National Artificial Intelligence Strategy Uruguay 2024 – 2030

Year: 2024

Table of Contents

Introduction

Artificial intelligence (AI) is becoming more and more present in all areas of society globally and in our daily lives, although we are not always fully aware of it. In this context of growing importance, the economic, social, cultural and environmental repercussions - positive and adverse - of AI are not evenly distributed between countries, and often not even within them.

The social, economic and geopolitical relevance of AI has been enhanced by technological progress, which has been particularly rapid in recent years, leading to new challenges for all governments. In this scenario, the international community has developed different efforts (in which Uruguay has actively contributed) in order to establish the bases for global and inclusive AI governance, which allows for common and interoperable frameworks to guarantee the ethical, safe, responsible, critical and creative development and use of these technologies for the benefit of humanity.[1].

Likewise, together with the countries of the region, Uruguay has highlighted the need for this international governance, its frameworks, processes and mechanisms, to take into account the particularities of Latin America and the Caribbean in order to strengthen the region's equitable access to the opportunities and benefits involved in AI.

In order for the potential that AI offers for human well-being to become tangible, and to prevent and mitigate the risks and adverse impacts on people's rights, the consensus achieved in these global and regional efforts must be translated by governments into public policies built and implemented jointly and collaboratively with multiple stakeholders.

[1]The reference to the ethical, safe, responsible, critical and creative development and use of artificial intelligence underlines, among other relevant aspects, that developments and their use are governed by ethical principles and are people-centred; they fully promote and respect the protection of human rights; they guarantee privacy; they are reliable and explainable; and they are oriented towards sustainable development in its various dimensions: economic, social and cultural. In addition, they are conceived and applied in a critical and creative way, considering the different impacts involved, with the aim of generating innovative solutions that contribute to the common good and facilitate the achievement of the objectives established in the Strategy.

This new National Artificial Intelligence Strategy constitutes the cornerstone for the deployment of a public AI policy that includes the public sector, the private sector and all interested parties, and that enhances the sustainable development of Uruguay in all its dimensions, contributing to inclusive economic growth, the environmental sustainability of the country and the strengthening of its sovereignty.

To this end, this National Strategy establishes the bases for national governance of AI based on a multi-stakeholder approach, and to ensure the capacities that enable its use for the development of the different sectors of the economy and the achievement of a more equal and inclusive society. It is based on the advances achieved by the country in terms of digital transformation and in the field of research and innovation, promoting them at the same time.

This Strategy articulates the artificial intelligence policy with the National Cybersecurity Strategy (2024-2030), the National Digital Citizenship Strategy for an Information and Knowledge Society (2024-2028)[2] and the National Data Strategy co-created together with this one.

In the public sphere, in particular, it provides sustainability to the progress achieved by the country from the AI Strategy for Digital Government[3] (2020) and seeks to deepen them by promoting the use of AI to improve public services and the management of public entities.

It lays the foundations for promoting and optimizing public and private investment that enables the country to have the infrastructure and capabilities necessary for the development and deployment of AI by the public and private sectors, recognizing that this aspect represents an important challenge for our country based on the size of its economy and the national budget.

[2] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-trabajo/comunicacion/publicaciones/estrategia-nacional-ciudadania-digital-para-sociedad-informacion

[3] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-trabajo/comunicacion/publicaciones/estrategia-inteligencia-artificial-para-gobierno-digital/estrategia

The Strategy does not ignore the risks to society, human rights and democracy involved in AI. On the contrary, it lays the foundations for them to be addressed appropriately and effectively, proposing various lines of action aimed at developing regulatory frameworks and the necessary capacities, promoting collaboration among multiple stakeholders.

This instrument was created through a broad participatory process, which gathered input from more than 300 people from different disciplines and fields, representatives from more than 40 State institutions, 11 civil society organizations, 45 private sector organizations, academia and various interest groups, who contributed from their perspectives. It had the technical cooperation of the Development Bank of Latin America and the Caribbean (CAF) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

This collaborative process has been precisely the methodological pillar that has supported the creation of the Strategy and will be the key to the success of its implementation, monitoring and periodic review to meet the national objectives outlined therein.

Background

Since 2019, Uruguay has made progress in the field of Artificial Intelligence (AI), driven by collaboration between the State, academia, civil society and the private sector. This joint effort has contributed to positioning the country in the region in terms of technological innovation and AI adoption, always with a firm commitment to human rights, privacy and ethics, aligning with UNESCO's Recommendation on the Ethics of AI.[4]Some of the country context indicators and main milestones are described below.

Country context

Indicators

Uruguay has seen significant progress in access to and use of the Internet, making progress in connectivity, access to households and individuals, and digital government services.

In addition, it has developed initiatives that promote digital inclusion by ensuring full coverage of educational establishments, 90% of which have high-speed access.

According to the Survey on the Use of Information and Communication Technologies (EUTIC) 2022[5],90% of people aged 14 and over are internet users, and 83% use it daily. The digital gaps in access and use are very low, whether analysed by age, gender or socioeconomic level.

These advances are largely related to specific long-term public policies, as can be seen through the successive digital agendas developed since 2008.[6].

[4] https://unesdoc.unesco.org/ark:/48223/pf0000381137_eng
[5] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/observatorio-sociedadinformacion
[6] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/politicas-ygestion/programas/agenda-digital-del-uruguay

Current conditions in the areas of digital development, connectivity and business climate have led to our country being the destination of important investments and initiatives that reaffirm Uruguay as a hub of technological innovation, such as Microsoft's AI Co-Innovation Lab - being the first country in Latin America and the third outside the United States along with China and Germany to have such a laboratory - and 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

- Internet access in homes: 91% of Uruguayan homes have Internet access. 72% of homes have a fixed broadband connection.
- Internet use in people: As mentioned above, 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.[7].
- 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[8].
- Digital Development Compass (DDC): is a tool developed by the United Nations Development Programme (UNDP) that measures the digital progress of countries, launched in 2023. It uses an extensive database with digital development indicators, organized into various pillars of the Framework for Action.

[7] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/datos-yestadisticas/estadisticas/encuesta-uso-tecnologias-informacion-comunicacion-2022
[8] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/datos-yestadisticas/estadisticas/indice-desarrollo-digital-ict

UNDP Digital Transformation. Uruguay stands out in several aspects, especially in the following pillars: Connectivity, Government (Uruguay is a leader in the digitalization of public services), People (extended digital use and skills) and Digital Public Infrastructure; achievements that position Uruguay as a benchmark in the region in terms of digital development.[9].

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 mainly directed to the United States. The sector's business model, focused on software development, represents 70% of the sector's activity and 80% of exports. According to the Uruguayan Chamber of Information Technologies (CUTI), the IT sector is growing more than the average of the economy and its share in the Gross Domestic Product (GDP) has been doubling every 10 years.[10].

- According to the Global Intellectual Property Innovation Index 2023, Uruguay shows a moderate presence in high-tech exports, constituting 0.8% of its total trade (position 75 worldwide). However, the country stands out significantly in the export of ICT services, representing 7.9% of its total trade and occupying the seventh position worldwide in this sector.[11].

- Uruguayan exports in information technology in 2022 amounted to 1,172 million dollars, the second most exported service in the country after tourism[12]. It is the largest

[9] https://www.digitaldevelopmentcompass.org/country/URY
[10] https://cuti.org.uy/destacados/el-sector-ti-en-la-economia-uruguaya-impacto-del-4-3-en-el-pib-y-quinto-rubrode-exportacion-del-pais/
[11] https://www.wipo.int/publications/es/details.jsp?id=4680
[12] https://www.uruguayxxi.gub.uy/es/centro-informacion/articulo/informe-anual-de-comercio-exterior-deuruguay-2023/

software exporter per capita in the region, and fourth in annual IT export turnover.

Digital Transformation of Government

- Digital Government Index: Uruguay is ranked 1st in Latin America, 2nd in the Americas and 25th among 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.[13].

- 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 promotion of GovTech enablers.[14].

Innovation

- Global Innovation Index (IGI): Uruguay is ranked 4th in Latin America and the Caribbean in the 2023 edition of the Global Innovation Index. The Global Innovation Index (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 groups in science and technology.[15].

- Investment in Innovation: The National Agency for Research and Innovation (ANII) has increased its budget for activities

[13] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/datos-yestadisticas/estadisticas/indice-desarrollo-del-gobierno-electronico-egdi
[14] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/datos-yestadisticas/estadisticas/indice-madurez-govtech-gtmi
[15] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/datos-yestadisticas/estadisticas/indice-global-innovacion-igi

to promote innovation, reaching $48 million in 2023.

Artificial intelligence

- Latin American Artificial Intelligence Index: According to this index, prepared by the National Center for Artificial Intelligence of Chile (CENIA) with the support of multiple actors from the public, private, multilateral and academic sectors, Uruguay presents important strengths as well as opportunities for improvement that place it in 3rd place in the region behind Brazil and Chile. This study delves into the dimensions: enabling factors, research, development and adoption, and governance.[16].
- The Global Responsible AI Index: This index, prepared by the Global Center on AI Governance (GCG), places Uruguay in 19th place worldwide and 2nd place in South America. It includes a set of indicators that allow comparing government commitments and the capacities of countries based on three dimensions: Capabilities, Human Rights and Governance. Each of them evaluates the performance of three different pillars of the responsible artificial intelligence (AI) ecosystem: institutional frameworks, government actions and initiatives of non-state actors, such as civil society, companies and academia.[17].

[16] https://www.cepal.org/es/eventos/lanzamiento-la-segunda-version-indice-latinoamericano-inteligenciaartificial-ilia

[17] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/datos-yestadisticas/estadisticas/indice-global-ia-responsable

Main milestones

2018: National Supercomputing Center (ClusterUY)

In 2018, the National Supercomputing Center (ClusterUY) began operating[18], and has established itself as a key platform for high-performance computing in Uruguay. This center is a high-performance computing platform that manages multiple computing resources in a coordinated manner. It has an infrastructure that includes more than 2,240 CPU computing cores and 100,352 GPU computing cores; and is essential for supporting AI research and development projects, providing the infrastructure necessary to perform complex data processing operations and advanced simulations.

2019: Data Science and Machine Learning Roadmap

The National System for Productive Transformation and Competitiveness launched the Roadmap in Data Science and Machine Learning[19], presenting a set of initiatives in strategic sectors. It was coordinated by the Ministry of Industry, Energy and Mining (MIEM) together with the Secretariat of Transforma Uruguay. This effort involved the collaboration of several key actors from the public and private sectors, including institutions such as the National Public Education Administration (ANEP), Ceibal, UdelaR, Uruguay XXI, the National Agency for Research and Innovation (ANII), among others.

2020: AI Strategy for the GovernmenteitherDigital

In 2020, Uruguay took a significant step with the approval of the AI Strategy for Digital Government[20]. This strategy, developed by the Agency for Electronic Government and Information and Knowledge Society (Agesic), sought to incorporate AI into digital government to improve decision-making based on

[18] https://www.cluster.uy/

[19] https://www.gub.uy/ministerio-industria-energia-mineria/sites/ministerio-industria-energiamineria/files/documentos/publicaciones/6112019%2BHoja%2Bde%2BRuta%2BCD%2BAA.pdf

[20] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/publicaciones/estrategia-inteligencia-artificial-para-gobierno-digital/estrategia

based on evidence and develop proactive services. The instrument was based on a set of nine principles: purpose, general interest, respect for human rights, transparency, responsibility, ethics, added value, privacy by design and security, and incorporated the principles of personal data protection. Its general objective was based on four pillars: AI governance in public administration, capacity building for AI, use and application of AI, and digital citizenship and AI.

2021: Interdisciplinary Center for Data Science and Machine Learning

In 2021, the Interdisciplinary Center for Data Science and Machine Learning was launched[21](CICADA). This initiative of the University of the Republic (UdelaR) aims to bring together researchers from various disciplines to address complex problems using data science and machine learning. Since its inception, CICADA[22] has launched projects in different areas. Examples of projects include genomics and bioinformatics, medical image processing, epidemiological analysis, ecology and environmental sciences, neuroscience and education research, and those involving natural language processing, promoting interdisciplinary research, international collaboration and currently focusing on the challenges and opportunities of AI in Uruguay.

2022: Computational Thinking and Artificial Intelligence, Innovation support for *startups* and modification of the Personal Data Protection Law

In 2022, Ceibal's Computational Thinking program, which has been offered to 4th, 5th and 6th grade public primary school students since 2017, will incorporate artificial intelligence projects into the curriculum that allow students to address how AI works, its potential and its limits. Its expansion is planned and in 2024 the program, in addition to being renamed Computational Thinking and Artificial Intelligence, will cover 74% of students in 4th, 5th and 6th grade of primary education.

[21] https://www.fing.edu.uy/es/node/41277
[22] Interdisciplinary Center for Data Science and Machine Learning (cicada.uy)

public. Based on this experience, Ceibal developed and presented the first reference framework for teaching artificial intelligence in Uruguay in 2023.

In addition, the Uruguay Innovation Hub was launched[23], a program promoted by the Ministry of Industry, Energy and Mining (MIEM), with the support of the Ministry of Economy and Finance (MEF), ANII, the Uruguay XXI Institute and the Inter-American Development Bank (IDB). This program aims to strengthen the innovation and entrepreneurship ecosystem in Uruguay, as well as position the country as a regional and global innovation hub. This *hub* seeks to attract investment and increase economic growth by creating a knowledge-based economy. In addition, the Microsoft AI Co-Innovation Lab[24]
In Montevideo, in collaboration with the Technological Laboratory of Uruguay (LATU), it supported more than 70 *startups* Uruguayans, helping them develop and scale innovative AI-based solutions.

The same year, through article 63 of Law No. 20,075 of October 20, 2022[25], article 34 of the Personal Data Protection Act, Law No. 18,331, of August 11, 2008, was amended and the Personal Data Regulatory and Control Unit (URDCP) was given the power to: "I) Establish the criteria and procedures to be observed by those responsible and in charge, in the automated processing of personal data indicated in article 16" of the aforementioned Law.

2023: Montevideo Declaration, new regulatory framework and review process of the AI Strategy for Digital Government

In March 2023, the Montevideo Declaration on Artificial Intelligence is adopted[26], at the Latin American Meeting on Artificial Intelligence (Khipu), which highlights the importance of using AI in a responsible and ethical manner. Its principles include the use of AI to improve the quality of life while respecting human rights, the representation of cultural and geographical diversity,

[23] https://uih.uy/
[24] https://www.gub.uy/ministerio-industria-energia-mineria/comunicacion/noticias/microsoft-ai-co-innovation-labcelebro-ano-se-situa-exitosos-empresa-mundo
[25] https://www.impo.com.uy/bases/leyes/20075-2022/63
[26] https://zenodo.org/records/8208793

minimizing environmental and social impact, and improving working conditions. In addition, the need to strengthen sovereignty and regulation in Latin American countries to ensure inclusive and sustainable technological development with a regional focus is emphasized.

In June 2023, Agesic began the process of reviewing the AI Strategy for Digital Government[27] through a broad participatory process.

In addition to article 74 of Law No. 20,212, of November 6, 2023[28], entrusted Agesic with the design and development of a national strategy "based on international standards, in the public and private spheres." The Law also established that the strategy must be aligned with the National Data Strategy, considering that data is a central element in the development of AI systems.

It was also incorporated into the Uruguay Digital Agenda 2025, in the 2023 version.[29], the following goal: "to establish the institutional and governance framework defined in the participatory process of developing the National Artificial Intelligence Strategy and the National Data Strategy, for the implementation and sustainability of the pillars and objectives developed therein, under the principles of equity, non-discrimination, responsibility, accountability, transparency, auditing and safe innovation, respecting human dignity, the democratic system and the republican form of government, considering the principles of personal data protection.", reaffirming the commitment to the country's digital policy.

27 https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/politicas-ygestion/process-revision-estrategia-inteligencia-artificial-elaboracion-estrategia

28 https://www.impo.com.uy/bases/leyes/20212-2023/74#:~:text=Atrib%C3%BAyese%20a%20la%20Agencia%20para,los%20%C3%A1mbitos%20p%C3%BAblico%20y%20privado .

29 https://www.gub.uy/uruguay-digital/comunicacion/publicaciones/agenda-uruguay-digital-2025-actualizacionmedio-termino

2024: Recommendations on the regulatory framework, State AI Observatory and academic programs and specializations

In June 2024, Agesic submitted to the Legislative Branch the report "Article 74 of Law No. 20,212 of November 6, 2023[30]: Recommendations for the regulation of Artificial Intelligence (AI) aimed at ethical development, the protection of human rights and the promotion of technological innovation"[31].

The report was prepared in collaboration with various public entities and was supported by contributions from academic and civil society figures. It made recommendations on three central aspects: institutionality and governance of AI; ethics, human rights and democracy; and responsible innovation.

In addition, the Artificial Intelligence Observatory was launched in the State[32], a commitment made within the framework of the Fifth National Open Government Action Plan 2021 - 2024[33], with the aim of promoting the ethical and responsible use of AI in the public sector. The design was carried out incorporating the contribution of various actors from public institutions, civil society and academia, and in its initial stage the observatory included the results of the first survey of AI use cases in the State and a guide with recommendations for algorithmic transparency.

By 2024, Uruguay has academic programs and specializations in the field of AI aimed at training highly qualified professionals to face the challenges and take advantage of the opportunities offered by this discipline. These programs include the Bachelor's Degree in Data Engineering and Artificial Intelligence from the Technological University of Uruguay (UTEC), the Engineering in Artificial Intelligence and Data Science from the Catholic University of Uruguay (UCU), the Diploma of Specialization in Artificial Intelligence from the ORT University of Uruguay, the Data Engineering and Artificial Intelligence from the University of Montevideo (UM), the Diploma in Applied Artificial Intelligence from the Universidad Católica del Uruguay (UCU), the Diploma of Specialization in Artificial Intelligence from the Universidad de Montevideo (UM), the Diploma in Applied Artificial Intelligence from the Universidad Católica del Uruguay (UCU), the Diploma of Specialization in ...

30 https://www.impo.com.uy/bases/leyes/20212-2023/74
31 https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/noticias/recomendaciones-para-regulation-inteligencia-artificial
32 https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/observatoriointeligencia-artificial
33 https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-knowledge/node/6200

Universidad de la Empresa (UDE) and the Master's Degree in Applied Data Science from the Universidad de la República (UdelaR). These initiatives expand the educational offering in the country and reinforce Uruguay's commitment to innovation and technological development.

Commitment to ethics and human rights

Uruguay has demonstrated a firm commitment to the application of ethical principles and the protection of human rights in their entirety in the development and implementation of AI.

In 2023, the country joined UNESCO's Recommendation on the Ethics of AI[34] and applied the Country Readiness Assessment Methodology (RAM) for the effective implementation of the Recommendation, the final report of which was published in October 2024.[35]. It also joined as an observer member the Council of Europe's Committee on Artificial Intelligence, the intergovernmental body in which the Framework Convention on Artificial Intelligence, Human Rights, the Rule of Law and Democracy was drawn up.[36], which represents the first binding treaty on the matter and was opened for signature on September 5, 2024.

In 2024, Uruguay adhered to the Recommendation of the Council on artificial intelligence of the Organization for Economic Cooperation and Development (OECD)[37] On 21 March of this year, it became one of more than 120 countries to support the adoption of the historic General Assembly resolution within the United Nations, entitled "Seizing the opportunities of safe and reliable artificial intelligence systems for sustainable development" (A/RES/78/265).[38].

[34] https://unesdoc.unesco.org/ark:/48223/pf0000381137_eng
[35] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/noticias/presentacion-del-informe-metodologia-ram-uruguay
[36] https://rm.coe.int/1680afae3c
[37] https://one.oecd.org/document/C/MIN(2019)3/FINAL/en/pdf
[38] https://documents.un.org/doc/undoc/gen/n24/087/86/pdf/n2408786.pdf

Regional and international articulation and leadership

In 2022, Uruguay assumed the presidency of the Digital Agenda for Latin America and the Caribbean (eLAC) for the period 2022-2024, within the framework of the Eighth Ministerial Conference on the Information Society in Latin America and the Caribbean held in Montevideo. Within this framework, the Working Group on Artificial Intelligence was formed, coordinated by the National Center for Artificial Intelligence of Chile and the Agency for Electronic Government and the Information and Knowledge Society (Agesic) of Uruguay.[39].

In 2024, Uruguay hosted the Preparatory Meeting for the Ninth Ministerial Conference on the Information Society in Latin America and the Caribbean (eLAC), where work was done on the agreements that led to the new Regional Digital Agenda 2026, approved in November 2024 in Santiago, Chile.

In the same year, Uruguay hosted and organized the Second Ministerial and High-Authority Summit on the Ethics of AI in Latin America and the Caribbean, where the Montevideo Declaration was approved.[40]and the Ethical Artificial Intelligence Roadmap for Latin America and the Caribbean 2024 – 2025[41], continuing the process initiated at the First Summit that took place in 2023 in Santiago de Chile.

At the Summit, the creation of the Working Group on the Ethics of Artificial Intelligence in Latin America and the Caribbean was consolidated as a space for permanent dialogue and periodic meetings, with a regional focus and coordination of the actions necessary for the implementation of the approved Roadmap. Within the framework of the Summit, Uruguay assumed the leadership of the Working Group, committing to lead its work to advance the implementation of the 2024-2025 Roadmap. This group has the technical secretariat of CAF and UNESCO.

[39] https://elac.cepal.org/docs/TdR%20Grupo%20de%20IA%2007_23.pdf
[40] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/noticias/aprobacion-declaracion-montevideo
[41] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/noticias/aprobacion-declaracion-montevideo

Also in 2024, at the eleventh meeting of the Ministerial Summit of the *Digital Nations* (DN) It was agreed that Uruguay will lead the AI working group during the year 2025.

Impact and future

Efforts made so far are having an auspicious impact in various strategic sectors. In healthcare, AI is being used to improve disease diagnosis and treatment, as well as patient data management. In agriculture, technologies such as weed detection and irrigation optimization are transforming agricultural production. In the energy sector, AI helps manage and optimize energy production and distribution, especially in renewable energy projects.

These initiatives reflect Uruguay's commitment to innovation and technological development. Continued collaboration between the State, academia, civil society and the private sector will be crucial to face future challenges and take advantage of the opportunities that AI offers, always with an ethical approach and respect for human rights.

Having a new national AI Strategy, articulated with all the instruments of the country's digital policy and other national strategies, is key to continuing and strengthening collaboration among multiple stakeholders in favor of sustainable development, fostering innovation, having horizontal and sectoral policies consistent with international standards, ensuring that the benefits of AI are accessible to all people, and enhancing Uruguay's regional leadership and the country's participation in the various efforts for global AI governance. The Strategy also becomes an important instrument to advance the implementation of the commitments assumed within the framework of the Global Digital Compact, approved by resolution of the United Nations General Assembly on September 22, 2024 at the Future Summit.

Objectives of the Strategy

General objective

Leverage artificial intelligence (AI) as an instrument for sustainable development and inclusive growth in Uruguay, promoting its ethical, responsible, safe, critical, creative and pro-innovation development and use, for the benefit of the well-being of people and all sectors of society, the economy and the improvement of public management.

Specific objectives

1. **Governance:**establish a governance framework that guarantees the ethical, responsible and safe development and use of AI, ensuring adequate institutionality, clear regulatory frameworks and efficient processes that promote transparency, security, inclusion and legal certainty in the field of AI.

2. **Capabilities:**develop the national capabilities and conditions necessary to foster and harness AI innovation and application, with a comprehensive approach that includes infrastructure, data, talent management and skills.

3. **Sustainable development:**Leverage AI as a key driver for inclusive economic growth, sustainable development of the country, strengthening the competitiveness of the private sector, deepening Uruguay's digital transformation process, improving management and public services, and promoting research and innovation. Maximize the benefits of this technology for society by considering the positive impacts and mitigating the possible adverse impacts, developing the capacities for the critical integration of AI in society.

Guiding principles

Purpose and scope

This section develops the set of guiding principles on which the National Artificial Intelligence Strategy of Uruguay is based in accordance with article 74 of Law No. 20,212, of November 6, 2023.[42].

These principles should govern AI governance to ensure the ethical, safe, responsible and pro-innovation development and use of these technologies and to achieve the objectives of this Strategy. They cover the public and private sectors and should be applied according to the context, the different roles, obligations and responsibilities that correspond to their various actors in accordance with the legal system. They do not create any new legal obligations other than those arising from the legal system, but rather specify the minimum measures and practices that enable their implementation.

They articulate Uruguay's National AI Strategy with the various instruments that make up the country's digital policy, among others, the Uruguay Digital Agenda 2025, the National Cybersecurity Strategy (2024 - 2030), the National Digital Citizenship Strategy for an Information and Knowledge Society (2024-2028)[43]and the National Data Strategy, the construction of which took place simultaneously with the present one. They are based on the UNESCO Recommendation on the Ethics of Artificial Intelligence[44], and the OECD Council Recommendation on Artificial Intelligence[45]to which Uruguay adhered.

They also reflect the emerging standards of the Framework Convention on Artificial Intelligence, Human Rights, Democracy and the Rule of Law adopted by the Council of Europe, which was developed by the Committee on International Intelligence

[42]https://www.impo.com.uy/bases/leyes/20212-2023/74#:~:text=Atrib%C3%BAyese%20a%20la%20Agencia%20para,los%20%C3%A1mbitos%20p%C3%BAblico%20y%20privado .
[43]https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/publicaciones/estrategia-nacional-ciudadania-digital-para-sociedad-informacion
[44]https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/noticias/uruguay-adhiere-recomendacion-etica-inteligencia-artificial-unesco
[45]https://one.oecd.org/document/C/MIN(2019)3/FINAL/en/pdf

Artificial intergovernmental organization in which Uruguay participates as an observer.

The guiding principles also contribute to the national implementation of the United Nations General Assembly Resolution of 21 March 2024, "Seizing the opportunities of safe and reliable artificial intelligence systems for sustainable development" (A/RES/78/265).[46], which was supported by more than 120 States, including Uruguay.

They are presented grouped according to the main values that underlie their foundation, without prejudice to the interrelation and complementarity of the principles and that they must be understood as an indivisible whole.

For the purposes of the Strategy, the following definitions developed by the OECD are adopted and reproduced below:[47]:

AI Actors: AI actors are those who play an active role in the AI system lifecycle, such as entities and people who deploy and exploit AI.

AI system lifecycle: The lifecycle of an AI system typically comprises several phases: planning and design; data collection and processing; creation of model(s) and/or adaptation of existing model(s) to specific tasks; testing, evaluation, verification and validation; entry into service/deployment; exploitation and monitoring; and retirement/decommissioning. These phases often occur iteratively and are not necessarily sequential. The decision to stop operating an AI system can occur at any time during the exploitation and monitoring phase..

AI system: An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input data it receives, how to generate output information such as predictions, content, recommendations or decisions, which can influence real or virtual environments.

[46] https://documents.un.org/doc/undoc/gen/n24/087/86/pdf/n2408786.pdf
[47] OECD (2019). Recommendation of the Council on Artificial Intelligence, C/MIN(2019)3/FINAL, point (I). Unofficial translation. Available at: https://one.oecd.org/document/C/MIN(2019)3/FINAL/en/pdf

Once deployed, different AI systems exhibit varying levels of autonomy and vary in their ability to adapt.

Beginning

1. AI for human well-being and sustainable development

The well-being of people must be placed at the centre of decisions, processes and applications related to artificial intelligence.

Technological advances represent new opportunities and also new challenges to ensure sustainable development, which involves, among other dimensions, inclusive economic growth, social inclusion and environmental protection.

Leveraging AI as a tool to achieve these goals requires public policies, joint efforts and collaboration between the public sector, the private sector and stakeholders, and continuous assessment of the social, economic and environmental impacts involved in the development and application of AI systems.

2. Strengthening democracy

The development and application of AI must be consistent with democratic values. This means taking advantage of the potential benefits that the incorporation of AI can bring to the functioning of democracy and addressing the challenges that require attention.

This objective requires, on the one hand, identifying and taking advantage of the possibilities offered by AI to strengthen the pillars of democratic functioning, such as transparency and public accountability, citizen participation and access to information, as well as to improve the efficiency of public management through its incorporation into processes that benefit from AI.

At the same time, it requires addressing current and future challenges amplified by AI in relation to the protection of public debate, the right of people to form their opinions freely, freedom of expression, and the integrity of data.

electoral processes. The above calls for addressing the impact of AI on disinformation in a manner consistent with freedom of expression and other rights, and seeking to leverage AI to combat this phenomenon.

This approach should be undertaken in a comprehensive manner involving multiple stakeholders and should include measures to strengthen digital and information literacy in all segments of the population, measures for legal regulation and co-regulation, and where appropriate, support for self-regulation measures that are proactively adopted in areas where such measures may be appropriate and/or complementary to others, in accordance with international standards.

When it comes to AI-generated content, this comprehensive approach should ensure that people are informed when interacting with an AI system and understand when content has been generated or manipulated by AI.

From a broad perspective, this means considering the impact of AI on disinformation in the frameworks developed for platform governance; strengthening people's instrumental and fundamental digital skills to interact critically in the digital environment and understanding how algorithms and the use of AI work in content moderation and curation; as well as ensuring the transparency and accountability of the frameworks and processes that underpin them.

The integration of AI into society must be done in a way that strengthens, not weakens, the fundamental principles of the rule of law and democracy. By ensuring transparency, accountability, information integrity and respect for freedom of expression, AI actors can contribute to a safer and more trustworthy information ecosystem. Fighting disinformation is an ongoing challenge that requires collaboration between governments, technology companies, civil organizations and citizens at large.

3. Respect for dignity and human rights

AI systems must be developed and used under ethical principles, in a manner compatible with human dignity and respectful of human rights protected by international instruments ratified by the State and by national legislation, ensuring the autonomy of people, their privacy, fundamental freedoms, equality and non-discrimination, among other rights.

To this end, the actions of public sector AI actors must be governed by the State's legal obligation to respect, guarantee and protect human rights.

This means, first of all, refraining from using AI systems in a way that may violate people's rights. Furthermore, and depending on the State's position as guarantor, it implies the duty of public bodies to maintain or adopt, within the scope of their powers, the measures that are necessary and appropriate to protect human rights in relation to the activities of both the public and private sectors involved in the AI life cycle.

These measures should include frameworks and procedures that enable the identification, assessment, prevention and mitigation, as appropriate ex ante or iteratively during the lifecycle of AI systems, of adverse human rights impacts based on the risk and intended use involved. Such frameworks should take into account the context and intended use of AI systems, as well as the severity and likelihood of the risks and impacts on human rights. Such measures should also ensure that human rights violations resulting from public and private sector activity involved in the lifecycle of AI systems can be adequately remedied by ensuring that mechanisms and resources are available to do so.

For public bodies, the implementation of this principle entails the specific duty to maintain or adopt measures to ensure that technological solutions using AI that they develop, acquire or use in the exercise of their duties respect human dignity and the rights of individuals.

In implementing this principle, the actions of private sector actors must be framed within the responsibility of private entities to respect human rights.[48] and the obligation to comply with national and international standards that protect such rights.

The responsibility to respect human rights requires proactive action on the part of private entities.

In this regard and following the United Nations Guiding Principles on Business and Human Rights[49]Such duty entails: I) refraining from violating human rights; ii) having a human rights due diligence process to identify, prevent, mitigate and account for how they address their impact on such rights, which must be defined based on the severity of the risks and impacts involved for human rights; iii) and mechanisms to remedy the violations they have incurred.

The use of AI systems in decision-making poses a fundamental challenge: ensuring that such decisions are fair, transparent and accountable.

Human oversight and decision-making play a key role in preventing applications of AI systems from having negative effects on people's rights. For the sake of ethical and human rights-respecting use of AI, AI actors must ensure that, when AI systems are used to make decisions or support decision-making, there is always human oversight over the results produced by AI, and it is relevant to consider the characteristics that such oversight should have, especially in high-risk systems. It will be a challenge to establish controls over data and systems, but as with automated processes used before the emergence of this technology, it is imperative to monitor the results and ensure their reliability before making decisions based on them.

---

[48]According to the Principles on Human Rights and Business adopted by the United Nations Human Rights Council in 2011, "*The responsibility to respect human rights is a global standard of conduct applicable to all businesses, wherever they operate. It exists independently of the ability and/or willingness of States to comply with their own human rights obligations and does not diminish those obligations. It is an additional responsibility to comply with national laws and standards protecting human rights.*"

[49]https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_sp.pdf

Another aspect of AI governance that particularly requires attention under this guiding principle is the development and use of artificial intelligence in the field of neurotechnology. In this sense, maximizing the present and future opportunities involved in neurotechnology for humanity requires addressing the challenges to human rights arising from the convergence, use and development of AI in this field, as has been raised by the Expert Advisory Committee of the Human Rights Council on this matter.[50].

Applying a human rights approach to AI governance also requires maximising opportunities for positive impact and addressing the differentiated risks involved for the most vulnerable groups.

4. Equity and non-discrimination

AI systems must be developed and used in a way that respects equality, as well as the prohibition of discrimination.

To this end, AI actors must consider, throughout all phases of the systems' life cycle, the specific needs and differentiated impacts on vulnerable groups, including those whose situation may be exacerbated by the characteristics of AI systems and their application in specific areas, such as children and adolescents, the elderly, and people with disabilities, among others.

The implementation of this principle also highlights the importance of adopting proactive measures to address the impact of AI on gender equality and other structural inequalities. Such measures should be aimed at preventing stereotypes and discriminatory biases due to factors such as gender, ethnic-racial identity, social status, national origin, among others, from being reproduced and/or perpetuated in AI systems and their application.

[50] https://documents.un.org/doc/undoc/gen/g24/133/31/pdf/g2413331.pdf

All AI stakeholders must work collaboratively to reduce the possibility of unwanted biases in the data and models used that may negatively impact people, adopting measures that promote the quality of training data. To this end, the diversity and interdisciplinarity of the teams that participate in the design, development and monitoring of these systems is important. To this end, the public sector must promote the development of AI models that use quality data by adopting measures that facilitate the opening and access to public data that contribute to overcoming the structural underrepresentation of various groups in society.

This principle covers both discrimination based on algorithmic bias and discrimination based on automation bias, that is, the human tendency to rely excessively on the support of algorithms, even when they make mistakes.

In implementing this principle, public sector actors should ensure, within their sphere of competence, that they promote equitable access for all people to the benefits of AI technologies, addressing the digital gaps that enable the achievement of this objective. Likewise, the efforts developed by the private sector, civil society organizations and academia are important for the achievement of this objective and should be encouraged.

5. Protection and privacy of personal data

Protection and respect for the privacy of personal data must be ensured by design and throughout all phases of the life cycle of AI systems.

To do so, AI actors – whether public or private – must ensure that the data they collect and use complies with current regulations on the protection and privacy of personal data, and the guidelines of the Personal Data Regulatory and Control Unit (URCDP). This involves compliance with formal obligations such as the registration of databases or the notification of security breaches, as well as proactive responsibility measures such as the implementation of impact assessments on the protection of personal data.

personal data, the appointment of data protection officers, the adoption of privacy measures by design and by default, among others.

The transversality of data protection principles contributes to generating certainty in the use of personal information and AI systems in particular, which is complemented by a set of rights that contribute to bringing transparency to automated processing activities, and legal certainty to AI actors, among others.

The Principles of Personal Data Protection established by Law No. 18,331 of 2008[51], of August 11, 2008, integrate the principles of this Strategy, in accordance with article 74 of Law No. 20,212, of November 6, 2023[52]These principles, regulated in articles 5 to 12 of Law No. 18,331, are: legality, veracity, purpose, prior informed consent, data security, confidentiality and responsibility (proactive).

6. Transparency and explainability

Transparency and explainability play a crucial role in ensuring the effectiveness of all the above principles. AI actors must ensure transparency and explainability in relation to AI systems.

This involves providing meaningful information appropriate to the specific context and situation, in a balanced manner with the protection of other rights that may be involved. The information disclosed must allow the results to be made intelligible and must be appropriate to enable people to challenge them when they are affected.

To do so, they must ensure that people are informed about the use of AI and adopt measures that enable the identification of content generated by this technology when technically feasible and appropriate.

[51] https://www.impo.com.uy/bases/leyes/18331-2008
[52] https://www.impo.com.uy/bases/leyes/20212-2023/74#:~:text=Atrib%C3%BAyese%20a%20la%20Agencia%20para,los%20%C3%A1mbitos%20p%C3%BAblico%20y%20privado.

In the specific case of the public sector, the implementation of this principle also implies that public entities that use AI, whether in the delivery of public services or in support of decision-making, guarantee access to the respective public information, in accordance with the provisions of Law No. 18,381 of October 2008. [53]and its regulatory decrees.

The application by public sector actors of Law No. 19,179 of December 27, 2013, regulated by Decree No. 44/015 of January 30, 2015, and the use of open AI models are also fundamental elements to ensure the transparency and explainability of the systems developed, used and acquired by the State.

7. Responsibility and accountability

AI actors must be responsible for the proper functioning of AI systems and ensure that they comply with all guiding principles.

In accordance with their functions, the context and the state of the technology, they must establish those responsible and mechanisms to ensure that the data sets they use are auditable and traceable.

Oversight and accountability processes must be transparent so that the public and those who use the systems can see how they are being managed and monitored.

Another aspect to consider is the definition of the corresponding areas of responsibility of each of the actors in the system, through legal, regulatory or contractual standards, where appropriate.

8. Reliability and security

AI systems must be reliable, secure and resilient, so that they are able to recover from failures or attacks and generate consistent results and actions. AI actors must ensure that AI systems

[53]https://www.impo.com.uy/bases/leyes/18381-2008

function properly and do not pose security risks, and comply with information security principles by design.

This means that they must adopt measures and procedures to ensure the robustness and resilience of the systems, their continuous updating and improvement, the quality of the data, the precision and consistency of the models, the stability of the systems, transparency and explainability, privacy, protection of personal data and security against possible cyber attacks, as well as their development and adoption under ethical principles.

The guidelines and regulations related to cybersecurity in force in Uruguay that apply to the development and use of AI are considered part of these principles.

9. Responsible and safe innovation

The implementation of these principles should be based on the importance of research and innovation as key factors for the sustainable development of the country in its different dimensions.

Collaboration between the public and private sectors, academia, and research and entrepreneurship centers are essential to foster technological innovation aimed at enhancing and harnessing the benefits of AI for people and society. Knowledge and collaboration networks at national and international levels are also essential.

Responsible and safe innovation in AI therefore involves developing technologies aligned with ethical principles and human rights, incorporating security and privacy measures from the design stage and throughout the life cycle, complying with regulations and adapting to regulatory changes. Responsible innovation also involves promoting positive social impact and continuously evaluating and adjusting innovations based on feedback to ensure safe and ethical implementation.

10.Multiple stakeholders

AI governance should be based on a multi-stakeholder approach.

This means that it must advance 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 contemplates spaces and mechanisms that make it possible.

This principle is key to enabling AI governance that includes different perspectives, approaches and disciplines, and involves broad, diverse and interdisciplinary participation.

Thematic axes

Axis 1. Governance

Establish a governance framework aimed at ensuring the ethical, responsible and safe development and use of artificial intelligence, using its potential as a tool for the sustainable and inclusive development of the country.

This framework must establish the institutionality, organization, regulatory frameworks and processes necessary to achieve the objective, as well as strengthen collaboration and coordination with stakeholders to ensure effective and coordinated implementation.

Line 1.1 Institutionality

Establish the institutional and organizational design in accordance with the objectives of the Strategy, incorporating processes and instruments for its implementation, follow-up, monitoring and updating, ensuring the articulated integration of multiple interested parties.

Actions

1. Define and establish the country's governance model and the appropriate institutional design for the implementation of the National AI Strategy, ensuring comprehensive and sectoral approaches that guarantee its sustainability and continuous improvement; mechanisms for permanent articulation and participation to integrate approaches from multiple actors and sectors; and mechanisms for follow-up, monitoring and accountability.

2. Incorporate and/or adaptthe powers of public bodies in relation to their substantive tasks, to strengthen supervision and oversight, and the availability of adequate and effective mechanisms for complaints.

3. Evolve and consolidate the AI Observatory in the State[54] as a tool to promote transparency in the use of AI by the State, generate information for decision-making and position it as a resource center for knowledge management in the matter, for all sectors of the ecosystem.

Line 1.2 Regulatory frameworks

Develop and adopt the necessary regulatory frameworks based on a risk approach and others that are determined to promote the ethical, responsible and safe development and use of AI systems, in accordance with the principles established in this Strategy.

These frameworks should promote and ensure transparency and respect for human rights, including privacy and personal data protection, democracy and the rule of law throughout all stages of the life cycle of AI systems, from initial analysis to implementation and oversight, as well as provide legal certainty.

Actions

1. Identify existing gaps at the regulatory level that limit or prevent the achievement of adequate governance based on ethical principles, the protection of human rights and the promotion of sustainable development and innovation, and promote, under a risk-based approach and others that are determined, binding or non-binding regulatory, co-regulatory and self-regulatory instruments, where appropriate, adapting regulatory requirements to the different layers of the technological architecture and the different roles within the AI life cycle. Analyze and define, on the basis of national consensus, the applications of AI systems that are unacceptable as a society due to their impact on human rights.

[54] Artificial Intelligence Observatory | Electronic Government and Information and Knowledge Society Agency

people, evaluating appropriate prohibitions or moratoriums.

2. Prepare a diagnosis that identifies the existing gaps at the regulatory level to address the challenges involved in AI in relation to the intellectual property and civil liability regime and establish frameworks based on national consensus on the basis of a multi-stakeholder approach, which takes into account the different interests and necessary balances.

3. Address the impacts of using AI for public safety purposes by seeking a balance between, on the one hand, innovation in public safety and, on the other, civil and political rights and their guarantees.

4. Create sector-specific regulatory frameworks through multi-stakeholder spaces around topics such as health, education, insurance and finance, security and privacy, creative industries, environment, neurotechnologies, among others.

5. Generate frameworks that guarantee the availability of instruments to identify, evaluate, prevent, mitigate risks and address the adverse impact of the application of AI on human rights, environmental protection, and other dimensions of sustainable development, as well as in sectors that require special measures.

6. Address the impacts of AI on the phenomenon of disinformation and on the integrity of democratic processes, consistent with freedom of expression, through a holistic and systemic approach.

7. Establish and adopt a public procurement policy that includes the development, use, acquisition and implementation of AI solutions, incorporates the principles of ethical, responsible and safe use of this technology, and considers any relevant adjustments to the regulatory framework.

8. Generate frameworks for transparency and accountability regarding the development and use of AI, establishing appropriate requirements for the

contexts, intended uses and specific risks associated with this technology.

9. Develop the necessary frameworks to implement audit models for cases where established in the regulation, and/or that allow monitoring the adoption of standards and guaranteeing quality in AI systems, both in the public and private sectors.

10. Adapt the country's current cybersecurity framework to integrate specific aspects of AI in a manner consistent with international standards. In this context, techniques for assessing and managing security risks associated with AI must be developed, especially in areas such as health, cybersecurity, critical information infrastructure and national security.

11. Promote the adoption of ethical principles for AI in the private sector, covering all branches of economic activity, to ensure responsible practices in the design and development of AI systems.

12. In accordance with the provisions of Article 75 of Law No. 20,212 of November 6, 2023[55], to promote the institutionalization of regulatory experimentation initiatives, which enable spaces to test innovative products, services or business models to produce evidence that informs regulatory decision-making and/or guides those regulated on the applicable regulations. Among these tools, the following will be considered: *sandboxes* regulatory and the *hubs* of innovation.

Line 1.3 International articulation

Strengthen Uruguay's participation in international spaces and instances where issues related to artificial intelligence are addressed, promote the construction of a regional perspective and contribute to international cooperation in this area. Also, advance in the adoption of international standards and instruments that are aligned with national policy, thus promoting the

[55] https://www.impo.com.uy/bases/leyes/20212-2023/75

Uruguay's global positioning as a key player in attracting investment.

Actions

1. Strengthen Uruguay's participation in subregional, regional and international areas in the field of AI, promoting inter-institutional coordination and specialized training of national representatives who participate in these areas.

2. Promote technical cooperation actions with multilateral organizations, exchange and bilateral cooperation with other countries and participation in international forums and networks for the development of the actions proposed in the strategy.

3. Strengthen Uruguay's adherence to the highest international standards and instruments and promote their implementation at the national level.

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.

5. Promote the participation of actors from the private sector, academia and civil society in international settings where technical standards for AI governance are defined.

Axis 2. AI capabilities

Develop the national capabilities and conditions necessary to foster and harness innovation and the application of artificial intelligence.

Addressing this goal requires a comprehensive approach., which includes human talent management and the promotion of digital skills. It is also essential to guarantee an adequate infrastructure, ensure data protection – while promoting the secure exchange and sharing of data –,

and strengthen cybersecurity. These elements are essential to build a robust ecosystem that promotes AI as a key tool for the sustainable and competitive development of the country, and the well-being of people.

Line 2.1 Infrastructure

Ensure the infrastructure available in the country to strengthen the development and use of AI, promoting public and private innovation and the improvement of public services.

This implies access to high-quality technological infrastructure, including high-speed networks, data storage and processing capacity that supports AI projects, contributing to national sovereignty in this area.

Actions

1. Design and implement an advanced digital infrastructure plan for the development and use of AI in the country, in accordance with international standards.

2. Establish a centralized infrastructure for AI that includes platforms, solutions and ecosystems, that incorporates standards and best practices and that is accessible to all State agencies. This infrastructure will support the implementation of services, optimize resources and improve efficiency.

3. Strengthen the national infrastructure for AI by consolidating a robust ecosystem that promotes collaboration between the public sector, the private sector, academia and civil society. This intersectoral articulation will maximize the potential of AI in the country, promoting its application in different areas and facilitating the development of innovative solutions that contribute to sustainable growth and the well-being of society.

4. Promote regional and international agreements to share knowledge, and facilitate access to the AI ecosystem in Uruguay to high-performance computing centers and networks.

5. Articulate the AI Strategy with national environmental strategies and policies, and participate in studies on environmental risks due to the use and development of AI in Latin America and the Caribbean that will be carried out within the framework of the implementation of the ethical AI roadmap for LAC 2020-2025.

Line 2.2 Data for AI

Contribute to the development of artificial intelligence solutions adapted to the context of Uruguay by democratising access to public data. This includes improving the quality of available data, establishing guidelines to reduce bias, and optimising AI applications developed or used, as established in the National Data Strategy.

Likewise, and in accordance with the provisions of the National Data Strategy, generate incentives for the secure and reliable exchange and sharing of data between actors in the public sector, the private sector, academia, and civil society, promoting its (re)use for the development of AI solutions.

Actions

1. Generate and make available data sets for model training, which take into account the characteristics of Uruguay, such as its culture, its institutional political organization, and the diversity of its social composition, within the framework of the regional community to which it belongs.

2. Strengthen the public data ecosystem by promoting the creation and use of open data platforms, which allow companies, researchers and public entities to access relevant information to develop and test AI solutions.

3. Support the creation of data spaces that contribute to the training of models, for the development, implementation and use of AI solutions, in strategic sectors.

4. Promote collaboration between the public and private sectors to facilitate secure access to private data sets under conditions that respect the privacy and rights of individuals, ensuring compliance with regulations and ethical standards.

Line 2.3 Cybersecurity

Develop capabilities to mitigate threats posed by AI and strengthen response mechanisms with the help of AI.

Promote the adoption of guidelines and techniques for AI systems projects that are reliable and secure from the design stage, as well as training and capacity building at all levels involved.

Actions

1. Establish specialized areas in AI cybersecurity (together with academia, the private sector and the public sector), which, through research, focus on formulating response mechanisms to the threats posed by AI, for the early detection of threats and the coordination of rapid actions aimed at mitigating their negative effects.

2. Adapt the country's cybersecurity framework by integrating aspects related to artificial intelligence and addressing the security risks of artificial intelligence systems, with respect to sectors such as health, critical information infrastructure and national security.

3. Research and develop technical guidelines for the design of reliable, secure and attack-resilient AI systems, with the participation of academia, the private sector and the public sector. Based on these, develop and offer training programs focused on AI for professionals in critical sectors.

Line 2.4 Talent management

Strengthen the capacities required in the country to develop, take advantage of and optimize the use of artificial intelligence, also promoting policies that promote the adaptation and job permanence of people in a constantly evolving environment.

To achieve this, it is essential to foster the development of technological skills and abilities in the population, promoting the incorporation of knowledge about AI in different training and education approaches, from an interdisciplinary perspective. This will ensure effective adaptation to the new challenges of the labor market.

Actions

1. To identify and understand the training needs in AI in Uruguay and the impact of this technology on the labor market, laying the foundations for continuous monitoring.

2. Promote the incorporation of AI training in formal and non-formal education in Uruguay at different educational levels and from early education, favoring the incorporation of skills and competencies necessary for work and the development of the industry.

3. Generate instruments and incentives to strengthen the capacity of universities to generate and retain talent in AI from disciplines associated with science, technology, engineering, mathematics and humanities (among others), including research, innovation and development.

4. Continue to encourage, through various initiatives, the enrollment of women in technological careers (Science, Technology, Engineering and Mathematics, STEM) to strengthen their participation in the AI ecosystem.

5. Include in all training proposals and plans aimed at job training content on the impact of technologies on work, with special emphasis on artificial intelligence. This will strengthen job reconversion processes and contribute to the continuous updating of people's skills for the work environment.

6. Design and implement a comprehensive training plan aimed at all State personnel involved, at all levels.

Axis 3. Sustainable development

Leverage AI as a key driver for the country's sustainable development, inclusive economic growth, strengthening the competitiveness of the private sector and deepening Uruguay's digital transformation process, promoting the integration of digital public goods and digital public infrastructure as key elements for achieving these objectives.

Establish programs and incentives to encourage the exploitation and adoption of AI, as well as research and innovation to maximize the benefits of this technology, also promoting the use of these benefits for society in different areas and sectors, addressing positive and adverse impacts, considering the differentiated effects on different segments of the population.

To achieve this, it is essential to develop capacities throughout the population, ensuring that people are prepared to manage and take advantage of AI tools in an ethical, responsible, critical and creative manner. These conditions will, at the same time, promote digital inclusion.

Incorporate AI to improve public management and the quality of public services and promote collaboration between the State, the private sector, academia and civil society.

Line 3.1 Sectors of the national economy

Maximize the exploitation of the benefits of AI by the different sectors of the national economy to improve their competitiveness and promote investment that enables research and innovation for this purpose.

Actions

1. Support the adoption of AI in the private sector to improve its production and operational processes that contribute to strengthening its competitiveness, through different instruments (incentives, programs, training plans, support in the validation of proposals), with special focus on Small and Medium Enterprises (SMEs).

2. Promote private investment in AI that contributes to boosting research and innovation for the growth of the national economy and its sectors.

3. Promote the creation, improvement and use of open source AI systems as an instrument to strengthen the ecosystem and open innovation, contributing to the development of different sectors and the benefit of society as a whole.

Line 3.2 Research and innovation

Strengthen support for research into artificial intelligence and AI ethics through various instruments and promote safe and responsible innovation.

Actions

1. Encourage the creation of multidisciplinary centres dedicated to AI research that offer solutions to specific problems with mechanisms that foster collaboration between the public sector, academia, civil society and the private sector.

2. Strengthen the ecosystem in the field of AI research by promoting the creation and/or consolidation of research networks involving entrepreneurs and the promotion of academic exchanges for advanced education (master's or doctorate).

3. Promote different instruments to encourage and support the participation and involvement of women in AI research and development areas.

4. Promote incentives and spaces for collaboration and technical support for the development of the entrepreneurial ecosystem in AI, through the creation and/or strengthening of incubators and accelerators of *startups* specialized in AI, and the creation of incentives for investment in R&D in AI.

5. Establish alliances with international institutions and organizations for the development of joint research projects in AI.

6. Promote a strategy that encourages public and private investment in AI research and development in an ethical, responsible and sustainable manner in key impact areas for the country's development, considering in particular the development of digital public goods.

7. Investigate the social, economic and environmental impact of AI and generate instruments for its measurement and approach through various tools, such as protocols, good practice guides and recommendations, as well as expand public knowledge about such impacts and provide support for decision-making.

8. Strengthen the local innovation ecosystem by promoting collaboration between the public sector, universities and companies for the development of AI solutions, fostering an approach aligned with the digital public goods standard for strategic sectors for the country.

Line 3.3 AI and Society

Strengthen existing initiatives and encourage the creation of new measures that enable people to be equipped with digital skills and abilities that are instrumental and fundamental to understanding the concepts involved in the development and use of AI, with critical and creative thinking. It is essential that both risks and opportunities are considered, in synergy with the objectives and actions established in the Digital Citizenship Strategy.[56]

Maximize the benefits of AI for society, addressing the opportunities and challenges for different areas and sectors to take advantage of the positive impacts and mitigating the potential adverse impacts. In this regard, the differentiated challenges and impacts posed by different segments of the population must be considered.

Actions

1. Develop training and awareness plans tailored to different segments of the population, around the identification of opportunities and risks of AI; safe interaction with this technology; the generation of instrumental skills for its use; and the understanding of its impacts from a critical, ethical and social perspective.

2. Design awareness and dissemination campaigns to promote people's knowledge of how to exercise their rights and responsibilities when interacting with AI systems in the digital environment, as well as the mechanisms to demand their protection.

3. Strengthen AI training in the educational community, especially in roles linked to academic and educational management.

[56] https://www.gub.uy/agencia-gobierno-electronico-sociedad-informaciontrabajo/comunicacion/publicaciones/estrategia-nacional-ciudadania-digital-para-sociedad-informacion

4. Consolidate a line of training for trainers by working with different institutions, in all aspects related to systems and/or products that incorporate AI, with a broad inclusive criterion, helping to reduce the existing gaps in the use of this technology.

5. Promote awareness-raising and training actions on cybersecurity and AI, in formal and informal settings.

6. Promote awareness-raising and training actions on the ethical use of AI, in formal and informal settings.

7. Promoteresearch and innovation to harness the potential of AI for sectors such as education and healthcare.

8.Addressing the particular challenges involved in AI with respect to various segments of the population, such as children and adolescents, people with disabilities and older people.

9.Promote initiatives to ensure equitable access to the benefits of AI for people.

Line 3.4 Public management

Apply artificial intelligence in the public sector to improve cross-sector services, integrate solutions that allow automating processes that can benefit from this technology, improve efficiency, promote transparency, and improve the quality of public services, ensuring proper integration with existing systems and continuous training of all those involved.

Actions

1. Develop a diagnosis and a plan for the adoption and use of AI in the public sector, which will allow for the promotion of cross-cutting solutions that benefit from

the application of these technologies, such as citizen service, document management and information searches in the State. In addition, integration with existing systems and staff involvement for effective change management must be considered, as well as the enabling of alternative service channels that ensure access possibilities for all people.

2. Promote the use of AI by the Uruguayan State to take advantage of its current and future benefits in strategic sectors and topics of public interest, such as education, health, work, economy and environment, among others. AI as an instrument that allows predicting trends, managing resources, simplifying processes, monitoring public policies, among others, thus improving the efficiency and effectiveness of public services.

3. Promote that AI solutions and platforms used by the State prioritize the adoption of international standards, open and interoperable specifications that contribute to digital public goods as part of the digital public infrastructure.

4. Design and implement a comprehensive training plan in collaboration with AI experts from different sectors, aimed at people involved in technical, specialized and operational functions in all sectors, and at all levels of decision-making in the State. This plan will include specific actions aimed at those who are part of the legislative body, the justice system and regulatory bodies.

5. Implement a system of indicators and mechanisms to assess the continuous improvement of processes that incorporate AI, as well as to monitor public policy and the evolution of such indicators. Possible indicators could include: AI adoption, operational efficiency, citizen perception and satisfaction with AI-enhanced public services, economic impact, including job creation and new technology companies, quality of public services, innovation

and development, training and education, evaluation of the regulatory framework and its effectiveness in the ethical and safe implementation of AI.

6. Strengthen and promote the Uruguayan State's Artificial Intelligence Community, through the implementation of actions that contribute to knowledge management and the development of institutional capacities.

Line 3.5 Impacts of AI on employment

Having instruments to address the impacts of AI on employment, including monitoring and incentive mechanisms, as well as programs to ensure the employment of all people and promote job creation in emerging sectors.

Actions

1. Conduct studies and projections on how AI will affect different labor sectors to anticipate changes and prepare appropriate responses, including identifying existing gaps in regulation to guarantee the rights of people in the labor field in the face of the development and use of AI.

2. Design instruments to maintain the employment of people and implement training and capacity building programs for those who are or are not in employment.

3. Incorporate the use of AI in processes related to management and advice to those who work and the continuous monitoring of the impact of AI on work.

4. Create work spaces with business chambers and representative groups of workers to identify opportunities and lines of human capital development in different sectors.

5. Encourage training and the creation of job opportunities considering a variety of new jobs that are emerging from AI such as specialization in generative design, AI input and output management, AI content review, specialization in AI security, specialization in AI education, among others.

6. Promote the development and use of AI as an instrument to favour the inclusion of groups traditionally excluded from the labour market, such as people with disabilities.

Process of creating, monitoring and reviewing the Strategy

Co-creation of the Strategy

The review process of the National Artificial Intelligence 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[57], and has the technical cooperation of 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 Readiness Assessment Methodology was applied: a tool of the Recommendation on the Ethics of Artificial Intelligence developed by UNESCO[58]to assess the degree of readiness to apply Artificial Intelligence in an ethical and responsible manner for citizens and the institutional framework was analyzed using. The tool developed by CAF was used to analyze the institutional framework for the governance, implementation and sustainability of Artificial Intelligence policies, as well as a comparative analysis of the state of the art in the matter.

- Stage 2 - Proposals. Seven roundtable discussions and work sessions were held to gather proposals related to possible objectives and actions to be included in the new strategy, as well as discussion groups with children and adolescents.

  The dialogue tables were attended by more than 300 people from more than 40 State institutions, 11 civil society organizations, 45 organizations from the private sector, academia and various

[57] https://www.impo.com.uy/bases/leyes/20212-2023/74
[58] https://unesdoc.unesco.org/ark:/48223/pf0000385198_eng

interest groups, who provided 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 Artificial Intelligence Strategy was prepared.

- Stage 4 - Public consultation. The document was published in public consultation of the September 16 to October 21, 2024through the Digital Citizen Participation Platform[59], thus allowing all people interested in the topic to make their contributions.

  Twenty-eight proposals were received from four national and international civil society organizations, six private sector organizations, one multilateral organization, and six interested individuals. These proposals resulted in 78 contributions, of which 63% were incorporated in whole or in part into the document and others will be incorporated into the Roadmap that will be developed.

- 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 Artificial Intelligence 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.

[59]https://plataformaparticipacionciudadana.gub.uy/processes/consulta-publica-estrategia-ia

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 must make 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 associated potential and challenges, a mid-term review will be carried out.

Participants

The review process of the National Artificial Intelligence 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

State Health Services Administration, National Fuel, Alcohol and Portland Administration, National Telecommunications Administration, Electronic Government and Information and Knowledge Society Agency, Film and Audiovisual Agency of Uruguay, National Research and Innovation Agency, Creative Economy Area of the Ministry of Education and Culture, 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, Photography Center of the Municipality of Montevideo, General Accounting Office of the Nation, General Tax Directorate, General Directorate of Registries, National Customs Directorate, National Cadastre Directorate, National Directorate of Industrial Property, National Telecommunications Directorate, Attorney General's Office of the Nation, Spatial Data Infrastructure, Municipality of Montevideo, Municipality of Canelones, National Institute of Performing Arts, National Institution of Human Rights and Ombudsman, National Institute of Visual Arts, National Institute of Letters, National Institute of of Meteorology, National Institute of Music, Institute of Children and Adolescents of Uruguay, National Institute of Employment and Professional Training, Ministry of Environment, Ministry of Education and Culture, Ministry of Industry, Energy and Mining, Ministry of National Defense, Ministry of Social Development, Ministry of Economy and Finance, Ministry of Livestock, Agriculture and Fisheries, Ministry of Foreign Affairs, Ministry of Public Health, Ministry of Transport and Public Works, Ministry of the Interior, National Office of Civil Service, Office of Planning and Budget, State Water Works, Judicial Branch, Legislative Branch - Chamber of Commerce

Representatives, Legislative Branch - Senate, Public Information Access Unit, Power Plants and Electric Transmissions, Personal Data Regulatory and Control Unit, Electric Services Regulatory Unit.

Academy

Center for educational innovation with digital technologies in Uruguay – Ceibal, Latin American Center for Human Economy, Regional University Center of the East, Catholic University of Uruguay, University of Business, University of the Oriental Republic of Uruguay, University of Montevideo, ORT University of Uruguay, Technological University of Uruguay.

Private sector

Abitab SA, ABYA, Adagio Consultores, Alphalabs, Amazon Web Services (AWS) Bantotal, Deloitte, Digital Sense, Discere, Editorial Planeta, Equipos, Flipando.ai, Fusion IT, Genexus Consulting, Geocom, Google, Goshops.ai, Intermedia, Internet Society, IUGO, IWTG, Knowmad Mood, Mega 6 SA, Microsoft, Penguin Random House, Promptior, Quanam, Sonda, Soul Training Taligent Telefónica Movistar, Wais SRL, Zafrales, Yeda, Latin American Internet Association, Chamber of the Digital Economy of Uruguay, Uruguayan Chamber of Information Technologies, Uruguayan Chamber of Video Game Developers.

Civil Society

Association of Notaries of Uruguay, Association of Librarians of Uruguay, General Association of Authors of Uruguay, Uruguayan Association of Comic Book Creators, Uruguayan Chamber of Design, Art is Ethics Collective, College of Translators of Uruguay Data Uruguay, Dataysoc, Data Management, Directors and Screenwriters of Uruguay, El Abrojo, Audiovisual Producers Rights Management Entity, Bensadoun Laurent Foundation, Commercial Defense League, IT Women, Nahual IT-Argentina, IT People, Uruguayan Society of Artists and Performers, Youth IGF Uruguay.

International organization

Development Bank of Latin America and the Caribbean, Inter-American Development Bank,Center for AI and Digital Policy,United Nations Educational, Scientific and Cultural Organization, Organization of American States.