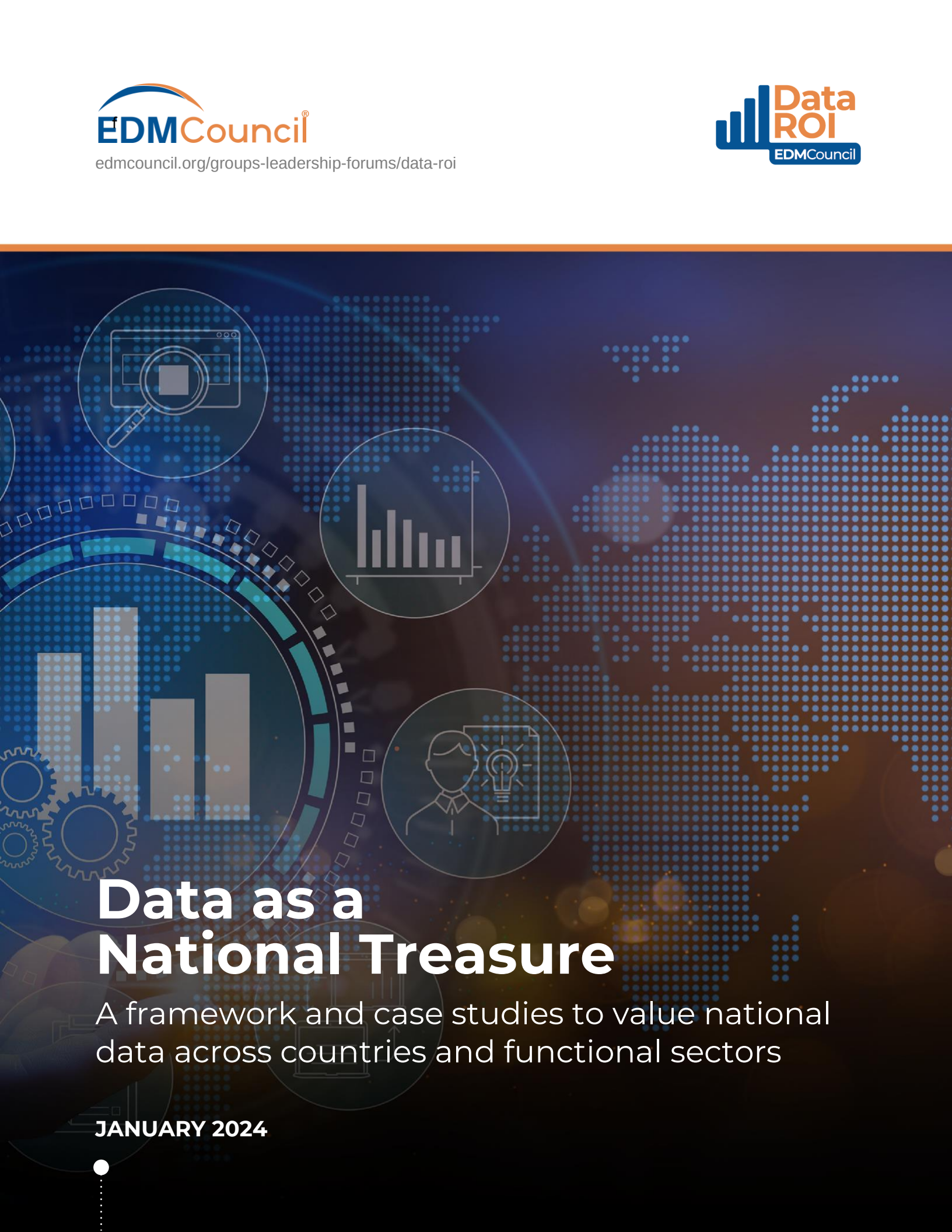
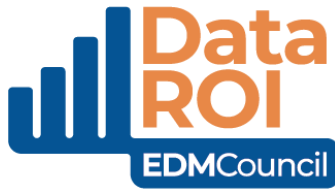


The background is a dark blue gradient with a faint world map made of dots. Overlaid on the map are several circular icons: a magnifying glass over a computer screen, a bar chart, a person with a lightbulb idea, and a large gear with a bar chart inside it.

Data as a National Treasure

A framework and case studies to value national data across countries and functional sectors

JANUARY 2024



Data as a National Treasure:

A framework and case studies to value national data
across countries and functional sectors

January 2024

EDM Council

edmcouncil.org

Abstract

Data should be treated as a national treasure similar to people and natural resources. Data is extremely valuable because it promotes transparency, drives innovation, informs decision-making, stimulates economic growth, empowers citizens, and supports research. Although valuation of data as a national treasure is still in its infancy, the EDM Council assembled a team of experts to compile an overall framework and approach. This paper contains a number of case studies across countries, functional sectors, and data products. The paper benchmarks the value of data based on key metrics such as gross domestic product, annual budget, and constituent count. The paper is intended as a guide to policymakers and data management professionals looking to leverage data to achieve mission, raise funds, and comply with regulations.

Feedback

The [Data ROI Working Group](#) of EDM Council welcomes your feedback. Please use the following link to provide your feedback and suggestions. Thank you!

<https://app.smartsheet.com/b/form/a363e8f1901e4a0396a1d95a77852d9a>

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- Sunil Soares, YDC
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Inventory of Case Studies by Functional Sector

Functional Sector	Country	Case Study
Country, Macro	Australia	Australia and Value of Open Data (Case Study 1)
Country, Macro	Estonia	Estonia E-Estonia Increases Cost Savings and Higher Voter Turnout (Case Study 2)
Country, Macro	Kingdom of Saudi Arabia	Kingdom of Saudi Arabia and Data as a National Treasure (Case Study 3)
Country, Macro	United States	- US Federal Data Strategy (Case Study 4) - US Office of Information and Regulatory Affairs Estimates of Government-Wide Cost of Information Collections (Case Study 5)
Central Banking	United States	US Federal Reserve Economic Data (Case Studies 6 and 7)
Communications	United States	US Federal Communications Commission Enforcement Bureau – Fines and Penalties (Case Study 8)
Defense	United States	US Department of Defense Acquisitions and Aggregate Spend on Data and Analytics (Case Study 9)
Defense	United States	US Department of Defense Global Positioning System and Value of Data (Case Study 10)
Financial Markets	United Kingdom	- UK Financial Conduct Authority – Removal of High-Risk Advertisements (Case Study 11) - UK Financial Conduct Authority – Identification of Scams (Case Study 12)
Health and Human Services	United Kingdom	UK National Health Service – Data Value per Patient (Case Study 13)
Meteorology	Australia	Australia Bureau of Meteorology and Damage Avoidance (Case Study 14)
Meteorology	United States	US National Oceanic and Atmospheric Administration and Value of Weather Data (Case Study 15)
Statistical Agencies	Australia	Australian Census and Value of Data (Case Study 16)
Statistical Agencies	European Union, United Kingdom, United States	Statistical Agencies and Open Data (Case Study 17)
Transportation	United Kingdom	National Highways, England – Data Value per Driver (Case Study 18)

Data as a National Treasure

A 2013 study by the McKinsey Global Institute estimated the value of open data at USD 3–5 trillion annually.¹ According to the Open Data Handbook, open data is data that can be freely used, re-used, and redistributed by anyone—subject only, at most, to the requirement to attribute and sharealike.²

This definition implies certain requirements for open data as follows:

- **Availability and Access:** The data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form.
- **Re-use and Redistribution:** The data must be provided under terms that permit re-use and redistribution, including the intermixing with other datasets.
- **Universal Participation:** Everyone must be able to use, re-use, and redistribute; there should be no discrimination against fields of endeavor or against persons or groups. For example, “non-commercial” restrictions that would prevent “commercial” use or restrictions of use for certain purposes (e.g., only in education), are not allowed.

A 2022 Data Foundation survey indicated that only 6 percent of US federal chief data officers (CDOs) believed they had the necessary resources to achieve their mission (see Figure 1).³

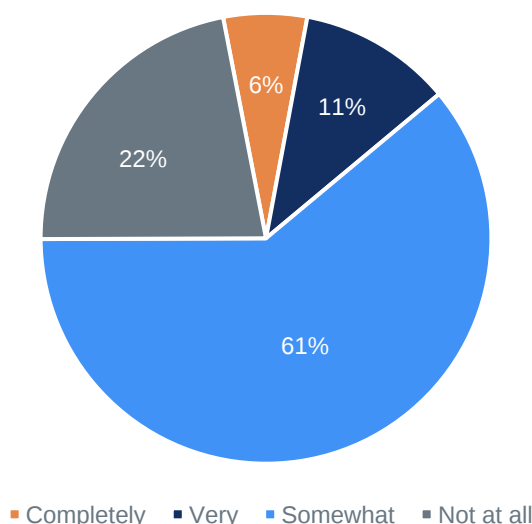


Figure 1: Do CDOs have the resources to achieve their mission?

¹ McKinsey Global Institute, *Open Data: Unlocking innovation and performance with liquid information*, October 2013, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Open%20data%20Unlocking%20innovation%20and%20performance%20with%20liquid%20information/MGI_Open_data_FullReport_Oct2013.ashx.

² Open Knowledge, Open Data Handbook, “What is Open Data?,” <https://opendatahandbook.org/guide/en/what-is-open-data>.

³ Data Foundation, *The Growth and Challenges of the Chief Data Officer (CDO) Role and Agencies’ Data Maturity: A 2022 Survey of Federal CDOs*, Lori Gonzalez, Tracy Jones, Jeff Lawton, <https://www.datafoundation.org/2022-survey-of-federal-chief-data-officers>.

The survey also found that approximately half of US federal CDO offices had fewer than 10 full-time equivalents, or FTEs (see Figure 2).

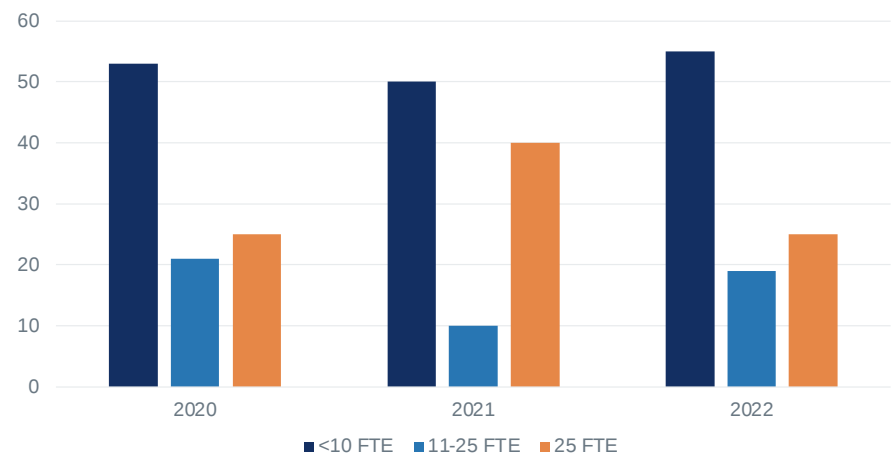


Figure 2: More than half of surveyed US federal CDO offices had fewer than 10 full-time equivalents (FTEs)

Figure 3 highlights the value of data by country. Because the valuations use different approaches and methodologies, comparisons are difficult. However, this approach represents a starting point to the treatment of data as a national treasure.

Data as a National Treasure:

Differing Methodologies Make Comparisons Difficult

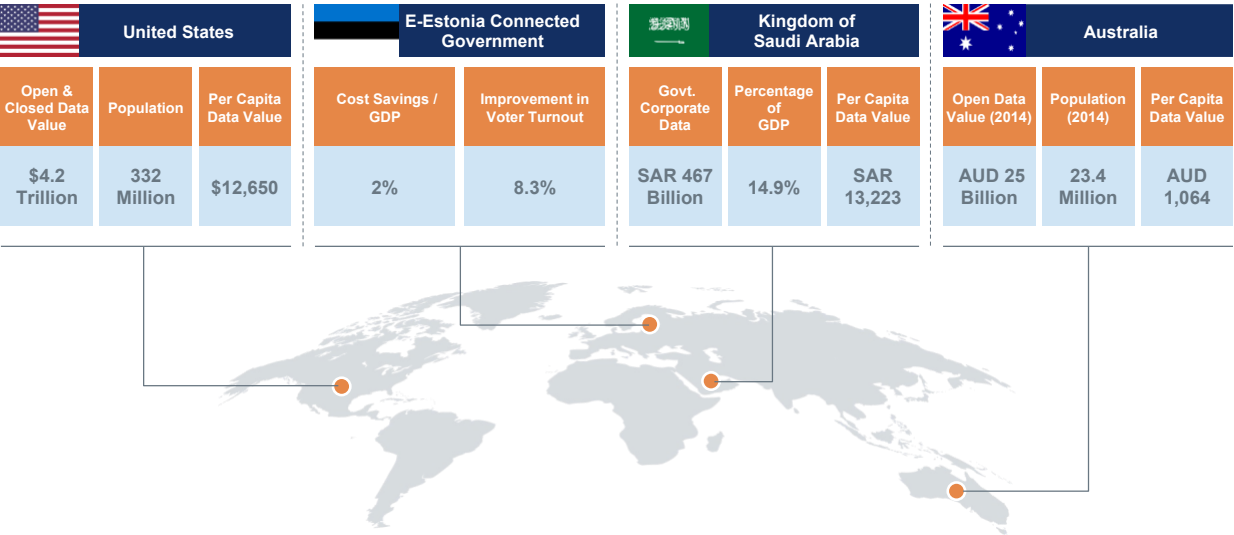


Figure 3: Data as a national treasure

Figure 4 shows a snapshot of the value of data by functional sector based on a subset of the 18 case studies in this playbook. The snapshot is a collection of data valuation results from different public organizations, which used different methodologies. However, in spite of not being able to compare their

data valuation calculations with systematic rigor, there is great strategic value in an organization having a data asset valuation.

Functional Sectors:
Differing Methodologies Make Comparisons Difficult

 Health Care	UK National Health Service		
	Aggregate Data Value	Number of Patients	Value of Data Per Patient
	£9.6 Billion	55 Million	£175
 Securities Markets	UK Financial Conduct Authority		
	Scams Avoided	Average Losses	Losses Avoided by Savers Due to FCA Actions
	1,966	£22,000	£43.2 Million
 Transportation	UK National Highways (England)		
	Value of Data	No. of Drivers	Value of Data Per Driver
	£60 Billion	34.8 Million	£1,724
 Defense	US Department of Defense - Acquisitions		
	Analytics-Related Workforce	IT Systems	Total
	\$11 – 15 Billion	\$3 Billion	\$14 – 18 Billion
 Communications	US Federal Communications Commission Enforcement Bureau		
	Average Fines Per Year	Annual Budget	Fines / Budget
	\$170 Million	\$48 Million	354%

Figure 4: Value of data by public sector entity

Why Is It important to Treat Data as a National Treasure?

There are several key imperatives to treat data as a national treasure (see Figure 5).

Regulatory Compliance		Fundraising	
	US Evidence Act		Use de-identified data to raise money
	European Union Data Governance Act		Healthcare Data
	China 20 Data Measures		Weather Data
	US Financial Data Transparency Act		Census Data
	Saudi National Data Management Office		
Quantify Mission Impact		Data Management Policy	
	Public Safety		Are we investing the right amount in data management given the value of data?
	Public Health		What are the five percent of datasets that account for 90 percent of value in terms of mission?
	National Census		How do data quality and cybersecurity increase the value of national data?
	Weather		
	Meteorology		
	Financial Markets Oversight		

Figure 5: Data as a national treasure imperative

Each imperative is discussed in detail below:

1. **Regulatory Compliance**

Several regulations, such as the Saudi National Data Management Office (NDMO) and the China 20 Data Measures, are creating an imperative for government entities to realize value from their data assets.

2. **Fundraising**

The EDM Council's Data ROI Report on DataCo focused on the creation of data subsidiaries to allow companies to quantify the financial value of data.⁴ Many of these data companies ("DataCos") are actually in the public sector. There could be situations in the foreseeable future when governments are able to raise loans based on the value of their national data.

3. **Quantify Mission Impact**

Data valuation enables policymakers to quantify the impact of data on public services. Government is about serving the public, so organizations should ask how their data can improve service delivery. This might involve identifying bottlenecks, understanding citizen needs, and predicting future demand for services. Similarly, can we identify the impact of data on services that are designed to prevent general crises of public wellbeing (e.g., contagious disease, hurricane destruction), national security intrusion (e.g., terrorist attack), or other public catastrophes?

4. **Data Management Policy**

CDOs may be able to lobby policymakers for higher levels of investment in data management. CDOs may also be able to prioritize their teams' efforts around data governance, data quality, and data protection based on the value of datasets.

"What are the 5 percent of datasets that account for 90 percent of value in terms of mission?"

Use of the Global Data Barometer Survey to Adjust the Actual Value of Open Data

The Global Data Barometer survey assessed the state of data for public good in 109 countries. An expert survey was conducted from May 2019 to May 2021. The United States and Estonia led the survey with scores of 68 and 67, respectively, out of a possible score of 100. Figure 6 shows the listing of the top countries in the survey.⁵ The Global Data Barometer score is a useful tool to deflate the value of open data based on actual versus potential use. Appendix A provides a listing of all the scores by country.

⁴ EDM Council Data ROI Report on DataCo, <https://edmcouncil.org/groups-leadership-forums/data-roi>.

⁵ Global Data Barometer, <https://globaldatabarometer.org>.



Figure 6: Global Data Barometer Survey, 2021

Role of the EDM Council

The success of public sector organizations increasingly depends on the proper management of their data assets. In fact, the EDM Council’s 2020 Global Data Management Benchmark survey indicated that the need to develop a standard way to predict the ROI of data programs was the highest-priority industry topic.⁶ The EDM Council convened the Data ROI Working Group to develop a “recipe book” to help organizations navigate these challenges. The Data Office ROI Playbook v1.1 and the Data As An Asset Playbook 1.0 were the culmination of intense work by more than 150 industry practitioners and interviews with 15 CDOs over the course of 18 months starting in September 2021. These participants were drawn from a global pool of practitioners across multiple industries, primarily in the commercial sector.

The EDM Council Data as a National Treasure Paper V1.0 extends this approach to the public sector and focuses on the use of data valuation techniques for governments at all levels using a data product framework. The data management products are enriched by the Data Management Capability Assessment Model (DCAM) and Cloud Data Management Capabilities (CDMC) frameworks from the EDM Council. Government entities, including regulators, are also members of the EDM Council and are actively using DCAM and contribute to the development of the framework.⁷

⁶ EDM Council, *Global Data Management Benchmark Report*, March 2020, <https://edmcouncil.org/innovation/research/benchmarks/>.

⁷ Board of Governors of the Federal Reserve System, Evaluation Report 2023-MO-B-001, January 18, 2023, *The Board Can Enhance Enterprise Practices for Data Management Roles and Responsibilities*, <https://oig.federalreserve.gov/reports/board-data-management-roles-responsibilities-jan2023.pdf>.

The EDM Council offers various options for live, online, and self-paced training for DCAM, CDMC, knowledge graphs, data ethics, data governance, data stewardship, and data literacy. The EDM Council also offers a number of certifications for DCAM, CDMC, Certified Information Management Professional (CIMP), and Data Literacy Certification (DLC).⁸ These training and certification programs provide the underpinnings of a strong data ROI program that supports a network of more than 25,000 data management professionals who constitute the EDM Council’s community.⁹

Framework for Data as a National Treasure

The value of national data is an amalgamation of multiple vectors (see framework in Figure 7). Similar data exists—and must be valued—at multiple levels of the framework. For example, Electronic Medical Records (EMRs) are a type of healthcare data product that resides within multiple federal departments, including the US Department of Health and Human Services and the US Department of Veterans Affairs. In addition, state and local healthcare agencies also manage EMRs.

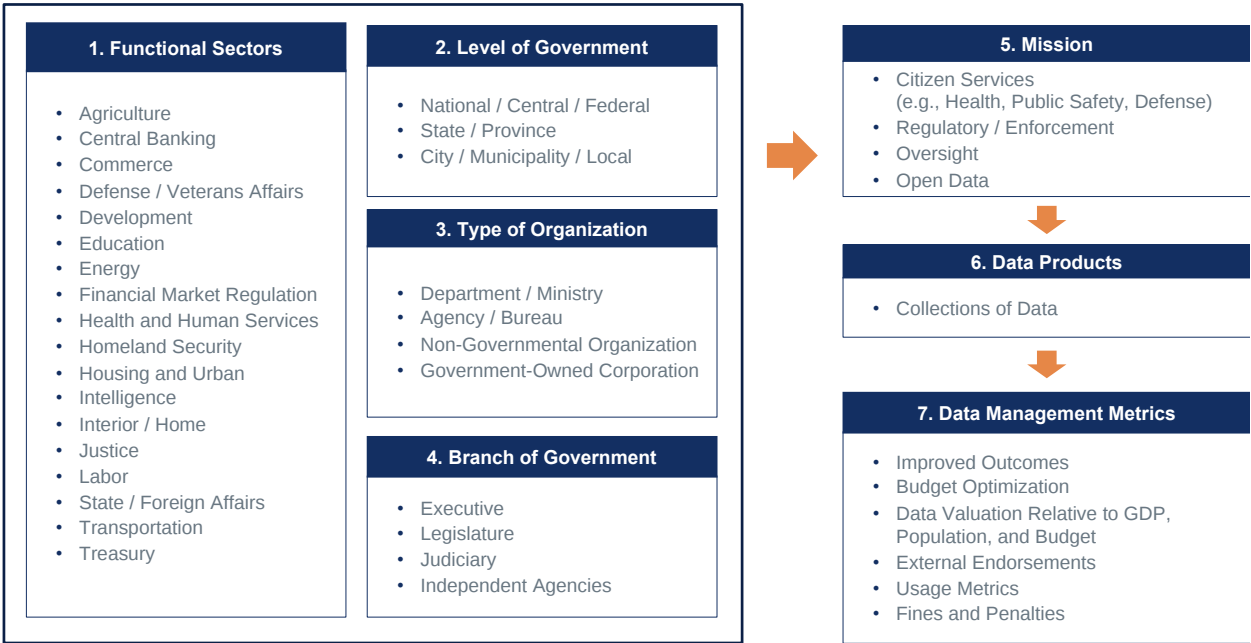


Figure 7: Multidimensional framework for valuation of data as a national treasure

⁸ EDM Council, “Training, Certifications & eLearning,” <https://edmcouncil.org/training>.

⁹ EDM Council, “About EDM Council,” <https://edmcouncil.org/about>.

Each vector in the framework is discussed below:

1. **Functional Sectors**

The precise nomenclature for departments or ministries varies by country. However, the departments or ministries generally fall within so-called functional sectors, including agriculture, central banking, commerce, defense/veterans affairs, development, education, energy, financial market regulation, health and human services, homeland security, housing and urban development, intelligence, interior/home, justice, labor, state/foreign affairs, transportation, and treasury.

2. **Level of Government**

The precise nomenclature for levels of government also varies by government but includes national/central/federal, state/province, and city/municipality/local.

3. **Type of Organization**

The type of organization includes department/ministry, agency/bureau, non-governmental organization (NGO), and government-owned corporation.

4. **Branch of Government**

Every country might use slightly different terminology, but branches of government include executive, legislature, judiciary, and independent agencies.

5. **Mission**

Public sector organizations typically have missions that fall within the following broad categories:

- **Provision of citizen services**

Public sector organizations often deliver citizen services such as public safety, public health, smart cities, and national defense.

- **Regulatory enforcement**

Certain agencies are responsible for enforcing regulations. For example, the US Securities and Exchange Commission (SEC) was founded at the height of the Great Depression with a mission of protecting investors; maintaining fair, orderly, and efficient markets; and facilitating capital formation.¹⁰

- **Oversight**

Oversight agencies also have valuable data. Many agencies have an Office of the Inspector General (OIG) to oversee internal activities. These agencies have an enforcement mission that is supportive of the broader mission of their parent department. For example, the OIG at the US Department of Health and Human Services (HHS) is focused on waste, fraud, and abuse and on improving the efficiency of Medicare, Medicaid, and more than 100 other programs. The HHS OIG is the largest inspector general's office in the US federal government, with approximately 1,650 personnel. The majority of the agency's resources goes toward oversight of Medicare and Medicaid, which represent a significant part of the

¹⁰ US Securities and Exchange Commission, "About the SEC," <https://www.sec.gov/about/what-we-do>.

federal budget.¹¹ The OIG supports the broader HHS mission to enhance the health and wellbeing of all Americans by providing for effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services.¹²

- **Open data**

Some agencies are also focused on open data and statistical analysis for the furtherance of public outcomes. Case Study 17 later in this document provides an overview of statistical agencies.

6. Data Products

For the purposes of this playbook, a data product is a named set of data organized to be valuable and accessible to a defined set of users.¹³ The EDM Council's Cloud Data Management Capabilities Plus (CDMC+) Working Group is working on a more detailed definition.¹⁴

7. Data Valuation Metrics

Metrics relate data management initiatives to the treatment of data as a national treasure (see Table 1).

Metric Category	Case Study
1. Business outcomes	• UK Financial Conduct Authority – Removal of High-Risk Advertisements (Case Study 11) • UK Financial Conduct Authority – Identification of Scams (Case Study 12) • Estonia E-Estonia – Higher Voter Turnout (Case Study 2) • Australia Bureau of Meteorology – Damage Avoidance (Case Study 14) • US Department of Defense Global Positioning System Economics Benefits (Case Study 10)
2. External endorsements	• US Federal Reserve Economic Data (Case Study 6)
3. Data value as a percentage of gross domestic product	• Australia – Open Data (Case Study 1) • Kingdom of Saudi Arabia and Data as a National Treasure (Case Study 3) • Estonia E-Estonia Increases Cost Savings (Case Study 2)
4. Data value as a percentage of annual budget	• Kingdom of Saudi Arabia and Data as a National Treasure (Case Study 3) • Australia Bureau of Meteorology – Damage Avoidance (Case Study 14) • US National Oceanic and Atmospheric Administration and Value of Weather Data (Case Study 15) • Australian Census – Value of Data (Case Study 16)
5. Data value per constituent, such as citizen, driver, or patient	• United States – Value of Open Data per Capita (Case Study 4) • UK National Health Service – Data Value per Patient (Case Study 13) • National Highways, England – Data Value per Driver (Case Study 18) • Kingdom of Saudi Arabia – Data Value per Citizen (Case Study 3)

¹¹ Office of the Inspector General, US Department of Health and Human Services, "About OIG," <https://oig.hhs.gov/about-oig>.

¹² US Department of Health and Human Services, "About HHS," <https://www.hhs.gov/about/index.html>.

¹³ EDM Council Data Office ROI Playbook Version 1.1, May 2023, <https://edmcouncil.org/groups-leadership-forums/data-roi>.

¹⁴ EDM Council, "Cloud Data – CDMC," <https://edmcouncil.org/frameworks/cdmc>.

6. Usage statistics to support data transparency	US Federal Reserve Economic Data (Case Study 7)
7. Budget optimization	- Estonia E-Estonia Increases Cost Savings (Case Study 2) - US Federal Communications Commission Enforcement Division – Value of Fines and Penalties (Case Study 8)
8. Aggregate data spend	- US Department of Defense Acquisitions – Spend on Data and Analytics (Case Study 9) - US Office of Information and Regulatory Affairs Estimates of Government-Wide Cost of Information Collections (Case Study 5)

Table 1: Categories of metrics to treat data as a national treasure

Compliance with Government Regulations

A number of regulations have heightened the urgency to treat data as a national treasure (see Figure 8).

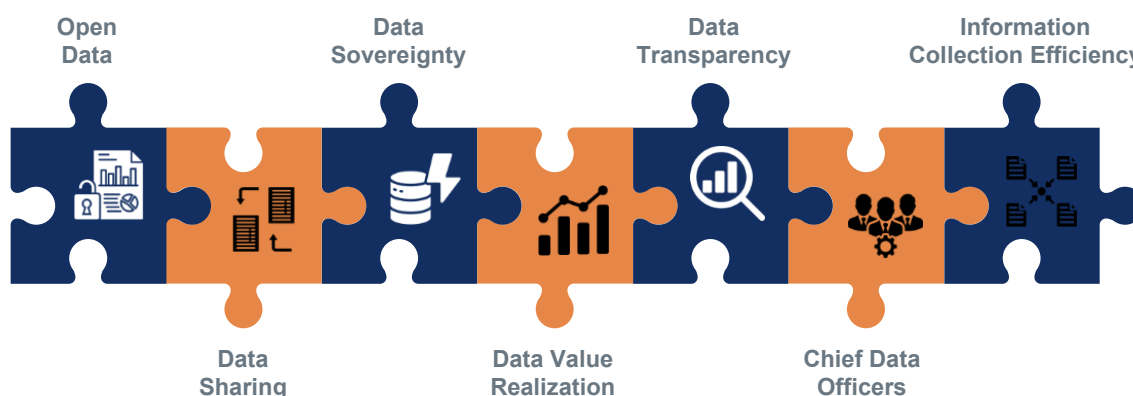


Figure 8: Categories of regulations that treat data as a national treasure

1. Open Data

The Open Data Impact Map has cataloged 1,615 organizations from 90 countries that leverage open data.¹⁵ Multiple regulations drive the need for open data. For example, the US Evidence Act and the Abu Dhabi government shape the need for open data (see Regulatory Spotlights 1 and 2).

Regulatory Spotlight 1: US Evidence Act Drives Open Data

The US Foundations for Evidence-Based Policymaking Act of 2018 (“Evidence Act”) formalizes the requirement for open data by mandating that public government data assets be published as machine-readable data. The act requires the General Services Administration to maintain an online federal data catalog to provide a single point of entry for the public to access agency data. Each agency must also develop and maintain a comprehensive data inventory and make data open by default.¹⁶

¹⁵ Open Data Impact Map, <https://opendataimpactmap.org>.

¹⁶ Foundations for Evidence-Based Policymaking Act of 2018, US Public Law No: 115-435 (01/14/2019), <https://www.congress.gov/bill/115th-congress/house-bill/4174>.

Regulatory Spotlight 2: Abu Dhabi Government Drives Open Data by Default

The Abu Dhabi Government developed a data management program to be implemented by all government entities in the Emirate. The goal of the Abu Dhabi Government Data Management Program is first to acknowledge that data is a key asset of the Abu Dhabi Government and then to improve data management functions and the data stored within the Abu Dhabi Government. Owning and using high-quality data is acknowledged as a strategic enabler for the Abu Dhabi Government in its journey to become a world-class administration.

Government entities shall evaluate each data source from an “open by default” perspective. All data sources will be deemed “open” unless there is a quantifiable reason for keeping the sources closed. Criteria for closing a source include concerns relating to security, privacy, and data quality.¹⁷

2. Data Sharing

Regulations such as the European Data Governance Act promote the need for data sharing (see Regulatory Spotlight 3).

Regulatory Spotlight 3: European Data Governance Act

The European Data Governance Act is effective from September 2023 and seeks to increase trust in data sharing, strengthen mechanisms to increase data availability, and overcome technical obstacles to the re-use of data.¹⁸

The Data Governance Act supports the setup and development of common European data spaces in strategic domains, involving both private and public players, in sectors such as health, environment, energy, agriculture, mobility, finance, manufacturing, public administration, and skills.

The European Union will boost the development of trustworthy data-sharing systems through four broad sets of measures:

- Mechanisms to facilitate the re-use of certain public sector data that cannot be made available as open data. For example, the re-use of health data could advance research to find cures for rare or chronic diseases.
- Measures to ensure that data intermediaries will function as trustworthy organizers of data sharing or pooling within the common European data spaces.
- Measures to make it easier for citizens and businesses to make their data available for the benefit of society.
- Measures to facilitate data sharing, in particular to make it possible for data to be used across sectors and borders and to enable the right data to be found for the right purpose.

¹⁷ Abu Dhabi Government Publishes World’s First Comprehensive Data Management Standards, Jason Edge, June 12, 2016, <https://medium.com/@berrylands/abu-dhabi-government-publishes-worlds-first-comprehensive-data-management-standards-3f0e75f0a94f>.

¹⁸ European Commission, “European Data Governance Act,” <https://digital-strategy.ec.europa.eu/en/policies/data-governance-act>.

The US Evidence Act also drives the need for data sharing (see Regulatory Spotlight 4).

Regulatory Spotlight 4: US Evidence Act Drives Data Sharing

The US Evidence Act also mandates that the Federal Chief Data Officer Council promotes data-sharing agreements among agencies.¹⁹

3. Data Sovereignty

Data sovereignty is a legally enforceable authority that is asserted over data by any entity, including not only the laws imposed by governments and regulators but also the legally binding contractual obligations between data providers and their customers.²⁰ Data sovereignty pertains to privacy legislation that covers data that is subject to the laws of the country in which it is physically located. This means that the legal rights of people whose personal data is being collected, processed, retained, and/or transferred across international borders depend on the location where their personal data is stored.²¹

There are a growing number of data sovereignty laws in multiple countries—Australia’s Privacy Principles (APP), Canada’s Canada Anti-Spam Law (CASL) and Personal Information Protection and Electronic Documents Act (PIPEDA), the European Union’s General Data Protection Regulation (GDPR), France’s Data Protection Act (DPA), the People’s Republic of China’s Cybersecurity Law, Russia’s Federal Law No. 152-FZ, and the United States’ Civil Rights Act of 1964, Fair Credit Reporting Act, California Privacy Rights Act (CPRA), and California Consumer Protection Act (CCPA), to name a few.

The deputy minister for a large public sector data management organization made the following observation: “We are pushing our cloud providers to situate their data locally in country. In the unlikely event that our government gets sanctioned by foreign governments, we do not want to be in an unfortunate position where we lose access to our data.”

The EDM Council Cloud Data Management Capabilities (CDMC) framework, component 1 (Governance and Accountability), addresses the management of data sovereignty and cross-border data movement risks. The CDMC framework asks the following questions:²²

- Are there requirements for managing data sovereignty?
- Have cross-border data movement risks been defined?
- Have controls for both been implemented?

CDMC capability 1.4 (Data Sovereignty and Cross-Border Data Movement Are Managed) states that the sovereignty of data in cloud environments must be tracked and used to ensure that the storage and cross-border movement and use of data conform to the relevant jurisdictional requirements.

¹⁹ Foundations for Evidence-Based Policymaking Act of 2018, US Public Law No: 115-435 (01/14/2019), <https://www.congress.gov/bill/115th-congress/house-bill/4174>.

²⁰ EDM Council Data Management Business Glossary, “Data Sovereignty,” <https://www.edmcportal.org/glossary/data-sovereignty>.

²¹ EDM Council Data Office ROI Playbook Version 1.1, May 2023, <https://edmcouncil.org/groups-leadership-forums/data-roi>.

²² EDM Council Cloud Data Management Capabilities Framework, <https://edmcouncil.org/frameworks/cdmc>.

Canada has addressed the data sovereignty requirements for its Indigenous Peoples (see Regulatory Spotlight 5).

Regulatory Spotlight 5: Indigenous Data Sovereignty in Canada

The 2023–2026 data strategy for the Canadian Federal Public Service recognizes Indigenous data sovereignty as a government-wide priority that contributes to Indigenous self-determination. The strategy recognizes that work co-developed with Indigenous partners will lay a strong foundation for a whole-of-government approach to support First Nations, Inuit, and Métis Nations as they realize their respective visions for data sovereignty. Indigenous Peoples have long recognized and emphasized the importance of data, not only to the equitable allocation of resources and the design and delivery of effective services, but also as a key part of their cultural heritage and an important means of capturing and sharing their collective stories. The recognition of the importance of Indigenous control over their own data is often referred to as Indigenous Data Sovereignty.²³

4. Data Value Realization

Regulators such as the Saudi National Data Management Office (NDMO) have issued standards regarding data value realization (see Regulatory Spotlight 6).

Regulatory Spotlight 6: Saudi NDMO Data Value Realization

The National Data Management Office is the national regulator of data in the Kingdom of Saudi Arabia. The NDMO developed the Data Management and Personal Data Protection Standards based on the National Data Management and Personal Data Protection Framework along with the required controls and specifications for implementing and governing effective data management practices across government entities. Through these standards, NDMO also aims to govern data management efforts and initiatives across entities. Data value realization is a key domain within the NDMO standards. This domain involves the continuous evaluation of data assets for potential data-driven use cases that generate revenue or reduce operating costs for the organization.²⁴

In 2022, China released 20 Data Measures to build basic systems for data to give full play to the country's massive data (see Regulatory Spotlight 7) .

Regulatory Spotlight 7: China 20 Data Measures

The China 20 Data Measures are intended to strengthen the digital economy and boost high-quality economic development while also stressing regulations to protect national security related to data transactions. Jointly released by the Central Committee of the Communist Party of China and the State Council, the new measures, which expand market access for both domestic and foreign players and put in place transparent regulations, will further boost the country's rapidly growing data industry while ensuring security, according to analysts. According to the document, the country will build basic data systems in four aspects, including data property rights, circulation and transaction, revenue distribution, and security governance, which is in accordance with the efforts made by the Central Economic Work Conference to support digital economy platforms.²⁵

²³ Government of Canada, "2023–2026 Data Strategy for the Canadian Federal Public Service," <https://www.canada.ca/en/treasury-board-secretariat/corporate/reports/2023-2026-data-strategy.html>.

²⁴ National Data Management Office, "Data Management and Personal Data Protection Standards, Version 1.5," January 2021, <https://sdaia.gov.sa/ndmo/Files/PoliciesEn001.pdf>.

²⁵ Global Times, "China issues 20 measures to build basic systems for data to boost devt, security," December 20, 2022, <https://www.globaltimes.cn/page/202212/1282215.shtml>.

5. Data Transparency

Several regulations mandate data transparency. For example, the US Securities and Exchange Commission adopted a rule adopting the eXtensible Business Reporting Language (XBRL) for financial reporting (see Regulatory Spotlight 8).

Regulatory Spotlight 8: SEC XBRL Reporting

In 2009, the SEC adopted a rule requiring companies to provide financial statement information using XBRL. This rule was intended to improve the usefulness of financial information to investors. Using the XBRL format, investors can download financial information directly into spreadsheets and commercial off-the-shelf software for further analysis.²⁶

The US Financial Data Transparency Act (FDTA) extends the requirements for data transparency to additional data domains and agencies (see Regulatory Spotlight 9).

Regulatory Spotlight 9: US Financial Data Transparency Act

The US Financial Data Transparency Act of 2022 amends securities and banking laws to make the information reported to financial regulators electronically searchable and to further enable the development of regulatory technologies and artificial intelligence applications. The ultimate goal is to harmonize reporting requirements, reduce the private sector's regulatory compliance burden, and enhance transparency and accountability. The covered financial regulatory agencies have two years from the date of enactment to issue joint rulemaking, and they will have two additional years to implement the standards from the final rule.

The act requires the Department of the Treasury, Securities and Exchange Commission, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, Consumer Financial Protection Bureau, Federal Reserve System, National Credit Union Administration, and Federal Housing Finance Agency to issue a joint rule to promulgate data standards governing the information that financial institutions report to each agency as well as data collected from member agencies on behalf of the Financial Stability Oversight Council.²⁷

²⁶ Securities and Exchange Commission, 17 CFR Parts 229, 230, 232, 239, 240, and 249, "Interactive Data to Improve Financial Reporting," <https://www.sec.gov/rules/final/2009/33-9002.pdf>.

²⁷ Data Foundation, "Financial Data Transparency Act of 2022," https://www.datacoalition.org/resources/Documents/FDTA%20ACT_final2_2022.pdf.

6. Chief Data Officers

Regulations such as the US Evidence Act also drive CDO appointments (see Regulatory Spotlight 10).

Regulatory Spotlight 10: US Evidence Act Drives CDO Appointments

The Evidence Act also mandates that each US federal agency must designate a chief data officer. The act establishes in the Office of Management and Budget (OMB) a Chief Data Officer Council for establishing government-wide best practices for the use, protection, dissemination, and generation of data and for promoting data-sharing agreements among agencies.²⁸ The OMB serves the President of the United States in overseeing the implementation of his or her vision across the Executive Branch.²⁹

7. Information Collection Efficiency

Regulations such as the US Paperwork Reduction Act (PRA) may also drive the need for heightened efficiency in information collection (see Regulatory Spotlight 11).

Regulatory Spotlight 11: US Paperwork Reduction Act

The Paperwork Reduction Act of 1995 required that US federal agencies obtain OMB approval before requesting most types of information from the public. These “information collections” include forms, interviews, and recordkeeping.³⁰

The goals of the PRA include the following:

- Minimizing paperwork and reporting burdens on the American public
- Ensuring the maximum possible utility from the collected information³¹

Tying It All Together: Value of United States Government Data

The aggregate value of open and closed government data in the US is at least \$4.2 trillion or \$12,650 per capita. This number is 18 percent of GDP and 61.8 percent of the federal budget.

This case study amalgamates the learnings from other use cases in this paper to compute the value of data in the United States. The case study consolidates the value of data across the following:

- Federal open data
- State and local open data
- Federal “closed” data within the intelligence community, the Department of Defense, and healthcare

²⁸ Foundations for Evidence-Based Policymaking Act of 2018, US Public Law No: 115-435 (01/14/2019), <https://www.congress.gov/bill/115th-congress/house-bill/4174>.

²⁹ The White House, “Office of Management and Budget,” <https://www.whitehouse.gov/omb>.

³⁰ Digital.gov, Paperwork Reduction Act, <https://digital.gov/resources/paperwork-reduction-act-44-u-s-c-3501-et-seq>.

³¹ Reginfo.gov, Frequently Asked Questions, <https://www.reginfo.gov/public/jsp/Utilities/faq.myjsp>.

Based on previous research, the aggregate value of open data in the United States across federal, state, and local governments is \$174 billion on a top-down basis (see Table 2). The Global Data Barometer score is used as a deflator to reflect the actual versus potential use of open data.

Metric	Value
A. US gross domestic product (World Bank, 2021) ³²	\$23,315 billion
B. Value of open data as a percentage of GDP based on previous research ³³	1.1%
C. Value of open data (A x B)	\$256 billion
D. US Global Data Barometer score on the use of data for public good	68%
E. Adjusted value of open data (C x D)	\$174 billion

Table 2: Adjusted value of US open data on a top-down basis, 2021

The relative top-down value of federal and state and local open data is shown in Table 3.

Metric	Value
A. US federal share of government spending ³⁴	59%
B. US state and local share of government spending	41%
C. Value of federal open data (Table 2.E x A)	\$103 billion
D. Value of state and local open data (Table 2.E x B)	\$71 billion

Table 3: Adjusted top-down value of US federal, state, and local open data, 2021

A summary of the key dataset counts on data.gov is shown in Table 4.³⁵ Data.gov has gone through a significant rationalization of its data sets since our analysis, and the latest counts are likely very different.

Organization	Count of Datasets
Agriculture	2,446
Commerce	246,277
Defense	176
Education	646

³² The World Bank, "GDP, Current US\$," 2021, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.

³³ Ross Dawson, "The massive impact on economic growth of open data in government," <https://rossdawson.com/impact-open-data-government-economic-growth>.

³⁴ USA Facts, "How much does the government spend and where does the money go? How does this affect the national debt?" <https://usafacts.org/state-of-the-union/budget>.

³⁵ Data.gov, Data Catalog, Metrics Dashboard, July 25, 2023, <https://catalog.data.gov/report/metrics-dashboard>.

Energy	3,329
Homeland Security	9,109
Independent Agencies and Entities	36,558
Interior	40,152
Justice	3,277
Labor	467
Other	200
State	382
Treasury	239
Transportation	4,303
Health & Human Services	2,082
Housing & Urban Development	164
Veterans Affairs	1,766
Total federal datasets	351,573
Total state and local datasets	38,174
Total datasets	389,747

Table 4: Number of datasets on data.gov

The US Department of Commerce accounts for approximately 70 percent of the federal datasets on data.gov. The majority of the Department of Commerce’s datasets are from the US Census Bureau (150,551) and the US National Oceanic and Atmospheric Administration (94,125).

Policy Question: “What if policymakers used the value of data as tied to mission to prioritize what datasets to make open?”

Table 5 provides an estimate of the value of open data from the US Census Bureau. We used an estimate for the value of Australian census data to derive a value for the United States based on adjustments for exchange rate and population.

Metric	Value
A. Five-year benefits from Australian census data, 2019 ³⁶	AUD 4.2 billion
B. Australian population, 2019 ³⁷	25,522,169
C. Value of census data per capita in AUD (A / B)	AUD 163
D. AUD/USD exchange rate, July 2023	\$0.68
E. Value of census data per capita in USD (C x D)	\$111
F. US population, 2021	332,000,000
G. Value of US census data (E x F)	\$36.8 billion

Table 5: Value of US census data

Table 6 provides an estimate of the value of data relating to intelligence and homeland security. This data is obviously not open, which we characterize as “closed.” While it is difficult to place a value relating to the avoidance of loss of life, this case study is based on the reduction in the market capitalization of the S&P 500 index after the terrorist attacks on September 11, 2001.

Metric	Value
A. Conservative S&P 500 Market Capitalization over 12 months prior to July 2023 ³⁸	\$32 trillion
B. Impact on S&P 500 index post-September 11 attacks ³⁹	11.6%
C. Value of Homeland Security & Intelligence public safety mission (A x B)	\$3.7 trillion
D. Attributable percentage of Homeland Security & Intelligence public safety mission to data (assumption)	20%
E. Value of Homeland Security & Intelligence data (C x D)	\$740 billion

Table 6: Value of US intelligence and homeland security data

An alternative approach might be to use the amounts paid out to the victims of the terrorist attacks on September 11, 2001. The September 11th Victim Compensation Fund (VCF) was created to provide compensation for any individual (or a personal representative of a deceased individual) who suffered physical harm or was killed as a result of the terrorist-related aircraft crashes of September 11, 2001, or the debris removal efforts that took place in the immediate aftermath of those crashes. As of December 31, 2021, the VCF has awarded \$9.3 billion in compensation to over 41,700 individuals who suffered

³⁶ Case Study 16 in this paper.

³⁷ Australian Bureau of Statistics, “National, state , and territory population,” <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/dec-2019>.

³⁸ YDC analysis, www.yourdataconnect.com.

³⁹ Investopedia, “How September 11 Affected the U.S. Stock Market,” <https://www.investopedia.com/financial-edge/0911/how-september-11-affected-the-u.s.-stock-market.aspx>.

physical health conditions, including the families of more than 2,200 people who lost their lives.⁴⁰ This alternative approach yields a much lower data valuation and has not been used in our analysis.

Table 7 provides a conservative estimate of the value of health care data maintained by the US Centers for Medicare & Medicaid Services (CMS), which is part of the Department of Health and Human Services (HHS). CMS provides health coverage to more than 100 million members through Medicare, Medicaid, the Children’s Health Insurance Program, and the Health Insurance Marketplace. This analysis provides an estimate of data value for only a subset of data at the CMS and HHS.

Metric	Value
A. Number of Medicare Parts A and/or B persons served during calendar year 2021 ⁴¹	33.3 million
B. Value of medical record (Case Study 13 adjusted for GBP/USD exchange rate as of October 2023)	\$215
C. Value of Medicare Parts A/B data (A x B)	\$7.2 billion

Table 7: Value of CMS Medicare Parts A/B data

Table 8 provides a conservative bottom-up estimate of the value of US open federal data. The bottom-up estimate is \$470.1 billion, which is way in excess of the top-down estimate of \$103 billion in Table 3. This valuation covers only a subset of the data within the US government.

Metric	Value
A. Census Bureau data (Table 5)	\$36.8 billion
B. Value of weather data (Case Study 15)	\$31.5 billion
C. Unvalued datasets on data.gov	
D. Value of open datasets on data.gov (A + B + C)	\$68.3 billion
E. US Federal Reserve Economic Data (FRED), covered in Case Studies 6 & 7 with value assumed to be equal to Census Bureau data	\$36.8 billion
F. GPS Data, estimated at \$1 billion per day in Case Study 10	\$365.0 billion
G. Open federal datasets NOT on data.gov (E + F)	\$401.8 billion
H. Aggregate value of federal open datasets (D + G)	\$470.1 billion

Table 8: Aggregate bottom-up value of US federal open data

⁴⁰ U.S. Department of Justice, “September 11th Victim Compensation Fund,” https://www.justice.gov/d9/pages/attachments/2022/04/06/vcf_fy_23_pb_narrative_3.23.22.pdf.

⁴¹ CMS Fast Facts, March 2023 version, <https://data.cms.gov/sites/default/files/2023-03/CMSFastFactsMar2023.pdf>.

Table 9 ties the entire analysis together with a conservative estimate of the value of US federal data.

Metric	Value
A. Aggregate value of federal open datasets (Table 8)	\$470.1 billion
B. Value of intelligence and homeland security data (Table 6)	\$3.7 trillion
C. Value of Department of Defense data (DoD acquisitions data and analytics spend, minimum value, Case Study 9)	\$14 billion
D. Value of CMS health care data (Table 7)	7.2 billion
E. Aggregate value of federal closed datasets (B + C + D)	\$3.7 trillion
F. Aggregate value of federal data (A + E)	\$4.2 trillion

Table 9: Aggregate value of US federal data

Table 10 maps the value of US federal open, closed, and aggregate data to GDP, population, and budget.

Metric	Open Data	Closed Data	Aggregate
A. Data Value	\$470.1 billion	\$3.7 trillion	\$4.2 trillion
B. US GDP, 2021	\$23.3 trillion	\$23.3 trillion	\$23.3 trillion
C. US Population, 2021	332 million	332 million	332 million
D. US Federal Budget, 2021 ⁴²	\$6.8 trillion	\$6.8 trillion	\$6.8 trillion
E. Data Value / GDP	2.0%	15.9%	18.0%
F. Data Value per Capita	\$1,416	\$11,145	\$12,650
G. Data Value / Budget	6.9%	54.4%	61.8%

Table 10: Value of US data relative to GDP, population, and budget (numbers rounded)

Table 11 shows the top-down value of open data by state for only those states that have posted datasets to data.gov. The aggregate top-down value of state open data of \$71 billion from Table 3 has been allocated to each state based on its relative share of 2021 GDP based on the US Bureau of Economic Analysis.⁴³ The aggregate state GDP and value of state open data are under-allocated because only 32 US states have posted at least one dataset on data.gov. For example, California has posted 6,130 datasets, while Texas has posted only 14.

⁴² Congressional Budget Office, "The Federal Budget in Fiscal Year 2021," <https://www.cbo.gov/publication/58268>.

⁴³ Bureau of Economic Analysis, "GDP by State," <https://www.bea.gov/data/gdp/gdp-state>.

State	Count of Datasets on Data.gov	GDP 2021 in Millions	Value of Open Data in Millions 2021
AK	1,799	\$57,349	\$176
AR	0	\$148,676	\$456
AZ	505	\$420,027	\$1,288
CA	6,130	\$3,373,241	\$10,345
CT	918	\$298,395	\$915
FL	3	\$1,255,558	\$3,851
GA	2	\$691,627	\$2,121
HI	67	\$91,096	\$279
IA	1,014	\$216,860	\$665
ID	111	\$96,283	\$295
IL	2,925	\$945,674	\$2,900
IN	242	\$412,975	\$1,267
KY	635	\$237,182	\$727
LA	432	\$258,571	\$793
MA	48	\$641,332	\$1,967
MD	1,941	\$443,930	\$1,361
MI	276	\$572,206	\$1,755
MO	170	\$358,572	\$1,100
MS	0	\$127,308	\$390
NC	80	\$662,121	\$2,031
NM	5,459	\$109,583	\$336
NY	4,124	\$1,901,297	\$5,831
OK	339	\$215,336	\$660
OR	472	\$272,191	\$835
PA	7,464	\$844,496	\$2,590
RI	213	\$66,571	\$204
SD	152	\$61,685	\$189
TX	14	\$2,051,769	\$6,292
VA	431	\$604,958	\$1,855
VT	177	\$37,104	\$114
WA	2,001	\$677,489	\$2,078
WV	26	\$85,434	\$262
Total	38,170	\$18,236,896	\$55,929

Table 11: Value of open data by state based on datasets posted on data.gov

The remainder of this paper includes a number of case studies across country, functional sector, and data product. In addition, Appendix A provides a detailed breakdown of the Global Data Barometer scores by country.

Case Studies

Case Study 1: Australia and Value of Open Data

Australian Government		
Country: Australia	Department: Not Applicable	
Agency: Not Applicable	Functional Sector: Aggregate	
Open Data Value (2014) AUD 25 Billion ⁴⁴	Population (2014) 23.4 Million ⁴⁵	Per Capita Data Value AUD 1,064
Mission: Improve the lives of citizens		
Data Products: Open data		
Data Management Metrics – Value of Data: The Australian Government acknowledges multiple estimates of the value of open data varying by levels of economic benefits. On the upper range, an estimate in 2014 valued Australia’s open data at AUD 25 billion, or 2 percent of GDP at the time. More-conservative estimates peg the value for economy-wide data to be up to AUD 34 billion but include a lower bound of public sector data at AUD 3.9 billion.		

⁴⁴ Australian Government, *Australian Data Strategy: The Australian Government’s whole-of-economy vision for data*, <https://www.finance.gov.au/sites/default/files/2022-10/australian-data-strategy.pdf>.

⁴⁵ Australian Bureau of Statistics, “3101.0 – Australian Demographic Statistics, Jun 2014,” <https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3101.0Main+Features1Jun%202014>.

Case Study 2: E-Estonia Increases Cost Savings and Improves Voter Turnout

Estonia	
Country: Estonia	Department: Not Applicable
Agency: Not Applicable	Functional Sector: Aggregate
Cost Savings / GDP	Improvement in Voter Turnout
2%	8.3%
Mission: The development of the Estonian e-Government is based on the Principles of the Estonian Information Policy, adopted by the Estonian Parliament in 1998. Through this, the government initiated a digital transformation to increase efficiency of its processes and public services.⁴⁶ Data Product: The first key decision was to create a digital identity (ID-card). This ID-card was made compulsory and was considered as the best way, in the digital world, to manage the impact of government services on individual citizens. The card was issued by the government and was made mandatory. The second foundational decision was to develop the X-Road data management infrastructure. Oftentimes, small governments seek to centralize their data in the name of efficiency. Centralized structures facilitate access to data and are usually less expensive to build. But centralized data management also creates vulnerabilities and increases risk: hackers would only have to attack one facility to access all data. Estonia chose a hybrid approach, innovating on the centralized structure to create a decentralized linked data infrastructure, thereby addressing intersystem connectivity up front, resulting in less duplication of data. To ensure all its government bodies would all adopt this strategy, the country passed a law stipulating that the same information should not be asked for twice. Agencies looking for some information should go directly to the agency holding the data. Data Management Metrics – Improved Voter Turnout and Cost Savings: The proof of concept was tested in 2004, with internet voting being the first application in 2005. The uptake slowly increased. In 2015, 19.6 percent of eligible voters voted online, representing 30.5 percent of the participating voters. In March 2019, the numbers were 27.9 percent and 43.9 percent, respectively. It is estimated that the use of the data exchange layer, X-Road, and electronic signature saves 2 percent of the Estonian GDP each year.	

⁴⁶ OECD iLibrary, “Chapter 13, Case Study 8: Estonia e-government and the creation of a comprehensive data infrastructure for public services and agriculture policies implementation,” <https://www.oecd-ilibrary.org/sites/510a82b5-en/index.html?itemId=/content/component/510a82b5-en>.

Case Study 3: Kingdom of Saudi Arabia and Data as a National Treasure

Kingdom of Saudi Arabia – Value of Data of Government-Owned Entities	
Country: Kingdom of Saudi Arabia	Ministry: Not Applicable
Agency: Not Applicable	Functional Sector: Aggregate
Mission: Manage data as a national treasure Data Products: Data owned by government-owned corporations Data Management Metrics – Value of Data: The Kingdom of Saudi Arabia (KSA) has established the National Data Management Office (NDMO)⁴⁷ within the Saudi Data & AI Authority (SDAIA)⁴⁸ to define how data should be used effectively and impartially within the Kingdom. The NDMO mission statement refers to data as “the new oil.” This analysis uses publicly available information to quantify the financial value of data for the largest companies in the KSA.⁴⁹ The aggregate data value for KSA is at least SAR 467 billion, or 4.8 percent of company market capitalization and 14.9 percent of gross domestic product (GDP). These numbers are based on an analysis of a sample of publicly traded companies that account for more than 88 percent of the market capitalization of the Saudi Stock Exchange Tadawul (see Figure 9). Based on a population of 35.3 million, the per capita data value is SAR 13,223. Approximately 63 percent of the per capita data value flows from hydrocarbons, with the remaining 37 percent flowing from non-hydrocarbon businesses. The hydrocarbon data value essentially flows from the Saudi Arabian Oil Company (Aramco).	
 SAR 9.8 Trillion Aggregate Corporate Value (YDC Covered Companies¹) SAR 3.1 Trillion Gross Domestic Product SAR 467 Billion Aggregate Data Valuation² 4.8% Weighted DMI™ Index³ (Data Value / Corporate Value) 14.9% Weighted DMI Index³ (Data Value / GDP) 35.3 Million Population SAR 88,683 Per Capita GDP SAR 13,223 Per Capita Data Value 63% Per Capital Data Value (Hydrocarbons) 37% Per Capital Data Value (Non-Hydrocarbons) - Covered companies in excess of 88 percent of Saudi Stock Exchange Tadawul - Source: YDC analysis as of October 13, 2022, www.yourdataconnect.com - DMI index is the ratio of data value to aggregate company enterprise value / market capitalization or Gross Domestic Product	
<i>Figure 9: Data as a national treasure for the Kingdom of Saudi Arabia</i>	

⁴⁷ National Data Management Office, “About National Data Management Office,” <https://sdaia.gov.sa/ndmo/?Lang=en>

⁴⁸ Saudi Data & AI Authority, <https://sdaia.gov.sa>

⁴⁹ Aggregate Data Value for Kingdom of Saudi Arabia Is at Least SAR 467 Billion, or 4.8 Percent of Corporate Value and 14.9 Percent of GDP, YDC Analysis, [www.yourdataconnect.com](https://yourdataconnect.com).

Case Study 4: US Federal Data Strategy and Value of Open Data

United States Federal Government		
Country: United States	Department: Not Applicable	
Agency: Not Applicable	Functional Sector: Aggregate	
Value of Open Data \$470 Billion	Population 332 Million	Value of Open Data per Capita \$1,416
Mission: The US Federal Data Strategy provides a common set of data principles and best practices in implementing data innovations that drive more value for the public.⁵⁰ Data Product: The US Federal Data Strategy is a key data product based on the GPRA Modernization Act of 2010.⁵¹ The Federal Data Strategy 2020 action plan contains a number of key actions, with a few noteworthy items listed below: • Action 5: Identify Priority Data Assets for Agency Open Data Plans By December 2020, all agencies will identify their initial list of priority data assets for agency open data plans as prescribed by the Evidence Act. This list will describe data assets that the agency considers especially valuable to the public interest and therefore intends to make available as open government data. Data.gov is the home of the US government’s open data, with 258,383 datasets available as of June 24, 2023.⁵² • Action 7: Launch a Federal Chief Data Officer Council By January 2020, the Office of Management and Budget (OMB) will launch, and agency chief data officers (CDOs) will participate in, a CDO Council as required by the Evidence Act. • Action 17: Pilot an Automated Tool for Information Collection Reviews That Supports Data Inventory Creation and Updates By July 2020, the National Center for Education Statistics (NCES) within the US Department of Education will complete a pilot of an automated tool that leverages agency Information Collection Review (ICR) processes and documentation to build agency data inventories and update metadata in agency data inventories. Under the Paperwork Reduction Act, all agencies must undergo an ICR in order to gain approval from OMB to collect information from the public. For many agencies, a substantial fraction of data inventory items originates with an information collection. Data Management Metrics – Value of Open Data: The value of open data is covered earlier in this paper.		

⁵⁰ US Federal Data Strategy, “2020 Action Plan,” <https://strategy.data.gov/action-plan>.

⁵¹ US Congress, *Government Performance and Results (GPRA) Modernization Act of 2010*, <https://www.congress.gov/111/plaws/publ352/PLAW-111publ352.pdf>.

⁵² Data.gov, “The Home of the U.S. Government’s Open Data,” <https://data.gov>.

Case Study 5: US Office of Information and Regulatory Affairs (OIRA) Estimates of Government-Wide Cost of Information Collections

US OIRA			
Country: United States		Department: Office of Management and Budget (OMB), The US White House	
Agency: Office of Information and Regulatory Affairs		Functional Sector: All	
Active OMB Control Numbers	Total Annual Responses	Total Annual Hours	Total Annual Cost
10,237	126 Billion	10.5 Billion	\$163 Billion
Mission: The Office of Information and Regulatory Affairs (OIRA) is a federal office that was established in the 1980 Paperwork Reduction Act (PRA). OIRA is part of the Office of Management and Budget (OMB), which is an agency within the Executive Office of the President. The goals of the PRA include (1) minimizing paperwork and reporting burdens on the American public and (2) ensuring the maximum possible utility from the information that is collected.⁵³ Data Product: An information collection request (ICR) is an agency request for OMB approval of an information collection. It includes a description of the collection and its planned use as well as other information that demonstrates that the agency has met the requirements of the PRA. OIRA reviews agency ICRs for approval or disapproval. When OMB approves an information collection, it assigns an OMB Control Number that the agency must display on the information collection. Data Management Metrics – Total Annual Hours and Cost Associated with ICRs: According to OIRA’s inventory of currently approved information collection, there were 10,237 active information collections on June 24, 2023. These information collections were estimated to generate 126 billion annual responses aggregating 10.5 billion hours at a cost of \$163 billion.⁵⁴			

⁵³ Reginfo.gov, Frequently Asked Questions, <https://www.reginfo.gov/public/jsp/Utilities/faq.myjsp>.

⁵⁴ Reginfo.gov, “Office of Information and Regulatory Affairs (OIRA) Inventory of Currently Approved Information Collections,” government-wide totals, <https://www.reginfo.gov/public/do/PRAREport?operation=11>.

Case Study 6: US Federal Reserve Economic Data – External Endorsement

Federal Reserve Economic Data (FRED)	
Country: United States	Department: Federal Reserve System
Agency: Federal Reserve Bank of St. Louis	Functional Sector: Central Banking
Mission: Ensure a safe, flexible, and stable monetary and financial system Data Product Overview: FRED is a database maintained by the research division of the US Federal Reserve Bank of St. Louis, which contains more than 822,000 US and international time series from 110 data sources.⁵⁵ The database covers topics across banking, business, fiscal, consumer price indexes, employment, population, exchange rates, gross domestic product, interest rates, monetary aggregates, producer price indexes, US trade and international transactions, and US financial data. The time series are compiled by the Federal Reserve, and many are collected from government agencies such as the US Census and the Bureau of Labor Statistics.⁵⁶ Metric Type – External Endorsement: Joe Weisenthal from <i>Business Insider</i> magazine characterized FRED as “The Most Amazing Economics Website in the World.”⁵⁷ Nobel Laureate economist Paul Krugman characterized his usage of FRED as follows: “I’d say three or four times a week, at least—basically any time I’m addressing a US macroeconomic issue.”⁵⁸	

⁵⁵ Federal Reserve Bank of St. Louis, “Federal Reserve Economic Data (FRED),” <https://fred.stlouisfed.org>.

⁵⁶ Wikipedia, “Federal Reserve Economic Data,” https://en.wikipedia.org/wiki/Federal_Reserve_Economic_Data.

⁵⁷ “The Most Amazing Economics Website in the World,” Joe Weisenthal, *Business Insider*, March 23, 2012, <https://www.businessinsider.com/fred-2012-3>.

⁵⁸ Ibid.

Case Study 7: US Federal Reserve Economic Data – Usage Metrics

Federal Reserve Economic Data (FRED)	
Country: United States	Department: Federal Reserve System
Agency: Federal Reserve Bank of St. Louis	Functional Sector: Central Banking
Mission/Data Product: See Case Study 6. Metric Type: Usage metrics. FRED had the following usage statistics during 2011:⁵⁹ • 1.9 million visits from 200 countries (42 percent increase over 2010) • 6,000 visits per day on average • 14.5 million page views • 14.7 million data calls sent through API in Q4 2011 • 15,000 new series added during 2011	

⁵⁹ Ibid.

Case Study 8: US Federal Communications Commission Enforcement Bureau – Fines and Penalties

Federal Communications Commission (FCC) Enforcement Bureau		
Country: United States	Department: Federal Communications Commission (FCC)	
Agency: Enforcement Bureau	Functional Sector: Communications	
Average Fines per Year \$170 Million ⁶⁰	Annual Budget \$48 Million ⁶¹	Fines / Budget 354%
Mission: The FCC is the agency charged with implementing and enforcing the provisions of the Communications Act of 1934. Pursuant to its authority under the Communications Act, the Commission promulgates rules and engages in enforcement actions to invoke its rules.⁶² The FCC consists of the following seven bureaus: • Consumer & Governmental Affairs Bureau • Enforcement Bureau • Media Bureau • Public Safety & Homeland Security Bureau • Space Bureau • Wireless Telecommunications Bureau • Wireline Competition Bureau And the following 12 offices: • Office of Administrative Law Judges • Office of Communications Business Opportunities • Office of Economics and Analytics • Office of Engineering and Technology • Office of the General Counsel • Office of Inspector General • Office of International Affairs (OIA) • Office of Legislative Affairs • Office of the Managing Director • Office of Media Relations • Office of the Secretary • Office of Workplace Diversity Data Products at Enforcement Bureau: Enforcement data on subjects of investigations. Data Management Metrics – Fines and Penalties: The FCC Enforcement Bureau levied 494 fines worth \$3.9 billion from the year 2000 through May 2023, or roughly \$170 million per year.⁶³		

⁶⁰ Good Jobs First, "Violation Tracker," <https://violationtracker.goodjobsfirst.org>.

⁶¹ US Federal Communications Commission, *2023 Budget-In-Brief*, March 2022, <https://docs.fcc.gov/public/attachments/DOC-381693A2.pdf>.

⁶² US Federal Communications Commission, "Enforcement," <https://www.fcc.gov/enforcement>.

⁶³ Good Jobs First, "Violation Tracker," <https://violationtracker.goodjobsfirst.org>.

Case Study 9: US Department of Defense Acquisitions Aggregate Spend on Data and Analytics

US Department of Defense			
Country: United States		Department: Department of Defense	
Agency: Acquisitions		Functional Sector: Defense	
Analytics Workforce	IT Systems	Data & Analytics Costs	Major Acquisition Costs
\$11 – 15 Billion	\$3 Billion	\$14 – 18 Billion	\$276 Billion
Acquisition FTEs	Data & Analytics Share of Acquisition Costs	Data & Analytics Costs per Acquisition FTE	
185K	5.1% – 6.5%	\$76K – \$97K	
Mission: The US Congress expressed concern over the past several years about the extent and currency of data analytics in the US Department of Defense (DoD) and their use in the DoD’s acquisition management and decision-making. One question asked was about the extent to which “data analytics capabilities have been implemented within the military services, DoD laboratories, test centers, and Federally Funded Research and Development Centers to provide technical support for acquisition program management.” The Rand Corporation produced a report to address these questions. ⁶⁴			
Data Product: DoD data analytics in support of acquisition program management and decision-making encompass a large array of data analytics applications, including market research, cost estimating, risk analysis, engineering, test and evaluation (T&E), security, supply chain, contracting, production, auditing, and sustainment.			
Data Management Metrics – Estimated Acquisition Spend on Data and Analytics: Cost estimating, engineering, T&E, production and quality management, and auditing functions are predominantly data analytic in nature. One estimate indicated that the DoD spends about \$13 billion per year on these capabilities (plus or minus \$2 billion per year), using the average wage levels reported by the US Bureau of Labor Statistics. In terms of major IT systems supporting acquisition (not desktop computing), the budget exhibits include about \$3 billion per year (about \$0.5 billion for acquisition systems and about \$2.5 billion for logistics and supply chain systems). These information systems have a mix of acquisition process support, data collection and archiving, and data analytics layers; this helps to measure the underlying enabling capability that ultimately informs acquisition decisions during execution, management, and oversight.			
The Defense Acquisition Workforce has 185,000 members. ⁶⁵ The Fiscal Year 2023 acquisition (Procurement and Research, Development, Test, and Evaluation (RDT&E)) funding requested by the DoD totaled \$276 billion. ⁶⁶			

⁶⁴ Rand Corporation, Philip S. Anton, Megan McKernan, Ken Munson, James G. Kallimani, Alexis Levedahl, Irv Blickstein, Jeffrey A. Drezner, Sydne J. Newberry, *Assessing Department of Defense Use of Data Analytics and Enabling Data Management to Improve Acquisition Outcomes*, https://www.rand.org/pubs/research_reports/RR3136.html.

⁶⁵ US Department of Defense, "Strengthening, Empowering the Acquisition Workforce Through Modernization," Devon Bistarkey, Matt Howard, February 8, 2022, <https://www.defense.gov/News/News-Stories/Article/Article/2927317/strengthening-empowering-the-acquisition-workforce-through-modernization>.

⁶⁶ *US Department of Defense Fiscal Year 2023 Budget Request*, https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2023/FY2023_Weapons.pdf.

Case Study 10: US Department of Defense Global Positioning System and Value of Data

Global Positioning System (GPS)		
Country: United States	Department: US Department of Defense	
Agency: US Space Force	Functional Sector: Defense	
Benefits 1980s – 2019 \$1.4 Trillion	Value per Day \$1 Billion	Value per Day During Planting Season \$1.5 Billion
Mission: The US Space-Based Positioning, Navigation, and Timing Policy of 2021 sought to maintain US leadership in the service provision and responsible use of global navigation satellite systems, including GPS and foreign systems. The US government provides civilian access to GPS on a continuous, worldwide basis, free of user fees. Data Products: GPS data is based on a constellation of satellites owned by the US Space Force. Data Management Metrics – Value of Data: A 2019 study by RTI International estimated that for the United States alone, GPS has generated roughly \$1.4 trillion in economic benefits since it was made available for civilian and commercial use in the 1980s. The estimate was based on 2017 dollars. The study’s authors further estimated that the loss of GPS service would average a \$1 billion per day impact to the nation. If the outage were to occur during the critical planting season in April and May and lasted multiple weeks, the impacts could be as much as 50 percent higher because of the widespread adoption of GPS-enabled precision agriculture technologies by American farmers. Benefits include productivity gains from new and existing products and services, improvements in quality, increases in personal enjoyment, and environmental and public health impacts. The benefits were based on 10 economic sectors, including precision agriculture, financial services, location-based services, mining, surveying, telecommunications, telematics, electricity, maritime navigation, and use in oil and gas industries.⁶⁷		

⁶⁷ NIST, “Economic Benefits of the Global Positioning System to the U.S. Private Sector Study,” Kathleen McTigue, October 2, 2019, <https://www.nist.gov/news-events/news/2019/10/economic-benefits-global-positioning-system-us-private-sector-study>.

Case Study 11: UK Financial Conduct Authority – Removal of High-Risk Financial Advertisements

UK Financial Conduct Authority (FCA)		
Country: United Kingdom	Department: Financial Conduct Authority	
Agency: Not Applicable	Functional Sector: Securities Enforcement	
High-Risk Advertisements Removed	Average Losses	Losses Avoided by Savers Due to FCA Actions
564	£22,000 ⁶⁸	£12.4 Million
Mission: The UK Financial Conduct Authority (FCA) regulates the conduct of 50,000 firms in the UK with the following mission:⁶⁹ • Protect consumers from bad conduct • Protect the integrity of the UK financial system • Promote effective competition in the interests of consumers Data Product: Analytical models to spot and intervene in potential instances of consumer harm with high-risk financial advertisements.⁷⁰ Data Management Metrics – Improved Outcomes: In 2021, FCA intervention caused firms to amend or withdraw 564 promotions, which was double the number of previous years.		

⁶⁸ Financial Conduct Authority, Average amount savers lost to investment scammers, April 2020 – March 2021, Action Fraud, <https://www.fca.org.uk/publications/corporate-documents/consumer-investments-strategy>.

⁶⁹ Financial Conduct Authority, "About the FCA," <https://www.fca.org.uk/about/what-we-do/the-fca>.

⁷⁰ Financial Conduct Authority, "Data strategy update 2022," <https://www.fca.org.uk/publications/corporate-documents/data-strategy-update-2022>.

Case Study 12: UK Financial Conduct Authority – Identification of Scams

UK Financial Conduct Authority (FCA)		
Country: United Kingdom	Department: Financial Conduct Authority	
Agency: Not Applicable	Functional Sector: Securities Enforcement	
Scams Avoided	Average Losses	Losses Avoided by Savers Due to FCA Actions
1,966	£22,000 ⁷¹	£43.2 Million
Mission: See Case Study 11.		
Data Product: The UK Financial Conduct Authority (FCA) scans an average of 100,000 websites created every day to identify newly registered domains that show characteristics that could be used for scams or fraud. Where the FCA identifies a fraudulent or illegal website, it publishes a warning to consumers and writes to the website's registrar to request that the site be taken down. ⁷²		
Data Management Metrics – Improved Outcomes: From May 2021 to April 2022, the FCA added 1,966 firms to the potential scams list. This ongoing scanning work is vital in supporting delivery of the FCA's commitment to reducing and preventing financial crime.		

⁷¹ Financial Conduct Authority, Average amount savers lost to investment scammers, April 2020 – March 2021, Action Fraud, <https://www.fca.org.uk/publications/corporate-documents/consumer-investments-strategy>.

⁷² Financial Conduct Authority, "Data strategy update 2022," <https://www.fca.org.uk/publications/corporate-documents/data-strategy-update-2022>.

Case Study 13: UK National Health Service and Value of Data

UK National Health Service (NHS)		
Country: United Kingdom	Department: NHS	
Agency: Not Applicable	Functional Sector: Health	
Aggregate Data Value	Number of Patients	Value of Data per Patient
£9.6 Billion	55 Million	£175
Mission: Improve constituent health and wellbeing, supporting them to keep mentally and physically well, to get better when they are ill, and, when they cannot fully recover, to stay as well as they can to the end of their lives. ⁷³		
Data Products: Healthcare records, including electronic medical records.		
Data Management Metrics – Value of Data: EY estimated that the 55 million patient records held by the UK’s National Health Service (NHS) may have an indicative market value of several billion pounds to a commercial organization. ⁷⁴ EY further estimated that the value of the curated NHS dataset could be as much as £5 billion per annum and deliver around £4.6 billion of benefit (aggregate value of £9.6 billion per annum) to patients per annum—generated through potential operational savings for the NHS, enhanced patient outcomes, and creation of wider economic benefits to the UK, generated through “big data,” artificial intelligence, and personalized medicine.		

⁷³ Department of Health and Social Care, “The NHS Constitution for England,” January 1, 2021, <https://www.gov.uk/government/publications/the-nhs-constitution-for-england/the-nhs-constitution-for-england>.

⁷⁴ EY, *Realising the value of health care data: a framework for the future*, https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/life-sciences/life-sciences-pdfs/ey-value-of-health-care-data-v20-final.pdf.

Case Study 14: Australian Bureau of Meteorology – Damage Avoidance from Meteorological Data

The Bureau of Meteorology		
Country: Australia	Department: The Bureau of Meteorology	
Agency: Not Applicable	Functional Sector: Meteorology	
Damage Avoidance AUD 450 Million ⁷⁵	Annual Budget AUD 334 Million ⁷⁶	Savings / Budget 135%
Mission: Provide trusted, reliable, and responsive weather, water, climate, ocean, and space weather services for Australia—all day, every day. Data Products: Meteorological data. Data Management Metrics – Value of Data: The Bureau of Meteorology within the Australian Government collects and uses data regarding weather activity within and around the continent. Natural disasters are better understood, and citizens are more prepared for them, through the use of this data. The estimated avoidance of damage as a direct result of the data being used is about AUD 450 million per year based on a 2016 study.		

⁷⁵ Australian Government, *Australian Data Strategy: The Australian Government's whole-of-economy vision for data*, <https://www.finance.gov.au/sites/default/files/2022-10/australian-data-strategy.pdf>.

⁷⁶ Bureau of Meteorology, *Strategic Cost Review*, http://www.bom.gov.au/foi/release/FOI30-003_Doc1_RedactedForRelease_20200929.pdf.

Case Study 15: US National Oceanic and Atmospheric Administration and Value of Weather Data

US National Oceanic and Atmospheric Administration (NOAA)			
Country: United States		Department: Department of Commerce	
Agency: NOAA		Functional Sector: Meteorology	
Value per Weather Forecast	Annual Value	Cost of Forecasts	Value / Cost of Forecasts
10.5¢	\$31.5 Billion	\$5.1 Billion	618%
Mission: To understand and predict changes in climate, weather, ocean, and coasts; to share that knowledge and information with others; and to conserve and manage coastal and marine ecosystems and resources.⁷⁷ Data Products: From daily weather forecasts, severe storm warnings, and climate monitoring to fisheries management, coastal restoration, and support of marine commerce, NOAA's products and services support economic vitality and affect more than one-third of the GDP of the United States.⁷⁸ Data Management Metrics – Value and Cost of Weather Forecasts: A 2009 survey by scientists at the National Center for Atmospheric Research (NCAR) indicated that US households placed an average value of 10.5 cents on every weather forecast obtained. This equated to an annual value of \$31.5 billion. In comparison, the cost of providing forecasts by government agencies and private companies was \$5.1 billion.⁷⁹			

⁷⁷ National Oceanic and Atmospheric Administration, "About Our Agency," <https://www.noaa.gov/about-our-agency>.

⁷⁸ Ibid.

⁷⁹ National Science Foundation, "Weather Forecasts of Great Value to Americans, Survey Finds," June 23, 2009, https://www.nsf.gov/news/news_summ.jsp?cntn_id=115039.

Case Study 16: Australian Census and Value of Data

Australian Bureau of Statistics		
Country: Australia	Department: Department of Treasury	
Agency: Australian Bureau of Statistics	Functional Sector: Statistics	
Five-Year Benefits AUD 4,160 Million	Five-Year Costs AUD 670 Million	Benefits / Costs 621%
Mission: The Australian Bureau of Statistics is the country's national statistical agency and an official source of independent, reliable information. Data Products: Australian Census. Data Management Metrics – Value of Data: In May 2019, the Australian Bureau of Statistics commissioned Lateral Economics to estimate the value of the benefits gained by the country through the use and application of census data. The report estimated the five-year benefits of census data at AUD 4,160 million, with associated costs of AUD 670 million. In summary, for every AUD 1 invested in the census, AUD 6 of value was generated to the Australian economy.⁸⁰		

⁸⁰ *Valuing the Australian Census*, August 27, 2019, Lateral Economics, <https://www.abs.gov.au/census/about-census/value-census>.

Case Study 17: Statistical Agencies and Open Data

Many countries have statistical agencies to provide trusted, open data. For example, Eurostat produces European statistics in partnership with national statistical institutes and other national authorities in the EU Member States. The US federal statistical system is a decentralized network of federal agencies, which produce data and official statistics about the country's people, economy, natural resources, and infrastructure. The federal statistical system is coordinated through the Office of Management and Budget (OMB). OMB establishes and enforces statistical policies and standards, ensures that resources are proposed for priority statistical programs, and approves statistical surveys conducted by the federal government. The chief statistician of the United States, also housed within OMB, provides oversight, coordination, and guidance for federal statistical activities, working in collaboration with leaders of statistical agencies.⁸¹

Profiles of Government Statistical Agencies

Agency: Eurostat	Parent: European Union
Country: European Union	Functional Sector: All
Description: Produces European statistics in partnership with national statistical institutes and other national authorities in the EU Member States. ⁸²	

Agency: Institut National de la Statistique et des Etudes Economiques (Insee)	Parent: France
Country: France	Functional Sector: All
Description: Produces statistics for France and coordinates with Eurostat. ⁸³	

Agency: Istituto Nazionale di Statistica (Istat)	Parent: Italy
Country: Italy	Functional Sector: All
Description: Produces statistics for Italy and coordinates with Eurostat. ⁸⁴	

Agency: Bureau of Labor Statistics	Parent: Department of Labor
Country: United States	Industry: Government
Description: Acts as the principal fact-finding agency in the broad field of labor economics and statistics. ⁸⁵	

Agency: Department of Commerce	Parent: Bureau of Economic Analysis
Country: United States	Industry: Government
Description: Produces some of the world's most closely watched statistics, including US gross domestic product, state and local numbers, foreign trade, investment statistics, and industry data. ⁸⁶	

Agency: Department of Transportation	Parent: Bureau of Transportation Statistics
Country: United States	Functional Sector: Transportation
Description: Acts as the preeminent source of US statistics on commercial aviation, multimodal freight activity, and transportation economics and provides context to decision-makers and the public for understanding statistics on transportation. ⁸⁷	

⁸¹ Wikipedia, "Federal Statistical System of the United States," https://en.wikipedia.org/wiki/Federal_Statistical_System_of_the_United_States.

⁸² Eurostat, <https://ec.europa.eu/eurostat/web/main/about-us/who-we-are>.

⁸³ Insee, <https://www.insee.fr/en/accueil>.

⁸⁴ Istat, <https://www.istat.it>.

⁸⁵ Bureau of Labor Statistics, <https://www.bls.gov/bls/about-bls.htm>.

⁸⁶ Bureau of Economic Analysis, <https://www.bea.gov/about/who-we-are>.

⁸⁷ Bureau of Transportation Statistics, <https://www.bts.gov/about-BTS>.

Agency: Library of Congress Country: United States Description: Acts as a research library in Washington, DC, which serves as the library of the US Congress and the de facto national library of the United States. ⁸⁸	Parent: Government of the United States Functional Sector: Archives
Agency: Energy Information Administration Country: United States Description: Collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. ⁸⁹	Parent: Department of Energy Industry: Energy
Agency: Office for National Statistics Country: United Kingdom Description: The UK's largest independent producer of official statistics and its recognized national statistical institute. Responsible for collecting and publishing statistics related to the economy, population, and society at national, regional, and local levels. Conducts the census in England and Wales every 10 years. ⁹⁰	Parent: UK Statistics Authority Functional Sector: All

⁸⁸ Britannica, "Library of Congress," <https://www.britannica.com/topic/Library-of-Congress>.

⁸⁹ US Energy Information Administration, <https://www.eia.gov/about>.

⁹⁰ Office for National Statistics, <https://www.ons.gov.uk/aboutus>.

Case Study 18: National Highways, England and Value of Data

National Highways, England		
Country: United Kingdom	Department: Independent	
Agency: Not Applicable	Functional Sector: Transportation	
Value of Data £60 Billion	Number of Drivers 34.8 Million ⁹¹	Value of Data per Driver £1,724
Mission: Manage and improve England’s motorways and major A roads, helping customers have safer, smoother, and more reliable journeys.⁹² Data Products: Data relating to roads, including tolls and vehicle movements. Data Management Metrics – Value of Data: Davin Crowley-Sweet is the CDO of National Highways in England. National Highways manages and improves over 4,300 miles of motorways and major roads in England known as the strategic road network (SRN). Davin discovered that Microsoft Windows® licenses were worth more on the balance sheet than 50 years of data describing how National Highways had successfully designed, built, maintained, and operated one of the safest, most complex, and high-performing pieces of critical transport infrastructure in the world. National Highways’ data is worth £60 billion to UK Plc, or half of the value of the tangible assets. These estimates are based on the agency’s internal methodologies, which were not made public.⁹³ Davin’s team also developed a value map that displayed direct line-of-sight between data and value. In addition, his team laid out several use cases for the data to drive value realization.		

⁹¹ RAC Foundation, Estimated number of English residents with a driving license in 2021, <https://www.racfoundation.org/motoring-faqs/mobility>.

⁹² National Highways, <https://nationalhighways.co.uk/about-us>.

⁹³ “The value of data: Delivering a digital road,” National Highways, Davin Crowley-Sweet, October 12, 2021.

Appendix A: Global Data Barometer Survey 2019–2021, Use of Data for Public Good

Country Name	GDB 2021 score	Country Name	GDB 2021 score	Country Name	GDB 2021 score	Country Name	GDB 2021 score
United States of America	68	Ireland	46	Viet Nam	33	Botswana	20
Estonia	67	Armenia	45	Uzbekistan	32	Côte d'Ivoire	20
France	66	Czechia	45	Jamaica	31	Gambia	20
New Zealand	66	Romania	43	New Caledonia	31	Belarus	19
United Kingdom	65	Sweden	43	Uganda	31	Guatemala	19
Republic of Korea	64	Israel	42	South Africa	30	Namibia	19
Canada	61	Kazakhstan	42	Saudi Arabia	29	Nepal	19
Brazil	58	Malaysia	42	Ghana	28	Liberia	17
Germany	58	Portugal	42	United Arab Emirates	27	Sri Lanka	16
Denmark	58	Russian Federation	42	Kenya	26	Malawi	15
Italy	57	Thailand	42	Honduras	25	State of Palestine	15
Spain	56	Moldova	41	Rwanda	25	Togo	15
Australia	55	China	40	Bangladesh	24	Benin	14
Finland	55	Georgia	40	Bahamas	24	Oman	14
Ukraine	55	Indonesia	40	Belize	24	Cambodia	13
Uruguay	55	Kosovo	40	Cameroon	24	El Salvador	13
Colombia	54	Albania	38	Kyrgyz Republic	24	Morocco	12
Netherlands	54	Peru	38	Nigeria	24	Senegal	12
Chile	53	Greece	37	Burkina Faso	23	Sierra Leone	12
Mexico	51	Lithuania	37	Tunisia	23	Tajikistan	12
Slovakia	51	Malta	37	Azerbaijan	22	Angola	11
Taiwan	51	Dominican Republic	35	Bahrain	22	Guyana	11
Argentina	50	Ecuador	35	Bolivia	22	Mozambique	10
Bulgaria	50	Panama	35	Egypt	22	Haiti	8
Hong Kong	49	Costa Rica	34	Jordan	22	Turkmenistan	6
Latvia	49	Philippines	34	Qatar	22		
Croatia	48	Paraguay	34	Trinidad and Tobago	22		
India	47	Mongolia	33	Saint Lucia	21		