

“AI developments in Bolivia and AI Strategies in Latin American Countries”

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Introduction

Artificial Intelligence understood as a technological tool for innovation, is important for both the public and private sector. New Technologies have transformed the way governments fulfil their role and procedures and the way they provide public services. The very high implementation of technology, has become a necessary and indispensable tool for public servants and government entities. Generating new ways of interaction and communication between governments and societies.

The Canadian organization CIFAR (Canadian Institute for advanced research) in its 2020 report, identified 28 national AI strategies, developed between 2018 and 2020. Most of these strategies are concentrated in advanced economies, although they mention the advances in emerging economies. CIFAR also identifies in its report 12 countries from the Latin American Region that count with AI Strategies which are: México, Costa Rica, Colombia, Ecuador, Dominican Republic, Trinidad y Tobago, Perú, Brazil, Paraguay, Uruguay, Chile and Argentina. Although governments and medium to large companies could benefit from adopting AI, the readiness index for AI of Oxford Insights, shows that there is a big complexity in the implementation of projects or strategies of AI in the Latin American Region. This complexity comes from the extreme inequality and low capacity of regulation that the Latin American countries have. (Scrolini, 2021)

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Among the shared challenges faced by Latin America countries, is economic and political uncertainty. Improving the delivery of government services is a top priority, especially for education and health. Developing strategies that can address these challenges in a positive way is getting more and more complex in the region, due not only to political, economic and cultural differences, but also to the growing social inequality. Although this is a challenge many researchers are looking for solutions based on technological tools that will help create a more prosperous Latin American Region. One of these tools is AI.

AI can have a huge impact in countries with developing economies like Latin America. Some researchers estimate that AI could contribute to an additional 14% of wealth to the emerging markets in Latin America. AI can improve quality of life so Latin American countries are seeing how they can apply it to: economy, health and education. Some researchers have conducted surveys on AI and their respondent's perception is that little importance is given to AI in the public agendas, more than half of the people surveyed perceived that civil society organizations and those dedicated to generating social impact are starting to consider the use of AI to accelerate its impact. (Gomez, 2020)

Bolivia doesn't have an AI strategy like other Latin American countries, this doesn't mean that there hasn't been any developments in AI and in the technological field. Bolivia is considered an emerging economy with many problems of inequality in different areas, developing a clear AI strategy is important because it can help address many of the challenges Bolivia is facing. In this sense the present paper has the following research questions: Is developing an AI strategy important for Bolivia's development? Does Bolivia political and economic reality affect the development of AI?

Relating to the delimitation of the present research we will mention some strategies in other Latin American Countries and we will see what developments Bolivia has had in the technological field.

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We have divided the present research in two main Chapters: 1.- Artificial Intelligence Strategies in Latin American Countries, and 2.- Artificial Intelligence development in Bolivia, to finally end in Conclusions.

Chapter 1: Artificial Intelligence Strategies in Latin American Countries

Studies have been conducted of AI strategies in the public sector of different Latin American countries, analyzing their characteristics based on categories of analysis like: objectives, principals, pillars/measures and vision/goals. Most studies are oriented on analyzing the ethics and human rights dimensions of AI strategies in Latin American Countries. These researches have concluded that the countries efforts to implement AI in the public sector are at an emerging stage and are achieving significant progress. They have also identified similarities in their ethical and human rights approaches and their differences are conditioned by the political administrative and technological approaches to which they are subject. (Benitez, 2021)

We will mention some of the AI strategies in Latin America as well as their year of implementation:

ARGENTINA (2020)

Argentina created a Nacional Artificial Intelligence plan called “ARGENIA”, the vision of this plan was to position Argentina as a regional leader in this subject. Its main objective was to generate politics that would contribute to the sustainable development and to improve equal opportunities in the country through AI technologies. The main focus of the plan was education, technological infrastructure, research, development and communication under principals of loyalty, responsibility, transparency and privacy. (Benitez, 2021)

BRAZIL (2021)

Brazil counts with its Brazilian Strategy for Artificial Intelligence, named “EBIA”, this strategy was constructed in three phases during the years 2019 and 2020. The first phase was hiring an AI specialized consultancy firm. In its second phase a comparative evaluation between the national and international was done. In the third phase a public consultation process was implemented. EBIA was created through the recollection of diverse perspectives from different social sectors. The strategy is oriented to the development of actions that will impulse research, innovation and the development of AI solutions, having in mind ethical considerations. The Strategy has nine thematic parts, characterized as pillars of the strategy. Offering strategic actions, highlighting that the strategy must constantly be monitored, evaluated and adapted to the advances of AI. (Benitez, 2021)

COLOMBIA (2019)

Colombia has been working to be the leader in the fourth industrial revolution in the region. At the end of 2019 it approved its “National Politics for Digital Transformation and Artificial Intelligence”. Colombia counts with two institutions to help implement its artificial intelligence policies. The first is the Task force for the development and implementation of Artificial Intelligence. The second is the International Council of Colombia for Artificial Intelligence. For the approval of AI politics in Colombia they considered the transversal and multidisciplinary implications of AI implementation as well as the challenges that elaborating public politics present. (Benitez, 2021).

MÉXICO (2018/2020)

Mexico is considered the first country in Latin America to coordinate task to launch an AI strategy in the year 2018. One of the first steps to elaborate the AI strategy in Mexico was the report “Towards an AI strategy in Mexico”. Taking advantage of the AI revolution, which gives an amount of recommendations, based on a qualitative analysis, through interviews conducted with more than sixty AI experts in different sectors of society. The report was ordered by the British embassy in Mexico and developed by the Oxford Insights Society and CMinds Company with the support and contribution of the government and Mexican experts in AI. (Benitez, 2021)

For the purpose of illustration, we have added below to the present research paper charts elaborated by researchers, the first is an overview of progress in AI by country and fields like: Government, Academia, Entrepreneurship ecosystem and civil society. In this chart the calculation was based on the average score of the World Banks Digital Adoption Index, the world economic forum networked reediness index, and the digital, data and AI strategy formulation Index, 100% if the country has such strategies, 50% if they are in progress or on hold, and 0 % if they don't have them.

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Table 1. Overview of Progress in AI in 12 Selected Latin America and Caribbean Countries (percent)

	Government	Academia	Entrepreneurship Ecosystem	Civil Society
Argentina	77.5	52	52.4	75
Brazil	77.4	88	41.8	50
Chile	79.1	76	50.9	75
Colombia	89.1	68	47.3	25
Costa Rica	65.1	75	n/a	100
Dominican Republic	61.6	46.4	45.7	75
Ecuador	61.4	60	n/a	75
Mexico	76.4	64	52.1	25

- Source part of chart shown on page 21 (Gomez, 2020)

The second chart shown below: Progress in Strategy Formulation and Infrastructure for Connectivity, we consider important to show, because Infrastructure and Connectivity is a big challenge, when trying to implement AI Strategies for many developing countries in Latin America.

The chart below, for an average score extracted from the World Bank Digital Adoption Index and the World Economic Forums networked readiness index, for the far-right column a “leader” level is for a score above 90 percent, “very advanced” between 80 and 90, “advanced” between 70 and 79 percent, and “semi-advanced” between 60 and 69 percent.

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Table 2. Progress in Strategy Formulation and Infrastructure and Connectivity

	Digital Strategy	Data Strategy	AI Strategy	Infrastructure and Connectivity
Argentina	Yes	Yes	Continuity to be explored	Very advanced
Brazil	Yes	Yes	In progress	Very advanced
Chile	Yes	Yes	In progress	Leader
Colombia	Yes	Yes	Yes	Very advanced
Costa Rica	Yes	Yes	No	Very advanced
Dominican Republic	Yes	Yes	No	Semi-advanced
Ecuador	Yes	Yes	No	Semi-advanced
Mexico	Yes	Yes	Continuity to be explored	Advanced

- Source part of chart shown on page 24 (Gomez, 2020)

Chapter 2: Artificial Intelligence developments in Bolivia

Bolivia doesn't have an AI strategy and doesn't have a digital strategy since 2005, but Latam Digital Center (2021) has identified that big advances have been made in the subject, that could be considered to be strategic, although they are fragmented in different regulation, documents and laws. (Scrolini, 2021)

Some researchers in Bolivia suggest, Bolivia could grow rapidly considering its culture of entrepreneurship, also its Competitive operative costs can attract investment. But they also identify the need of having institutions that fulfil contracts. (Velarde, 2019)

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The digital initiatives in Bolivia go back to 1970, but its only in the beginning off the first decade off 2000, that a strong impulse to adopt technology in different parts of the government happened, potential in the internet phenomenon was identified, that could impact cultural, social and economic sectors of life in Bolivia. (Martinez,2022)

Bolivia participated in 2003 in the “World forum of information societies CMSI. After its participation Bolivia created the “ADSIB” Agency for the development of information society that replaces the “UFI” Unit for Information Technology, strengthening. ADSIB represented in Bolivia for the first time an institution with the clear mission of “development of policies, strategies and actions to offer reliable, innovative and quality services in Information Technology (IT).

This was the base for the later elaboration of “ETIC” Bolivian Strategy for IT. ETIC was elaborated in consensus with different parts of society. ETIC is based in five main pillars, four with a central objective that was to develop and execute policies, programs, initiatives and proposals of use of IT and the development of human capacities, with emphasis in the human groups with lower income, in rural non-urban areas. ETIC at the end, for many different reasons was not applied. One of the reasons was the political crisis at that moment (gas war and resignation of the then president, Gonzalo Sanchez de Lozada).

A second phase is between 2006 and 2015 and some researchers call it the “Massification of service: Internet as a right”, this phase has three elements: approval of the 2009 Constitution, that recognizes the right of access to telecommunications and the states duty to implement strategies to incorporate the knowledge and application of new IT. Second the approval of the law of telecommunications, that promotes the use of IT. Last the creation of “AGETIC” Agency of the electronic government and IT Technologies and communication in 2015, during this phase it's not possible to find a document that establishes a specific strategy, like the ETIC in 2005. But the regulations in this phase demonstrate the importance of counting with public policies in the digital sector. Some researchers say that although there is not a specific document with Bolivia's strategy, it

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does have a strategy and it is proven by the advances and work of the AGETIC. But that strategy seems to be fragmented in several regulations and parts. And a specific AI only strategy doesn't exist. There is a document that supports a possible strategy, in January 2020, some argue it might have been delayed because of COVID, and some argue that at the present it's not a priority in Bolivia. (Martinez, 2022)

Conclusions. -

Bolivia is in front of a great opportunity to take advantage of the circumstances of the fourth industrial revolution, Bolivia's attitude towards entrepreneurship, its youth and the nature of business can be advanced by Artificial Intelligence. But there are challenges to confront so the Bolivian government must act fast and impulse a Strategy for Artificial Intelligence. (Velarde, 2020)

Bolivia should set as a high priority the development of an AI Strategy. It should view AI as an excellent opportunity for economic growth and social equality. The strategy should be oriented to obtaining the most benefits for the people in general.

We have observed that although Bolivia doesn't have a specific AI strategy it does have some regulations that are fragmented and in hands of different authorities, although AGETIC is the conducting entity in some cases it seems that the others are duplicating some functions and discourses. A participative process that can be widely spread can count with the support of digital communities of Bolivia but must include the highest authorities like ministers and vice ministers.

We agree with some researchers that suggest after analyzing Bolivia's Plan for an electronic government, that counting with an AI Strategy is possible, and benefits like: strengthening collaboration between the public and private sector, an AI strategy can help support the agenda of Sovereignty and industrialization that has been driven since 2009.

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AGETIC has established that there are other priorities other than an AI Strategy, like improving what they call the technological consumption in the country. (Martinez, 2022)

We disagree with the last statement made by AGETIC that there are other priorities, considering that the priority they mention can be included in the AI strategy that Bolivia needs to design. Also considering Bolivia's current political divisions in the country, developing an AI strategy would help foment dialogue between sectors that have been confronted in the past. It is necessary that all these sectors understand that Bolivia's economic and technological advances can help all sectors of society. Bolivia can have the example of AI Strategies developed in other Latin American countries but can also improve them and adapt a personal AI Strategy according to its capabilities and realities.

It is important that Bolivia considers AI as a priority in its public agenda. It is also important that this agenda is constructed not only based on governmental actors but through a collaborative process between all productive sectors, of the private and academic. We analyzed in class that in order for AI process to be applied the acceptance of the civil society is necessary. Considering this we think it's important to make them participate so they can also understand the benefits that can be obtained by applying AI, also not forgetting that the government should be the one taking care of the ethical challenges this can bring. (Benitez, 2021)

About the AI Strategies we have seen in Latin American countries we can conclude that: AI strategies are being focused mostly on ethical elements. Although some Latin American countries have developed AI Strategies the real question should also be: are these sustainable AI policies? Researchers have suggested most Latin American countries, lack a coherent AI Strategy. Most of the countries had an open process that allowed participation in the design of their AI strategy's. There is still a lack of regulation in terms of privacy and data sharing. Also, there is a lack of a shared approach in AI by the region. Some even suggest that the lack of regulation encourages a self-regulatory approach by the private firms. (Scrollini, 2022)

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AI is being developed and applied in the world and the Latin American region that is considered in the economic charts as developing countries have a great opportunity to advance through them in all sectors of their societies.

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