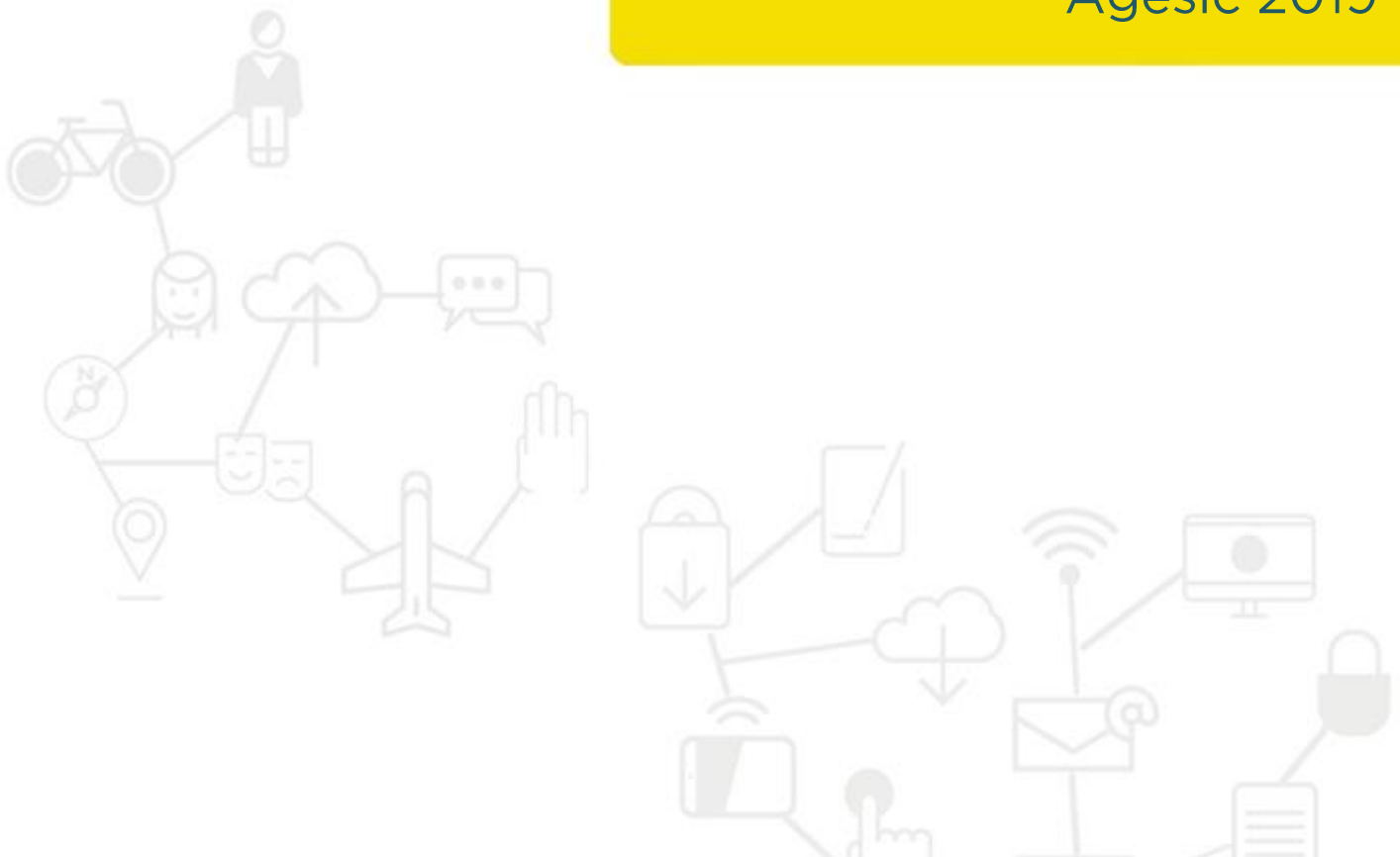


# Artificial Intelligence Strategy for the Digital Government

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## Introduction

In the history of human evolution, there are milestones that have transformed culture and generated changes in all disciplines, activities and the way people live.

Today, artificial intelligence (AI), associated with large volumes of data, opens a new scenario that generates changes of great impact in all areas of human life.

As a leader in Digital Government, Uruguay has identified this trend in advance and is currently preparing to incorporate AI to the Digital Government. Within that context, Uruguay has defined the goals and objectives for its digital development in the Uruguay Digital Agenda 2020<sup>1</sup> and in the 2018-2020<sup>2</sup> Digital Government Plan. Both documents, which are based on the principle of digital transformation with equity, provide a framework to incorporate AI at different levels of government. One of the dimensions established in the Digital Government Plan is the Smart Government, which strengthens decision making by basing decisions on evidence and improves the performance and monitoring of public policy results. In addition, it includes the development of predictive analytical platforms and models to design proactive services.

At present, AI has a potential that allows governments to incorporate new forms of analysis and the use of existing information by adopting a proactive attitude, with the ability to anticipate people's needs or prevent problems. These skills strengthen the development of public policies and consolidate a closer relationship between people and the State. Within the context of the Smart Government, AI appears as a technology conducive to implementing more efficient and innovative services.

However, AI also poses challenges and risks that need to be considered when developing a solution based on this type of technology. As part of the Digital Policy of Uruguay, the implementation of AI in Public Administration (PA) requires general principles that guide the digital transformation of the government and provide a framework to use it in the public sphere. In addition, it is necessary to have a clear strategy in place that incorporates different visions and considerations for the development and responsible use of this technology.

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<sup>1</sup> <https://uruguaydigital.uy>

<sup>2</sup> <https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/politicas-y-gestion/plan-de-gobierno-digital-uruguay-2020>

The purpose of this document is to materialize this strategy so that the Public Administration uses artificial intelligence in the development of public services and in the improvement of its internal processes. The general objective of the strategy is to promote and strengthen the responsible use of AI in Public Administration, identifying specific pillars and specific lines of action.

This first version was generated by a multidisciplinary working group of Agésic professionals who come from different fields such as technology, law, sociology, and medicine, among others. This holistic approach provides different perspectives on how to address the challenge.

This working group began researching state-of-the-art situations, in particular, examining the experience of countries such as Canada and Italy, pioneers in addressing artificial intelligence strategies focused on digital government. These activities involved the study of work processes and generated documents, as well as exchange instances with directly involved experts.

After this initial stage, this document began to shape up and its main objective is, as mentioned above, to promote the responsible use of AI throughout the PA, with a focus on generating better digital services and working processes.

This Artificial Intelligence Strategy for the Digital Government presents the first actions to be carried out, through an open construction process, and shares what has been elaborated with different stakeholders to obtain their vision and contributions, both nationally and internationally. These actions will be the initial kick off of a process that will have to continuously monitor and evolve the use of technology, as well as the results obtained to ensure the equal digital transformation of the Public Administration in Uruguay.

## Background

As a consequence of the evolution in the application of Artificial Intelligence in different areas and topics, several strategies and guidelines have been established in the past periods of government for the development and promotion of AI.

Countries such as the United States, Finland and France, among others, have developed national strategies for the development of Artificial Intelligence, while, for example, Canada and Italy have focused these strategies on the use of technology to improve public services. A good report on these experiences can be found in the article “An Overview of National AI Strategies” by Tim Dutton<sup>3</sup>.

In line with this trend, in 2018 member countries of Digital 9 (D9), of which Uruguay is a member, developed and agreed on a series of general objectives on the application and use of AI by national governments (see text box). In turn, as of 2019, this group of countries formed a working group to share and generate knowledge on the subject, such as, for example, frameworks for the responsible use of AI and the impact analysis on the development of algorithms and models, among others.

### Objectives agreed by the D9:

1. **Understand and measure** the impact of using AI by developing and sharing tools and approaches
2. **Be transparent** about how and when we are using AI, starting with a clear user need and public benefit
3. **Provide meaningful explanations** about AI decision making, while also offering opportunities to review results and challenge these decisions
4. **Be as open as we can** by sharing source code, training data, and other relevant information, all while protecting personal information, system integration, and national security and defense
5. **Provide sufficient training** so that government employees developing and using AI solutions have the responsible design, function, and implementation skills needed to make AI-based public services better

<sup>3</sup> <https://medium.com/politics-ai/an-overview-of-national-ai-strategies-2a70ec6edfd>

At the national level, multiple initiatives and projects in various areas of the State converge with this strategy. As relevant examples, we could mention the work of the Planning Directorate in the Office of Planning and Budget (OPP in Spanish), which created a series of prospective jobs, such as the document “Automation and employment in Uruguay”<sup>4</sup>, within the framework of "A national development strategy, Uruguay 2050". In turn, “Transforma Uruguay” (Transform Uruguay)<sup>5</sup> (National System of Productive Transformation and Competitiveness) is about to launch a Roadmap on Data Science and Machine Learning, with the aim of presenting a set of initiatives in this area in strategic sectors. Also in the field of Departmental Governments, it is worth mentioning Montevideo del Mañana (Tomorrow’s Montevideo)<sup>6</sup>, a process that integrates the prospective analysis with citizen participation towards the formulation of the Vision of the Future for Montevideo.

In the area of capacity building, new training options in data science have taken place, such as the Master's Degree in Data Science<sup>7</sup> at the School of Engineering of the University of the Republic or the Program in Data Science<sup>8</sup> of the Technological University of Uruguay (UTEC), as well as other courses and specializations taught in private institutes and universities in Uruguay.

Finally, in recent years, the Public Administration has not been oblivious to this strategy when developing working fields such as interoperability, open data and data management.

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<sup>4</sup> [https://www.opp.gub.uy/sites/default/files/documentos/2018-06/2256\\_Publicacion\\_Automatizacion\\_y\\_empleo\\_en\\_Uruguay.pdf](https://www.opp.gub.uy/sites/default/files/documentos/2018-06/2256_Publicacion_Automatizacion_y_empleo_en_Uruguay.pdf)

<sup>5</sup> <https://www.transformauruguay.gub.uy/es/>

<sup>6</sup> <http://montevideo.gub.uy/montevideo-del-manana>

<sup>7</sup> <https://www.fing.edu.uy/cpap>

<sup>8</sup> <https://datascience.edu.uy/>

# AI Strategy for the Digital Government

Artificial Intelligence (AI) is a term used to describe a field of study and a set of technologies that study and develop systems capable of performing tasks that are normally attributed to human intelligence. Some examples of this may be to translate a document or recognize a person by his or her face. AI also includes systems that learn to behave autonomously, such as driverless vehicles, programs that play chess or perform other activities.

Although the beginnings of AI development can be traced to the mid-twentieth century, currently, the generation and availability of large amounts of data, the evolution of techniques and algorithms, as well as the decrease in infrastructure costs increasingly efficient for the processing of this type of information, have made this technology advance very fast in recent years.

Increasingly, AI applications are becoming part of our everyday life: virtual assistants in our cell phones, algorithms in social networks that show us information in one way or another, driverless cars, programs that learn from our actions to recommend music, movies or consumer items at online stores, real-time translators, systems that detect diseases or health risks early, just to name a few.

In turn, solutions based on Artificial Intelligence have become an indispensable tool for the development and provision of digital services for citizens. Through its implementation, the digital transformation of the Public Administration can be enhanced, which requires a strategy to guide the decisions to be taken in this regard.

For the use of AI tools in the Public Administration to be successful, the strategy is to be legitimately designed and implemented; it needs to build trust and understanding, and consider the implications in the short, medium and long term. This work is to be carried out together with the citizens and different groups of stakeholders: final recipients of the tools and parties involved in the process of construction, development and use of the emerging product of the AI application.

In view of the above, the AI strategy as a tool for digital transformation is developed with the purpose of promoting and strengthening its responsible use in Public Administration.

The responsible use of AI involves four dimensions: the ethical, regulatory, technical and social dimensions, which must be present from the design to the implementation of its various applications.

The **ethical dimension** in Public Administration implies that the ethical framework must structure all public actions and therefore, set the guidelines for developments in AI. For its application and implementation, transparency in the actions of the Public Administration is essential. This transparency does not only imply comprehensive knowledge of the information managed, but of the strategies applied, their aims and contents. At the same time, by introducing transparency rules, the possibilities of unwanted bias and discriminations will be mitigated.

The **legal dimension** in Public Administration implies developments within a pre-existing legal framework that establishes the rights and obligations of individuals, as well as the scope of action of public bodies. In this respect, adherence to the Human Rights standards enshrined in international instruments is essential, which ensures the balance between the rights of individuals and the limitation of the scope of state action.

The **technical dimension** in Public Administration implies compliance with technical and regulatory frameworks that guarantee the solvency and soundness of AI systems. This also requires constant attention to good practices, permanent review of the measures implemented and audits by impartial third parties.

The **social dimension** in Public Administration implies generating people oriented solutions that seek the general interest and consider the agency capacity of human beings.

These four dimensions must be present during the execution of the lines of action of the AI strategy, with a view to contributing to its responsible use for the digital transformation. Within that framework, AI generates opportunities to create public services with more quality. It works as support for decision-making processes and the design of public policies that respond in a more appropriate way to people needs. At the same time, it implies risks and threats that we must take into account when developing AI applications in the public sphere.

To take advantage of these opportunities and reduce risks and threats, an AI strategy for the Digital Government and a set of general principles were set up to provide a general framework for using Artificial Intelligence in the public sphere.



The general objective of the strategy is to **promote and strengthen the responsible use of AI in Public Administration**. Within that framework, four pillars that make up this strategy have been identified, each with specific objectives and lines of action.

1. AI governance in Public Administration.
2. Capacity development for AI.
3. Use and application of AI.
4. Digital citizenship and AI.

## General principles

**Purpose:** AI must enhance the capabilities of human beings, complementing them as much as possible, aiming to improve the quality of people's life, facilitating processes and adding value to human activity.

**General interest:** AI-based solutions promoted by the State should tend to protect the general interest, guaranteeing inclusion and equity. For this, work must be carried out specifically to reduce the possibility of unwanted biases in the data and models used that may negatively impact people or favor discriminatory practices.

**Respect for Human Rights:** Any technological solution that uses AI must respect Human Rights, individual freedoms and diversity.

**Transparency:** AI solutions used in the public sphere must be transparent and comply with the regulations in force. This transparency must:

- Make available the algorithms and data used for training the solution and its implementation, as well as the tests and validations performed.
- Explicitly make visible, through active transparency mechanisms, all those processes that use AI, either in the generation of public services or in support of decision-making processes.

**Responsibility:** Technological solutions based on AI must have a clearly identifiable person responsible for the actions derived from the solution actions.

**Ethics:** When the application and / or development of AI-based solutions present ethical dilemmas, they must be addressed and resolved by human beings.

**Added value:** AI-based solutions should only be used when adding value to a process. AI should not be an end in itself, but a tool that can enhance the development of the digital government.

**Privacy by design:** AI solutions should contemplate people's privacy from their design stage. Personal Data Protection principles in force in Uruguay are considered components of this document.

**Security:** AI developments must comply, from their design, with the basic principles of information security. The guidelines and regulations related to cybersecurity in force in Uruguay that apply to the development of AI are considered components of this document.

## Pillars, objectives and lines of action

## *AI Governance in Public Administration*

The purpose of the dimension of AI Governance for the Digital Government is to ensure the principles and comply with the recommendations indicated in this document.

Likewise, the frame of reference must contemplate the generation of a model for the selection and prioritization of AI projects that contain acceptance criteria considering the principles generated such as: the purpose, the contribution of value to the processes, the general interest and the need that originates the project.

In turn, the frame of reference should contemplate an AI maturity model that contains all the technical, organizational and human aspects, among others. This model allows to have a unique indicator that contributes to the evolution of AI in Public Administration.

The Governance reference framework should contemplate a quality data model with an open data standard, which will generate the necessary foundations to implement AI.

The Governance model should contemplate follow-up procedures and structures, an AI observatory that allows to obtain information for decision-making. Likewise, it will be convenient to generate a monitor of the projects under execution in order to identify impacts and be able to take actions accordingly.

Finally, Governance will contemplate a process of knowledge management in order to capitalize and manage the lessons learned and the knowledge generated in the ecosystem.

In view of this, the following objectives have been defined:

### **OBJECTIVE I: To identify the AI ecosystem in Uruguay**

- To prepare a map with the different stakeholders (role, sector, experience, value contribution, areas of action, etc.) and identify the ecosystem that brings together public and private sectors, academia and civil society, as well as stakeholders and international organizations that will later enable to develop and enhance their capabilities.

- To generate a discussion on the use of AI in Public Administration, which allows: to define guidelines, ensure capacity building and favor a research culture in AI.

## OBJECTIVE II: To define an AI Governance Model in Public Administration

- To define an AI Governance model for the PA, as well as a reference framework for its implementation that includes, among others: stakeholders, roles and responsibilities, standards, procedures and decision-making mechanisms, as well as performance indicators and guidelines for impact analysis.
- To promote active transparency in compliance with agreed ethical principles and values.

## *Capacity Development*

As a corner stone for the adoption of AI in PA, it will be necessary to train its staff in different capacities. This will enable to understand the benefits and risks of this technology, fields of application where value can be added, as well as technical elements (not only technological), for its correct implementation, execution and continuous monitoring. It will be increasingly necessary to generate the conditions for a good design and development of AI systems and applications, in close collaboration with the academia, the private sector and civil society.

It is important to prioritize training in multidisciplinary contexts, generating skills that enable to understand all the difficulties, challenges and impacts that arise when using AI in the services and processes of Public Administration. In addition to the technical and business profiles that are linked to Information Technology in the public sphere, there is a need to incorporate new profiles, such as those related to humanistic training, whose contribution is essential to improve the interaction between AI systems and their users.

Training should be extended to professional training methodologies within a context of permanent and accessible learning. This implies the development of cross-cutting and specific training in topics related to AI, both for the development of talent of professionals in the area and for the necessary updating of knowledge of the society in general.

The transfer of knowledge among universities, research centers, the public sector and the private sector is essential for the improvement of public services, through new

opportunities for innovation and development areas.

In view of this, the following objectives have been defined:

**OBJECTIVE III: To generate capabilities for the development and use of AI in PA**

- To develop a training program that includes the different disciplines related to AI, as well as the different profiles involved.
- To train 100% of the Organizations in the Central Administration according to the program defined.
- To encourage an organizational culture that allows the promotion of AI development as a tool for the Digital Transformation of Public Administration and addresses aspects such as change management, among others.

**OBJECTIVE IV: To generate a space for learning**

- To promote the exchange of experiences of use of AI in the public and private spheres, both nationally and internationally.
- To generate a Space for Learning in AI for the Public Administration, with the objective of sharing best practices and experiences among its participants.

## *Responsible use*

AI is not an end in itself, but a strategic capacity that organizations can develop and mature to achieve specific, measurable and transformative results. A capacity where the journey from pilot projects or short-term plans to large-scale implementations is a task that requires solid planning.

This planning should consider various aspects that have a direct impact on implementation, in particular, all those related to how data should be treated, manipulated and managed. Thus, the data management strategy of the Public Administration, its existing regulations on privacy and data protection, its openness policy and available data as well as the regulation related to information security, among others, will be strongly linked to the success of the use of AI in this area. Therefore, building a Public Administration based on data, where these are considered a critical asset, is key to the success of AI initiatives; a practice that combines business and technology understanding and skills.

Due to the complex nature of AI solutions, solutions that use this technology can generate unpredictable or unexpected results. These results may even seem opaque due to the difficulty in explaining the results obtained.

Although transparency is a vital element for trust, there is a challenge that the Public Administration must contemplate: establishing the level of opacity to address (and even in what contexts) in order to take advantage of the potential offered by AI, whether using open source or even proprietary solutions, always in accordance with current regulations.

Together with the development of capacities, all the aforementioned aspects make it relevant to implement lines of action that strengthen the good use of AI, through the generation of technical guidelines, guides and good practices that can be shared in the Public Administration.

In view of this, the following objectives have been defined:

### **OBJECTIVE V: To generate technical guides for the good use of AI in Public Administration**

- To develop technical guides for problem selection, as well as the design and implementation of AI-based solutions. These guidelines should consider, among other aspects, the relevance of the use of AI services in the cloud, the identification of appropriate tools for different cases of application, protection and data privacy, etc.
- To strengthen the integration, good management and availability of quality data in the PA, as well as data of private public interest, thus generating the necessary

inputs for the generation of AI-based systems of high quality and added value.

#### OBJECTIVE VI: To promote algorithm transparency

- To define standards, guidelines and recommendations for impact analysis, monitoring and auditing of the decision-making algorithms used in PA, as well as for their interpretability and explainability.
- Establish standards and procedures for the dissemination of the processes used for the development, training and commissioning of algorithms and AI systems, as well as the results obtained.

#### OBJECTIVE VII: To design specific action plans in strategic sectors.

- To design specific action plans to strengthen the responsible use of AI in defined strategic sectors
- To implement concept tests and pilots in the defined strategic sectors.

## *AI and digital citizenship*

Science fiction has been responsible for generating the first constructions on AI in the social imaginary, usually with apocalyptic perspectives and dystopian futures, which has fostered the fear of the unknown. Nevertheless, AI is already part of our life.

The application of AI in Public Administration opens a series of potentialities that can radically change the way we interact with the State, the way we design and implement public policies and the way we measure results and make decisions.

Currently, several nations are already applying AI systems in areas of high sensitivity such as education, the justice system or public health. For this reason, it is increasingly important for the citizenship to have sufficient knowledge and the availability of tools to interact with AI, protect their rights and know the scope of the application of emerging technologies.

The application of AI may have effects on the way we use and protect data, on equal access to public services and opportunities and on how we exercise our rights and interact. For this reason, this strategy includes a dimension that seeks to prepare citizens to take advantage of opportunities and face the challenges that AI poses, as well as to generate the necessary confidence in people to develop and use new technologies.

With this in view, the following objectives have been defined:

### OBJECTIVE VIII: To raise awareness and citizen trust

- To implement dissemination and awareness campaigns that allow to transmit to the public what Artificial Intelligence is and how it is being used by the Public Administration
- To strengthen the mechanisms so that citizens know their rights in the digital sphere and how to exercise them.
- To promote the development of Digital Intelligence, in its three levels (digital citizenship, creativity and digital initiative) to enhance the involvement, participation and apprehension in the development and application of AI solutions.