# Invest 2035:

# The UK's Modern Industrial Strategy

Open Data Institute response

November 2024

# About the ODI

The Open Data Institute (ODI) is an independent, non-partisan, not-for-profit organisation founded by Sir Nigel Shadbolt and Sir Tim Berners-Lee in 2012. We have a mixed funding model and have received funding from multiple commercial organisations, philanthropic organisations, governments and intergovernmental organisations to carry out our work since 2012.

The ODI wants data to work for everyone: for people, organisations and communities to use data to make better decisions and be protected from any harmful impacts. We work with companies and governments to build an open, trustworthy data ecosystem. Our work includes:

- consultancy: working with organisations in the public, private and third sectors, building capacity, supporting innovation and providing advice
- research and development: identifying good practices, building the evidence base and creating tools, products and guidance to support change
- policy and advocacy: supporting policymakers to create an environment that supports an open, trustworthy data ecosystem

Our 5 year strategy sets out what we think are the elements of an open and trustworthy data ecosystem for a world where data works for everyone. Our approach allows us to adjust our implementation and engagement as the world around us, and the organisations we work with, change. Our activities will be set out on an annual basis, mapped to the six principles that guide everything we do:

1. We believe that a strong data infrastructure is the foundation for building an open, trustworthy data ecosystem on a global scale and that this can help address our most pressing challenges.
2. Strong data infrastructure includes data across the spectrum, from open to shared to closed. But the best possible foundation is open data, supported and sustained as data infrastructure. Only with this foundation will people, businesses and governments be able to realise the potential of data infrastructure across society and the economy.
3. For data to work for everyone, it needs to work across borders – geographic, organisational, economic, cultural and political. For this to happen ethically and sustainably, there needs to be trust – trust in data and trust in those who share it.
4. There is greater need than ever for trusted, independent organisations to help people across all sectors, economies and societies to benefit from better data infrastructure.
5. For data to work for everyone, those collecting and using it need to be highly alert to inequalities, biases and power asymmetries. All organisations working in data must take proactive steps to ensure that they contribute fully and consciously to creating a diverse, equitable and inclusive data ecosystem.

6. The world needs a new cohort of data leaders – individuals who have data knowledge and skills and are equipped to understand the value, limitations and opportunities offered by data, data practices and data sharing.

# The ODI's approach to this consultation

This document responds to the Department for Business and Trade's consultation on Invest 2035: the UK's modern industrial strategy green paper. As we outline in this response, we believe that data infrastructure should be recognised not just as an enabler but as a critical growth-driving sector in its own right, requiring its own comprehensive 10-year plan in the form of a National Data Infrastructure Roadmap. This infrastructure sits horizontally across the economy and society, underpinning productivity, innovation and public service delivery across all growth-driving sectors.

Throughout our response, we emphasise four key messages that we think should inform the industrial strategy:

1. The National Data Library must be designed to be AI-ready from the outset. Our forthcoming research shows that current government data is not AI-ready - based on testing more than 13.5K pages on data.gov. Making data more Findable, Accessible, Interoperable and Reusable (FAIR) through standards like Croissant would enable its use in AI development while ensuring appropriate governance befitting public sector data.
2. Smart Data schemes require pan-sector standards and governance mechanisms to deliver economic benefits. A central authority should develop cross-sector standards, ensuring interoperability and reducing data silos. The UK should learn from international initiatives like Data Spaces which highlight successful models for automating data access, incentivising business participation and establishing sector-based data ecosystems.
3. The potential of privacy-enhancing technologies (PETs) must be thoroughly explored to build public trust, which is essential for unlocking the full value of data across the economy. Technologies like Solid - which is now stewarded by the ODI - can give citizens control of their data through Personal Online Data Stores (Pods) while enabling innovation. This is crucial for unlocking value from sensitive data, particularly in healthcare.
4. We must better recognise data's value as a national asset. While traditional accounting standards do not universally recognise data as an asset, evolving standards may become necessary as data becomes increasingly central to business operations and strategy. The government has a role in engaging on this key issue which affects every business and sector.

At the ODI we have extensive experience working on data infrastructure and governance initiatives that have helped give insight to this submission. We've worked with industry, civil society, smart data implementation entities, and also are members of the Smart Data Council to the government—all of which hopefully gives a sense of the scope of our institutional insight

into these recommendations for how data can be a foundation and driver of growth in the decade ahead.

Finally, we believe civil society must play a significant role in shaping data infrastructure and governance. We recommend throughout this response - and in all our work - that involving diverse stakeholders in stewarding initiatives like the National Data Library and smart data schemes will ensure different perspectives are properly represented.

## Q1. How should the UK government identify the most important subsectors for delivering our objectives?

To meet the ambitious objectives of Invest 2035, the UK government must adopt a comprehensive, and forward-looking approach to identifying critical subsectors. This approach should balance immediate opportunities with long-term investment, ensuring that the necessary interventions and sustainable investment are in place to support emerging and foundational sectors across the economy.

In this context, it is vital to recognise data infrastructure not only as an enabler but as a sector in its own right, requiring its own comprehensive 10-year plan, and sitting horizontally, as a foundational "layer" across the economy and society. More detail on the rationale behind this recommendation is given in our response to Q4. However, in relation to Q1, it is significant because data itself will be crucial for identifying the subsectors critical for delivering the overall goals of Invest 2035, not only as the strategy is being developed but throughout its delivery.

**Data's role in identifying critical subsectors:**

1. **Data infrastructure underpins productivity, innovation, and public service delivery across all of the UK's growth-driving sectors:** advanced manufacturing, clean energy industries, creative industries, defence, digital and technologies, financial services, life sciences, and professional and business services. It is often treated primarily as a horizontal enabler. This framing is in-part correct but it also fails to account for vertical needs and applications (e.g., sector-specific data requirements such as financial data for banking or geospatial data for clean energy) and the unique barriers it faces, such as scaling interoperable platforms and building public trust to enable widespread data access across the country.
2. Positioning data infrastructure as a dedicated sector will give it the strategic oversight needed to **address these horizontal and vertical demands**. By establishing a **10-year National Data Infrastructure Roadmap**, the UK can ensure the long-term development of interoperable systems, open standards, AI-ready datasets, and privacy-enhancing technologies that fuel growth and empower citizen with their data. This approach will also provide government and other stakeholders with the data needed to identify areas of potential growth - and emergent subsectors - within the wider growth-driving sectors across the lifetime of the industrial strategy. There is more detail on the collection, use and sharing of this data - especially for decision making - in other sections of this consultation response.
3. In relation to the on-going identification of sub-sectors for the delivery of the Invest 2035 objectives, government should consider implementing **a robust, data-driven framework to monitor and evaluate the rollout of the strategy**. This framework is

crucial for continuously evaluating and adapting Invest 2035. By integrating real-time data monitoring, tailored indicators, and participatory insights, a framework can help identify emerging industrial sub-sectors that warrant focused attention and investment in order to deliver the wider objectives of Invest 2035. This approach ensures the strategy remains responsive to evolving economic, technological, and societal conditions and might include:

a. **A centralised data monitoring system:** A central dashboard could aggregate and analyse real-time data from government, industry, and regional partners. By leveraging AI and machine learning, this system would identify trends and anomalies, such as growth in niche sectors or new clusters of innovation. The insights would enable policymakers to pinpoint emerging sub-sectors with high growth potential or strategic importance, facilitating timely interventions and investment.
b. **Sector-specific KPIs:** Developing indicators tailored to different sectors and regions would allow for granular analysis of economic and social impacts. KPIs tracking R&D investment, workforce shifts, and data infrastructure adoption would highlight where sub-sectors are thriving or facing challenges, enabling strategic prioritisation. For instance, identifying rapid advancements in areas like AI-powered healthcare or green construction could guide additional support for scaling these sectors.
c. **Independent evaluation and scenario planning:** Annual evaluations and forward-looking techniques, such as scenario planning, would provide insights into how economic shifts and technological advancements are reshaping industry landscapes. This process could help anticipate emerging sectors, such as those driven by advancements in smart data schemes or decarbonisation technologies, and inform adjustments to the strategy.
d. **Participatory feedback mechanisms:** Regular engagement with businesses, workers, and communities would capture ground-level perspectives on industrial trends and challenges. Feedback from these groups could help identify areas of untapped potential or systemic barriers that need to be addressed to support emerging sub-sectors.
e. **Spillover analysis:** Using methodologies like network analysis, the framework could map how innovation in one sector creates opportunities in adjacent areas, revealing new industrial sub-sectors that might benefit from targeted investment. For example, knowledge spillovers from advancements in renewable energy technologies could catalyse growth in specialised manufacturing or logistics solutions.
f. **Ethics and governance:** Embedding robust data governance within the framework would ensure the responsible use of data and build public trust, which is critical for long-term engagement with the strategy. Ethical oversight

could also help identify emerging sectors aligned with societal priorities, such as sustainability or digital inclusion.

By incorporating these components, the framework would allow the government to monitor the evolving industrial landscape systematically, highlighting sectors with strategic importance or high growth potential. This rolling, evidence-based approach will ensure timely investments in emerging sub-sectors, aligning Invest 2035 with the UK's long-term economic and social goals.

## Q2. How should the UK government account for emerging sectors and technologies for which conventional data sources are less appropriate?

To effectively address the challenges and opportunities posed by emerging sectors and technologies, the UK Government should adopt an holistic approach that acknowledges the transformative potential of innovations like artificial intelligence (AI) while ensuring robust mechanisms for measurement and evaluation. This comprehensive approach would involve several key actions:

1. **Advancing measurement frameworks**

The government should develop new frameworks to go beyond traditional economic indicators, creating metrics that capture the nuanced impacts of emerging technologies. These could include sector-specific performance dashboards, trend analysis and forecasting (preferably open and scrutinisable), flexibility for indicators that analysts identify and feed-in to government, policy impact assessments with regular reporting, and comparative international benchmarking (particularly around regulation for emerging technologies). Some indicators that could be explored include adoption rates of emerging technologies, energy and data consumption, network performance and utilisation, job dislocation metrics, retraining and lifelong learning data, regulatory approval speeds, and sector specific patent lodging. This list is by no means exhaustive, but is hopefully useful.

Flexible data collection methods that are tailored to rapidly evolving sectors should be designed, alongside standardised approaches for measuring the adoption and impact of these innovations. Incorporating AI-specific assurance metrics (such as transparency and usefulness of data, model performance stability, error tracking rates, robustness against data poisoning, demographic bias detection, training data documentation completeness, opt-out request processing, data access control effectiveness — again this list is not exhaustive) will be crucial for evaluating the trustworthiness and responsibility of AI development, deployment and diffusion.

2. **Building trust through assurance**

Mechanisms to demonstrate the trustworthiness of emerging technologies should be implemented. This includes supporting independent assurance providers and establishing clear frameworks for risk assessment and mitigation. Transparency in technology evaluation will further bolster public confidence, ensuring responsible development and adoption. Amongst others, the ODI has developed several tools and frameworks to assure the trustworthiness of new technologies including a Data Practices Assessment and a Data Sharing Risk Assessment tool.

### 3. Leveraging the National Data Library (NDL)

The National Data Library should be designed to be AI-ready from the outset, enabling it to support advanced data analytics and AI applications. There is understandably a lot of excitement around the potential for AI to improve public services. For instance, The Alan Turing Institute has estimated that of the 143 million complex tasks performed by civil servants every year, approximately 1,200 person-years of work could be saved if even just one minute could be freed up through AI-enabled automation. That requires quality data and robust data management and governance; the National Data Library should leverage the UK's world-leading capabilities to get them right from the start. This includes some well-tested data hygiene measures that the ODI has helped establish over the years: using open, interoperable standards and technologies to share and safely access data; identifying and fixing data gaps and other limitations through continuous assessments and user feedback; setting up clear governance structures that are conducive to innovation while maintaining public trust; and giving people and communities meaningful tools to have control over how their data is used and by whom. This also includes some emerging AI-related measures that will ensure that the data assets of the National Data Library can be used effectively and responsibly by AI innovators in the public and private sectors. Our data-centric AI programme and recent white paper on building a better future with data and AI discuss these measures in detail.

As we explore further in our response to Question 10, government data is not currently AI-ready and this could hamper efforts to maximise the productivity gains promised from emerging technologies, including AI. Government should become a good provider for AI-ready data. Using established practices like FAIR-ness (findable, accessible, interoperable, reusable) and linked data are a strong starting point. There are also innovative standards emerging, like Croissant which can enable data.gov datasets and future National Data Library datasets to be indexed by Google datasets search and easily integrated into AI developer workflows. Government data with attached metadata in the Croissant format will be FAIR and overall more AI-ready, likely encouraging its use amongst AI developers.

### 4. Fostering cross-sector collaboration

The NDL can act as a bridge for data sharing between traditional and emerging sectors, unlocking new cross-sector opportunities for growth. By facilitating collaboration, the government can harness the full potential of data-driven innovation to drive economic and societal progress. Through these initiatives, the UK can position itself as a leader in harnessing the transformative power of emerging technologies while maintaining trust, transparency, and responsibility.

## Q3. How should the UK government incorporate foundational sectors and value chains into this analysis?

The government should build on their recognition in the Invest 2035 green paper that certain sectors and capabilities form the foundation for wider economic growth and innovation. AI assurance, estimated to be worth £1.01bn in GVA currently with potential to reach £6.53bn by 2035, represents one such foundational capability that we're pleased to see the government recently recognise through its Assuring a Responsible Future for AI report released in November. AI assurance is underpinned by data assurance with the market for data assurance services also emergent. In our 2023 paper, International Data Assurance, the ODI revealed that the global data assurance market could grow by 60% and reach a value of $5.6bn (US dollars) by 2027.

There is high demand for data assurance products and services that are both affordable and effective. Our research found that there  is also a strong appetite for accredited external suppliers. Nearly three-quarters (73%) of data users trust suppliers more if they are recognised by a data assurance standards body. As the need for data assurance services continues to increase, there is a growing global desire for recognised practices, standards and codes of conduct that can provide credibility and trust to suppliers and consumers.

There are opportunities for the UK to achieve significant market share in data assurance, and this should be given proper consideration as part of the creation of a National Data Infrastructure Roadmap as mentioned in our response to Q1. Moreover the Data (Use and Access) Bill, currently making its way through parliament presents a significant requirement for standards in data collection, access, use and sharing, as well as those responsible for these activities. It is especially important that the UK achieves adequacy with global data standards, including those developed by the W3C, IEEE and ISO. Having recognised adequacy with global standards will enable data to flow more freely across borders, and apps and services to reach bigger markets beyond the UK. Only in this way can the government's promised annual £10bn boost to the economy come about.

The UK Government should continue with its commitment of establishing the National Data Library as a foundational element of the country's data infrastructure, supporting various sectors and value chains. Indeed, While it's encouraging to see digital and technology

sectors emphasised, with a particular focus on AI, we must not overlook the foundational role of data (we explore this foundational role of data infrastructure in more detail in our responses to Questions 12 and 13). The startup ecosystem, business models, and innovation rely on high quality data infrastructure. Public data, in particular, could serve as a key lever here.

Here's how the government can incorporate foundational sectors and value chains:

1. **Conduct comprehensive value chain mapping:** Using data-driven approaches to map out the complete value chains of growth-driving sectors would help identify key dependencies and foundational elements.
2. **Develop a data ecosystem approach:** Recognising that data flows between sectors are crucial, mapping how data is created, shared, and used across different sectors can identify foundational data providers and users.
3. **Prioritise foundational datasets:** Ensure the NDL includes high-quality, regularly updated datasets from foundational sectors such as energy, transport, and finance. These datasets can serve as a backbone for analysis across multiple sectors. The work of the European Union in developing European Data Spaces could act as a guide to what is possible.
4. **Assess the maturity and quality of existing data infrastructure:** Evaluating the quality and accessibility of data infrastructure (including standards, APIs, and shared vocabularies) in foundational sectors is vital, as this can significantly impact the performance of growth-driving sectors.
5. **Implement cross-sector data sharing initiatives:** Encouraging data sharing between growth-driving and foundational sectors through initiatives like data trusts or data collaboratives could unlock new value.
6. **Facilitate secure data sharing:** Utilise Privacy Enhancing Technologies (PETs) within the NDL to enable secure sharing of sensitive data across value chains, particularly where personal or commercially sensitive data is involved.
7. **Evaluate skills transferability:** Assessing how skills developed in foundational sectors could support growth in emerging sectors, particularly focusing on transferable data skills, is important.
8. **Support data standards development:** Encouraging the creation and adoption of data standards that facilitate interoperability between foundational and growth-driving sectors could drive innovation and efficiency.

## Q4. What are the most important subsectors and technologies that the UK government should focus on and why?

It is vital to recognise data infrastructure not only as an enabler but as a sector in its own right, requiring its own comprehensive 10-year plan, and sitting horizontally, as a foundational “layer” across the economy and society.

**Key recommendations**

1. **Recognise the UK’s data infrastructure as a critical growth-driving sector in its own right, or (less desirable for reasons outlined in this consultation response) a subsector of the “Digital and Technologies” sector.**
    a. Data infrastructure underpins productivity, innovation, and public service delivery across all of the UK’s growth-driving sectors: advanced manufacturing, clean energy industries, creative industries, defence, digital and technologies, financial services, life sciences, and professional and business services. It is often treated primarily as a horizontal enabler. This framing is in-part correct but it also fails to account for vertical needs and applications (e.g., sector-specific data requirements such as financial data for banking or geospatial data for clean energy) and the unique barriers it faces, such as scaling interoperable platforms and building public trust to enable widespread data access across the company.
    b. Positioning data infrastructure as a dedicated sector will give it the strategic oversight needed to address these horizontal and vertical demands. By establishing a 10-year National Data Infrastructure Roadmap, the UK can ensure the long-term development of interoperable systems, open standards, AI-ready datasets, and privacy-enhancing technologies that fuel growth and empower citizen with their data. This long-term horizon for the UK’s data infrastructure will also give businesses the confidence to invest in their own data estates; the lack of digital maturity in businesses (and imperceptable incentives to invest in improvement) is a widely recognised barrier to growth in the digital economy. Long term thinking will incentivise the development of public-private collaborations, for example, in the roll-out of smart data schemes.
2. **Implementing the National Data Infrastructure Roadmap**
    a. A coherent 10-year plan which has **concrete delivery goals for one, three and 10-years**, should focus on:

   i. Building the **National Data Library (NDL)** to facilitate AI-ready public data, enabling advanced analytics while ensuring trust.
   ii. Scaling **smart data schemes** across sectors like finance, energy, and transport to improve efficiency and competition.
   iii. Developing **a central authority for data standardisation** to ensure interoperability and scalability between smart data and broader data access schemes.
   iv. Promoting the use and application of **Privacy Enhancing Technologies (PETs)** as an enabler for government, companies, and individuals in the data economy.
   v. Exploring the latest thinking on **the value of data** to leverage the true value of data as a national asset - economically and socially - incentivising businesses to invest in data sharing and access, and building public trust.
2. b. This plan should also address:
   i. Securing long-term funding models to ensure the data projects and the UK's data infrastructure are sustainable.
   ii. Providing mechanisms to incentivise private sector investment in data assets.
   iii. Gaps in digital and data literacy and other access barriers that exist to the UK's data infrastructure for innovation-fueling SMEs, who are compliance-weary and struggling due to recent changes to employer National Insurance contributions.

**3. Learn, and align with the proposed sector focus for smart data schemes**

a. The government and the Smart Data Council have previously adopted a similar sector-focused approach in proposing new smart data schemes. For each sector identified in Invest 2035, the government should engage with the Smart Data Council to learn from their experience of pursuing sector change. Moreover, they should explore opportunities for rolling out smart data schemes alongside other programmes of investment and incentives to grow the sectors in the industrial strategy.

**4. Conduct data-informed analysis**

a. The best way to identify the most important subsectors, is through detailed analysis of the data. Economic data, including productivity metrics, growth rates, and export performance, can be used to identify high-potential subsectors within each growth-driving sector.
b. Once identified, proposed subsectors should be evaluated based on their data maturity and potential for data-driven innovation. Sectors with high-quality, accessible data are often better positioned for rapid growth and innovation.

**The UK Government should move beyond viewing data as an enabler and instead recognise it as a dynamic, foundational sector with unique horizontal and vertical needs and value.** By investing in a 10-year National Data Infrastructure Roadmap, the government will unlock untapped potential in productivity, innovation, and societal benefit, creating a resilient foundation for the industrial strategy's success. This proactive step will position the UK as a world leader in leveraging data to drive sustainable and inclusive growth.

## Q5. What are the UK's strengths and capabilities in these sub sectors?

The UK is a global leader in the enablers - and components - of strong data infrastructure, a cornerstone of the broader digital and technology industry. This leadership is rooted in several key strengths and capabilities, positioning the UK as a hub for innovation, investment, and excellence in data management and governance:

1. **Robust digital and emerging technical data infrastructure**
   The UK's digital infrastructure is strong, driven by significant investments and strategic initiatives. Project Gigabit and the Shared Rural Network aim to provide nationwide gigabit-capable broadband by 2030. Meanwhile, the £3.75 billion Hertfordshire data centre project demonstrates the potential of the UK as a hub for world-class facilities. Additionally, the designation of data centres as Critical National Infrastructure in 2024 underscores their economic importance and security. High rankings in global digital economy indices and the recognition of the value of data to the UK economy - including in Invest 2035 - further cement its leadership in digital and data infrastructure. In our recent Five Year Strategy, we at the ODI emphasise the critical role of data infrastructure as foundational to an open, trustworthy data ecosystem, addressing global challenges such as climate change and socio-economic inequality.
2. **Thriving data economy and ecosystem**
   As one of Europe's largest data markets, the UK benefits from a vibrant tech sector and strong innovation. In the data centre sector itself, London is recognised as Europe's largest data centre market, boasting more than 1 gigawatt (GW) of live data centre capacity. Moreover, the market is experiencing significant growth. Projections indicate that it will expand from 2.19 thousand megawatts (MW) in 2024 to 3.61 thousand MW by 2029, reflecting a compound annual growth rate (CAGR) of 10.49%. Strategic approaches to digital innovation can enhance connectivity, support data-driven businesses, and foster sustainable economic growth.
3. **Pioneering Privacy-Enhancing Technologies (PETs)**
   The UK is a leader in developing PETs, which enable secure data use while preserving privacy. These technologies include personal online data stores, privacy-enhancing protocols like Solid, and advanced socio-technical methods such

as synthetic data, federated learning and multi-party computation. The ODI has contributed significantly to this field by researching and fostering discussions around standards and governance. We are now advancing the adoption of PETs directly with our organisational stewardship of Solid.

4. **Leadership in data-centric AI**
   The UK excels in data-centric AI research, focusing on improving AI systems through enhanced data quality. Data is the feedstock of AI, and for AI technologies to reach their full potential, the data they are built on must be AI-ready. Organisations like the ODI have advanced work in this domain, identifying the key components for an AI-ready data infrastructure for the UK and building standards and tools to support it, including the Croissant standard for metadata in machine learning.
5. **Innovative approaches to data valuation**
   The UK is advancing the recognition of data as an intangible asset vital for modern economies. Without this recognition, significant barriers exist to investment in data-driven and digital sectors as organisations struggle to demonstrate the economic potential of their data, deterring investors who favour assets with established worth. This - in turn - can inhibit businesses' ability to secure financing and limit their capacity to scale. Valuing data on the balance sheet can strengthen investor confidence, provide a foundation for new funding models, and promote sustained growth by showcasing data as a driver of economic impact. The UK is leading the way in advancing approaches to the valuation of data through professional organisations like the ICAEW, government entities like the Isle of Man's Digital Isle of Man (which is working on a Data Stewardship Framework) and the ODI, which has been working on the topic since 2016.
6. **World first data governance research and impact**
   Over the past ten years, the UK has developed many world-firsts in researching, designing and implementing innovative data governance models, enabling fresh thinking and innovation, and catalysing a thriving global data ecosystem. The UK has led the way in designing new models of data stewardship that enable safe data sharing for research and innovation, including many forms of Data Institution (a concept coined by the ODI). It has evolved new standards that enable the secure sharing of data to enable new apps and services to be built, for example through Open Banking but also through OpenActive. This six-year programme enables data sharing in the sport and physical activity sector and is stewarded by the ODI. Tools and products including data maturity assessments like those designed by organisations like Data Orchard and the ODI are widely deployed and frameworks like the ODI's Data Skills Framework and Data Practices Framework - amongst many others from across the sector - have been widely adopted worldwide.
7. **Ethical data governance**
   Ethical considerations are central to the UK's data infrastructure leadership. Tools

like the ODI's Data Ethics Canvas, which has been downloaded over 90k times, guide organisations in adopting responsible data practices. The UK's thriving data ethics ecosystem, which includes organisations like the Ada Lovelace Institute, Connected by Data, Careful Industries, and many, many more, places the UK in a leadership role where others seek to learn and implement best practices based on our research and thinking.

8. **Focus on emerging trends and spillover effects**
   The ODI identifies trusted data-sharing and access mechanisms and federated models as critical to unlocking the economic and societal benefits of data infrastructure. By advancing mechanisms such as data assurance and fostering data literacy, the UK is well-positioned to lead in emerging areas like digital twins and cross-sector knowledge sharing.

The UK's data infrastructure—encompassing technological, ethical, and economic dimensions—has all the hallmarks of a unique sector (or subsector) of the economy, positioning, as it does the country as a global leader. Institutions like the ODI are pivotal in advancing research, governance, and innovation, ensuring that the UK remains at the forefront of the global data economy. These strengths support a sustainable, inclusive, and dynamic digital future, making the UK a key player in shaping the evolving landscape of data infrastructure.

## Q6. What are the key enablers and barriers to growth in these sub sectors and how could the UK government address them?

Data infrastructure is a foundational part of the UK's digital and technology industry and critical to catalysing innovation, productivity, and economic growth. Recognising it as a distinct industrial subsector (or - ideally - a primary growth-driving sector), rather than solely as an enabler can unlock significant social and economic potential.

**Enablers**

1. **Proven success of smart data schemes**
   The UK's leadership in sector-wide smart data initiatives, such as Open Banking, demonstrates how shared, interoperable data infrastructure can stimulate innovation, empower consumers, and unlock economic growth. Other countries have seen significant successes with similar schemes, including those in the EU (especially in Estonia), India, Australia, Singapore, and more. Existing schemes serve as models for expansion into other sectors like energy, transport, and telecommunications and for combining data from different sectors to release more benefits for consumers and greater growth potential.
2. **World-class research and development in Privacy-Enhancing Technologies (PETs)**

The UK excels in developing PETs, such as federated learning, personal data storage, and multi-party computation. These technologies enable secure data sharing and analysis, overcoming privacy concerns while delivering data-driven innovation. The ODI plays a pivotal role here, supporting research and standards-setting to advance PET adoption across industries.

3. **Established institutions driving data infrastructure excellence**
   Organisations like the ODI are at the forefront of fostering innovation and trust in data use. Our initiatives in ethical data governance, AI-readiness, and data sharing mechanisms have set global benchmarks, strengthening the UK's position as a leader in data infrastructure. Other bodies, such as the Ada Lovelace Institute, Alan Turing Institute, Oxford Internet Institute, Tony Blair Institute and Minderoo Centre for Democracy and Technology, contribute to research excellence in AI and data science, creating a world-leading data infrastructure ecosystem in the UK.
4. **Existing interoperable standards and frameworks**
   The UK has developed foundational data-sharing and interoperability frameworks, ensuring seamless data flows across industries and sectors. These include the frameworks underpinning initiatives like OpenActive for physical activity data and secure, scalable geospatial data sharing to support renewable energy initiatives.
5. **Supportive policy environment**
   While regulatory complexities remain challenging, recent advances such as the new Data (Use and Access) Bill, now making its way through parliament, and the Digital Markets, Competition and Consumer Bill (which has come into law), indicate a favourable environment for data innovation. These policies are complemented by the growing emphasis on responsible data-sharing practices.
6. **Leading-edge data centres and digital connectivity**
   The UK's investments in data centres, combined with initiatives like Project Gigabit to deliver gigabit-capable broadband, ensure robust infrastructure for managing and processing data. The designation of data centres as Critical National Infrastructure further safeguards these assets.

Barriers

1. **Fragmented data valuation frameworks**
   The lack of universal mechanisms for recognising the value of data hinders its use as a financial asset, limiting investments in data-intensive projects.
2. **Skills and digital literacy gaps**
   An ongoing shortage of skilled professionals in data governance, analysis, and AI hinders the sector's ability to scale, with SMEs particularly affected.
3. **Infrastructure gaps in underserved regions**
   Regional disparities in access to advanced data infrastructure create inequities, limiting the participation of SMEs and local governments in data-driven opportunities.

4. **Public trust and governance challenges**
   Concerns around data privacy, security, and ethical use reduce public confidence in data-sharing initiatives, which are critical to the sector's success.
5. **Regulatory fragmentation and complexity**
   Siloed approaches to data protection and sharing impede cross-sector interoperability, limiting the full potential of smart data schemes.

**Recommendations for the UK government**

1. **Scale proven models like smart data schemes**, building on the success of Open Banking by expanding smart data initiatives to other sectors, ensuring there are cross-government interoperable data-sharing frameworks that operate horizontally across the economy.
2. **Conduct comprehensive research on international data access initiatives**, such as the European Data Spaces, learning from their successes and failures to inform the development of a world-leading smart data strategy. Review how such schemes across the EU, India, Singapore, Estonia and more have successful models for automating data access, incentivising company participation, and establishing sector-based data ecosystems with standardised services. All of which will be critical to the success of smart data schemes in the UK. Wherever possible, seek alignment with international standards to maximise the innovation potential of cross-border data flows.
3. **Invest in skills development and public trust** by funding training programmes in - for example - data governance, PETs, and AI. Create a Data Skills Council, or expand the role of the Digital Skills Council to incorporate data skills and coordinate efforts between government, industry, and education providers. This, in turn, might be supported and be a part of Skills England when implemented and funded via the Skills Levy. The growth and skills levy should prioritise digital and data roles, as they are essential for all the high growth sectors. Support public awareness campaigns to build confidence in data use and sharing.
4. **Strengthen standards and data valuation frameworks**
   Partner with data research organisations like the ODI and accountancy bodies like the ICAEW to develop globally aligned data standards and valuation mechanisms, enabling better investment flows into the sector. While traditional accounting standards do not universally recognise data as an asset, it can be classified as an intangible asset under certain conditions. Organisations must ensure that data meets the relevant criteria set out in accounting frameworks like IFRS or GAAP to capitalise on its value. As data becomes increasingly central to business operations and strategy, continuing to evolve standards for its recognition may become necessary and the government has a role in engaging on this key issue, which affects every business and every sector.

5. **Encourage collaboration across sectors**
   Promote cross-sector partnerships and knowledge-sharing through innovation hubs and forums, fostering new applications of data infrastructure.

The UK is well-positioned to lead globally in data infrastructure, with existing enablers like proven smart data schemes, cutting-edge PETs, and strong institutional support already paving the way. Addressing the identified barriers will allow the government to unlock the full potential of data infrastructure, driving inclusive and sustainable economic growth.

## Q7. What are the most significant barriers to investment? Do they vary across the growth-driving sectors? What evidence can you share to illustrate this?

The lack of universal recognition of data as an intangible asset creates significant barriers to investment in data-driven and digital sectors. Without formal acknowledgment, organisations struggle to assign clear monetary values to their data, resulting in valuation challenges that deter potential investors who prefer assets with established worth. Additionally, companies may find it difficult to secure funding, as they cannot use data as collateral for loans or financing. This uncertainty can lead to investor hesitancy, particularly when businesses rely heavily on data without demonstrating its economic benefits, ultimately impacting long-term growth strategies.

Viewing data merely as an operational resource can lead to fragmented management approaches, preventing organisations from fully leveraging their data assets, thereby leading to inefficiency. The complexities of data privacy regulations also add to the reluctance to invest, as companies may fear compliance issues and liability. Without recognising data as an intangible asset, the development of data-driven markets can be impeded. However, emerging trends advocating for better data governance and rights may shift perspectives, paving the way for increased investment opportunities. To overcome these challenges, it is essential to improve regulatory frameworks, refine data valuation practices, and emphasise the economic potential of data within industries. This issue is increasingly under discussion amongst international accountancy bodies including the ICAEW.

As an example, if the data held within the National Data Library were recognised as a valuable national asset, sufficient funding for its maintenance and development would be more readily secured. This, in turn, would improve data quality, accessibility, and ultimately, its value for innovation and public benefit. This could be a focus area for **a National Data Infrastructure Roadmap** as outlined in our response to Q1.

The current lack of robust data valuation frameworks has cascading effects. It exacerbates the skills gap, as businesses are less inclined to invest in data skills training when the return

on investment is unclear. It also contributes to uncertainty around data protection and sharing, as the perceived value of data influences decisions about its use and protection. Limited data infrastructure, including inadequate standards and interoperability, further diminishes the perceived value of data, hindering investment in improvements. Uneven access to high-quality data, particularly for SMEs and start-ups, also stems from this underlying challenge, as the lack of clear valuation mechanisms makes it difficult to establish fair pricing and access models.

Beyond data valuation, the other barriers that might hinder investment include:

- A lack of data skills across technical, business, and leadership roles.This might limit the effective use of data and hinder the adoption of new technologies. Organisations like the ODI have developed tools like the Data Skills Framework to help others evaluate their skills in key areas.
- Uncertainty around data protection regulations and a lack of trust in data sharing mechanisms, which deters investment in data-intensive projects.
- Limited data infrastructure, including inadequate data standards, interoperability, and sharing mechanisms, which restricts the flow of data needed for innovation.
- Uneven access to high-quality data, especially for SMEs and start-ups, creating a barrier to developing innovative products and services.
- Regulatory uncertainty, particularly in emerging tech sectors, discouraging long-term investment due to unclear or rapidly changing rules.

These barriers can manifest differently across sectors. Highly regulated sectors like finance and healthcare face greater challenges related to data governance and compliance, while emerging tech sectors often struggle with skills gaps and access to specialised datasets. However, the underlying challenge of data valuation permeates all sectors, hindering investment and limiting the potential of the data economy. By addressing this fundamental challenge head-on, the government can unlock significant opportunities for growth and innovation.

## Q8. Where you identified barriers in response to Question 7 which relate to people and skills (including issues such as delivery of employment support, careers, and skills provision), what UK government policy solutions could best address these?

To address issues around data skills barriers, it might be helpful to:

1. **Develop an updated national data skills strategy:** Drawing on the ODI's Data Skills Framework, create a comprehensive plan with adequate resources over a

long-term to boost data literacy across all levels of the workforce, from entry-level to leadership positions, and allowing for lifelong learning.

2. **Integrate data skills into education:** Embed data skills training throughout the national curriculum and beyond, from primary school through to higher education and vocational training. Coordination with the Curriculum and Assessment Review may help develop a holistic view of these skills throughout the education system.
3. **Support lifelong learning in data skills:** Encourage continuous professional development in data skills.
4. **Create a Data Skills Council, or expand the role of the Digital Skills Council to incorporate data skills:** The UK Government could embed the implementation of the national data skills strategy to a renamed Digital and Data Skills Council, and coordinate efforts between government, industry, and education providers. This, in turn, might seek to be supported and be a part of Skills England when implemented and be funded via the Skills Levy. In addition, the growth and skills levy should prioritise digital and data roles, as they are essential for all the high growth sectors
5. **Promote diversity in data skills:** Implement targeted programs to increase participation of underrepresented groups in data-related careers.

## Q9. What more could be done to achieve a step change in employer investment in training in the growth-driving sectors?

The ODI didn't submit an answer to this question

## Q10. Where you identified barriers in response to Question 7 which relate to RDI and technology adoption and diffusion, what UK government policy solutions could best address these?

The barriers to RDI and technology adoption identified in Question 7, including skills gaps, lack of data valuation frameworks, limited data infrastructure, uneven data access, and regulatory uncertainty, require a multi-pronged policy response. The UK government can effectively address these barriers by taking some clear steps.

1. Following through with the establishment and adequate resourcing of the National Data Library, a secure and accessible repository of high-quality datasets designed to fuel research and innovation for public good. This NDL should utilise a tiered access system that balances data availability with robust privacy and security controls. To maximise its utility, the library should be built with a user-centric design and be fully AI-enabled for efficient data retrieval and analysis. A tiered access system can balance open access to the NDL with appropriate safeguards for

sensitive data, mitigating concerns around data protection and trust. The "innovation dividend" model, incentivising data sharing and contribution, can further address the uneven data access barrier.

2. The government should lead the way here. Access to government data is massively important for AI, not only because of the potential of government data to catalyse the development of the AI ecosystem but also because of its potential to enhance AI tools like LLM-based chatbots in public services and citizen query tasks. Soon to be published ODI research has found that despite crawlers (used to train LLMs) having scraped 13,556 data.gov pages, common citizen queries were not answerable by common LLMs suggesting that the data from data.gov is not used by general-purpose LLMs to answer queries, meaning that the data uploaded to data.gov is not AI-ready and that data on data.gov is inaccessible to machines and crawlers.
3. So, how can data.gov be made more AI-ready, and how can government websites' AI-readiness potentially be improved? Overall, how can the government be a better data provider for AI?
    a. What AI-ready data means in practice depends on many factors, but established practices like FAIR-ness (findable, accessible, interoperable, reusable) and linked data are a strong starting point. There are also emerging solutions such as Croissant, a machine-readable metadata format specifically designed for machine learning. Supporting Croissant would allow data.gov datasets to be indexed by Google datasets search and easily integrated into AI developer workflows. Government data with attached metadata in the Croissant format will be FAIR and overall, more AI-ready, likely encouraging its use amongst AI developers.
    b. In addition, we suggest that steps should be taken to make data.gov information as accessible to web crawling as possible, following best practices on making data accessible and usable, which include useful text summaries on dataset description pages with key information about scope of the data, range of values, descriptive statistics etc.
    c. To further accommodate crawling across all of its digital resources, the UK government should revisit its data reuse policies, taking care to define their practices regarding their permissions for web crawlers on the robots.txt conditions both on government websites and data portals.
4. Beyond data.gov and the National Data Library, fostering broader data sharing across sectors is critical. Expanding smart data schemes, particularly in key areas like finance, transport, and energy, can facilitate secure and ethical data exchange for innovation. Investing in robust data infrastructure, including open standards, shared vocabularies, and common APIs, will enhance data interoperability and unlock its true potential. It has often been quoted that wider data mobility could increase GDP by £27.8 billion per year so this is an investment worth making.

5. To fully leverage the power of data and technology, a balanced regulatory framework is paramount. Agile regulations, such as regulatory sandboxes, could encourage experimentation and responsible innovation without stifling progress - as would learning from efforts to mandate and regulate overseas.
6. Simultaneously, investing in digital skills development through comprehensive programmes in data science, AI, and emerging technologies will equip the workforce for the future.
7. Fostering cross-sector collaboration is crucial. Innovation Bridges - like BridgeAI - can facilitate knowledge transfer between academia, industry, and the public sector through secondments, joint research projects, and shared facilities.
8. Support for technology diffusion is also vital. Introducing new services, or funding existing organisations to assist businesses, particularly SMEs, in understanding and implementing new technologies, offering advice, providing practical support, and connections to technology providers. At a recent growth hackathon with SMEs run by Goldman Sachs' 10KSB, where the ODI was a panellist, the need for mentorship and support to mitigate the time and costs attached to tech adoption was a recurrent theme mentioned by SME participants.

## Q11. What are the barriers to R&D commercialisation that the UK government should be considering?

The ODI did not submit a response to this question.

## Q12. How can the UK government best use data to support the delivery of the Industrial Strategy?

The government's recognition of data as a lever for economic growth is a welcome step, placing it on par with skills, innovation and regulation. However, to truly capitalise on the opportunities data brings and achieve the desired economic growth, a more comprehensive approach is needed—one that recognises data as both foundational infrastructure across all sectors of the economy and a catalyst for innovation in its own right. This must include the development of robust national data infrastructure, support for AI-ready datasets, mechanisms to catalyse cross-sector smart data schemes (following the passage of the Data (Use and Access) Bill, which places them on a statutory footing, and the application of privacy-enhancing technologies as enablers of privacy and secure data access and sharing. Furthermore, recognising the value of data as an intangible asset—both in the private and public sectors—will be critical for attracting investment, driving efficiency, and ensuring data can deliver all of the industrial strategy objectives.

The following recommendations outline how the UK government can leverage data to achieve its industrial objectives, while fostering innovation, economic growth, and social value.

**Recommendations**

**1. Support AI-Ready data in the National Data Library (NDL) and across government**

Public sector data represents an enormous untapped resource for innovation and economic advancement. The NDL offers a prime opportunity to realise this potential, serving as an AI-ready hub that can fuel advanced analytics and machine learning applications across the economy. To maximise its impact, the NDL should:

- **Have cross-departmental backing** and be adequately resourced with long-horizon funding to give confidence to both data publishers and data users.
- **Create and enforce standards** to ensure data interoperability, making it easier for researchers and innovators to work with diverse datasets. The government should implement "open by default" policies for public sector data, requiring clear justifications for any exceptions, and invest in real-time monitoring tools.
- **Be AI-ready from the outset** to support advanced analytics and AI applications, providing a robust foundation for data-informed decision-making across all aspects of Invest 2035. This includes ensuring that datasets are structured and labelled in ways that facilitate AI and machine learning applications. Soon to be published research by the ODI on the state of public data reveals that an overwhelming majority of the  more than 13,500 pages of data on data.gov are not AI-ready. To establish an AI-ready NDL, the government must address gaps in data quality, accessibility, and interoperability to enable machine-learning applications and implement FAIR principles across all public datasets. The ODI could help the government explore emerging solutions like the Croissant metadata standard for machine learning, which could be applied to all the datasets listed on data.gov and make public data more machine-readable and accessible for developers and researchers.
- **Integrate privacy-enhancing features into the library's design**, prioriting federated, decentralised architectures, and privacy-enhancing technologies, such as Solid and federated learning, to safeguard citizen data but allow restricted access to high-value personal data. These features should be embedded into the design of the NDL from the outset to build public trust, enable secure data sharing, and unlock growth across the economy.
- **Create a regulatory sandbox for innovation** to enable safe experimentation with sensitive datasets under regulatory oversight. This sandbox would allow businesses, researchers, and government agencies to test innovative technologies and applications in a controlled setting, fostering responsible innovation practices.

**2. Leverage horizontal mechanisms for Smart Data Schemes**

Smart Data schemes have received widespread backing for their potential to generate growth, improve consumer services and products, and empower citizens with their data. However, as stated by Lord Knight in the second reading of the Data (Use and Access) Bill on 19th November 2024, “there is a danger in the Data (Use and Access) Bill that the [current] data-sharing provisions are protected within sectors, and I wonder whether we need some kind of authority to drive that.”

In calling for a **singular data standards authority** for smart data schemes, Lord Knight advocates for the potential of Cross-Sector Smart Data schemes and their ability to enable data to flow seamlessly across traditional sector boundaries. Cross-sector smart data schemes that combine financial data with energy usage or transport data can unlock innovative services that empower consumers to make better decisions across multiple facets of their lives. The success of Open Banking, which has generated £12 billion for consumers and £6 billion for businesses, clearly demonstrates the potential of such schemes. When sectors collaborate - such as telecoms, energy, and finance- they can leverage shared data infrastructure to tackle complex challenges like climate change while enhancing public services.

To lay the groundwork for horizontal smart data schemes, the ODI recommends:

- Establishing a central authority to develop cross-sector smart data standards. A centralised body would streamline implementation, promote interoperability, and reduce data silos, supporting innovation and competition across the economy. Smart data standards would also be rolled out faster and synchronously across sectors, and shared standards could be used for data that different sectors have in common. For instance, most verticals should use the same standards to define the attributes of a ‘customer’ or ‘person’. Shared standards would reduce the development costs for each individual sector, as much of the work would be done once centrally.
- Similarly, the government should consider **empowering a Cabinet Minister** to lead smart data initiatives across sectors, supported by cross-departmental collaboration. Senior ministerial leadership could ensure the timely implementation of smart data legislation, which is necessary to secure frameworks for sector-wide initiatives and avoid fragmentation.
- The data exchanged within smart data schemes must also be **AI-ready and reusable**, embedding context through frameworks like Enterprise Knowledge Graphs (EKGs). EKGs are already industry best practice; used, for instance, to improve the correctness of answers given by Gemini in Google searches. This is important because AI requires data that is meaningful and contextual—data-centric AI. Standardising context with knowledge graphs (e.g., defining that “T: 32”

represents temperature in Celsius) ensures that data is interpretable and useful for AI applications. This would enhance the value and applicability of smart data across all sectors of the economy.

- Finally, the government should **conduct comprehensive research on international data access initiatives**, such as the European Data Spaces, learning from their successes and failures to inform the development of a world-leading smart data strategy. We should review how such schemes across the EU, India, Singapore, and more have successful models for automating data access, incentivising company participation, and establishing sector-based data ecosystems with standardised services. All of which will be critical to the success of smart data schemes in the UK. Where possible, we should also look to seek alignment with international standards to maximise the innovation potential of cross-border data flows.

**3. Support the use and application of Privacy-Enhancing Technologies (PETs)**

Public trust is paramount for the successful deployment of technology and AI across the economy. Technologies that protect sensitive data and/or put control back in the hands of citizens, enabling them to manage their data, are essential for building this trust and unlocking the economic value of data, especially in sensitive areas like health. While the upfront investment in such technologies may appear significant, it is vital for achieving wider data sharing and unlocking potentially billions of pounds for the economy.

The ODI recently became the organisational steward of one such PET, Solid. At its core, Solid allows individuals to store their data in personal online data stores, or Pods, allowing them to control how, when, and with whom their data is shared. This approach shifts the focus from centralised data platforms - where third-party applications often hold the power - back to individuals. Solid - and technologies like it - could support nearly all aspects of Invest 2035, including facilitating access to data in the NDL, the one-time storage and sharing of key datasets across government, and the technical underpinning of smart data schemes.

Solid is one among many PETs that could be used to unlock value while building public trust, highlighting that the government should:

- Invest in R&D for scalable PET solutions that enable data sharing without exposing sensitive information.
- Promote adoption of PETs across government agencies, businesses, and research institutions through targeted funding and technical guidance.
- Mandate the integration of privacy-preserving features where appropriate.

**4. Recognise the true value of data**

As set out in our consultation response, data will be crucial to successfully delivering the industrial strategy. However, as previously mentioned, the lack of universal recognition of data as an intangible asset creates significant barriers to investment within data-driven and digital sectors of the economy. Without formal acknowledgment, organisations struggle to assign clear monetary values to their data, resulting in valuation challenges that deter potential investors who prefer assets with established worth. This uncertainty can lead to investor hesitancy, particularly when businesses rely heavily on data without demonstrating its economic benefits, ultimately impacting long-term growth strategies.

The same is true for government data. Viewing data merely as an operational resource can lead to fragmented management approaches, preventing the public sector from fully leveraging its data assets and fostering inefficiency. By recognising government data as an intangible asset and assigning it appropriate value, the UK can prioritise the maintenance and expansion of national datasets, ensuring they are continuously improved and remain relevant for both public and private sector use.

To overcome these valuation challenges, it is essential to improve regulatory frameworks, refine data valuation practices, and emphasise the economic potential of data within and across government and industries. In the first instance, the ODI and other organisation in the space can help the government:

- Learn from international frameworks and accountancy standards to quantify the economic value of data.
- Work with industry and standards bodies to create consistent methodologies for recognising data on balance sheets, enabling businesses to secure investment for data-driven initiatives.
- Explore new sustainability and business models for government datasets, particularly when they form the basis of commercial business models.
- Establish mechanisms to reward organisations for contributing to shared data infrastructure, using models like the “innovation dividend” policy.

The UK government must go beyond viewing data as a resource to leverage and position it as transformative infrastructure capable of driving economic growth and delivering societal benefits. By prioritising a 10-year **National Data Infrastructure Roadmap**, preparing AI-ready datasets, enabling cross-sector smart data schemes, scaling Privacy Enhancing Technologies, and adopting progressive valuation models, the UK can establish itself as a global leader in the data economy. Our strategic recommendations will empower businesses and citizens alike, and unlock the full potential of data to deliver the industrial strategy’s objectives.

## Q13. What challenges or barriers to sharing or accessing data could the UK government remove to help improve business operations and decision making?

The UK faces significant challenges in realising the full potential of data sharing and access. These barriers broadly fall into four key areas: organisational capability, trust and governance, technical infrastructure, and incentives for sharing.

1. **Organisational capability and data maturity:** A fundamental challenge lies in the low level of data maturity across UK businesses. Despite the growing importance of the data economy, only 21% of businesses that handle digitised data analyse it to generate insights, and a mere 2% use it for AI or Automated Decision-Making. Many organisations lack the skills, understanding, and governance structures needed to effectively use and share data. This requires investment in data skills development across sectors, from integrating data literacy into the national curriculum to supporting vocational training and incentivising workforce development. Organisations also need support implementing effective data governance practices, potentially through a national framework and certification scheme for data governance excellence. The ODI has already provided a foundation for this, by developing a Data Practices Assessment.
2. **Trust, privacy and ethics:** Building trust in data sharing is crucial - research commissioned by the ODI shows that building trust in data and data organisations has the potential to contribute 2.5% to UK GDP. This requires a multi-faceted approach to privacy and control. The government should promote privacy-enhancing technologies like homomorphic encryption and federated learning, while also supporting user-centric technologies like Solid that give individuals control over their personal data through Pods. The success of Solid's implementation in Flanders, where 6.8M citizens now control their government service data, demonstrates how these technologies can enable data sharing while maintaining individual privacy and trust. This technical foundation should be supported by strengthened data protection regulations and clear ethical guidelines, particularly in sensitive areas like health and finance, backed by an independent ethics advisory board for complex scenarios. Legal and regulatory uncertainty, particularly around intellectual property rights and competition law, must be addressed through clear guidelines on data rights and responsibilities.
3. **Technical standards and infrastructure:** Technical barriers significantly hinder data sharing. The lack of standardisation across sectors creates unnecessary complexity and addressing this requires developing common data formats, shared vocabularies, and standardised APIs. Digital infrastructure investment is needed to ensure reliable connectivity, alongside funding and technical support to help organisations, particularly SMEs, upgrade their data systems. Data quality remains a persistent

challenge, requiring clear guidelines and tools for assessment and improvement, building on the Government Data Quality Framework.

4. **Incentives and value realisation:** Organisations often lack clear incentives for data sharing or worry about losing competitive advantage. The government should consider policies that incentivise sharing, such as tax breaks for organisations participating in data collaboratives or a national 'Data for Good' programme recognising impactful initiatives. Data trusts and other intermediary models, such as Data Stewardship Foundations, currently being developed by the Isle of Man government, can help organisations share data while protecting their competitive interests.

By addressing the interconnected challenges through coordinated policy intervention, HM Government can create an environment that fosters responsible data sharing while improving business operations and decision-making across the economy. This requires sustained focus on building both capability and trust, while providing the technical infrastructure and incentives needed to drive change.

## Q14. Where you identified barriers in response to Question 7 which relate to planning, infrastructure, and transport, what UK government policy solutions could best address these in addition to existing reforms? How can this best support regional growth?

The ODI did not submit a response to this question.

## Q15. How can investment into infrastructure support the Industrial Strategy? What can the UK government do to better support this and facilitate co-investment? How does this differ across infrastructure classes?

The government's recognition of data as a lever of growth is laudable. However, to truly unlock data's potential, a comprehensive, long-term strategy is crucial, including placing it - in terms of significance - alongside other critical national infrastructure, like roads and energy. The UK government should establish a **National Data Infrastructure Roadmap** with a ten-year horizon, underpinned by multi-year funding secured through the Spending Review. This long-term vision will provide stability and predictability, encouraging sustained investment and fostering a thriving data ecosystem. The strategy has a welcome focus on three key pillars: unlocking public sector data, empowering individuals with data control, and strengthening organisational data capabilities. We support these areas of focus and also share the view of Baroness Kidron that “our data reserves could have a significant role to play in powering the AI transformation”. We further encourage some thinking in government around her recommendation for “reimagining and reframing publicly held data

as a sovereign asset accessed under licence, protected and managed by the Government acting as custodian on behalf of UK citizens", noting that this could provide value for taxpayers for the products and services built and trained on public sector data. To that end we suggest looking in greater detail at the frameworks behind the valuation of data on balance sheets, we've given more detail on this issue in our response to Question 7.

Data infrastructure will enhance all other sectors' efficiency and productivity. By providing accessible, high-quality data, the government can unlock innovation and drive economic growth. To facilitate investment and co-investment, a tailored approach is needed: for example, with public-private partnerships for smart data schemes, learning from successful implementations of similar schemes in other countries, targeted grant programmes for data innovation, and regulatory frameworks that incentivise private sector investment while safeguarding public interests.

## Q16. What are the barriers to competitive industrial activity and increased electrification, beyond those set out in response to the UK government's recent Call for Evidence on industrial electrification?

The ODI did not submit a response to this question.

## Q17. What examples of international best practice to support businesses on energy, for example Purchase Power Agreements, would you recommend to increase investment and growth?

The ODI did not submit a response to this question.

## Q18. Where you identified barriers in response to Question 7 which relate to competition, what evidence can you share to illustrate their impact and what solutions could best address them?

The ODI did not submit a response to this question.

## Q19. How can regulatory and competition institutions best drive market dynamism to boost economic activity and growth?

Concentration of data in the hands of a few large players could stifle innovation and limit the ability of smaller businesses to compete effectively. This is particularly relevant in the context of data monopolies. Evidence from other sectors demonstrates that a lack of competition can lead to higher prices, reduce consumer choice, and slow down innovation. In the data economy, similar dynamics could play out, with data monopolies hindering the development of new data-driven products and services.

Regulatory and competition institutions like the ICO and CMA play a vital role in driving market dynamism and boosting economic activity in the data economy. They can achieve this by:

1. **Promoting competition:** Actively monitoring the data landscape for anti-competitive practices and intervening to ensure a level playing field for businesses of all sizes. This includes enforcing existing competition laws and potentially developing new regulations specific to the data economy.
2. **Facilitating data access:** Encouraging data sharing and portability through appropriate regulatory frameworks and data governance mechanisms. This could involve mandating data sharing in certain circumstances, supporting the development of data trusts, or promoting the use of data intermediaries.
3. **Encouraging innovation:** Creating regulatory sandboxes and other agile regulatory approaches that allow businesses to experiment with new data-driven technologies without undue regulatory burden.
4. **Protecting consumer rights:** Ensuring that individuals have control over their personal data and that their privacy is protected in the data economy. This includes enforcing data protection regulations and promoting the development of privacy-enhancing technologies
5. **Building trust:** Promoting transparency and accountability in the data ecosystem, fostering trust among businesses, consumers, and regulators.

## Q20. How can regulatory and competition institutions best drive market dynamism to boost economic activity and growth?

The UK has a unique opportunity to shape a regulatory environment that fosters innovation while upholding public trust and individual agency in the data economy. This requires a forward-thinking approach that addresses key challenges, streamlines processes, and champions responsible data and technology use. A robust **National Data Infrastructure Roadmap**, underpinned by multi-year funding secured through the Spending Review, is crucial for providing the long-term stability and predictability necessary for this transformative vision.

Invest 2035 should recognise the transformative potential of **smart data schemes** across the whole economy. Built upon principles of data portability, interoperability, and individual control, smart data schemes empower consumers and businesses alike. Given the correct regulatory environment, including the mandation of standards for privacy, quality and interoperability, they can enable the secure and ethical flow of data across traditional sector boundaries, fostering innovation and creating new opportunities. For example, combining financial data with energy usage or transport data, could lead to innovative services that empower consumers and drive economic growth. Specific sectors, where they could be

implemented quickly and at scale have been identified as: finance, transport, energy, home buying, retail, and telecommunications.

**Data protection and sharing:** Building on the existing data protection framework, the UK should prioritise dynamic consent mechanisms. This approach, which has significant buy-in from key stakeholders including the HRA and MHRA within the NHS, empowers individuals with granular control over their data, fostering trust and unlocking the value of data for innovation. Building on the scope of the Data (Use and Access) Bill, we think that the Secretary of State should play a key role in developing an automated privacy framework, in consultation with the ICO and international standards bodies. This framework should protect privacy in diverse contexts and provide consistent privacy management options. A crucial element of this framework is the establishment of a "privacy manager" role—a trusted expert who can assist individuals in making informed privacy decisions, operating within clearly defined rights and responsibilities. In the near term, mandating Global Privacy Control (GPC) and Advanced Data Protection Control (ADPC) privacy signals can provide immediate benefits, laying the groundwork for the broader automated privacy framework. A practical "Data Sharing Code of Practice" would further empower organisations with actionable guidelines for responsible data sharing. Furthermore, if data portability rights are enshrined across sectors within the Data (Use and Access) Bill, mirroring the success of Open Banking (which has shown in the stimulation of new fintechs of considerable value - and employment - that data portability stimulates competition and start-up growth, and has driven exports of British expertise) the government could achieve more easily its goal of stimulating competition, innovation, and growth more easily. Data portability both within and across sectors means that firms, both new and existent, can introduce products based on data that was previously solely in the proprietary ownership of a single firm - meaning that competitors can deliver options for consumers and reduce the number of monopsonic and monopolistic incumbents.

**AI and emerging technologies:** Establishing an AI governance framework is paramount. Such a framework should provide clear guidelines for AI development and deployment, addressing transparency, accountability, and equity. Since AI's effectiveness hinges on the quality and accessibility of data, this framework must prioritise robust and responsible data governance. **A scheme that certifies the provenance of data used in AI could build public confidence and provide a competitive advantage for compliant companies.** Regulations requiring adherence to standards that might include explainability, interpretability, and transparency of the data used to train AI systems used in public services - or critical sectors - could further enhance trust and accountability.

**Open data and government transparency:** The UK should maintain its commitment to "open by default" policies for government data, requiring clear justification for any exceptions. Open government data acts as a catalyst for innovation by enabling citizens,

researchers, and businesses to investigate, experiment, and launch services or goods from that information. Open transport data in real time, for example, allows apps like Citymapper, TfL Go, Google Maps and Apple Maps to make transport options more accessible and travellers more empowered within a competitive market. Open data itself enhances the UK's reputation for reliable delivery of good quality data that, in turn, drives investment from firms looking to build future services for citizens, and it can attract the talent to do that too. These goods and services, the ideas that the sector builds upon, create a virtuous cycle of growth and prosperity - the foundation of which is the data.

**Engaging the International Accounting Standards Board (IASB) to recognise the value of data as an asset:** The IASB as an independent standard-setting body is responsible for developing and maintaining International Financial Reporting Standards (IFRS). These standards guide the accounting practices of entities globally. As part of standard setting, expanding the recognition of intangibles (IAS38) to include the recognition of data as an asset is important for unlocking its economic potential and fostering innovation. The IASB based in the UK operates as part of the IFRS Foundation, which oversees the development and promotion of IFRSs. By taking the lead on recognising data as an intangible asset, the IASB can position the UK as a global leader in the data economy. The IASB can champion the development of a universal framework for recognising data as an intangible asset. Such a framework would provide businesses with the tools to measure and report data's economic value, enabling its inclusion on the balance sheet. This could attract investment, support financing opportunities, and demonstrate the strategic importance of data as an economic asset.

In addition, recognising data as an intangible asset has the potential to encourage innovation in financial instruments. Data-backed loans or bonds would allow businesses, particularly SMEs, to secure funding by leveraging their data assets. This approach not only expands access to capital but also reinforces data's importance as a key driver of economic growth.

The Financial Conduct Authority (FCA) as regulator for the sector would enforce compliance of the accounting standards ensuring that financial markets operate fairly, regulatory oversight helps maintain the integrity of financial reporting, ultimately protecting investors and enhancing confidence in the UK financial systems.

Q21. What are the main factors that influence businesses' investment decisions? Do these differ for the growth-driving sectors and based on the nature of the investment (e.g. buildings, machinery & equipment, vehicles, software, RDI, workforce skills) and types of firms (large, small, domestic, international, across different regions)?

The ODI did not submit a response to this question.

Q22. What are the main barriers faced by companies who are seeking finance to scale up in the UK or by investors who are seeking to deploy capital, and do those barriers vary for the growth-driving sectors? How can addressing these barriers enable more global players in the UK?

The ODI did not submit a response to this question.

Q23. The UK government currently seeks to support growth through a range of financial instruments including grants, loans, guarantees and equity. Are there additional instruments of which you have experience in other jurisdictions, which could encourage strategic investment?

The ODI did not submit a response to this question.

Q24. How can international partnerships (government-to-government or government-to-business) support the Industrial Strategy?

International partnerships are crucial for supporting Invest 2035, particularly in the data and digital spheres. Collaboration with other governments and international businesses can accelerate innovation, expand market access, and enhance the UK's global competitiveness.

**Trade and data flows:** Seamless international data flows are essential for a thriving global economy, and to unlock value from exports - of which services are a significant part. According to the Resolution Foundation, "Services industries already account for more than two-thirds of British exports by value added and services exports have almost doubled as a share of total exports over the past 25 years – from 30 per cent in 1997 to 56 per cent in Q3 2023." At the same time, the government has stated that "The proportion of total UK trade in services accounted for by services in the digital sector has increased between 2019

(pre-pandemic) and 2021 for both imports (15.4% to 19.3%) and exports (16.3% to 18.9%)." It would be a reasonable assumption to make that the figure today is even higher, and the *potential* far higher than this. The industrial strategy green paper itself notes that data specialised businesses are a growing part of the economy as a whole, comparing favourably against all other European countries, bar Estonia. Yet the potential has yet to be fully realised. Overall we lag behind in terms of innovation, and still struggle to convert our world-class RDI into goods and services.

To overcome some of these barriers, and enable data and the apps and services that are built with it to flow, the UK government should actively participate in international forums to shape data standards, ensuring they align with UK interests while promoting interoperability. Data adequacy agreements, like the existing agreement with the EU due to expire in June 2025, are vital for facilitating secure and efficient data transfers while maintaining high data protection standards with the UK's largest trading partner. These agreements should be a priority in trade negotiations while being mindful of the potential of standalone data and digital agreements with third countries, or a comprehensive trade agreement with countries where talks are ongoing (such as India), where there is potential for a deal (such as the USA), and blocs such as the Gulf Cooperation Council (GCC), again, where talks are progressing.

Being part of bodies that promote international standards can also ensure greater interoperability and thus digital trade promotion across borders. In Digital Verification Services, a growth area, we note the ongoing work of the UK Government in producing a **trust framework** but believe that the final framework should bear in mind and be based on international standards that allow for international interoperability with the W3C and IEEE being two of the international bodies that should be consulted when developing these standards as well as the domestically located standards bodies, research institutes (such as the ODI) and think tanks with expertise in designing such data standards.

We note that other countries have already done this:

- **Luxembourg** has national data spaces that use verifiable credentials built on W3C standards. They use these standards to support secondary healthcare data reuses and identity management (so individuals can prove who they say they are and consent to data sharing).
- **Flanders** has provided each citizen with a Solid Pod, including verifiable identity credentials built on W3C standards. These credentials can be used for identity verification or shared by individuals when accessing services.

Q25. Which international markets do you see as the greatest opportunity for the growth-driving sectors and how does it differ by sector?

The ODI did not submit a response to this question.

Q26. Do you agree with this characterisation of clusters? Are there any additional characteristics of dimensions of cluster definition and strength we should consider, such as the difference between services clusters and manufacturing clusters?

The ODI did not submit a response to this question.

Q27. What public and private sector interventions are needed to make strategic industrial sites 'investment-ready'? How should we determine which sites across the UK are most critical for unlocking this investment?

The ODI did not submit a response to this question.

Q28. How should the Industrial Strategy accelerate growth in city regions and clusters of growth sectors across the UK through Local Growth Plans and other policy mechanisms?

The ODI did not submit a response to this question.

Q29. How should the Industrial Strategy align with Devolved Government economic strategies and support the sectoral strengths of Scotland, Wales, and Northern Ireland?

The ODI did not submit a response to this question.

Q30. How can international partnerships (government-to-government or government-to-business) support the Industrial Strategy?

Robust national data infrastructure will be key to delivering and monitoring the progress of Invest 2035. From inception, the Industrial Strategy Council should establish a comprehensive monitoring framework that utilises public and open data to track the delivery of the strategy. A key feature of this framework should be a centralised data monitoring

system that utilises public and open data to track the delivery of the strategy and sector-specific KPI data, monitoring  progress in real time for each strategic objective within the strategy. Data sources could include ONS data, macro economic indicators, R&D expenditure, wellbeing indices, research data and participatory insights.

The monitoring system would provide transparency and visibility into the strategy's progress and, in turn, inform investment decisions to maximise impact and return on investment. This would allow the council and the government to adapt and adjust course if key indicators showed that expected outcomes and growth are not being realised. In setting up the dashboard, the government should draw inspiration from the International Data Spaces RADAR tool, which provides visibility into all data space initiatives within the EU. The RADAR tool offers transparency on the impact of data spaces and highlights key use cases for future public-private interventions.

For the data-focused investments, the Industrial Strategy Council should firstly monitor how effectively public sector data is supporting the strategy's objectives. This includes assessing the quality and accessibility of government datasets, tracking their use in innovation and decision-making, and measuring the impact of initiatives like the National Data Library. The council should evaluate how well public sector data is being made 'AI-ready' and monitor the adoption of open standards across government departments. This oversight is crucial as public sector data forms a foundation for many of the strategy's growth-driving sectors. In short: **monitor data infrastructure accessibility, resilience and openness through metrics like standards adoption, system reliability and data discoverability; track progress on making data infrastructure trustworthy and federation-ready.**

The council should track data maturity across the UK economy. Currently, only 21% of businesses that handle digitised data analyse it to generate insights, and just 2% use it for AI applications. The council should establish metrics to monitor improvement in these figures, tracking how effectively organisations collect, manage, and use data. This could include measuring the adoption of data governance frameworks, assessing data skills development, and monitoring the growth of data-driven innovation across sectors. The council should pay particular attention to data maturity in the strategy's identified growth-driving sectors. Tools and frameworks - based on robust research - already exist in the market to accelerate this work. They include he Open Data Institute's Data Practices Assessment and Data Skills Framework. These can be used by the public and private sector alike.

The council should monitor citizen empowerment in the data economy. This includes tracking the success of smart data schemes in enabling individuals to control and share their data, measuring public trust in data sharing, and assessing the adoption of particular Privacy-Enhancing Technologies that are designed to give agency and control to people as

citizens and consumers. The council should monitor how effectively people can exercise their data rights and the impact this has on innovation and growth.

The Council should also assess the effectiveness of cross-sector data sharing initiatives and monitor the development of data infrastructure that enables innovation while protecting privacy. This includes evaluating the success of data sharing frameworks, measuring the adoption of common standards, and assessing the impact of data trusts and other new models of data institutions.

To deliver this effectively, the Council should:

- Develop clear metrics for measuring the health of data infrastructure
- Create open dashboards for monitoring progress across key indicators to increase accountability, especially to citizens
- Establish regular reporting mechanisms to government
- Provide recommendations for improvement where needed
- Engage with stakeholders across the data ecosystem, including research institutes, industry and civil society, as standard practice

## Q31. How should the Industrial Strategy Council interact with key non-government institutions and organisations?

The Industrial Strategy Council should establish meaningful, ongoing dialogue with a broad range of stakeholders to effectively monitor and guide the strategy's implementation. This engagement should go beyond traditional consultation to create genuine feedback loops with sector players, citizens, research and policy institutes and civil society organisations.

Regular engagement with sector players is crucial for understanding how the strategy impacts different parts of the economy. The council should establish sector-specific working groups that meet regularly to discuss challenges and opportunities, particularly around data sharing and use. These groups should include both large incumbents and innovative startups to ensure diverse perspectives. The success of initiatives like the Smart Data Council, which brings together industry expertise across sectors like finance, energy and telecommunications, demonstrates the value of sustained sector engagement in developing effective data policy.

Citizen engagement is equally important. The council should create mechanisms for ongoing dialogue with the public about how data is being used to drive economic growth. This could include citizen panels, regular surveys, and open forums. Understanding public attitudes toward data sharing and use is crucial - research shows that building trust in data and data organisations could contribute 2.5% to UK GDP. The council should particularly

focus on understanding how initiatives like smart data schemes - and the use of smart data across the economy - are empowering citizens and affecting their daily lives.

Research and policy institutes and civil society organisations play a vital role in representing diverse community interests, researching real-world impacts and highlighting the potentially unintended consequences of policy decisions. The Council should establish regular roundtables with such organisations, ensuring their perspectives inform the strategy's development. These organisations - which include the ODI - often have deep expertise in areas like privacy, standards, ethics, and digital rights, making them valuable partners in developing responsible approaches to data use and sharing.

Ensuring the sustainability of the entire data ecosystem is crucial - the expertise and experience built up in research institutes is invaluable and would be costly to replicate from scratch. Identifying effective ways to support them over long-term time horizons will enable them to continue delivering significant contributions of value to taxpayers.

The Council should, therefore, also create formal and adequately funded mechanisms for these different stakeholders to interact with each other. Cross-sector forums could help identify opportunities for collaboration and innovation, while helping to build shared understanding of challenges and potential solutions. This could be particularly valuable for developing approaches to cross-sector data sharing that benefit both industry and citizens while protecting privacy and maintaining trust.

To make this engagement meaningful, the council should:

- Establish clear channels for ongoing dialogue
- Create regular reporting mechanisms to show how feedback is being incorporated
- Ensure engagement informs real policy decisions
- Share insights between different stakeholder groups
- Monitor the effectiveness of engagement mechanisms

## Q32. How can the UK government improve the interface between the Industrial Strategy Council and government, business, local leaders and trade unions?

The ODI did not submit a response to this question.

## Q33. How could the analytical framework (e.g identifying intermediate outcomes) for the Industrial Strategy be strengthened?

The analytical framework for the industrial strategy should recognise **data infrastructure as fundamental to economic growth and innovation**. Just as physical infrastructure enables transportation and trade, data infrastructure enables the flow of information that powers modern economies. This is particularly relevant for the growth-driving sectors identified in the strategy - from financial services to advanced manufacturing - which increasingly rely on high-quality data to innovate and compete.

To strengthen the framework, intermediate outcomes should track the development and health of the UK's data infrastructure. **This includes measuring the adoption of data standards that enable interoperability between sectors and across borders, the emergence of novel data institutions that steward valuable datasets and overcome barriers to access, the adoption of privacy enhancing technologies that empower citizens,  and the success of smart data schemes in enabling data to flow securely between organisations.** For example, the framework should track how effectively data flows between finance, energy, and telecommunications sectors through smart data initiatives, as these cross-sector data flows are crucial enablers of innovation.

The framework should also measure business data maturity across sectors, tracking how effectively organisations collect, manage, and use data. This is particularly important for the strategy's focus on supporting growth-driving sectors and clusters. Understanding data maturity helps identify where intervention might be needed to build capabilities and unlock potential. What is clear is that there is currently an enormous disconnect between the vision and ambitions for what value data - and technology - can unlock for the economy and for citizens. Forrester's 2023 **Your Data Culture is in Crisis** report indicated that 41% of employees often mistrust the data available to them for decision-making, and according to Multiverse, as much as a third of the time spent by employees working with data is unproductive, with just under two-thirds reporting that they don't even have basic Excel skills. So taking steps to address this, and then measuring progress should be a significant part of the TOC. It will be hard to achieve without including data as **a growth driving sector** with a **National Data Infrastructure Roadmap** setting out its 10-year trajectory, as recommended in this consultation response.

As previously mentioned in this response, establishing better mechanisms for evaluating data will be key for measuring the outcomes and impact of data in the economy and for society. A universal framework for recognising data as an intangible asset is essential to enabling the government to measure growth - both in the data infrastructure and all the eight growth-driving sectors included in the industrial strategy -  in terms of clear outcomes and impacts.

By formally valuing data, organisations across the economy can demonstrate its (data's) economic significance, **allowing policymakers to track its contribution to GDP, sectoral growth, and innovation**. This provides a foundation for evidence-based decisions about the industrial strategy, as the value of data assets can be directly linked to investments in data infrastructure, skills development, and innovation-driven industries. Without this framework, efforts to assess and guide growth in the data sector remain fragmented and imprecise.

**Recognising data as an intangible asset also enables more robust evaluations of the long-term impacts of public investments**, such as those in data infrastructure or national assets like the National Data Library. For example, assigning an economic value to the data held within the National Data Library would support strategic decisions about funding, access, and its role in fostering innovation. These measurable outcomes would demonstrate how investments in data governance and infrastructure translate into tangible benefits such as increased accessibility, improved data quality, and enhanced public trust.

By embedding data valuation into policy and regulatory frameworks, the government can more effectively map the logical relationships between investments in the data sector and their broader economic and societal impacts. This approach not only aligns with international best practices but also positions the UK as a leader in the global data economy, supporting the objectives of a modern industrial strategy and driving sustainable growth across sectors.

Given the strategy's emphasis on trust and responsible innovation, the framework should also track indicators of public confidence in data sharing and the effectiveness of data protection measures. This is essential for maintaining public trust that enables data to flow and create value while protecting privacy and security. The government could consider conducting a benchmarking survey around trust in data sharing and use, or trust in data sharing and use could be measured as part of its roll-out of smart data schemes and other data sharing initiatives, for example in the healthcare and digital identity fields.

By incorporating these elements, the analytical framework would better reflect how data infrastructure underpins modern economic growth and innovation, helping ensure the Strategy builds on strong foundations while measuring progress toward its objectives.

## Q34. What are the key risks and assumptions we should embed in the logical model underpinning the Theory of Change?

The logical model underpinning the industrial strategy's Theory of Change must account for several critical assumptions and risks, particularly regarding data's role as both infrastructure and asset.

The model assumes that data infrastructure will function as a fundamental driver of economic growth, similar to physical infrastructure. It presumes that cross-sector data sharing will drive innovation, that organisations will invest in data capabilities when supported, and that public trust can be maintained while expanding data access. Yet as mentioned in our response above, for these effects to be correctly monitored and measured, data must be properly valued and recognised as both a national asset and an intangible asset on company balance sheets. While current accounting standards struggle with this evolving concept, there are now concerted efforts by accountancy bodies like the ICAEW, and organisations like the ODI to address this that need to be accelerated. This will boh unlock the value of the data infrastructure sector to the wider economy, and enable effective measurement of data in other high-growth sectors, allowing everyone to evaluate the outcomes and impacts of the industrial strategy.

There are additional risks that need careful consideration. Infrastructure risks include public sector data remaining unsuitable for AI applications, data quality issues preventing effective sharing, and security breaches eroding public trust. Implementation challenges include securing sustained funding for initiatives like the National Data Library, achieving cross-departmental coordination and incentivising businesses to partake in smart data schemes. The persistent skills gap could also prevent organisations from effectively utilising data resources.

Economic risks warrant particular attention. The model must ensure returns from national datasets benefit UK taxpayers and promote a truly competitive marketplace. There's a risk that smaller businesses may struggle to participate in the data economy compared to resource-rich larger organisations. The strategy's effectiveness depends on maintaining international data adequacy agreements and preventing excessive market concentration. Furthermore, the current lack of standardised approaches to data valuation - particularly for evolving datasets - creates uncertainty around investment decisions and asset recognition.

Most significantly, there is a risk that there will be insufficient funding to deliver - and sustain - all the ambitions contained in the strategy and that data infrastructure (which is as fundamental to overall success as an affordable, sustainable energy supply) will be inadequately supported, so that all other gains are impossible to deliver. Data infrastructure is - like fuel - somewhat ‘hidden’ from the public view and has all-too-frequently been

overlooked for investment in favour of initiatives with more immediate curb appeal. This is as much a risk for the growth of the UK economy as would have been a failure to adopt rail transportation in the early 19c, or electricity in the early 20c. Unless data infrastructure is given significant attention and funding in delivering this strategy, all other ambitions within it are at risk.

The risks and assumptions outlined above require active monitoring by the Council through metrics that can capture both traditional economic indicators and emerging measures of data valuation. Regular evaluation should assess not just economic outcomes but also progress in recognising and measuring data's worth as a national asset, and tangible benefits to citizens.

## Q35. How would you monitor and evaluate the Industrial Strategy, including metrics?

Monitoring and evaluating the industrial strategy requires **a robust, data-driven framework that embraces transparency, adaptability, and ethical considerations**. This framework should move beyond simple quantitative metrics to incorporate qualitative assessments, (for example of the lived experiences of workers, businesses, communities and citizens) as well as socio-technical issues and solutions in order to capture the nuanced impact of the strategy across various sectors and regions. The following are some ideas for how this might be achieved:

1. **A centralised data monitoring and reporting system:** Building and maintaining a central industrial strategy dashboard is crucial. This platform should aggregate real-time data from diverse sources, including government departments, industry bodies, and regional partners. Standardised data collection methods are essential for ensuring consistency and comparability. Leveraging AI and machine learning can unlock deeper insights, identifying trends, predicting outcomes, and flagging potential issues early on. The dashboard should be publicly accessible, promoting transparency and accountability.
2. **Key performance indicators (KPIs):** A balanced set of KPIs, aligned with the core objectives of the industrial strategy, is essential for measuring progress. These KPIs should encompass both high-level economic indicators (GDP growth, employment rates, R&D expenditure, wellbeing indices, for example) and sector-specific metrics tailored to each focus area of the strategy. Crucially, the KPIs should also measure the inclusivity and sustainability of growth, tracking regional disparities and the environmental impact of economic activity. Furthermore, KPIs should assess the development of data infrastructure, the growth of smart data schemes, and progress towards a more robust and ethical data ecosystem.

3. **Regular reporting and independent evaluation:** Quarterly progress reports on key metrics should be complemented by an annual comprehensive evaluation report, incorporating both quantitative data and qualitative insights. Independent evaluations, conducted by an independent body composed of experts from industry, academia, and civil society, would provide crucial external scrutiny and ensure objectivity. These reports should be publicly available, further fostering transparency and accountability.
4. **Benchmarking and participatory feedback mechanisms:** Regularly benchmarking the UK's performance against other leading economies, using international indices like the Global Innovation Index, provides valuable context. Establishing ongoing feedback channels with businesses, workers, and the public, through surveys and focus groups, could help capture crucial qualitative insights and ensure the strategy remains responsive to evolving needs. More fully, this means establishing regular consultation with communities, creating clear channels for public feedback on data use, and ensuring transparent reporting on how public input shapes policy. Metrics could track both the diversity of participation in data governance and the tangible influence of public input on decision-making. This participatory approach helps ensure the strategy delivers value that citizens and communities can recognise and trust.
5. **Policy coherence, adaptability, and long-term outcomes:** Any measurement framework must assess the internal coherence of the strategy, identifying any contradictions or inefficiencies between different policy elements. It should also measure the strategy's adaptability and responsiveness to changing economic conditions and technological advancements. Metrics assessing long-term structural changes, such as shifts in sectoral composition and skills profiles, are essential for understanding the lasting impact of the strategy. Scenario planning and foresight techniques can enhance preparedness for future economic and technological shifts and shocks.
6. **Data ethics and governance:** Robust data governance practices must underpin the entire monitoring and evaluation process. Ethical implications of data use should be regularly assessed and reported, ensuring responsible and transparent data handling. The ODI's expertise in data ethics and governance can inform these processes, our Data Ethics Canvas is our most well-used and popular assessment tool, having been downloaded more than 90k times.
7. **Spillover effects:** Capturing and measuring the indirect benefits and unintended consequences of the strategy is crucial for a complete understanding of its impact. Methodologies like network analysis - a way to analyse the connections between elements in a network to gain insights into how the entire system operates - can map and quantify knowledge spillovers and innovation diffusion resulting from the strategy.

In combination, all these elements would enable the UK to establish a world-leading data-driven framework for monitoring and evaluating the industrial strategy. An open, transparent, and adaptable approach will ensure the strategy remains effective, responsive, and aligned with the long-term goals of building a dynamic, inclusive, and sustainable economy.

## Q36. Is there any additional information you would like to provide?

Data has and will continue to have a critical role in driving the UK's economic growth and innovation, which should be a central part of the industrial strategy. The UK has a significant opportunity to use its data more strategically. As the strategy itself indicates, data-specialised businesses are already a growing part of our economy, increasing their share of GDP from 6.5% to 7.4% between 2021 and 2023. At 7.4% of GDP, the UK data economy is larger as a fraction of the total economy than any European country bar Estonia. However, there remains significant untapped potential - of businesses that handle digitised data, only 21% analyse their data to generate insights, and just 2% use it for AI or Automated Decision-Making. Building a strong national data infrastructure is, itself, a critical success factor in ensuring the successful implementation of the industrial strategy. As such it should be treated as a growth-driving sector in its own right, with a National Data Infrastructure Roadmap setting out a strategic plan for delivery, aligned with the industrial strategy.

In addition, there are four specific points - intrinsic to the establishment of a strong national data infrastructure - that we would like to emphasise in our summing up, and that should be used to inform the work of both a **National Data Infrastructure Roadmap** and the industrial strategy - and its implementation - in the next decade.

**Firstly, the National Data Library must be designed to be AI-ready from the outset.** Our soon to be published research shows that current government data is not AI-ready - based on testing more than 13.5K pages on data.gov. Making data more Findable, Accessible, Interoperable, and Reusable (FAIR) through standards like Croissant would enable its use in AI development while ensuring appropriate governance befitting public sector data.

**Secondly, Smart Data schemes require pan-sector standards and governance mechanisms to deliver economic benefits.** A central authority should develop cross-sector standards, ensuring interoperability and reducing data silos.The UK should learn from international initiatives like Data Spaces which highlight successful models for automating data access, incentivising businesses to participate and establishing sector-based data ecosystems.

**Thirdly, the potential of privacy-enhancing technologies (PETs) must be thoroughly and strategically explored to build public trust (which is essential for unlocking the full value of data across the economy).** Technologies like Solid can give citizens control of their data through Personal Online Data Stores (Pods) while enabling innovation. This is crucial for unlocking value from sensitive data, particularly in healthcare. Other PETs, including synthetic data, federated learning and multi-party computation have the capacity to unlock some of the challenges around data access, use and sharing, and build citizen trust in the meantime.

**Fourthly, we must better recognise data's value as a national asset.** While traditional accounting standards do not universally recognise data as an asset, evolving standards may become necessary as data becomes increasingly central to business operations and strategy. The government has a role in engaging on this key issue which affects every business and every sector. This is particularly important for public sector data assets, where return on investment should benefit UK taxpayers. Organisations must ensure that data meets the relevant criteria set out in accounting frameworks like IFRS or GAAP to capitalise on its value.