Artificial intelligence and automated decisions for public policymaking in Latin America

Maximiliano Campos Ríos

ORCID: https://orcid.org/0009-0004-5683-3623

https://maxicamposrios.com.ar/

maximilianocampos@gmail.com

University of Buenos Aires

Abstract

In the digital era, artificial intelligence (AI) and automated decisions (AD) have become the tools with the greatest capacity to transform public management. These technologies have shown their ability to combine to formulate anticipatory public policies, which are government strategies and actions designed to anticipate and address future needs before they become critical problems.

AI analyzes large volumes of data to identify patterns and anticipate future problems, while DAs facilitate rapid and accurate responses in public management. This approach has the potential to significantly improve the efficiency and effectiveness of public policies, since it enables more personalized and adaptive services that improve the quality of life of citizens.

This article analyzes the application of AI and DA in various public issues in Latin American countries, with the aim of identifying how these disruptive technologies help to address critical problems and improve the delivery of public services. It also presents guidelines to overcome their challenges, including the development of digital capabilities, the strengthening of technological infrastructure and the promotion of public-private collaboration.

Key words: Anticipatory public policies - Data - Digital capabilities - Public management - Technology.

Introduction

The modern era has seen how tasks that traditionally required human intervention are increasingly taken over by automated systems, machines that are based on a multidisciplinary approach that encompasses fields as varied as economics, politics and everyday life. This trend has led experts to call the current era the "Second Machine Age" (Brynjolfsson and McAfee, 2014), in which machines not only perform specific tasks, but also provide explanations and justifications for their actions. This is because automated systems can analyze large amounts of data and apply complex algorithms to make informed decisions. In economics, for example, machine learning systems can analyze consumer behavior patterns and predict market trends. In politics, artificial intelligence (AI) systems help leaders make more informed public policy decisions and forecast the impacts of these decisions. In everyday life, virtual assistants and recommender systems enable people to make more informed decisions about products and services.

In this scenario, AI and automated decisions (AD) have emerged as powerful tools to transform public management. In Latin America, where socioeconomic and environmental challenges are prominent, these technologies offer significant potential not only to improve the efficiency and effectiveness of public policies, but also to anticipate and address future needs, optimize resource allocation, and improve the efficiency and effectiveness of public services. However, their adoption also poses significant ethical and technical challenges, such as the transparency and explainability of algorithms, the protection of personal data and non-discrimination.

Countries in the region have begun to explore the use of AI and DA in the design and implementation of anticipatory public policies that seek to foresee and address future needs before they become critical problems, rather than reacting to events once they have occurred. By combining AI and DA, governments can develop more accurate predictive models and make decisions in a more agile and effective manner. However, the adoption of these technologies in the regional public sector faces several challenges, such as the need for investment in technological infrastructure, training of government personnel, collaboration with the private sector and academia, and the development of appropriate regulatory and ethical frameworks.

This paper seeks to provide an overview of the intersection between AI, AD and proactive policies in Latin America by identifying the opportunities and challenges that arise in this context. To do so, it analyzes the use of AI in various sectors, its potential to transform the public sector in Latin America and generate a positive impact on their societies.

Artificial intelligence and automated decisions: conceptualization and scope

AI is a field of computer science that focuses on the creation of intelligent agents or machines capable of performing tasks that traditionally require human intelligence, i.e., that can reason, learn and act autonomously. This technology has experienced rapid growth in recent years, driven by advances in machine learning, cloud computing and big data. As Criado (2021) explains, these are technologies that are reshaping management models, fostering an organizational culture focused on innovation and encouraging the adoption of more flexible and collaborative structures, such as holacracy.

Although the definition of AI is still under debate and there is none that is universally accepted in different academic communities, when speaking of this technology, reference is made to a computer system capable of performing tasks that normally

require human intelligence, such as perception, reasoning and problem solving (Boden, 2017). Key elements include a learning capability whereby systems must be able to learn from experience and improve their performance over time; reasoning that allows them to analyze information and make logical decisions; autonomy to act without the need for constant human intervention; perception of the world around them so that they can understand it; and interaction with the world around them in a meaningful way (Leslie et al., 2021).

Beyond the discussion of whether AI is a system that can learn and adapt to new contexts or whether it is a technology that can simulate human intelligence in certain tasks, what is of interest in this paper is its scope and applications, which are increasingly broad. Without claiming to be exhaustive, the list cannot fail to include voice recognition systems, which are used in virtual assistants and voice command systems for cars; artificial vision, such as facial recognition, image analysis and product inspection; natural language processing, used in machine translation, chatbots and text generation; robotics for medical care or space exploration; and decision making in a wide variety of areas, such as finance, health care, marketing and public policy. This last point is of relevance, as it refers to the ability of computer systems to make decisions without direct human intervention, based on the use of algorithms and data to determine outcomes. These types of operations are known as DA or automated decision-making and have become a topic of great interest in recent years, as they are driven by the rise of machine learning.

According to Brynjolfsson and McAfee (2014), these systems can process large volumes of data, identify patterns and execute tasks with an efficiency that surpasses human capacity, since the key to DA is the ability of algorithms to learn and adapt to new information, improving their decisions over time. One of the central concepts is the use of neural networks and deep learning, topics worked on by LeCun et al. (2015), who describe how these techniques allow systems to identify complex features in data and make accurate predictions. Decision making is based on models trained on large data sets, allowing them to generalize and decide in diverse contexts.

DAs span a variety of applications, from recommendation systems in entertainment platforms to medical diagnostics and credit approvals. In the financial industry, for example, DA systems are used for risk assessment, fraud detection and risk assessment, fraud detection and lending, as these types of institutions use algorithms to analyze credit histories and determine the creditworthiness of loan applicants, reducing response times and improving the accuracy of decisions. Regarding healthcare, Topol (2019) highlights that DA systems can analyze medical images, genomic data, and

electronic health records to identify pathologies and suggest personalized treatments, thus improving outcomes for patients. In turn, e-commerce and digital marketing platforms use DA to personalize their users' experience, and according to research by Jarek and Mazurek (2019), recommendation algorithms analyze user behavior to offer products and services that match their preferences, increasing customer satisfaction and sales. In the transportation sector, DA systems are fundamental for the development of autonomous vehicles, as Goodall (2014) mentions when studying how they make split-second decisions to ensure the safety of passengers and other road users.

Another use is for public policy management, in cases such as benefit claim evaluations, traffic management or fraud and corruption detection. This is possible because they improve efficiency and effectiveness by automating repetitive and tedious tasks, freeing up time and resources for public servants to focus on more complex and strategic issues, in addition to the fact that they can perform large-scale data analysis and identify patterns and trends that might go unnoticed by humans. This gives rise to a new kind of understanding of the population's needs and problems, enabling more informed and effective decision making. DAs make it possible to offer personalized public services to each citizen, considering their specific characteristics and needs, as well as having the capacity to provide greater transparency for accountability, since the algorithms they use can be documented and audited.

Governments and States are increasingly exploring the use of DA to improve the efficiency and effectiveness of public policies, in view of their ability to optimize resource allocation, improve public service delivery and increase transparency and accountability in public administration. In terms of optimizing resource allocation, DAs allow resources to be distributed more efficiently and equitably, such as when there is a proactive distribution of medical resources and vaccines, a situation that was particularly relevant in the management of the COVID-19 pandemic, where the models helped plan hospital capacity and the distribution of personal protective equipment (Keesara et al., 2020).

In terms of improving the delivery of public services, the implementation of DA makes them more accessible and efficient, as governments can assess applications for social benefits more quickly and accurately, reducing waiting time for citizens and minimizing errors in their adjudication. This has been implemented in several countries, such as in the United Kingdom with the Universal Credit system (Ministry of Housing, Communities and Local Government, 2019). In turn, AD-based traffic management systems optimize flow and reduce travel times and congestion using smart traffic lights that adjust light times (Orozco Aguirre et al., 2018).

In terms of increasing transparency and accountability in public administration, algorithms are used to detect suspicious behavior patterns in government contracts, which reduces the risk of fraud and corruption by generating automatic alerts (López Espinosa, 2019).

Beyond the valuable contribution made by DAs to public management, the uses mentioned so far show that their contribution occurs ex-post, i.e., after the events have occurred events. However, the most interesting aspect of this technology is its ability to act ex-ante, i.e., to anticipate events based on predictive models. AD, using advanced algorithms and analysis of large volumes of data, can provide the necessary tools to implement anticipatory public policies efficiently and effectively. In this way, it enables governments and states to anticipate and manage future challenges and opportunities proactively.

Anticipatory public policies

Anticipatory public policies are government strategies and actions designed to anticipate and address future needs before they become critical problems, rather than reacting to events once they have occurred. These policies are based on prospective analysis and aim to anticipate emerging trends and challenges, enabling a proactive and effective response. According to Havas et al. (2010), anticipatory policies seek to manage uncertainty and build adaptive capacity and resilience in society, and this paper argues that when combined with AI and DA they can be significantly more accurate and effective.

The conjugation of AI and DA generates a virtuous circle, where the former involves the use of algorithms and machine learning models to analyze large volumes of data, identify patterns and make predictions, while the latter use computer systems to make decisions based on predefined rules and algorithms. These systems can process information and execute actions without human intervention, enabling a fast and accurate response. Anticipatory public policies based on these technologies include crisis prediction and prevention, as they use historical and real-time data to foresee adverse events such as natural disasters, epidemics, economic crises and take preventive measures; resource optimization, as they anticipate the demand for public services and adjust the allocation of resources more efficiently; and public service improvement, as they use data to identify areas for improvement in the provision of public services and make informed decisions to address these needs.

On the prediction and prospective analysis side, algorithms show their usefulness in the ability to forecast economic fluctuations, identify sectors at risk and suggest timely policy interventions, vital to avoid economic downturns and promote sustained growth. Regarding resource optimization, by analyzing historical and real-time data, algorithms can identify a more effective allocation of limited resources, such as emergency funds, personnel and supplies. Such is the case in natural risk management, where systems can predict the trajectory of potential disasters and recommend the optimal location for evacuation centers and storage of supplies, to improve emergency response and minimize damage. In terms of improving the provision of public services, they enable early identification of emerging risks and opportunities, which facilitates the implementation of proactive policies that mitigate risks and capitalize on opportunities before they become problems or are lost. An example of this is the ability of algorithms to analyze climate data to forecast extreme events and their potential impacts, so that governments can use this information to design climate change adaptation policies, such as building resilient infrastructure.

The capacity of anticipatory public policies is also observed in the field of urban planning, where DA systems can analyze data on mobility, population density and land use to forecast future needs for urban infrastructure needs. This allows governments to plan and build infrastructure that is resilient and sustainable, addressing problems before they become crises. Another scope of anticipatory public policies is national security, since the systems make it possible to foresee threats by analyzing intelligence data and behavioral patterns, enabling governments to implement proactive security measures to prevent attacks before they occur. In turn, in terms of security and justice, predictive models can analyze historical crime data to identify areas with a higher probability of criminal activity, enabling law enforcement to allocate resources more efficiently and proactively. However, in this case, it is critical to address algorithmic bias issues to avoid perpetuating injustices. And with respect to the judicial system, they can assist in recidivism risk assessment and probation decisions. For example, the COMPAS system in the United States uses algorithms to assess the probability of recidivism of defendants, although it has been the subject of controversy due to possible racial bias (Roa Avella et al., 2022).

As can be seen, beyond the benefits of anticipatory public policies, it is necessary to consider the challenges and ethical considerations they raise. The use of DA in public policy has the potential to transform governance and public administration by optimizing resource allocation, improving service delivery, increasing transparency, and addressing security and justice issues. However, it is vital to address the associated ethical and

technical challenges to ensure that they benefit all of society in an equitable and fair manner. Transparency in DA making, in how these systems are designed and operated, is critical to maintaining public trust. Therefore, it is essential that algorithms are auditable and decisions are explainable. Furthermore, it is determined to eliminate algorithmic biases that can lead to unfair or discriminatory decisions and perpetuate existing inequalities, ensuring that DA systems are designed and implemented in a fair and equitable manner.

Application of AI and DA in public policy in Latin America

Governments and states around the world are incorporating AI and DA for a wide range of purposes with the goal of improving efficiency, effectiveness and accuracy in the delivery of public services. Among the most prominent cases is Estonia, a country that is positioned as a global leader in the adoption of digital technologies and innovation in Public Administration. Known for its advanced e-government infrastructure, Estonia has gone a step further by incorporating AI and DA in various topics, such as the use of Rapid software for CT scans, which processes the data and allows sending the results of the study to the neurologist's cell phone and email address (Kratid, n.d.). This AI was trained to search the different areas of the brain and identify damaged and healthy tissues, saving time and giving the patient a better chance of recovering his or her brain tissue. Since 2018 municipal governments have been using a youth support tool that helps social workers to identify young people between 16 and 26 years old who are not studying or working and have no training. In this way, from the Vida Laboral portal they contact the young people identified by the system, who receive a letter or SMS indicating when the dates for job applications start (Tööelu, 2021). Another example of the use of AI and DA in public policy is in Spain, where the Administration of the Generalitat Valenciana has developed the SALER system, which analyzes digitized files of administrative data to detect irregularities or risks of fraud and prevent corruption (Anti-Fraud Knowledge Centre, 2021). Mention should also be made of the study carried out by a team of experts from the United States, China and Egypt, who developed an algorithm with a 70% earthquake prediction capacity up to a week before an earthquake occurs (Saad et al., 2023).

Regarding Latin America, a diverse, complex and dynamic region with a rich history and great potential for economic, social and environmental development, the experiences of incorporating AI and DA found in different countries are very dissimilar, both in the area of scope they cover and in the level of development and implementation achieved. In the

field of public health, the DART (Diabetic Retinopathy Artificial Intelligence Retinal Testing) platform is a tool developed in Chile for the screening and treatment of diabetic retinopathy, one of the main causes of blindness in that country and in the world. It was created by the company TeleDx (Telediagnostics) with support from the Instituto Sistemas Complejos de Ingeniería (ISCI) and adopted by the Ministry of Health to improve early detection and management of this disease (Ministry of Health, 2018). DART uses AI to analyze retinal images and allows to automatically identify signs of diabetic retinopathy in the images, generating a preliminary report that classifies cases at risk and refers them for remote review by ophthalmologists. This optimizes the use of medical resources by prioritizing cases requiring immediate specialized care, reducing the need for detailed reports by ophthalmologists by 50%. Since its implementation in 2018, DART has enabled more than 350,000 exams, benefiting patients at more than 140 points of care across the country. The platform is 94% accurate in detecting the disease, ensuring high diagnostic accuracy (Pro Salud Chile, 2023).

In turn, in Peru, an innovative project has been carried out that uses AI to detect anemia in children in a fast, non-invasive and accessible way, developed jointly between Innóvate Perú of the Ministry of Production, Ayni Lab Social of the Ministry of Development and Social Inclusion and the Laboratory of Bioinformatics and Molecular Biology of the Peruvian University Cayetano Heredia (Ministry of Development and Social Inclusion, 2019). It is based on a mobile application that allows users to take pictures of the conjunctiva of the eye and the fingernails of children's hands and using AI algorithms, analyzes the images and determines the level of hemoglobin in blood, a key indicator for detecting anemia. In addition to being non-invasive, this technology can be used in rural and hard-to-reach areas, where access to traditional health services may be limited.

Regarding the environment, in Brazil the University of the State of Amazonas (UEA) is developing the Curupira project, an innovative device that uses AI to combat deforestation in the Amazon (Nascimento Costa, 2023). Inspired by the mythical figure of the forest guardian from Brazilian folklore, the Curupira acts as a caretaker through a wireless modem installed in Amazonian trees, which has an AI sensor trained to identify anomalous sounds in the forest environment, such as the noise of chainsaws, tractors or other activities that indicate ongoing deforestation. In this way, it can alert authorities in real time about ongoing deforestation, enabling a quick and effective response, as the use of AI allows for rapid and accurate analysis of forest sounds, optimizing threat detection. Although this project is in the development phase, it has already been presented to the authorities of the Manaus Free Trade Zone Superintendency (Suframa),

an agency linked to the Ministry of Development, Industry and Foreign Trade that manages the Manaus Free Trade Zone (ZFM) (Ministério do Desenvolvimento, Indústria, Comércio e Serviços, 2023).

In Uruguay, the Hands-on Data-Uruguay (MeD-Uruguay) initiative was launched in 2020 by CAF-Development Bank of Latin America and the Agency of Electronic Government and Information and Knowledge Society (AGESIC) to promote the intensive, efficient and secure use of data within the State (Berniell et al., 2020). The objective is to generate synergies between data scientists and public policy, applying AI techniques to extract more value from data and assist decision-makers, in a way that allows the configuration of a DA system. This proposal consists of three projects developed simultaneously by different state agencies and the company Dymaxion Labs: the first is the processing of aerial images, both from photogrammetric flights managed by the Spatial Data Infrastructure of Uruguay and satellite images, using AI techniques; the second project collected information in 40 locations to estimate the amount of solar energy equipment (including solar panels) installed and their georeferencing, in a joint work with the National Energy Directorate of the Ministry of Industry, Energy and Mining, which gathers the main results of the energy sector at the national level; Finally, the third is a collaboration between the Office of Planning and Budget and the Departmental Governments within the framework of the Rural Roads Program, with the objective of identifying, from aerial photos, what type of road it is in order to program its asphalting and maintenance, in a project called Caminos que Conectan (Roads that Connect).

Related to justice and security, in Colombia the PretorIA and Prisma programs are technological initiatives developed to strengthen management using AI and data analysis (López Vega et al., 2023). On the one hand, the PretorIA program is an AI-based tool used by the Constitutional Court, which aims to improve efficiency and effectiveness in the fight against corruption and other crimes through the analysis of large volumes of data. This program has achieved significant progress in the training of officials and the exchange of information, while concrete results have been obtained in the investigation and prosecution of crimes. On the other hand, the Prisma program is a technological initiative of the Attorney General's Office focused on data analysis and AI to strengthen criminal investigation and the administration of justice, achieving significant progress in the creation of specialized units and in the training of officials.

Another of the most notable examples of the use of AI in Latin America is the OlivIA IA for Her project, an initiative to support care for women victims of gender-based violence who seek assistance from the services of the Secretariat for Substantive Equality

between Women and Men of the Government of Jalisco (FAIr LAC Jalisco, n.d.). The system, which is an initiative led by the IDB Group, the Tecnológico de Monterrey in Guadalajara, the Government of Jalisco and C Minds, is implemented through a platform that allows first contact public officials to register the victim's data and details of the incident, classify the type of violence suffered, identify the level of risk and generate an immediate response. This facilitates and streamlines the process of caring for victims of violence and generates data and information that can be used to improve prevention and care strategies.

As can be seen, there are a variety of projects and initiatives of different types under development and being implemented in Latin America. However, when we look at experiences related to anticipatory public policies, very few actions have been able to be effectively articulated and translated into tangible results. In Argentina, the ARPHAI project (Argentinian Public Health Research on Data Science and Artificial Intelligence for Epidemic Prevention) aims to develop tools based on AI and data science for the early detection of epidemic outbreaks. Launched in October 2020, it aims to use electronic medical records to anticipate and detect outbreaks of diseases such as COVID-19 and dengue (Avolio, 2022; Telemedicina, 2022). Currently, it is in an initial development phase with the development of processes to obtain anonymized data from the electronic medical records in the suburbs of the province of Buenos Aires and plans to evaluate its performance in real epidemiological scenarios, as well as to achieve scalability at the national level (Centro Interdisciplinario de Estudios en Ciencia, Tecnología e Innovación, 2022). This project considers gender perspective and other socioeconomic factors in data analysis to avoid biases and ensure equity in medical care.

Uruguay's Administración Nacional de Usinas y Transmisiones Eléctricas (UTE), a public company of the Energy Sector, also carries out an anticipatory public policy, as it uses AI to analyze data from sensors and monitoring systems in its infrastructures, such as transmission lines and substations (Administración Nacional de Usinas y Trasmisiones Eléctricas, 2023). In this way, AI contributes to predictive maintenance, as it helps to predict failures and determine the necessary maintenance before serious problems occur, with the consequent benefit of reducing downtime, lowering maintenance costs and extending the useful life of equipment.

In education, both countries have initiatives aimed at preventing school dropouts. In the case of Uruguay, the Student Dropout Predictive System (SPDE) is an initiative under development by the Uruguayan Agency of Electronic Government and Information Society (Agesic) and the National Administration of Public Education (ANEP), which uses

AI to identify students at risk of dropping out of school and develop intervention strategies to prevent it (FAIr LAC, n.d.). It is based on a machine learning model that analyzes a large amount of data on students, such as their academic history, attendance, socioeconomic status and psychosocial factors so that, based on the identification of dropout risk patterns, a personalized intervention plan can be implemented (Tasende et al., n.d.). In Argentina, an Early Warning System (SAT) is being implemented in the provinces of Entre Ríos and Mendoza through an agreement between the provincial governments and the Center for the Implementation of Public Policies for Equity and Growth (CIPPEC) (Delprato et al., 2023). This program is based on the use of AI to identify early on students at risk of dropping out of school and develop strategies to prevent it, such as sending early alerts to educational authorities that allow them to implement personalized intervention plans for each case. In Entre Ríos, the pilot system was launched in 2023 with 20 schools and is expected to be extended to the entire educational system in the coming years, while, in Mendoza, it was implemented in 2021 in 170 schools and has shown a significant reduction in the dropout rate in the centers where it has been applied (Xanthopoulos, 2024).

These experiences suggest that there is great room for innovation and the development of anticipatory public policies that take advantage of the opportunities offered by emerging technologies such as AI and DA for real-time data analysis. However, in order to expand their presence, it is an inescapable task for all countries to develop a strategy for elaboration and implementation that allows them to be carried forward in a productive manner.

Strategies and challenges for successful implementation of AI and DA policies

For governments and states to successfully implement public policies that use AI and DA, it is essential to develop a roadmap that establishes the key strategies to achieve this. Along these lines, the Block Center for Technology and Society at Carnegie Mellon University in the United States produced a report with a detailed guide on how to adopt and take advantage of these new technologies (Andes, 2020). First, the report highlights the need to develop a national AI strategy based on the formulation of a clear plan that defines the objectives, priority areas and resources needed for its implementation in public policies. A well-defined strategy provides a roadmap to guide the development and use of AI, ensuring that all efforts are aligned with national goals. Second, investment in technology infrastructure is required, as government agencies must have advanced data storage systems, cloud computing platforms and robust communication networks.

This infrastructure not only supports the implementation of AI solutions but also ensures that the solutions are sustainable and scalable. In addition, continuous education and training of public servants is indispensable, so offering training programs focused on the use and management of AI technologies enables government staff to be prepared to handle these tools effectively. Collaboration with the private sector and academia also plays an important role, as establishing partnerships with universities, research centers and technology companies facilitates access to additional expertise and resources. These collaborations can drive innovation and enhance the government's ability to develop and implement effective AI solutions.

In turn, governments must take on the task of developing regulatory and ethical frameworks to ensure the responsible use of AI in a way that protects the privacy and security of citizens and ensures transparency and accountability in the use of technologies. This helps build public trust and helps ensure that AI is used in a fair and equitable manner. Finally, the implementation of pilot projects in key areas allows the effectiveness of AI solutions to be evaluated prior to full-scale implementation. Pilot projects provide an opportunity to identify and solve potential problems, adjust strategies, and measure the actual impact of AI technologies in the context of public policy (Andes, 2020). Despite the many concrete and potential benefits of AI and DAs, there are also some challenges that need to be worked on. It is timely, then, to address them in greater detail.

Among them is the problem of bias, since these systems can lead to discrimination by copying, perpetuating and amplifying existing discrimination schemes referring to different areas of human diversity, such as sexual, ethnic, linguistic and religious diversity, just to name a few of the most salient. In turn, inequalities in access to technologies can limit the effectiveness of AI and DA-based policies, exacerbating existing disparities, and this shows the need to address digital divides to ensure that all citizens benefit equitably from technological innovations.

Another major challenge is the transparency and explainability of algorithms. Lipton (2018) notes that complex models, such as deep neural networks, often operate as "black boxes," i.e., systems whose inner workings are unknown or non-transparent to the user. These models can be difficult to interpret due to their complexity and lack of explainability, making it difficult to understand how decisions are made. Furthermore, the successful implementation of AI requires a robust technological infrastructure and adequate training, which can be a challenge in regions with limited resources. In this regard, governments need to invest in advanced technologies and train their employees

to take full advantage of the benefits of AI. However, the adoption of new technologies may encounter resistance within public administrations, a situation that requires significant organizational change efforts. Therefore, it is essential to promote a culture of innovation and adaptability to overcome resistance to change and encourage the adoption of advanced technologies.

Europe's General Data Protection Regulation (GDPR) establishes that, in the case of DA that produce legal effects or significantly affect individuals, meaningful information must be provided on the logic applied and the intended consequences. In Latin America the situation is very different, since, although nineteen countries in the region have enacted laws on personal data protection, there is no instrument with the characteristics of the GDPR. Transparency and the protection of individuals are fundamental in relation to DA making, but the complexity of the systems and the lack of understanding by users can make it difficult to comply with these requirements. It is therefore important that data controllers provide clear and accessible information about DAs, including the logic applied and the intended consequences. Monitoring and evaluation of the impact of these technologies is what is needed to identify potential risks and opportunities for improvement.

From all the above, responsible implementation of AD in public policies requires the definition of clear principles to guide their development and use, guaranteeing respect for human rights, privacy and non-discrimination. This highlights the urgency of implementing measures to protect personal data used in DA algorithms and the desirability of developing a Latin American data protection framework in the style of the European GDPR.

Conclusions

In the current landscape, characterized by rapid technological evolution and the increasing complexity of social challenges, AI is positioned as an inescapable tool for transformation and progress. Latin America, a region marked by inequality, is at a crossroads, so its responsible and ethical adoption in the public sector presents unprecedented opportunities to address these pressing issues and build a more prosperous future for its citizens.

The combination of AI and DA has the potential to automate tasks, analyze large volumes of data, optimize resources, and generate predictive information that makes them

invaluable resources for strategic decision making in various fields, especially in public policy.

In the landscape of AI, DA and anticipatory policies in Latin America, a picture of possibilities and challenges emerges, where the combination of AI and DA has the power to redefine the way public policies are formulated and executed, offering a more efficient and proactive response to citizens' needs. For your Public Administrations, adopting these technologies involves a collaborative approach in which overcoming ethical, technological and organizational challenges requires training, adequate technological infrastructure and sound regulatory frameworks.

The immediate future envisions a landscape where AI is further integrated into government decision making, where emerging technologies and deep learning promise new capabilities and greater transparency in decision processes. It is expected that AI and DA will continue to evolve with increasingly sophisticated applications in governance and that technologies such as deep learning can offer new capabilities and improve transparency and interpretation of results.

In terms of projections, AI has the capacity to further integrate into policymaking, transforming the way governments anticipate and respond to societal needs. As AI and AD technologies become more accessible and affordable, they will allow more governments to benefit from their capabilities, as they are tools with real potential to help close inequality gaps, improve public services and foster economic development in the region.

Bibliographic references

Administración Nacional de Usinas y Trasmisiones Eléctricas (15 de noviembre de 2023). Energía Inteligente en las redes de UTE. https://www.ute.com.uy/noticias/energia-inteligente-en-las-redes-de-ute

Andes, S. (2020). A Policy Maker's Guide to Artificial Intelligence for State and Local Governments: Reaching Safe, Effective and Equitable Scale. Block Center for Technology and Society, Carnegie Mellon University.

Anti-Fraud Knowledge Centre (31 de marzo de 2021). Sistema de alerta rápida SALER. Comisión Europea. https://antifraud-knowledge-centre.ec.europa.eu/library-good-practices-and-case-studies/good-practices/saler-rapid-alert-system_es

Avolio, M. (8 de agosto de 2022). Un proyecto argentino busca anticipar epidemias con inteligencia artificial. Periferia. https://periferia.com.ar/innovacion/un-proyecto-argentino-busca-anticipar-epidemias-con-inteligencia-artificial/

Berniell, L., Juncosa, F. y Bayle, F. (14 de diciembre de 2020). Tres herramientas basadas en IA e imágenes aéreas desarrolladas en Manos en la Data-Uruguay. CAF-Banco de Desarrollo de América Latina. https://www.caf.com/es/conocimiento/visiones/2020/12/tres-herramientas-basadas-en- ia-e-imagenes-aereas-desarrolladas-en-manos-en-la-datauruguay/

Boden, M. (2017). Inteligencia artificial. Turner.

Bruno, F., Cardoso, P. y Faltay, P. (2021). Brasil. Sistema Nacional de Empleo y la gestión automatizada de la desocupación laboral. Derechos Digitales.

Brynjolfsson, E., y McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company.

Centro Interdisciplinario de Estudios en Ciencia, Tecnología e Innovación (25 de febrero de 2022). ARPHAI implementa la Historia de Salud Integrada en Almirante Brown. https://www.ciecti.org.ar/arphai-implementa-la-historia-de-salud-integrada-en-almirante-brown/

Criado, J. I. (2021). Inteligencia artificial: madurez tecnológica, adopción e innovaciones en la gestión pública. En Colección Experiencias Escuela CLAD, Inteligencia artificial y ética en la gestión pública (pp. 13-44). Centro Latinoamericano de Administración para el Desarrollo.

Delprato, M., Perusia, J. C. y Paparella, C. (septiembre de 2023). Diagnóstico del abandono escolar en Mendoza. Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento. https://www.cippec.org/publicacion/diagnostico-del-abandono-escolar-en-mendoza/

FAIr LAC (s.f.). Abandono escolar. Banco Interamericano de Desarrollo. https://fairlac.iadb.org/piloto/abandono-escolar-jalisco

FAIr LAC (s.f). Deserción escolar. Banco Internacional de Desarrollo. https://fairlac.iadb.org/piloto/desercion-escolar-uruguay

FAIr LAC Jalisco (s.f.). Reporte final OlivIA IA for Her. C Minds, Gobierno de Jalisco, Tecnológico de Monterrey, Artificial Intelligence Hub y Grupo BID. http://oliviaforher.com/documentos/Resumen_Ejecutivo.pdf

Goodall, N. J. (2014). Machine ethics and automated vehicles. En G. Meyer y S. Beiker (eds.), Road Vehicle Automation (pp. 93-102). Springer.

Havas, A., Schartinger, D., y Weber, M. (2010). The impact of foresight on innovation policy- making: recent experiences and future perspectives. Research Evaluation, 19(2), 91- 104.

Jarek, K., y Mazurek, G. (2019). Marketing and artificial intelligence. Central European Business Review, 8(2), 46-55.

Keesara, S., Jonas, A., y Schulman, K. (2020). Covid-19 and health care's digital revolution.

New England Journal of Medicine, 382(23), e82(1-3).

Kratid (s.f.). Automatiseeritud KT-perfusiooniuuringud ajuinfarkti diagnostikas. https://www.kratid.ee/kasutuslood-kratid

LeCun, Y., Bengio, Y., y Hinton, G. (2015). Deep learning. Nature, 521(7553), 436-444. Leslie, D., Burr, C., Aitken, M., Cowls, J., Katell, M., y Briggs, M. (2021). Artificial intelligence,

human rights, democracy, and the rule of law: a primer. The Council of Europe.

Lipton, Z. C. (2018). The mythos of model interpretability. Communications of the ACM, 61(10), 36-43.

López Espinosa, J. N. (2019). Uso de técnicas de machine learning para la detección de fraudes en los contratos de obras públicas. Revista Chilena de la Administración del Estado, 2, 35-72.

López Vega, J. E., Becerra, V., Guzmán, M. A. y Landazuri Sandovala, J. K. (2023). Inteligencia artificial en la justicia colombiana: ¿la solución a la congestión judicial? Revista Lecciones Vitales, 1, 1-11.

Ministerio de Desarrollo e Inclusión Social (27 de noviembre de 2019). Midis implementa soluciones innovadoras para mejorar calidad de vida de población en pobreza o vulnerabilidad. https://www.gob.pe/institucion/midis/noticias/69960-midis-implementa-soluciones-innovadoras-para-mejorar-calidad-de-vida-de-poblacion-en-pobreza-o-vulnerabilidad

Ministerio de Salud (23 de mayo de 2018). Ministro de Salud presenta software que permitirá triplicar la cantidad de exámenes para prevenir la ceguera diabética.

https://www.minsal.cl/ministro-de-salud-presenta-software-que-permitira-triplicar-la-cantidad-de-examenes-para-prevenir-la-ceguera-diabetica/

Ministério do Desenvolvimento, Indústria, Comércio e Serviços (25 de septiembre de 2023). Suframa conhece 'Curupira' e 'Yara', projetos tecnológicos do Hub da UEA. https://www.gov.br/suframa/pt-br/publicacoes/noticias/suframa-conhece-curupira-e-yara-projetos-tecnologicos-do-hub-da-uea

Ministry of Housing, Communities and Local Government (2019). National evaluation of the Troubled Families Programme 2015-2020: Findings.

Nascimento Costa, J. (21 de agosto de 2023). Projeto Curupira, da UEA, vai ajudar no combate à derrubada de árvores. Universidade do Estado do Amazonas. https://www.uea.edu.br/index.php/2023/08/21/projeto-curupira-da-uea-vai-ajudar-no-combate-derrubada-de-rvores/

Orozco Aguirre, H. R, Lazcano Salas, S. y Landassuri Moreno, V. M. (2018). Simulación basada en agentes para el control inteligente de semáforos mediante lógica difusa. Pistas Educativas, 39(128), 1206-1223.

Pro Salud Chile (11 de septiembre de 2023). Minsal destaca plataforma DART para abordar una de las principales causas de ceguera en Chile: la retinopatía diabética. https://prosaludchile.cl/minsal-destaca-plataforma-dart-para-abordar-una-de-las-principales-causas-de-ceguera-en-chile-la-retinopatia-diabetica/

Reglamento (UE) 2016/679 del Parlamento Europeo y del Consejo. Protección de las personas físicas en lo que respecta al tratamiento de datos personales y a la libre circulación de estos datos.

Roa Avella, M. P., Sanabria-Moyano, J. E. y Dinas-Hurtado, K. (2022). Uso del algoritmo COMPAS en el proceso penal y los riesgos a los derechos humanos. Rev. Bras. de Direito Processual Penal, 8(1), 275-310.

Saad, O. M., Chen, Y., Savvaidis, A., Fomel S., Jiang X., Huang D., Oboué, Y., Yong, S., Wang, X., Zhang, X. y Chen, Y. (2023). Earthquake Forecasting Using Big Data and Artificial Intelligence: A 30-Week Real-Time Case Study in China. Bulletin of the Seismological Society of America 113(6), 2461–2478.

Tasende, M., Laborde, S. y Montesano, J. P. (s.f.). SPDE: Sistema Predictivo de Deserción Estudiantil. Agencia de Gobierno Electrónico y Sociedad de la Información de Uruguay. https://www.gub.uy/agencia-gobierno-electronico-sociedad-informacion-conocimiento/sites/agencia-gobierno-electronico-

sociedad-informacion-
conocimiento/files/documentos/publicaciones/Grupo%20Predictiva%20-
%20Sistema%20Predictivo%20deserción%20estudiantil.pdf

Telemedicina. Salud en línea (19 de enero de 2022). Verónica Xhardez de ARPHAI: "El orgullo de contar con desarrollos realizados en Argentina por argentinos". https://saludenlinea.com.ar/2022/01/19/veronica-xhardez-de-arphai-el-orgullo-de-contar-con-desarrollos-realizados-en-argentina-por-cientificos-y-cientificas-que- trabajan-en-el-pais/

Tööelu (19 de agosto de 2021). Avanes taotlusvoor mitteõppivate ja -töötavate noorte ning pikaajaliselt töölt eemal olnud inimeste tööturule aitamiseks. Tööinspektsioon. https://www.tooelu.ee/et/uudised/214/avanes-taotlusvoor-mitteoppivate-ja-tootavate-noorte-ning-pikaajaliselt-toolt-eemal

Topol, E. J. (2019). Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. Basic Books.

Valderrama, M. (2021). Chile. Sistema Alerta Niñez y la predicción del riesgo de vulneración de derechos de la infancia. Derechos Digitales.

Velasco Fuentes, P. y Venturini, J. (2021). Decisiones automatizadas en la función pública en América Latina. Una aproximación comparada a su aplicación en Brasil, Chile, Colombia y Uruguay. Derechos Digitales.

Xanthopoulos, J. (14 de junio de 2024). El impulso de los Sistemas de Alerta Temprana (SAT) en Argentina: un aliado para prevenir el abandono escolar. Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento. https://www.cippec.org/textual/el-impulso-de-los-sistemas-de-alerta-temprana-sat-en-argentina-un-aliado-para-prevenir-el-abandono-escolar/