
BRAZIL

Reaping the benefits of artificial intelligence with some cautionary notes

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Key takeaways:

- The need to facilitate AI research and development has driven the Brazilian government to enact legislative reform and a key achievement is the partnership of the Ministry of Science with national funders and experts for the creation of AI Applied Research centres.
- Challenges in the country include a gap in AI literacy and education as well funding for AI research. There is also worry on the stagnation of the national AI strategy and bills of law that could hinder science and research priorities, foster uncertainty among researchers and limit international collaboration.

Brazil has a significant history in promoting long-term policies for digital development, beginning in the 1970s with improved digital infrastructure for data collection, storage, processing and sharing (for example, within the federal agencies SERPRO and DATAPREV). Since then, specific legislation has supported the creation of networks by bringing companies and universities together – for instance, IBM and the University of São Paulo, which have developed a joint initiative for long-term research projects on AI such as AI for sustainable agribusiness and food networks, climate decision-making with multiple criteria among other projects – and accelerating deployment of Internet usage, including by instituting an encompassing Civil Framework for the Internet (Government of Brazil, 2014).

However, according to a Berkman Klein Center research report (Fjeld et al., 2020) and the MIT Technology Review (Gupta and Heath, 2020), despite those important steps Brazil was not ranked well amongst Latin American countries, up until 2020, in terms of AI regulations and respective national strategies. It made some progress thereafter, with later initiatives positioning it on OECD's Policy Observatory map of AI regulation and national strategies, as well as in reports from private organizations such as the Global AI Index and others (IAPP, 2023).

Research centres

Brazil reached important milestones between 2018 and 2021, particularly with the enactment of new laws (Government of Brazil, 2018; 2019a) that removed bureaucratic barriers to digital transformation driven by AI research and development. That was the scenario when, in 2019, the Ministry of Science, Technology, Innovation and Communications (MCTIC) partnered with the Foundation for Research in the State of São Paulo (FAPESP) and the Brazilian Internet Steering Committee to launch a call for creation of eight AI Applied Research Centres.

The targeted beneficiary sectors were health, industry, cities, agriculture (formally prioritized in the Science, Technology and Innovation national policy), information security (including the investigation and design of algorithms and mechanisms) and cyber defence systems. Six of these centres were selected in May 2021 (one for AI in smart cities, one for agriculture, two for industry and two for healthcare) and four in 2023 (two for AI in industry 4.0, one for renewable energy and one for cybersecurity). Each centre involves dozens of senior researchers and dozens of students, and each centre receives around USD 200,000 a year for up to ten years from FAPESP.

The EBIA aimed at designing an AI development plan for the country by providing guidelines for the federal Executive Branch to encourage research, innovation and development of AI solutions as well as on ethical and reliability concerns.



National strategy

In April 2021, MCTIC presented the Brazilian National Strategy for Artificial Intelligence (EBIA), which was linked to the AI Applied Research Centres as another MCTIC structuring action to prepare the Brazilian science and innovation system for AI (MCTI, 2021). The EBIA aimed at designing an AI development plan for the country by providing guidelines for the federal Executive Branch to encourage research, innovation and development of AI solutions as well as on ethical and reliability concerns. Although the EBIA is a general and macro-level national strategy, and has not specified particular fields for research on AI, it has indicated strategic actions where references to research are made, especially regarding research aimed at developing ethical AI solutions. These directions were addressed in the 2024-2028 Brazilian National Plan for Artificial Intelligence (PBIA), published in 2024, aiming at ensuring proper infrastructure of high-performance computing (HPC) capable of processing large volumes of data and of developing advanced algorithms. The 2024 Brazil National Plan also highlight's the establishment of an AI Institute (IIA) at the National Laboratory for Scientific Computing (LNCC) in charge of coordinating applied research, promoting innovation, and seeking cooperation from international institutions. The 2024 Brazil Nation Plan plans for a significant budget and the improvements in the HPC infrastructure where the Brazilian government is calling on researchers to develop a "Brazilian AI". While the research needed for developing this goal of a national AI remains unclear, one of the major goals is to develop advanced language models in Portuguese, trained with national data that encompasses the cultural, social and linguistic characteristics of the country.

Bills of law

In parallel to the structuring of an overall administrative strategy, the legislative attempts to legitimize the national plan were followed, from 2019 through 2021, by the introduction of three AI bills of law in Congress (Government of Brazil, 2019b; 2020; 2021), which particularly envisaged the fostering of innovation and the safeguarding of harm minimization. None of those bills of law were approved. In 2023, therefore, the Senate invited a group of 40 jurists to conceive of a fourth bill (Government of Brazil, 2023; Hilliard, 2023). Its contents were inspired by the European Union's AI Act – then considered as international standard of good practice on the matter – and included the aim of sustaining a risk-based approach to AI regulation. Such a long sequence is indicative of concentrated efforts on legislative action so far. Finally, since the last quarter of 2023, Congress has debated on all bills of law in an attempt to consolidate them, and has drafted a replacing text, which is expected to be voted after the Country-wide municipal elections to take place in November, 2024.

Strategic goals and action

At the other end, in the administrative sphere, EBIA purports to be driving the Brazilian government to stimulate research, innovation and development of AI solutions in accordance with multiple considerations, including the assurance of reliable and ethical development and usage (Government of Brazil, 2022). Such goals have drawn on Organisation for Economic Co-operation and Development (OECD) concepts and principles as source of reference for key issues to be addressed, and inspired EBIA's structure with regards to areas of concern – for instance, inclusive growth. In practice, EBIA is split into six primary goals, namely: education, training and workforce; research development and innovation; application in productive sectors; application in public administration; and public security. However, although such EBIA axes point to strategic actions, they have been vaguely worded, so there is lack of clarity on concrete ways to set proper public policies. The goals do not get into prescribed instrumental actions (Filgueiras and Junquillo, 2023).

For example, in the education axis the development of digital literacy programs is generically advocated for all areas and levels of education, irrespective of the natural specificities of each such as the particularities for the teaching of AI in the context of fundamental schooling, or of academic advanced studies. Paradoxically, the Latin American AI Index has interpreted these generic terms as a strength, making the assumption that Brazil has effectively incorporated AI elements into its national school curriculum. The Common National Curriculum Base has indeed been recently updated to add computational thinking and computer programming items, but the reality is that AI literacy has not been properly introduced, as there are neither qualified teachers nor a defined strategy.

Research guidelines

Mirroring such a scenario, in November 2023 the Brazilian Academy of Sciences published a set of recommended guidelines for the use and scientific advancement of AI in Brazil (ABC, 2023). The recommendations stress the existing gap in AI literacy and education throughout civil society, especially for minors, and in fundamental action to prepare the national system for AI in the long term. Alongside these and other issues, the group of researchers from the Academy highlights the need for an immediate increase in funding from the government for

public research (as public universities lead AI research in Brazil), the creation of mechanisms for the private sector to also increase investments in this technology, and the need for a regulatory environment safe for teachers and researchers (ABC, 2023).

In essence, the development of a national science system for AI necessitates the implementation of public policies designed to coordinate the various enabling factors involved. Consequently, it is expected that the examination of the current legislative and administrative landscape in Brazil, coupled with an analysis of select studies from both scientific and grey literature, will afford insight into Brazil's efforts to establish its national science system for AI and the resultant impact on the national science and research framework.

EBIA and AI bills of law serve as the principal instruments guiding scientific research priorities and fostering a targeted innovation ecosystem in Brazil. Failure to contemporaneously advance these instruments may engender negative impacts by creating an uncertain regulatory environment for researchers and professors. Moreover, such stagnation could restrict international collaboration and funding.

Missing implementation

However, generally speaking, other Latin American countries' national AI strategies (Chiarini and Silveira, 2022) propose circa a decade to be implemented, while Brazil has attempted to do it within a relatively short period from 2020 to 2022. There should be little surprise, then, that no specific goals have been substantially achieved so far, despite the magnitude they may represent in the context of a country with a continental size and population. EBIA's missing cascade of detailed indications of opportunities and challenges to implementation (Chiarini and Silveira, 2022) is therefore a serious and urgent problem for Brazil, and for everyone who would likely benefit from AI research for accelerated solutioning.

Given all of the above, the fact that AI is quoted in the Brazilian Digital Transformation Strategy 2018 nine times, but very generically and disconnected from any effective action or concrete objective, seems like one more sign that Brazil has not properly set EBIA's goals and has struggled for too long to approve a legislative platform. Brazil's insufficient preparation for AI and machine learning makes its national science system inconsistent with international good practices. Its national challenges and possibilities, and regional prominence, demand prompt action and support.

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