**DIGITAL TRADE &
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A Content Analysis of National Data Strategies
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Overview

Data has become the foundation of the global economy. Individuals, governments, and firms have long relied on data to better understand their world, but today researchers use large troves of data and new analytic techniques to generate insights and make predictions. Various types of data can be analyzed to create new products and services or to mitigate complex wicked problems that transcend generations and nations (a public good function). Because of the multidimensional nature of data, some analysts describe data as both a commercial asset *and* a public good.[2]

However, data doesn't quite fit the public good paradigm. Data is inherently non-rival—it doesn't get used up as more people use it. Data can be copied and reused at little or no cost. But users can be excluded through a wide range of strategies including intellectual property rights, trade rules, data governance rules, and price.[3]

In most economies, we rely on market forces–supply and demand to produce needed goods and services. But markets, including markets for data, don't always work efficiently or equitably. The people of the world don't all have equal access, ability, and understanding to use data effectively (a data divide). Countries also have different abilities to collect and monetize data to enhance human welfare.[4]

Today, data is both plentiful and precious. Data is plentiful for a wide range of reasons including an explosion in the number of firms, devices and apps using data and a dramatic decrease in the cost of data storage and data analysis[5]. Data is precious because many government, business and civil society officials see the data they have collected as proprietary. These officials understand the data they hold will have value and they can easily store and hoard it. However, an economy built on data analysis also brings problems — firms and governments can manipulate or misuse data, and in so doing undermine human autonomy and human rights. Moreover, governments struggle to govern data—to balance open access and sharing of data, with protection and anonymization of data. Given the complicated nature of data and its various types (for example,

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[2] Bennett Institute for Public Policy, 2020a, "The Value of Data, Summary Report,"
[3] Bennett Institute, "The Value," p. 7.
[4] UNCTAD. "Digital Economy Report, Cross-Border Data Flows and Development: For whom the data flow," 2021, https://unctad.org/webflyer/digital-economy-report-2021 and Miranda Montoya MC, et al, " A blank check or a global public good? A qualitative study of how ethics review committee members in Colombia weigh the risks and benefits of broad consent for data and sample sharing during a pandemic," PLOS Glob Public Health 2(6): 2022, https://doi.org/10.1371/journal.pgph.0000364
[5] OECD, Digital Data Governance Indicators, https://www.oecd.org/digital/data-governance-indicators/

personal, proprietary, public, and so on), a growing number of governments have decided to outline how they see data's role in the economy and polity. Put differently, policymakers in these countries have created a national data strategy.

In a recent paper, Aaronson examined national data strategies to better understand what policymakers sought to achieve. The author based her analysis on a sample of 51 nations plus the EU from various regions, income levels, and digital prowess. She found there is a correlation between income, democracy, levels of digital prowess and data governance. Approximately one-fifth, or 10 governments, issued national data strategies, delineating how various types of data could contribute to their nation's social and economic development. All of these nations are characterized as high income by the World Bank, except for China, which is an upper-middle-income country. Two nations in this sample were China and Saudi Arabia are authoritarian. All have medium to high levels of digital prowess. Despite these differences, all of these nations aimed to expand the scale and variety of data, increase skill endowments, build data infrastructure, and use governance (encourage network effects, expand free flow of data, and so on) to enhance the digital economy in their nation. Some governments explicitly used their plans to state that they want to achieve competitive advantage in data-driven sectors. Moreover, sixty percent of these nations want to build comparative advantage in data-driven sectors, while 70 percent say that they use these data governance strategies to build trust in their policies.[6]

Staff at the Digital Trade and Data Governance Hub wanted to examine these data strategies in greater detail. We also thought we could understand them better by relying upon a different approach. First, we expanded the sample from 51 to 68 countries and the EU using 2022 data from the Digital Trade and Data Governance Hub metric.[7] Secondly, we wanted to take a quantifiable approach to examining this set of national data strategies. We utilized a content analysis on the set of text to answer our research questions. Content analysis is a research tool used to determine the presence of certain words, themes, or concepts within some given set of data,[8] For this analysis we focused on the presence of certain words related to our questions.

We had two pressing research questions: First, who was the strategy aimed at? Secondly, does the data strategy address human rights?

We wanted to know the audience for these strategies because data strategies are both innovation strategies and a key component of data governance. Innovation strategies are central to economic performance and social welfare. The Organization for Economic Cooperation and Development (OECD) recommends that nations draft innovation strategies aimed at spurring innovation in people, firms and governance.[9]

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[6] Susan Ariel Aaronson, A Future Built on Data: Data Strategies, Competitive Advantage and Trust, CIGI Papers No. 266, June 2022, https://www.cigionline.org/publications/a-future-built-on-data-data-strategies-competitive-advantage-and-trust/

[7] https://datagovhub.elliott.gwu.edu/research/

[8] https://www.publichealth.columbia.edu/research/population-health-methods/content-analysis

[9] https://www.oecd.org/innovation/the-innovation-imperative-9789264239814-en.htm

We wanted to know if they mentioned human rights for two reasons. First, data governance is not only an important element of governance, but also an essential part of human rights governance. While no one has exact statistics, a large amount of the data collected, analyzed, and sold is personal data. Personal data is information that relates to an identified or identifiable individual. People's ability to control their data, like other issues of autonomy, is becoming a civil rights issue [10] Hence, the OECD defines data governance as principles and policy guidance on how governments can maximize the cross-sectoral benefits of all types of data — personal, non-personal, open, proprietary, public and private — while protecting the rights of individuals and organizations.[11] We wanted to see whether governments acknowledge that delicate balancing act in their data strategies.

We found that as of 2022, twelve countries (17%) from our sample of 69 have produced national data strategies. Table 1 describes our questions, what we hope to learn by asking them, and our findings.

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[10] Pascal D. König, "The place of conditionality and individual responsibility in a 'data-driven economy.'" *Big Data & Society,* November. 2017, https://doi.org/10.1177/2053951717742419, and Susan Aaronson, Data is Different and that's Why the world Needs a new Approach to Governing Cross-Border Data Flows, Digital Policy, Regulation and Governance, May 2019, https://www.emerald.com/insight/content/doi/10.1108/DPRG-03-2019-0021/full/html

[11] OECD, Data governance: Enhancing access to and sharing of data." December 10. https://www.oecd.org/sti/ieconomy/enhanced-data-access.html

Table 1 Overview of approach and research questions

Question	Objective: what do we seek to understand?	Findings
Who was the strategy aimed at?	By understanding who the strategy was aimed at we could better ascertain its purpose(s)	Policymakers most frequently mentioned the private sector, and so we concluded these strategies were aimed at the private sector more than civil society or academics/research. New Zealand was the one exception. We were surprised that policymakers often framed their public audience not as the broad public or constituents or stakeholders but as the workforce or as consumers—two important economic roles.
Does the data strategy discuss human rights?	By seeing if these strategies discuss human rights we can see if data governance is viewed as a means to achieving human rights-oriented goals	We found that policymakers mentioned words describing how market actors should act (with trust, transparently, accountably) towards data in relatively the same amount as mentions of specific human rights. Our finding was consistent across all countries, but Saudi Arabia was the least likely to mention human rights or any of these terms.

While we did not put forward and test specific hypotheses, our finding were both expected and surprising. We were not surprised that policymakers are more focused on the private sector as the key beneficiary of such strategies given that policymakers clearly also see data as a commercial asset. However, we were surprised that they also referred to the public in their economic roles and not more broadly. Moreover, we did not anticipate that policymakers more frequently mentioned how firms should act—built trust, be responsible, act ethically, rather than mention specific human rights that market actors should protect and respect. By so doing, this finding reiterates the first finding that these strategies are aimed at the private sector.

However, we found our methodology was not robust enough to fully meet our objectives. By focusing on specific meanings of words within a sentence, we may have missed the larger context. For example, if a document discussed how certain data analysis techniques might lead to different outcomes for different individuals but does not specifically mention discrimination or bias, our method of analysis would miss this. To put it differently, because of the limitations of our analytical approach, we may have missed the multidimensional nature of data as a consequence of our approach to analysis.

Methods

This report draws on data drawn from the DataGovHub's metric of 68 countries and the EU[12]. Of those countries, we found 12 countries that had national data strategies. Our sample is current as of September 2022. Table 2 lists the countries and shows their type of government, income, and digital prowess. Our sample consists of 9 full democracies; two flawed democracies and one authoritarian nation (Saudi Arabia) The countries that have national data strategies are not economically diverse. Nine of our 12 nation sample are members of the G-20, the world's largest economies—only New Zealand, Norway, and Switzerland are not. They are all high income nations according to the World Bank. Moreover, although some countries do not have a high level of digital competitiveness (Saudi Arabia and Japan) the rest are considered high or very high, according to the IMD World Digital competitiveness ranking, which ranks countries on a scale of 1-100.[13]

Table 2: Nations with National Data Strategies

Country	Type of Government	Income	Digital Competitiveness
UK	Full Democracy	High income	85.83 high
Australia	Full Democracy	High income	78.68 high
EU	Flawed Democracy	High income	Not ranked but generally high or very high
Germany	Full Democracy	High income	79.33
Singapore	Flawed Democracy	High income	95.14.very high
Norway	Full Democracy	High income	91.3 very high
South Korea	Full Democracy	High income	89.72 very high
Saudi Arabia	Authoritarian	High income	64.5 medium
New Zealand	Full Democracy	High income	77.13 high
Japan	Full Democracy	High income	73.1 medium
Switzerland	Full Democracy	High income	94.94 very high
Sweden	Full Democracy	High Income	95.1 very high

Sources: Regime Type: The Economist Intelligence Unit Democracy Index 2021, The China Challenge, https://www.eiu.com/n/campaigns/democracy-index-2021/; Income and Regions from the World Bank, https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups and Digital Competitiveness from IMD, https://www.imd.org/centers/world-competitiveness-center/rankings/world-digital-competitiveness/

We define national data strategies as a strategy designed to increase the provision, use, and re-use of various types of data. Most such data strategies cover data as a commercial asset, and

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[12] https://datagovhub.elliott.gwu.edu/research/

[13] The World Digital Competitiveness Ranking analyses and ranks countries' ability to adopt and explore digital technologies leading to transformation in government practices, business models and society in general. Digital competitiveness is assessed based on three major criteria: knowledge, technology, and future readiness. World Digital Competitiveness Ranking 2021, https://www.imd.org/centers/world-competitiveness-center/rankings/world-digital-competitiveness/

some strategies address data as a public good.[14] According to the World Bank, data strategies include plans for ethically making the most of data, devising domestic institutional arrangements, identifying government entities that need to be created or appointed, as well as key performance indicators to measure how well institutions are achieving results.[15]

The 12 countries and the links to the national data strategies can be found in Table 3 below. We note that in contrast with Aaronson: 2022, our sample does not include China because China issued multiple documents discussing data including in its 5 year plans, but we did not find an overarching document that discussed the role or data in the economy and the polity.

Table 3: National Data Strategies

Country	Title	link to web
Australia	Australian Data Strategy: The Australian Government's whole-of-economy vision for data (December 2021)	https://ausdatastrategy.pmc.gov.au/sites/default/files/2021-12/australian-data-strategy.pdf
European Union	A European strategy for data: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (19 February 2020)	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0066&from=EN
Germany	Data Strategy of the Federal German Government: An innovation strategy for social progress and sustainable growth (27 January 2021)	https://www.bundesregierung.de/resource/blob/998194/1950610/fb03f669401c3953fef8245c3cc2a5bf/datenstrategie-der-bundesregierung-englisch-download-bpa-data.pdf?download=1
Japan	Comprehensive Data Strategy (18 June 18, 2021)	https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/63d84bdb-0a7d-479b-8cce-565ed146f03b/02063701/policies_data_strategy_outline_02.pdf
New Zealand	Data Strategy and Roadmap for New Zealand (December 2018)	https://www.data.govt.nz/assets/Uploads/data-strategy-and-roadmap-dec-18.pdf
Norway	Data as a resource: The data-driven	https://www.regjeringen.no/no/doku

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	economy and innovation of (26 March 2021)	menter/meld.-st.-22-20202021/id2841118/
Saudi Arabia	Realizing our Best Tomorrow: Strategy Narrative (October 2020)	https://ai.sa/Brochure_NSDAI_Summit%20version_EN.pdf
Singapore	Smart Nation: The Way Forward (November 2018)	https://www.smartnation.gov.sg/files/publications/smart-nation-strategy-nov2018.pdf
South Korea	Korea New Deal 2.0: National Strategy for a Great Transformation (July 2021)	https://digital.go.kr/common/file/uploadFileDownload.do?atchFileId=147&fileSeq=1
Sweden	Data – an underutilized resource for Sweden: A strategy for increased access to data for e.g. artificial intelligence and digital innovation (20 October 2021)	https://www.regeringen.se/informationsmaterial/2021/10/data--en-underutnyttjad-resurs-for-sverige/
Switzerland	Digital Switzerland Strategy (September 2019)	https://www.bakom.admin.ch/bakom/en/homepage/digital-switzerland-and-internet/strategie-digitale-schweiz/digitale-schweiz.html
United Kingdom[16]	National Data Strategy (Updated 9 December 2020)	https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy

Policymakers in our sample took different approaches to presenting their strategy. While Germany devoted 116 pages to describing its strategy, New Zealand put forward a slide deck, and Saudi Arabia produced a brochure. The first of these strategies published was Singapore in November of 2018, quickly followed by New Zealand and then Switzerland in September of 2019. However, most countries published their strategies during the pandemic year, from 2019-2022 with Australia being the latest published in December of 2021.

Many of these strategies directly address how the pandemic has changed the way the government sees data. South Korea for example states "Korean government introduced the Korean New Deal Master Plan (14 July 2020) to overcome the economic crisis caused by COVID-19 and preemptively respond to changes in economic and social structures" (p.5)[17]. The UK explains in its strategy, "The UK response to the global coronavirus pandemic has powerfully illustrated the potential benefits of data" (Executive Summary)[18]. Overall, what connects all of these documents are that they strategize how the government sees data impact on the economy and society.

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[16] We had to used www.onlinedoctranslator.com to translate Sweden and Japan's national data strategy
[17] https://digital.go.kr/common/file/uploadFileDownload.do?atchFileId=147&fileSeq=1
[18] https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy

In order to examine our research questions in Table 1 we performed a manifest content analysis by looking for terms related to each question. Researchers perform a manifest content analysis when they hope to convey what is close to the text, what is literally present. Manifest content analysis is concerned with data that are easily observable both to researchers, without the need to discern intent or identify deeper meaning. Researchers can easily recognize and count such content with little training.[19]

We began our research by reading each of the 12 national strategies and noting shared terms associated with the questions we wanted to answer such as stakeholders, privacy, human rights, education etc. With this technique, we could distinguish among terms (a word that has specific meaning in a sentence)[20] used across all of the countries and terms only used by certain countries. For the first question, we found terms that referred to different groups like 'companies', 'people', or 'workers.' For the second question we found terms like 'data protection', 'discrimination', or 'culture'.

Once we gathered all of the terms related to our two questions, we manually put the terms into broader categories that made sense for the terms we found.

For question 1, when looking for who these strategies address, we found that most of the terms fit into 3 categories-- public, private, and research. We gathered terms for government, but since many of these were self-referential we decided not to include them in our final analysis. Since these strategies were authored by the government, references to the government were sometimes referring to what the government would do but were other times references to the authors themselves. We also did not use ambiguous terms not referring to a specific group like 'stakeholder'. Since the purpose of question one was to identify specific stakeholder groups, terms that did not fit into one of the identified categories could not be counted. We also noticed that the grouping for the public generally also had three distinct groups of the general public (people, individuals, citizens), workforce (workers, workforce), and consumers (consumers, customers).

For question two, the authors read through the documents looking for terms used to describe human rights and behaviors of firms. A wide range of terms were found and are present in the findings.

Once we had a full list of terms that addressed the two questions we sought to answer, we searched for the frequency of each term over the 12 national data strategies. By using terms drawn from the texts themselves, we were able to distinguish among different term usages by each country.

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[19] AJ Kleinheksel Rockich-Winston N, Tawfik H, Wyatt TR. Demystifying Content Analysis. Am J Pharm Educ. 2020 Jan;84(1):7113. online at. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7055418/
[20] https://www.differencebetween.com/difference-between-term-and-vs-word/

We also looked for terms referring to the economics of data, the public good nature of data, and sovereignty of data. However, because our methodology was too shallow, we decided not to include it in this paper. For example, several governments discussed how data was used during the Covid-19 pandemic to trace how citizens responded to government mandates or recommendations. In these discussions, policymakers essentially acknowledged the non-commercial aspects of data. However, because they did not explicitly use terms we could directly associate with the public good we could not capture and count the non-economic aspect of this activity.

Findings -

Question 1: Who is the strategy aimed at?

Table 4: Stakeholder table (Percentage of References of stakeholder group/all stakeholder term references)

Country	Academic/Research	Private Companies	General Public
Overall	**7%**	**57%**	**36%**
Australia	3%	54%	43%
European Union	5%	58%	37%
Germany	13%	54%	33%
Japan	11%	60%	28%
Norway	5%	71%	24%
New Zealand	0%	17%	83%
Saudi Arabia	6%	56%	38%
Singapore	5%	46%	49%
South Korea	2%	69%	30%
Sweden	5%	53%	42%
Switzerland	8%	41%	51%
United Kingdom	15%	43%	43%

We concluded that these strategies are generally focused on private sector actors, because the authors of these strategies mentioned them the most frequently in our mapping of word frequency. Out of all the terms relating to academics/researchers, private companies or the general public, 57% of references were to the private sector, 36% references the general public, and only 7% referenced academics/researchers. New Zealand was the one outlier-83% of the terms referencing stakeholders referenced stakeholders in the general public category.

Table 5 below assesses how the countries characterize members of the general public most frequently mentioned in the strategies. We found it interesting that policymakers most frequently described the public as the general public, but 10% of the time, talked about the public as the workforce or consumers. Two countries stand out as outliers. Saudi Arabia viewed the public more as a workforce than other countries, characterizing the public as the workforce 33% of the time when they referenced the public. [21] In contrast, Australia framed members of the public as consumers 19% of the time-- more than any other country.[22]

Table 5: Characterization of the Public in Data Strategies

Breakdown of the General Public	workforce	general public	consumers
Overall	**10%**	**79%**	**10%**
Australia	14%	66%	19%
European Union	5%	88%	7%
Germany	4%	80%	16%
Japan	2%	94%	4%
Norway	14%	73%	13%
New Zealand	2%	97%	2%
Saudi Arabia	33%	61%	0%
Singapore	10%	84%	6%
South Korea	21%	79%	0%
Sweden	0%	100%	0%
Switzerland	1%	90%	7%
United Kingdom	7%	79%	11%

Question 2: What if any human rights are they concerned about?

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[21] Objective 2 of their strategy is "Transform KSA's workforce with a steady local supply of Data & AI - empowered talents" focusing on experts who can innovate, specialists who can support the development of data and AI, and the general workforce who need to be literate in data and AI topics. https://ai.sa/Brochure_NSDAI_Summit%20version_EN.pdf p. 22

[22] Under the section '1.2.2 Data benefits consumers' they frame the benefits "Australians are increasingly using their personal data to choose products and services that are right for them" https://ausdatastrategy.pmc.gov.au/sites/default/files/2021-12/australian-data-strategy.pdf p.13

Finally, we wanted to find out whether and how policymakers thought about human rights related to data. We then searched for key words associated with human rights and data such as trust, trust, responsibility, ethical, and transparency or human rights such as participation, privacy, and property rights.

Table 6: Number of Mentions of Key terms related to Human Rights or Behavior related to data

Term	Type	Overall	Australia	European Union	Germany	Japan	Norway	New Zealand	Saudi Arabia	Singapore	South Korea	Sweden	Switzerland	United Kingdom
trust	Behavior	0.11%	0.15%	0.08%	0.10%	0.40%	0.05%	0.44%	0.00%	0.05%	0.00%	0.12%	0.10%	0.09%
privacy	Human Right	0.09%	0.40%	0.03%	0.03%	0.10%	0.08%	0.21%	0.07%	0.02%	0.00%	0.10%	0.00%	0.05%
education	Human Right	0.09%	0.04%	0.04%	0.08%	0.07%	0.10%	0.00%	0.08%	0.05%	0.30%	0.02%	0.25%	0.05%
data protection	Behavior	0.09%	0.01%	0.11%	0.24%	0.03%	0.07%	0.00%	0.07%	0.08%	0.01%	0.05%	0.07%	0.06%
responsible	Behavior	0.07%	0.10%	0.01%	0.11%	0.02%	0.06%	0.12%	0.02%	0.05%	0.00%	0.08%	0.05%	0.15%
culture	Human Right	0.06%	0.05%	0.01%	0.09%	0.06%	0.03%	0.06%	0.00%	0.05%	0.06%	0.12%	0.16%	0.07%
transparency	Behavior	0.05%	0.10%	0.07%	0.07%	0.01%	0.01%	0.21%	0.00%	0.01%	0.00%	0.03%	0.08%	0.10%
ethical	Behavior	0.04%	0.09%	0.01%	0.02%	0.01%	0.04%	0.08%	0.10%	0.04%	0.00%	0.00%	0.01%	0.06%
fair	Behavior	0.03%	0.00%	0.09%	0.04%	0.03%	0.04%	0.00%	0.00%	0.01%	0.06%	0.03%	0.02%	0.03%
participation	Human Right	0.03%	0.02%	0.03%	0.04%	0.02%	0.04%	0.02%	0.00%	0.02%	0.03%	0.00%	0.14%	0.01%
discrimination	Human Right	0.02%	0.02%	0.02%	0.03%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%
anonymization	Behavior	0.01%	0.00%	0.00%	0.04%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
self-determination	Human Right	0.01%	0.00%	0.01%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%
Intellectual property	Human Right	0.01%	0.01%	0.00%	0.00%	0.02%	0.01%	0.00%	0.00%	0.01%	0.00%	0.02%	0.00%	0.01%
accountable	Behavior	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.02%
freedom of expression	Human Right	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
total words		243,416	25,233	14,349	41,623	19,784	56,122	4,827	6,040	13,101	11,633	6,040	13,400	31,264

We categorized the terms in Table 6 on whether they described how market actors should act (with trust, transparently, accountably) or whether they mentioned specific human rights. We found that terms that described how data controllers should behave appeared 991 times (0.41% of the total words in the strategies) over the 12 national strategies when human rights terms appeared 738 times (0.30%) across the 12 national strategies. The strategies mentioned privacy and education more than other human rights issues. Trust and data protection were the most

mentioned behaviors. Our results show that when policymakers think about data governance, they tend to focus on privacy and data protection-- issues related to personal data. Our finding was consistent across all countries, but Saudi Arabia was the least likely to mention human rights or any of these terms even when accounting for the relative shortness of their national data strategy.

Conclusion

We had hoped our research strategy would provide new insights into the priorities of those drafting these data strategy documents. We found that content analysis can provide some information about audience priorities. It was a worthwhile exercise to investigate who these national strategies are talking to and how they frame different stakeholders. National data strategies are meant to be society wide strategies that impact both the economy and society. Everyone has a stake in data governance and some groups like the general public have a stake in data governance as workers, consumers, and as citizens. We hope our analysis will draw attention to the importance viewing how nations view different stakeholders as they work to grapple with the future of data governance. Our analysis of how these strategies balance terms used often in relation to how market actors should act like trust, transparency, and accountability with direct human rights discussions like culture, education, and privacy is also of value. The governance of data can directly impact human rights and governments need to directly address this. While these national data strategies are not laws and regulations, they set the tone for a country as it moves forward with governing data.