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International data governance: Pathways to progress

Addendum 1:

Mapping and comparing data governance frameworks

(Prepared by the HLCP Working Group on International Data Governance¹)

¹ The HLCP Working Group on International Data Governance commissioned this study authored by Sara Marcucci, Natalia González Alarcón, Stefaan G. Verhulst, and Elena Wüllhorst



Mapping and Comparing Data Governance Frameworks

A benchmarking exercise to inform global data governance deliberations

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Executive Summary

Data has become a critical resource for organizations and society. Yet, it is not always as valuable as it could be since there is no well-defined approach to managing and using it. This article explores the increasing importance of global data governance due to the rapid growth of data and the need for responsible data use and protection. While historically associated with private organizational governance, data governance has evolved to include governmental and institutional bodies. However, the lack of a global consensus and fragmentation in policies and practices pose challenges to the development of a common framework.

The purpose of this report is to compare approaches and identify patterns in the emergent and fragmented data governance ecosystem. This research thus compares and identifies patterns in data governance emergent frameworks within sectors close to the international development field, ultimately presenting key takeaways and reflections on when and why a global data governance framework¹ may be needed. Overall, the report highlights the need for a more holistic, coordinated transnational approach to data governance to manage the global flow of data responsibly and for the public interest.

This work was first initiated to inform the United Nations High-level Committee on Programmes (HLCP) Core Group on New Global Public Goods, and has subsequently evolved into being aimed at advising other intergovernmental and governmental institutions, non-governmental organizations (NGOs), academic and research institutions, and other stakeholders that aim to use and govern data. indeed, the audience for this report is likely to be individuals and organizations involved in policy development, implementation, and advocacy in the field of data governance, particularly in the context of humanitarian and development efforts. This may include policymakers, government officials, NGOs, civil society organizations, and other stakeholders interested in promoting global data governance. The report may also be of interest to researchers and academics working on issues related to data governance, cybersecurity, information science, public policy, human rights and international development.

Given the vast diversity of efforts and the dynamic nature of the space, it is not our intention to include every possible framework. Rather we have focused on developing a broad sample that reflects the complexities and approaches, with a preference for those frameworks that have a more international scope. In addition, the fact that the research stemmed from an effort to inform the UN HLCP Group inevitably skews the sample in favor of frameworks that operate with a humanitarian and developmental lens.

The report begins by giving an overview of the current fragmented data governance ecology, and then proceeds to illustrate the reasons why a global governance framework may be necessary in

¹ In this report, “framework” refers to any type of document or project subject to being analyzed under this analysis template.

the first place, building on existing literature. Subsequently, it explains the methodology used and presents the most relevant findings. These findings focus on six key elements: (a) purpose, (b) principles, (c) anchoring, (d) data description and lifecycle, (e) processes, and (f) practices. Finally, the report presents a series of ten recommendations that hope to advance the development of a global data governance framework.

Key Findings

The key findings around the six elements we prioritized are the following:

- 1. Purpose:** Regarding a purpose-oriented approach, we identified an emerging purpose across all frameworks to reconcile the tension between data protection and the increased use of data for societal goals.
- 2. Principles:** Although we identified three main types of principles –for processes, for decisions, and for data handling– most of them regarding trust, individual rights and public interest, there is still a lack of clarity and harmonization of meanings, especially across different countries. This makes it difficult to operationalize the principles.
- 3. Anchor Documents:** Looking at anchoring documents, we identified that most frameworks refer to human rights protection standards or previously-established privacy legislation mainly as starting points instead of binding documents to comply with.
- 4. Data Description and Lifecycle:** We observed a lack of unified definitions, particularly relevant when describing the type of data the frameworks oversee. They often define data in general but don't explain the data they handle. Regarding the data lifecycle approach, it helps estimate the value of data since it identifies the particular characteristics and requirements when managing data in each stage. Yet only a fourth of the frameworks acknowledge the relevance of the data lifecycle approach, develop it and provide specific recommendations for each stage.
- 5. Processes:** As part of the governance framework, defining roles, responsibilities, and associated compliance procedures are critical to guarantee the fair share, use, and reuse of data. Most of the frameworks added extra functions, sometimes vague high-level recommendations, to existing agencies or authorities instead of creating specific bodies with functions to oversee the implementation and monitor compliance with the framework.
- 6. Practices:** Regarding practices, there is a mixed bag of frameworks providing applied tools and recommended actionable practices for data governance implementation. Still, most of them are not binding and fail to define who, how, and when these practices should be followed, limiting their operational effectiveness.

Recommendations

Based on the findings, the report closes with a series of recommendations that hope to advance the development of a global data governance framework. A more detailed explanation of how to operationalize each category can be found in the recommendations section of the report.

- 1. Consider data stewardship to reconcile the tension between data protection and data promotion:** Moving forward, there may be a need to adopt a broader framework and concept of data stewardship. This would indeed allow to achieve and maintain the dual goal of protecting and promoting data in a more systematic, sustainable and responsible way.
- 2. Focus on responsible re-use to unlock the socioeconomic value of data:** It may be beneficial to integrate the concept of reuse in the development of a global data governance framework, so as to create shared approaches and standards with respect to the sharing of data amongst different stakeholders.
- 3. Harmonize meanings to operationalize principles:** It may be worth universalizing the principles to be embedded in a global data governance framework, so as to systematically operationalize them and ensure compliance across different regions and nations.
- 4. Use broader anchoring frameworks to provide common North Stars:** Only some of the analyzed approaches explicitly mention global human rights frameworks, and anchor documents are mainly starting points rather than binding documents to comply with. Having broader frameworks related to universal human rights, as well as establishing clear levels of compliance and responsible roles, may be beneficial in developing a global data governance framework.
- 5. Unify key definitions of data and incorporate emerging concepts such as synthetic data:** It seems crucial to develop a series of mechanisms that allow flexibility and clarity of what we mean by 'data'. To do so, it may prove useful to incorporate emerging, flexible concepts such as synthetic data, as well as relational data, thick data, and sensitive data.
- 6. Adopt the data lifecycle approach to promote benefits and minimize harms:** Given the breadth of contexts in which data governance must be applied, it may be beneficial to use a standardized framing to structure the needs, risks, and opportunities when handling data. Adopting the data lifecycle could be one way to do so.
- 7. Incorporate more participatory processes and collective agency to develop a data governance framework:** To encourage transparency and accountability—and, consequently, trust and trustworthiness—in data governance efforts, it may be beneficial for decision-makers to offer opportunities for scrutiny and input from data subjects.
- 8. Invest in and create new professions with specific roles and responsibilities:** The analysis reveals the importance of having trained and dedicated individuals (whether chief data, chief privacy, or chief security officers, or the equivalent body) with specific functions and binding responsibilities for long-lasting, sustainable, and informed data actions.

- 9. Improve accountability and transparency by defining oversight and compliance mechanisms:** It's important to have monitoring and evaluation mechanisms to define roles and responsibilities in data governance. An organization's accountability can be measured by how it monitors and assesses its internal policies, and it's recommended to establish the mechanism and how it should be implemented.
- 10. Translate values and recommendations into practical tools:** The article suggests collaborating with diverse stakeholders to identify useful tools for implementing a data governance policy. It recommends three practical tools: model consent forms, checklists for data quality and security, and data risk assessment guidelines, to aid in implementation and monitoring compliance.

1. Introduction: Identifying Patterns in a Fragmented Data Governance Ecology

Data has become a global asset; therefore, how it is managed and governed has become a priority for a diverse number of stakeholders around the world. Historically, data governance has often been associated with private organizational or corporate governance approaches. However, as technological innovation and the amount of data have increased rapidly in recent years, the notion of data governance has evolved to include governmental and institutional bodies. There have been increasing calls for a global data governance framework that would help manage the global flow of data responsibly, while ensuring a necessary balance between its undeniable potential and equally undeniable risks. The World Development Report 2021 by the World Bank, for instance, acknowledges the increasing development of data governance arrangements, yet incipient, and alerts on how the current regulatory efforts might be inadequate for the 'majority world' (Mungai et al. 2022). There are different reasons associated, some related to significant gaps in infrastructure, security, institutional and safeguard mechanisms, and others linked to countries' unlike needs and priorities. "A global consensus would give individuals and enterprises confidence that data relevant to them carry similar protections and obligations no matter where they are collected or used. (..) It would also establish ground rules for the exchange of data between commercial use and the public good" (World Bank 2021, 297).

The search for a global data governance framework emerges from a complex landscape that bridges policy and practice, and encompasses a number of different domains, such as data management, data ethics, and data protection. "The approach to governing data and data flows varies considerably among the major players in the digital economy, and there is little consensus at the international and regional levels" (UNCTAD 2021, 98). In addition, different frameworks within and across countries, regions, sectors, and organizations have resulted in a patchwork of policies, frameworks and practices, leading to a fragmented ecology that poses certain challenges to the evolution of a common framework.



Figure 1: Word cloud of key words emerging from the frameworks analyzed in this report.²

This fragmentation is heightened by the dynamism of the ecology, with new solutions, often technical in nature, being released on a regular basis, often seeking to update legacy approaches that are no longer fit for the challenges and opportunities of new data realities. In addition, emerging technologies and concepts, for instance Artificial Intelligence or Distributed Ledger Technologies, lead to new governance needs and result in sometimes ad-hoc extensions to existing data governance approaches (World Bank 2021, 271; Anthony 2022, 293).

While some of the frameworks—such as data protection regimes—are more mature and lend themselves to standardization and codification, others fall short, representing more reactive approaches. As a result, efforts to harmonize and coordinate the various frameworks have often been led by business or professional associations, standard-setting bodies, or international fora connecting national data protection authorities rather than by any entity with truly global reach and credibility. Because of the diversity of entry points, concerns, and interests, there is a wide diversity of actors advocating for different approaches, often operating in silos without much engagement or coordination. However, the increasing interconnection and interdependence within the global data economy urge to evolve towards a more holistic, coordinated transnational approach that might require new and innovative global governance (UNCTAD 2021, 215).

² The word cloud was generated from a short description of each framework, which is included in the repository. The descriptive data was cleaned through removing words such as yes, verbs, commas, and quotation marks. 25 keywords of the cleaned descriptive data were visualized using the word cloud generator freewordcloudgenerator.com. Each term shown in Figure 1 occurs at least 10 times.

2. Why a Global Governance Framework May Be Necessary

As mentioned above, this paper seeks to inform current deliberations on whether a global data governance framework is needed. In the below, we summarize some of the existing literature exploring why and when global governance may be beneficial, focusing particularly on (a) global coordination to prevent harmful fragmentation, (b) the advancement of global principles and values, and (c) using data as a resource to advance global public goods.

2.1. Global Coordination to Prevent Harmful Fragmentation

As the world becomes increasingly interconnected, it is ever more urgent to build systems of cooperation that allow multiple and diverse actors to collaborate and make use of a dedicated framework for sharing information, expertise, and experience. It could seem particularly crucial to develop a standardized approach to data in certain sectors or at certain moments, such as in times of humanitarian crisis, as this will ultimately enable more coordination and prevent harmful fragmentation. Given the multiple and complex interactions between regulations and asymmetries at local, national, and international levels, fragmentation may have profound implications on individuals and businesses, both intended and unintended, for virtually all aspects of our daily lives (Fay 2022).

Further, the absence of a systematic global approach to data governance may create inequitable consequences for low- and middle-income countries as it would be harder for them to participate in the global digital economy and develop their own frameworks responsibly (Pisa and Nwankwo 2021). Even more ambitious approaches argue that a “new Bretton Woods-style agreement” is necessary to redefine the global governance model in a digital and hyper-globalized world (Medhora and Owen 2020). By enhancing cooperation and shared standards and principles, global data governance might allow nations and organizations to collectively take advantage of the potential data harbors to face common challenges and respond to collective needs.

2.2. Advancing Global Principles and Values

A global data governance framework would enable international cooperation and coordination to promote globally shared principles and values, such as human rights, and to further anchoring frameworks such as the Universal Declaration of Human Rights or the SDGs. In fact, data is playing an increasingly important role in the humanitarian field. From the United Nations to private Non-Governmental Organizations (NGOs), organizations across the world are starting to adopt data on ever larger scales to enable more agile, efficient and evidence-based decision-making to promote human rights and other global values.

For example, the World Economic Forum (WEF) has proposed a new data governance model called Authorized Public Purpose Access (APPA), defined as “a model for realizing value by

permitting access to data for specific, agreed public purposes (...) through processes that do not rely exclusively on explicit, individual consent as a means of protecting human rights” (World Economic Forum 2021). The ultimate goal is guaranteeing individual human rights regarding data use, not limited to privacy rights. Also, as part of the 2030 Agenda, the UN reaffirmed its commitment to international law and emphasized that all efforts shall be implemented in a manner that is consistent with human rights (United Nations High Commissioner for Human Rights 2018). Given the international and often borderless nature of these objectives, and considering the key role data has in achieving them, a global data governance framework is essential.

2.3. Using Data as a Common Resource to Advance Global Public Goods

Increasingly, data is a resource for supporting global public goods. It is crucial that no single entity has sovereignty over data and that these collective public goods are managed responsibly, in a manner that secures and preserves them for all of humankind. Lately, there has been a debate on treating data as ‘commons’ when the economic characteristics of data define it as an intangible non-rival asset, which may suggest an opposite definition. However, it is a practical approach when considering data governance and regulation.

Ostrom’s principles (Ostrom 2012) for managing shared resources (commons) offer insightful guidelines to reach an agreement about rules for accessing data when some individuals may need to sacrifice personal benefit for the greater common good (Coyle et al. 2020). The principles help understand the asymmetries of information and incomplete agreements that characterize the data economy and provide innovative ways to govern shared resources. For example, defining the rights of different entities to control, access, use and share data, and establishing monitoring and auditing mechanisms for data use and sharing (Coyle et al. 2020) might help to address the governance challenge of preventing misuse of sensitive data while fostering the reuse of data to create social value and potential ‘knowledge spillovers’ (Coyle 2020) (Aaronson 2022).

3. Methodology

Our findings and recommendations are based both on a wide set of empirical data as well as an analytical framework permitting us to derive broader conclusions from the data.

3.1. Empirical Data: Sampling Strategy

In conducting this research, we identified more than 100 data governance documents, of which we curated and surveyed 58 into more detail, across at least 37 organizations (non-governmental, intergovernmental and independent), 8 national or local government entities and 4 regional bodies. Appendix A includes the full list of the frameworks analyzed in depth,

while the Template of Analysis in Section 3.3. provides a detailed assessment strategy of the frameworks considered.

This report was first initiated to inform the United Nations High-level Committee on Programmes (HLCP) and has subsequently evolved to provide insights to other intergovernmental and governmental institutions, non-governmental organizations, academic and research institutions, and other stakeholders that aim to use and govern data.

In building and curating our universe of analysis, we took into account the following considerations:

- **Timeframe:** To ensure relevance and validity, this research focused on frameworks created within the last ten years (2013-2022).

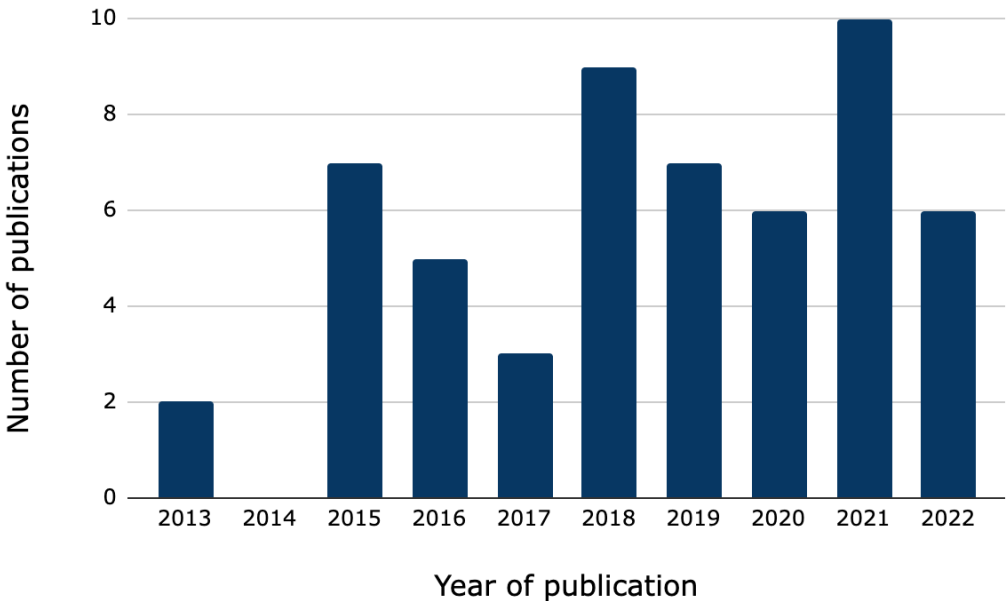


Figure 2: Number of publications per year.

- **Variety of frameworks:** This research aims to represent the variety and heterogeneity of existing data governance frameworks and approaches, and thus includes a wide range of examples and formats, encompassing principles, guidelines, and regulatory frameworks and standards.

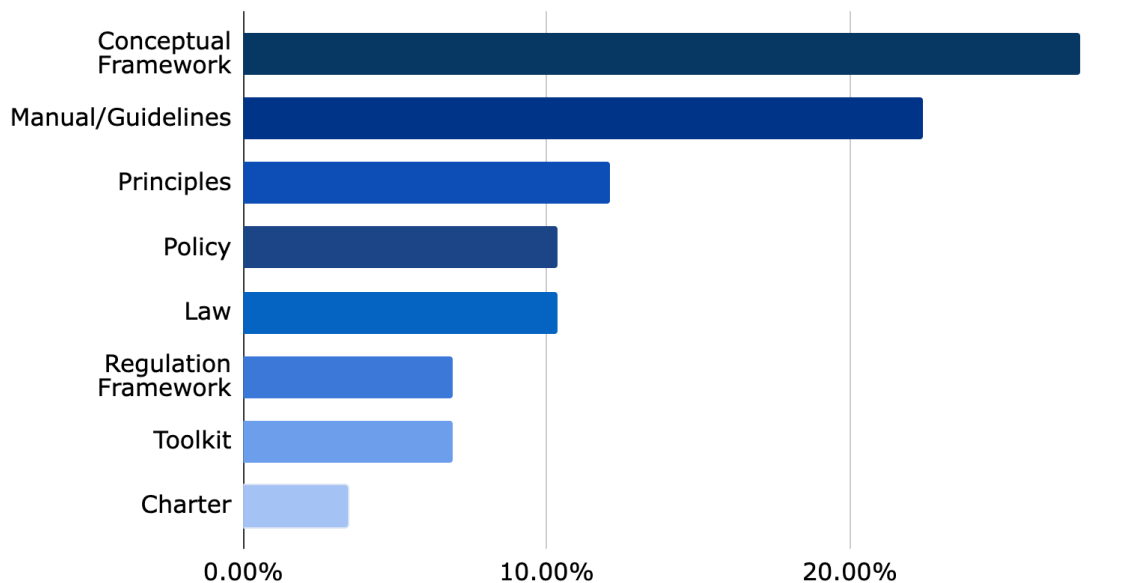


Figure 3: Types of frameworks.

- Types of organizations:** The research prioritized public sector efforts over private-sector-oriented ones, cognizant of how the public sector plays a critical role in setting policies and regulations for data governance. While private sector efforts are also important in this regard, to maintain the scope of the research manageable, they were not the primary focus of this research. Thus, the sample prioritizes governmental and intergovernmental institutions, non-governmental organizations, academic and research institutions, and international independent (sectoral) coalitions.

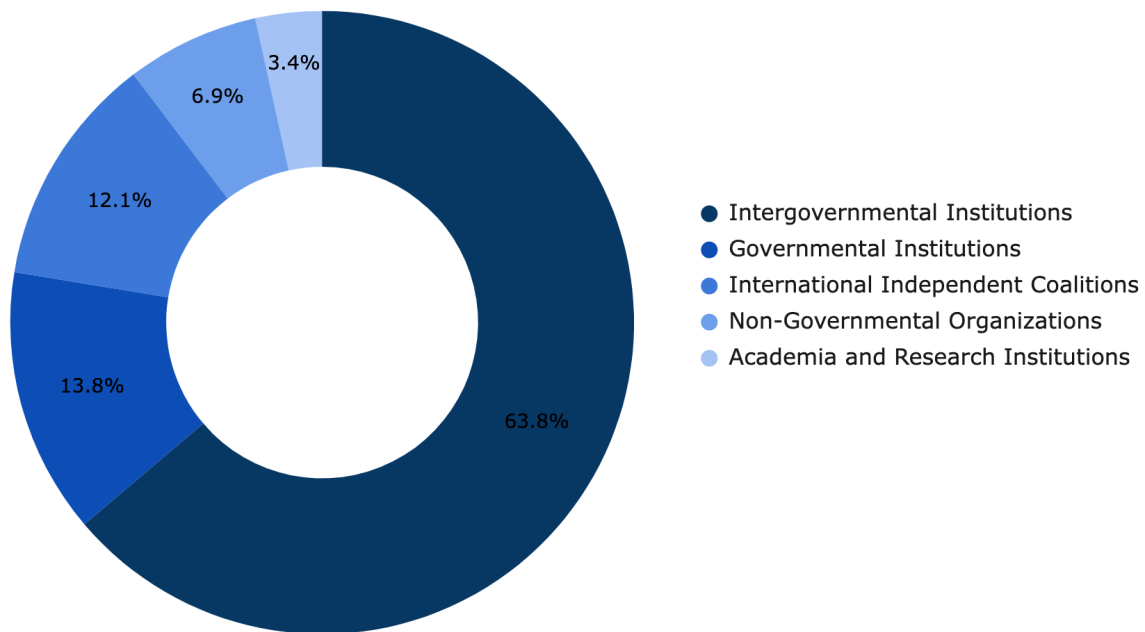


Figure 4: Type of organization.

- Geographical scope:** When considering the geographical scope to consider, we aimed at covering various levels of jurisdictions, including global, regional, and national frameworks. Although we sought diversity and comprehensive representation across regions, a stocktaking of various data governance frameworks and practices from the Global South is still largely missing. On the one hand, that is due to a lack of a clear and widely spread understanding of the frontier of data governance best practices. This might limit some governments from finding a suitable reference when building and prioritizing their own (Chen 2021). On the other hand, sometimes legal and regulatory frameworks for data are inadequate in lower-income countries, which too often face substantial gaps in safeguards and shortages of infrastructure. Indeed, as the World Development Report 2021 by the World Bank notes, “less than 20 percent of low- and middle-income countries have modern data infrastructure such as colocation data centers and direct access to cloud computing facilities. Even where nascent data systems and governance frameworks exist, a lack of institutions with the requisite administrative capacity, decision-making autonomy, and financial resources holds back their effective implementation and enforcement” (World Bank 2021, 13).

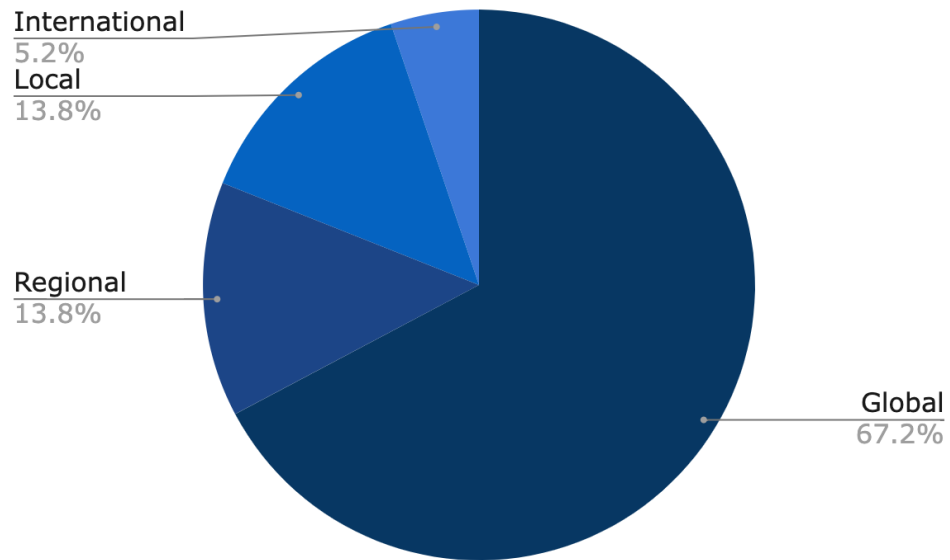


Figure 5: Geographical scope.

- Sectoral diversity:** As mentioned above, the initial objective of this research was to inform the UN HLCP Group, which is primarily focused on issues related to the UN's programs and strategies for sustainable development. Given the Group's focus on humanitarian and development issues, the research prioritized frameworks and policies that were most relevant to those areas.

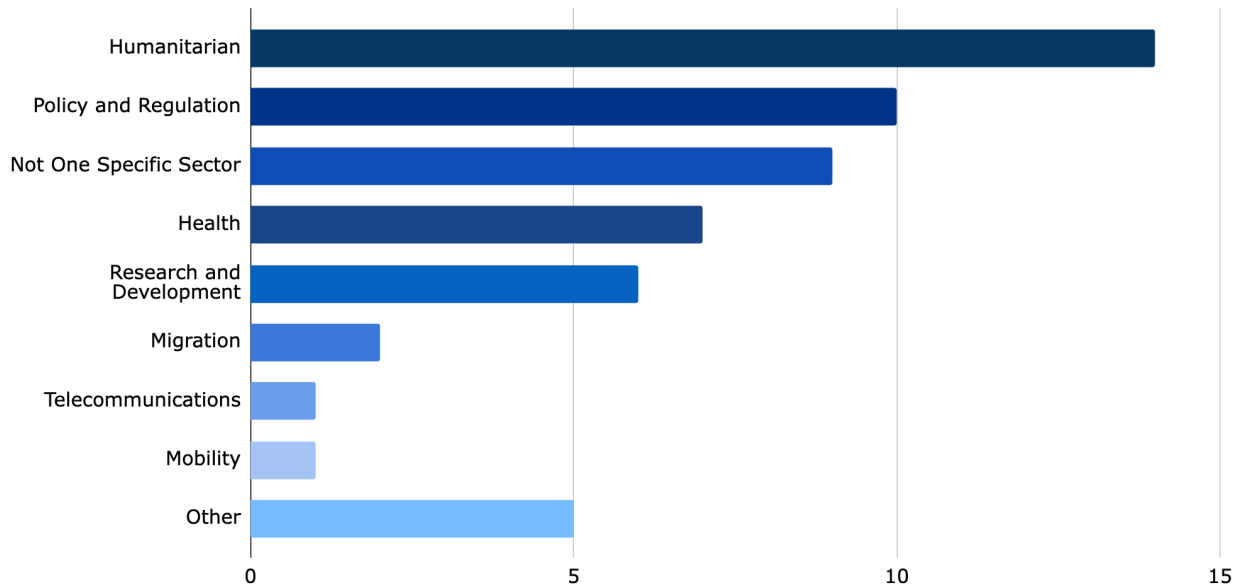


Figure 6: Sectoral diversity.

3.2. UN Agencies Sub-sample

Given the initial intent to inform UN decisions on global data governance, it is worth declaring the weight the UN-system agencies represent in our sample. Of the frameworks analyzed, twenty-six correspond to UN-system data governance frameworks. Twenty-five of those have a global scope except for the Pan American Health Organization’s (PAHO) National Data Governance Framework, since PAHO serves as the Regional Office for the Americas of the World Health Organization. Similarly to the entire sample, the frameworks are skewed toward the conceptual side of the spectrum; indeed, 69% of them are conceptual frameworks or guidelines. And, as expected, 42% are in the humanitarian sector.

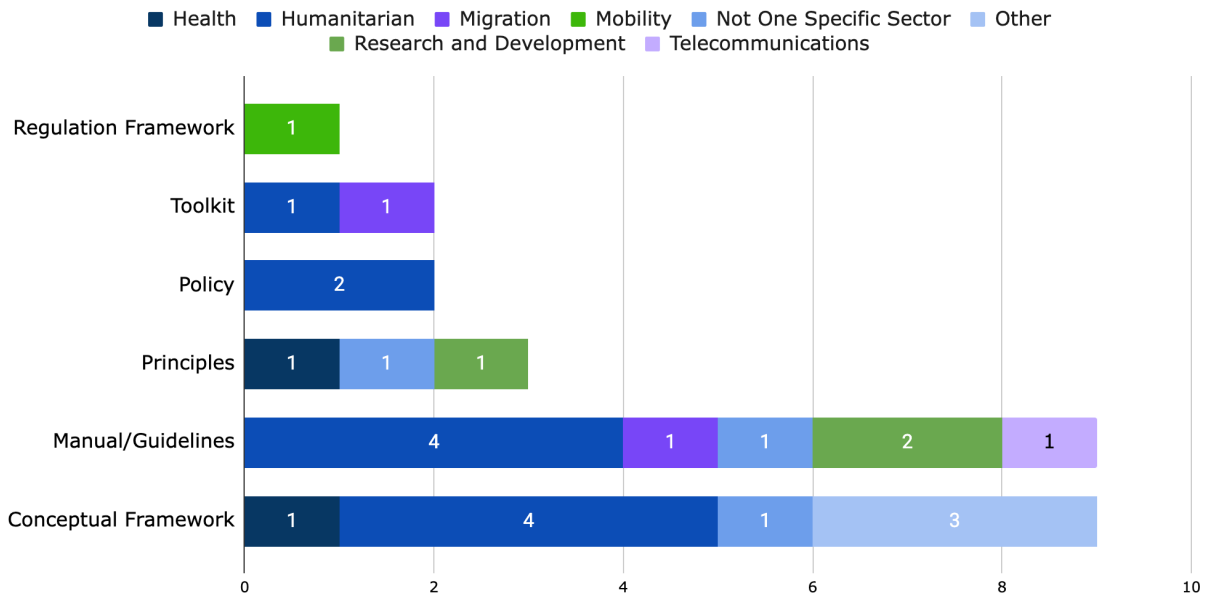


Figure 7: Types and sectors of UN-system data governance frameworks.

3.3. Analytical Framework

Once our empirical sample was assembled, we sought to analyze the various examples in our framework through a conceptual prism consisting of the following “Template of Analysis”

Purpose: Purpose serves as the guiding objective of data governance frameworks. It illustrates the reason why a framework is needed in the first place, identifying a gap, and indicates the value the framework wants to bring about by filling that gap.

Purpose: Does the governance framework clarify its goals and objectives?

Principles: Principles serve as the guidance for a governance framework, ensuring that all activities are aligned with specific commonly agreed criteria and allows for easier interpretation.

Principles: Are there principles to guide the framework, and what are they?

Anchoring: Is the legal basis or other anchor documentation upon which the policies and principles built sufficiently explained? What is the nature of that basis?

Data: Describing and defining the data handled by the organization facilitates the understanding of the framework and pushes the organization to determine and justify the data they access and use. It also helps identify the data they seek to govern within the data value chain/ data lifecycle.

Data Description: Do the frameworks define the data they oversee? Is it personally identifiable data or not?

Data Lifecycle: Does the framework describe the value-chain of data and the benefits and risks at each stage? (e.g., data localization)

Processes and Practices: Operationalize the framework and ensure the principles are supported, and the processes are undertaken and monitored.

Governance Roles: Does the framework explain any roles and functions that are tasked with the implementation of the framework? (e.g., code of conduct, data sharing agreement)

Tools: What tools and practices are specified to implement the framework?

Monitoring and Evaluating: What monitoring and evaluation mechanisms are implemented?

4. Findings: What Have We Learnt?

The following section summarizes our key findings with respect to existing data governance frameworks leveraging the above-mentioned analytical framework.

4.1. Purpose

Key Takeaways:

- Overall, all the reviewed data governance frameworks explicitly mentioned their purpose.
- In some cases, goals and objectives as it relates to data governance were sector specific; in others, they were more general, broader aims.
- We identified an emerging purpose across all frameworks, namely to reconcile the tension between data protection and the increased use of data for societal goals.

All of the reviewed data governance frameworks include an explanation of the overall purpose of the document. From our sample, it seems there is great variety in the scope of the purposes identified by the different frameworks. Mainly, we identified two types of purposes: those that refer to very specific cases and sectors where data is used, and those that aim to improve data governance in general. Often, the latter are pursued by national or local governments seeking to achieve responsible use and reuse of data.

As for the former, for instance, the International Committee of the Red Cross (ICRC)'s "Handbook on Data Protection in Humanitarian Action" seeks to raise awareness and assist humanitarian organizations in ensuring that they comply with existing personal data protection standards in carrying out humanitarian activities specifically. As for the latter, on the other hand, the Personal Information Charter developed by the Foreign, Commonwealth & Development Office (FCDO) in the United Kingdom has very data-focused objectives that don't refer to one specific field (e.g. the humanitarian sector). Indeed, the charter provides the standards people can expect from the FCDO when they ask for, or hold, people's personal information.

Overall, however, we identified an overarching purpose across all frameworks, regardless of their scope: to balance the tension between the importance of *protection* against unauthorized collection and potential misuse of data versus the wider *promotion* of data for advancing various public interest goals. In fact, the frameworks identified often stemmed from the dual realization that data is indeed very valuable and potentially beneficial for public purposes, on the one hand, and that at the same time it poses a series of challenges and risks across its life cycle. Indeed, the promotion of data has the potential of bringing about a series of public benefits, spanning from more efficient mobility (Lau 2020) to personalized healthcare (Morgan 2021), from improved waste management (Abdallah et al. 2020) to more accessible education (Marchant 2021). However, the misuse of data can result in potential issues including social exclusions (O'Neil 2016) and injustices (Couldry and Mejias 2019), wasted time and resources (Redman 2016), as well as privacy (Cohen 2012) and legal concerns (Rodrigues 2020).

As a result, many governance frameworks seek to develop a variety of approaches aimed to leverage the new opportunities data presents, while avoiding the risks of its misuse. Often, this seems to be a balancing act that is necessary but sometimes uneasy. Indeed, these efforts can result as being fragmented and hard to operationalize.

One way to tackle such fragmentation is through data stewardship, which The GovLab defines as “policies, functions and competencies to enable access to and re-use of data for public benefit in a systematic, sustainable, and responsible way” (Verhulst 2021a). Similarly, the Ada Lovelace Institute defines it as “The responsible use, collection and management of data in a participatory and rights-preserving way” (Ada Lovelace Institute 2021). The concept of stewardship has been used by Nobel Prize-winning economist Elinor Ostrom to describe the governance of common resources (Ostrom 2012). When considering data as a common good, Ostrom’s design principles and conceptualization of stewardship can be a useful tool to find a balance between data protection and data promotion. Data stewards can indeed play a crucial role in steering the process of using data and the insights it can generate by deciding who has access to data, for what purposes and to whose benefit (Open Data Institute 2022), ultimately addressing society’s biggest questions and challenges in a systematic and responsible way (The GovLab 2018).

4.2. Principles

Key Takeaways:

- When it came to principles, we identified three main themes, namely: (a) trust, (b) individual rights and interests, and (c) public interest .
- Among the most used principles, Confidentiality and Security, Accountability, and Transparency were the most three mentioned principles, and all of them build on the earlier Fair Information Practice Principles (FIPPS).
- There is a lack of clarity and harmonization of meanings, especially across different countries. This makes it difficult to operationalize the principles.
- Three main types of principles were identified, namely principles for processes, principles for decisions, and and principles for handling data. These are often overlapping.

4.2.1. Main Themes

In examining the principles across the various governance frameworks in our sample, three main themes can be identified:

- **Trust:** Trust is essential both as a right in and of itself and also to enable the adoption and widespread usage of technologies and data platforms. Accordingly, many of the frameworks under examination emphasize trust as a central principle, both on ethical and practical grounds. An example can be found in the Privacy Impact Assessment developed by the Office of the Australian Information Commissioner, which emphasized a value proposition to strengthen community trust in the data initiatives carried out by the government. Another example, at the international level, are the WHO Data Principles. These highlight that their aim is to “provide a foundation for continually reaffirming trust in WHO’s information and evidence on public health” (World Health Organization (WHO))

2020, 1).

- **Individual rights and interests:** Protecting citizen and user privacy rights emerges as one of the core principles for a large number of frameworks, spanning across sectors and geographies. For example, the International Organization for Migration’s Data Protection Manual emphasizes a core value proposition to “assist IOM staff to take reasonable and necessary precautions in order to preserve the confidentiality of personal data and ensure that the rights and interests of IOM beneficiaries are adequately protected” (International Organization for Migration 2015, 3).
- **Public interest:** Finally, many of the frameworks under examination also emphasize the importance of increasing the scope of use of data so that it can be deployed more widely, in service of various public interests. For instance, the Data Sharing Policy of Médecins Sans Frontières (MSF) emphasizes that the organization’s repository of data “can potentially be of value to researchers working in public health” (Médecins Sans Frontières (MSF) 2013, 4).

4.1.2. Most Used Principles

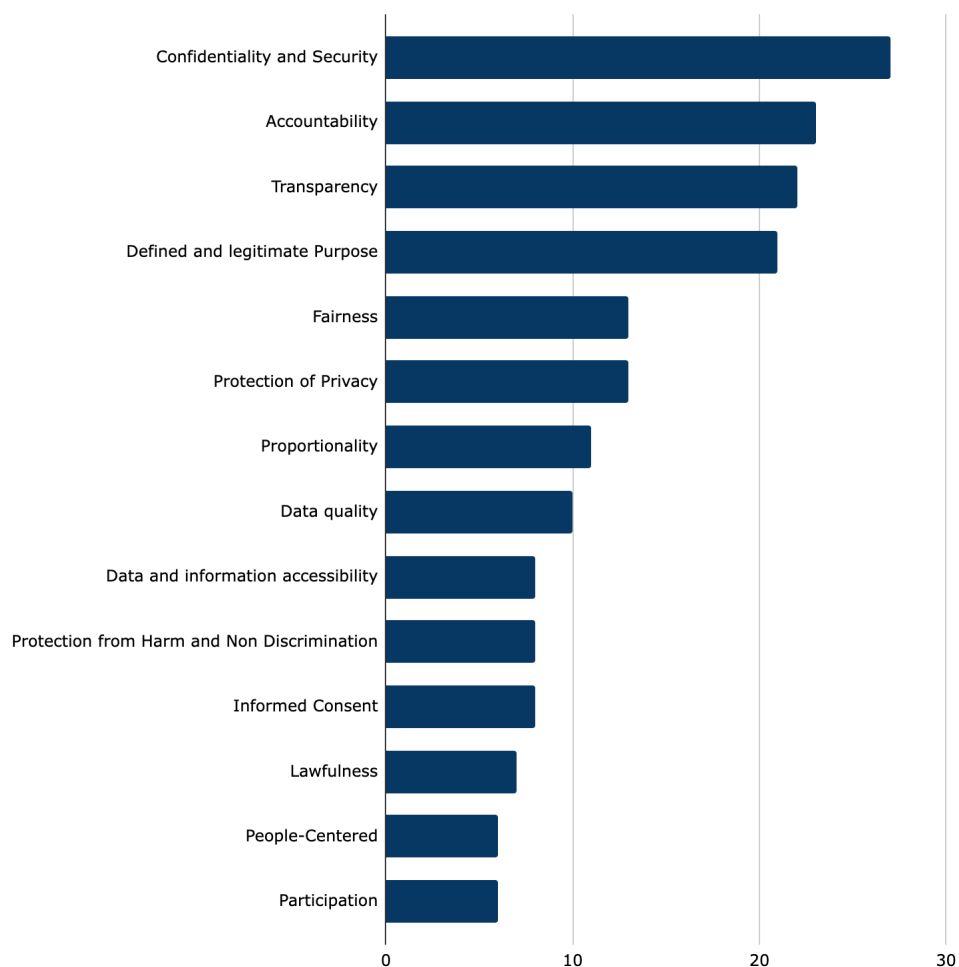


Figure 8: Most used principles.

Some key findings with regard to the various frameworks we examined are the following:

- **Lack of clarity and harmonization of meanings**
 - Many of the frameworks include similar principles, but use different nomenclature (thus increasing the challenges of cross-framework comparison and analysis). For instance, the principle of “equity” is fairly absent, but it seems to often be implied under "fairness" or "non-discrimination".
 - Moreover, many frameworks do not separate principles, but group them together. Examples of principles often mentioned together are “necessity and proportionality” and “legitimate and fair processing”.
- **Different meanings in different countries**

- The difference in nomenclatures—and even substantive definitions of similar concepts—is especially striking across countries and geographic regions. For instance, “privacy” means different things and is applied differently in different countries. How can that difference be reconciled under a global data governance framework?
- **Association with Fair Information Practice Principles**
 - Many of the most used principles are associated with the Fair Information Practice Principles. Among those, we find: Confidentiality and Security, Purpose specification, Transparency, Accountability, Data & Information Accessibility, Data Quality, Proportionality, Participation.

4.1.3. Processes, Governance, and Handling Principles

In our analysis, we identified different categories of principles that sought to inform and steer different aspects of the data governance life cycle i.e. processes, decisions and data handling (albeit often overlapping):

- **Principles for Processes**, which include principles whose aim is to shape the processes followed to arrive at certain governance decisions. These include:
 - Transparency
 - Accountability
 - People-Centered
 - Fairness
 - Participation
 - Lawfulness
- **Principles for Decisions**, which include principles whose aim is to shape the governance decisions themselves. These include:
 - Transparency
 - Proportionality
 - Defined Purpose
 - Accountability
 - People-Centered
 - Fairness
 - Protection from Harm
 - and Non-Discrimination
 - Participation

- **Principles for Data Handling**, whose aim is to influence the way data is processed and handled. These include:
 - Confidentiality and Security
 - Proportionality
 - Data and Information Accessibility
 - Protection of Privacy
 - Lawfulness
 - Informed Consent
 - Data Quality

4.3. Anchoring

Key Takeaways:

- 63% of the frameworks analyzed mentioned anchoring documents that they built on and referred to as a point of reference.
- Anchor documents are mainly referred to as starting points, instead of binding documents to comply with.
- Of all the approaches analyzed, only 39% explicitly mentioned universal human rights frameworks.
- We identified two specific types of anchoring documents that were referred to in our sample: (a) international data and/or human rights protection standards, (b) previously-established privacy legislation.
- A minority of the frameworks considered did not specifically refer to any legal basis.

Overall, 63% of the frameworks analyzed mention anchoring documents that they built on and referred to as a point of reference. Of those, 59% built on international human rights norms and principles. This means that, of all the approaches analyzed, only 39% explicitly mention universal human rights frameworks. Moreover, anchor documents are mainly referred to as starting points, instead of binding documents to comply with. Because of that, it is interesting to note that none of the frameworks in question mention roles or groups responsible for overseeing compliance with said anchor document. However, it is relevant to highlight that many actors that authored the analyzed frameworks are international and supranational organizations that might possess specific privileges and autonomy to act and decide what to comply with (Reinisch 2009).

Overall, analyzing the sample, we identified three main types of frameworks in relation to anchor documents:

- **Frameworks that refer to international data and/or human rights protection standards**
 - An example of a framework that refers to international data protection standards is the Data Strategy of the UN Secretary-General for Action by Everyone,

Everywhere with Insight, Impact and Integrity, which emphasizes respect for human rights as well as international standards, such as the UN Personal Data Protection and Privacy Principles (United Nations 2020, 60). Another example is the Signal Program on Human Security and Technology at the Harvard Humanitarian Initiative, which builds on rights identified in the Universal Declaration of Human Rights (UDHR), the International Covenants on Civil and Political Rights (ICCPR), and other instruments of humanitarian law (rights that apply to all people “regardless of the use of any specific technology” (Harvard Humanitarian Initiative 2015, 8).

- **Frameworks that refer to previously-established privacy legislation**

- An example of a framework that builds on pre-existing privacy regulation is the Australian Information Commissioner’s Privacy Impact Assessment, which evaluates compliance to previously-established privacy legislation such as the Privacy Act 1988. Another example is the United Kingdom’s Personal Information Charter, which seeks to ensure that all personal information is treated in accordance with the UK General Data Protection Regulation and the Data Protection Act from 2018.

- **Frameworks that don’t refer to any specific legal basis**

- Finally, a minority of the frameworks considered did not specifically refer to any legal basis. These were mainly collections of principles and general data governance guidelines, such as the Data Privacy, Ethics and Protection: Guidance Note on Big Data for Achievement of the 2030 Agenda developed by the UN Development Group (UNDG). This document sets out general guidance on data privacy, data protection and data ethics for the United Nations Development Group (UNDG) concerning the use of big data collected in real time by private sector entities, and was shared with UNDG members for the purposes of strengthening operational implementation of their programmes to support the achievement of the 2030 Agenda. The guidelines do not refer to any legal basis, and provide a minimum base for self regulation.

4.4. Data Description

Key Takeaways:

- 51% of the frameworks analyzed clearly define the type of data they aim to oversee..
- 49% of the frameworks have an unclear or only partial definition. These often define data in general but don’t provide a definition of the data they oversee.
- Emerging concepts such as sensitive and synthetic data are often missing, and so is an exploration of relational data, group privacy, and collective rights.

When considering the data included in a framework, we can examine both the type of data (data description) and the data lifecycle. With regard to data type, an examination of our sample results in the following observations:

- 51% of the frameworks analyzed clearly define the type of data they aim to oversee. It is interesting to note how nearly all of the frameworks that clearly define data are involved with the oversight of personal data. Indeed, 90% of those frameworks oversee personal identifiable data. Although there is a lack of consensus about a unique data definition, some of the frameworks follow a definition close to the one proposed by the UN World Food Program: “Personal data is any information relating to an individual that identifies the individual or can be used to identify them” (UN World Food Programme (WFP) 2016, 2) which is similar in other UN agencies such as UNICEF, UNFPA, and International Organization For Migration.
- 49% of the frameworks have an unclear or only partial definition. These often define data in general but don’t provide a definition of the data they oversee. For instance, the Responsible Data Management Training Pack by Oxfam follows the definition developed by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). Data is indeed defined as “the physical representation of information in a manner suitable for communication, interpretation, or processing by human beings or by automatic means. Data may be numerical, descriptive or visual” (Oxfam 2015, 6).
- In general, we find certain emerging definitions and data types missing from the governance frameworks. In particular, new concepts such as sensitive and synthetic data are often missing, as well as an exploration of relational data, which would lead to a broader discussion of collective or community rights.

4.5. Data Lifecycle

Key Takeaways:

- Nearly a fourth (24%) of the frameworks acknowledge the relevance of the data lifecycle approach, develop it and provide specific recommendations for each stage while recognizing the different needs of each one.
- 38% of the frameworks only provide partial or general recommendations, often associated with limited scope or specific coverage of the data cycle.
- There is a noticeable lack of frameworks covering the data re-use stage.

When understanding data as a global asset, the concept of the “data lifecycle” is helpful for estimating the value of data. Value emerges in data transformation, from data collection, processing, and analysis into digital intelligence so that it can be monetized for commercial

purposes or used for social objectives (UNCTAD 2021, 17). This process identifies the particular characteristics and requirements when managing data in each stage. The decisions at every stage of the data life cycle will vary, depending on the type of data and their proximity to features of public goods. Therefore, addressing data governance through a data lifecycle approach is helpful because it enables a comprehensive analysis of how data should be overseen at various stages and create value from data use and reuse in a safe and equitable manner. Figure 9 presents a graphic representation of the data lifecycle.

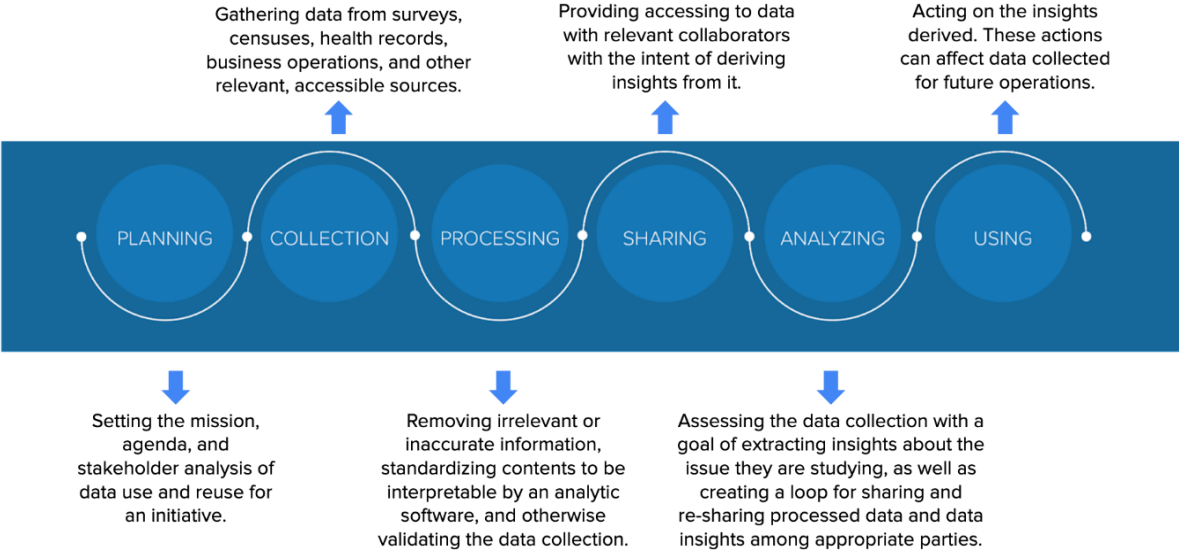


Figure 9: Data Lifecycle by The GovLab.

When analyzing our sample frameworks from a lifecycle approach, we find:

- Only 24% of the frameworks acknowledge the relevance of the data lifecycle approach, develop it and provide specific recommendations for each stage while recognizing the different needs of each one.
 - A good example of those is the ASEAN Data Management Framework. It has been developed to support one of the four strategic priorities identified in the ASEAN Framework on Digital Data Governance, the Data Life Cycle & Ecosystem, to define data governance throughout the data lifecycle (e.g., collection, use, access, storage). The framework then provides adequate data protection recommendations for different data types within an organization and throughout the data lifecycle.
 - Another example from a sectoral lens is the ICAO Aeronautical Information Services Manual (Doc 8126). It recognizes the different stages of data under the "Aeronautical Information Management concept" that compiles acquiring aeronautical data, processing (validation, verification, and management)

aeronautical data and information, providing access to aeronautical information through information services, and consuming aeronautical information by the end users. For each of those stages, the framework gives specific recommendations.

- For instance, the Responsible Data for Children Synthesis conceptual framework from UNICEF and The GovLab describes the data lifecycle in six broad stages: planning, collecting, storing and preparing, sharing, analyzing and using, and provides actionable insights to work with children's data in the advancement of responsible practices through the data lifecycle.
- 38% of the frameworks mention (directly or implicitly) the data lifecycle approach, yet provide partial or general recommendations. In some cases, it is associated with limited coverage of the data cycle. In general, existing governance frameworks tend to focus mainly on the use of data for purpose collected (planning stage), while only four of our frameworks cover data localization requirements (processing stage). There is a noticeable dearth of frameworks covering the data re-use stage.
 - For instance, the Data Security Law of the People's Republic of China acknowledges the data lifecycle by stating that "Data handling" includes the collection, storage, use, processing, transmission, provision, and disclosure of data. However, the law does not provide particular recommendations or guidelines for each stage.
 - In the case of the GDPR, for example, there is no explicit differentiation between the stages of data processing since "processing" is defined as any operation performed on personal data "*such as collection, recording, organization, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction*" (*General Data Protection Regulation 2016, Article 4(2)*). Although it covers different data lifecycle phases under the processing definition, it does not provide specific recommendations based on the data cycle stages. This approach applies throughout the regulatory framework, except for the chapter on "transfers of personal data to third countries or international organizations" (*General Data Protection Regulation 2016, Chapter V*), where the focus is data sharing.
 - For example, among the frameworks with limited scope, the Data Sharing Policy of the Médecins Sans Frontières (a non-governmental organization) stands out. This policy aims to guide the use of health data generated by its programs. Even though it recognizes the different stages of the data lifecycle, the only concern of this policy is the data-sharing stage.
- Finally, 38% of the frameworks do not identify nor acknowledge explicitly the data lifecycle and its different stages to develop their approach to data governance.

4.6. Processes

Key Takeaways:

- Only 5% of the frameworks followed a participatory process that included data subjects when defining the data governance approach.
- 22.4% of the frameworks created a specific governance body with functions to oversee framework implementation. The rest added extra functions to existing agencies or authorities or made vague high-level recommendations.
- Only 29% of the sample explicitly state how supervisory authorities will monitor and evaluate compliance with the framework. 29% vaguely recommend establishing a monitoring mechanism, and 41% did not establish or mention the need for monitoring mechanisms.

A well-functioning data governance framework should define the roles, responsibilities, and associated compliance procedures to safely share, use, and reuse data by all stakeholders. We identified three types of processes:

- **Process to develop the governance framework:** Move toward more participatory processes.
 - In at least 18% of the sample, we found that multi-stakeholder and multisectoral approaches were used to define frameworks in our sample, especially those within intergovernmental institutions and international coalitions. For example, the Recommendation of the OECD council on health data governance is the product of a multi-stakeholder effort. It was jointly developed by the Committee on Digital Economy Policy and the Health Committee, the former Working Party on Security and Privacy in the Digital Economy (renamed in 2019 as the Working Party on Data Governance and Privacy), and the former Health Care Quality Indicators Expert Group (OECD 2016). However, it did not involve any data subjects in the process.
 - Only 5% of the frameworks followed a participatory process that included data subjects when defining the data governance approach. For instance, and perhaps the most representative example of participation, is the Data Governance Framework for New Zealand, where the government co-designed the framework with the Māori community (data subjects) to reflect Māori needs and interests in data. Another example is UNESCO's Internet Universality Indicators which were developed in three phases, including two rounds of consultations, consultative meetings and workshops at international, regional, and national events with a diverse group of stakeholders, including civil society and individuals.
 - In general, the remaining frameworks displayed shortcomings with regard to inclusiveness.

- **Process to identify and create new professions and functions:** Need for more specific roles and binding responsibilities.
 - Roughly a fourth (22.4%) of the frameworks created a specific governance body with functions to oversee framework implementation. Titles for these bodies varied, and included such designations as Data Protection Officers and Chief Data Officers.
 - For example, the Policy on the Protection of Personal Data of Persons of Concern for the UNHCR creates new roles and responsibilities: the Data Controller, the Data Protection Officer and the Inspector General's Office, and the Ethics Office with specific responsibilities to oversee the compliance of the policy. The data controller is responsible to establish procedures that respect the rights of data subjects. The data protection officer supervises and monitors the compliance with the Data Protection Policy. The Inspector General's Office must investigate complaints of data subjects under the right to information. And, the Ethics committee must provide a whistle blower policy with respect to data protection (UN High Commissioner for Refugees (UNHCR) 2018).
 - In the case of the GDPR, for example, each member state must establish an independent public authority responsible for monitoring the application of the GDPR, which is called "supervisory authority". Further, a lead supervisory authority is established for cross-border data processing. The supervisory authorities are designed to monitor and enforce the regulation on their territory. Moreover, the GDPR establishes a European Data Protection Board, composed of the heads of the supervisory authorities of each member state. In addition, each data controller or processor must designate a data protection officer.
 - The California Consumer Privacy Act (CCPA), for instance, created the California Privacy Protection Agency, which is vested with full administrative power, authority, and jurisdiction to implement and enforce the CCPA. It also specifies that the agency will have a five-member board, including a chairperson. "The chairperson and one member of the board shall be appointed by the Governor. The Attorney General, Senate Rules Committee, and Speaker of the Assembly shall each appoint one member. These appointments should be made from among Californians with expertise in the areas of privacy, technology, and consumer rights" (*California Consumer Privacy Act 2018, Section 1798.199.10*) .
 - In contrast, 24.1% of the sample simply added extra data governance functions to existing agencies or authorities, often without the required capacity- and expertise-building.

- The Office for the Coordination of Humanitarian Affairs (UN OCHA) data responsibility guidelines, for example, establish that OCHA Centre for Humanitarian Data, an existing body, “is committed to supporting offices and sections across OCHA in adopting the Guidelines” (OCHA Centre for Humanitarian Data 2021, 34).
 - For instance, the Responsible Program Data Policy by Oxfam (non-governmental organization) explicitly states that overseeing the framework implementation must be executed by the Oxfam Country Directors as an additional task.
 - Also, the Procedures for Ethical Standards in Research, Evaluation, Data Collection and Analysis by UNICEF present a similar approach. It states that Country Representatives, Regional Directors, and Heads of Divisions must ensure and maintain “the highest ethical standards in all evidence generation endeavors” (UNICEF Division of Data, Research and Policy 2015, 2) by implementing the procedures laid out in the framework.
- A small number of other frameworks (19%) recommend the establishment of roles and governance bodies, but do not actually include provisions for creating them as part of non-binding recommendations.
 - The OECD’s Recommendation of the Council on Health Data Governance provides vague instructions to existing governance bodies given its supranational nature. It recommends governments engage with relevant experts and organizations to develop mechanisms to implement the framework. It also encourages non-governmental organizations to follow the recommendation when processing personal health data for health-related purposes that serve the public interest. However, the recommendations are not legally binding for member states or non-governmental institutions.
 - For example, the Association of Southeast Asian Nations (ASEAN) Data Management Framework (DMF) advises members to define roles and responsibilities for implementing each action described in the framework: "To develop and implement the 6 foundational components of the DMF, an organization is required to identify and determine different roles and responsibilities in order to ensure adoption, operation, and compliance, in accordance with business needs" (Association of Southeast Asian Nations (ASEAN) 2021, 12). However, the framework is not specific regarding the new professional roles and skills required.
- There is another group of frameworks that do not provide governance information nor propose new roles or tasks (34.5%), mainly because of the nature and scope of the document.

- This usually happens when looking at principles frameworks such as the Gemini Principles, the CARE Principles for Indigenous Data Governance, or the UN High-Level Committee on Management Personal Data Protection and Privacy Principles. None of those specify or suggest establishing governance roles since they mainly focus on the values when managing data. Or in the case of the Risks, Harms and Benefits Assessment by UN Global Pulse, for example, given that it is a data privacy and protection compliance mechanism, the scope limits its role to provide governance recommendations.
- **Processes to monitor and evaluate:** Highly related to governance roles and functions, these elements that fell short are generally insufficiently defined.
 - 41.4% of the frameworks did not establish or mention the need for monitoring mechanisms, which are a vital component of successful operationalization for any framework.
 - For example, the Handbook on Data Protection in Humanitarian Action created by the Brussels Privacy Hub and the International Committee of the Red Cross (ICRC) recognizes that international organizations have complete independence on how to process data and monitor compliance of data protection recommendations “they can therefore process Personal Data according to their own rules, subject to the internal monitoring and enforcement of their own compliance systems; in this regard they constitute their own jurisdiction” (International Committee of the Red Cross, 35) .
 - On the other hand, the considerations for Using Data Responsibly for the United States Agency for International Development (USAID) acknowledge that this is not an enforceable framework and define it as an internal document to start the conversation on data governance.
 - Some of the frameworks (29.3%) recommend establishing a monitoring mechanism, although it is often unclear whose responsibility it is to ensure those mechanisms are implemented.
 - For instance, the International Organization for Migration's (IOM) Data Protection Manual acknowledges the importance of oversight and compliance. Still, it only advises creating, without appointing, "an independent body to oversee the implementation of these principles and to investigate any complaints, and designated data protection focal points should assist with monitoring and training" (International Organization for Migration 2015, 12).
 - The International Civil Aviation Organization (ICAO)'s Aeronautical Information Services Manual, for example, recommends establishing monitoring and evaluation mechanisms but falls short of providing real

- instruments or mandates. "States must implement well-documented surveillance processes by defining and planning inspections, audits, and monitoring activities on a continuous basis" (International Civil Aviation Organization 2021, Section 2.8.1).
- The other 29.3% of the sample explicitly state how supervisory authorities are going to supervise and monitor the compliance of it. Some of them might correspond to regulatory frameworks or laws.
 - Canada's Personal Information Protection and Electronic Documents Act (PIPEDA), for instance, establishes that the Office of the Privacy Commissioner of Canada will oversee compliance with the PIPEDA legislation. Further, the Commissioner may audit an organization's personal information management practices if the Commissioner believes that the organization has not followed a recommendation set out in the Act; it may ask for additional resources to monitor implementation.
 - Similarly, the GDPR establishes in Articles 41 and 42 that a supervisory authority for monitoring compliance may be carried out by a body with an appropriate level of expertise in relation to the subject matter of the code and is accredited for that purpose. That way, the Member States, the supervisory authorities, the Board, and the Commission shall encourage compliance with this Regulation of processing operations by data controllers and processors (*General Data Protection Regulation 2016*).
 - Another example is the Recommendation of the OECD council on health data governance. In this case, the framework provides detailed guidelines to implement monitoring and evaluation mechanisms, such as assessing whether the uses of personal health data have met the intended health-related public interest purposes and brought the benefits expected by i) pursuing a periodic review of developments in personal health data availability, the needs of health research and related activities, and public policy needs; and i) following a systematic assessment and updating of policies and practices to manage privacy, protection of personal health data and security risks relating to personal health data governance.
 - In addition, none of the frameworks under study established evaluation mechanisms, which makes it difficult to assess their impact or effectiveness.

4.7. Practices

Key Takeaways:

- Only 29% of frameworks provided practical tools such as templates, checklists, or assessments.
- 38% of the frameworks analyzed recommend and describe, often in a detailed fashion, good practices for data governance. But they fail to define who, how, and when these practices should be implemented.
- With few exceptions (e.g., data protection regulatory frameworks and laws), most recommended practices are not binding. This may limit their effectiveness and the extent to which they are operationalized.

We examined the sample frameworks for their practices, which aimed to analyze their practical approach, and how they translate the theory, values, and principles into practice. From applied templates and checklists to the description of processes, sometimes imprecise, four trends were observed:

- **Plethora of practices but often vague**

- 38% of the frameworks analyzed recommend and describe, often in a detailed fashion, good practices for data governance. However, in most cases the frameworks do not include detailed recommendations or guidelines for who, how, and when these practices should be implemented.
 - The California Consumer Privacy Act (CCPA), for example, provides guidance to businesses on how to inform consumers of their rights under the CCPA, how to handle consumer requests, how to verify the identity of consumers making requests, and how to apply the law as it relates to minors. It stipulates the processes businesses need to implement to follow the CCPA while making it easier for consumers to exercise their CCPA rights (*California Consumer Privacy Act 2018*).
 - Another example is the UNICEF & UNFPA Policy on Personal Data Protection. The Policy describes good practice when collecting data from individuals and explains how to notify the data subject. It presents the information that shall be provided to each identified data subject within a reasonable period when personal data are collected by UNICEF or UNFPA (as controller), taking into account the logistical constraints both organizations face (UNICEF 2020).
 - For example, the Privacy Impact Assessment Toolkit from the Office of the Australian Information Commissioner describes a detailed ten-step process for undertaking a privacy impact assessment to apply the toolkit. Similarly, the Data responsibility guidelines of the UN Office for the Coordination of Humanitarian Affairs (UN OCHA) recommend eight actions to be implemented at the system-wide, sector, and organizational levels. The framework guides OCHA Staff to implement these processes at

different levels. However there is no clarity regarding the timing and the ways in which the actions should be implemented.

- **Need for practical tools such as templates for sharing agreements**

- Data collection and data sharing are key components of the data life cycle, but rife with potential minefields (e.g., potential regulatory or privacy violations). Organizations, especially if they are under-resourced technically or financially, can greatly benefit from detailed guidelines such as templates and checklists to help guide their decisions. In our sample, only 29% of frameworks provided tools such as templates, checklists, or assessments.
 - One of them is the International Organization for Migration's Data Protection Manual that provides a number of practical tools: templates and checklists. Templates of model consent forms, general contractual clauses to be inserted into contracts, and request forms for data subjects seeking access to their personal data; and checklists for data quality, data security, and data protection.
 - Also, the USAID's Considerations for Using Data Responsibly offers applied tools for how to help guide discussions or navigate areas of responsible data practice that may be unclear. The tools range from the key events planning table to the benefits risk assessment, a worksheet to track and protect copies of sensitive data and IT security highlights checklist.
 - The UNDP's Data Principles, even though they are principles, provide practical resources to implement their recommendations. For example, the Informed Consent explanation for Safeguarding personal data, the Responsible Development Data Book for Manage Data Responsibly, and the Mozilla Science Data Reuse Checklist for planning for reusability and interoperability.
 - For example, the WFP's Guide to Personal Data Protection and Privacy offers a Self-Assessment Compliance Checklist that allows personnel to measure compliance with each of the elements of the guidelines. Further, it presents a Model Consent Forms that can be used to develop local templates for obtaining informed consent and responding to beneficiaries' requests for access to their data.

- **Risk assessments and compliance mechanisms**

Within the processes and tools presented in the analyzed frameworks, there is a subgroup of risk assessments that stand out as a good practice for applying responsible data management.

- For example, the Risks, Harms and Benefits Assessment of the UN Global Pulse develops a two-steps assessment: the first one is a checklist, which is used as an initial assessment tool that identifies potential risks and helps evaluate whether a

more comprehensive review should be conducted; and the second one consists of a detailed measurement of the likelihood, magnitude, and significance of impacts of a data innovation project if a medium or high risk was identified in the initial assessment.

- Also, the Handbook on Data Protection in Humanitarian Action by the Brussels Privacy Hub (VUB) and ICRC offers a Data Protection Impact Assessment (DPIA) tool to identify, evaluate and address the risks to Personal Data arising from a project, policy, program, or another initiative. It includes a step-by-step guide for humanitarian organizations to conduct it. It also has a template for a DPIA report.
 - The USAID's Considerations for Using Data Responsibly, among the other provided tools, develops the Benefits risk assessment, a tool designed to help assess potential benefits and risks of data collection, use, and sharing. To properly evaluate risks and benefits, it is critical to include relevant stakeholders in this process, including those from whom you collect data.
- **Non-binding frameworks**
 - With few exceptions (e.g., data protection regulatory frameworks and laws), most recommendations are not binding. This may limit their effectiveness and the extent to which they are operationalized. Their list of recommendations and good practices are “suggestions” or “proposals.”
 - Furthermore, 34% of the data frameworks reviewed do not provide detailed processes or explicit practical tools.

5. Final Recommendations

Data governance embraces a wide range of elements and concepts without a unified or unique definition, which might create asymmetries when establishing a data governance framework. The analysis has shown a variety of purposes, approaches and scopes at the local, national, and international levels. Davis proposes a definition aiming to gather multiple components of it: “Data governance concerns the rules, processes and behaviors related to the collection, management, analysis, use, sharing and disposal of data - personal and/or non-personal. Good data governance should promote benefits and minimize harms at each stage of relevant data cycle” (Davis 2022, 12).

Well-designed data governance, according to the World Bank , can be defined as the framework that allows capturing the central values and purposes of an entity (country, international body, region, etc.) to leverage the synergies with multiple stakeholders while creating trust and promoting the use of data (World Bank 2021, 10). Based on those definitions and building upon the main takeaways from the detailed analysis of 58 data governance frameworks, there is an opportunity for researchers, decision-makers and other stakeholders to identify critical elements

and follow good practices. The following reflections are clustered according to the proposed analytical framework (Section 2.3.):

- 1. Consider data stewardship to reconcile the tension between data protection and data promotion:** Moving forward, there may be a need to adopt a broader framework and concept of data stewardship. This would indeed allow to achieve and maintain the dual goal of protecting and promoting data in a more systematic, sustainable and responsible way. Indeed, as mentioned in Section 3.1., data stewardship aims to make the use of data more responsible, systematic and sustainable (Verhulst 2021a); achieve the responsible and accountable use of common resources (Ada Lovelace Institute 2021) allowing to make full use of data's benefits and avoiding the social and economic harms that can stem from its misuse (Open Data Institute 2022). In particular, it may be useful to (a) Provide a legal, shared definition for global data stewardship, (b) Rationalize and coordinate existing support to international data stewardship efforts, and (c) Commission research and trials to assess the potential of a global data stewards association.

- 2. Focus on responsible re-use to unlock the socioeconomic value of data:** In recent years, the open data movement to improve public governance has grown significantly (The GovLab 2016). As a consequence, increasing amounts of both public and private data have been made available to external stakeholders. However, although the frameworks analyzed in this research did aim to develop different ways to govern the use of data, they overall lacked a focus on the re-use of data—i.e., the sharing of data across different domains. It may in fact be beneficial to integrate the concept of reuse in the development of a global data governance framework, so as to create shared approaches and standards with respect to the sharing of data amongst different stakeholders. In particular, it may be useful to (a) Develop methodologies to define and measure the value of data, (b) Develop structures to incentivize the 'co-creation of value' (Mazzucato 2019), (c) Encourage data collaboratives,³ and (d) Identify and nurture data stewards, as further specified in Reflection 1 (Verhulst 2020). Finally, in order for the reuse of data to be deemed responsible and consequently legitimate, it is crucial to create avenues for public assemblies and value the importance of social licenses (see Recommendation 7) (Verhulst 2021b).

- 3. Harmonize meanings to operationalize principles:** This research showed that there is an overall lack of clarity and harmonization of meanings across different countries, sectors, and organizations. This makes it difficult to operationalize the principles in a harmonized manner and at a global level. Whereas different contexts are bound to value different principles to some degree, there seem to be an overarching agreement on a series of

³ We define 'data collaboratives' as "...an emerging form of public-private partnership that enables sharing and co-creation of value. They may involve, for instance, informal and time-bound collaborations between a company and an academic research group or civil society organization, and allow data to be re-purposed, typically in an anonymized form and with specific intent." (Verhulst 2020).

data governance principles (See Section 3.1.2.). These, however, seem to be defined differently by different organizations. It may be worth universalizing the principles to be embedded in a global data governance framework, so as to systematically operationalize them and ensure compliance across different regions and nations.

- 4. Use broader anchoring frameworks to provide common North Stars:** As mentioned in Section 3.2., of all the approaches analyzed, only 39% explicitly mention global human rights frameworks. Moreover, anchor documents are mainly starting points, instead of binding documents to comply with. Finally, because of the loose nature of the “anchoring process”, none of the frameworks clearly mention responsible roles or identify processes for overseeing compliance with an anchor document. First, it seems that having broader frameworks—and not only, for instance, privacy-focused legal bases—related to universal human rights may be beneficial in developing a global data governance framework (MacFeely et al., 2022). Second, it seems important to establish clear levels of compliance required with such documents. Finally, based on those levels, it may be beneficial to answer the question of who oversees compliance, so as to ultimately materialize the relationship between the framework and its anchor document.
- 5. Unify key definitions of data and incorporate emerging concepts such as synthetic data:** Whereas it is important to keep in mind that a fixed definition of data may be more harmful than beneficial, mainly due to the ever-changing nature of both data and the technologies it relates to, it is also crucial to develop a series of mechanisms that allow flexibility and clarity of what we mean by ‘data’. To do so, it may prove useful to incorporate emerging, flexible concepts such as synthetic data, as well as relational data, thick data, and sensitive data (with the latter having been increasingly more adopted lately). This indeed could enable the definitions to be more precise, without referring to the broad, general concept of data, and at the same time it may result in a malleable approach that could allow for the various data-related evolutions and developments to be assimilated.
- 6. Adopt the data lifecycle approach to promote benefits and minimize harms:** Given the breadth of contexts in which data governance must be applied, it is beneficial to use a standardized framing to structure the needs, risks, and opportunities when handling data. As mentioned before, data governance results from multiple processes all aligned toward data promotion and protection. These processes can be hard to understand when viewed together, and although the data lifecycle is not linear, it could help to inform responsible data handling approaches better while promoting better and more impactful data management (The GovLab 2021).
- 7. Incorporate more participatory processes and collective agency to develop a data governance framework:** Participatory data governance occurs when organizations allow different constituents to contribute to the discussion and are accountable for their

decisions to the public. To encourage transparency and accountability in data governance efforts, decision-makers should offer opportunities for scrutiny and input from data subjects. This policy feedback process is particularly relevant within the data governance discussion since it will allow obtaining the most value from data while protecting people from harm (The Digital Trade and Data Governance Hub 2022). Therefore, public consultations on the design of policies and regulations could support transparency and stakeholder engagement (World Bank 2021, 284) while fostering the social license of the process. The social license refers to the informal permissions granted to institutions such as governments or corporations by members of the public to carry out a particular set of activities (Shaw, Sethi, and Cassel 2020), in this case, the collection, sharing, and use of their data.

Most of today's participatory processes focus on protecting individuals' rights. Yet these debates fail to consider the agency of data subjects as a collective. There are often massive asymmetries between individuals and stronger stakeholders, such as the public or the private sector, that exploit their data while restricting its potential. To address these asymmetries, a new principle of digital self-determination is needed. Verhulst defines digital self-determination as "the principle of respecting, embedding, and enforcing people's and people's agency, rights, interests, preferences, and expectations throughout the digital data life cycle in a mutually beneficial manner for all parties involved" (Verhulst 2022, 10). In the context of data governance, building symmetric relationships can help data subjects leverage their self-determination more effectively to exert greater control over how their data is used and reused (Verhulst 2022). This is particularly relevant for underrepresented groups, which possess even lower bargaining power than other collectives.

- 8. Invest in and create new professions with specific roles and responsibilities:** Attracting data talent and promoting data stewardship is key to ensuring compliance with data governance frameworks and fostering a culture around data collaboration and protection within organizations. The Third Wave of Data by The GovLab proposes a focus on new institutional arrangements to achieve a data-driven culture with particular attention on the role of the data steward - accountable data leaders that seek new ways to create value through cross-sector data collaboration (The GovLab 2021). The analysis reveals the importance of having trained and dedicated individuals (whether chief data, chief privacy, or chief security officers, or the equivalent body) with specific functions and binding responsibilities for long-lasting, sustainable, and informed data actions.
- 9. Improve accountability and transparency by defining oversight and compliance mechanisms:** There is a need to explicitly define monitoring and evaluation mechanisms linked to defining roles and responsibilities. An organization's accountability can be measured by how it monitors and assesses its internal policies to manage, protect and secure data effectively (Centre for Information Policy and Leadership 2011) or simply by

complying with the data governance policy. To do so, it is recommended to establish not only the mechanism but also who, when, how often, and how it should be implemented.

- 10. Translate values and recommendations into practical tools:** In collaboration with diverse policy-makers and stakeholders, identify the most valuable tools to facilitate and accelerate the implementation of a data governance policy. The analysis identified three practical tools that should be considered to help data stewardship: model consent forms, checklists for data quality, data security and data protection, and data risks assessment step-by-step guidelines. These tools may indeed prove useful to guide implementation, document progress, and monitor compliance.

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Appendix

Appendix A: List of Analyzed Frameworks

Name of the Framework	Type	Owner/Author	Type of Organization	Geographical Scope	Sector	Year
<u>Personal Information Charter</u>	Charter	Foreign, Commonwealth & Development Office (FCDO)	Governmental Institutions	Local	Policy and Regulation	2021
<u>Industry Toolkit: Children's Online Privacy and Freedom of Expression</u>	Toolkit	UNICEF	Intergovernmental Institutions	Global	Humanitarian	2015
<u>A Human-Rights Based Approach to Data: Leaving No One Behind in the 2030 Agenda for Sustainable Development</u>	Conceptual Framework	Office of the United Nations High Commissioner for Human Rights (OHCHR)	Intergovernmental Institutions	Global	Human Rights	2018
<u>Data Strategy of the Secretary-General for Action by Everyone, Everywhere with Insight, Impact and Integrity</u>	Conceptual Framework	United Nations	Intergovernmental Institutions	Global	Not One Specific Sector	2022
<u>Principles for Digital Development</u>	Principles	Principles for Digital Development	International Independent Coalitions	Global	Research and Development	2017
<u>Responsible Data Program</u>	Conceptual Framework	The Engine Room	International Independent Coalitions	Global	Research and Development	2016
<u>Risks, Harms and Benefits Assessment</u>	Conceptual Framework	UN Global Pulse	Intergovernmental Institutions	Global	Humanitarian	2020

<u>DTM & Partners Toolkit: Enhancing Responsible Data Sharing</u>	Toolkit	International Organization for Migration	Intergovernmental Institutions	Global	Migration	2018
<u>Oxfam Responsible Program Data Policy</u>	Toolkit	Oxfam	Non-Governmental Organizations	Global	Humanitarian	2015
<u>Data Sharing Policy</u>	Conceptual Framework	Médecins Sans Frontières	Non-Governmental Organizations	Global	Health	2013
<u>Data Privacy, Ethics and Protection: Guidance Note on Big Data for Achievement of the 2030 Agenda</u>	Manual/Guidelines	UN Development Group (UNDG)	Intergovernmental Institutions	Global	Research and Development	2017
<u>Signal Program on Human Security and Technology at the Harvard Humanitarian Initiative.</u>	Conceptual Framework	Harvard Humanitarian Initiative (HHI)	Academia and Research Institutions	Global	Humanitarian	2015
<u>IOM Data Protection Manual</u>	Manual/Guidelines	International Organization for Migration	Intergovernmental Institutions	Global	Migration	2015
<u>Undertaking a Privacy Impact Assessment</u>	Toolkit	Office of the Australian Information Commissioner	Governmental Institutions	Local	Policy and Regulation	2020
<u>Responsible Data for Children Synthesis report</u>	Conceptual Framework	UNICEF and The GovLab	Intergovernmental Institutions	Global	Humanitarian	2019
<u>General Data Protection Regulation Framework</u>	Regulation Framework	European Union	Intergovernmental Institutions	Regional	Policy and Regulation	2018
<u>Handbook on Data Protection in Humanitarian Action</u>	Manual/Guidelines	Brussels Privacy Hub (VUB) and International Committee of the Red Cross (ICRC)	Non-Governmental Organizations	Global	Humanitarian	2020

<u>Policy on the Protection of Personal Data of Persons of Concern to UNHCR</u>	Policy	UNHCR	Intergovernmental Institutions	Global	Humanitarian	2018
<u>OCHA data responsibility guidelines 2021</u>	Manual/Guidelines	UN Office for the Coordination of Humanitarian Affairs (UN OCHA)	Non-Governmental Organizations	Global	Humanitarian	2021
<u>Procedures for Ethical Standards in Research, Evaluation, Data Collection and Analysis</u>	Manual/Guidelines	UNICEF	Intergovernmental Institutions	Global	Humanitarian	2015
<u>Personal Data Protection and Privacy Principles</u>	Principles	UN High-Level Committee on Management (HLCM)	Intergovernmental Institutions	Global	Not One Specific Sector	2018
<u>Considerations for Using Data Responsibly</u>	Policy	United States Agency for International Development (USAID)	Intergovernmental Institutions	Global	Research and Development	2019
<u>The Geneva Declaration on Targeted Surveillance and Human Rights</u>	Charter	Access Now and Government of Catalonia	International Independent Coalitions	International	Not One Specific Sector	2022
<u>Recommendation of the Council concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data</u>	Manual/Guidelines	OECD (Organisation for Economic Co-operation and Development)	Intergovernmental Institutions	Global	Not One Specific Sector	2013
<u>WHO Data Principles</u>	Principles	UN - World Health Organization	Intergovernmental Institutions	Global	Health	2020
<u>EU Data Governance Act (2021)</u>	Law	European Union	Intergovernmental Institutions	Regional	Policy and Regulation	2022
<u>UN Global Pulse Principles on Data Protection and Privacy</u>	Manual/Guidelines	UNGP Global Data Access Initiative (GDAI)	Intergovernmental Institutions	Global	Research and Development	2020

<u>Data Principles for UNDP</u>	Principles	UNDP	Intergovernmental Institutions	Global	Research and Development	2020
<u>UNICEF & UNEPA Policy on Personal Data Protection.</u>	Policy	UNICEF	Intergovernmental Institutions	Global	Humanitarian	2020
<u>UNICEF Data Quality Framework</u>	Conceptual Framework	UNICEF	Intergovernmental Institutions	Global	Humanitarian	2021
<u>WFP Guide to Personal Data Protection and Privacy</u>	Manual/Guidelines	WFP	Intergovernmental Institutions	Global	Humanitarian	2016
<u>ICAO Aeronautical Information Services Manual - Doc 8126</u>	Regulation Framework	ICAO - International Civil Aviation Organization	Intergovernmental Institutions	Global	Mobility	2021
<u>An operational Data Governance Framework for New Zealand Government</u>	Regulation Framework	Stats NZ	Governmental Institutions	Local	Policy and Regulation	2019
<u>California Consumer Privacy Act (CCPA)</u>	Law	California	Governmental Institutions	Local	Policy and Regulation	2018
<u>African Union Data Policy Framework</u>	Policy	African Union Commission	Intergovernmental Institutions	Regional	Policy and Regulation	2022
<u>Japanese Basic Act on the Advancement of Public and Private Sector Data Utilisation</u>	Law	Japan	Governmental Institutions	National	Policy and Regulation	2016
<u>National Data Governance Framework: Information Systems for Health</u>	Conceptual Framework	PAHO	Intergovernmental Institutions	Regional	Health	2021

<u>Recommendation of the Council on Health Data Governance</u>	Conceptual Framework	OECD	Intergovernmental Institutions	Global	Health	2016
<u>IGAD Regional Health Data Sharing and Protection Policy FRAMEWORK</u>	Policy	IGAD (Intergovernmental Authority on Development)	Intergovernmental Institutions	Regional	Health	2022
<u>Technical Report D4.1 - Framework for security, privacy, risk and governance in data processing and management</u>	Manual/Guidelines	ITU - International Telecommunication Union	Intergovernmental Institutions	Global	Telecommunications	2019
<u>GSMA Guidelines on mobile money data protection</u>	Manual/Guidelines	GSMA	International Independent Coalitions	Global	Telecommunications	2018
<u>OPERATIONAL GUIDANCE DATA RESPONSIBILITY IN HUMANITARIAN ACTION</u>	Manual/Guidelines	Inter-Agency Standing Committee (IASC) - (UN)	Intergovernmental Institutions	Global	Humanitarian	2021
<u>ASEAN Data Management Framework</u>	Manual/Guidelines	Association of Southeast Asian Nations (ASEAN)	Intergovernmental Institutions	Regional	Not One Specific Sector	2021
<u>United Nations Fundamental Principles of Official Statistics, Implementation Guidelines</u>	Manual/Guidelines	United Nations Statistics Division (UNSTATS)	Intergovernmental Institutions	Global	Not One Specific Sector	2015
<u>OECD AI principles</u>	Principles	OECD	Intergovernmental Institutions	Global	Not One Specific Sector	2019
<u>UNESCO Recommendation on the Ethics of AI</u>	Conceptual Framework	UNESCO	Intergovernmental Institutions	Global	Other	2021

<u>UNESCO's Internet Universality Indicators</u>	Conceptual Framework	UNESCO	Intergovernmental Institutions	Global	Other	2018
<u>Data Security Law of the People's Republic of China</u>	Law	Republic of China	Governmental Institutions	Local	Not One Specific Sector	2021
<u>Cybersecurity Law of the People's Republic of China</u>	Law	Republic of China	Governmental Institutions	Local	Not One Specific Sector	2017
<u>Recommendation of the OECD council on health data governance</u>	Conceptual Framework	OECD	Intergovernmental Institutions	International	Health	2016
<u>Inter-American Open Data Program to Combat Corruption - PIDA</u>	Regulation Framework	OAS	Intergovernmental Institutions	Regional	Other	2019
<u>APEC SECRETARIAT Personal Data Protection Policy</u>	Policy	Asia-Pacific Economic Cooperation (APEC)	Intergovernmental Institutions	Regional	Policy and Regulation	2021
<u>Canada's Personal Information Protection and Electronic Documents Act (PIPEDA)</u>	Law	Government of Canada	Governmental Institutions	Local	Policy and Regulation	2015
<u>UN Integrated Geospatial Information Framework (UN-IGIF)</u>	Conceptual Framework	UN-IGIF	Intergovernmental Institutions	International	Other	2019
<u>The Gemini Principles</u>	Conceptual Framework	Centre for Digital Built Britain	Academia and Research Institutions	Global	Research and Development	2018
<u>CARE Principles for Indigenous Data Governance</u>	Conceptual Framework	Global Indigenous Data Alliance	International Independent Coalitions	Global	Other	2019

<u>Health Data Governance Principles</u>	Principles	Transform Health	International Independent Coalitions	Global	Health	2022
<u>Cross-Border Data Policy Principles</u>	Principles	Global Data Alliance	International Independent Coalitions	Global	Economics and Finance	2021

Appendix B: Extended Public Repository

At this link can be found an extended version of our repository, which served as the table of analysis for this research:
<https://docs.google.com/spreadsheets/d/1O6iPENGkQ6DLD3SQmZt3qlqGGnwmAeQbUtviqy5TYLk/edit?usp=sharing>.