National Data Strategy

2030

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Content

Introduction

In a world where data is the engine of innovation and the basis for informed decision-making, it is crucial to maximise the opportunities offered by the information age to promote the well-being of all people and sustainable development and to strengthen democracy, foster economic growth, inclusion and equality through efficient data-driven policies and public services. At the same time, it is necessary to address challenges associated with data, such as privacy, security, accessibility, the digital divide and environmental impact.

To do this, it is necessary to develop comprehensive policies and promote the data culture, which promotes the responsible and ethical use of data, guarantees the protection of fundamental rights, and strengthens the capacities of individuals and public and private institutions to take advantage of their potential.

The National Data Strategy provides sustainability to the national policies that have been developed in Uruguay in this area and establishes the bases for their strengthening, while promoting the development, deployment and articulation of new policies that address the current and future opportunities and challenges of the digital society and emerging technologies.

Framed in article 74 of Law No. 20,212, of November 6, 2023[1], the Strategy covers the public and private sectors and multiple stakeholders. The objectives and lines of action that are developed are complemented and articulated with the National Artificial Intelligence Strategy (2024-2030)[2], the National Digital Citizenship Strategy for an Information and Knowledge Society. Uruguay 2024-2028[3], and the National Cybersecurity Strategy (2024-2030).

In line with the objectives of Uruguay's digital policy, defined in the Uruguay Digital Agenda 2025[4], the National Data Strategy conceives the data

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[1] Article 74, Law No. 20,212 (impo.com.uy)
[2] National Artificial Intelligence Strategy 2024-2030
[3] National Digital Citizenship Strategy for an Information and Knowledge Society 2024-2028
[4] Uruguay Digital Agenda 2025

as a key asset to support effective decision-making and efficient public management, and aims to further develop the country's capabilities, including infrastructure to enable the integration, exchange and optimized consumption of services and data by the public and private sectors, in a secure and controlled environment.

In recent years, the country has demonstrated a sustained commitment to digital transformation, with initiatives such as 360° data,datos.gub.uy , the open data action plans and the Interoperability Platform, which have promoted the data culture in the public sector. Likewise, the existence of national policies associated with the protection of personal data, information security, transparency and data openness and interoperability have also played a key role in the country's digital transformation processes and constitute the foundations of this Strategy.

Through the thematic axes of Data Governance, Capabilities and Infrastructure, and Country Development, the Strategy proposes a set of lines of action aimed at ensuring a comprehensive framework for data governance and management, promoting the quality, interoperability, and availability of data, both in the public and private spheres. These actions include initiatives aimed at guaranteeing regulatory frameworks that enable their proper implementation, developing capabilities and technological infrastructure that enable the use of the potential of data, promoting research and innovation, boosting the data-based economy, improving public services, advancing transparency and accountability issues, and ensuring the safe and ethical use of data.

The Strategy reflects the State's leading role in promoting a reliable data ecosystem, with the aim of reducing digital and social gaps and continuing to drive the country's digital transformation.

This instrument was created through a broad participatory process, which gathered input from more than 120 people from different disciplines and fields, representatives from more than 35 public institutions, 8 civil society organizations, 12 from the private sector and 6 from academia, who contributed with their perspective. It was also enriched with the contributions emerging from the round tables

dialogue and work developed within the framework of the review process of the Artificial Intelligence Strategy. The process of creating the National Data Strategy was led and articulated by Agesic, in coordination with the Strategic Committee of the Public Sector for Artificial Intelligence and Data.

The adoption of this Strategy is a significant step that contributes to advancing the implementation of treaties and other international commitments assumed by Uruguay, including the Global Digital Pact approved by Resolution of the United Nations General Assembly on September 22, 2024.

Background

The progress that Uruguay has made on its path towards digital transformation and the construction of an open State are the basis of this Strategy. These advances have been driven through the development of an enabling institutional and regulatory framework that has provided sustainability to national policies in this field, while encouraging the implementation of multiple initiatives from various areas of the State and sectors of society, and which has also contributed to the development of ecosystems of involved actors.

The baseline on which the National Data Strategy is based is made up of the results of initiatives led and implemented by multiple public institutions within their areas of competence, and from the private sector, civil society and academia.

The successive editions of the Uruguay Digital Agenda and the National Open Government Action Plans have been fundamental instruments for the sustained and consensual development of Uruguay's digital policy and the construction of an open State.

These instruments and other initiatives have led to the development of the institutions, regulations and tools that make up the national policy on personal data protection, information exchange,

interoperability, public transparency, open data and information security. Some of these backgrounds are summarised below:

Regulatory and institutional framework

There are multiple regulations related to data; those that address general aspects related to data governance are mentioned below, in particular in its role as a driver of digital transformation processes. Sectoral regulations associated with the management of certain types of data necessary for the fulfillment of specific tasks by public entities are not considered in this analysis.

As part of its digital policy, Uruguay has developed a robust regulatory framework over the years. Among the milestones of this journey, the approval of Law No. 18,331 stands out.[5]Personal Data Protection Act of 11 August 2008, which established the regulations applicable to the public and private sectors in this area, and the creation of the Personal Data Regulatory and Control Unit as a decentralised body of Agesic, endowed with technical autonomy.

Data protection regulations have been modernised through successive reforms over the years. Based on this sustained policy, Uruguay has been recognised as an adequate country by the European Commission since 2012, according to resolution 2012/484/EU of 21 August 2012, adopted within the framework of Directive No. 95/46/EC, as well as, since 2024, its new ratification following the approval of the European General Data Protection Regulation (GDPR).

In 2013, Uruguay became the first non-European country to join the Council of Europe Convention 108 and its Additional Protocol of 2001, which was approved by Law No. 19,030.[6], of December 23, 2012. In addition, in 2021 it was the first country in Latin America to ratify the Protocol of Amendment to the Convention for the protection of individuals with respect to the processing of personal data

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[5]Law No. 18,331 (impo.com.uy)
[6]Law No. 19,030 (impo.com.uy)

(Convention 108+), Law No. 19,948[7], of April 16, 2021. In 2020, Uruguay was elected a member of the Bureau, composed of representatives of the States Parties to Convention 108.

Regarding the transparency policy, it is worth highlighting the approval of Law No. 18,381[8] on the Right of Access to Public Information, of October 17, 2008, which placed the country at the forefront in the region with regard to regulating the exercise of the right of access to public information. The law created the Public Information Access Unit (UAIP) as the decentralized control body of Agesic, endowed with technical autonomy. In addition, it established a set of active transparency obligations for public entities.

Likewise, the country has positioned itself as a benchmark in open data at a regional level due to the implementation of a sustained policy on the matter since 2010. This policy had a strong boost in 2015, through the sanction Article 82 of Law No. 19,355 of December 19, 2015[9], by which it was established that, as a minimum, all public entities are obliged to publish in open data format the information included in the active transparency obligations established by the Law on Access to Public Information and its Regulatory Decree No. 54/017 of February 20, 2017[10], which established the "Technical guidelines for the publication of open data".

Additionally, in order to facilitate the exchange of information and promote its preferential use in public entities, Uruguay adopted Law 19,179[11], of December 27, 2013, for the regulation of free software.

Data communication is a central aspect. In the case of public bodies, the country has a regulation originally created by Law No.

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[7] Law No. 19,948 (impo.com.uy)
[8] Law No. 18,381 (impo.com.uy)
[9] Article 82, Law No. 19,355 (impo.com.uy)
[10] Law No. 19,355, Regulatory Decree 54/017 (impo.com.uy)
[11] Law No. 19,179 (impo.com.uy)

18.719[12], of December 27, 2010 (articles 157 and following), which considers the obligation to exchange public information between them, and private information as long as Law No. 18,331 on the Protection of Personal Data is complied with. An example of the relevance of these exchanges for the fulfillment of the State's purposes is the National Demographic Registry, created by article 51 of Law No. 19,996, of November 3, 2021.[13].

Uruguay has also developed an information security and cybersecurity policy through which the country has built an institutional, legal and regulatory framework to contribute to the development of a safer digital environment, highlighting among other milestones in this field the creation of the Cybersecurity Framework and the sanction of articles 78 to 84 of Law No. 20,212, of November 6, 2023, which establish a new institutionality, generate new powers, and provide support for the National Cybersecurity Strategy.

All of the above-mentioned background information has allowed Uruguay to have specialized regulations and institutions for different aspects of data governance and management.

Cross-cutting initiatives

In accordance with the provisions of Executive Decree No. 184/015, of July 14, 2015, Agesic coordinates a set of initiatives associated with data management.

Within this framework, different practical management tools have been developed, such as reference frameworks, data policies, strategies, and the Interoperability Platform, among others, which contribute to generating and consolidating ecosystems to keep data protected.

With a focus on the public sector, one of the significant milestones of the digital transformation is the launch in 2008 of REDuy, a platform to interconnect all state agencies through standards, facilitating the

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[12]Law No. 18,719 (impo.com.uy)
[13]Law No. 19,996 (impo.com.uy)

exchange of information and promote collaborative services between them. At the same time, the Interoperability Platform was created, a fundamental pillar for the digital transformation of the State that allows the computer systems of the various public institutions to be connected. This platform streamlines procedures, improves the quality of services and promotes transparency in government management.

Another important precedent is the Data Policy for Digital Transformation, which established the fundamental principles for data management in the State, such as quality, security and open access. This policy has been a reference framework for the development of various initiatives, such as the Data Vocabulary and the Reference Framework for Data Quality Management, whose objective is to provide government organizations with tools and guidelines to improve the quality of their data.

In parallel, instruments have been implemented to ensure data security and privacy, such as the guide on anonymization and the impact assessment on the protection of personal data, as well as the Cybersecurity Framework that provides a holistic approach to data protection, integrating technical, administrative and awareness measures.

In terms of open data, Uruguay has developed various instruments and tools over the years. Among them, the adoption of the first Open Data Action Plan 2011-2015 stands out, based on which the National Open Data Catalogue was created, which facilitates access to more than 2,500 data sets from public bodies, academia, civil society organizations and private companies.

The background information provided is not intended to be an exhaustive list of the data initiatives and policies on which this Strategy is based. On the contrary, beyond the examples mentioned, there are other initiatives, such as those carried out in the area of health by the Ministry of Public Health and the Digital Health area of Agesic, or those led by the National Institute of Statistics, the Uruguayan Institute of Meteorology and the Spatial Data Infrastructure (IDE), which have

contributed significantly to the baseline, from which the implementation of the Strategy will be carried out in different sectors and areas.

Country context

Uruguay has seen significant progress in access to and use of the Internet, making progress in connectivity, access to this technology and to the services developed there by households and individuals, including digital government services. The country has also been a pioneer in the development of initiatives that promote digital inclusion, for example, by guaranteeing full access to educational establishments, 90% of which have high-speed access.

According to the Survey on the Use of Information and Communication Technologies (EUTIC) 2022[14], 90% of people aged 14 and over are Internet users, and 83% use it daily. The digital gaps in access and use are low, whether analysed by age, gender or socioeconomic level. This situation, to a large extent, could be linked to specific long-term public policies, as can be seen through the successive digital agendas developed since 2008.[15]

Current conditions in the areas of digital development, connectivity and business climate have led our country to be the destination for initiatives such as Microsoft's AI Co-Innovation Lab - the first country in Latin America and the third outside the United States, along with China and Germany, to have such a laboratory -, the installation of a Datacenter by Google - the second in Latin America besides Chile -, or the arrival of satellite connectivity.Below is a summary of some data related to the country context:

Digital development

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[14][Information Society Observatory](#)
[15][Uruguay Digital Agenda](#)

- Internet access in homes: 91% of Uruguayan homes have Internet access. 72% of homes have a fixed broadband connection.

- Internet use by people: 90% of people over 14 years of age are Internet users, and 83% use it daily. Among those under 50 years of age, Internet use is universal, that is, it reaches 100% of this population.[16].

- Digital Development Index: Uruguay is ranked number 2 in Latin America and the Caribbean and 43 in the world, in this index of the International Telecommunication Union (ITU) that measures the level of development of the Information and Communication Technologies (ICT) sector of 169 countries worldwide[17].

- Digital Development Compass (DCC): This is a tool developed by the United Nations Development Programme (UNDP) that measures the digital progress of countries, and was launched in 2023. It uses an extensive database with digital development indicators, organized into several pillars of the UNDP Digital Transformation Framework. Uruguay stands out in several aspects, especially in the following pillars: Connectivity, Government (Uruguay is a leader in the digitalization of public services), Peoples (extended digital use and skills) and Digital Public Infrastructure, achievements that position Uruguay as a benchmark in the region in terms of digital development[18].

Software Industry

- Sector growth: In 2022, IT sector exports reached US$ 1,816 million, equivalent to 65% of its total turnover, with 85% of these exports directed mainly to the United States. The sector's business model, focused on software development,

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[16]Information and Communication Technology Usage Survey 2022

[17]Digital Development Index (DDI)

[18]Digital Development Compass

It represents 70% of the sector's activity and 80% of exports. According to the Uruguayan Chamber of Information Technology (CUTI), the IT sector is growing more than the average for the economy and its share of GDP has been doubling every 10 years.

- It is the largest software exporter per capita in the region, and the fourth in annual IT export turnover.

Digital Transformation of Government

- Digital Government Index: Uruguay ranks first in Latin America, and is ranked 25th out of 193 countries in the United Nations Digital Government Index 2024. This is a composite index that includes the dimensions Telecommunications infrastructure, Human capital, Online services and Citizen participation.[19]

- GovTech Maturity Index: Uruguay is in the Very High development level group (group A) of the index developed by the World Bank. The index was developed as part of the GovTech initiative to introduce a measure of GovTech maturity in four focus areas: support to central government systems; improvement of service delivery; integration of citizen participation; and fostering GovTech enablers.[20]

Innovation

- Global Innovation Index (IGI): Uruguay is ranked 4th in Latin America and the Caribbean in the 2023 edition of the Global Innovation Index (IGI). The IGI is prepared by the World Intellectual Property Organization (WIPO) of the United Nations, and measures the innovation performance of 132 countries worldwide, locating the 100 main innovation clusters in science and technology.[21]

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[19] Digital Government Development Index (EGDI)
[20] GovTech Maturity Index (GTMI)
[21] Global Innovation Index (IGI)

- Investment in innovation: The National Agency for Research and Innovation (ANII) has increased its budget for innovation promotion activities, reaching 48 million dollars in 2023.

Open data

- Global Data Barometer (GDB): Uruguay obtained an overall score of 55, placing it above the global average of 34. This index evaluates the governance, capacity, availability and use of data for the public good in 109 countries.

- Open Data Barometer for Latin America and the Caribbean: Uruguay is ranked 1st[22], with a score of 64. The index measures governments' readiness to implement open data initiatives, implementation, linking the quality and scope of open data programs in place, and impact, assessing the effects open data has on the economy, politics and civil society.

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[22] Regional Open Data Barometer

Objectives of the Strategy

General objective

Promote the availability and strategic use of data as an asset for evidence-based decision-making, innovation for the benefit of society as a whole, inclusive economic growth and strengthening the pillars of democracy, leveraging data – responsibly and respecting in particular the protection of personal data – to increase transparency, accountability, citizen participation and efficiency in the provision of public services.

Ensure adequate protection of people's rights and maximize the use of data to address major societal challenges such as inequality, environmental sustainability, climate change, improved competitiveness and the development of a data-driven economy, while maintaining digital sovereignty.

Deepen digital transformation, taking advantage of the potential of data, strengthen public digital infrastructure, the publication of quality and timely open data, and promote a culture oriented towards the use of information.

Specific objectives

1. **Data governance:** ensure a comprehensive national framework for ethical governance and management of data that is responsible and respectful of people's rights, which enables the availability, use, integration, openness and exploitation of data, in accordance with current national regulations by the different sectors, for the benefit of people and the development of the country.

2. **Capacity and infrastructure:** develop the capabilities, infrastructure and conditions necessary for generating value from data by promoting digital sovereignty, and promote the training of specialized talent that will enhance the development of the data-based economy, and

generate the capacity in people to understand the impact and potential of data in their daily lives.

3. **Country development:** Promote the strategic and responsible use of data to boost the development of all sectors of the national economy and inclusive economic growth, build a more egalitarian society, improve the efficiency of public policies and services, and strengthen transparency, accountability and citizen participation in public management.

Guiding principles

This section develops the guiding principles that underpin the National Data Strategy and guide its implementation.

These principles cover the public sector, the private sector and the entire national ecosystem, and must be applied taking into account the context, roles and responsibilities of the different actors throughout the data life cycle.

They are based on article 74 of Law No. 20,212, of November 6, 2023[23] and they reflect regulatory advances, good practices and international standards. In particular, they are based on the principles established in the International Open Data Charter, adopted by Uruguay on October 23, 2015, the principles established in the Global Digital Pact[24] and the Data Policy for Digital Transformation[25], adopted in 2019. They are articulated with the National Strategy for Artificial Intelligence[26], the National Cybersecurity Strategy and the National Digital Citizenship Strategy for an Information and Knowledge Society Uruguay 2024 - 2028[27].

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[23] Law No. 20212 (impo.com.uy)
[24] Resolution adopted by the General Assembly, Pact for the Future
[25] Uruguay: Data Policy for Digital Transformation | Agesic (www.gub.uy)
[26] National Artificial Intelligence Strategy 2024-2030
[27] National Digital Citizenship Strategy for an Information and Knowledge Society. Uruguay 2024-2028 | Agesic (www.gub.uy)

1. People-centered

Data governance and management must be carried out for the benefit of people, placing the well-being of human beings, respect for their dignity and their inherent rights at the centre of decision-making throughout the data lifecycle.

The generation and use of data entails ethical and legal responsibilities that must be addressed by those who create, manage and use it.

Ethical management of the data life cycle implies respect for the human person, who must always maintain a central role as the recipient of data-based services, products or policies.

From a practical perspective, ethical data management involves ensuring that it is respectful of human rights and consistent with the standards that protect them, consideration for the content, preservation of its integrity and consistency, and certainty and explicitness of the sources used.

In relation to personal data, this management necessarily implies the full application of the set of principles, rights and obligations of personal data protection, which will be developed later.

In the case of public entities, the generation and use of data depends on the tasks assigned to them.legally and according to the rules that regulate such tasks. In this area, data life cycle management should be oriented towards the common good, the generation of public value, and sustainable development in its different dimensions, strengthening informed decision-making, transparency and accountability.public management.

2. Data value

From the perspective of organizations, data constitutes assets to be managed, including their structuring and protection. Adequate data management allows value to be built both for the organization that generates it and for those who are linked to it.

The use of quality and appropriate data to build systems and define informed policies reflects the value of data in our societies.

Recognition of this value is associated with practices that promote the importance of data within organizations, from the application of standards for its management to the definition of roles that collaborate in the processes involved in its life cycle; all in an ethical, responsible and secure manner.

The creation of a culture of data value in a national strategy must also be seen as a principle with a collective and forward-looking perspective. It is necessary to recognize the value of data beyond individual or sectoral criteria.

In this sense, it is expected that the principles of this Strategy, and the initiatives linked to them, will enable the construction of collective added value, which benefits society as a whole and the different sectors, establishing a framework to take advantage of the data.

In this way, the social and productive challenges of our country can be addressed, contributing to its economic growth and sustainable development, while seeking to maximize the benefits of data-based research and innovation to achieve these objectives.

In the case of public entities, this culture of data value is essential to take advantage of the potential that data holds for public management, enabling, among others, the design, execution, monitoring and evaluation of public policies, citizen participation in public affairs, and the

addressing disinformation among other phenomena present in society, thus contributing to strengthening democracy.

3. Quality

The quality of the data generated and used is essential within the data management cycle and impacts the results derived from its use. It is understood as the set of characteristics of the data – among which are the correctness and the degree of updating – or as the capacity to comply with the requirements defined for its use – and in this sense its quality depends not only on the data but on the use itself.[28].

Quality also involves data integrity. Lack of representation of certain population groups and/or sectors of society can lead to erroneous or biased results.

This quality component is particularly important when the generation and use of data occurs in the public sphere, especially in order to maximize the benefits of data as an asset for decision-making in public management and to avoid the reproduction or consolidation of structural inequalities.

The State must guarantee the quality of the data provided and used by public entities, but it must also arbitrate the mechanisms – regulatory, technical, procedural – necessary to ensure its reliability in other sectors. Knowledge of the data life cycle, determination of the roles to be assumed by the different actors involved and the instantiation in stages of the quality management process are essential elements for compliance with what this principle proposes.

Data quality must be ensured throughout its life cycle, so it is also necessary to consider the adoption of audit, review and supervision mechanisms, applicable by all actors in the ecosystem.

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[28]Definitions collected in the "Framework for Data Quality Management in Digital Government ".

The application of this principle also finds regulatory support in our country when it comes to personal data. Article 7 of Law No. 18,331[29]

It specifically states that "personal data collected for processing purposes must be truthful, adequate, fair and not excessive in relation to the purpose for which it was obtained. Data collection may not be done by unfair, fraudulent, abusive, extortionate means or in a manner contrary to the provisions of this law. The data must be accurate and updated if necessary."

4. Availability, sharing and openness

Data must be available and accessible for use by organisations that require it to fulfil their duties or exercise their powers or purposes, provided that such use complies with all the principles defined in the Strategy and the rules associated with the management of different types of data. It is essential that data be available in compliance with interoperability standards that enable the integration and efficient exchange of data between different systems and entities, in accordance with current regulations.

The proper implementation of this principle implies that data is digital and in open format by default, always respecting the principles of personal data protection.

In the case of public entities, the implementation of this principle must be carried out in accordance with the obligations stipulated by Law No. 18,381[30], of October 17, 2008 and article 82 of Law No. 19,355[31], of December 19, 2015, which provided for the publication in open data format of a set of categories of active transparency obligations established in the regulations governing the exercise of the right of access to public information.

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[29] Article 7, Law No. 18,331 (impo.com.uy)

[30] Law No. 18381 (impo.com.uy)

[31] Law No. 19355 (impo.com.uy)

Ensuring the availability and access to data in accordance with current regulations is an enabling factor for the monitoring of public management by citizens and informed citizen participation, and for promoting the reuse of open data, in such a way that they allow the generation of new services and/or applications, favor the generation of knowledge and promote innovation.[32]

The publication of data is a tool that facilitates the availability of data, facilitating timely access and enabling the processes of reusing public information for the indicated purposes.

The guiding criteria applicable to public entities must be considered for the purposes of their application in the private sector, which should evolve from a role of re-user of open public information to that of producer of data that can be used collaboratively by other actors - whether private, public, academic or civil society - in support of the sustainable development of the country and in strategic sectors that are defined.

Making data available also involves the generation and use of mechanisms that facilitate exchange, as well as the creation of new mechanisms that favor exchange between multiple interested parties, so that the availability and use of data is done in an agile and secure manner for all those involved. Data must be easy to retrieve, use, reuse, deliver and exchange, complying with the data, integration and exchange standards established for this purpose.

In this context, it is necessary to consider the principles of interoperability applicable to the public sector based on legal regulations - such as articles 157 and following of Law No. 18,719[33], of December 27, 2010 and Article 6 of Law No. 19,869[34], of April 2, 2020-, to other sectors of activity.

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[32]As it arises from the "Instructions - Publication of Open Data for Active Transparency " of the "National Catalogue of Open Government Data ".

[33]Law No. 18,719 (impo.com.uy)

[34]Law No. 19,869 (impo.com.uy)

Finally, this principle should include the need to have instruments that allow the secure exchange of data – personal and non-personal – across borders, applying concepts such as convergence and trust that are promoted by various regional and international actors.

5. Privacy and security

This Strategy is linked to a broader concept of data than the strictly personal - such as that associated with a specific or determinable person in the definition of Law No. 18,331, of August 11, 2008.[35-]. However, the fundamental role that personal data currently plays in the training and application of systems, in the definition of public policies and business strategies, among others, is indisputable. The concepts of privacy by design and privacy by default are becoming more widespread, as is the use of technologies that allow the use of data while safeguarding the privacy of its owners.

For its part, the determination of responsibilities of organizations in the use of personal data in certain areas of activity imposes the need to designate roles - such as the data protection officer, the information security officer - who collaborate internally in permeating the culture of personal data protection.

The scope of privacy and data protection is not only limited to personal information obtained with the consent of the data holders, but also to that information constructed or inferred from their behavior and habits. That is why, in any data strategy, compliance with the principles of personal data protection takes on a fundamental centrality, which in our country and in accordance with articles 5 and following of Law No. 18,331[36], are: legality, veracity, purpose, prior informed consent, data security, confidentiality and responsibility -proactive-.

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[35] Law No. 18,381 (impo.com.uy)

[36] Article 5 Law No. 18,381 (impo.com.uy)

In addition, and based on the determination of data as an asset, there is a need to establish management procedures that guarantee its security and preservation, providing an adequate level of confidentiality, integrity and authenticity, also ensuring continuity of access for as long as necessary. The practical application of information security standards such as those derived from the Cybersecurity Framework[37], and those resulting from the National Cybersecurity Strategy, are essential to compliance with this principle.

6. Responsible innovation

The implementation of this Strategy and associated initiatives and actions requires consideration of the particular importance of the development of research and innovation as a driver of national development, and the relevance of data and its proper management during all phases of the data life cycle as a crucial enabling factor.

Collaboration between the public and private sectors, academia and civil society is a key factor, as is evident from the other principles set out in this Strategy.

The adoption of initiatives from all these sectors, enabled by a regulatory framework that provides the necessary certainties - such as controlled test environments and data spaces - are practical examples of the application of this principle.

The State must not only propose appropriate regulatory frameworks, but also provide the necessary incentives so that innovative proposals have the necessary support for their implementation and generate the enabling conditions that ensure the availability, quality of data, and openness in accordance with current regulations, for the development of sustainable innovation processes.

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[37] Cybersecurity Framework

7. Multiple stakeholders

Building and implementing a national data strategy that projects its impact across all sectors of society requires the participation and collaboration of multiple stakeholders.

The diversity of disciplines associated with data management requires interdisciplinary and multi-sectoral approaches within organizations, in order to ensure compliance with current regulations and the principles outlined in this Strategy.

This multi-stakeholder perspective is necessary not only for the development of the initiatives that are part of the Strategy, but also to build and ensure adequate data governance.

This means that progress must be made with the participation of the public sector, the private sector, civil society, the technical community and academia, among other actors, supported by an institutional design that includes spaces and mechanisms that make this possible.

This principle is key to enabling data governance, in which different perspectives, approaches and disciplines are present and involves broad, diverse and interdisciplinary participation.

Thematic axes

Axis 1. Data governance

Ensure a comprehensive national framework for data governance and management, which enables the generation, use, integration and exploitation of data by different sectors for the benefit of people and the sustainable development of the country with equality.

This approach will promote democratization and digital sovereignty, and move towards a data culture and economy.

Line 1.1 Institutionality

Establish and implement the institutional design and specific functions that promote data culture at the national level and ensure the implementation of the National Data Strategy, its sustainability and continuous improvement, as well as permanent mechanisms for inter-institutional and multi-stakeholder coordination and participation. Develop instruments that promote transparency and monitoring of data policies in the State.

Actions

1. Define the institutional design to support Uruguay's data governance model and the implementation of the National Data Strategy. This design should ensure comprehensive approaches, guarantee sustainability and continuous improvement; provide permanent mechanisms for articulation and participation to integrate multi-stakeholder approaches; and provide follow-up, monitoring and accountability. This approach should identify and strengthen existing sectoral spaces by integrating them into the national governance model.

2. Establish an Internal Data Committee in public sector entities. The Committee will coordinate with the governing body the implementation of the defined data governance and strategy, where appropriate. It will be composed of those responsible for transparency, delegates of

data protection, information security officers, open data referents and those who exercise data management.

3. Designate the role of Chief Data Officer (CDO) in public sector entities and promote its adoption in the private sector. Their main function will be to strategically address the use of data, ensuring its security, integrity and unique vision towards data culture.

4. Establish a national coordination mechanism that allows for the articulation, management of knowledge and management of joint actions between the different Internal Data Committees.

5. Strengthen the technical and infrastructure institutional capacities of governing bodies in data matters, integrating the approach to data of different nature, as well as the spaces and processes of articulation between them.

Line 1.2 Governance model and tools

Establish a national data governance and management model, including policies and processes with roles and responsibilities, with an integrated and holistic vision of personal, statistical, open and other specific data, in conjunction with national and international strategies.

Promote integration, interoperability and data exchange for efficient and responsible management, thereby enhancing data-driven digital transformation.

Actions

1. Establish a data governance and management model in accordance with the objectives of this Strategy, the National Artificial Intelligence Strategy, the National Cybersecurity Strategy and its integration with the

Integrated Government Architecture[38] and digital public infrastructure, promoting data-driven digital transformation. This model must define the priority types of data in the country, their characteristics, classification, organization and relationships.

2. Identify master data and its owners. Standardize the minimum set of attributes and metadata that define that entity, semantic and technical standards, considering national and international interoperability, and the required roles responsible for its management.

3. Identify and establish data standards for reference data.

4. Create a single, national and public repository of metadata on the data managed in the State and the mechanisms necessary for its sustainability.

Line 1.3 Regulatory frameworks

Adapt and create the reference frameworks and other regulatory instruments that enable the proper implementation of the National Data Strategy and the achievement of its objectives.

These instruments should promote the ethical and responsible management and use of data, protect people's rights and promote innovation for the benefit of society as a whole and for the sustainable development of the country.

Strengthen mechanisms for monitoring compliance with current regulations, especially with regard to the protection of personal data, data management, open data and interoperability, among other priority regulations.

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[38] Integrated Government Architecture

Actions

1. Identify existing gaps at the regulatory level to ensure adequate data governance and management in accordance with the objectives of this Strategy. Update and create reference frameworks and other regulatory instruments to facilitate openness, create shared data spaces, cross-border data flow, integration and reuse of data from the public and private sectors and other stakeholders in priority areas, ensuring data security and protection.

2. Develop a data management reference framework with a holistic and comprehensive vision and the sectoral adaptations that are established as priorities and promote its adoption.

3. Create a framework for the long-term preservation of State data considering international preservation standards.

4. Strengthen and evolve oversight mechanisms to ensure compliance with regulations regarding data management, transparency and access to public information, open data, personal data protection, interoperability and information security.

Line 1.4 International scope

To promote Uruguay's active participation and contribution in international spheres regarding data governance, regulations and regional and international projects related to data, open data, personal data protection, among others.

To advance in the adoption of international standards and instruments aligned with national policy, promoting the positioning of Uruguay as a key player in the promotion of technical cooperation in data and regional public policies, which impact the improvement of services and development in priority sectors and topics.

Actions

1. Strengthen Uruguay's active participation in specific and general regional and international areas regarding data governance, personal data protection, open data, among other dimensions.

2. Contribute to the development of international standards and frameworks for data management and exchange at the regional and international level, in priority sectors and topics, and promote Uruguay's adherence to regional and international data governance models, guidelines and principles.

3. Generate regional and international alliances that allow the development of new projects at the local level, strengthen the capacities of the national ecosystem through the exchange of experiences and facilitate regional processes for the exchange of data that contribute to the improvement of regional services and policies.

4. Promote the country's access to international technical cooperation funds for the development of national or regional projects, exchange of experiences, technology transfer and capacity building.

Axis 2. Capabilities and infrastructure

Ensure the capabilities, infrastructure and conditions necessary to efficiently manage and exploit data.

Promote the training of specialized data talent that will boost the development of a data-driven economy, and generate the instrumental and fundamental capabilities and skills in people to understand the impact and potential of data in their daily lives.

Line 2.1 Talent and skills development

Generate capacities and instruments so that the country has specialized talent in the areas of knowledge linked to the different phases and components of data management.

Promote the development of capacities and skills in people to understand the data life cycle and the rights associated with each of the phases, such as the protection of personal data and access to public information, and the mechanisms available for their effective exercise, aligned with the National Digital Citizenship Strategy for an Information and Knowledge Society[39].

Actions

1. Promote the creation of new training plans and programs in the different areas of knowledge related to data management in formal and non-formal education, as well as support the development of existing ones at all educational levels and areas of application, with special emphasis on specializations, professional updating and programs aimed at maintaining people's employment.

2. Promote promotion instruments for the development of data science specialists, including specific initiatives that promote the

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[39]National Digital Citizenship Strategy for an Information and Knowledge Society. Uruguay 2024-2028 | Agesic (www.gub.uy)

participation of women in this field. Incorporate the approach to data management from early levels in STEM education programs.

3. Promote capacity building in the private sector for the implementation of regulatory frameworks and good practices in ethical and responsible data management.

4. Generate data literacy and awareness plans aimed at different segments of the population with the aim of helping people develop instrumental and fundamental skills to understand the life cycle of data, the information derived from it, its value and the associated risks, as well as the scope of their rights and the mechanisms available to protect them.

5. Promote the evolution and adoption of tools that make it easier for people to maintain control over their personal data and its use, such as data use consent and personal information management applications, taking into account the different segments of the population and their context.

6. Establish a data community of practice, made up of multiple stakeholders and the participation of different sectors of society, that allows for the exchange of knowledge, experiences and good practices.

Line 2.2 Infrastructure and technologies

Deploy and adopt resilient and sustainable infrastructure and technologies, and enabling data management tools to enhance the collection, use and integration of quality, secure and reliable data.

Actions

1. Design a resilient, secure and inclusive national data infrastructure plan that allows for the collection, storage of large volumes of structured and unstructured data, integration and analysis of data from diverse sources.

2. Evolve a centralized and secure data infrastructure, accessible to the public sector, including collection, storage, management and analysis, in strategic initiatives and in the national interest. This infrastructure will support data-driven decision making and the adoption of standards.

3. Strengthen the infrastructure and mechanisms for the exchange and access to geographic, statistical and open data, among others.

4. Develop instruments and tools to harness the potential of synthetic data as an instrument for research, innovation and data-driven decision-making, based on ethical standards and personal data protection.

5. Promote interoperability within and between organizations by providing public and private entities with different solutions and components for their implementation,

6. Implement and integrate data management tools and other reusable components in strategic sectors and in existing cross-cutting solutions in the public sector, promoting innovation and the development of open source solutions and publication as a digital public good, aligned with the provisions of Law No. 19,179, of December 27, 2013.[40]

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[40] Law No. 19,179 (impo.com.uy)

Axis 3. Country development

Harnessing the potential of data to promote the growth and development of all sectors of the national economy and the construction of a more inclusive and equal society.

Promote the production, management and use of data aimed at creating services and products based on reliable, secure and high-quality data in both the public and private sectors.

Promote the generation and use of data to drive the development of strategic sectors through research and innovation.

Strengthen Uruguay's open data policy and promote data as an instrument to advance in areas such as transparency and accountability in public management and strengthen effective citizen participation in the formulation and monitoring of public policies.

Line 3.1 Data availability, integration and interoperability

Generate spaces and mechanisms to share, integrate and make available data at different levels of openness in a national and cross-border context, in a reliable and secure manner, providing guarantees on its correct treatment, use and management, in accordance with the established governance model and current regulations and with the participation of multiple interested parties.

Actions

1. Generate and promote secure, reliable and interoperable data spaces with different levels of openness, enabling the participation of all sectors under a governance model that clearly establishes and defines licenses, agreements and rules for their use in compliance with current regulations.

2. Promote the creation of "transversal data spaces", safe, reliable and interoperable that allow data to be shared between public bodies, that integrate data from systems, transversal areas or lines

shared strategies according to the missions of each of the institutions involved.

3. Design and implement a national interoperability plan that addresses semantic, organizational, regulatory and technical aspects to deepen the exchange and integration of data, within and between organizations, including cross-border data flow, establishing the necessary controls to ensure the quality and integrity of the data, in accordance with current regulations.

Line 3.2 Data in the public sector

Implement institutional data strategies and the adoption of Integrated Government Architecture[41] in public sector entities, which allow maximizing the value of data for the benefit of people and the different sectors of society and the economy, improving processes, management and cross-cutting services, contributing to the achievement of objectives and the optimization of resources.

Integrate solutions and tools to strengthen data generation processes that enable openness and analysis, ensuring proper integration with existing systems and ongoing training of all people involved within the framework of data culture, transparency and in accordance with current regulations.

Promote the generation of quality data linked to the Sustainable Development Goals in collaboration with multiple stakeholders.

Actions

1. Establish institutional strategies and policies in public entities for the management and use of data that contribute to their strategic objectives, to evidence-based decision-making, to the improvement and design of public policies and to increase efficiency in the

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[41] Integrated Government Architecture

provision of public services, transparency, accountability and citizen
participation, ensuring adequate protection of people's rights.

2. Promote the adoption of Integrated Government Architecture in public
   entities as a tool to guide the efficient use of data to achieve their
   strategic objectives and optimize public sector resources.

3. Implement a comprehensive training plan on data management, personal
   data protection, access to public information, open data, cybersecurity, tools
   for analysis and data science aimed at public entities and directed at people
   with different profiles and at all decision-making levels necessary for
   comprehensive data management and governance. Facilitate the
   application of current regulations through the development of
   recommendations and tools that allow understanding the scope,
   applicability and use of technologies, particularly public clouds.

4. Create instruments to strengthen technical teams, infrastructures and
   technological solutions in an agile manner that promote data policies, the
   different lines of this Strategy and data management and governance in
   the organizations.

5. Implement centralized data science and analytics projects to improve the
   quality of services provided by agencies, evidence-based decision-making,
   cross-cutting products, processes and management in general.

6. Incorporate business analytics, observability of its behavior and best
   software development practices into data-driven solutions and cross-
   cutting digital government solutions for improvement and efficiency.

7. Evolve public procurement mechanisms to encourage the diversification of suppliers linked to research and innovation projects, as well as suppliers of data-based technology solutions and services.

8. Monitor compliance with the regulatory and strategic framework linked to the exchange of information between agencies, in accordance with regulatory decree 353/023 of article 76 of law 19,355[42].

Line 3.3 Open data

Deepen and evolve Uruguay's open data policy as an instrument to strengthen transparency, accountability, citizen participation and innovation, advancing in the construction of an Open State.

Actions

1. Promote the adoption of institutional open data policies and the creation of data opening plans in the different State agencies, taking into account the needs or demands of the multiple interested parties and implement monitoring and follow-up mechanisms on the adoption of institutional open data policies and progress at the national level. Identify and develop the adjustments to the regulatory framework that are determined to be necessary to achieve these purposes.

2. Strengthen the production and timely availability of data for monitoring and following up on public policies, through the creation and evolution of observatories and other tools for the publication, access and analysis of data that strengthen transparency and accountability processes.

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[42] Decree No. 353/023

3. Improve data sources taking into account the needs of multiple stakeholders and make available open sectoral data on topics such as environment, climate change, public integrity, health and finance, among others, that support the fulfillment of national objectives and international commitments assumed by the country.

4. Promote the implementation of web services and geoservices in public entities to facilitate and promote the consumption of quality, up-to-date open data in different formats.

5. Harness the potential of artificial intelligence (AI) to evolve the National Open Data Catalogue, quality processes, searches, analysis and data visualization, and develop good practices for the publication of open data that consider its reuse for AI.

6. Develop open data training plans aimed at decision-makers and technical teams of public bodies for the development of open data policies, opening plans, publication processes, compliance with regulations, knowledge of demand and use of data, among others.

7. Promote the development of the open data community through training and promotional activities aimed at journalists, students, the entrepreneurial sector, the research ecosystem, civil society and academia, with the aim of facilitating the creation of innovative products and services based on open data and promoting active participation. Likewise, promote the creation of an innovation space that encourages the exchange of knowledge, the development of use cases and research, contributing to the strengthening of public policies and the generation of data-based solutions.

Line 3.4 Using data for well-being

Promote initiatives to encourage the generation and use of data analytics solutions that support data-driven decision-making by providing accurate and reliable evidence for the design, implementation and evaluation of public policies that address social and digital gaps and inequalities and other challenges present in society for the well-being of people and accelerate the achievement of the Sustainable Development Goals.

Actions

1. Design and promote programs and agreements in collaboration with the private sector, civil society and academia to generate and securely share quality data, in order to improve public policies, contribute to the Sustainable Development Goals and develop data management and science initiatives focused on social well-being and priority attention to people and groups in vulnerable situations. These actions must guarantee privacy and identity protection.

2. Promote the development of analytical solutions for the use of data related to the environment and climate change, in comprehensive risk management, emergency and disaster response, promoting collaborative work between different sectors of society.

3. Maximize the use of geographic data available in Uruguay, strengthening capacities for its use and analysis in the public and private sectors.

4. Promote agreements and international cooperation for the secure flow of cross-border data to boost the development of the digital economy and the improvement of cross-border services.

Line 3.5 Research, innovation and development

Promote agreements and collaborative areas to boost innovation, research and development of data-based solutions in strategic sectors and initiatives of general interest, promoting work between the public sector, the private sector, academia, civil society organizations and in collaboration with the international community.

Support promotion measures and incentives for the generation and sustainability of innovative proposals that contribute to the sustainable development of the country.

Actions

1. Promote and implement the use of controlled test environments for research and experimentation in data science and evaluation of technologies linked to safeguarding data privacy and security, in accordance with article 75 of Law No. 20,212, of November 6, 2023[43].

2. Support collaborative research environments, with the participation of multiple stakeholders, generating shared mechanisms and tools for data science that make use of data spaces for innovation and research and generating agreements that enable the exchange of scientific research data among multiple stakeholders.

3. Generate agreements to produce and share quality data between different sectors of society for research and innovation in public policies and the improvement of services to citizens, making them available as open data for use and improvement.

4. Promote the development, strengthening and implementation of instruments and incentives that encourage entrepreneurs, small and medium-sized companies, academia, researchers and civil society to generate innovative proposals in data management, promoting sustainable projects aimed at

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[43] Law No. 20212 (impo.com.uy)

social well-being, the improvement of public services and environmental development, with a focus on sustainability and positive impact for the entire population.

5. Establish collaboration agreements with regional and international programs and initiatives to obtain a greater volume of quality data that enhances analytical capacity and the availability of data for research and innovation.

Line 3.6 Data driving the economy

Promote the development of data-based services and products with high quality and safety standards, both for local supply and for export, contributing to the development of the industry, competitiveness and private investment.

Consider data as an asset in the development of key productive sectors for the country, promoting the use of new technologies such as artificial intelligence to improve its competitiveness.

Actions

1. Generate and implement instruments and plans that promote the evolution of the data industry in the country and that strengthen digital sovereignty, covering infrastructure, services and data-based solutions, which encourage the development of key productive sectors, considering data as a strategic asset, incorporating advanced analytics, adopting new technologies and promoting innovation and collaborative work between academia, entrepreneurs, researchers and the private sector, in order to improve competitiveness and sustainable development.

2. Promote and generate strategic alliances to strengthen investment and development of the national data infrastructure.

3. Promote agreements with other countries at the regional and international level to boost the export of innovative data-based services and developments by the entrepreneurial ecosystem.

Process of creating, monitoring and reviewing the Strategy

Co-creation of the Strategy

The process of creating the National Data Strategy was led and articulated by Agesic, in coordination with the Strategic Committee of the Public Sector for Artificial Intelligence and Data, under article 74 of Law No. 20,212 of November 6, 2023[44]The overall process has received technical cooperation from the Development Bank of Latin America (CAF) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

It was launched in June 2023 and developed in five stages, using the participation standards established by the Open Government Partnership for the creation of national action plans:

- Stage 1 - Diagnosis. During this stage, the Country Readiness Assessment Methodology was applied: a tool of the Recommendation on the Ethics of Artificial Intelligence developed by UNESCO[45]to assess the degree of readiness to apply Artificial Intelligence, in all its dimensions, in an ethical and responsible manner for citizens. Although the focus was on the ethics of artificial intelligence, aspects that access the Data Strategy were considered. The institutional framework was also analyzed through a tool developed by CAF to analyze the institutional framework for the governance, implementation and sustainability of Artificial Intelligence and Data policies, as well as a comparative analysis of the state of the art in the matter.

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[44]Law No. 19,179 (impo.com.uy)
[45]Country Readiness Assessment Methodology: A Tool of the Recommendation on the Ethics of Artificial Intelligence

- Stage 2 - Proposals. Two roundtable discussions were held, specifically focused on the National Data Strategy, to gather proposals related to the possible objectives and actions to be integrated into the Strategy.

  All the roundtable discussions held within the framework of the process of developing the National Data Strategy and reviewing the National Artificial Intelligence Strategy were attended by more than 300 representatives from more than 40 State institutions, 11 civil society organizations, 45 private sector organizations, academia and various interest groups, who contributed different perspectives. All the reports with each of the contributions are published on the Agesic website.

- Stage 3 - Systematization of proposals. The lines of action were further explored, a feasibility analysis was carried out in conjunction with the different institutions linked to the proposals, and a first draft of the National Data Strategy was prepared.

- Stage 4 - Public consultation. The document was published for public consultation from October 22 to November 4, 2024 through the Digital Citizen Participation Platform[46], thus allowing all people interested in the topic to make their contributions.

  11 proposals were received from 1 civil society organization, 1 public body, 2 private sector organizations, and 1 researcher. These proposals resulted in 16 contributions, of which 94% were incorporated in whole or in part into the document and in some cases will also be incorporated into the Strategy's Implementation Roadmap.

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[46] Public consultation of the National Strategy for Artificial Intelligence

- Stage 5 – Approval and publication. The final stage includes approval and publication of the final document.

Monitoring the implementation

The implementation and monitoring process of the National Data Strategy seeks to ensure compliance with the objectives set out in this instrument, as well as transparency and accountability regarding its execution.

To ensure proper implementation of the strategy, a roadmap will be drawn up that will establish deadlines, responsible institutions, specific goals and monitoring indicators.

The strategic objective of the monitoring and follow-up process is to establish a framework that allows progress to be measured and areas for improvement to be identified to ensure that the Strategy meets its objectives and goals.

A public monitoring tool will be implemented through which the institutions responsible for leading each of the actions will report on their progress every six months.

Each institution will be responsible for the execution of the actions set out in the roadmap and will be in charge of leadership, execution and accountability in relation to the implementation of such actions, and will be required to submit periodic reports.

The results achieved will be regularly disseminated to all interested parties.

Period of validity

The term of validity of this Strategy is 2024-2030. In order to ensure that the country has suitable and effective instruments that adapt to the nature of technological advances, the potential and the associated challenges, a mid-term review will be carried out.

Participants

The process of developing the National Data Strategy included the participation of organizations represented in the dialogue spaces developed at different stages of the process.

The participating organizations are listed below:

State Agencies

National Fuel, Alcohol and Portland Administration, National Telecommunications Administration, Electronic Government and Information and Knowledge Society Agency, National Research and Innovation Agency, General Archive of the Nation, Central Bank of Uruguay, Mortgage Bank of Uruguay, Social Security Bank, Bank of the Eastern Republic of Uruguay, State Insurance Bank, General Accounting Office of the Nation, General Tax Directorate, General Records Directorate, National Customs Directorate, National Cadastre Directorate, Attorney General's Office of the Nation, Spatial Data Infrastructure, Municipality of Montevideo, National Human Rights Institution and Ombudsman's Office, Institute for Children and Adolescents of Uruguay, National Institute of Employment and Vocational Training, Ministry of Education and Culture, Ministry of Industry, Energy and Mining, Ministry of Social Development, Ministry of Economy and Finance, Ministry of Public Health, Ministry of Transport and Public Works, Ministry of the Interior, National Civil Service Office, Planning and Budget Office, State Water Works, Judicial Branch, Public Power Legislative - Chamber of Representatives, Legislative Branch - Senate, Public Information Access Unit, Power Plants and Electric Transmissions, Personal Data Regulatory and Control Unit, Electric Services Regulatory Unit.

Academy

Ceibal, Catholic University of Uruguay, Business University, University of the Oriental Republic of Uruguay, University of Montevideo, Technological University of Uruguay.

Private sector

Adagio Consultores, Bantotal, Deloitte, Discere, Equipos, Intermedia, IUGO, Knowmad Mood, Promptior, Quanam, Sonda, Telefónica Movistar, Latin American Internet Association, Uruguayan Chamber of Information Technologies.

Civil society

Association of Notaries of Uruguay, Association of Librarians of Uruguay, Data Uruguay, Data Management, Bensadoun Laurent Foundation, Commercial Defense League, IT Women, Nahual IT-Argentina, IT People.

International organization

Development Bank of Latin America and the Caribbean, Inter-American Development Bank, for Education, Science and Culture.