A Future Built on Data

Data Strategies, Competitive Advantage, and Trust

Susan Ariel Aaronson

Executive Summary

In the 21st century, data became the subject of national strategy. This paper examines these visions/strategies in order to better understand what these policymakers hope to achieve.

Policymakers in many countries have long drafted strategies for economic growth or to govern various technologies. Some of these strategies may be designed to achieve comparative advantage or as Michael Porter asserted, competitive advantage. But data is different from other inputs: it is plentiful, easy to use and many different people can use and share it without using it up. Conversely, various types of data can be analyzed to mitigate wicked problems (a public good function). Moreover, an economy built on data analysis also brings problems; firms and governments can manipulate or misuse personal data, and in so doing undermine human autonomy and human rights. Hence, given the complicated nature of data as a commercial input, intellectual property, and as a public good, a complete strategy will address these issues.

We used a sample of 51 nations plus the EU from various regions, income levels and digital prowess. We found that by 2021, ten governments issued national data strategies, delineating how various types of data could contribute to their nation's social and economic development. All of these ten governments are high income except for China, which is an upper middle income country according to the World Bank. Two are authoritarian. All of the ten, have high levels of digital prowess. Despite these differences, all of the plans aim 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 etc..) to enhance the digital economy in their nation. Some of these plans make it quite clear that these nations hope to achieve competitive advantage in data-driven sectors.. Very few are focused on creating shared value—such as digital public goods (as example shared AI to solve wicked problems). But many nations also use these data strategies to build trust in their policies. Our review highlights the importance of trust to a future built on data.

A Future Built on Data:

Data Strategies, comparative Advantage and Trust

Susan Ariel Aaronson[1]

Introduction: Data, Data, Data!

There is a straight line from Arthur Conan Doyle's mystery, The Adventures of Sherlock Holmes[2] to China's 14th 5 year plan.[3] Both documents highlight the importance of collecting and analyzing data. However, while Holmes used data to find the perpetrator (whodunit), China's leaders were thinking big. They proclaimed that China would "activate the potential of data factors of production… We will give full play to the advantages of massive data."[4] To put it differently, while Holmes sought data to answer crucial questions, China sought to control massive amounts of data to build its economy.

China was not the first or only nation to assert its vision of data's role in the economy and polity. In 2017, Japanese Prime Minister Abe issued a 'Declaration to Be the World's Most Advanced IT Nation Basic Plan for the Advancement of Public and Private Sector Data Utilization.' The 115 page plan delineated how the internet and the data that underpinned it created a new interdependent economy "through the use and application of data."[5] The plan promised that Japan would build a model of a society in which people are enriched by data."[6] The government followed the declaration with a strategy for data in December 2021.[7]

Why would a nation issue a vision for data's role in the economy? After all, data is plentiful and easy to share. However, countries and firms do not all have the same capacity to acquire and control various types of data. They also don't all have the same ability to analyze and monetize this data. Moreover, it is difficult to establish property or ownership rights for data for two reasons: First, many people can simultaneously use data and secondly, some of that same data comes from individuals' actions, behaviors, and thoughts. Hence while data may not be their property, personal data is by and about them. Even when personal data is anonymized and analyzed, individuals deserve some means of control over their personal data. Governments that

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[1] The author is grateful to Marc Froese, Burman University and her colleagues at the Digital Trade and Data Governance Hub for helpful comments.

[2] Holms exclaims, "Data! Data! Data!" he cried impatiently. "I can't make bricks without clay." The quote is from The Adventure of the Copper Beeches, in Arthur Conan Doyle, The Adventures of Sherlock Holmes, London, Edwards Publishing House, October 14, 1892.

[3] The five year plan focuses on data and digitalization, mentioning data 69 times. CSET, "Translation: Outline of the People's Republic of China 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives for 2035, May 13 2021, . https://cset.georgetown.edu/wp-content/uploads/t0284_14th_Five_Year_Plan_EN.pdf

[4] Five-Year Plan, Part Five Accelerate digitalization-based development and construct a digital China, quotes from Article V and VI, p. 43 to 44, https://cset.georgetown.edu/wp-content/uploads/t0284_14th_Five_Year_Plan_EN.pdf

[5] Declaration to Be the World's Most Advanced IT Nation Basic Plan for the Advancement of Public and Private Sector Data Utilization.' https://japan.kantei.go.jp/policy/it/2017/20170530_full.pdf

[6] Declaration, p. 4.

[7] Cabinet Secretariat, Office of IT, National Data Strategy, December 2, 2021, https://cio.go.jp/sites/default/files/uploads/documents/digital/20210901_en_05.pdf

issue a strategy for data's role in the economy are marking their turf, setting expectations for their economy, and delineating how data can yield economic and social progress.

Strategizing is an essential activity for all organizations. Managers put forward a strategy to outline an organization's goals, paths to achieve those goals, and a plan as to how resources will be allocated to carry out those goals (Chandler: 1962, 13) A national data strategy is a plan or vision that aims to increase the provision, use, and re-use of various types of data held by public and private entities in adherence with national norms and laws. According to the OECD, governments use these national strategies to focus attention and resources at a national level, describe how societal entities can work together to benefit from data, and to put forward a vision on how to manage both the opportunities and risks that may arise for individuals and the nation as a whole.[8]   Data strategies can address multiple aspects of the data value chain, including data collection, analysis, and sharing among different societal entities.. In this paper, we focus only on those plans that articulate the country's vision for data in the economy and polity. We do not discuss strategies for public data or visions that examine how to protect data as a national security asset.[9] We focus only on those plans that articulate the country's vision for data in the economy and polity.

Given the importance of data, these plans may also reveal if a country is trying to achieve comparative or competitive advantage through and with data.   A comparative advantage exists when a country can produce goods or services at a lower opportunity cost compared to other countries. Trade theory emphasizes the roles of scale, competition, knowledge creation and knowledge diffusion as fundamental to *comparative advantage* in services (Goldfarb and Trefler: 2018.) While comparative advantage seeks to explain patterns and gains from trade, *competitive advantage* explains which firms,[10] industries or nations will be winners in a global competition to produce goods or services (Neary: 2003). Thus, herein we focus on competitive advantage.

This paper uses a dataset developed by the Digital Trade and Data Governance Hub which analyzes and compares data governance in 51countries and the EU. We examined every strategy document published by our sample of 52. While most of our sample have adopted various types of data strategies such as a public data strategy, only ten (or one fifth) of the countries have produced a national data strategy. These strategies have much in common: we found policymakers aimed to expand data scale and scope (diversity); increase skill endowments, build data infrastructure, and use governance (encourage network effects, expand free flow of data etc..) to attempt to achieve comparative advantage in data and data driven sectors. Only two of the plans focused on data analysis as a global public good.   But we also find many of these strategies focus on a component missed by scholars of competitive advantage: the need to build and maintain trust in their efforts.

This paper proceeds as follows: we first delineate the state of knowledge about data's role in the economy; we next discuss two theories of what kinds of goods and services nations trade and

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[8]https://oecd.ai/en/dashboards/policy-instruments/National_strategies_agendas_and_plans. An example of such a plan is National AI Strategy, Smart Nation Singapore, https://www.smartnation.gov.sg/files/publications/national-ai-strategy.pdf, which in turn is part of Singapore's Smart Nation Strategy. -

[9] The US, China, the UK and France have issued such strategies.

[101010] France's International Data Strategy, Switzerland's Digital Foreign Policy Strategy 2021–24, Australia's International Cyber and Critical Tech Engagement Strategy, China's 2017 International Strategy of Cooperation on Cyberspace, and even the USA's 2011 International Strategy for Cyberspace (also likely USAID's Digital Strategy).

show that visions and strategies are generally expressions of competitive advantage. We then note that this theory does not include the essential role of trust. (which we define as policies and practices designed to promote confidence, reliability, credibility and security online).

We define data as raw unanalyzed figures or facts that can be encoded as zeros and ones. Such data may include personal information about information about people, things and systems (as example online buyers, satellite images, and healthcare systems(Veldkamp and Chung: 2019).

Data's role in the world has evolved since the time of Sherlock Holmes. In the past twenty years, as computing power increased, firms were able to process data faster, cloud innovations allowed more data to be stored more cost effectively, and most of all, researchers developed new analytical techniques that allowed researchers to use large troves of data to generate insights and make predictions (Veldkamp and Chung: 2019) .But our economic understanding has not kept pace with technological change. Economists are just beginning to examine the economics of data ownership, access and trade in data markets (Duch- Brown et al.: 2017, Carrière-Swallow and Haksar 2019; and Veldkamp and Chung:).

Researchers understand that data acts differently than other inputs. It is hard to value and the value of data to society as a whole is different from the commercial value for private firms collecting and exploiting them: some types of data have public good characteristics. (UNCTAD: 2021, 70. Firms that use data can benefit from a "data feedback loop" (Farboodi et al. 2019) or direct network externalities (Goldfarb and Trefler 2018), in which a firm's success attracts more users and user data, which improves the quality of products through AI and leads to more users and data. But this feedback loop also means that firms are likely collecting too much data (Acemoglu et al: 2021). Some economists argue that this has been the business model of most of the largest firms. (Carrière-Swallow and Haksar 2019; Jones and Tonetti: 2019).

Moreover, such privileged access to data (economies of scale) provides a competitive advantage, which gives rise to other economic concerns including income inequality, market concentration and even global monopoly power, and the absence of a level playing field for countries. (UNCTAD: 2019, 137; Liu: 2021) . According to UNCTAD, such control gave them both "power and competitive advantages…in digital technologies such as data analytics, artificial intelligence, blockchain, the Internet of things, cloud computing and all Internet based services." (UNCTAD: 2020, 3). Moreover, command of data leads to information advantages, adding to the sources of potential market failure in economies built on data, including economies of scale and scope, as well as network effects (UNCTAD: 2021). If UNCTAD is right, countries that have access to a diverse and large supply of high quality data are likely to have an advantage if they also have the funds and skills to analyze and monetize data (Sheehan: 2019). Several high income countries and China are the biggest beneficiaries of the ubiquitous availability of data on customer preferences (Mayer: 2020).These countries have lots of firms with intangible assets, which can include not only large troves of data, but also goodwill, brand recognition, skills and intellectual property such as trademarks or trade secrets (Tambe et al. 20201).

While scholars have some understanding of data's role in the economy, they are not yet at a place where they can effectively guide policymakers as to how best to govern data. No one yet really knows how to:

1. balance innovation, growth and competition with the need to protect the data of individuals and firms from cyber-theft, hacking, manipulation, and privacy violations;

2. ensure that all of the world's people benefit from the production and analysis of data, given differences in infrastructure (cloud capacity) and skills as to how to collect, analyze and monetize data as well as infrastructure.
3. mitigate the negative spillovers of data collection and analysis such as disinformation, discrimination, self-censorship, etc.… Markets alone cannot ensure that society receives benefits from data.
4. retool policies that may be effective in the wealthiest countries to meet conditions in the developing world where informed consent and personal data protection may not be viable strategies (Medine and Murthy: 2020).
5. incentivize data sharing while simultaneously protecting data from hacking, violations of privacy, and manipulation.

Despite these gaps in knowledge, some officials have a vision of how they can move forward in the data-driven world. These officials want to use data to help social entities innovate by creating new products, services, and new processes, while limiting the risks to society and individuals.   And many want to create a competitive advantage for their firms.

Competitive Advantage, Comparative Advantage and Data Driven Sectors

Economists have long argued about why nations trade and what makes a nation successful at exporting. In 1787, David Ricardo presented his theory of comparative advantage to describe why countries specialized in exporting one good over another. He highlighted the role of factor endowments (resources.) and costs of production.[11]

But the theory of comparative advantage does not work well to explain trade behavior for all sectors. In the 20th century, nations also began to sell more services such as legal, health-care and data processing services across borders. Scholars have found that for trade in services, skill endowments, infrastructure, and regulatory institutions are more important than factor endowments such as the supply of resources (Matoo: 2017; Van der Marel: 2011, Hoekman 2020.) Hence, services including those of global platforms don't quite fit Ricardo's theory.

Meanwhile, in 1990 Michael Porter, a professor at Harvard Business School, posited a new paradigm to explain trade and investment patterns across countries. Porter and his team conducted in-country research in ten leading nations, closely studying the interaction of industry success, company strategy, and national policies. In so doing, Porter was both wrecking and rebuilding Ricardo's intellectual structure. In his view, competitive advantage is based on four types of national attributes: factor conditions (human resources, physical resources, knowledge resources, capital resources, and infrastructure); (2) demand conditions (the size of the home demand and the sophistication of home country buyers as determinants of the international competitiveness of countries); (3) firm strategy, structure, and rivalry (systematic differences in the national environment determining strategies and structures of firms across countries); and (4) related and support industries (clustering of competitors in the country or region.) (Porter: 1990).

Porter made two other key points. First, he showed that like comparative advantage, competitive advantage is a systemic process, which will change over time as consumer demand, technology, society and the polity evolve. Secondly, he cited the importance of government policies.

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[11] Comparative Advantage, https://www.wto.org/english/res_e/reser_e/cadv_e.htm. The quote is based on P.A. Samuelson (1969), "The Way of an Economist," in P.A. Samuelson, ed., *International Economic Relations: Proceedings of the Third Congress of the International Economic Association*, Macmillan: London, pp. 1-11.

"National prosperity is created, not inherited… Government's proper role is as a catalyst and challenger; it is to encourage— or even push— companies' competitive advantage." (Porter: 1990, pp. 3, 17).   Porter's perspective seems to summarize what nations are trying to say with their national strategies.

We could find no analysis of competitive advantage in data, but several researchers have examined comparative advantage in data driven services such as AI.[12] Yet researchers seem to conflate comparative advantage in data and comparative advantage in a particular data driven sector. The Canadian AI pioneer Geoffrey Hinton stressed that countries need large pools of data, because "for a machine to "think" intelligently, it must be trained with lots of data." (Goldfarb and Trefler: 2018, 5).[13] UNCTAD says that major digital platform companies consider their data pools and data-processing capacities to be a key competitive advantage (UNCTAD: 2019) The WTO noted, "data are essential to determine firms' competitiveness and a country's comparative advantage.. raising an important challenge of structural inequality within and across countries." (WTO: 2020, p. 92).   One analyst argues that comparative advantage is determined not just by the supply but the accessibility of a diverse pool of high quality data. (Sheehan: 2019). So they are arguing that comparative advantage in data is all about economies of scale and scope of data. However, the Center for Security and Emerging Technology (CSET) noted that although the US and China lead the world in AI, "neither the US nor the PRC possesses a definite or generalized advantage in data. The availability of data may be less important than policy and bureaucratic initiatives that make data more available and facilitate its integration."(Imbrie et al, 2020, 3-4J).

Researchers examining comparative advantage in data-driven sectors argue that countries that are major exporters of these services have a broad mix of skills, endowments and institutions. They too are essentially discussing competitive advantage. UNCTAD recently argued that "China and the US account for half the world's hyperscale data centers, the highest rates of 5G adoption in the world, 94 per cent of all funding of AI start-ups in the past five years, 70 per cent of the world's top AI researchers, and almost 90 per cent of the market capitalization of the world's largest digital platforms. These firms invest in all parts of the global data value chain: data collection through the user-facing platform services; data transmissions through submarine cables and satellites; data storage and data analysis, processing and use, for instance through AI. (UNCTAD: 2021, #36). But the two nations have different advantages. While China may have advantages in its large pool of personal data from more than 800 million mobile internet users, the US has access to global data pools from consumers, firms, satellites, and machines. The US also has greater cloud storage capacity, widespread use of business analytics software, and access to business-specific data, which can be valuable for training machine learning systems (Imbrie et al. 2020, 8-9) . America's cloud providers "control the terms of access to, and administration of, infrastructure [and] are in

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[12] In 2017, economist Simon Evenett asked his colleagues to examine whether Ricardo's theory of comparative advantage remains valid for new sectors and economic activities. Evenett recruited University of Michigan trade economist Alan Deardorff to write about a relatively new kind of trade based on cross-border data flows--digital trade. After examining several examples of digitally traded services, Deardorff concluded that data storage and computer applications accessible in the 'cloud' did not fit the theory. Deardorff noted that platforms are the key actors in digital trade and their success depends on network effects. Hence, he noted that it was hard to tell if country success was due to country size (e.g. its large pool of data) rather than inherent comparative advantage (Deardorff: 2017). In this regard, Deardorff was citing demand conditions.

[13] However, researchers increasingly rely on alternative analytical techniques which don't require large pools of data or new AI strategies such as reinforcement learning which generates its own data through simulations. Hence, the sheer volume of data may not be as essential to success in data-driven services (Chahal, Toner, and Rahkovsky, 2021; Sheehan: 2019).

a position to dominate those who depend on that infrastructure" (Rahman, 2018a: 237) Moreover, cloud providers that utilize their own software have a built in advantage as their customers must rely on their software (UNCTAD: 2019, p. 115) because the internet began in the US and US firms were among the first to commercialize the internet, these firms early on began to serve international markets (in contrast with those in China.) These firms have had more than 20 years of data and experience providing data driven services internationally. UNCTAD: 2019,126) Finally, American companies have developed the dominant primary toolkits and software frameworks—such as TensorFlow, Pytorch, and Caffe—generally employed in AI research (Imbrie et al: 2020, 9, 11). These analyses are essentially about competitive advantage.

In looking to comparative advantage in AI, Goldfarb and Trefler note that public policies can create an advantage with consequences if there are economies of scale, local externalities and/or rents. For example, if policymakers provide generous access to government data only to national market actors, such access could act as a subsidy. But they also note that countries need diversity of data: economies of scale associated with data, economies of scale associated with an AI research teams, and economies of scope in the use of the teams for multiple applications (Goldfarb and Trefler: 2018, 20).[14] They too are making an argument about competitive advantage: the interaction of social, political and economic systems and actors.

Thus, we sought to examine if policymakers use data strategies both to present a vision of a country's data driven future and to ascertain if a country is trying to achieve competitive (but not comparative) advantage through and with data?

We used a dataset of 51 countries plus the EU. We chose these nations from a 90 nation sample from the Tufts Digital Economy Index (now the Digital Intelligence Index). The group of 90 nations includes many nations that have some level of digital prowess, which we define as the ability to use data both to solve problems and to create new and/or more efficient data driven goods and services. Nations with digital prowess tend to be early innovators not only in the use of data, but also in the governance of data. To ensure that we created a balanced sample, we grouped countries by region and income, according to the World Bank's categorization (Struett and Aaronson: 2021). We next examined if these countries had a national data strategy and found only ten (approximately 19% had produced such a strategy document. Three of the ten are not full democracies, two are authoritarian regimes.[15] We then read and compared these plans,. We found that in general policymakers aim to expand data scale and scope (diversity); increase skill endowments, build data infrastructure, and use governance (encourage network effects, expand free flow of data etc..) to attempt to achieve comparative advantage in data and data driven sectors. Each plan outlines a systemic approach. But we also found that many of these plans focused on building trust.

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[14] But other countries could catch up in data analysis if they have access to diversified high quality data. UNCTAD notes digital latecomers have the advantage of learning from the mistakes of the frontrunners, and "developing countries have the possibility to build a digital economy with a better (albeit still imperfect) privacy and data protection system built from the ground up. UNCTAD: 2019, 134.

[15] The Global Data Governance mapping Project, https://datagovhub.elliott.gwu.edu/2021/05/17/the-global-data-governance-mapping-project/. On whether these states are democratic or not, we relied on the Economist Intelligence Unit, Global Democracy Index, 2020, https://www.economist.com/graphic-detail/2021/02/02/global-democracy-has-a-very-bad-year

Trust is important in trade, particular in trading services such as AI. Consumers of services don't know enough about the service provider to know if one provider is better than another. In addition, data markets and services are constantly changing and can make it harder to develop or maintain trust (Chen: 2021). Hence, markets for services are more uncertain than those for goods, and services consumers will confront higher pre-choice risk than goods buyers. Services consumers may rely on non-economic factors, such as the reputation of and trust in sellers or other cultural traits. (Choi and Park: 2018, Tabellini: 2018) Policymakers hope to establish laws and regulations that protect individuals from harm (such as regulating competition, spam, and protecting consumers and privacy). A growing literature stresses that countries with higher levels of trust and that work to build and maintain 'trust'' tend to have more effective public policies and more successful economic outcomes. (Alesina and La Ferrara: 2000). Scholars have found that policies that emphasizes certainty, rules, and predictability as well as procedural due process supports the creation of trust in the data economy (Chen: 2021). The World Bank notes that the regulatory framework for data does not exist in isolation from a country's wider governance framework and is closely correlated in countries where citizens perceptions indicate relatively high levels of trust in the regulatory environment. However, the World Governance Indicators measure public trust in governance environment in general, rather than direct measurements of public trust in the data economy (Chen: 2021,27) .

The importance of online trust

As the government of Germany noted, in its data strategy, "Trust is the basis on which data is shared. "If you do not trust the source of the data, you won't trust the data itself either…This trust is fragile, …It can be permanently broken, especially if personal data is misused or its security is not guaranteed. It can also be broken when data is not used for the common good."[16]

Trust is a leap of faith and simultaneously an integral component for human interaction. Trust allows people to act in conditions of uncertainty . It is particularly important online when people don't know who they are interacting with (Artz and Gill: 2007) Users must trust that the content is legitimate each time they go to a web page; that the providers of online services such as twitter or e-commerce are legitimate and trust worthy; and whether the people we interact with on social networking or gaming sites (Goldbeck: 2006, 2009).

Unfortunately several polls show declining trust in providers of online services and in how these firms use personal data. In 2019, researchers at the Pew Research Center found that many people fear that their data is being used without their consent and are concerned that firms might use their clients' personal data to discriminate and manipulate them (Auxier et al. 2019). The Centre for International Governance Innovation (CIGI) and Ipsos have conducted large international user surveys since 2014 and, in 2019, they found that 75 percent of 25,000 users polled cited Facebook, Twitter and other social media platforms as contributing to their lack of trust (CIGI and Ipsos 2019, 116).

Policymakers are developing initiatives at the national and international levels to build trust through data governance (Aaronson: 2021). For example, the World Economic Forum notes that trust in data sharing is broken, but data sharing is essential to achieving societal and commercial

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[16] The Federal Government of Germany, Data Strategy of the Federal German Government, January 27, 2021, p. 8https://www.bundesregierung.de/resource/blob/998194/1950610/fb03f669401c3953fef8245c3cc2a5bf/datenstrategie-der-bundesregierung-englisch-download-bpa-data.pdf?download=1

goals related to data analysis (World Economic Forum: 2021b, 5). Not surprising, many governments are determined that their data strategies build trust among and within society.

The table below outlines some of the objectives delineated in data strategies as well as examples of policies that officials may propose.

Table 1 Objectives and Strategies for Competitive Advantage in Data

Objective	Examples of Policies Articulated in Data Strategies
Skill endowment	Encourage research and training. Invest and subsidize research and education. Ensure broadband and internet access
Data scale: Make and grow large pools of data	Make it easy to collect data Free flow of data provisions in trade agreements but also make it harder for foreign actors to get access to
Data diversity	Data sharing policies and platforms
Build infrastructure	Invest in cloud and other forms of infrastructure
Use regulatory policy to promote advantage	Lax competition policies, rigorous intellectual property protections t IP policies
Use trade policies to promote comparative advantage	Strong protection and enforcement of IP including trade secrets Encourage data free flow and access to government data. Ban performance requirements (or use them) Ban data localization (or require it) Ban requirements to share source code
Build trust	Link to personal data protection, consumer welfare, accountability initiatives, limit disinformation and discrimination, promote public participation in decision-making. Commit to human rights online

The Data on Data Strategies

Table 2 shows which countries have issued national data strategies as of August 2021. At first glance, these countries share certain characteristics: All of the countries are high or middle income nations according to World Bank groupings. But we found some key differences. Most of these countries are located in Asia or Europe. Saudi Arabia and China are authoritarian nations, the others are democracies, with Singapore a flawed democracy.

Table 2 also shows that some of our case study countries have issued multiple strategies. Some 28 countries in the sample issued strategies regarding public data (data collected, held, and/or funded by governmental entities) but only 8 have issued strategies or guidelines for private sector data sharing.

Table 2: 51 countries and EU plans/visions for data August 2021

	Data Strategy	Governmental Data Strategy	Strategic Plan for Private Sector or Data Sharing

Number of Sampled Countries with the Strategy or Guidelines	Australia, China, European Union, Germany, Japan, Saudi Arabia, South Korea, Singapore, Switzerland, United Kingdom,	Australia, Brazil, Canada, China, Estonia, European Union, Finland, France, Germany, Indonesia, Ireland, Israel, Japan, Netherlands, New Zealand, Norway, Russia, Saudi Arabia, Singapore, South Korea, Sweden, Taiwan, Thailand, United Arab Emirates, United Kingdom, United States, Uruguay, Vietnam	European Union, Japan, Netherlands, New Zealand, Norway, Philippines, Singapore, United Kingdom

Table by Andrew kraskewicz

Country Specific Analysis

Australia: trust, data sharing and enhancing human welfare

Australia's data strategy is all about using governance to create trust while simultaneously empowering business to use and share data. [17] The strategy notes that "data is critically important to building a modern digital economy and delivering better outcomes for Australians. The Data Strategy will outline a clear vision for maximizing data-driven innovation across the economy by improving access to data, data sharing arrangements, data asset management and strengthening collaboration between government and business." The government issued a discussion draft in 2021, seeking public comment, which it then responded to. The government made clear that the data strategy would be just one of several plans issued by officials, showing that the approach would be comprehensive and systemic. .[18]

The Australian data strategy is designed to explore the contribution of data to the digital economy, identify the Government's use of data in delivering its functions and set out how the Government will manage data as a critical asset. [19]To meet these goals the government plans to improve access to data, data sharing arrangements, data asset management, and strengthening collaboration between government and business.

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[17] https://digitaleconomy.pmc.gov.au/fact-sheets/data-and-digital-economy
[18] https://www.sydney.edu.au/content/dam/corporate/documents/about-us/governance-and-structure/university-policies/2021/australian-data-strategy-discussion-paper-july-2021.pdf
[19] Ibid. The government also drafted an Artificial Intelligence (AI) Action Plan, the National Data Security Action Plan, the Consumer Data Right expansion and the Privacy Act 1988 review.

The draft strategy notes that "Australians must feel comfortable their Government respects and secures their data appropriately.[20] To build trust the government could "identify how the Consumer Data Right and supporting institutions could be further leveraged to build a data-driven economy."[21] The government stresses that because the data economy and many platforms are global, the governments efforts to build the data driven economy must be global; hence, Australia plans to expand international engagement to export Australia's leading data portability framework, and promote an interoperable and rules-based approach to international consumer data portability frameworks and provide offshore opportunities for Australian technology companies to scale globally."[22] In sum, Australia's focus is on building a trust environment for data, encouraging data sharing, and enhancing human welfare by empowering users.

China: data as a factor of production, link digital and real-world economies, ensure government control over most data

China is a nation of planners, and Chinese officials have issued several plans for and about data in recent years. Data is a key component in China's 2021 Five-Year Plans, which can be defined as social and economic development initiatives delineated by the Chinese Communist Party (CCP) since 1953.[23]

Chinese officials first presented their plans for data in 2006. The government issued an informatization strategy where it promised to "accelerate the process of constructing a legal system for informatization including revising laws and regulations for information infrastructure, intellectual property, information security, open government innovation, the protection of personal data. The government also promised to "vigorously participate in the research and formulation of related international norms."[24] More recently, officials described data as a factor of production.[25] In addition, China put forward a big data strategy in 2015.[26] In its 2016-2021 the government promised to "accelerate the integration of digital and real economies"[27] This plan was designed

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[20] https://www.sydney.edu.au/content/dam/corporate/documents/about-us/governance-and-structure/university-policies/2021/australian-data-strategy-discussion-paper-july-2021.pdf

[21] Australia, "Data and the Digital Economy," https://digitaleconomy.pmc.gov.au/sites/default/files/2021-05/digital-economy-strategy-fact-sheet-data-and-the-digital-economy.pdf, pp. 1-2.

[22] https://digitaleconomy.pmc.gov.au/sites/default/files/2021-05/digital-economy-strategy-fact-sheet-data-and-the-digital-economy.pdf, p. 2.

[23] https://www.uschina.org/sites/default/files/chinese_government_agency_2020_work_priorities_and_plans.pdf

[24] CCP Central Committee General Office and State Council General Office Notice concerning Printing and Issuing the "2006-2020 National Informatization Development Strategy" ZBF No. (2006)112006-2020 March6, 2006, translated by *Prof. Rogier Creemers of the University of Leiden.* https://digichina.stanford.edu/work/2006-2020-national-informatization-development-strategy/

[25] Fourth Plenary Session of the 19th Central Committee of the Communist Party of China, Decision of the Central Committee of the Communist Party of China on several major issues concerning upholding and improving the socialist system with Chinese characteristics and promoting the modernization of the national governance system and governance, October 31, 2019 (http://www.12371.cn/2019/11/05/ARTI1572948516253457.shtm

[26] State Council, Action Plan for Promoting the Development of Big Data http://www.gov.cn/zhengce/content/2015-09/05/content_10137.htm; and State Council, National Informatization Plan In the "13th Five year" Period , http://www.gov.cn/zhengce/content/2016-12/27/content_5153411.htm. Also see http://english.www.gov.cn/policies/latest_releases/2016/12/27/content_281475526646686.htm

[27]http://english.www.gov.cn/statecouncil/ministries/202112/01/content_WS61a6d009c6d0df57f98e5da0.html

to: expand the Cyber-Economic Space; establish a widely efficient information network; develop the modern Internet industrial system; implement the national Big Data strategy; and strengthen information security.[28]

We focused our analysis on China's most recent five year plan, which reflects Chinese policymakers' fears about the power of China's giant data firms. In recent years, Chinese officials recognized that Chinese platforms threatened the power of the communist party. These huge platforms have global reach, huge financial resources, massive amounts of consumer data, and dominance in a growing range of business activities. Moreover, these firms likely know more about Chinese consumers than the party and that data was held outside the state's grasp (Wei,2021; Bloomberg News: 2021).

Hence China's most recent 5 year plan (2021) as translated states, " We will welcome the digital age, activate the potential of data factors of production, promote the construction of a cyber powerhouse accelerate the construction of a digital economy, digital society, and digital government, and leverage digital transformations to drive overall changes in production methods, lifestyles, and governance. We will give full play to the advantages of massive data." The plan then delineates key digital sectors that the government will focus on such as cloud computing and VR.[29]

The plan reflects lessons learned about how to share data among different societal entities. China will "deepen the sharing and utilization of basic information resources such as national demographic, legal person, and geospatial information. We will expand the safe and orderly opening of basic public information and data,…build a unified national public data open platform and development and utilization ports and prioritize and promote the opening to society of high-value data sets."[30]   The plan mentions the import of building infrastructure, noting that the government will . accelerate the construction of a national integrated big data center system, strengthen the overall smart scheduling of computing power, build several national hub nodes and big data center clusters, and build large supercomputing centers.[31]

China's approach bolsters the government's recent push to gain greater control over China's massive platforms., which some analysts believe are an attempt to gain access to the data troves of these firms .[32] "We will strengthen the economic supervision of internet platforms in accordance with laws and regulations, clarify platform enterprise positioning and regulatory rules, improve the laws and regulations concerning the identification of monopolies, and crack down on monopolies and unfair competition."[33]

The plan frequently mentions China's future ambition to be a science and technology powerhouse. "We will deeply implement the strategy of reinvigorating China through science and education, the

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[28] https://www.uschina.org/sites/default/files/Outline%20of%20the%20PRC%2013th%20Five-Year%20Plan%20%28FYP%202016-2020%29.pdf

[29] Part Five, Article 15, Accelerate digitalization-based development and construct a digital China, p. 26, https://cset.georgetown.edu/wp-content/uploads/t0284_14th_Five_Year_Plan_EN.pdf

[30] Ibid, Article 17, Section 1.

[31] Article 6, Section 2

[32] For a timeline, see SupChina, China's Big Tech crackdown: A complete timeline   https://supchina.com/big-tech-crackdown-timeline/

[33] Article 8, Section 2, pp.43-44.

talent powerhouse strategy, and the innovation-driven development strategy, refine the national innovation system, and speed up the effort to make China into an S&T powerhouse." [34]

China's data strategy main focus is about improving the national capacity to use data both for commercial purposes and for research. In contrast with other nations' visions, China's data strategies have three notable gaps: it never mentions global markets or the ethical issues associated with data. In addition, translations of these plans never mention trust (Aaronson review of the plans and a discussion email with Professor Henry Gao, 2022).

Some analysts have argued that China's vision doesn't mention trust because trust plays a different function in China. According to one analysis, in China the primary function of trust is to protect and establish feelings of safety. In Western democracies, individuals use trust to test where there is ground for future opportunities (De Cremier: 2015). Yet, levels of trust in the government have declined significantly in China over the previous year (Edelman: 2021, 11,44). Moreover, while the translations don't mention trust, China's focus on establishing laws to limit misuse of personal data by firms (the government is exempt) may give its citizens the perception that the government is a trustworthy controller of both personal and public data. [35]

The European Union: Trust and Building Competitive Advantage

The EU has put forward a data strategy designed to build trust and facilitate competitive advantage in data. As early as 2014, EU officials recognized that they needed to find ways to allow data to flow freely among the many states of Europe, with their different levels of digital prowess, different languages, and economic cultures. [36] In 2014, the European Commission adopted a Communication on the data-driven economy and again in 2017. These communications were strategy documents, addressing issues such as the free flow of data across borders and data localization restrictions, as well as emerging legal issues in the context of new data technologies (e.g. access, liability, portability), including: access to and transfer of non-personal machine-generated data, data liability, and portability of non-personal data, interoperability and standards.[37]

In 2020, the Commission issued a fuller data strategy focused on data sharing and trust. The strategy highlights Europe's history as a center of human rights oriented governance. The EU describes it as putting people first when developing technology. The EU states the plan is designed to facilitate a transformation built on data, "that works for all, reflecting the best of Europe: open, fair, diverse, democratic and confident. It…put(s) people first, opens up new opportunities for businesses, and boosts the development of trustworthy technology to foster an open and democratic society and a vibrant and sustainable economy."[38] The EU stresses that the strategy will create "a single market for data that will make the EU more competitive globally and will enable more innovative process, products and services while keeping those who generate the

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[34] Article 4, Section 1, pp. 11-12.

[35] See as example this translation of China's regulations on the use of algorithmic recommendations. Provisions on the Management of Algorithmic Recommendations in Internet Information Serviceshttps://www.chinalawtranslate.com/en/algorithms/?utm_source=POLITICO.EU&utm_campaign=d8ec1c5ea7-EMAIL_CAMPAIGN_2022_01_12_10_14&utm_medium=email&utm_term=0_10959edeb5-d8ec1c5ea7-189969753

[36] https://www.mtitc.government.bg/upload/docs/2014-04/Data_value_chain_strategy.pdf

[37] https://digital-strategy.ec.europa.eu/en/library/elements-european-data-economy-strategy-2018

[38] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_273

data in control. "European rules for privacy and data protection as well as competition law will be fully respected and the rules for access and use of data are fair, practical and clear."[39]

The EU is especially focused on the industrial internet of things, noting that European firms will be processing and sourcing more data from smart connected objects. The strategy also discusses the need to train data professionals and equip the EU citizenry with basic digital skills.[40]

The EU coupled the strategy with a proposed regulation on data sharing among business and governmental entities. The regulation is designed to allow personal data to be used with the help of a 'personal data-sharing intermediary', who can help individuals exercise their rights under the General Data Protection Regulation (GDPR); while allowing data use on altruistic grounds.[41] The proposal was designed to illuminate how data could be shared without abridging data that might be subject to data protection legislation, intellectual property, or contain trade secrets or other commercially sensitive information. The Regulation will empower users to stay in control of their data and encourage the creation of common European data spaces in crucial sectors.[42]

Germany: Trust, Data Sharing, Data Competency, and Leadership in Data Use

Germany has developed the most comprehensive and clear data strategy in 2021. The architects of the strategy hoped to "ensure that we, can both add value and improve the lives of everyone,"[43] Germany's data strategy has 4 key components: it focuses on data infrastructure such as cloud, quantum and high performance computing, articulates a framework to ensure that more data can be used and shared responsibly while also preventing any misuse of data, builds digital skills and establishes a data culture (data competency) and finally makes Germany a world leader in data use. To achieve that last goal, the government admits it will have to adapt—and build new institutional structures.[44] German policymakers also aim to empower users. "We want to support informed and sovereign handling of data by citizens of all age groups through various formal and informal educational opportunities. We also want to train citizens to become experts."[45]

Germany's data strategy is easy for citizens as well as experts to understand. Each chapter of the strategy discusses: where do we stand; what do we want to achieve, and how—how will our efforts be measured?

Germany's plan is not only unusual because it is easy to read and understand. First, it discusses openness, cooperation and digital protectionism. "We will also work to ensure that the European Union remains the world's most open region for trade and investment in the digital age, supporting international cooperation on ambitious obligations relating to the free movement of data and countering digital protectionism."[46] Secondly, it focuses on data as a global public good. We will trial data sharing as a global public good and common good with Africa and Asia and will set up a

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[39] https://ec.europa.eu/commission/presscorner/detail/en/fs_20_283

[40] https://ec.europa.eu/commission/presscorner/detail/en/fs_20_283

[41] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on European data governance (Data Governance Act), COM(2020) 767 final2020/0340 (COD)

[42] https://digital-strategy.ec.europa.eu/en/policies/strategy-data

[43] https://www.bundesregierung.de/breg-en/news/data-strategy-adopted-1845882

[44] Data Strategy of the Federal German Government, https://www.bundesregierung.de/resource/blob/998194/1950610/fb03f669401c3953fef8245c3cc2a5bf/datenstrategie-der-bundesregierung-englisch-download-bpa-data.pdf?download=1

[45] Ibid. p. 39

[46] Ibid., p. 8 and 25.

platform for sharing such data.[47] Thirdly, the vision examines the role of one kind of intellectual property protection, trade secrets, in preventing data sharing, reducing competition and potentially favoring the creation of monopolies.[48] Firms can use trade secrets to protect their algorithms and then they obtain control of any data they analyze with such algorithms. Hence, Germany is arguing for greater amounts of data to be viewed as a digital public good that should be shared openly while protecting privacy. Finally, the vision states that governance must change. we need to create new processes, standards, roles and institutions that facilitate data-based and evidence-based governance for the good of society."[49] As example, we will gradually equip all legislative experts with the ability to enact digital-compatible laws. In the meantime, we will perform digital feasibility checks on new draft laws."[50] In so doing, German officials hope to model responsible use of data.

Japan: Data to enrich People, Data Sharing and Performance Requirements

Japan has put forward several visions for its future built on data beginning in 2013.[51] In 2017, it promised it would become the world's most advanced IT Nation. In that Declaration, Japan said it would build a model of a society in which people are enriched by data.[52] The government stated that to achieve that goal, it would facilitate public and private sector data utilization, open data and data sharing. The plan also talked about building skills, ensuring consistency in governance, and improving governance so that as the Japanese population aged with low birthrates, could continue to flourish.[53]

In December 2020, Japan issued its first data strategy. Like its digital trade strategy, it is focused on trust. "We aim to realize a sustainable human society. It is the human-centric society that creates new value by achieving both economic development and solving social issues....Our society values trust and safety." The planners believe that trust would be fostered by open data, open government, trust based systems evidence-based policymaking, diverse, and high-quality data[54] The plan is designed to shape the common rules necessary for data coordination; develop norms that facilitate data flows and eliminate barriers to those flows; construct data platforms and create data markets. The plan noted that the Government would set an example. "The Government is the largest data holder in Japan, and its systems and actions will have a significant impact on Japan's society, economy and industries. The Government plays a role as "a platform of platforms" in the digital society."[55]

Like the other plans discussed herein, Japanese policymakers are also focused on infrastructure and digital capacity building.[56] But we were confused by its international approach. On one hand, the government pledged to build a shared approach to data free flow with trust-as suggested by Prime Minister Abe in 2019. He proposed no barriers to the flow of medical, industrial, traffic and

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[47] Ibid. pp. 34, 53.

[48] Ibid, p. 21

[49] Ibid. p. 47 and 54.

[50] Ibid. p. 56.

[51] https://japan.kantei.go.jp/policy/it/2013/1029_fulltext.pdf

[52] ; Government of Japan, "https://japan.kantei.go.jp/policy/it/2013/0614_declaration.pdf

[53] Ibid, pp. 10-12, 13.

[54] Government of Japan, National Strategy Office of IT, Cabinet Secretariat, National Data Strategy, June 18, 2021, pp. 3, 6, 10 https://cio.go.jp/sites/default/files/uploads/documents/digital/20210901_en_05.pdf

[55] Ibid, p. 6.

[56] Ibid, 21-22.

non-personal, anonymous data.[57] However, in June, 2021 the government issued its Strategy for Semiconductors and the Digital Industry. The strategy reflects Japanese concerns about being caught between China and the US. "In order to ensure Japan remains strategically essential and strategically independent amid the conflict for technological hegemony between the U.S. and China, "the government consolidate Japanese digital business. The strategy also called for encouraging "data centers to be located in Japan and to make it Asia's core data center base," and to foster cloud players that are based in Japan. [58] Hence Japan wants to promote free flow with trust but simultaneously practice server localization, and nurture local cloud players. In short Japan wants to achieve competitive advantage through both openness and protectionism.

Saudi Arabia: Competitive Advantage Through "Testbeds"

The Kingdom's vision for Data and AI was issued in 2020; it seems drafted to reassure Saudi citizens that the government understands its future will not be built on oil alone. The government admits it issued the strategy "to capitalize on Data & AI for the Kingdom economically and socially through national combined efforts by all stakeholders."[59] The plan asserts that the Kingdom is already in a good position: the Kingdom is a young and vibrant country and it has smart cities that can serve as testbeds. It also notes the Kingdom's centrality to the Arabic speaking populace and countries that surround it. With these arguments, the data strategy seems centered on seeking competitive advantage.

The Kingdom plans "One single source of truth for all government data, centrally managed cloud platform for all government entities and whole-government analytics and AI platform."[60] The government plans to upgrade skills, be a friendly environment for foreign investors, fund Ai projects, and open government data by default by 2025. The plan notes that this will require legislative changes but is vague about what that entails. "In policies and regulations, NDMO is developing a number of regulatory frameworks including topics such as data privacy and freedom of information."[61] While the plan is vague about how the country will protect these human rights associated with data, the plan has a timetable for what the Saudi government hopes to achieve with data. "By 2030, we aim to achieve: ~40% of the total workforce trained on basic Data & AI literacy skills' ~~5K Data & AI experts; Top 10 countries in Open data index; Top 20 countries in peer reviewed Data & AI publications; and ~300 Data & AI startups[62] The plan never states how the Kingdom can achieve these metrics. Finally the plan is silent about how the Saudi's will create trust in data and AI.

Singapore: Smart Nation is focused on Skills, Infrastructure, and Competitive Advantage

Singapore was also early to put forward a vision of how data would drive its economy and society. In 2014, then Prime Minister Lee announced the Smart Nation plan, "where people will be more empowered to live meaningful and fulfilled lives, enabled seamlessly by technology ,offering

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[57] Ibid, pp. 22. Japan's Prime Minister Shinzo Abe invited leaders to develop shared norms and rules to govern the free flow of nonpersonal data across borders in a speech on January 19, 2019 In Davos, Switzerland. https://www.mofa.go.jp/ecm/ec/page4e_000973.html

[58] Government of Japan, "The Strategy for Semiconductors and the Digital Industry (Summary), June 4, 2021, Ibid., pp. 2-3, #2, 4, and 5 https://www.meti.go.jp/english/press/2021/0604_005.html.

[59] Kingdom of Saudi Arabia, National Strategy for Data and AI, 2020, https://ai.sa/Brochure_NSDAI_Summit%20version_EN.pdf

[60] Ibid, p. 12.

[61] Ibid., p. 14.

[62] Ibid, p. 28

exciting opportunities for all. It is where businesses can be more productive and seize new opportunities in the digital economy. Singapore is pursuing its smart nation strategy "to protect its technology and growth prospects in the region."[63] Thus, it can be described as a vision focused on achieving competitive advantage with a regional growth focus. The government updated the plan in 2018 and data governance is a key component.. The country aims to continually up-skill, re-skill and raise the digital capabilities of the workforce; encourage firms to innovate and leverage intellectual property for competitive advantage, harnessing the capabilities in our research and innovation community; update policy and regulations, to ensure that the environment for data innovation, is globally competitive in a digital world; and update infrastructure."[64]

The Smart Nation plan addresses the need for new approaches to governing and using data. "Data is a key resource in Smart Nation. It will enable our businesses to grow and create new business opportunities, and allow Government to have more informed policymaking, service delivery and operations.." The government plans to "maximize the value of data in a trusted environment" by encourage data sharing among government institutions, it will scale up data collaboration efforts, which allows companies to share data securely and access data analytics tools., and by creating trust among users and providers..[65]

The plan also focused on infrastructure and skill training by promoting an innovation culture. Singapore wants to encourage various means of citizen engagement in the smart nation plan. Government officials emphasize that a smart nation is not built by government, but by everyone – citizens, companies, and agencies and they have established several portals to do so.[66]

South Korea: jumpstarting Digitalization, promoting data sharing through a data dam

In June 2020, South Korea's President Moon saw opportunity in the pandemic. The Moon Administration took a page from Depression-era US President Franklin Roosevelt and announced the "Digital New Deal." He stated, "We are pursuing the Digital New Deal to spearhead a forward-looking innovative economy. We will push ahead with the accelerated transition to a digital economy by extensively digitalizing the national infrastructure while fostering the D.N.A (data, network and AI) ecosystem and non-face-to-face industries."[67] The Digital New Deal has 4 components: accelerating the digitalization of industries; expand digital infrastructure and capacity; make people's lives safer through smart cities/logistics and actively nurture contactless services. Specifically the plan will promote the collection, sharing and use of data, establish a digital education infrastructure, smart caregiving and health infrastructure, encourage digital innovation, and smart logistics, among other goals.[68]

The Digital New Deal includes a new platform called a "data dam." According to President Moon, "This data dam will amass data generated through our public and private networks. Currently, raw

[63] Singapore's data strategy targets regional growth https://aiforgood.itu.int/singapores-data-strategy-targets-regional-growth/

[64] Singapore, Smart Nation, the Way Forward, 2018, p. 12
https://www.smartnation.gov.sg/files/publications/smart-nation-strategy-nov2018.pdf

[65] Singapore, Smart Nation, the Way Forward, 2018 , pp. 18-19, #32-36.

[66] https://aiforgood.itu.int/singapores-data-strategy-targets-regional-growth/; on portals, see Smart Nation, p. 33.

[67] Republic of Korea, Opening Remarks by President Moon Jae-in at 6th Emergency Economic Council Meeting, June 1, 2020, https://english1.president.go.kr/Briefingspeeches/Speeches/833

[68] Ministry of Science and ICT rolls out Digital New Deal to leap forward into a new economy beyond COVID-19, June 6, 2021, https://digital.go.kr/resources/UPLOAD//2021/07/09/125/cbc29d4f-f3a6-43fb-834b-9c55517c310b.jpeg

data collected in this way cannot be utilized as it is; we need to standardize and combine the data in order to process it. In addition, we have to generate de-identified data – with personal information sorted out as a safeguard. The more this data is utilized through such a process, the smarter artificial intelligence will become."[69] So the data dam is designed to standardize and de-identify data, creating a trustworthy process and platform. But the translations of the plan never mention building trust. Nonetheless, the Korean government states that because of its approach to data-sharing and anonymization with the data dam, its projects will become the global golden standard.[70]

Switzerland: An International and Trust Focus

The "Digital Switzerland" strategy provides the guidelines for government action on digitalization and is binding on the federal administration. It is based on 4 principles and objectives. It is focused on empowering people, providing room for development, enabling structural change, and working domestically ad internationally. The plan is designed to guaranteeing security, trust and transparency while continuing to strengthen people's digital empowerment and self-determination.[71] Like other plans, the strategy is designed to build skills and infrastructure, improve online security, and increase political participation in decisions about data. [72]

The plan notes that Switzerland will constantly monitor whether its legislation and the international agreements for the data economy are optimally designed. "Switzerland is developing an internationally coordinated data policy, which among other things covers issues of data sovereignty, access to government data, international data traffic, regulation of competition intellectual property, data protection and handling localization guidelines." In this regard the government is updating its personal data protection laws and examining how to facilitate data portability and creating trustworthy data spaces.[73] Finally, the country is examining whether "data sovereignty can be improved and dependence on the large international public cloud service providers can be minimized in the medium to long term."[74]

United Kingdom: A domestic and international focus

According to the UK government, "the aim of the National Data Strategy (NDS) is to drive the collective vision that will support the UK to build a world-leading data economy. It is vital that the UK has a data regime that promotes growth and innovation for businesses of every size, while

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[69] Republic of Korea, Remarks by President Moon Jae-in During Visit to Business in Digital Economy, Korean Version of New Deal, June 18, https://english1.president.go.kr/BriefingSpeeches/Speeches/840, for more on the data dam, see https://digital.go.kr/resources/UPLOAD//2021/07/09/120/f401d66d-24e4-46db-9576-5bcc2c5b154f.jpeg

[70] Ministry of Science and ICT rolls out Digital New Deal to leap forward into a new economy beyond COVID-19

[71] https://www.digitaldialog.swiss/en/

[72] https://www.digitaldialog.swiss/en/objectives/the-public-service-in-the-media-sphere-promotes-political-participation-and-strengthens-democracy; https://www.digitaldialog.swiss/en/objectives/the-opportunities-of-digitalisation-will-be-used-to-increase-security and https://www.digitaldialog.swiss/en/objectives/new-technologies-are-used-to-strengthen-political-participation-by-the-population-and-businesses

[73] https://www.digitaldialog.swiss/en/objectives/switzerland-has-a-modern-coherent-legal-foundation-in-terms-of-the-rights-to-data-and-its-use; and https://www.digitaldialog.swiss/en/objectives/switzerland-has-trustworthy-data-spaces-in-which-residents-can-exercise-control-over-their-own-data

[74] https://www.digitaldialog.swiss/en/objectives/access-to-digital-content-is-improved; and https://www.digitaldialog.swiss/en/objectives/the-need-for-a-%E2%80%9Cswiss-cloud%E2%80%9D-and-its-feasibility-have-been-examined

maintaining public trust." The government wants to build trust, easy data access, data capability and effective cooperation.[75]

The UK hopes that data can help transform the country in 5 ways: by boosting productivity and trade, supporting new business and jobs; improving scientific research, delivering better policy and public services and creating a fairer society for all. Business People should be empowered to choose whether and how to share data in both the public and private sectors, including where the use of their data can help others.

The plan is unique in its focus on helping civil society as well as individual citizens to benefits "Powered by better data, civil society organizations can be better equipped to reach the people most in need, at the time they most need it. Better data use could also significantly decrease operating costs, allowing charities to focus resources on protecting the most vulnerable parts of our society."[76]

The government established four pillars to realize the data economy: first by improving the quality of data; improving education in data skills; ensuring data is available, shared and appropriately protected across borders; and used responsibly, in a way that is lawful, secure, fair and ethical, sustainable and accountable, while supporting innovation and research.[77]

The UK is determined to create a flexible data regime that provides both regulatory certainty and high data protection standards. "We will seek EU 'data adequacy' to maintain the free flow of personal data from the EEA, and we will pursue UK 'data adequacy' with global partners to promote the free flow of data to and from the UK and ensure that it will be properly protected". The government seems committed to interoperable solutions to data governance internationally.[78]

Like the Swiss plan, the UK Data Strategy has a strong international focus. The UK pledges to support open data; use big data to help in development , and work with international agencies such as the Red Cross and the UN to ensure data on crisis affected areas is handled safely, legally and ethically.[79]

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[75]. https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy#about-the-national-data-strategy

[76] Section 2.5, https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy#about-the-national-data-strategy

[77] Ibid., Section 2.6. ,

[78] Ibid., section 4.2.

[79] Section 6.3.3, https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy#about-the-national-data-strategy

TABLE 3- DATA STRATEGY COMPARISON

Countries Data strategies	Achieve Economies of scale	Data Diversity (Economies of Scope/data Sharing)	Trust model	Disseminating Data Public Goods Internationally	Build Infrastructure	Increase skills	Policies to favor domestic producers	Focus On Comp. Advantage?
Australia		Yes	Yes			Yes		
China 2006 Informalization and 2021-2025	Yes	Yes			Yes	Yes		Yes
European Union-2014, 2017, 2020	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Germany 2021		Yes	Yes		Yes	Yes	Yes	
Japan 2017 and 2021		Yes	Yes		Yes	Yes	Yes	Yes
Saudi Arabia 2020					Yes	Yes	Yes	Yes
Singapore, 2018, 2021			Yes			yes		Yes
South Korea 2021		Yes			Yes	Yes		Yes
Switzerland 2020		Yes	Yes	Yes	Yes	Yes	Yes	
United Kingdom 2020			Yes	Yes		Yes		
Totals	2	7	7	2	7	9	5	6

Table by Susan Aaronson and Andrew Kraskewicz

What's Going on here-- The Meaning of National Data Strategies

The ten nations with data strategies present complementary yet different visions of their peoples' data-driven future. Policymakers from these countries want to ensure that their nation's economy and polity can use data effectively and prosper. Some such as Singapore and Saudi Arabia have a regional growth focus, while others such as the UK are more focused on the global digital economy. While Korea aims to "set the gold standard with its strategy", and the UK will be "world leading," Saudi Arabia plans to use its money and its position in the Middle East as a means of building a future with data.

Porter's conception of how nations sought to achieve competitive advantage fits these plans. He argued that competitive advantage is a moving target, and policymakers must take a systemic approach. At the same time, governments must act as a catalyst and challenger. These visions show that ten nations clearly take that role of catalyst seriously. Some plans are essentially a roadmap (here's where we will go and when we will arrive) while others are a promise that government officials will both empower their citizens with data and protect their personal data (as example, the EU). Yet, as Table 3 reveals some governments promise to favor specific firms or sectors rather than adopting a systemic approach. As example, the EU wants to build capacity in smart objects and the internet of things, while Saudi Arabia and Singapore focus on AI. Policymakers may want to mark their territory, where they plan to make a mark.

These visions are a form of signaling—that policymakers have a plan. Yet these visions underscore that policymakers don't completely understand the complicated role of data in the economy. Almost every plan highlights data's use and potential as a commercial asset rather than as a global public good. The German and Swiss plans are a notable exception. To ensure that the public good nature of data can be realized, policymakers, especially those who work on development should encourage a greater focus on capacity building, open source and data sharing among nations. The UN notes "The utilization of big data and artificial intelligence to create "digital public goods in the form of actionable real-time and predictive insights" is critical for all stakeholders, including the United Nations, as they can serve to identify new disease outbreaks, counter xenophobia and disinformation and measure impacts on vulnerable populations, among other relevant challenges. "(UN: 2020, #21, 22, pp. 6-7) . While it is understandable that a national strategy on data would focus on national needs, national needs are also served by viewing data as a public good and by creating shared open source information.[80]

Many of the plans focus on the need to build shared or interoperable rules to govern cross-border data flows. But only the UK and Switzerland even mention the need to build data governance capacity oversees as part of their vision.

Yet Porter missed an essential element of the digital economy, the role of trust. The UK, EU, Swiss, German, Japanese, Singaporean, and Australian plans highlight how these governments plan

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[80] For example open-source code may be easier to hack then proprietary codes. But groups have worked to help software developers disclose vulnerabilities and coordinate with organizations that depend on their code, a scorecard that can automatically assess a software project's security posture, a framework for building anti-tampering protections into code and a service that issues security certificates to help developers prove their software updates are authentic. https://openssf.org/blog/2021/09/27/announcing-the-openssf-vulnerability-disclosure-wg-guide-to-disclosure-for-oss-projects/; and https://www.politico.com/news/2022/01/06/open-source-software-help-526676

to remain trusted and trustworthy as they use and share data to serve commercial interests and society.

Finally, Porter's analysis and our own does not explain why Brazil, Canada, Russia, and the US, all important players in data driven sectors, have not put forward a broad vision of data's role in the economy and polity.[81] Only Sherlock Holmes can solve 'The case of the missing data strategy.' However, these four World War II allies might benefit from General Dwight D. Eisenhower's experience leading the invasion of Normandy, which turned the tide in Europe "Plans are worthless, but planning is everything."[82]

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[81] Meanwhile, other nations such as Vietnam and South Africa are debating such vision statements. See as example, South Africa, Draft National Strategy on Data and Cloud, https://www.gov.za/sites/default/files/gcis_document/202104/44389gon206.pdf

[82] From a speech to the National Defense Executive Reserve Conference in Washington, D.C. (November 14, 1957) ; in *Public Papers of the Presidents of the United States, Dwight D. Eisenhower, 1957*, National Archives and Records Service, Government Printing Office, p. 818

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