on how the National Data Strategy should approach data ethics have been covered in section 4.5. Our implementation considerations for data ethics are:

	Implementation consideration
5.4 A	We find the data ethics space crowded and confusing and suggest there are too many actors, with overlapping remits, being separately supported and promoted by Government.
5.4 B	We would like to see a single, overarching, principles-based framework for data ethics for the UK.
5.4 C	We urge government to move on from discussions about the importance of ethics and the development of multiple, largely similar, sets of principles for data ethics to focus on putting data ethics into practice.

We highlight the Office for National Statistics (ONS) as an example of good practice on practitioner led Data Ethics, noting that ONS is ahead in its thinking because data privacy and data ethics issues have been central to the national statistics system for many years. ONS has solid data ethics policies and has operationalised these, taking a risk-based approach, through the Accredited Researcher Scheme[15],

[15] https://uksa.statisticsauthority.gov.uk/digitaleconomyact-research-statistics/research-accreditation-panel/

published guidance for data practitioners in the Self-assessment guidance for researchers [16]and the National Statistician's Data Ethics Committee[17] .

We observe that barriers to linking citizen records or making use of citizen data for operational purposes are frequently made on privacy, ethics and/or security grounds and highlight that this is to the detriment of citizens who simply want government to work for them when they interact with it. During a crisis (for example Covid-19 or Grenfell) these barriers are challenged and removed to resolve the pressing political imperatives of the day. We think that post Covid-19 citizens should be re-consulted about how they would prefer the government to use their data.

	Implementation consideration
5.2 D	We recommend the NDS should commit to roadshow style consultation with society and citizens on the acceptable use of citizen records for operational and analytical purposes, both for citizen specific decisions and for sharing data to improve policy-making and public services at local, regional and national level. This should set out the potential benefits to society, citizens, and in national spending through enabling timely information and improved decision making.

5.4.3 Legal barriers to public sector data sharing

We wish to highlight some legal barriers to data sharing which are wholly inefficient. The UK legislative framework for data sharing has been in place since 2017 but, as with most new things put into practical use for the first time, there are areas where it could be improved. For example:

a) We have previously highlighted the importance of unique entity identifiers (5.2.2). Readily available data on UK businesses is limited to the open register of Limited Companies published by Companies House. However, only a small proportion of UK economic activity is conducted through Limited Companies and over the years many different government bodies have each developed their own lists of identifiers for businesses and trading entities. Not only is this inefficient, but it also risks multiple indices for the same thing, which do not match.

   Recently, to improve its measurement of UK economic activity ONS started to develop a Business Index to deliver a set of unique identifiers for all UK traders and trading entities. As ONS is required to measure the entire economy this Index will, naturally, be a superset of all other government department lists. However, under the current DEA provisions, the ONS Business Index (because it has been developed for statistical purposes) should not be shared with other public bodies who need Business identifiers for operational use. For example, Environment Agency told us how useful a set of unique Business Identifiers would be to them and it would be also useful to other bodies such as the Health and Safety Executive and Local Authority Business Inspectors.

[16] https://uksa.statisticsauthority.gov.uk/about-the-authority/committees/national-statisticians-data-ethics-advisory-committee/ethics-self-assessment-tool/

[17] https://uksa.statisticsauthority.gov.uk/about-the-authority/committees/national-statisticians-data-ethics-advisory-committee/

b) Very recently the legislative barriers against sharing all Health and Social Care data for operational use severely hampered the Covid-19 response. These barriers indiscriminately prevent all Health and Social Care data from being used for operational purposes outside the health system. We suggest that there may be a middle ground where certain Health and Social Care data could be shared for operational use without compromising patient confidentiality

The UK's current data sharing legislation somewhat artificially enforces a separation between the use of data for statistics and research purposes and the use of data by government for operational purposes. Covid-19 can also be used to illustrate this point. Technically, those working out what is happening with the disease (researchers) should not be sharing the data they collect with those on the ground managing the situation (operations). This barrier has been removed to fight Covid-19 where, if the ONS finds you test positive in its household surveys your data will be sent to track and trace.

It is difficult to argue that that there is anything wrong with this, yet without emergency legal frameworks put in place specifically for the Covid-19 emergency, this would not have been possible.

Legal barriers to public sector data sharing

Trying to share data between public agencies working to respond to the recent Covid-19 pandemic has highlighted drawbacks in the data sharing laws created under the Digital Economy Act 2017 (DEA) where part 5 of the DEA introduced *"a number of new powers to share information to help make the digital delivery of government services more efficient and effective."*

Data sharing is subject to overall data protection restrictions and there are very limited instances where information can be used by a public authority for another purpose. Against this legal backdrop the DEA sets out permissive powers to allow data sharing between public authorities (or persons providing services to public authorities) for general public service delivery, fuel poverty and water poverty.

The conditions for public service delivery data sharing are defined as:

1. the purpose is the improvement or targeting of a public service provided to individuals or households, or the facilitation of the provision of a benefit (whether or not financial) to individuals or households

2. the purpose is the improvement of the well-being of individuals or households; and

3. the purpose is the supporting of the delivery of a specified person's functions, or the administration, monitoring or enforcement of a specified person's functions.

However, Health and Social Care bodies are not permitted to use these permissive powers. This caused major problems and delays in tackling the Covid-19 pandemic, for example to develop the data systems required to deliver the Covid App. These restrictions caused significant delays in the initial Covid-19 response and were eventually overcome by opening up legal gateways under the DEA's National Security provisions.

To improve the use of and sharing of data across government there are two options:

1. to legislate specifically on a case-by-case basis and set-up more legal gateways to data sharing for each use-case (as was necessary for Covid-19).
2. to find a way to legislate generally to open up more data sharing across government.

We note that the Digital Economy Act 2017 appears in two NDS case studies and as the framework to enabling public sector data sharing (6.2.1). However, the NDS does not consider or propose a review of the Digital Economy Act to determine if it is fit for purpose for now and the future. The direction of travel for data regulation seems to have been punted out into the forthcoming Digital Strategy (See 4.3). We suggest that with the benefit of evidence about what has and hasn't worked since 2017, the DEA would benefit from review and suggest:

	Implementation consideration
5.4 E	The government should formally review current data sharing legislation to make sure that it enables rather than hinders public sector operations (taking into account current examples of best practise in data-enabled service delivery, whilst considering the benefits data sharing can deliver in time and cost and recognising the need for improved data sharing for wider social, economic and environmental benefit).
5.4 F	In addition to a review of data sharing legislation for operational purposes, to make sure that data can be shared effectively across public service boundaries and help more joined-up future service design. We believe a review of how operational data can be shared more effectively with analysts and researchers would also be useful.

6 Authors

Dan Klein
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Data has been the overarching passion and theme of Dan's career, starting with real-time aerospace systems, to now leading Zühlke Engineering's data practice.

Dan has helped plan enterprise data transformation programmes and led delivery teams, including for:

- **DWP** Universal Credit Data Platform
- **ONS** data transformation
- **Ofgem** data infrastructure, Exchange and Hub
- **Home Office** identity services/real-time data
- **MoD** battlespace information
- **Audi** real-time vehicle data streaming and analytics
- **Rolls-Royce Marine** intelligent autonomous ships

Dan's common contribution to each of these organisations, has been to re-shape these transformation programmes so that they achieved much more, much faster.

Having done it himself, Dan provides stakeholders with reliable advice, gained from leading the:

- team that set-up and ran BT's £4BN 21CN UK telecommunications infrastructure transformation.
- rescue of the BMW 5 series entertainment, telematics and navigation platform for Siemens VDO.

An engineer by training, Dan bridges the gap between the boardroom and teams working at the coalface. Dan is an inquisitive and practical problem solver, who couples this with strategic thinking, commitment and years of experience.

Heather Savory

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Heather's central career pillar and lifelong interests are in leading–edge technology and data, particularly the use of data for Public Good.

Previously Co-chair of the United Nations Global Working Group on Big Data and Director General for Data Capability at the Office for National Statistics, she also Chaired the Open Data User Group (ODUG), an independent advisory group to the UK Government, and was a member of the Regulatory Board of the Royal Institute of Chartered Surveyors (RICS).

In her executive career Heather was Vice President of Engineering and Operations for 3Dlabs, a high-tech start-up which designed and manufactured the world's first 3D-graphics accelerators for the consumer market. She has held CEO roles at SMEs including leading the development of early Voice-over-IP technology. She has also worked extensively across UK Government including for HM Treasury, the Better Regulation Executive (Department for Business, Energy and Industrial Strategy) and the Office for National Statistics. She developed and built the ONS Data Science Campus in 2017. She currently advises a number of non-profit organisations.

Heather has a proven track record in business and government, strategic innovation, policy development, transformational change, organisational growth, user-centric design, delivering best-in-class technologies, governance, and regulation.

Heather's background in policy and high technology delivery is coupled with strong entrepreneurial leadership skills, customer facing and regulatory experience. Heather is a great believer in the 'art-of-the-possible' and enjoys working out how to deliver it. She enjoys working across cultural boundaries and in diverse teams and is passionate about genuine diversity of thought.

Kevin Murray

Director Solution Centre Manchester at Zühlke Engineering
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Kevin brings to transformation programmes a focus on people and the implementation of structures that enable teams to test, learn and adapt to achieve better outcomes.

Always seeking better tools, techniques and approaches, Kevin leads teams that find better ways of working. Passionate about helping others, Kevin supports his teams to share their learning, which has often become best practice adopted by others across the wider industry.

As the Government Digital Service (GDS) formed, Kevin's experience of both rescuing major government programmes and also leading lean high-performing cross-functional Agile delivery teams, helped deliver several of the GDS exemplar projects.

When GDS sought to establish new ways of working, Kevin led DWP's first GDS exemplar project to re-imagine the Carer's Allowance service. Passionate about user needs led delivery, Kevin led the team for Toyota that cracked the problem of designing the new business model and service relationship between customers, dealers and the manufacturer.

Kevin gives both teams and stakeholders the confidence to try new things and to trust evidence to inform difficult decisions. This approach binds large groups together, to strive towards achieving common goals. An example being delivery of the Blue Badge disabled parking service, which orchestrated contribution from 206 local authorities, going on to win the 2019 Cross-Sector Digital Collaboration of the Year award.

David Clark

Business Solution Manager Data at Zühlke Engineering
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David is a hands-on practitioner with a track record of leading the implementation of new digital services in accordance with the government service manual.

David has led digital and data transformation projects for the Driver and Vehicle Standards Agency, NHS, Skills Funding Agency, Department for Work and Pensions and Ofgem.

With the rise of modern data streaming technologies, Dave has found ways to effectively bind the contribution of new role types within delivery teams, including Data Architects, Data Scientists and Data Engineers.

When stakeholders are moving into new and uncharted waters, Dave provides a guiding hand. With a focus on citizen and user needs and evidence-based decision making, Dave has helped programmes to adapt and pivot to deliver better outcomes. Sometimes the right answer is to stop after Discovery and teams that Dave has led have made evidence-based recommendations, that citizens will be better served if alternative initiatives are pursued.

Dave was the delivery manager who led teams to build Ofgem's new data infrastructure, involving Ofgem's own people, helping them to change and acquire new skills with data and data technologies. This programme moved Ofgem away from managing data for the £80bn energy market in a spreadsheet, towards using enterprise grade data infrastructure to better assure regulation of the energy industry.

7 Annex A – Formal consultation questions and responses

Q1. To what extent do you agree with the following statement: Taken as a whole, the missions and pillars of the National Data Strategy focus on the right priorities. Please explain your answer here, including any areas you think the government should explore in further depth.

Q1 Answer

Somewhat Agree. The consultation prompts analysis of the missions and pillars and whether they focus the NDS on the right priorities.

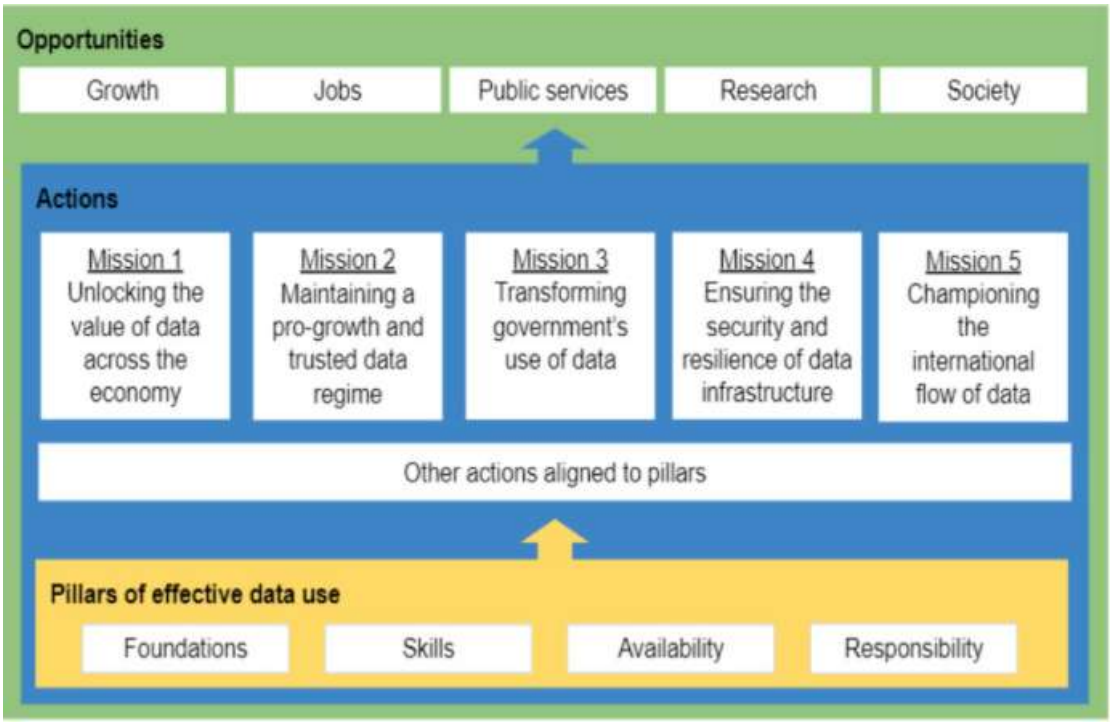

Figure 2: The NDS strategy and pillars diagram

There is little anyone could disagree with in this framework per-se, but we question the specific choice of the five Missions and find the connection between the Missions and the Pillars unclear. For example, we:

- would suggest it is impossible to separate Mission 3 (Transforming government's use of data) from Mission 4 (Ensuring the security and resilience of data infrastructure).

- don't understand why 'Championing the international flow of data' is a separate Mission in isolation from data 'Availability'.

- agree with the opportunities but find the framework confusing and can't find clear links between the Opportunities, Missions and Pillars which signpost *what* is going to be delivered and *why*, *how* these things will realise the opportunities or *how* they will to be delivered.

We have proposed a reframing of the strategy in our recommendations in section 5:

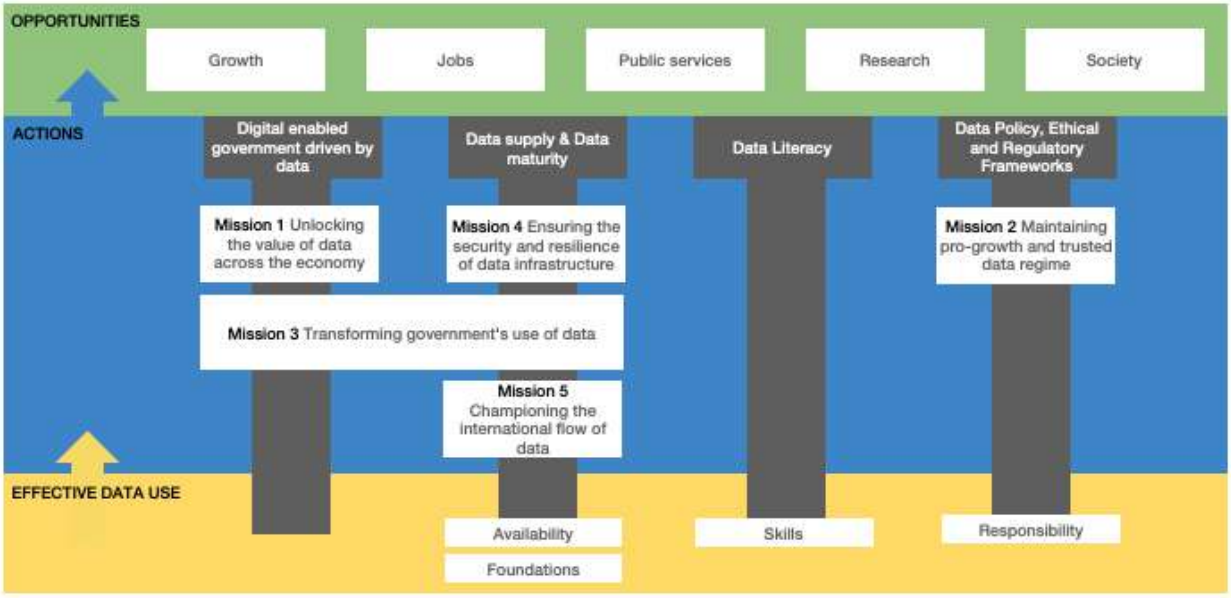

Figure 3: an evolution of the NDS strategy and pillars

Our recommendation to help engage the communities working with data better is that the NDS should be reframed as outcome focused, centred around four pillars. These are:

1. **Digitally enabled Government – driven by data**
2. **Data supply and Data maturity**
3. **Data Literacy**
4. **Data Policy, Ethical and Regulatory Frameworks**

We would therefore re-cast the NDS framework as shown in the diagram below into a cross-government framework which can be driven forward by the cross-cutting, practitioner-focused, actionable pillars we have identified. We think these four interrelated, actionable pillars can transform the use of data by government. We recommend they are considered in priority order:

- The first (Digitally enabled Government – driven by data) is driven by **user needs**
- The second (Data supply and Data maturity) tackles **sorting out data itself**
- The third (Data Literacy) is to **drive capability** and
- The fourth (Data Policy, Ethical and Regulatory Frameworks) is about building the **future governance regime** for data

Q2. We are interested in examples of how data was or should have been used to deliver public benefits during the coronavirus (COVID-19) pandemic, beyond its use directly in health and social care. Please give any examples that you can, including what, if anything, central government could do to build or develop them further.

For question two, we are only looking for examples outside health and social care data. Health and social care data will be covered in the upcoming Data Strategy for Health and Social Care.

Q2 Answer

Generally our view is that there are too many disjointed strategies referenced in the NDS as it stands, and we question (4.3 above) why there needs to continue to be a separate Data Strategy for Health and Social Care if this is a genuine National Data Strategy? We suggest that the Government should, instead develop a single Data Strategy for all types of personal data.

We are aware that much of the immediate Covid-19 response activity was more difficult than it needed to be because of historic cultural barriers to cross government data sharing also inadequate cross government data infrastructure, technical solutions or processes. We also highlight that barriers to data-sharing for Covid-19 were unblocked due to the sheer force of political will at the time. We comment on this 'crisis' dynamic in section 5.1 and 5.4.2 above, stating *"during a crisis (for example Covid-19 or Grenfell) these barriers are challenged and removed to resolve the pressing political imperatives of the day. We think that post Covid-19 citizens should be re-consulted about how they would prefer the government to use their data."*

We think there should be a review to identify what can be built on as a result of Covid-19 and to take the lessons learned further, rather than contract data sharing across government and the wider public sector.

In terms of specific examples of how data was or should have been used to deliver public benefits during the Covid-19 pandemic we observe that:

- Data was used well by the Department for Transport to create a real-time dashboard of all traffic movement in the UK (Motorways, A & B roads) to understand the impact of Traffic Restriction Orders. This allowed a level of understanding be provided to local police forces to understand enforcement needs.

- Data should have been used to link direct operational front-line hospital throughput, in near real-time, to drive the logistics and supply chain of relevant material and resources (i.e. PPE, Ventilators, staff movement). The inability to link this data to geospatial data infrastructure made this impossible. This would have enabled a more managed and timely provision of the relevant services in specific geolocations. Central Government would have been Regional and Local by design from the outset.

Q3. If applicable, please provide any comments about the potential impact of the proposals outlined in this consultation may have on individuals with a protected characteristic under the Equality Act 2010?

Q3 Answer

The proposals outlined are so general in nature, yet wide ranging, that this question is difficult to answer. All policy responses should be independently subject to Equality Impact Assessments. We have concerns that digital and data policy responses should not result in either the exclusion nor the stigmatisation of any individual citizen or group of citizens.

We are worried that if training data sets for Artificial Intelligence are not drawn from de-identified operational data the eventual products/services developed will not deliver benefits to minority groups.

We hope that citizen facing services will make better use of data (once improved data sharing is possible) to provide all citizens with the support that they need from central and local services, delivered in whatever way is best for the individual and highlight that by using data smartly it should become far easier than ever before to deliver efficient, bespoke citizen services.

Q4. We welcome any comments about the potential impact of the proposals outlined in this consultation on the UK across all areas, and any steps the government should take to ensure that they take account of regional inequalities and support the whole of the UK?

Q4 Answer

The NDS, as drafted, is lacking in that it does not propose any tangible outcomes or set out the anticipated benefits (or costs) of proposals on a national or regional basis. Our major concern regarding regional action with data is that the ability to share and make use of data at a local level should not become overly concentrated in the better funded local authorities i.e. large cities, or in areas of particular political interest to the current government.

We hope the NDS will lead to proposals to deliver generic processes and systems for widespread data sharing which will deliver effective data services to all local councils, regardless of their local funding and level of technical capability.

We draw attention to the need for training and skills building across all local government to strengthen data literacy at all levels.

We comment extensively on the lack of consideration of Local Government in section 4.6 above.

Q5. Which sectors have the most to gain from better data availability? Please select all relevant options listed below, which are drawn from the Standardised Industry Classification (SIC) codes.

Accommodation and Food Service Activities
Administrative and Support Service Activities

Agriculture, Forestry and Fishing
Arts, Entertainment and Recreation
Central/Local Government inc. Defence
Charity or Non-Profit
Construction
Education
Electricity, Gas, Steam and Air Conditioning Supply
Financial and Insurance Activities
Human Health and Social Work Activities
Information and Communication
Manufacturing
Mining and Quarrying
Transportation and Storage
Water Supply; Sewerage, Waste Management and Remediation Activities
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
Professional, Scientific and Technical Activities
Real Estate Activities
Other

Q5 Answer

Data availability will benefit all the sectors identified. Data associated with natural monopolies (proof of who you are, geospatial, natural resources) will enable all sectors to derive information and take beneficial decisions.

We suggest that industry bodies in each sector, should be asked to comment on the impact of the National Data Strategy on their sector.

Q6. What role do you think central government should have in enabling better availability of data across the wider economy?

Q6 Answer

The government should:

- Specify and plan to deliver a well-defined National Information Infrastructure for the longer term, also making a commitment to future funding.
- Reiterate a firm commitment to Open Data, especially for national location and planning data.
- Put in place a long-term solution for Earth Observation Data for the UK, which makes it accessible and more easily usable by everyone.
- Encourage large corporations to be more transparent and open up more of their data to small businesses and citizens.

- Ensure that citizens have the rights to and can access all the data generated by commercial organisations they interact with as a result of their interactions.

- Commit to opening up data about the progress of key government policies and programmes in a timely manner, so the public can assess the government's performance against its promises in near real-time.

- In particular, develop a data ecosystem, based on government and public sector data which will allow innovation around sustainability and climate change, with improved ability for the public to assess the government's progress towards the delivery of the 2030 Sustainable Development Agenda and progress towards net zero.

Q6a. How should this role vary across sectors and applications?

Q6a Answer

The government's role should vary across sectors and applications as little as possible; it should be simple, straightforward and consistent imposing the minimum necessary regulatory burdens or reporting requirements.

Q7. To what extent do you agree with the following statement: The government has a role in supporting data foundations in the wider economy. Please explain your answer. If applicable, please indicate what you think the government's enhanced role should be.

Q7 Answer

Strongly agree. Data associated with natural monopolies (proof of who you are, geospatial, natural resources) are the supporting data foundations for the wider economy.

The true value of data can only be fully realised when it is fit for purpose, recorded in standardised formats on modern, future-proof systems and held in a condition that means it is discoverable, accessible, interoperable and reusable. By improving the quality of the data it can be used more effectively and will drive better insights and outcomes.

The government has the primary role in managing natural monopolies and putting in place Data Infrastructure and Data Architecture. We do not think the Data Foundations actions defined by the NDS are sufficient to drive forward to deliver effective data services for the medium term. See section 5.2, above, for our detailed recommendations.

Q8. What could central government do beyond existing schemes to tackle the particular barriers that small and medium-sized enterprises (SMEs) face in using data effectively?

Q8 Answer

We believe that SMEs, over and above the current SME-related recommendations in the NDS, would benefit from National Information Infrastructure and the availability of more Open Data and that these would help enable further innovation with data, across many economic sectors.

We think the Government should take action to improve general data literacy as well as data skills. See section 5.3.

The Smart Data Review in 2019 consulted on ways to make evolving schemes more coordinated across banking, finance, telecoms and energy. The focus of Smart Data is citizens asking their providers to share information about them with third parties.

Q9. Beyond existing Smart Data plans, what, if any, further work do you think should be done to ensure that consumers' data is put to work for them?

Q9 Answer

We agree with the broad thrust of the Smart Data agenda and welcome further work in this area.

We think a focus on consumer and citizen data are synonymous and related. Please see our response and recommendations in section 5 above, focussing on putting the citizen at the heart of this strategy.

Q10. "How can the UK's data protection framework remain fit for purpose in an increasingly digital and data driven age?"

In section 7.1.2 we lay out the functions of the Centre for Data Ethics and Innovation (CDEI), set up in 2018 to advise the Government on the use of data-driven technologies and AI.

Q10 Answer

The UK's data protection framework needs to be reviewed in light of social and economic developments and needs to be kept under constant review. Please see our commentary and recommendations in section 5.4. Our specific recommendations are:

- The government should, taking into account current examples of best practise in data-enabled service delivery, considering the benefits data sharing can deliver in time and cost and recognising the need for improved data sharing for wider social, economic and environmental

benefit, formally review current data sharing legislation to make sure that it enables rather than hinders public sector operations.

- In addition to a review of data sharing legislation for operational purposes, to make sure that data can be shared effectively across public service boundaries and help more joined-up future service design, we believe a review of how operational data can be shared more effectively with analysts and researchers would also be useful.

Q11. "To what extent do you agree with the following statement: the functions for the Centre for Data Ethics and Innovation (CDEI) should be Artificial Intelligence (AI) monitoring, partnership working and piloting and testing potential interventions in the tech landscape?"

Q11 Answer

Neither agree nor disagree

- We are not clear in this question what the scope of the 'tech landscape' is? Does this mean across government and/or across specific industry sectors?

- We would like the functions for the CDEI to be considered in the context of the wider landscape of actors in the Data Ethics space, described above.

Q11a. "How would a change to statutory status support the CDEI to deliver its remit?"

Q11a Answer

- This question cannot be answered without clarity on the functions of the CDEI (previous question), explaining the rationale for putting the CDEI on a different statutory footing, explaining what the CDEI's new powers would be or providing us with an understanding of how this single action would improve the overall landscape of data ethics for the UK.

Q12. We have identified five broad areas of work as part of our mission for enabling better use of data across government:

- Quality, availability and access
- Standards and assurance
- Capability, leadership and culture
- Accountability and productivity
- Ethics and public trust

We want to hear your views on any actions you think will have the biggest impact for transforming government's use of data.

Q12 Answer

We think the biggest impact for transforming governments use of data, will be driven by our recommendations:

- The National Data Strategy (NDS) needs strong political backing for medium term investment, with a clear strategy for data across government and the wider public sector, and a framework which is outcome focussed and assigns delivery responsibilities.

- The NDS should be practitioner lead. User needs are the practical lens for directing action and focusing efforts to assure different data sharing initiatives drive value through to citizens.

- The newly appointed Government CDIO should become the Data Controller for all central government data, with each department becoming a Data Processor. The intention of this is to put in place a simple, central arbitration mechanism to resolve debates and unblock barriers to data sharing between departments. A similar arrangement should be put in place for Local Government data.

- Improvements in the Data Literacy (as opposed to Data Skills) of politicians and senior officials is essential to meet the needs of a modern digital economy. We recommend the development of collaborative data platforms for policy makers to guide and assure the use of data and to improve data literacy through sharing.

- Government should commit to move away from data silos, by developing cross-Government Data Infrastructure for citizen facing service delivery, assessing public sector IT spend from a data perspective and mandating all data is designed and prepared for re-use from the outset.

- The building blocks of interoperability are current blind spots in the NDS and should be addressed, including data infrastructure, data architecture and the significant omission of geospatial data.

- Implement the NAO report "Challenges in using data across government" June 2019 in full.

- Government should develop a single framework for Data Ethics and Data Transparency based on current working examples from within Government and remove siloes of activity in this area. Citizen user research should be undertaken on the public acceptability of personal data use across the public sector for operational systems, in policy development and for statistics and research purposes. Parallel citizen user research should be carried out to determine the public acceptability of business and commercial use of personal data.

- Legislative changes may be necessary to enable a fully functioning public and private sector data-enabled economy for the UK. We recommend that the reduction in siloed working for data should also applied to the policy space to ensure that future legislation draws on working examples of best practice with data (i.e. learn by doing).

We first introduce these recommendations in the Executive Summary of this document and provide more detailed commentary in section 5.

Q13. The Data Standards Authority is working with a range of public sector and external organisations to create a pipeline of data standards and standard practices that should be adopted. We welcome your views on standards that should be prioritised, building on the standards which have already been recommended.

Q13 Answer

Yes, there should be a pipeline of data standards and standard practices, but these should build on best practice to-date, which tends to sit outside central government.

We are unclear which standards have been recommended.

Q14. What responsibilities and requirements should be placed on virtual or physical data infrastructure service providers to provide data security, continuity and resilience of service supply?

Q14 Answer

The principles here should be the same as the ones applied to other critical national infrastructure e.g. energy, water etc.

Government needs to recognise that, in practice, there are only a handful of technology suppliers to choose between – AWS, Google, IBM and Microsoft. If the Government is building National Data Infrastructure it should seek to engage with these suppliers directly at senior levels and avoid reseller networks. The UK is unlikely to have any major bargaining power with these suppliers, so we suggest the Government looks at international best practice in other nations and attempts to strike similar deals.

Going further government should consider:

- the value of hybrid cloud and making use of more than one vendor and where UK suppliers such as Crown Hosting might form part of the hybrid mix https://crownhostingdc.co.uk

- designing services and infrastructure in a way that switching between vendors is viable, to for instance take advantage of different commercial regimes and also to avoid being 'held hostage' by a single vendor.

Q14a. How do clients assess the robustness of security protocols when choosing data infrastructure services? How do they ensure that providers are keeping up with those protocols during their contract?

Q14a Answer

This question is esoteric for a data strategy and assumes that clients are not keeping up with robust security protocols. Clients with good well-funded contract governance will have the necessary mechanisms in place. If this is a concern arising from clients who impact on Critical National Infrastructure, then the Government should apply the existing arrangements in the data space.

Q15. Demand for external data storage and processing services is growing. In order to maintain high standards of security and resilience for the infrastructure on which data use relies, what should be the respective roles of government, data service providers, their supply chain and their clients?

Q15 Answer

This is an esoteric question that rather assumes the roles can be redefined. We would suggest the roles 'are what they are' and the Government should continue in the role of guardian for Critical National Infrastructure. As guardian, the Government should ensure that organisations are able to easily move between external data storage and processing services. Commercial providers make it difficult to extract large volumes of data out, in order to move to another provider – this needs to be resolved.

Q16. What are the most important risk factors in managing the security and resilience of the infrastructure on which data use relies? For example, the physical security of sites, the geographic location where data is stored, the diversity and actors in the market and supply chains, or other factors.

Q16 Answer

Reputational damage is the single biggest lever that can be brought to bear on the actors in the data infrastructure market, closely followed by diversity of supply and ability to change supplier. Physical security and location are only relevant in so far as the Government has a lever over the actors operating within jurisdiction.

Q17. Do you agree that the government should play a greater role in ensuring that data does not negatively contribute to carbon usage? Please explain your answer. If applicable, please indicate how the government can effectively ensure that data does not negatively contribute to carbon usage.

Q17 Answer

Strongly agree. Yes, but this pales into insignificance in comparison with the fact that the consultation pays no attention whatsoever to the use of data to underpin climate change measures, delivering net-zero or delivering the wider set of sustainable development goals. This is a very narrowly focused question indeed, once again focusing rather myopically on a very small part of the overall data agenda.

Q18. How can the UK improve on current international transfer mechanisms, while ensuring that the personal data of UK citizens is appropriately safeguarded?

We will seek EU 'data adequacy' to maintain the free flow of personal data from the EEA and we will pursue UK 'data adequacy' with global partners to promote the free flow of data to and from the UK and ensure it will be properly protected.

Q18 Answer

These are huge questions given that there is very little information and certainly no background information in the consultation document to help us provide an informed response.

Q19. What are your views on future UK data adequacy arrangements (e.g. which countries are priorities) and how can the UK work with stakeholders to ensure the best possible outcome for the UK?

Q19 Answer

We are very concerned about the potential outcome of Brexit and losing the information connections with have with our (current) EU counterparts.

We believe there are serious National Security risks for the UK which need to be managed effectively.

By losing flows of information we will be unable to work out what we know, or even what we don't know.

8 Annex B – About Zühlke

Zühlke is an engineering services company.

We believe that innovation and technology are a positive force of change for business and society. We are a global innovation service provider. We envisage ideas and create new business models for our clients by developing services and products based on new technologies, from the initial vision through to development to deployment, production and operation.

Our expertise includes:

1. **Data & AI Solutions:** we believe in delivering change to humans and the planet through ethical use of data. Data & AI solutions are key to overcoming significant challenges for society, the economy and the planet.

2. **Device & Systems Engineering:** we are trusted by our clients from design, through to production and launch of innovative devices and systems.

3. **Digital Solutions & Application Services:** we develop new digital products and turn-key applications with added value.

4. **Strategy & Business Innovation:** we create digital strategies and breakthrough innovations that deliver long-term value.

About us:

- Founded in 1968
- Owned by partners
- Teams in UK, Germany, Austria, Serbia, Singapore, Hong Kong and Switzerland
- We have delivered over 10,000 innovation projects
- 1,200 employees
- Certifications: ISO 9001 and 13485
- Supplier to UK public sector via Digital Marketplace https://www.digitalmarketplace.service.gov.uk/g-cloud/supplier/92728

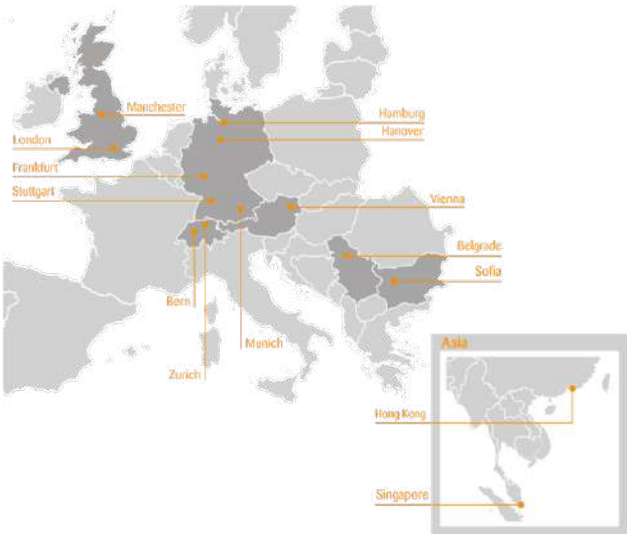

Figure 4 our locations

End of document