



Uruguay
Presidencia



National Artificial Intelligence Strategy Uruguay 2024 – 2030

Year: 2024

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Introduction

Artificial intelligence (AI) is becoming more present every day in all spheres of society worldwide 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—both positive and adverse—of AI are not equitably distributed among countries, and often not within them either.

The social, economic, and geopolitical relevance of AI has been heightened by technological progress, which has been particularly dizzying in recent years, resulting in new challenges for all governments. In this scenario, the international community has made various efforts (to which Uruguay has actively contributed) to establish the foundations for global and inclusive AI governance, one that makes it possible to have 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.

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 reached in these global and regional efforts need to be translated by governments into public policies built and implemented jointly and collaboratively with the multiple stakeholders.

¹ The reference to the ethical, safe, responsible, critical, and creative development and use of artificial intelligence underscores, among other relevant aspects, that developments and their use are governed by ethical principles and are people-centered; promote and fully respect the protection of human rights; guarantee privacy; are reliable and explainable; and are oriented toward sustainable development in its various dimensions: economic, social, and cultural. In addition, they are conceived and applied critically and creatively, 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 set out in the Strategy.

This new National Artificial Intelligence Strategy is the cornerstone for the deployment of a public AI policy that encompasses the public sector, the private sector, and all stakeholders, and that fosters the sustainable development of Uruguay in all its dimensions, contributing to inclusive economic growth, the country's environmental sustainability, and the strengthening of its sovereignty.

To this end, this National Strategy establishes the foundations for national AI governance based on a multistakeholder approach, and for ensuring the capabilities that enable its use for the development of the different sectors of the economy and the achievement of a more egalitarian and inclusive society. It builds on the progress the country has made in digital transformation and in the field of research and innovation, while at the same time fostering them.

This Strategy links 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 made by the country since the AI Strategy for Digital Government ³ (2020) and seeks to deepen it by promoting the use of AI to improve public services and the management of public entities.

It lays the foundations for promoting and optimizing the public and private investment that will enable 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 is where a major challenge lies for our country given the size of its economy and of the national budget.

² <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/publicaciones/estrategia-nacional-ciudadania-digital-para-sociedad-informacion>

³ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/publicaciones/estrategia-inteligencia-artificial-para-gobierno-digital/estrategia>

The Strategy does not overlook the risks that AI entails for society, human rights, and democracy. On the contrary, it lays the foundations for them to be addressed adequately and effectively, setting out various lines of action aimed at developing regulatory frameworks and the necessary capabilities, and promoting collaboration among multiple stakeholders.

This instrument was created through a broad participatory process, which gathered contributions from more than 300 people from different disciplines and fields, representatives of 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 precisely been the methodological pillar that has underpinned the creation of the Strategy and will be the key to the success of its implementation, monitoring, and periodic review in order to fulfill the national objectives it sets out.

Background

Since 2019, Uruguay has made progress in the field of Artificial Intelligence (AI), driven by collaboration among the State, academia, civil society, and the private sector. This joint effort has helped position the country in the region in terms of technological innovation and AI adoption, always with a firm commitment to human rights, privacy, and ethics, in alignment with the UNESCO Recommendation on the Ethics of AI ⁴. Below, some of the country context indicators and main milestones are described.

Country context

Indicators

Uruguay has made significant progress in Internet access and use, advancing in connectivity, in access by households and individuals, and in digital government services.

In addition, it has developed initiatives that foster digital inclusion, guaranteeing full coverage of educational establishments, 90% of them with high-speed access.

According to the 2022 Survey on the Use of Information and Communication Technologies (EUTIC) 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 small, whether analyzed by age, gender, or socioeconomic level.

These advances are, to a large extent, related to specific long-term public policies, as can be seen in the successive digital agendas developed since 2008 ⁶.

⁴ https://unesdoc.unesco.org/ark:/48223/pf0000381137_spa

⁵ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/observatorio-sociedad-informacion>

⁶ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/politicas-y-gestion/programas/agenda-digital-del-uruguay>

The current conditions in terms of digital development, connectivity, and business climate have made our country the destination of significant investments and initiatives that reaffirm Uruguay as a hub of technological innovation, such as Microsoft's AI Co-Innovation Lab—Uruguay being the first country in Latin America and the third outside the United States, together with China and Germany, to have such a lab—, the installation of a Datacenter by Google—the second in Latin America besides the one in Chile—, or the arrival of satellite connectivity.

Below, some data related to the country context are summarized:

Digital development

- Internet access in households: 91% of Uruguayan households have Internet access. 72% of households have a fixed broadband connection.
- Internet use among individuals: as mentioned above, 90% of people over 14 are Internet users, and 83% use it daily. Among those under 50, Internet use is universal, that is, it reaches 100% of that 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 Technology (ICT) sector of 169 countries worldwide ⁸.
- Digital Development Compass (DDC for its acronym in English): it is a tool developed by the United Nations Development Programme (UNDP) that measures countries' digital progress, launched in 2023. It uses an extensive database of digital development indicators, organized into several pillars of the

⁷ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/datos-y-estadisticas/estadisticas/encuesta-uso-tecnologias-informacion-comunicacion-2022>

⁸ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/datos-y-estadisticas/estadisticas/indice-desarrollo-digital-ict>

UNDP Digital Transformation Framework. Uruguay stands out in several respects, especially in the following pillars: Connectivity, Government (Uruguay is a leader in the digitalization of public services), People (widespread 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

- Growth of the sector: in 2022, IT sector exports reached US\$1,816 million, equivalent to 65% of its total revenue, with 85% of these exports going mainly to the United States. The sector's business model, centered on software development, accounts for 70% of sector activity and 80% of exports. According to the Uruguayan Chamber of Information Technologies (CUTI), the IT sector is growing faster than the average for the economy and its share of Gross Domestic Product (GDP) has been doubling every 10 years ¹⁰ .
- According to the Global Innovation Index in Intellectual Property 2023, Uruguay shows a moderate presence in high-technology exports, accounting for 0.8% of its total trade (position 75 worldwide). However, the country stands out significantly in the export of ICT services, accounting for 7.9% of its total trade and ranking seventh worldwide in this sector ¹¹ .
- Uruguayan information technology exports 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-rubro-de-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-de-uruguay-2023/>

software exporter per capita in the region, and the fourth in annual revenue from IT exports.

Digital government transformation

- Digital Government Index: Uruguay is ranked position 1 in Latin America, position 2 in the Americas, and position 25 among 193 countries in the 2024 United Nations Digital Government Index. This is a composite index that includes the dimensions of Telecommunications infrastructure, Human capital, Online services, and Citizen participation ¹³.
- GovTech Maturity Index: Uruguay is in the group of Very High development level (Group A) in the index produced 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: supporting core government systems, improving service delivery, integrating citizen participation, and fostering GovTech enablers ¹⁴.

Innovation

- Global Innovation Index (GII): Uruguay is ranked 4th in Latin America and the Caribbean in the 2023 edition of the Global Innovation Index. The Global Innovation Index (GII) is produced by the World Intellectual Property Organization (WIPO) of the United Nations, and measures the innovation performance of 132 countries worldwide, identifying the top 100 science and technology innovation clusters 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-conocimiento/datos-y-estadisticas/estadisticas/indice-desarrollo-del-gobierno-electronico-egdi>

¹⁴ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/datos-y-estadisticas/estadisticas/indice-madurez-govtech-gtmi>

¹⁵ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/datos-y-estadisticas/estadisticas/indice-global-innovacion-igi>

of innovation promotion, reaching \$48 million in 2023.

Artificial Intelligence

- Latin American Artificial Intelligence Index: According to this index, developed 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 shows significant strengths as well as opportunities for improvement that place it 3rd in the region, behind Brazil and Chile. This study looks in depth at the following dimensions: enabling factors, research, development and adoption, and governance ¹⁶.
- The Global Index on Responsible AI: this index, developed by the Global Center on AI Governance (GCG) ranks Uruguay 19th worldwide and 2nd in South America. It includes a set of indicators that make it possible to compare governments' commitments and countries' capacities across three dimensions: Capacities, 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 by non-state actors, such as civil society, business, and academia ¹⁷.

¹⁶ <https://www.cepal.org/es/eventos/lanzamiento-la-segunda-version-indice-latinoamericano-inteligencia-artificial-ilia>

¹⁷ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/datos-y-estadisticas/estadisticas/indice-global-ia-responsable>

Key milestones

2018: National Supercomputing Center (ClusterUY)

In 2018, the National Supercomputing Center (ClusterUY) ¹⁸ began operating, and it has become established 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 way. It has an infrastructure that includes more than 2,240 CPU compute cores and 100,352 GPU compute cores, and it is fundamental to supporting AI research and development projects, providing the infrastructure needed to carry out complex data processing operations and advanced simulations.

2019: Data Science and Machine Learning Roadmap

The National System for Productive Transformation and Competitiveness launched the Data Science and Machine Learning Roadmap ¹⁹, presenting a set of initiatives in strategic sectors. It was coordinated by the Ministry of Industry, Energy, and Mining (MIEM) together with the Transforma Uruguay Secretariat. 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, and the National Agency for Research and Innovation (ANII), among others.

2020: AI Strategy for Digital Government

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

¹⁸ <https://www.cluster.uy/>

¹⁹ <https://www.gub.uy/ministerio-industria-energia-mineria/sites/ministerio-industria-energia-mineria/files/documentos/publicaciones/6112019%2BHoja%2Bde%2BRuta%2BCD%2BAAB.pdf>

²⁰ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/publicaciones/estrategia-inteligencia-artificial-para-gobierno-digital/estrategia>

on evidence and to 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 it incorporated the principles of personal data protection. Its general objective was grounded in four pillars: AI governance in public administration, capacity development 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 ²¹ (CICADA) was launched. 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 include projects developed around genomics and bioinformatics, medical image processing, epidemiological analyses, work in ecology and environmental sciences, research in neuroscience and education, and projects involving natural language processing, promoting interdisciplinary research and international collaboration and currently focusing on the challenges and opportunities of AI in Uruguay.

2022: Computational Thinking and Artificial Intelligence, innovation and support for startups, and amendment of the Personal Data Protection Law

In 2022, Ceibal's Computational Thinking program, which since 2017 has been offered to groups in the 4th, 5th, and 6th grades of public primary school, incorporated into the curriculum artificial intelligence projects that make it possible 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, reaches 74% of 4th-, 5th-, and 6th-grade students in primary

²¹ <https://www.fing.edu.uy/es/node/41277>

²² Interdisciplinary Center for Data Science and Machine Learning (cicada.uy)

public education. 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 ²³ was launched, a program driven 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). The program aims to strengthen the innovation and entrepreneurship ecosystem in Uruguay and to 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), supported more than 70 Uruguayan startups, helping them develop and scale innovative AI-based solutions.

That same year, through Article 63 of Law No. 20.075 of October 20, 2022 ²⁵, Article 34 of the Personal Data Protection Law, Law No. 18.331 of August 11, 2008, was amended, and the Personal Data Regulatory and Control Unit (URDCP) was granted the power to: “I) Establish the criteria and procedures that controllers and processors must observe in the automated processing of personal data referred to in Article 16” of the cited 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 ²⁶ was adopted at the Latin American Artificial Intelligence Meeting (Khipu), which underscores the importance of using AI in a responsible and ethical manner. Its principles include the use of AI to improve quality of life while respecting human rights, the representation of cultural and geographic diversity, the

²³ <https://uih.uy/>

²⁴ <https://www.gub.uy/ministerio-industria-energia-mineria/comunicacion/noticias/microsoft-ai-co-innovation-lab-celebro-ano-se-situa-exitosos-empresa-mundo>

²⁵ <https://www.impo.com.uy/bases/leyes/20075-2022/63>

²⁶ <https://zenodo.org/records/8208793>

minimization of environmental and social impact, and the improvement of working conditions. In addition, it emphasizes the need to strengthen sovereignty and regulation in Latin American countries to ensure inclusive and sustainable technological development, with a regional approach.

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

In a complementary way, 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 are a central element in the development of AI systems.

In addition, the following goal was incorporated into the Uruguay Digital Agenda 2025, in its 2023 version ²⁹: “to establish the institutional and governance framework defined in the participatory process for developing the National Artificial Intelligence Strategy and the National Data Strategy, for the implementation and sustainability of the pillars and objectives developed in them, 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-conocimiento/politicas-y-gestion/proceso-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%ABlico%20y%20privado.>

²⁹ <https://www.gub.uy/uruguay-digital/comunicacion/publicaciones/agenda-uruguay-digital-2025-actualizacion-medio-termino>

2024: Recommendations on the regulatory framework, AI Observatory in the State, 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 a regulation of Artificial Intelligence (AI) oriented to ethical development, the protection of human rights, and the promotion of technological innovation” ³¹ .

The report was prepared with the collaboration of various public entities and drew on contributions from leading figures in academia and civil society. It made recommendations on three central aspects: institutional framework and governance of AI; ethics, human rights, and democracy; and responsible innovation.

In addition, the Observatory of Artificial Intelligence in the State ³² was launched, a commitment undertaken 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 incorporated input from various actors in 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.

As of 2024, Uruguay has academic programs and specializations in the field of AI aimed at training highly skilled professionals to face the challenges and take advantage of the opportunities that this discipline offers. These programs include the Bachelor's Degree in Data Engineering and Artificial Intelligence at the Technological University of Uruguay (UTEC), the Engineering in Artificial Intelligence and Data Science at the Catholic University of Uruguay (UCU), the Specialization Diploma in Artificial Intelligence at ORT Uruguay University, Data Engineering and Artificial Intelligence at the University of Montevideo (UM), the Diploma in Applied Artificial Intelligence at the

³⁰ <https://www.impo.com.uy/bases/leyes/20212-2023/74>

³¹ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/noticias/recomendaciones-para-regulacion-inteligencia-artificial>

³² <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/observatorio-inteligencia-artificial>

³³ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/node/6200>

University of the Enterprise (UDE), and the Master's in Applied Data Science at the University of the Republic (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 shown a firm commitment to applying ethical principles and protecting human rights in their entirety in the development and implementation of AI.

In 2023 the country adhered to the UNESCO Recommendation on the Ethics of AI³⁴ and applied the Readiness Assessment Methodology (RAM) for the effective implementation of the Recommendation, whose final report was published in October 2024³⁵. It also joined as an observer member the Committee on Artificial Intelligence of the Council of Europe, the intergovernmental body in which the Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law³⁶ was drafted, which represents the first binding treaty on the subject and which was opened for signature on September 5, 2024.

In 2024 Uruguay adhered to the Recommendation of the Council on Artificial Intelligence of the Organisation for Economic Co-operation and Development (OECD)³⁷. On March 21 of that same year it became one of more than 120 countries to join, within the United Nations, in supporting the adoption of the landmark General Assembly resolution entitled "Seizing the opportunities of safe, secure and trustworthy artificial intelligence systems for sustainable development" (A/RES/78/265)³⁸.

³⁴ https://unesdoc.unesco.org/ark:/48223/pf0000381137_spa

³⁵ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/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](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 coordination 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. In 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 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 gave rise to the new Regional Digital Agenda 2026, approved in November 2024 in Santiago, Chile.

In the same year Uruguay hosted and co-organized the Second Ministerial and High-Level Authorities Summit on the Ethics of AI in Latin America and the Caribbean, where the Montevideo Declaration ⁴⁰ and the Ethical Artificial Intelligence Roadmap for Latin America and the Caribbean 2024 – 2025 ⁴¹ were approved, continuing the process begun at the First Summit, which took place in 2023 in Santiago, Chile.

At that 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 approach and coordination of the actions needed to implement the approved Roadmap. Within the framework of the Summit, Uruguay assumed leadership of the Working Group, committing to guide its work to advance the implementation of the 2024 -2025 Roadmap. The group has CAF and UNESCO as its technical secretariat.

³⁹ https://elac.cepal.org/docs/TdR%20Grupo%20de%20IA%2007_23.pdf

⁴⁰ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/noticias/aprobacion-declaracion-montevideo>

⁴¹ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/noticias/aprobacion-declaracion-montevideo>

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

Impact and future

The efforts made to date are having a promising impact in various strategic sectors. In health, AI is used to improve the diagnosis and treatment of diseases, 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 among the State, academia, civil society, and the private sector will be crucial to meet future challenges and take advantage of the opportunities that AI offers, always with an ethical approach that respects human rights.

Having a new nationwide AI Strategy, coordinated 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 strengthening Uruguay's regional leadership and the country's participation in the various efforts toward global AI governance. The Strategy also becomes an important instrument for advancing the implementation of the commitments undertaken within the framework of the Global Digital Compact, approved by resolution of the United Nations General Assembly on September 22, 2024 at the Summit of the Future.

Objectives of the Strategy

General objective

To leverage artificial intelligence (AI) as an instrument for Uruguay's sustainable development and inclusive growth, promoting its ethical, responsible, safe, critical, creative, and pro-innovation development and use, for the benefit of people's well-being and of 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 an adequate institutional framework, clear regulatory frameworks, and efficient processes that promote transparency, security, inclusion, and legal certainty in the field of AI.
2. Capacities: develop the national capacities and conditions necessary to foster and leverage innovation and the application of AI, with a comprehensive approach that addresses infrastructure, data, talent management, and skills.
3. Sustainable development: leverage AI as a key driver for economic growth with inclusion, the sustainable development of the country, the strengthening of private-sector competitiveness, the deepening of Uruguay's digital transformation process, the improvement of public management and services, and the boosting of research and innovation. Maximize the benefits of this technology for society, considering positive impacts and mitigating possible adverse impacts, developing the capacities for the critical integration of AI into society.

Guiding principles

Purpose and scope

This section sets out the guiding principles on which Uruguay's National Artificial Intelligence Strategy is founded, in accordance with Article 74 of Law No. 20.212 of November 6, 2023 ⁴².

These principles must govern AI governance in order 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 must be applied according to the context and the different roles, obligations, and responsibilities that fall to their various actors in accordance with the legal system. They do not create any new legal obligation beyond those that derive from the legal system, but rather specify the minimum measures and practices that make their implementation possible.

They link Uruguay's National AI Strategy with the various instruments that make up the country's digital policy, including the Agenda Uruguay Digital 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, which was developed simultaneously with this one. They are based on the UNESCO Recommendation on the Ethics of Artificial Intelligence ⁴⁴, and the OECD Council Recommendation on Artificial Intelligence ⁴⁵, both of which Uruguay has adhered to.

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 drafted by the Committee on Artificial

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-informacion-conocimiento/comunicacion/publicaciones/estrategia-nacional-ciudadania-digital-para-sociedad-informacion>

⁴⁴ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/noticias/uruguay-adhiere-recomendacion-etica-inteligencia-artificial-unesco>

⁴⁵ [https://one.oecd.org/document/C/MIN\(2019\)3/FINAL/en/pdf](https://one.oecd.org/document/C/MIN(2019)3/FINAL/en/pdf)

Intelligence of the intergovernmental organization in which Uruguay participates as an observer.

Likewise, the guiding principles contribute to the national implementation of the United Nations General Assembly Resolution of March 21, 2024, “Seizing the opportunities of safe, secure and trustworthy 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 them as their foundation, without prejudice to the interrelation and complementarity of the principles and to the fact 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 are reproduced below ⁴⁷ :

AI actors: AI actors are those who play an active role in the AI system lifecycle, such as the entities and individuals that deploy and operate AI.

AI system lifecycle: the lifecycle of an AI system generally 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; operation and monitoring; and retirement/decommissioning. These phases often take place iteratively and are not necessarily sequential. The decision to stop operating an AI system may occur at any time during the operation and monitoring phase.

AI system: an AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that 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](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 capacity for adaptation.

Principles

1. AI for people's well-being and sustainable development

People's well-being must be placed at the center of the decisions, processes, and applications related to artificial intelligence.

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

Harnessing AI as an instrument for achieving these goals requires public policies, joint effort and collaboration among the public sector, the private sector, and stakeholders, and continuous assessment of the social, economic, and environmental repercussions 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 incorporating AI can bring to the functioning of democracy and addressing the challenges that require attention.

Such a purpose requires, on the one hand, identifying and making use of the possibilities that AI offers to strengthen the pillars of democratic functioning, such as public transparency and accountability, citizen participation, and access to information, as well as to improve the efficiency of public administration by incorporating it into the processes that stand to benefit from AI.

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

electoral processes. The foregoing demands addressing the repercussions of AI on disinformation in a manner consistent with freedom of expression and other rights, while also seeking to harness AI to combat this phenomenon.

This approach must be carried out under a comprehensive approach that involves the multiple stakeholders and includes measures to strengthen digital and information literacy in all segments of the population, measures for legal regulation and co-regulation, and, where relevant, support for self-regulation measures that are adopted proactively in the areas where such measures may be appropriate and/or complementary to the others, in accordance with international standards.

With regard to AI-generated content, this comprehensive approach must ensure that people are informed when they interact with an AI system and understand when content has been generated or manipulated by AI.

From a broad perspective, it means considering the impact of AI on disinformation in the frameworks developed for platform governance; strengthening people's instrumental and fundamental digital skills so that they can interact critically in the digital environment and understand how algorithms work and how AI is used in content moderation and curation; as well as ensuring the transparency and accountability of the frameworks and processes on which these rest.

The integration of AI into society must be done in a way that strengthens, rather than weakens, the fundamental principles of the rule of law and democracy. By guaranteeing transparency, responsibility, the integrity of information, and respect for freedom of expression, AI actors can contribute to a safer and more trustworthy information ecosystem. The fight against disinformation is an ongoing challenge that requires the collaboration of governments, technology companies, civil organizations, and citizens at large.

3. Respect for human dignity and human rights

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

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

This means, first, refraining from using AI systems in a way that may violate people's rights. Likewise, and by virtue of the State's position as guarantor, it implies a duty of public bodies to maintain or adopt, within the scope of their competencies, 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 lifecycle.

These measures must include frameworks and procedures that make it possible to identify, assess, prevent, and mitigate, as appropriate ex ante or iteratively during the lifecycle of AI systems, adverse impacts on human rights, according to the risk and intended use involved. Such frameworks must 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. Likewise, such measures must ensure that human rights violations resulting from the activity of the public and private sectors involved in the lifecycle of AI systems can be duly redressed by ensuring the availability of mechanisms and remedies for that purpose.

For public bodies, implementing this principle entails the specific duty to maintain or adopt measures to ensure that the AI-based technological solutions they develop, acquire, or use in the exercise of their duties respect human dignity and people's rights.

In implementing this principle, the conduct of private sector actors must be framed within the responsibility of private entities to respect human rights ⁴⁸ and the obligation to comply with the national and international norms that protect those 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, this duty entails: i) refraining from infringing human rights; ii) having a human rights due diligence process in place to identify, prevent, mitigate, and account for how they address their impact on such rights, which must be defined according to the severity of the risks and impacts involved for human rights; iii) and mechanisms to remedy the violations in which they have been involved.

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 fundamental role in preventing the applications of AI systems from having negative effects on people's rights. For the sake of an ethical use of AI that respects human rights, AI actors must ensure that, when AI systems are used to make decisions or to support decision-making, there is always human oversight of the results produced by AI, and it is relevant to consider the characteristics that such oversight must have, primarily in high-risk systems. It will be a challenge to establish controls over data and systems, but as with the 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 In accordance with the Guiding Principles on Business and Human Rights adopted by the United Nations Human Rights Council in 2011, "the responsibility to respect human rights is a global standard of expected conduct for all business enterprises wherever they operate. It exists independently of States' abilities and/or willingness to fulfill their own human rights obligations, and does not diminish those obligations. And it exists over and above compliance with national laws and regulations protecting human rights"

⁴⁹ https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinessshr_sp.pdf

Another aspect of AI governance that particularly needs to be addressed under this guiding principle is the development and use of artificial intelligence in the field of neurotechnology. In this regard, maximizing the present and future opportunities that neurotechnology holds for humanity requires addressing the human rights challenges arising from the convergence, use, and development of AI in this area, as set out by the Advisory Committee of experts of the Human Rights Council on this matter ⁵⁰ .

Applying the human rights approach to AI governance also requires maximizing the opportunities for positive impact and addressing the differentiated risks involved for groups in situations of greater vulnerability.

4. Fairness 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, during all phases of the systems' lifecycle, the specific needs and differentiated impacts on groups in vulnerable situations, including those whose situation may be heightened by the inherent characteristics of AI systems and their application in specific areas, such as children and adolescents, older persons, and persons with disabilities, among others.

Likewise, implementing this principle highlights the importance of adopting proactive measures to address the repercussions of AI in relation to gender equality and other structural inequalities. Such measures must 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 actors must work collaboratively to reduce the possibility of unintended biases in the data and models used that may negatively impact people, adopting measures that promote the quality of training data, and to that end the diversity and interdisciplinarity of the teams involved in the design, development, and monitoring of these systems is important. To the same end, the public sector must encourage the development of AI models that use quality data, adopting measures that facilitate the openness of and access to public data that help overcome the structural underrepresentation of various groups in society.

This principle covers both discrimination based on algorithmic bias and that 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 must ensure, within the scope of their competencies, that they promote equitable access for all people to the benefits of AI technologies, addressing the digital divides in order to enable the achievement of that objective. Likewise, the efforts undertaken by the private sector, civil society organizations, and academia are important for achieving that objective and should be encouraged.

5. Protection and privacy of personal data

The protection of and respect for the privacy of personal data must be ensured by design and in all phases of the lifecycle of AI systems.

To that end, AI actors –in the public or private sphere– must guarantee that the data they collect and use comply with the regulations in force on personal data protection and privacy, and with the guidelines of the Personal Data Regulatory and Control Unit (URCDP). This ranges from compliance with formal obligations such as the registration of databases or the notification of security breaches, to proactive accountability measures such as the implementation of impact assessments for the protection of

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

The cross-cutting nature of data protection principles helps generate certainty in the use of personal information and of AI systems in particular, which is complemented by a set of rights that help bring 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, form part of 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 the aforementioned Law No. 18.331, are: legality, veracity, purpose, prior informed consent, data security, confidentiality, and –proactive– accountability.

6. Transparency and explainability

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

This entails providing meaningful information appropriate to the context and the specific situation, balanced against the protection of other rights that may be involved. The information disclosed must make it possible for the results to be intelligible and must be appropriate to enable people to challenge them when they are affected.

To that end, they must ensure that people are informed about the use made of AI and adopt measures that make it possible to identify 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, implementing this principle further entails that public entities that use AI, whether in delivering public services or in supporting decision-making, guarantee access to the corresponding public information, in accordance with Law No. 18.381 of October 2008 ⁵³ and its implementing 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 for ensuring 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 the guiding principles.

According to their roles, the context, and the state of the technology, they must establish those responsible and the mechanisms to ensure that the systems are auditable and that the datasets they use are 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 overseen.

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 rules, where applicable.

8. Reliability and security

AI systems must be reliable, secure, and resilient, so that they are able to recover in the event of failures or attacks and produce 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 that they comply with the principles of information security by design.

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

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

9. Responsible and secure innovation

These principles should be implemented on the basis of the importance of research and innovation as key factors for the sustainable development of the country in its different dimensions.

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

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

10. Multiple stakeholders

AI governance must be based on the multistakeholder approach.

This means that it must move forward 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 provides spaces and mechanisms to make this possible.

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

Thematic axes

Axis 1. Governance

Establish a governance framework aimed at ensuring the ethical, responsible, and secure 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 institutional structure, the organization, the regulatory frameworks, and the processes necessary to achieve the objective, as well as strengthen collaboration and coordination with stakeholders, to ensure an effective and coordinated implementation.

Line 1.1 Institutional framework

Establish an institutional and organizational design consistent with the objectives of the Strategy, which incorporates processes and instruments for its implementation, follow-up, monitoring, and updating, ensuring the coordinated integration of multiple stakeholders.

Actions

1. Define and establish the national governance model and the institutional design suitable for the implementation of the National AI Strategy, which ensures comprehensive and sectoral approaches that guarantee its sustainability and continuous improvement; permanent coordination and participation mechanisms to integrate the approaches of multiple actors and sectors; and follow-up, monitoring, and accountability mechanisms.
2. Incorporate and/or adapt the competencies of public agencies in relation to their core mandates, in order to strengthen supervision and enforcement, and the availability of adequate and effective complaint mechanisms.

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

Line 1.2 Regulatory frameworks

Develop and adopt the necessary regulatory frameworks based on a risk-based approach and others that may be determined, to promote the ethical, responsible, and secure development and use of AI systems, in accordance with the principles set out in this Strategy.

These frameworks must promote and guarantee 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 the initial analysis to implementation and enforcement, 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 may be determined, regulatory, co-regulatory, and self-regulatory instruments—binding or not—where appropriate, adapting the 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 to us as a society because of their impact on the rights of

⁵⁴ Artificial Intelligence Observatory | Agency for E-Government and the Information and Knowledge Society

individuals, evaluating the prohibitions or moratoriums that may be appropriate.

2. Prepare a diagnosis that identifies the existing gaps at the regulatory level in order to address the challenges involved in AI in relation to the intellectual property regime and civil liability, and establish frameworks supported by national consensus on the basis of a multistakeholder approach that takes into account the different interests and balances needed.
3. Address the impacts of the use of AI for public security purposes, seeking a balance between, on the one hand, innovation in public security and, on the other, civil and political rights and their guarantees.
4. Create specific sectoral regulatory frameworks through multistakeholder spaces on topics such as health, education, insurance and finance, security and privacy, creative industries, the environment, and neurotechnologies, among others.
5. Generate frameworks that guarantee the availability of instruments to identify, assess, prevent, and mitigate risks and to 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, consistently 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 secure use of this technology, and provides for the adjustments to the regulatory framework that may be pertinent.
8. Generate frameworks for transparency and accountability regarding the development and use of AI, establishing requirements appropriate to the

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

9. Develop the frameworks necessary to implement audit models for cases where this is established in regulation, and/or that make it possible to oversee the adoption of standards and guarantee quality in AI systems, in both the public and private sectors.

10. Adapt the cybersecurity framework in force in the country to integrate the 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. Encourage 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 line with the provisions of Article 75 of Law No. 20.212 of November 6, 2023 ⁵⁵, encourage the institutionalization of regulatory experimentation initiatives, which create spaces to test innovative products, services, or business models in order to produce evidence that informs regulatory decision-making and/or guides regulated entities on the applicable regulations. These tools will include regulatory sandboxes and innovation hubs.

Line 1.3 International coordination

Strengthen Uruguay's participation in the international forums and bodies where issues related to artificial intelligence are addressed, drive the development of a regional perspective, and contribute to international cooperation in this area.

Likewise, move forward in adopting international standards and instruments that are aligned with national policy, thereby promoting the

⁵⁵ <https://www.impo.com.uy/bases/leyes/20212-2023/75>

global positioning of Uruguay as a key player for attracting investment.

Actions

1. Strengthen Uruguay's participation in subregional, regional, and international forums on AI, fostering inter-institutional coordination and the specialized training of the national representatives who take part in these forums.
2. Promote technical cooperation actions with multilateral organizations, bilateral exchange and 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. Encourage the participation of private sector actors, academia, and civil society in the international forums where technical standards for AI governance are defined.

Axis 2. AI capabilities

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

Addressing this objective requires a comprehensive approach that covers human talent management and the promotion of digital skills. It is also essential to guarantee adequate infrastructure, ensure data protection—while promoting the secure exchange and sharing of data—,

and strengthen cybersecurity. These elements are fundamental to building a robust ecosystem that drives AI as a key tool for the sustainable and competitive development of the country and for the well-being of people.

Line 2.1 Infrastructure

Secure the infrastructure available in the country to strengthen the development and use of AI, fostering 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 to support 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 good practices, and that is accessible to all State agencies. This infrastructure will make it possible to 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 among the public sector, the private sector, academia, and civil society. This cross-sector coordination will make it possible to maximize the potential of AI in the country, driving 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 to facilitate access for the AI ecosystem in Uruguay to high-performance computing centers and networks.

5. Align the AI Strategy with national environmental strategies and policies, and participate in the studies on environmental risks from 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 democratizing access to public data. This includes improving the quality of the available data, establishing guidelines to reduce biases, and optimizing the AI applications developed or used, as established in the National Data Strategy.

Likewise, and in line with the provisions of the National Data Strategy, generate incentives for the secure and reliable exchange and sharing of data among 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 datasets for training models that take into account the characteristics of Uruguay, such as its culture, its political and institutional 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 fostering the creation and use of open data platforms that enable 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 datasets under conditions that respect privacy and people's rights, ensuring compliance with ethical regulations and standards.

Line 2.3 Cybersecurity

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

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

Actions

1. Establish specialized cybersecurity forums for AI (together with academia, the private sector, and the public sector) that, 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 address 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 AI systems that are reliable, secure, and resilient to attacks, with the participation of academia, the private sector, and the public sector. On that basis, develop and offer AI-focused training programs for professionals in critical sectors.

Line 2.4 Talent management

Strengthen the capabilities required in the country to develop, take advantage of, and optimize the use of artificial intelligence, while also enhancing policies that promote people's adaptation and job retention in a constantly evolving environment.

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

Actions

1. Survey and understand AI training needs in Uruguay and the impact of this technology on the labor market, laying the foundations for continuous monitoring.
2. Promote the incorporation of AI education into formal and non- formal education in Uruguay at the different educational levels and starting from early childhood education, favoring the incorporation of the skills and competencies needed for work and for the development of industry.
3. Generate instruments and incentives to strengthen the capacity of universities to generate and retain AI talent from disciplines associated with science, technology, engineering, mathematics, and the humanities (among others), including research, innovation, and development.
4. Continue to encourage, through various initiatives, the enrollment of women in technology programs (Science, Technology, Engineering, and Mathematics areas, STEM – the English acronym –) to strengthen their participation in the AI ecosystem.

5. Include in all training proposals and plans intended for job training content on the impact of technologies on work, with special emphasis on artificial intelligence. This will strengthen job retraining processes and contribute to the continuous updating of people's skills for the workplace.
6. Design and implement a comprehensive training plan aimed at all the State personnel involved, at all levels.

Axis 3. Sustainable development

Harness AI as a key driver for the country's sustainable development, economic growth with inclusion, the strengthening of private sector competitiveness, and the deepening of 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, further enhancing the benefit it brings to society in the different areas and sectors, addressing positive and adverse impacts, and taking into account the differentiated effects on the different segments of the population.

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

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

Line 3.1 Sectors of the national economy

Maximize the benefits of AI across the different sectors of the national economy in order to improve their competitiveness and encourage the 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 operating processes in ways that help strengthen its competitiveness, through different instruments (incentives, programs, training plans, support in validating proposals), with a special focus on Small and Medium-Sized Enterprises (SMEs).
2. Promote private investment in AI that helps drive 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 to the benefit of society as a whole.

Line 3.2 Research and innovation

Strengthen, through different instruments, support for research on artificial intelligence and on AI ethics, and encourage safe and responsible innovation.

Actions

1. Encourage the creation of multidisciplinary centers dedicated to AI research that offer solutions to specific problems, with mechanisms that foster collaboration among 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 networks of researchers that involve entrepreneurs, and the promotion of academic exchanges for advanced education (master's or doctoral degrees).
3. Encourage different instruments to drive and support the participation and involvement of women in research and development areas of AI.
4. Promote incentives and spaces for collaboration and technical support for the development of the AI entrepreneurial ecosystem, through the creation and/or strengthening of incubators and accelerators of AI-specialized startups, and the creation of incentives for investment in AI R&D.
5. Establish partnerships with international institutions and organizations for the development of joint AI research projects.
6. Drive a strategy that encourages public and private investment in AI research and development in an ethical, responsible, and sustainable way in areas of key impact for the country's development, considering in particular the development of digital public goods.
7. Research the social, economic, and environmental impact of AI and develop instruments for measuring and addressing it through diverse 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 among the public sector, universities, and companies for the development of AI solutions, encouraging an approach aligned with the digital public goods standard for sectors that are strategic for the country.

Line 3.3 AI and society

Strengthen existing initiatives and encourage the creation of new measures that equip people with the instrumental and fundamental digital competencies and skills needed to understand the concepts involved in the development and use of AI, with critical and creative thinking. To this end, it is essential to consider both the risks and the opportunities, in synergy with the objectives and actions set out in the Digital Citizenship Strategy.⁵⁶

Maximize the benefits of AI for society, addressing the opportunities and challenges for different areas and sectors in order to take advantage of the positive impacts while mitigating possible adverse impacts. In this regard, the differentiated challenges and impacts posed for different segments of the population must be taken into account.

Actions

1. Develop training and awareness-raising plans adapted to the different segments of the population, concerning the identification of the opportunities and risks of AI; safe interaction with this technology; the building of instrumental skills to take advantage of it; and an understanding of its impacts from a critical, ethical, and social perspective.
2. Design awareness-raising and outreach campaigns to promote that people know how to exercise their rights and responsibilities when they interact with AI systems in the digital environment, as well as the mechanisms for demanding their protection.
3. Strengthen AI training in the educational community, especially in the roles linked to academic and educational management.

⁵⁶ <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/comunicacion/publicaciones/estrategia-nacional-ciudadania-digital-para-sociedad-informacion>

4. Consolidate a train-the-trainers line of training, coordinating with different institutions, on all aspects linked to systems and/or products that incorporate AI, with a broadly inclusive approach, helping to reduce the existing gaps in the use of this technology.
5. Drive awareness-raising and training actions on cybersecurity and AI, in formal and non-formal settings.
6. Drive awareness-raising and training actions on the ethical use of AI, in formal and non-formal settings.
7. Promote research and innovation in order to take advantage of the potential of AI for sectors such as education and health care.
8. Address the particular challenges involved in AI with respect to various segments of the population, such as children and adolescents, persons with disabilities, and older persons.
9. Promote initiatives to guarantee equitable access to the benefits of AI for people.

Line 3.4 Public management

Apply artificial intelligence in the public sector to improve cross-cutting services, integrate solutions that make it possible to automate the 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 the ongoing training of everyone involved.

Actions

1. Prepare a diagnosis and a plan for the adoption and use of AI in the public sector, making it possible to leverage cross-cutting solutions that benefit from

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

2. Leverage the use of AI by the Uruguayan State to take advantage of its current and future benefits in strategic sectors and in topics of public interest, such as education, health, labor, the economy, and the environment, among others. AI as an instrument that makes it possible to predict trends, manage resources, simplify processes, and monitor public policies, among other things, thereby improving the efficiency and effectiveness of public services.
3. Promote that the AI solutions and platforms used by the State prioritize the adoption of international standards and of open, interoperable specifications that contribute to digital public goods as part of 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 decision-making levels of the State. This plan will include specific actions aimed at those who make up the legislative body, the justice system, and regulatory bodies.
5. Implement a system of indicators and mechanisms to evaluate the continuous improvement of the processes that incorporate AI, as well as to monitor public policy and the evolution of those indicators. Possible indicators could include: AI adoption, operational efficiency, citizens' perception of and satisfaction with public services improved by AI, economic impact, including the creation of jobs 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 drive the Artificial Intelligence Community of the Uruguayan State, through the implementation of actions that contribute to knowledge management and the development of institutional capacities.

Line 3.5 Impacts of AI on employment

Have instruments in place to address the impacts of AI on employment, including monitoring mechanisms and incentives, as well as programs to ensure the continued employability of all people, and encourage the creation of jobs in emerging sectors.

Actions

1. Carry out studies and projections on how AI will affect different labor sectors in order to anticipate changes and prepare appropriate responses, including the identification of existing gaps in regulation to guarantee people's rights in the workplace in the face of the development and use of AI.
2. Design instruments to keep people employable and implement training and skills programs for those who are or are not currently working.
3. Incorporate the use of AI in the processes linked to the management of and advice to workers, and the continuous monitoring of the impact of AI on work.
4. Create working spaces with business chambers and groups representing workers to identify opportunities and lines of human capital development in different sectors.

5. Encourage training and the creation of job opportunities considering the variety of new jobs that are emerging from AI, such as specialization in generative design, management of AI inputs and outputs, 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 foster the inclusion of groups traditionally excluded from the labor market, such as persons with disabilities.

Process of creation, monitoring, and review of the Strategy

Co-creation of the Strategy

The review process of the National Artificial Intelligence Strategy was led and coordinated by Agesic in coordination with the Public Sector Strategic Committee 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 began in June 2023 and was carried out 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 way 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 on the subject.
- Stage 2 - Proposals. 7 dialogue and working roundtables were held to gather proposals related to the possible objectives and actions to be integrated into the new strategy, along with discussion groups with children and adolescents.

The dialogue roundtables involved the participation of more than 300 people representing more than 40 State institutions, 11 civil society organizations, 45 private sector organizations, academia, and various

⁵⁷ <https://www.impo.com.uy/bases/leyes/20212-2023/74>

⁵⁸ https://unesdoc.unesco.org/ark:/48223/pf0000385198_spa

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 examined in greater depth, a feasibility analysis was carried out together 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 for public consultation from September 16 to October 21, 2024 through the Digital Citizen Participation Platform ⁵⁹, thus allowing everyone interested in the topic to make their contributions.

28 proposals were received from 4 national and international civil society organizations, 6 private sector organizations, 1 multilateral organization, and 6 interested individuals acting in a personal capacity. These proposals translated into 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 prepared.

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

Monitoring of implementation

The process of implementing and monitoring the National Artificial Intelligence Strategy seeks to ensure compliance with the objectives set out in this instrument, as well as transparency and accountability for its execution.

To ensure proper implementation of the Strategy, a Roadmap will be prepared that will establish timeframes, responsible institutions, specific goals, and monitoring indicators.

⁵⁹ <https://plataformaparticipacionciudadana.gub.uy/processes/consulta-publica-estrategia-ia>

The strategic objective of the follow-up and monitoring process is to establish a framework that makes it possible to measure progress and identify areas for improvement, 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 of the institutions will be responsible for carrying out the actions provided for in the Roadmap and will be in charge of the leadership, execution, and accountability in relation to the implementation of those actions, and must submit periodic reports.

The results achieved will be regularly disseminated to all stakeholders .

Period of validity

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

Participants

The review process of the National Artificial Intelligence Strategy involved the participation of organizations represented in the dialogue spaces developed in the different stages of the process.

The participating organizations are listed below.

State bodies

Administración de Servicios de Salud del Estado, Administración Nacional de Combustibles, Alcohol y Portland, Administración Nacional de Telecomunicaciones, Agencia de Gobierno Electrónico y Sociedad de la Información y del Conocimiento, Agencia del Cine y el Audiovisual del Uruguay, Agencia Nacional de Investigación e Innovación, Área de Economía Creativa del Ministerio de Educación y Cultura, Archivo General de la Nación, Banco Central del Uruguay, Banco Hipotecario del Uruguay, Banco de Previsión Social, Banco de la República Oriental del Uruguay, Banco de Seguros del Estado, Centro de Fotografía de la Intendencia de Montevideo, Contaduría General de la Nación, Dirección General Impositiva, Dirección General de Registros, Dirección Nacional de Aduanas, Dirección Nacional de Catastro, Dirección Nacional de la Propiedad Industrial, Dirección Nacional de Telecomunicaciones, Fiscalía General de la Nación, Infraestructura de Datos Espaciales, Intendencia de Montevideo, Intendencia de Canelones, Instituto Nacional de Artes Escénicas, Institución Nacional de Derechos Humanos y Defensoría del Pueblo, Instituto Nacional de Artes Visuales, Instituto Nacional de Letras, Instituto Nacional de Meteorología, Instituto Nacional de Música, Instituto del Niño y Adolescente del Uruguay, Instituto Nacional de Empleo y Formación Profesional, Ministerio de Ambiente, Ministerio de Educación y Cultura, Ministerio de Industria, Energía y Minería, Ministerio de Defensa Nacional, Ministerio de Desarrollo Social, Ministerio de Economía y Finanzas, Ministerio de Ganadería, Agricultura y Pesca, Ministerio de Relaciones Exteriores, Ministerio de Salud Pública, Ministerio de Transporte y Obras Públicas, Ministerio del Interior, Oficina Nacional del Servicio Civil, Oficina de Planeamiento y Presupuesto, Obras Sanitarias del Estado, Judicial Branch, Legislative Branch - Chamber of

Representatives, Legislative Branch - Chamber of Senators, Unidad de Acceso a la Información Pública, Usinas y Transmisiones Eléctricas, Unidad Reguladora y de Control de Datos Personales, Unidad Reguladora de Servicios Eléctricos.

Academia

Centro de innovación educativa con tecnologías digitales de Uruguay - Ceibal, Centro Latinoamericano de Economía Humana, Centro Universitario Regional del Este, Universidad Católica del Uruguay, Universidad de la Empresa, Universidad de la República Oriental del Uruguay, Universidad de Montevideo, Universidad ORT Uruguay, Universidad Tecnológica del Uruguay.

Private sector

Abitab S.A., 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 S.A., Microsoft, Penguin Random House, Promptior, Quanam, Sonda, Soul Training Taligent Telefónica Movistar, Wais SRL, Zafrales, Yeda, Asociación Latinoamericana de Internet, Cámara de la Economía Digital del Uruguay, Cámara Uruguaya de Tecnologías de la Información, Cámara Uruguaya de Desarrolladores de Videojuegos.

Civil society

Asociación de Escribanos del Uruguay, Asociación de Bibliotecólogos de Uruguay, Asociación General de Autores del Uruguay, Asociación Uruguaya de Creadores de Historietas, Cámara de Diseño del Uruguay Colectivo Arte es Ética, Colegio de Traductores del Uruguay Data Uruguay, Dataysoc, Data Management, Directores, Directoras y Guionistas del Uruguay, El Abrojo, Entidad de Gestión de Derechos de Productores Audiovisuales, Fundación Bensadoun Laurent, Liga de Defensa Comercial, Mujeres IT, Nahual IT-Argentina, Personas IT, Sociedad Uruguaya de Artistas e Intérpretes, 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 .