Utilization of Artificial Intelligence in Brazilian Public Administration

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Abstract. The main objective of this research project is to conduct a demonstrative analysis using a qualitative method of scientific articles, aiming to show how other authors have identified the use of artificial intelligence in Brazilian Public Administration and how institutions handle its daily use. Among the findings, it is highlighted that technological advancements in Artificial Intelligences represent both opportunities and risks for use by managers and public servants. The research has identified that institutions and the public system can benefit from simple services automated by AI. The results obtained indicate that AI's have a promising future in Public Administration, however, ethical, responsible and social use is necessary, since their misuse can result in complications for the entire society.

Keywords. Artificial intelligence, Public Management, IA .

1. Introduction

The topic of Artificial Intelligence (AI) has been gaining more prominence in the modern world, presenting two sides of the same coin: on one side, its innovation and capacity to change technology, and on the other, its threat to the security of the modern world. This paper aims to demonstrate the potential uses of AI technology in Public Administration, as well as the associated risks of its use.

The integration of artificial intelligence (AI) into Public Administration represents a significant advancement in efficiency and decision-making. This paper explores the concepts of AI modeling and its potential functions in public organizations, highlighting the need to revisit the principles of Administrative Law in light of the growing presence of AI. The use of Artificial Intelligence by society, and its easy access, demonstrate that its use is not restricted only to the major holders of advanced technologies. AI today is not just a theoretical field; it is a rapidly expanding industry, with practical applications that directly affect people's daily lives. Virtual assistants, recommendation systems, automated medical diagnostics, and autonomous vehicles are just a few examples of how AI is integrated into our daily routine. Inevitably, at some point, the presence of AI in the public management system will also become commonplace, making it crucial to address its applications.

As discussed by Valle [1] (2020, p. 181), "The speed at which this AI toolkit infiltrates—not only in the realm of relations with Public Administration but in all domains of life—makes this investigative agenda urgent."

1.1 Artificial Intelligence

Artificial Intelligence (AI) is a branch of computer science that focuses on the development of machines and software with human-like intelligence. This includes learning, reasoning, problem-solving, perception, and language use.

According Peixoto e Silva [2] (2019, p.24 apud. SAVERIO; NICOLAS,2023, p.3) AI had its roots in the 20th century. During the 1940s, British mathematician Alan Turing proposed the idea of machines that could mimic human intelligence, which later became known as the Turing Test. However, it was at the Dartmouth conference in 1956 that the term "Artificial Intelligence" was coined and the field as we know it today began to take shape.

Since then, AI has evolved significantly. In the 1980s, the concept of expert systems emerged, computer programs that simulate the knowledge and analytical skills of a human expert. More recently, we have seen the emergence of machine learning and neural networks, which allow computers to learn and

improve from data and experiences, rather than being explicitly programmed.

Of course, it is necessary to address that artificial intelligence has levels of knowledge, as highlighted by Valle (2020), There are two fronts of artificial intelligence: Narrow Artificial Intelligence(weak AI) and General Artificial Intelligence (strong or deep AI). Strong AI refers to the ideato imitate human intelligence through the ability to think, understand, learnand apply your intelligence to solve any problem, just like humans doin any situation, however, there is still no technology of this type that isfully developed and functional. Normally this type of technology is the mostdraws attention to the popular imagination and contributes to mistrust and the creation of theoriesconspiracies about technology, mainly due to the influence of filmsbHollywoodians. On the other hand, weak AI is not intended to imitate or surpass the intelligencenhuman, but complement it, using the idea that humans and computers have different skills

1.2 Machine learning

Machine learning (machine learning) enables independent learning. According to Peixoto e Silva (2019 cited by SAVERIO; NICOLAS, 2020, p.23) "[...] set of methods that can automatically detect patterns in data, and later use these patterns to predict future data or perform other forms of decision making" Therefore, machine learning has levels of functioning, as explained by SAVEIRO;NICOLAS (2022, p.24) "Machine learning has three different forms of learning: i)supervised learning: so that the machine can make its predictions, this ispreviously trained by humans, with examples of input information and what iswaiting for the exit. The greater the volume of data and training, the better the performanceof the algorithm; ii) unsupervised learning: it is normally used in scenariosin which a large volume of data is not expected and, furthermore, there is no accuracyabout the expected output. In this way, it is possible to identify standardized behaviors,anomalies, clusters and other information, without humans telling the machine whatidentify; and iii) reinforcement learning: it acts a little differently from the other two formsof learning and does not have an answer on how to achieve a certain objective." Fig 1
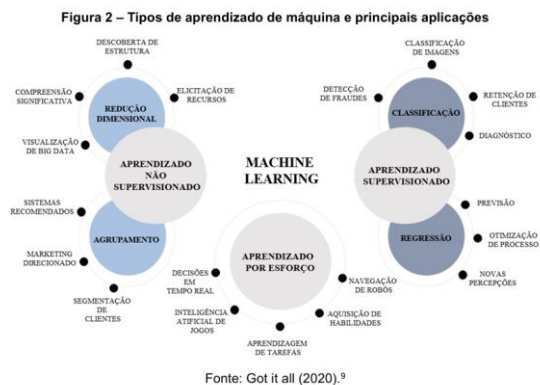

Fig. 1 - types of learning and applications

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1.3 Brazilian reality

According to Filgueiras (2022) apud. SAVERIO; NICOLAS,2023, p.3), there are two different views on public policies for the advancement of artificial intelligence. The first is concerned with the potential consequences of AI technologies on society and seeks to define ethical and regulatory standards for their use. The second vision focuses on stimulating the growth and manufacturing of technology, including government actions that promote the development of AI instruments to ensure digital sovereignty, data defense, cybersecurity and internet governance.

"Similar to previous industrial revolutions, regulations will playa decisive role in the adaptation and dissemination of new technologies. However, governments will be forced to change their approach when it comes to creating, reviewing, and applying regulations. [...] Because of the accelerated pace of changes triggered by the fourth industrial revolution, regulators are being challenged to an unprecedented degree. Currently, public, legislative and regulatory authorities are often overtaken by events, unable to deal with the speed of change technology and the importance of its implications. [...] In such conditions, how could Lawmakers and regulators support technological advances without stifling innovation, preserving the interest of consumers and the general public? The answer is in agile governance. [...] This is the challenge of governments, which have never been more necessary than in this fourth industrial revolution: they must let innovations flourish, while minimize risks. (SCHWAB, K., p.73, 2016, apud SAVERIO; NICOLAS,2023, p.5)"

Brazil established it through Ordinance MCTI 4,617/2021, amended by Ordinance MCTI 4,979/2021, the Brazilian Artificial Intelligence Strategy (EBIA), which aims to "[...] enhance the development and use of technology with a view to promoting advancement scientific and solve concrete problems in the country, identifying priority areas in which there is greater potential for

obtaining benefits." (MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATIONS, p.5, 2021).

In a survey carried out by SAVÉRIO;NICOLAS (2022, p. 6-7) , it was found that 293 organizations were contacted through a questionnaire, where 263 sent the information within the deadline established by the TCU. To evaluate the result, the Artificial Intelligence Maturity Model proposed by Gartner Group, which proposes structuring the maturity of organizations into five levels, in addition,Based on the responses, they chose to create a sixth parameter, level 0. As a result, around 100 (38%) of organizations are at AI maturity level 0,that is, they do not use, nor do they intend to use, the tool. Other 88 (33.5%) are at maturity level 1, that is, they understand the potential of the tool and speculate its use. 45 (17.1%) are in the experimentation phase (level 2), testing or pilot mode. In around 21 (8%) are in the stabilization phase (level 3), that is, they are already in production, have exclusive budget for AI projects, providing experts and technologies for application best practices. Of the amount, only 9 (3.4%) are at level 4, characterized by the level of expansion. It is important to note that none of the institutions managed to qualify for level 5, where AI is considered routine and expected as an element of the execution of your processes internal management.

2. IA in practice

In Brazil, the practical use of AI occurs mainly in the Federal Audit Court (TCU) . In the context of internal operations, there are efforts to increase efficiency, such as the Alice robot, which stands for Tender and Notice Analysis. In collaboration with Sofia and Monica, Alice examines federal contracts for potential irregularities.

Since February 2017, Alice has analyzed bids and price records from federal entities, as well as some state bodies and state-owned companies, using information from the Official Gazette and Comprasnet11. After her analysis, Alice generates a report pointing out possible irregularities so that the auditor can investigate further. With Alice's contribution, auditors managed to block irregular hiring in several states and even in Itamaraty tenders, demonstrating the effectiveness of the system in improving and speeding up public services.

The Sofia robot identifies errors in texts prepared by auditors. It works as an icon in the text editor, displaying relevant information such as CNPJ, process number and CPF, which the auditor may have accidentally omitted.

Monica is a panel that shows all public purchases, including those not identified by Alice, such as direct contracts and bidding exemptions. These robots are part of the Control Information Laboratory (Labcontas), which integrates 77 databases, such as government purchasing records, public policies and corporate details. Labcontas also has technology to correlate data between its databases. In addition to the Federal Audit Court, other bodies such as the Federal Comptroller General, Federal Public Ministry and Federal Police use Alice, Sofia and Monica in their operations.

The TCU also uses the Zello robot, an artificial intelligence on Twitter that interacts with the public by providing information about the Court's activities. People can consult the robot about accounts considered irregular by the TCU, providing the name or CPF of the person responsible.

One of the main benefits of Artificial Intelligence (AI) is undoubtedly its speed, which is often cited as an argument for its usefulness in improving the efficiency of public administration. With this evidence in mind, it is argued that AI applications in the administrative context have the potential to add value. As cited by VALLE (2020, p. 191) "They can enable the automation of decisions, resulting in time savings that benefit the population. This is especially relevant in matters that generate frequent challenges, such as administrative appeals against traffic fines."

2.1 Can intelligence be a risk to public administration?

Although Artificial intelligence guides great advances, in terms of management, there is a macro perspective that suggests the possibility of setbacks towards previous management models, especially with regard to decision-making power.

A first challenge in adopting AI in public administration is the risk of regression to a predominantly subsumptive decision-making logic. The growing appreciation of the gains provided by automation, in which the machine makes administrative decisions in place of the human being, has encouraged this search for automated solutions. However, redemocratization brought an opening to constitutionally guaranteed principles and values, resulting in a reconfiguration of Administrative Law into a "Right of public power for solidarity freedom". Therefore, if automation leads to results that are incompatible with the fundamental values of the normative system, it will be necessary to abandon a strictly subsumptive logic in favor of a proportionality judgment that balances the different normative elements in conflict. AI, however, does not perform this weighting of values, which favors old models based on subsumption. The idea that AI can

make complex evaluative choices is an illusion fueled by science fiction.

Even in non-determinative AI systems, which only assist in decisions without deciding, there is a risk of marginalizing the formulation of relevant evaluative judgments provided for by the Constitution. Excessive dependence on these systems can lead administrative agents to adopt machine suggestions, increasing the risks associated with decision making.

In short, the incorporation of AI in Public Administration can both stimulate experimentalism and induce conservatism. Public agents, when facing the alternatives suggested by AI, must be aware of the associated risks and the importance of maintaining a balance between innovation and prudence.

3. Conclusion

It is crucial to adopt an approach of considered enthusiasm towards the implementation of Artificial Intelligence (AI)-based systems in Public Administration. Although the potential benefits are recognized, such as greater efficiency, impartiality and quality in decisions, it is essential to be alert to the risks associated with its indiscriminate adoption in different sectors.

The definition of artificial intelligence may vary, but, according to current literature, it is an area of computer science focused on reproducing human skills, such as logical reasoning, interpretation, communication and learning, autonomously through devices. The main objective is to improve performance in specific tasks for which they were developed.

For Brazil to make the most of the benefits of this innovative technology and minimize its risks, it is vital that the Public Administration is aligned with advances in AI. It is necessary to strike a balance between innovation, respect for individual rights, ethics and security, ensuring that the implementation of AI is carried out in a responsible and sustainable way.

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