# 5. RESEARCH ANNEX NATIONAL LANDSCAPE

LATAM SingularityNET Community

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## Argentina, Colombia and Mexico Artificial Intelligence Landscape

Welcome to the Annex of the LATAM SingularityNET Community's study on the national artificial intelligence scenario in Argentina, Colombia, and Mexico. From dissecting national strategies to evaluating infrastructure, educational pursuits, private sector engagement, civil society contributions, and diverse use cases, this annex provides a concise yet insightful perspective into the dynamic world of artificial intelligence across these three Latin American nations. Argentina's strategy emphasizes talent, infrastructure, and R&D. Colombia focuses on digital transformation and partnerships, while Mexico showcases a robust academia, government initiatives, and a flourishing entrepreneurial ecosystem leveraging AI.


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for **LATAM @SingularityNET Community**
Creating and growing a vibrant and high-spirited community of talented LATAM innovators for decentralized AI revolution

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## Overview

This annex serves to unveil a comprehensive analysis of the national artificial intelligence landscape in Argentina, Colombia, and Mexico. Dive into an intricate exploration encompassing key facets: national strategies, infrastructure assessment, educational endeavors, the dynamic involvement of private sectors and civil society, and a rich tapestry of AI use cases unique to each country. This collective effort aims to offer an illuminating glimpse into the evolving AI ecosystems across these vibrant nations.

**1. AI National Strategy:** Unveiling the foundational blueprints guiding the advancement of AI within Argentina, Colombia, and Mexico, this section dissects the pivotal strategies formulated by respective governments. These strategies serve as roadmaps, elucidating the vision, objectives, and policies aimed at fostering AI innovation and implementation.

**2. Infrastructure and connectivity:** An in-depth analysis of the technological infrastructure supporting AI development forms the cornerstone of this segment. Evaluating the technological backbone, including computing resources, data repositories, and connectivity, unveils the robustness and readiness of each nation in harnessing AI capabilities.

**3. Academy:** Charting the educational landscape, this section provides an exhaustive inventory of academic programs and initiatives in AI across universities and educational institutions within Argentina, Colombia, and Mexico. It highlights the educational frameworks nurturing the next generation of AI talent.

**4. Contribution of the Private Sector and Civil Society**: Examining the pivotal role played by private enterprises and civil society organizations, this segment scrutinizes their involvement in propelling AI innovation. Insights into collaborative efforts, investments, and initiatives aimed at leveraging AI for societal advancement are outlined herein.

**5. Use Cases by Country:** Diving into the practical application of AI, this section presents a diverse array of use cases prevalent within Argentina, Colombia, and Mexico. From industries like healthcare, finance, agriculture, to governance and beyond, each country's unique implementation scenarios shed light on the transformative impact of AI.

# Argentina

**AI National Strategy:** The National AI Plan, which is part of the Innovative Argentina 2030 Plan and the Digital Agenda 2030, was incorporated at the end of 2019 into the national objectives and efforts to outline a digital integration strategy.

This document is the result of a process of consultations with different actors in thematic tables and meetings (Conference on Artificial Intelligence, 2019). With the aim of building capabilities so that Argentina assumes a leading role in technology to promote local development, instead of simply being a consumer of external technologies and advances.

The plan lays the foundations and lines of action focused on promoting talent; data; supercomputing infrastructure, R&D&i (Innovation, Development and innovation); implementation in the public and private sectors; impact on work; ethics and regulation; international linkage, and innovation laboratory. The project has the status of state strategy and policy and has been one of the only policies that has not been affected in the transition of governments.

**Infrastructure and connectivity:** The country has digital infrastructure that allows innovation in the use and consumption of technologies. The World Bank Digital Adoption Index (2019) considers that Argentina has reached 69% of a total technological adoption level; More than 74% of its population has access to the internet, the speed of download is higher than the world average and there are 1.3 mobile phone subscriptions per inhabitant (World Bank, 2019). Regarding the development of 5G, Argentina began technical tests since November 2017 (GSMA, 2019), although due to the magnitude of the legal and infrastructure adjustments, it is expected that the commercial use of this technology will only materialize in 2021 or 2022.

Despite its strengths, according to the Network Availability Index (NRI) of the World Economic Forum, Argentina ranks ninth in the region and 89th among 139 countries in the world in terms of willingness to take advantage of the opportunities offered by Network Technologies. Information and Communication (ICT) (WEF, 2017). Among the indicators that affect its position are the low effectiveness of its legislative bodies, the high cost of cell phones, the moderate success of the government in promoting ICT and the low government adoption of advanced technologies (WEF, 2017). According to the GSMA Intelligence Consumer Survey (GSMA, 2016), income inequality is a barrier to digital inclusion in

Argentina. Nearly 30% of people without an internet connection surveyed consider that the price of equipment and services represents a barrier to their adoption.

Likewise, according to the IDB Broadband Accessibility Index (measures the percentage of income that a basic broadband connection represents for the 40% of the population that receives the least income), citizens of the LAC region allocate 10% of their monthly inflows to fixed or mobile broadband, while in OECD countries the figures are 2% (mobile broadband) and 3% (fixed broadband) (IDB, 2020). In terms of cybersecurity, the International Telecommunications Union (ITU) grants Argentina a score of 0.407 out of 1, placing it in 11th place out of 33 in the Americas region and 94th out of 175 in the world.

**Academia:** Argentina is one of the LAC countries whose basic education curricula integrate specific objectives and subjects on basic computer knowledge (GSMA, 2016). This allows young people to acquire from an early age the minimum skills and understanding of the potential of using technology. Although AI is a topic present in university programs, there is little transversality outside of engineering areas. Business and economics degrees constitute an area of opportunity for the study and use of AI. According to the QS World University Rankings (2019), the five best universities in Argentina are located in the capital and only one of them is public. Although this represents an obstacle regarding the scope of capacity building and accessibility to AI-related careers, there are also quality free institutions in other regions of the country that offer relevant programs for the development of the ecosystem. In such universities there are not only AI-related curricula, but also research to develop capabilities and train talent in the country.

**Other relevant institutions:** Other relevant institutions in this field also operate in Argentina: (i) the National Institute of Agricultural Technology (INTA), an educational center with international coverage that focuses on technological innovation in the agricultural sector; (ii) the National Scientific and Technical Research Council (CONICET), the country's main body dedicated to the promotion of science and technology with researchers in different branches of AI; and (iii) the National Agency for the Promotion of Research, Technological Development and Innovation, from which it connects to researchers, projects and funds dedicated to these topics. The last two organizations depend on the Ministry of Science, Technology and Innovation. Likewise, the efforts of the Center for Studies in Technology and Society (CeTyS) of the University of San Andrés stand out, through which the preparation of a series of documents is being facilitated within the framework of the GuIA Project (seven publications) for the public of “He speaks Spanish”. These allow the consolidation of a base dedicated to the reflection and implementation of principles and

instruments for AI and digitalization policies. The authors participating in this exercise come from Argentina, Colombia, Chile, Mexico, Uruguay, and Trinidad and Tobago. Finally, the Artificial Intelligence, Philosophy and Technology Research Group (GIFT) brings together academics from various disciplines whose contributions contribute to a better understanding of the ethical problems that arise around exponential technologies such as AI. Within the framework of the CETyS GuIA Project, this group participated with the research “Humanistic toolbox.” It presents a series of philosophical reflections aimed at clarifying the nature of AI and its relationship with human intelligence, as well as a review of recent literature on the main ethical risks associated with this technology.

**Contribution of the Private Sector and Civil Society:** Argentina is one of the countries with the most emerging companies dedicated to AI (Costa, 2019). Since the creation of the Entrepreneurship Law, efforts have focused on using AI technologies, including machine learning and deep learning. Examples of impact ventures that take advantage of AI include Bandit, dedicated to the area of human resources. It has designed a tool that empowers and enhances recruitment processes by establishing the best skills of workers and the needs of companies. Other startups have spun off from there, including EmiLabs, a recruiting platform that recently raised USD $2 million (López, 2019). Regarding the social sector, initiatives have emerged that are laying the foundations to promote an ecosystem that takes advantage of AI for social good. Some of these are briefly described below.

• Argentine Artificial Intelligence Foundation: It is a non-profit organization that promotes the development of a sustainable AI ecosystem to generate impact in Argentina and the world. The foundation encourages dialogue on the topic, as well as the dissemination, promotion and linking of AI topics and projects. https://iaar.site/

• Argentine Computer Science Society (SADIO): Created in 1960, SADIO's objectives are to identify, unify and expand knowledge of the sciences and techniques of information processing, as well as the practice of objective and quantitative methods for decision making. It also conducts numerous courses and workshops that mainly focus on data analysis through machine learning, AI applications and development of programming capabilities, among others. http://www.sadio.org.ar

• Chequeado: It is considered a reliable organization when it comes to data verification. Together with Africa Check, Full Fact and the UK's Open Data Institute, it received funding from Google to use AI to detect disinformation and fake news campaigns. https://chequeado.com/acerca-de-chequeado/

Last December 6, 2023, INTA awarded two innovative developementsin the use of AI in the AGRO sector that use artificial intelligence.
https://www.argentina.gob.ar/noticias/el-inta-premio-ideas-innovadoras-para-el-agro

1. - Agricultural autonomous capsules (CAAS). Development of Agricultural Autonomous Capsules (CAAS) that operate for measurement and/or control of actuators in production areas. The interaction of these devices would allow the deployment of a wide range of solutions: frost detection, alert and control, soil variables, optimization of water and fertilizer use, plot characterization (hours of sunshine, salinity, humidity), crop modeling, plots and soils, use of data with Artificial Intelligence. Developed by the Patagonia Innovation Node.

2. - BioTango has the mission of developing a new standard in fruit production. This is a platform that will provide recommendations to producers during the campaign in order to optimize performance and production return. These recommendations are made based on artificial intelligence that combines information from the DNA of the fruit trees, climatic data and characteristics of the productive forest. Developed by the Patagonia Innovation Node.

**Use cases:** Below is a synoptic table of the main use cases of AI in Argentina.

**1. Amanda Care** www.amanda-care.com
Year they started using AI: 2019 / SDG: 3 (health and well-being)
Actors involved: insurers, hospitals and corporations pharmaceutical
Current Status: Early Stage Startup

What is proposed: Optimize monitoring and follow-up practices between medical staff and patients. Amanda Care is a virtual assistant designed to monitor a large number of patients to prevent health problems. Like a personal assistant, Amanda makes sure to connect patients with doctors using messaging tools already adopted by users such as WhatsApp and Facebook Messenger, among others. Amanda improves patient length of stay and protocol compliance while reducing healthcare costs.

AI Applications: Natural language generation, natural recognition, virtual agents, machine learning, AI-optimized hardware, decision making, and natural language processing.

How they use AI: Amanda Care's software uses machine learning to manage a natural conversation with the user and identify the best contact strategy (Facebook, WhatsApp,

among others) according to their preferences. When reviewing those conversations, Amanda follows each entry in its context, identifying any deviations

**2. DYMAXION LABS** www.dymaxionlabs.com
Year they started using AI: 2018 / SDGs: 1 (end poverty), 2 (zero hunger), 11 (sustainable cities and communities), 13 (climate action), 16 (peace, justice and strong institutions) and 17 (partnerships to achieve the goals)
Actors involved: Dymaxion Labs Current status: emerging company in consolidation stage.

What is proposed: Optimize the distribution of resources through evidence-based decision making. Brief description of the project: Structure, collect and analyze geographic satellite data to support decision-making on the use of resources, for which it intelligently installs Internet of Things (IoT) sensors. It also shortens project development times to incorporate irregular settlements into urban planning. Allows you to experiment and validate hypotheses quickly and economically.

AI Applications Machine learning platforms, AI-optimized hardware, decision making, image recognition.
How they use AI: Dymaxion uses AI and computer vision to analyze geospatial data in satellite images. Depending on the image, stored in different databases to understand how climate change evolves or what variables are relevant to the topic.

**3. Kilimo** https://www.kilimo.com.ar/
Year they started using AI: 2015
SDGs: 2 (zero hunger), 6 (clean water and sanitation), 12 (responsible production and consumption) and 13 (climate action)

Actors involved: Kilimo Current status: company in scaling stage
What is proposed: Given that agriculture consumes 70% of the freshwater available in the world, Kilimo seeks to optimize its use to avoid waste. Brief Project Description: Kilimo helps farmers optimize water use through customized irrigation programs, which in turn reduces costs. Kilimo manages to reduce the use of water used in crops by up to 40%. In 2019 alone, savings of 15 billion liters of water were achieved in 50 thousand hectares. It currently has operations in Argentina, Chile, Uruguay, Paraguay, Peru, Brazil and the United States (Kilimo is a private company incorporated in the United States with two subsidiaries, an Argentine company and another a Chilean one).

AI applications Machine learning platforms, data science and satellite image identification. How they use AI Based on field data, satellite images and large historical databases, the machine learning model makes it possible to estimate the crop's water consumption for seven days and offer periodic advice on the amount of irrigation.

**4. Laura**
For more information: n.d. Year they started use AI: 2019
SDG: 16 (peace, justice and strong institutions)
Actors involved: Ministry of Finance of the Province of Córdoba
Current status: government project in initial stage

What is proposed: Close the gap between citizens and government to create faster and more efficient processes that promote good democratic practices. Brief description of the project: Laura is a software that allows you to automate tasks in bureaucratic procedures, managing them in a more efficient and agile way. One of these tasks is the verification of retirement contributions in Anses (Federal Administration), a procedure that an employee must complete to begin managing the provincial retirement.

AI applications Process automation
How they use AI: The software connects with the Anses database to check the pension situation of a potential beneficiary, verifying key information such as years of contributions and salaries. In this way, Laura establishes whether a national or provincial benefit corresponds and determines the retirement benefit. It also allows the existence of possible incompatibilities to be detected more quickly.

**5. Promethea** https://ialab.com.ar/
Year they started using AI: 2017
SDG: 8 (work and economic growth), 9 (industry, innovation and infrastructure), 11 (sustainable cities and communities) and 16 (peace, justice and strong institutions)
Current status: government project in initial stage

Actors involved: Faculty of Law of the University of Buenos Aires, Public Prosecutor's Office of the Autonomous City of Buenos Aires
What is proposed: Strengthen the rights of citizens, particularly with gender violence.
Brief description of the project: Prometea is part of the IALAB of the Government of Argentina and allows the process of reporting gender violence to be accelerated and made more efficient by automating steps of the administrative procedure through online platforms.

AI applications: Natural language generation, natural recognition, virtual agents, robotic process automation, natural language processing, image recognition.

How they use AI: Prometea uses machine learning techniques; operates as an expert system to automate document creation, perform intelligent searches, and assist in data control. It also has an intuitive and friendly interface that allows you to “talk” to the system or chat.

**6. Anyone.AI** https://anyoneai.com/
Year they started using AI: 2020
SDG: 4 (quality education), 8 (work and economic growth), 9 (industry, innovation and infrastructure)

Actors involved: GFC -Global Founders Capital, Canvas Ventures, Latitud Fund
Current status: Onboarding Students.
What is proposed: Invest in people from Latin America, preparing them for the jobs of the future, and thus solve the existing talent shortage in the field of AI.
Brief description of the project: Invest in Latin American talent to close the AI talent gap. Develop an intensive training program designed by industry experts to provide potential young people with all the tools they need for their future as an AI developer.

How they use AI: Educational tools for personal transformation and strengthen AI development in the LATAM region.

**Conclusions:** Argentina is a pioneer country in the adoption of AI in LAC. Its AI strategy—still to be consolidated—will be an instrument that contributes to strengthening the AI ecosystem in the country. Likewise, the Future Commission is promoting the continuity of tools and the digital strategy. Argentina is a country with a significant history of AI research, both carried out by its main universities and external research centers.

The latter have gained prominence and at least three of them (INTA, CONICET and the National Research Promotion Agency) are dedicated to promoting the development and implementation of AI. The participation of these institutions is an element that distinguishes Argentina from other countries in the region. In the private sector, the entrepreneurship ecosystem has the largest number of emerging companies dedicated to AI, thanks to legal support and the participation of angel investors and capital funds. For its part, civil society has already made some specialized efforts in promoting AI and exhibits cases of use of AI for social good that are at different degrees of maturity.

## Colombia:

**AI National Strategy:** At the end of 2019, the Colombian government approved the National Policy for Digital Transformation and AI. According to the MinTIC, its objective is to promote the strategic use of digital technologies in the public and private sectors. This is expected to boost productivity and promote the well-being of citizens. This policy seeks to create international alliances for innovation, the design and execution of initiatives that promote entrepreneurship and digital transformation. Its priorities are the creation of an AI market in the country and the attraction of international talent.

As part of one of the strategies of the National Development Plan 2018-2022, the government of Colombia, through the MinTIC, granted 25,000 public officials full scholarships on the Coursera and Platzi platforms to strengthen their technological skills through five courses. about AI and digital transformation.

**Infrastructure and connectivity:** In Colombia, a little more than half of the population (62%) has access to the internet. The country has made progress of 64% in its transition towards digitalization, according to the World Bank Digital Adoption Index (2019). Regarding the Network Availability Index, Colombia obtains 49% readiness. In the International Telecommunication Union's 2018 Global Cybersecurity Index, Colombia obtains a score of 0.565/1, which places the country in 7th place out of 33 in the Americas and 73rd out of 145 in the world.

**Academia:** Of the top five Colombian universities according to the QS World University Ranking (2019), the majority offer technical degrees and postgraduate degrees that form competencies for the development of AI technologies. As in the Chilean case, three of the five most important universities in the country are private, which represents a challenge for the access possibilities of the general population. These educational centers are concentrated in the northwest region of the country, which could constitute a limitation in the same sense (QS World University Rankings, 2019).

In Colombia, intersectoral alliances are common. Some of the AI centers listed above receive support through, for example, the MinCiencias (formerly the Administrative Department of Science, Technology and Innovation-Colciencias). This, together with MinTic, develops and implements AI projects in which universities and private actors such as the Bancolombia Group also participate.

**Other relevant institutions:** Colombia has numerous research institutions that seek to advance knowledge of AI. Among them are the International University of La Rioja-Colombia (UNIR), which offers a master's degree in AI, and the University of Medellín which, through the Systems Engineering and Telecommunications Engineering Research Group, leads a line of research on AI for various programs. On the other hand, there is the Industrial Technological Innovation Center of Colombia (CITIC) of the Ibero-American University Foundation (FUNIBER), which has the support of the Colombian Family Subsidy Fund (Colsubsidio). Its purpose is to exponentially expand the innovation of Colombian companies from a technological perspective, both in their products and in their processes.

**Contribution of the Private Sector and Civil Society:** Of the countries included in this report, Colombia is the most competitive: it ranks 28 out of 140 in the World Economic Forum's Global Competitiveness Index (2018). At the same time, it is one of the LAC countries that shows the greatest advances in ventures that take advantage of AI. One of the most notable examples is Rappi, the first Colombian technological unicorn. This is a home delivery service for products in nine LAC countries. Among other ways to leverage AI, Rappi developed and implemented its own digital banking using FinTech to combat the barrier to access financing that prevails in Colombia. Another innovative example is NUXTU, https://www.nuxtu.co/ which uses AI to emulate and enhance the reach of human senses of taste and smell through electronic nose and taste buds. According to local experts, among the main drivers of entrepreneurship are both the national government and subnational administrations, which have favored the creation of companies through a flexible legal framework and tax incentives.

Colombia.AI: This is a community of experts, learners, and machine learning enthusiasts who, as volunteers, spread data science and AI. Through free monthly talks and workshops, Colombia.AI shares knowledge, learnings and experiences around technologies that harness the power of data. Its purpose is to unite industry and academia to contribute to the growth and development of AI in Colombia. This community currently has more than 5,700 members in two cities: Bogotá and Barranquilla.

Center for the Fourth Industrial Revolution of the World Economic Forum (WEF): This center, located in Medellín, is the first of the WEF in Latin America and the fifth worldwide, along with those in San Francisco, Tokyo, Beijing and Mumbai. This center strengthens Colombia's agenda for the development of policy frameworks on AI, blockchain and the internet of things. It also seeks to disseminate the benefits and mitigate the risks of emerging technology. To achieve this, it brings together governments, leading companies, CSOs and

experts from around the world in an effort to co-design and test innovative policy and technology approaches to governance, as well as to develop pilots.

Ruta N: This company emerged in 2009 as a center of innovation and business in Medellín. Its purpose is to contribute to improving the quality of life of the city's inhabitants through science, technology and innovation. Its vision aims to transform Medellín into a city where innovation is the main driver of the economy. To achieve this, it attracts talent, capital and global companies to the city; strengthens the innovative and entrepreneurial business fabric; and generates CTi solutions for the challenges facing Colombia's second city. Ruta N also houses the Center for the Fourth Industrial Revolution of the WEF.

Regarding the efforts of civil society organizations (CSOs), some of these focus on the issue of digital rights. For example, the Karisma Foundation works to promote human rights in the digital world. Another foundation, Digital Rights of Latin America, has among its purposes to integrate good use of AI in public discourse in Colombia. This is a non-governmental organization that fights to democratize new technologies and promote the use of a more open, secure and respectful of human rights Internet.

**Use cases:** Below is a synoptic table of the main cases of use of AI in Colombia.

**1. 1DOC3** www.1doc3.com
Year they started using AI: 2015
SDG: 3 (health and well-being), 4 (quality education) and 10 (reduction of inequalities)
Actors involved: 1DOC3 Current status: emerging company in scaling stage.

What is proposed: Given that in the LAC region there are only 1.9 doctors per 1,000 inhabitants, and that only 5% of the population can afford private health insurance, 1DOC3 offers the first level of primary access to health through technology. Brief Description of the Project: 1DOC3 is a digital platform that offers virtual medical guidance so that anyone can consult online, ask questions or chat with a doctor for an affordable price, or consult reliable information for free. 1DOC3 is available throughout the Spanish-speaking world and serves one million people a month.

AI applications Natural language generation, decision making, natural language processing. How they use AI: The 1DOC3 model is trained with data from medical encyclopedias, external medical libraries and medical tags created by more than 400 doctors, as well as with the questions and answers that circulate on the platform.

**2. Trabajos de Paz** http://www.atrabajosdepaz.co/
Year they started using AI: 2008
SDG: 16 (justice, peace and stronger institutions)
Actors involved: Quantil Current status: government project and emerging company in scaling stage.

What is proposed: Facilitate citizen understanding of the legal documents arising from the "Colombia Peace Agreements" in order to democratize their compliance.
Brief description of the project: The government of Colombia and the Revolutionary Armed Forces of Colombia (FARC) signed the "Agreement for the termination of the conflict and the construction of a stable and lasting peace." It is a long and difficult document to read, which is why Quantil created an algorithm that analyzes the text and can answer specific citizen questions with graphs and concise answers.

AI Applications Natural Language Processing.
How they use AI: Quantil built mathematical models in the task of developing a series of algorithms and searchable services on the web that facilitate the study of the agreement in an efficient and intuitive way. The algorithm analyzes text and generates images, text and graphics to answer questions, such as:

Q: Does the agreement talk about prison sentences?
A: Yes, in Point 5

**3. SISBÉN (**Beneficiary Selection System for Social Programs) https://www.sisben.gov.co/
Year they started using AI: 2019
SDG: 1 (end of poverty)
Actors involved: National Planning Department, Governments, Mayors
Current status: government project in escalation stage

What is proposed: Improve the distribution of social program resources.
Brief description of the project: SISBÉN is the national survey that Colombia uses to obtain reliable and up-to-date socioeconomic information on less advantaged groups throughout the country's national territory. This allows the population to be classified according to socioeconomic levels to optimize the distribution of resources from social programs.

AI applications Support in decision making
How they use AI: Through the survey, a machine learning model (Quentile Gradient Boosting) is applied to identify potential beneficiaries of social programs. The Sisbén IV methodology allows us to identify not only the population in a state of income poverty, but also multidimensional poverty.

**4. ARKANGEL**

https://www.arkangel.ai/
Year they started using AI: 2018
SDG: 3 (health and well-being), 4 (quality education) and 10 (reduction of inequalities)
Actors involved: José Zea and Laura Velásquez,Novartis, AstraZeneca, Unicef, Abbot, Merck, Fundación Santa fe de Bogotá or the Barraquer Clinic.
Current status: emerging company in scaling stage.

Arkangel AI: algorithms that save lives.
https://twitter.com/ArkangelAi / https://github.com/arkangelai
See What's Possible / Explore what's possible with some example applications for common use cases. https://arkangel.ai/templates

AI Applications:Transforming disease detection from the ground up, making it faster, cheaper and better.
How they use AI: It is a platform aimed at the health sector that operates under the service model and uses algorithms that allow it to transform its clients' data into predictive models, automatically. The platform converts medical data into AI algorithms, without code. The data used includes images, tabulated data, texts, video, voice, among others.

In the News / Arkangel AI: algoritmos que salvan vidas

**Conclusions:** In the coming years, in line with its National Development Plan, Colombia intends to produce very significant changes based on the use of technology. One of its main goals is to democratize the internet and achieve a full coverage network in the country. With the Open Data Portal, and with the infrastructure of 5G antennas and prototypes, it is intended that the adoption of AI can be carried out in a more organic way. In addition, the country is a pioneer in the implementation of an AI strategy by the government. Unlike other nations in the region, Colombia is already executing its AI development and adoption plan at the national level.

In the field of academia, both universities and research centers have prepared different studies on AI and its applications. In turn, these centers work jointly with the business and government sector, as demonstrated in cases such as Ruta N and the Center for the Fourth Industrial Revolution of the FEM, both promoted by the government through support and financing policies. . It should be noted that it is not only the private sector that has an interest in contributing to the implementation of AI. Civil society organizations have launched initiatives that promote the use of AI, and at the same time have addressed the ethical and legal conditions of the adoption of this new technology.

## México:

**AI National Strategy:** Mexico has a flourishing and prosper AI landscape with advancements in various sectors like automotive, healthcare, and finance. Government initiatives and partnerships with academia and industry drive AI growth.

**AI Strategy:** Based on the EDN, in 2018 the Mexican government presented the first outline of the MX AI Strategy 2018 with a view to laying the foundations for its development in the country. This is how Mexico became one of the first ten nations where the public sector has carried out actions to advance the development of AI (Martinho-Truswell 2018).

In addition to the diagnostic document, the Coordination of the National Digital Strategy (CEDN), in collaboration with the Digital Government Unit of the Ministry of Public Administration and the AI Subcommittee of the Intersecretarial Commission on Electronic Government, developed and launched a broad consultation and published the General Principles and the Impact Analysis Guide for the development and use of systems with elements of artificial intelligence in the Federal Public Administration in Mexico, the first LAC country to carry out an effort of this nature.

Based on the recommendations made in the aforementioned national AI strategy, and seeking the continuity of these efforts, in mid-2018 more than 10 institutions created the multi sector coalition IA2030MX. This is an alliance made up of professionals, academic institutions, established and emerging companies, public agencies and other key actors in the digital and AI ecosystem in Mexico, with the aim of conducting concrete actions in this field. The first activity consisted of carrying out the first National AI Survey, which had the participation of more than 1,500 people. They are currently working on the formulation of a new proposal for a National AI Strategy organized into six working groups by themes: (i) ethics; (ii) governance, government and public services; (iii) research and development; (iv) skills, abilities and education; (v) data, digital infrastructure and cybersecurity; and (vi) Mexicans abroad. These groups are co-led by recognized institutions, including the UNAM Complexity Sciences Center, the Mathematics Research Center (CIMAT), C Minds, the Scientific and Technological Consultative Forum (FCCyT), the Plenum Group, the Federal Institute of Telecommunications (IFT), the Ministry of Economy (2018-2024), the Ministry of Foreign Affairs (2018-2024) and the Mexican AI Society (SMIA). The result of this collaborative work of more than 180 coalition members, coordinated by C Minds, is expected in mid-2020 (Gómez-Mont, Martínez Pinto and Del Pozo, 2019).

Among the relevant efforts at the state level, the AI agenda developed by the Government of Jalisco stands out, the first in the country—and one of the first subnational governments in LAC—to have an AI direction to take advantage of this technology. with a focus on government innovation.

**Infrastructure and connectivity:** In Mexico, 66% of the population has access to the internet (UNESCO, 2019). Although efforts are still needed to expand coverage and offer this service to a greater number of inhabitants, the country is already working on the bidding for frequencies to launch 5G services at the end of 2020 (Jaimovich, 2019). The World Bank's Digital Adoption Index gives Mexico a score of 60.11, placing it in seventh place of the 12 countries considered here. The same in the Network Availability Index of the World Economic Forum: seventh among the 12 considered here and 76 among the 139 countries in the world that are part of this ranking. Although Mexico does not yet have all the structural capabilities to take advantage of the opportunities offered by ICT, current efforts, as well as those presented in this document, promise to promote development in this field to achieve greater technological capabilities in the coming years.

Currently, Mexico is making efforts to reduce the digital divide and facilitate greater coverage and connectivity for citizens. Among such efforts is the recent creation of the Federal Electricity Commission (CFE) Telecommunications and Internet for All, a new government company that aims to achieve connectivity throughout the country. On the other hand, although Mexico City, along with the states of Jalisco, Nuevo León and Querétaro, are among those that are formulating, its own connectivity strategies, the country must address the challenge of making technology and access to a network affordable for the majority of citizens. According to a survey carried out by GSMA (2018) for Latin America, around 30% of people without an internet connection consulted in several countries - including Mexico - expressed that the price of equipment and services constitutes a barrier to its adoption (Connected Society: digital inclusion in Latin America and the Caribbean, 2016).

In the area of cybersecurity, the country obtains a score of 0.629/1 in the 2018 Global Cybersecurity Index of the International Telecommunications Union (ITU), which places it in 4th place out of 33 in the Americas and 63 in 145 in the world.

**Academia:** In Mexico, both the educational offer and research in areas related to the development of AI are extensive. Among the academic strengths is the capacity of universities to absorb a large number of students in free programs offered by institutions such as the Tecnológico Nacional de México (TecNM), made up of 266 institutions in the 32

states of the Republic; the National Autonomous University of Mexico (UNAM); and the National Polytechnic Institute (IPN). All of them have headquarters or research centers in different parts of the country. Regarding private education, in recent years the offer of careers and postgraduate programs in branches such as data science and specializations in AI has expanded significantly.

Other relevant institutions: The National Council of Science and Technology (CONACYT) is a public and autonomous body within which there is a consortium specialized in promoting AI research and implementation projects. In addition, Mexico has the Artificial Intelligence Research Center (CIIA) of the Universidad Veracruzana, one of the oldest (founded in 1994). There is also the Mexican Society of Artificial Intelligence (SMIA), which is responsible for various publications and coordinates the Annual International Mexican Congress of Artificial Intelligence (MICAI), and the Mexican Academy of Computing (AMEXCOP), focused especially on AI research. Finally, the National Institute of Astrophysics, Optics and Electronics (INAOE) offers a specialized postgraduate course in which the current and future uses of AI are explored.

On the other hand, there is the Center for Research and Advanced Studies (CINVESTAV), a Mexican public institution specialized in the development of science and technology, and in research and postgraduate training in STEM. It had the first AI program in the country in 1981. In turn, CentroGeo is a public research entity integrated into the CONACYT system dedicated to scientific research, the training of high-level academics, and technological development and innovation. . focused on geospatial information sciences. Similarly, the Ensenada Scientific Research and Higher Education Center (CICESE), in Baja California, is a regional entity that is organized into research groups in the areas of parallel and distributed computing; image processing and vision; scientific computing; process engineering, and software and artificial intelligence. It is worth mentioning that Mexico has a developed program to promote supercomputing that has facilities at the Autonomous University of Puebla and at CINVESTAV-IPN, among other places; Likewise, state AI research centers have recently been established, one of them in Jalisco and another in Yucatán; It also records efforts such as that of the AI headquarters of the Tecnológico de Monterrey, the Mexican National Institute of Artificial Intelligence (MICAI), and the Mexican Academy of Computing (AMEXCOP), focused especially on AI research. Finally, the National Institute of Astrophysics, Optics and Electronics (INAOE) offers a specialized postgraduate course in which the current and future uses of AI are explored.

For all of the above, Mexico's academic sector is considered to be one of the most advanced in artificial intelligence in Latin America.

For more information, https://www.cinvestav.mx/ / https://www.centrogeo.org.mx/ / https://www.cicese.edu.mx/

**Contribution of the Private Sector and Civil Society:** The Mexican entrepreneurship ecosystem in AI issues has boomed in recent years. Among the most notable emerging companies are Prosperia Labs, Artificial Nerds, Quantum Labs and other established companies such as Nearshore Solutions, Bluemessaging and Territorium Life. All of them offer different types of services aimed, in some cases, at the efficiency and automation of processes, and in others, at the resolution of social challenges using AI systems.

Although Mexican impact entrepreneurs share challenges similar to those of the rest of the region, at the same time they have taken advantage of the growing interest in the benefits of this technology, as well as the existence of better articulated communities of practice. There are also social organizations such as The Data Pub, a community focused on data science, AI.Saturdays and De Cero a Ciencia de Data, groups based in Guadalajara that work on the training of specialized talent and that coexist closely with entrepreneurs seeking to articulate larger scope projects. A notable example of these collaborative efforts between sectors is the signing of an agreement between the

Ministry of Foreign Affairs and the National Autonomous University of Mexico (UNAM), whose purpose is to develop AI-driven solutions in favor of vulnerable migrant communities. another of

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**Artificial Intelligence At The Service Of The Social Good In Latin America And The Caribbean**

The relevant UNAM projects consist of setting up an AI laboratory with the support of Microsoft. Local efforts include the Global Shapers Mexico City Hub general perception survey on AI; the WEF youth community, which explored and identified examples of AI initiatives for social good; and TalentLand, a consortium of which the government of the State of Jalisco and various allies (universities, local governments, industry, civil society) are

part, based in Guadalajara and which since 2017 has brought together more than 60,000 young talents each year in a week of talks, hackathons, and conferences about the use of emerging technologies such as AI.

Examples of AI for social good include the work of organizations such as C Minds, a women-led institution dedicated to innovation that seeks to accelerate the positive impact of new technologies in Mexico and the region. C Minds has promoted AI initiatives for social good since 2017. She was institutional co-author of the study that led to the development of the Federal Administration's 2013-2018 national AI strategy, and co-founder of the National AI coalition in Mexico, IA2030Mx, and the first AI center for social good in the country (fAIr Jalisco), together with the IDB Group, the Government of Jalisco and the Tecnológico de Monterrey, among other initiatives. It has also developed tools, guides and regulatory frameworks for the responsible use of AI in Mexico and other LAC countries.

Organizations such as SocialTic, R3D: Network in Defense of Digital Rights and the NGO Digital Rights have played a central role in defending data privacy, protection and promotion of rights in digital environments, and discussions on ethical issues, including the opportunities and challenges that arise from facial recognition technologies.

**Use cases:** Below is a synoptic table of the main AI use cases in Mexico.

**1. CEDO Intercultural** cedo.org
Year they started using AI: 2017
SDG: 13 (climate action)
Actors involved: Department of Marine and Coastal Sciences of the Autonomous University of Baja California Sur, Udall Center for Public Policy Studies of the University of Arizona and the Department of Marine Ecology of the Center for Scientific Research and Higher Education of Ensenada. Current status: NGO in consolidation stage.

What is proposed: Mitigate the impact of climate change on marine life.
Brief description of the project: The CEDO platform allows the analysis of available information on climate change to determine how the media frames this science and the adaptation strategies of the coastal states of Mexico. This in order to offer officials responsible for making decisions on resource management an overview of the level of understanding and acceptance of the information by local fishermen, given the influence that these reports have on the development and application of the politics.
AI Applications Machine learning, AI-optimized hardware, emotion recognition.

How they use AI: To train and build topic models, CEDO uses natural language processing. It also applies Latent Dirichlet Allocation (LDA), an unsupervised machine learning approach in which no information is provided about how articles should be classified and set pre interpretations are not applied to identify groups of words that can be considered as frames, but rather which is based rather on the co-occurrence of words. The trained model is included in a dashboard that presents the study results graphically and allows it to be used to classify additional texts.

**2. Doc.com** https://www.doc.com/
Year they started using AI: 2012
SDG: 3 (health and well-being), 4 (quality education), 5 (gender equality), 10 (reduction of inequalities)
Actors involved: Doc.com (ex Docademic) Current status: Early-stage startup
What is proposed: Facilitate access to health services.
Brief description of the project: Doc.com is an online platform that quickly and efficiently resolves patient questions through its “medical advice” product. With this tool, any type of doubt can be resolved by consulting a health professional without necessarily requiring a complete medical consultation. Doc.com offers medical guidance and psychological support services to the Spanish-speaking world. To date it has served more than 250,000 people.

AI applications: Virtual agents, AI-optimized hardware, decision making, deep learning, emotion recognition, marketing automation.
How they use AI: Using recommendation systems—an AI technology—patient input is used to compare it with databases and make medical diagnoses.

**3. Unima** www.unimadx.com
Year they started using AI: 2016
SDG: 3 (health and well-being), 8 (work and economic growth) and 11 (sustainable cities and communities)
Actors involved: Unima Current status: Early stage startup
What is proposed: Solve the lack of access to medical services.
Brief description of the project: Unima developed a low-cost device that allows doctors, nurses and healthcare workers to diagnose diseases directly at the point of care in less than 15 minutes and for the cost of USD 1 per test.

AI Applications Machine Learning, Image Recognition and Neural Networks

How they use AI: AI algorithms are used in a mobile application that is part of the diagnostic tests conducted in the field. The examination, performed with a drop of blood, begins with a biochemical reaction that develops in a paper microfluidics device, which reports a visual reaction that is evaluated in the app through image analysis algorithms and convolutional neural networks. These suggest a final decision based on the diagnostic result of the test.

**4. Support for workers and migrants**

Name: Support for workers and migrants
http://www.saiph.org/
Year they started using AI: 2007
SDG: 1 (end of poverty), 4 (quality education), 8 (decent work and economic growth) and 9 (industry, innovation and infrastructure)
Actors involved: DLP Laboratory, National Autonomous University of Mexico (UNAM), Ministry of Foreign Affairs (SRE), Infra Rural (project), Gabilooo Digital Consulting
Current status: academic project with government support in consolidation stage.
What is proposed: Solve the lack of updated labor skills in populations of workers and migrants in rural areas with a view to making them part of the Fourth Industrial Revolution.

Brief description of the project: Intelligent tools are designed that guide workers and migrants in rural areas in the development of their digital and creative skills so that they can access well-paying jobs on the internet that will not be automated in the near future. These tools are used to introduce workers to the tasks they will have to perform on the Internet to acquire certain digital skills while earning a salary. This ensures that the worker or migrant from rural areas can earn a living while learning.

AI applications Natural language processing, deep learning platform, decision making, machine learning platforms, virtual agents.
How they use AI: Use AI to identify the best sequence of micro-jobs on the Internet that helps workers and migrants advance in the development of their digital skills and thus access better salaries.

**Conclusions:** Mexico is a benchmark for the development and implementation of AI at the service of social good in the region. Although the country still faces important challenges in terms of connectivity and is lagging in taking advantage of opportunities for the development of a digital society, it is equipped with the necessary foundations to accelerate the adoption of new technologies, while addressing the task of closing gaps. of access and training of technical and socio-emotional skills. In this sense, the current administration has made overcoming the digital divide a priority, and has announced policies to accelerate and guarantee the inclusion of the entire population in the digital era.

The three great allies of the country's digital transformation are academia, the entrepreneurial ecosystem and civil society. It is evident that Mexico has a very wide offer of degrees, postgraduate degrees, headquarters, programs, laboratories and research centers that offer training in topics related to AI. Thanks to this, research on these topics is prolific and there are collaborative initiatives with the business sector, and also with federal and local governments. In Mexico there is also a culture of entrepreneurship in the process of consolidation. From there, innovative solutions to social challenges are being explored. collaboratively with those civil society organizations that seek to take advantage of new tools to expand their impact. Although Mexico still has several challenges to overcome, it is a fertile country to materialize the promise of AI in the service of social good, as is the case in other more digitally mature countries in LAC.