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Article

Artificial intelligence as a public problem: proposal for a multidimensional agenda for public administration

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Abstract

The recent incorporation of Artificial Intelligence (AI) systems into the public sector has frequently been framed as a matter of administrative efficiency and technological innovation. Such an approach, however, tends to obscure broader institutional, distributive, and organizational implications associated with the digitalization of the State. This article proposes to understand AI as a general-purpose technology and a multidimensional public problem, whose effects cut across state capacities, regulatory arrangements, and the conditions for guaranteeing rights. Based on an integrative literature review, an analytical framework is developed consisting of five structural axes articulated with strategic public policy sectors. From this framework, a multidimensional matrix and a research agenda are established to systematize recurring dilemmas and guide future investigations. The study contributes to the field of Public Administration by integrating fragmented debates on AI, repositioning the technology as an issue of governance and social justice, and provides conceptual contributions for the design of more responsible and democratic public policies.

Keywords: artificial intelligence, public governance, state capacities, general-purpose technology, public policies.

Inteligência artificial como problema público: proposta de agenda multidimensional para a administração pública

Resumo

A incorporação recente de sistemas de Inteligência Artificial (IA) no setor público tem sido frequentemente tratada como questão de eficiência administrativa e inovação tecnológica. Essa abordagem, contudo, tende a obscurecer implicações institucionais, distributivas e organizacionais mais amplas associadas à digitalização do Estado. Este artigo propõe compreender a IA como tecnologia de propósito geral e problema público multidimensional, cujos efeitos atravessam capacidades estatais, arranjos regulatórios e condições de garantia de direitos. Com base em

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uma revisão integrativa da literatura, constrói-se um referencial analítico composto por cinco eixos estruturantes articulados a setores estratégicos de políticas públicas. A partir dessa estruturação, elabora-se uma matriz multidimensional e uma agenda de pesquisa destinada a sistematizar dilemas recorrentes e orientar investigações futuras. O estudo contribui para o campo da Administração Pública ao integrar debates fragmentados sobre IA, reposicionando a tecnologia como questão de governança e justiça social, e oferece subsídios conceituais para o desenho de políticas públicas mais responsáveis e democráticas.
Palavras-chave: Inteligência Artificial, governança pública, capacidades estatais, tecnologia de propósito geral, políticas públicas.

Inteligencia artificial como problema público: propuesta de una agenda multidimensional para la administración pública

Resumen

La reciente incorporación de sistemas de Inteligencia Artificial (IA) en el sector público ha sido tratada con frecuencia como una cuestión de eficiencia administrativa e innovación tecnológica. Sin embargo, este enfoque tiende a opacar implicaciones institucionales, distributivas y organizativas más amplias asociadas a la digitalización del Estado. Este artículo propone comprender la IA como una tecnología de propósito general y un problema público multidimensional, cuyos efectos atraviesan capacidades estatales, marcos regulatorios y condiciones para la garantía de derechos. A partir de una revisión integradora de la literatura, se construye un marco analítico compuesto por cinco ejes estructurantes articulados con sectores estratégicos de políticas públicas. A partir de esta estructuración, se elabora una matriz multidimensional y una agenda de investigación destinada a sistematizar dilemas recurrentes y orientar futuras investigaciones. El estudio contribuye al campo de la Administración Pública al integrar debates fragmentados sobre IA, reposicionando la tecnología como una cuestión de gobernanza y justicia social, y ofrece insumos conceptuales para el diseño de políticas públicas más responsables y democráticas.
Palabras clave: inteligencia artificial, gobernanza pública, capacidades estatales, tecnología de propósito general, políticas públicas.

1. INTRODUCTION

The recent diffusion of artificial intelligence (AI) in the public sector has been accompanied by growing expectations regarding its potential to expand administrative efficiency, support decision-making and modernize the provision of state services (Organization for Economic Cooperation and Development [OECD], 2021; Wirtz et al., 2019). In large part, this debate has treated AI as a technological instrument capable of optimizing processes and reducing operational costs, associating its adoption with agendas for innovation and digital transformation of the State.

This reading, although relevant, proves insufficient to grasp the extent of the institutional effects produced by this technology. The literature already characterizes AI as a general-purpose technology (Bresnahan & Trajtenberg, 1995), that is, an infrastructure capable of reconfiguring multiple sectors, organizational routines and forms of social coordination, in a perspective in which AI ceases to be understood only as a management tool and begins to directly impact state capacities, power relations, work dynamics and patterns of inclusion and exclusion in access to rights. In this sense, its impacts extend beyond the sphere of administrative efficiency and assume properly political and distributive contours.

Despite this transversal character, the literature on AI and public policies remains fragmented. Predominantly, analyses are focused on specific sectoral applications or isolated normative debates such as algorithmic ethics, data protection or transparency, without systematic integration efforts capable of articulating these dimensions to broader institutional arrangements of the State (Eubanks, 2018; Paul, 2022). As a result, there are still few analytical references that allow us to understand AI as a phenomenon simultaneously technical, organizational and political within the public administration.

The combination between structural inequalities, heterogeneity of bureaucratic capacities, complex federalism and technological dependence creates conditions in which the adoption of algorithmic systems can both expand government capacities and deepen institutional asymmetries and vulnerabilities. In the Brazilian case, this diagnosis gains greater density when articulated to the federal inequalities in the implementation of public policies and the institutional capacity asymmetries between entities and state organs, which condition the unequal incorporation of digital infrastructure, interoperable data and technical competencies (Bichir et al., 2024; Ribeiro & Segatto, 2025).

At the same time, literature on digital sovereignty and infrastructural dependence shows that the adoption of AI in peripheral countries tends to occur in ecosystems marked by strong private concentration of platforms, cloud services and proprietary models, which limits state autonomy over data, systems and decision-making criteria (Cesarino & Arruda, 2025; Flonk et al., 2024; Zanatta & Abramovay, 2019). Nevertheless, recent government strategies have emphasized AI above all as a vector of innovation, productivity and digital transformation, with less analytical density on its distributive, regulatory and labor effects, as observed in the Brazilian Strategy for artificial intelligence and in related documents on state digitization (Ministério da Ciência, Tecnologia e Inovações, 2026; OECD, 2025).

In the face of this scenario, this article argues that artificial intelligence should be treated, in the field of public administration, not only as a technological solution, but as a multidimensional public problem, whose effects transcend different sectors of public policy and tension central principles of democratic governance, equity and state autonomy. Such a framework requires analytical approaches capable of integrating regulatory, institutional and social dimensions, overcoming overly instrumental readings.

In summary, this article repositions artificial intelligence in public administration as a multidimensional public problem that tensions democratic governance, equity and state autonomy, overcoming strictly instrumental approaches. Through an integrative review, the study introduces an analytical matrix and a research agenda that articulates transversal axes of state action to strategic sectors of public policy. The central contribution lies in systematizing fragmented debates, offering a framework for future empirical investigations and subsidizing political formulations sensitive to institutional asymmetries and technological dependence, with special adherence to the Brazilian context. Structurally, the work is organized into five sections: this introduction, theoretical reference, methodological procedures, presentation of the matrix with the proposed agenda and final considerations.

2. LITERATURE REVIEW

2.1 AI as a General-Purpose Technology and the Challenge of Cross-Cutting Governance

Literature already recognizes AI as a General-Purpose Technology (GPT), characterized by its wide applicability in markets and instances of economic and social life, as well as its ability to continuous improvement and potential to generate complementary innovations in multiple sectors (Agrawal et al., 2019; Bresnahan & Trajtenberg, 1995).

Just like other GPTs, such as electricity, telephony and the internet, AI does not limit itself to incremental gains in efficiency, but redefines decision-making processes, organizational structures and forms of institutional coordination, configuring itself in a technological layer that allows the

emergence of new markets and restructures those that remain existing (Bresnahan & Trajtenberg, 1995). Just because of its characteristic as a general-purpose technology, within the scope of the State, the effects of the diffusion of AI cannot be analyzed in isolation, requiring systemic and multidimensional approaches that consider simultaneous impacts on governance, state capacities and distribution of power.

Recent studies emphasize that, by drastically reducing the costs of forecasting and classification, AI changes the logic of decision-making in public and private organizations, shifting the focus from human judgment to algorithmic systems (Agrawal et al., 2019). This shift, however, is not neutral, as it carries assumptions embedded in the data, models and technical architectures, with direct implications for the legitimacy of state action, given that the functioning of AI is based on probabilistic foundational models, trained from available data that reflect human behavior and culture.

Consolidated trends in critical literature demonstrate that AI systems tend to reproduce and amplify pre-existing social inequalities when implemented in contexts marked by structural asymmetries (Eubanks, 2018; O'Neil, 2021). Algorithms, which are trained with historical data from citizens, reflect discriminatory patterns of race, gender and class, introducing bias into administrative decisions, with the risk of automated exclusion processes (Curto et al., 2024).

In Brazil, this debate gains strength from specific themes, such as the concept of "algorithmic racism", proposed by Silva (2022), which highlights how surveillance technologies, facial recognition and automated screening affect black and peripheral populations in an unequal way. Just as the literature on work highlights the emergence of algorithmic management, in which public sector professionals begin to have their autonomy progressively mediated by digital platforms, redefining professional identities and organizational routines (Antunes, 2020; Raichelis, 2022).

Although there is widespread recognition of the risks of reproducing inequalities by algorithmic systems, there is an important gap in the literature regarding how these biases interact with specific institutional arrangements, such as federalism, street-level bureaucracies and universalist policies. In the Brazilian public administration, this analytical absence limits the understanding of how structural inequalities are technically operationalized through AI, reinforcing the need for research agendas that articulate technology, institutions and power in an integrated manner, suggesting space for an approach that investigates the effects and impacts of AI on society as a public and multidimensional problem, given the transversal nature of such effects and impacts.

This point becomes even more important when observing recent international experiences. Reports from the OECD (2019, 2025) and the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2021), as well as analyses by Ruvalcaba-Gomez and Garcia-Benitez (2025), indicate that different countries have begun formulating national AI strategies seeking to balance the promotion of innovation, risk mitigation,and protection of rights. Canada, the European Union, the United Kingdom and Singapore, for example, have been adopting distinct arrangements for algorithmic governance, but they share the perception that AI cannot be regulated only at the level of isolated applications. On the contrary, its diffusion requires coordination between sectors, definition of responsibilities, human supervision and public control mechanisms.

However, as Ribeiro and Segatto (2025) warn, the mere international circulation of regulatory models does not solve the challenges faced by countries marked by institutional inequalities and technological dependence. In contexts such as Brazil, AI governance is strained by federal heterogeneity, bureaucratic capacity asymmetries and low autonomy over digital infrastructure. Thus,

the general-purpose nature of AI produces a central tension for the public administration: while technology spreads transversally and pervasively, the State remains organized in often fragmented, sectoral and unequal structures. It is precisely in this tension that AI ceases to be merely an innovation and begins to constitute a public governance problem.

2.2 From the public problem to digital sovereignty: political dimensions of AI

Critical literature on algorithmic systems has shown that AI does not operate in a social vacuum, nor does it produce neutral effects (Cesarino & Arruda, 2025). On the contrary, when incorporated into contexts marked by structural inequalities, technology tends to reproduce, intensify and, in some cases, obscure already existing asymmetries. Eubanks (2018) demonstrates how automated systems applied to social policy management can reinforce administrative exclusions and widen barriers to access to rights. In a similar direction, O'Neil (2021) argues that algorithmic models often transform historical inequalities into seemingly objective technical classifications, with profound distributive effects and low public visibility.

This discussion is especially relevant for the public administration, as much of the state applications of AI involves exactly screening, prioritization, surveillance, risk classification and decision support in sensitive areas. Curto et al. (2024) observe that algorithms trained with historical data carry marks of discrimination associated with race, gender, territory and class, which can produce biases in administrative decisions and automated exclusion processes. Bioni and Dias (2020), as well as Doneda et al. (2018), emphasize that the combination of technical opacity, information asymmetries and regulatory fragility makes it difficult to publicly contest these decisions and expands risks to the protection of rights.

In parallel, the literature on work highlights the emergence of algorithmic management, whereby public-sector professionals' autonomy is increasingly mediated by digital platforms, reshaping professional identities and organizational routines (Antunes, 2020; Raichelis, 2022). Passos (2024) reinforces this reading by highlighting that decision-making automation can reinforce selective patterns already settled in state action, especially when there is no transparency about data, classification criteria and mechanisms for accountability. Under these conditions, AI is not presented as just a technical challenge for improving models, but as a political problem linked to the reproduction of social hierarchies within public institutions.

Beyond its distributive effects, AI also reconfigures power relations between the State, the market and citizenship. The literature on work has shown that algorithmic management alters routines, redefines margins of discretion and reorganizes professional identities in public and private environments. Antunes (2020) interprets this process as part of broader transformations of digital capitalism, marked by intensified control and precariousness of work. In the field of social policies, Raichelis (2022) suggests that the growing use of automated platforms and systems modifies bureaucratic mediation and affects the autonomy of professionals responsible for implementing rights. Thus, AI produces effects that do not limit themselves to the citizen as the final user, but also reach the State workers and the very functioning of the public bureaucracy.

It is at this point that the notion of public problem is articulated with the dimension of digital sovereignty. Recent literature indicates that AI must also be understood as a strategic asset of contemporary geopolitics. Csernatoni (2024) and Barac and Rodríguez (2025) argue that the

concentration of computational infrastructure, digital platforms, cloud services and processing capacity in a few transnational corporations redefines the conditions of autonomy of States. In the same direction, Cesarino and Arruda (2025) interpret this process as a manifestation of new forms of data colonialism, in which the extraction, storage and processing of information come to occur in technical and legal environments controlled by external agents.

In this context, digital sovereignty is not limited to the abstract protection of data, but involves the state's ability to control critical infrastructures, guide the use of strategic information, define rules for technological development, and reduce dependencies that limit its regulatory and decision-making autonomy. Zanatta and Abramovay (2019) already pointed out that the debate on digital infrastructure must be incorporated into the field of public policies as a matter of collective interest, while Belli et al. (2025), Flonk et al. (2024), and Silveira and Xiong (2025) reinforce that, for countries in the Global South, technological dependence compromises not only economic competitiveness, but also the ability to formulate policies guided by public objectives.

From this perspective, AI cannot be treated only as an instrument of efficiency, nor only as a point of ethical risk. It must be understood as a multidimensional public problem, because it simultaneously tensions equity, accountability, state autonomy, protection of rights and the ability to govern strategic infrastructures. In the Brazilian case, this framework is even more relevant due to the combination of persistent social inequalities, complex federalism, bureaucratic heterogeneity and peripheral insertion in global technological chains.

More than just a technical problem associated with algorithmic biases, artificial intelligence must be understood as an eminently political issue, linked to sovereignty and control over critical knowledge infrastructures. When countries and organizations depend heavily on systems, models and platforms developed by large global technology companies, they are not only outsourcing solutions; they are also transferring decision-making power over how data is processed, how classifications are made and what criteria guide automated decisions.

In this context, the dependence on Big Techs limits the ability of the State to regulate, audit and correct distortions, making it difficult to mitigate algorithmic inequalities that affect social groups asymmetrically. Thus, the debate on AI goes beyond the sphere of engineering and enters the field of governance: it is about who defines the rules of the game, who controls the technological means and who has the effective capacity to intervene to ensure that their effects are socially just.

3. METHODOLOGY

This study is characterized as a theoretical and propositional essay, oriented towards the construction of an analytical framework and a research agenda for the field of public administration. To this end, the integrative literature review was adopted, an approach particularly suitable for emerging, interdisciplinary phenomena and still marked by conceptual and methodological dispersion, as is the case of AI in the public sector. According to Torraco (2016), integrative reviews are not primarily intended for the measurement of effects or the statistical aggregation of evidence, but for the interpretative synthesis of heterogeneous contributions, allowing the identification of convergences, gaps and analytical structures useful for the consolidation of research agendas. This option is consistent with the purpose of the article, which seeks to understand AI as a multidimensional public problem and, from this, propose a guiding analytical matrix for future investigations.

The choice of this methodological strategy stems from the very nature of the object. The literature on AI in the public sector is distributed among different disciplines, analytical scales and publication formats, ranging from sectoral empirical studies to regulatory, organizational, normative and geopolitical analyses. In this context, the integrative review proved to be more suitable than strict systematic reviews, as it allows combining empirical, conceptual and institutional materials without losing sight of the analytical coherence of the whole. More than offering an exhaustive inventory of existing production, the strategy adopted sought to produce a synthesis capable of organizing scattered debates and explicating recurring patterns relevant to the public administration.

3.1 Search, screening and composition strategy of the corpus

The bibliographic survey included articles indexed in the Scopus, Web of Science and Scientific Electronic Library Online (SciELO) databases, complemented by qualified gray literature, such as government reports, guidelines from international organizations and technical publications. The inclusion of this type of material is justified by the applied nature of the topic, since, in the field of public policies and government innovation, institutional documents often anticipate diagnoses, shape regulatory agendas and influence the formulation of policies before their consolidation in academic journals.

The temporal cut favored publications between 2018 and 2025, a period associated with the recent consolidation of deep learning-based AI applications, the diffusion of generative systems, and the intensification of the regulatory and institutional debate on their effects on the State. The searches were carried out with combinations of descriptors in Portuguese and English and used the combinations of descriptors: ("inteligência artificial" OR "algoritmos") AND ("políticas públicas" OR "governo" OR "capacidade estatal") AND ("Brasil" OR "Global South").[1]

In the identification stage, this procedure resulted in an initial corpus of 392 documents. Then, the screening phase was carried out through exploratory reading of titles, abstracts and keywords. In this stage, the following were excluded: (i) strictly technical studies, exclusively focused on the science of computing; (ii) duplicate documents; and (iii) empirical analyses of foreign contexts without comparative potential or analytical relevance for the Brazilian case. After this filter, the set was reduced to 115 potentially relevant works. Table 1 summarizes this corpus composition process, highlighting the passage between the initial universe of records and the final set of analyzed documents.

[1] In English: ("artificial intelligence" OR "algorithms") AND ("public policies" OR "government" OR "state capacity") AND ("Brazil" OR "Global South").

TABLE 1 STAGES OF COMPOSITION OF THE CORPUS OF THE INTEGRATIVE REVIEW

Stage	Proceedings	Number of documents
Identification	Records located in the Scopus, Web of Science and SciELO databases, complemented by qualified gray literature	392
Initial screening	Exclusion of duplicates, strictly technical studies and texts without adherence to the public administration	115
Eligibility	In-depth reading of the remaining texts, considering adherence to the analytical objective of the study	115
Final corpus	Selected documents for interpretive analysis and construction of the multidimensional matrix	53

Source: Elaborated by the authors.

In the final stage, a in-depth reading of the remaining texts was carried out, considering their adherence to the objective of the study. Works that discussed institutional, regulatory, distributive, organizational or labor implications of the incorporation of AI in the public sector were prioritized. At the end of this process, an analytical corpus composed of 53 documents was constituted, which underpinned the construction of the reference proposed in the article. More than representing a statistical sample, this corpus was constituted as a set analytically relevant for the understanding of AI as a multidimensional public problem in the field of public administration.

3.2 Analytical procedure: coding, thematic aggregation and construction of the dimensions

The analytical stage was conducted through inductive thematic categorization, seeking to identify recurring patterns in the problems, tensions and challenges associated with the incorporation of AI in state action. It drew inspiration, for this, from qualitative approaches to conceptual construction, especially in Gioia et al. (2013), not with the objective of mechanically reproducing an organizational research design based on primary data, but to confer greater transparency to the process of passage between evidence extracted from the corpus, intermediate groupings and more abstract analytical categories. In other words, the inspiration from Gioia was mobilized as a strategy for explicating analytical reasoning and not as a literal transposition of method.

The analysis was carried out in three articulated movements. In the first, the full reading of the 53 documents was carried out, with the extraction of excerpts, arguments, diagnoses and findings relating to regulatory problems, distributive risks, institutional capacities, technological dependence, transformations of work and organizational effects associated with the use of AI in the public sector. In this stage, we sought to preserve, as much as possible, the language of the authors themselves, producing 1st order codes close to the native categories of the corpus, such as algorithmic opacity, low explicability, automated discrimination, undue exclusion, institutional fragility, dependence on suppliers, intensification of work and reorganization of bureaucratic routines.

In the second movement, the initial codes were compared with each other and grouped by substantive similarity, giving rise to 2nd order themes. This procedure allowed us to move from scattered findings, often located in specific sectors, to broader interpretative groupings, such as algorithmic accountability, reproduction of inequalities, institutional capacity for implementation and supervision, technological autonomy and transformation of public work. Instead of simply enumerating problems found in the literature, this stage sought to identify analytical recurrences that crossed different implementation contexts and different fields of public administration.

In the third movement, the 2nd order themes were consolidated into aggregated dimensions, understood as structuring axes of the public problem of AI in the public administration. It was at this stage that the five dimensions maintained in the article emerged: governance and regulation; inequalities and biases; state capacities; digital sovereignty; work. It is important to highlight that these dimensions were not imposed a priori as closed categories, but they did not also emerge in a theoretical vacuum. The process was guided by a theoretically sensitive inductive logic: the reading of the corpus was guided by the research question and by sensitizing concepts already present in the literature on general-purpose technology, state capacities, public governance, inequalities and work transformation; however, the final consolidation of the categories depended on the effective recurrence and the articulation observed in the analyzed texts. Thus, the theoretical framework functioned as a horizon of problematization, and not as a rigid classification grid.

This formulation is relevant because it preserves the interpretative nature of the study without reducing the construction of the dimensions to the mere intuition of the authors. The dimension "governance and regulation", for example, resulted from the recurrence of discussions on opacity, explainability, accountability, legal responsibility and human supervision. "Inequalities and biases" consolidated problems related to automated discrimination, reproduction of historical patterns of exclusion, risk profiles and disproportionate impacts on vulnerable groups. "State capacities", in turn, gathered findings related to infrastructure, data, technical competencies, contracting capacity, supervision and auditing. "Digital sovereignty" added topics related to dependence on platforms, control over strategic data and technological autonomy. Finally, "work" condensed discussions on intensification, decision standardization, reconfiguration of routines and erosion of professional discretion. These five dimensions, therefore, do not represent an arbitrary scheme, but the analytical systematization of recurring patterns identified in the corpus.

To expand the traceability of the procedure, Table 2 explicitly explains the passage between 1st order concepts identified in the corpus, 2nd order themes and aggregated dimensions, according to the recommendation of Gioia et al. (2013). This resource allows us to visualize how the proposed multidimensional matrix derives from a progressive abstraction process anchored in the analyzed literature.

TABLE 2 INTEGRATIVE REVIEW DATA STRUCTURE

Final corpus references	1st order concepts (extracted from the corpus)	2nd order topics	Aggregated dimension
• Bichir et al. (2024); • Azevedo et al. (2023); • Cebrian et al. (2024); • Price et al. (2019); • Setzer et al. (2021)	Algorithmic opacity; low explainability; difficulty of auditing; undefined accountability; need for human supervision.	Algorithmic accountability and regulation of the state use of AI	Governance and regulation
• Bioni & Dias (2020); • Azevedo et al. (2023); • Doneda et al. (2018); • Salomão et al. (2025); • Cebrian et al. (2024); • Price et al. (2019);	Information asymmetries between the State, suppliers and citizens; low transparency of decision-making criteria; fragility of public control.	Public governance of automated systems	Governance and regulation
• Doneda et al. (2018); • Eubanks (2018); • Isaguirre-Torres & Maso (2023); • Curto et al. (2024); • O'Neil (2021); • Panch et al. (2019); • Silva (2022)	Automated discrimination; reproduction of historical biases; undue exclusion; racial and territorial selectivity.	Reproduction of inequalities by algorithmic systems	Inequalities and biases
• Bioni & Dias (2020); • Doneda et al. (2018); • Passos (2024); • Curto et al. (2024); • O'Neil (2021); • Silva (2022)	Stigmatization of vulnerable groups; reinforcement of access barriers; distributive impacts hidden by technical language.	Algorithmic injustice and protection of rights	Inequalities and biases
• Ministério da Ciência, Tecnologia e Inovações (2026); • OECD (2025); • Ribeiro & Segatto (2025); • van Noordt & Misuraca (2020); • Wirtz et al. (2019); • World Bank (2021); • AlMurtadha (2024); • Valle & Gallo (2020)	Lack of infrastructure; low interoperability; insufficient technical staff; federal heterogeneity; dependence on consulting firms; fragility of monitoring; difficulties in interorganizational coordination.	State capacity for implementation, supervision and governance of AI	State capacities
• Agrawal et al. (2019); • Antunes (2020); • OECD (2019); • Raichelis (2022);	Intensification of work; decision standardization; reduction of professional discretion.	Transformation of public work by AI systems	Work

Continua

Final corpus references	1st order concepts (extracted from the corpus)	2nd order topics	Aggregated dimension
• Agrawal et al. (2019); • Antunes (2020); • Calvino et al. (2018); • OECD (2019); • Raichelis (2022); • World Bank (2019).	Need for requalification; reorganization of bureaucratic routines; new management and monitoring mechanisms	Algorithmic management and labor impacts in the public sector.	Work

Source: Elaborated by the authors.

3.3 Construction of the multidimensional matrix and selection of the strategic sectors

Once the five transversal dimensions were consolidated, the construction of the multidimensional matrix proposed in the article proceeded. In line with the tradition of integrative reviews aimed at developing conceptual frameworks, the matrix was conceived as an analytical synthesis instrument, aimed at crossing recurring axes of the literature with strategic sectors of public policies. Its objective was not to produce an exhaustive typology of all AI applications in the State, but to organize a heuristic reference capable of explicating interdependencies between analytical dimensions and sectoral domains, guiding future research. This logic already appears in the articulation between the five axes and the six sectors contemplated in the frames of the analytical matrix of the manuscript.

The selection of the sectors did not result from exclusively theoretical arbitration, but from the density of incidence observed in the corpus and the institutional relevance of the areas for the debate on AI and public policies. The sectors of education, health, social assistance, public security, tax-financial and environment were highlighted, as they concentrate empirical and normative discussions relevant to understanding the effects of AI on rights, governance, state capacities, technological autonomy and work. To make this selection criterion more transparent, the 53 documents must be classified according to their predominant analytical incidence sector. In cases where the same study dialogues with more than one area of public policy, the most central sector to the argument of the text is adopted. Table 3 presents this distribution in absolute numbers and percentages, justifying the choice of the six sectors highlighted in the matrix.

TABLE 3 DISTRIBUTION OF THE CORPUS BY DOMINANT SECTOR

Predominant sector	Number of documents	Percentage of the corpus
Education	5	9,4%
Health	5	9,4%
Social assistance	5	9,4%
Public security	5	9,4%
Tax-financial	3	5,7%
Environment	4	7,6%
Others / transversal / multisectoral	26	49,1%
Total	**53**	**100%**

Source: Elaborated by the authors.

It is important to emphasize that the sectoral classification was used exclusively for analytical systematization purposes, not implying the assumption of rigid boundaries between areas of public policy. Part of the corpus studies have a transversal or inter-sectoral character, which is why the selection of sectors must be understood as a heuristic strategy to organize the research agenda, and not as an attempt to compartmentalize a phenomenon whose nature is transversal. The matrix thus operates in two complementary directions: horizontally, it allows identifying recurring patterns that cross different sectors; vertically, it allows observing how these patterns assume specific configurations in different institutional contexts.

3.4 Interpretative validity criteria and limits of the methodological strategy

As with any integrative review, this study presents limitations that must be explicitly stated. First, it is an interpretive synthesis dependent on the documentary and temporal scope adopted, which means that other sets of literature could give distinct emphasis to certain aspects of the phenomenon. Second, although the analytical procedure sought to expand the transparency of coding and thematic aggregation, the construction of the dimensions necessarily involves interpretive judgment by the authors, as occurs in reviews aimed at developing conceptual frameworks. Third, the proposed matrix has a heuristic character and does not replace direct empirical investigation in specific organs, policies or levels of government. Its contribution lies, first of all, in offering an analytical framework capable of integrating scattered debates and guiding future research agendas.

Nevertheless, some elements reinforce the consistency of the procedure adopted. First, the analysis starts from a corpus explicitly outlined and selected by transparent criteria, going from 392 initial records to 115 potentially relevant texts and, at the end, 53 documents read in depth. Second, the path between empirical-documentary material, thematic groupings and aggregated dimensions is explicitly outlined in a progressive manner, approaching a logic of opening the analytical black box. Third, the five dimensions obtained show adherence both to the corpus and to the literature mobilized throughout

the article, which is subsequently articulated in a consistent manner to the strategic sectors of the matrix. For these reasons, the methodological contribution of the study is not in the pretension of exhausting the field, but in offering a traceable interpretative synthesis, conceptually robust and useful for the consolidation of a multidimensional research agenda on AI in public administration.

4. RESULTS AND DISCUSSION

4.1 Analytical characterization of the corpus and emergence of the transversal dimensions

The integrative analysis of the corpus revealed that the impacts of artificial intelligence on the public sector do not manifest themselves in an isolated or restricted form to specific applications. On the contrary, the 53 documents analyzed reveal recurring problems that span different areas of state action and simultaneously affect the State's ability to regulate, implement, supervise and account for its decisions. In this sense, AI ceases to be configured only as technological innovation and begins to operate as a vector of broader institutional, distributive and organizational transformations, in line with the argument already supported by the literature on digital governance and emerging technologies in the public sector. This reading is also consistent with the methodological orientation adopted in the article, according to which the objective of the integrative review was not only to map studies, but to analytically organize recurring patterns of the corpus.

As explicitly stated in the methodological section, the analytical procedure was carried out through in-depth reading, extraction of 1st order concepts, aggregation into 2nd order themes and subsequent consolidation into more abstract analytical dimensions. The result of this process was the identification of five transversal dimensions that are systematically repeated in the reviewed literature: governance and regulation; inequalities and biases; state capacities; digital sovereignty; and work. These dimensions are treated here as structuring axes of the public problem of AI in public administration, as they allow us to understand how the incorporation of algorithmic systems reconfigures state action beyond isolated sectoral uses.

Table 2, presented in the methodological section, precisely synthesizes this trajectory between corpus findings, thematic groupings and aggregated dimensions and systematizes the main references associated with each structuring axis and its predominant conceptual contributions, as demonstrated in section 3.2. Its purpose is not to exhaust the literature, but to make the bibliographic anchoring of the five dimensions more transparent, responding to the need to explicitly explain which authors and which debates support each analytical axis. Below, each dimension is discussed analytically, with emphasis on how it emerges from the corpus and the way it helps to understand AI as a multidimensional public problem.

4.1.1 Governance and regulation

The governance and regulation axis brings together, in the corpus analyzed, the works that deal with the opacity of algorithmic systems, the difficulty of explaining automated decisions, the indefiniteness of accountability regimes and the need for human supervision in contexts of public authority. Instead of appearing as an accessory issue, this set of problems repeats itself in different sectors and constitutes one of the most consistent cores of the reviewed literature. It is an axis linked

to the tension between decision-making automation and classical principles of public administration, such as motivation of acts, transparency, social control and state accountability.

Within this axis, Doneda et al. (2018) mainly support the dimension of opacity and the legal risks associated with the use of automated systems in decisions with impacts on rights, drawing attention to the difficulty of making algorithmic criteria intelligible for citizens and control bodies. Price et al. (2019) contribute more specifically to the problem of accountability, by showing, in the health sector, that clinical decision-support tools blur the boundaries between professional judgment, algorithmic recommendation, and institutional responsibility. In this case, the issue is not only whether the system "works", but who is responsible when its recommendation influences a substantive decision. In turn, the OECD (2019, 2021), mobilized in the corpus, emphasizes the need for human supervision, data governance, and objective accountability rules as a condition for the legitimate use of AI by governments. The contribution of Bichir et al. (2024), although less focused on algorithmic regulation in the strict sense, helps to understand how institutional asymmetries and federal arrangements make it more complex to build consistent and comparable controls in the public sector.

Three types of problems are anchored in the corpus. Low technical explicability appears especially in Doneda et al. (2018) and in OECD reports; the indefiniteness of liability regimes becomes more visible in Price et al. (2019), especially in sensitive decision-making contexts; and information asymmetries between the State, suppliers and citizens emerge both from the broader regulatory debate and from the difficulty of supervision in heterogeneous administrative arrangements, as Cebrian et al. (2024) point out. Thus, the reviewed literature converges to the interpretation that the adoption of AI in the public sector cannot be treated as just process innovation, but requires institutional design capable of guaranteeing intelligibility, contestability, the right to explanation and public control of automated decisions.

4.1.2 Inequalities and biases

The axis of inequalities and biases shows that the algorithmic systems analyzed in the corpus do not operate in a neutral social environment. On the contrary, they tend to incorporate historical patterns present in the databases, in the classification criteria and in the institutional logics that guide their application. This diagnosis appears particularly strongly in the works of Eubanks (2018) and O'Neil (2021), which show how automation can convert structural inequalities into apparently objective technical classifications, reducing the political visibility of their distributive effects.

In the corpus, this dimension is expressed above all in three types of problem. The first is the undue exclusion in eligibility, screening or prioritization processes, a particularly strong theme in discussions about social policies. The second is the reinforcement of stigmas and risk profiles on vulnerable groups, which makes poverty, territory, race or administrative history come to function as technically legitimated markers of suspicion or negative priority. The third is the higher incidence of errors and unjust classifications on underrepresented or historically discriminated populations. In the Brazilian case, Silva (2022) and Passos (2024) concretize this debate by discussing algorithmic racism, automated discrimination and disproportionate impacts on black and peripheral populations, especially in contexts of surveillance and public security.

This anchoring is important because it allows us to better specify who supports each aspect of the axis. Eubanks (2018) contributes mainly to the discussion of algorithmic exclusion and automated

management of poverty; O'Neil (2021) sheds light on the mechanism by which structural inequalities are translated into seemingly neutral metrics; and Silva (2022) and Passos (2024) show how this process assumes racialized and territorially selective contours in the Brazilian context. Thus, the axis "inequalities and biases" does not only refer to a technical problem of model calibration, but to a distributive and political problem, in which AI can reinforce barriers to access to rights and deepen pre-existing asymmetries within the scope of state action.

4.1.3 State capacity

The axis of state capacity shifts the focus from the abstract potential of technology to the effective institutional conditions of its incorporation by the State. In the corpus, this dimension appears in discussions on digital infrastructure, data interoperability, technical competencies, contracting capacity, continuous supervision and coordination between bodies and levels of government. In this sense, the reviewed literature suggests that the adoption of AI depends less on the mere availability of tools and more on the existence of bureaucracies capable of planning, integrating, monitoring and auditing complex systems throughout the cycle of public policies.

Van Noordt and Misuraca (2020) and the World Bank (2021), mobilized in the manuscript, more generally support the idea that the state use of AI requires bureaucratic, technical, and analytical capabilities that are not confused with simple acquisition of technology. Wirtz et al. (2019) help demonstrate that, without these internal capabilities, digitization tends to shift decision-making power and technical knowledge to private suppliers, weakening the state's position in defining, supervising, and correcting the systems employed. This point directly responds to the criticism of "loss of state control": in the corpus, this loss does not appear only as an abstract theoretical formulation, but as a practical consequence of the asymmetry between bureaucracies with low auditing capacity and private markets that dominate infrastructure, models, and technical knowledge. Ribeiro and Segatto (2025), in turn, reinforce this argument by pointing out inequalities in digital maturity and institutional capacity in the Brazilian public sector, especially in federal and heterogeneous contexts.

With this, the idea of "loss of state control" can be decomposed into elements more observable in the corpus: dependence on suppliers for contracting and operation, fragility of continuous monitoring, low capacity for internal auditing, difficulty of integration between bodies and asymmetries between government entities. Instead of being treated as just a generic risk, it is now understood as the result of the combination between technical insufficiency, low organizational capacity and institutional heterogeneity. Thus, the axis of state capacity reveals that AI governance is inseparable from the State's ability to maintain substantive control over data, models, contracts and decision-making processes.

4.1.4 Digital sovereignty

The axis of digital sovereignty introduces, in the corpus, the geopolitical and infrastructural dimension of the incorporation of AI by the State. It brings together works that deal with the concentration of computing infrastructure, cloud services, digital platforms, control over strategic data and the new forms of dependence produced by highly centralized technological ecosystems.

Flonk et al. (2024) are particularly important to support the argument of infrastructural dependency, by showing how the concentration of computing capacity and digital services redefines the margins of state autonomy. Csernatoni (2024) and Barac and Rodríguez (2025), also present in the manuscript, help frame AI as a strategic asset of contemporary geopolitics, in which infrastructure, data and processing capacity become power resources. Meanwhile, Cesarino and Arruda (2025) radicalize this diagnosis by interpreting the concentration of data and infrastructure as an expression of new forms of data colonialism. Finally, Zanatta and Abramovay (2019) reinforce, in a more normative and institutional key, that digital infrastructure and data governance should be treated as matters of public interest.

This articulation allows us to better detail what the axis means by digital sovereignty. It is not just about abstract data protection, but about the effective capacity of the State to control sensitive information assets, reduce dependence on critical private services, guide technological uses in line with public objectives, and preserve regulatory autonomy over strategic infrastructures. In the corpus, this dimension gains density above all in sectors where sensitive databases, cloud services, and proprietary models play a central role. Therefore, digital sovereignty appears as a distinct dimension and not just a mere sub-item of state capacities, as it refers to a scale of dispute that simultaneously involves public administration, digital markets, and geopolitical order.

4.1.5 Work

The labor dimension allows us to observe that AI does not only affect citizens and decision-making processes, but also reorganizes routines, assignments, margins of discretion and forms of control within the State itself.

Antunes (2020) offers the widest base to understand automation and algorithmic management as part of contemporary transformations of work marked by the intensification of control, standardization, and reconfiguration of tasks. In the field of social policies, Raichelis (2022) helps translate this debate into the public sector, showing how digitization modifies bureaucratic mediation and redistributes responsibilities between systems and professionals. Williamson and Eynon (2020) specifically contribute to highlighting how data-driven platforms and systems alter teaching work, pedagogical autonomy, and evaluation criteria in the educational sector. Similarly, Price et al. (2019) show, in the health sector, that algorithmic tools can support clinical decisions, but they also intensify requirements for monitoring, supervision, and professional adaptation.

With this, the labor dimension can be read according to three main movements observed in the corpus: reconfiguration of routines and professional assignments; expansion of standardization and monitoring mechanisms; and the need for requalification in environments increasingly mediated by algorithmic systems. The central point is that AI does not simply replace human work or merely "support" it; it redefines the content of public work, the forms of professional decision-making and the very bureaucratic mediation between the State and society. Therefore, labor emerges as a distinct analytical dimension in the framework of the article, and not as a residual consequence of technological adoption.

This diagnosis brings the debate on AI closer to the classical theories of street-level bureaucracy, by suggesting that algorithmic systems do not eliminate discretion, but reconfigure it. Instead of disappearing, professional judgment is redistributed between rules, interfaces, platforms, metrics

and supervision mechanisms, altering the concrete mediation between the State and the citizen in the provision of public services.

4.2 Sectoral distribution of the corpus and analytical density of the sectors

Once the five transversal dimensions of the incorporation of artificial intelligence into state action were identified, the next step of the analysis consisted of observing how these axes manifest themselves in specific sectoral domains. On the one hand, the integrative review revealed that governance and regulation, inequalities and biases, state capacities, digital sovereignty and work cross different institutional contexts, on the other hand, the corpus also showed that such dimensions assume particular configurations according to the type of public policy, the degree of discretion involved, the sensitivity of the data used and the available organizational capacities. This movement is important because it avoids two opposite simplifications: the one of treating AI as a homogeneous phenomenon, indifferent to the context, and the one of excessively fragmenting the analysis into disconnected sectoral applications.

Based on the classification of the corpus by predominant sector, six domains of public policy were highlighted in which the analyzed literature presented greater empirical density and greater institutional relevance for understanding the effects of AI in the public sector, as described in Table 3 of subitem 3.3: education, health, social assistance, public security, tax-financial and environmental. These sectors were selected not by exhaustiveness, but because they concentrate particularly revealing dilemmas about rights, regulation, state autonomy, organization of work and distributive inequalities. In other words, they function as heuristic contexts integrated into the matrix, privileged to observe, in a comparative key, how the five structuring axes identified earlier materialize in distinct decision-making arenas, fulfilling an analytical support role in the proposal of multidimensionality.

Table 4 presented below systematizes the main references mobilized in each strategic sector. Its objective is not only to bring together authors, but to explicitly explain the analytical basis that supports the subsequent sectoral discussion and reinforce the traceability between corpus, selected sectors and multidimensional matrix proposed at the end of the section.

TABLE 4 CONTRIBUTION OF REFERENCES BY STRATEGIC SECTORS

Strategic sector	Supporting bibliographic references
1. Education	• du Boulay (2023) • Silva et al. (2023) • Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação (Cetic.br) & Comitê Gestor da Internet no Brasil (Cgi.br) (2024) • Silva & Carolei (2024) • Williamson & Eynon (2020)

Continue

Strategic sector	Supporting bibliographic references
2. Health (SUS)	• Ministério da Saúde (2020) • Panch et al. (2019) • Price et al. (2019) • Bruno et al. (2023) • Torres et al. (2025)
3. Social Assistance	• Bichir et al. (2024) • Eubanks (2018) • Meato et al. (2019) • Taylor (2023) • Torres et al. (2025)
4. Public security	• Azevedo et al. (2023) • Fórum Brasileiro de Segurança Pública (2024) • Cebrian et al. (2024) • Silva (2022) • Díaz et al. (2025)
5. Taxation and Finance	• Banco Central do Brasil (n.d.) • OECD (2019) • Nunes & Delgado (2023)
6. Environment	• Abramovay (2020) • Isaguirre-Torres & Maso (2023) • Maranhão (2024) • Sander (2025)

Source: Elaborated by the authors.

4.2.1 Education

In the educational sector, the literature highlights the growing use of AI in adaptive platforms (Cetic.br & Cgi.br, 2024; Silva & Carolei, 2024), assessment systems, teaching personalization (du Boulay, 2023), performance monitoring and school data management (Silva & Carolei, 2024). Williamson and Eynon (2020) show that these tools reorganize pedagogical mediation, introducing new forms of data-based governance and new relationships between the State, schools and private platforms. In the corpus, education appears as a particularly sensitive space to the articulation between innovation, inequality and technological dependence (du Boulay, 2023; Williamson & Eynon, 2020), since digital systems can both expand pedagogical capacities and intensify access asymmetries, surveillance of students and erosion of teacher autonomy.

This combination makes education a privileged sector to observe the intersection between governance and regulation, digital sovereignty and work. Issues such as control over school data, transparency of automated evaluation criteria, the role of private platforms and impacts on teaching routines show that AI, in this domain, does not operate only as a support tool, but as a device capable of reorganizing decision-making structures and pedagogical mediations.

4.2.2 Health

In health care, AI appears associated with diagnostic support, screening, risk classification, clinical management, epidemiological surveillance, and optimization of care flows (Bruno et al., 2023; Torres et al., 2025). Panch et al. (2019) and Price et al. (2019) show that such applications offer relevant potential for improving decision-making and resource allocation, but simultaneously raise dilemmas of accountability, explainability, and professional supervision. Panch et al. (2019) also indicate that the quality, representativeness, and interoperability of health data become central issues, especially when training biases can compromise equity in care and clinical safety.

Health is, thus, a sector in which the five axes appear in a particularly concentrated way: governance and regulation (Price et al., 2019), because clinical decisions require explicability and responsibility; inequalities and biases (Curto et al., 2024; Panch et al., 2019), because errors can affect underrepresented groups; state capacities (OECD, 2025; Wirtz et al., 2019), because infrastructure and data governance are decisive; digital sovereignty (Cesarino & Arruda, 2025), because sensitive bases and critical systems require public control; and work (Antunes, 2020; Torres et al., 2025), because algorithmic tools reconfigure professional practice.

4.2.3 Social assistance

Social assistance constitutes one of the contexts most sensitive to decision automation, given the centrality of administrative registrations (Bichir et al., 2024), eligibility criteria (Eubanks, 2018) and prioritization mechanisms in access to benefits (Bichir et al., 2024). Eubanks (2018) and Taylor (2023) show that the use of predictive models and automated data crossings is often justified by arguments of efficiency and combat against fraud, but can produce undue exclusions, reinforcement of stigmas and deepening of surveillance of vulnerable populations. In the corpus, this sector particularly strongly highlights the link between inequalities and biases (Ribeiro & Segatto, 2025; Taylor, 2023), state capacity (Wirtz et al., 2019) and transformation of work at the implementation front (Calvino et al., 2018; Taylor, 2023).

Classification errors, low decision-making transparency and informational asymmetry between the State and citizens tend to weaken the protective character of social policy and make public contestation difficult. Therefore, social assistance appears as a strategic sector to examine how AI can convert social vulnerability into administrative risk, while reconfiguring the bureaucratic mediation of access to rights.

4.2.4 Public security

In public security, the adoption of facial recognition (Cebrian et al., 2024), biometrics (Silva, 2022), automated surveillance (Fórum Brasileiro de Segurança Pública, 2024) and predictive policing (Silva, 2022) directly impacts civil liberties and fundamental rights. The corpus documents high rates of false positives, racial biases and disproportionate impacts on black and peripheral populations (Fórum Brasileiro de Segurança Pública, 2024; Silva, 2022). In this sector, AI explicitly sharpens the entanglement between structural inequalities, decisional opacity, technological dependence and fragility of democratic control.

Public security highlights, perhaps more intensely than any other sector, that AI can expand the selectivity already present in state action and reduce the public visibility of the criteria that guide sensitive decisions. For this reason, the literature points to the need for more restrictive regulatory regimes (Díaz et al., 2025), continuous auditing (Azevedo, 2023), independent tests (Silva, 2022), significant human supervision and democratic control over surveillance technologies (Cebrian et al., 2024).

4.2.5 Taxation and Finance

In the tax-financial field, digitization presents relatively high levels of institutional capacity, with intensive use of data analysis for auditing, monitoring and collection. Initiatives such as Pix and Drex illustrate the potential for public innovation and state coordination in this domain (Banco Central do Brasil, n.d.).

However, tax automation also raises debates about financial privacy, transparency of the criteria for selecting taxpayers and possible regressive distributive effects (Nunes & Delgado, 2023; OECD, 2019). Thus, even in contexts of greater technological maturity, AI introduces regulatory and normative dilemmas that go beyond efficiency gains.

4.2.6 Environment

In the environmental sector, AI has been employed mainly for territorial monitoring, remote sensing and monitoring of deforestation and environmental crimes (Sander, 2025). These tools expand the state's capacity to act in contexts of great territorial complexity, such as the Amazon (Abramovay, 2020).

At the same time, the intensive use of geospatial data and external technological infrastructures raises questions about the sovereignty of strategic information, technological dependence and socio-environmental justice (Maranhão, 2024). The sector illustrates how AI can simultaneously strengthen state control capabilities and generate new institutional vulnerabilities, reinforcing the need for public governance over critical data and infrastructures.

4.3 Multidimensional matrix and research agenda

4.3.1 Construction and integrative logic

The articulation between the transversal dimensions identified in section 4.1 and the sectoral contexts examined in section 4.2 allowed the construction of a multidimensional matrix intended to synthesize the main dilemmas associated with the incorporation of artificial intelligence into state action. Instead of treating challenges in a fragmented manner, by technology, sector or instrument, the matrix crosses structuring analytical axes with strategic areas of public policy, allowing us to visualize how recurring institutional problems assume specific configurations according to the implementation context.

This arrangement makes it possible for two complementary analytical movements: horizontally, identifying patterns that cross different sectors; vertically, understanding institutional particularities that modulate the effects of AI in each policy. The matrix, therefore, does not only constitute a tool for organizing literature, but an interpretative device that explicates relationships between governance, inequalities, state capacities, digital sovereignty and work.

Tables 5 and 6 present this systematization, organizing the main dilemmas, regulatory risks and knowledge gaps identified at each intersection between axes and sectors.

TABLE 5 MULTIDIMENSIONAL ANALYTICAL MATRIX: RESEARCH AGENDA ON ARTIFICIAL INTELLIGENCE AND PUBLIC POLICIES FOR THE EDUCATION, HEALTH AND SOCIAL ASSISTANCE SECTORS

Axis / Sector	Education	Health	Social Assistance
1. Governance and regulation	(1) Regulation of educational platforms	(7) Responsibility for automated clinical decisions	(14) Social registration governance
2. Inequalities and biases	(2) Algorithmic bias and educational inequalities	(8) Underrepresentation of vulnerable groups in health data	(15) Algorithmic exclusion and eligibility errors; (16) Digital stigmatization of poverty
3. State capacities	(3) State capacity to govern educational AI	(9) Analytical capacity in the Unified Health System (SUS); (10) Integration of AI into primary care	(17) Local capacities in the management of the Single Registry
4. Digital sovereignty	(4) Curriculum sovereignty and dependence on platforms	(11) Health sovereignty and control of health data	(18) State control of sensitive social bases
5. Work	(5) Reconfiguration of teaching work; (6) Algorithmic management of pedagogical activity	(12) Intensification of healthcare work; (13) Reconfiguration of clinical practices	(19) Changes in the work of the social worker

Source: Elaborated by the authors.

TABLE 6 MULTIDIMENSIONAL ANALYTICAL MATRIX: RESEARCH AGENDA ON ARTIFICIAL INTELLIGENCE AND PUBLIC POLICIES FOR THE PUBLIC SECURITY, TAXATION AND FINANCIAL AND ENVIRONMENTAL SECTORS

Axis / Sector	Public security	Taxation and Finance	Environment
1. Governance and regulation	(20) Regulatory limits on the use of AI in policing; (21) Moratoriums and restrictive regimes	(27) Regulation of automated tax systems	(33) Legal validity of environmental evidence based on AI
2. Inequalities and biases	(22) Criminal selectivity and racial false positives	(28) Distributive bias in the automated selection of taxpayers	(34) Unequal impacts of environmental surveillance

Contine

Axis / Sector	Public security	Taxation and Finance	Environment
3. State capacities	(23) Institutional audit of police AI	(29) Institutional maturity for tax AI	(35) Technical capacities for environmental inspection
4. Digital sovereignty	(24) Technological dependence in surveillance systems	(30) Monetary sovereignty and financial data; (31) Digital infrastructure of the tax administration	(36) Sovereignty over territorial data
5. Work	(25) Algorithmic management of policing; (26) Police discretion and AI	(32) Automation and tax work	(37) Automated technical and environmental work; (38) Technological mediation in environmental work; (39) Dependence on private systems in public-sector work; (40) Professional reskilling in the digital state

Source: Elaborated by the authors.

4.3.2 Identified cross-sectional patterns

The integrated reading of the matrix reveals three central analytical patterns. First, governance and accountability challenges are shown to be ubiquitous. Regardless of the sector, algorithmic opacity, auditing difficulties, and the undefinedness of institutional responsibilities appear as recurring obstacles. This result suggests that the regulation of AI constitutes a structural problem of the digital state, and not a question located in specific applications.

Secondly, distributive impacts tend to concentrate on policies aimed at vulnerable populations. Social assistance, public security and education present a greater risk of reproducing inequalities, highlighting those automated decisions can thus convert historical asymmetries into technically mediated exclusions. Technology, in these contexts, operates as a mechanism for amplifying existing inequalities.

Finally, the effectiveness of AI applications is strongly conditioned by state capacity and the degree of technological autonomy. More robust experiences are associated with the existence of public data infrastructure, qualified technical personnel and less dependence on external suppliers. This indicates that the digitization of the State does not replace institutional competencies, but requires their strengthening.

In the Brazilian case, these conditions assume a particularly acute form due to two additional factors. The first is the federal fragmentation of data infrastructure and interoperability capabilities, which makes it difficult to coordinate between systems, government levels and sectoral policies. The second is the risk of technological lock-in in public procurement of proprietary solutions, a situation in which contractual dependence, low auditability and technical asymmetry between the State and suppliers can restrict correction of biases, data portability and institutional autonomy over time.

4.3.3 Research agenda

Based on the identified standards, an research agenda is proposed guided by three complementary fronts. The first refers to the deepening of studies on governance and regulation, with a focus on algorithmic transparency mechanisms, public auditing, human supervision and institutional accountability capable of reconciling technological innovation and democratic control.

The second involves investigations into distributive impacts and social justice, especially in social protection and security policies, exploring how algorithmic biases affect vulnerable groups, how inequalities are incorporated into administrative data, and which institutional strategies can mitigate exclusionary effects.

The third front focuses on the organizational conditions of the digital transformation of the State, including the development of internal technical capabilities, data sovereignty, digital infrastructure industrial policy and regulation of public work in algorithmic environments.

An additional advancement of the proposed agenda consists of incorporating the perspective of Public Interest Tech, shifting the focus of AI as an object of ex post regulation to its conception as a sociotechnical infrastructure capable of being designed with a public interest orientation. Under this perspective, the public sector should not be understood only as a supervisor of private systems, but also as an actor capable of defining requirements for transparency, auditability, interoperability and public purpose from the conception, contracting and technological implementation phase. This expansion is particularly relevant in contexts such as the Brazilian one, in which digital sovereignty and state autonomy depend not only on risk regulation, but also on the ability to induce technological architectures compatible with rights, contestability and democratic control.

Due to the institutional fragmentation of the Brazilian State, the proposed agenda also demands criteria for prioritization. Instead of treating the 38 topics as a homogeneous and simultaneous agenda, a phased strategy is suggested. In the short term, topics related to governance, contestability, data interoperability and contractual lock-in risks should be prioritized due to their enabling nature. In the medium term, investigations into sectoral state capacities and professional discretion gain centrality. In a broader horizon, topics related to digital sovereignty and the public design of technological infrastructures oriented to the collective interest become decisive to reduce structural dependencies.

A particularly promising research front consists of examining how AI reconfigures bureaucratic discretion at the forefront of the State. In dialogue with the tradition of street-level bureaucracy, it is important to understand whether algorithmic systems reduce, displace or reformulate the judgment space of public professionals, and to what extent this affects access to rights, administrative responsiveness and capacity to adapt to concrete contexts.

The agenda should also more explicitly incorporate the perspective of the affected citizen. This implies investigating not only the internal governance of the systems, but the subjective experience of individuals subjected to automated classifications, as well as the concrete conditions for challenging, reviewing and explaining public decisions mediated by AI. Without this dimension, there is a risk that the debate will remain centered only on the state's capacity and lose sight of the democratic legitimacy of the use of these technologies.

Based on these fronts, priority research topics were systematized in each intersection between analytical dimensions and strategic sectors, translating the findings of the matrix into concrete research questions and gaps. Table 7 organizes this agenda, synthesizing guiding questions and possibilities for empirical advancement.

TABLE 7 SYNOPSIS OF THE RESEARCH AGENDA THEMES

Axis / Sector	Theme of the research agenda	Synopsis of the research topic
Governance - Education	(1) Regulation of educational platforms	Analyze how regulatory frameworks can limit power asymmetries between the State, schools and digital platforms.
Inequalities - Education	(2) Algorithmic bias and educational inequalities	Investigate how algorithmic systems reproduce pre-existing educational inequalities.
Skills - Education	(3) State capacity to govern educational AI	Examine the institutional capacities necessary for planning, contracting, interoperability, supervision and public design of AI systems in education.
Sovereignty - Education	(4) Curriculum sovereignty and dependence on platforms	Analyze risks of loss of curricular autonomy associated with the platformization of public education.
Labor - Education	(5) Reconfiguration of teaching work	Investigate the impacts of AI on autonomy, evaluation and intensification of teaching work.
Labor - Education	(6) Algorithmic management of pedagogical activity	Examine the use of automated systems for the control and standardization of pedagogical practices.
Governance - Health	(7) Responsibility for automated clinical decisions	Analyze professional and institutional accountability regimes in decisions mediated by AI.
Inequalities - Health	(8) Underrepresentation of vulnerable groups in health data	Investigate the effects of excluding vulnerable populations in algorithmic health modeling.
Capabilities - Health	(9) Analytical skills in the SUS	Examine technical and organizational capabilities for critical use of AI in the SUS.
Capabilities - Health	(10) Integration of AI into primary care	Analyze the limits and possibilities of AI in territorial and longitudinal care.
Sovereignty - Health	(11) Health sovereignty and control of health data	Investigate disputes over control, storage, interoperability and use of public health data, as well as public requirements for auditability and technological autonomy.
Labor - Health	(12) Intensification of health work	Analyze the effects of AI on the pace, workload and accountability of work in health care.
Labor - Health	(13) Reconfiguration of clinical practices	Examine how AI changes decisions, routines and clinical authority.

Continue

Axis / Sector	Theme of the research agenda	Synopsis of the research topic
Governance - Assistance	(14) Social registration governance	Analyze governance models, contestability and review of automated decisions on sensitive social bases.
Inequalities - Assistance	(15) Algorithmic exclusion and eligibility errors	Investigate exclusion errors generated by predictive models in social policies.
Inequalities - Assistance	(16) Digital stigmatization of poverty	Examine how automation reinforces narratives of suspicion about beneficiaries.
Capabilities - Assistance	(17) Local capacities in the management of the Single Registry	Analyze federal inequalities in the implementation of automated systems.
Sovereignty - Assistance	(18) State control of sensitive social bases	Investigate risks of outsourcing and technological dependence in social policies.
Labor - Assistance	(19) Changes in the work of the social worker	Examine the impacts of AI on discretion and professional mediation.
Governance - Security	(20) Regulatory limits to police use of AI	Analyze legal frameworks to restrict abusive uses of AI in public security, including explainability requirements, auditing and social control.
Governance - Security	(21) Moratoriums and restrictive regimes	Investigate normative foundations for moratoriums and prohibitions of certain technologies.
Inequalities - Security	(22) Criminal selectivity and racial false positives	Examine racial biases in facial recognition systems and predictive policing.
Capabilities - Security	(23) Institutional audit of police AI	Analyze state capacities for auditing, transparency, algorithmic control and prevention of technological lock-in in police systems.
Sovereignty - Security	(24) Technological dependence in surveillance systems	Investigate risks of dependence on private suppliers in public security.
Labor - Safety	(25) Algorithmic management of policing	Examine the impacts of AI on police autonomy and discretion.
Governance - Tax	(26) Regulation of automated tax systems	Analyze legal and institutional limits of tax automation.
Inequalities - Tax	(27) Distributive bias in the selection of taxpayers	Investigate the regressive effects of automation on tax enforcement.
Capabilities - Tax	(28) Institutional maturity for tax AI	Examine analytical, technological and contractual capabilities of tax administrations, including prevention of dependence on proprietary solutions.
Sovereignty - Tax	(29) Monetary sovereignty and financial data	Analyze the implications of Drex and monetary digitization for the State.

Continue

Axis / Sector	Theme of the research agenda	Synopsis of the research topic
Sovereignty - Tax	(30) Digital infrastructure of the fiscal State	Investigate state control over critical revenue infrastructure.
Labor - Tax	(31) Automation and tax work	Examine the impacts of AI on tax careers and routines.
Governance - Environment	(32) Legal validity of environmental evidence based on AI	Analyze the legal admissibility of automated environmental evidence.
Inequalities - Environment	(33) Unequal impacts of environmental surveillance	Investigate unequal territorial effects of automated enforcement.
Capabilities - Environment	(34) Technical capacities for environmental inspection	Examine state capacity for sovereign use of environmental AI.
Labor - Environment	(35) Automated technical-environmental work	Analyze disputes over control of strategic environmental data.
Labor - Environment	(36) Technological mediation in environmental work	Examine reconfiguration of technical work in environmental monitoring.
Labor - Environment	(37) Dependence on private systems in public work	Investigate the impacts of environmental technological outsourcing on state autonomy.
Labor - Environment	(38) Professional requalification in the digital State	Analyze training and re-qualification challenges in the state guided by AI in environmental work.

Source: Elaborated by the authors.

4.3.4 Interpretative synthesis

The proposed matrix and agenda reinforce the central argument of this study: artificial intelligence should be treated, in the field of public administration, not only as a tool for managerial modernization, but as a multidimensional public problem. Its effects simultaneously cross regulatory arrangements, distributive dynamics, institutional capacities, geopolitical relations and working conditions.

By integrating these dimensions into a single analytical framework, the article offers a reference capable of guiding future research and subsidizing public decisions more sensitive to institutional and social risks. Thus, the contribution of the study lies less in the evaluation of specific technologies and more in the proposal of an analytical lens that allows us to understand, systematically, how AI reconfigures the contemporary State.

5. FINAL CONSIDERATIONS

This article argues that artificial intelligence should not be understood, within the scope of public administration, only as a tool for managerial modernization, but as a multidimensional public problem, whose effects transcend institutional arrangements, distributive dynamics, organizational capacities and power relations. By shifting the focus from specific technological applications to their structural implications on the State, the study sought to offer an analytical lens capable of integrating debates still fragmented in the literature.

The main theoretical contribution lies in the proposal of a conceptual framework that articulates general-purpose technologies, state capacity and public governance. By identifying five structuring axes, the article systematizes recurring, but dispersed, dimensions, allowing us to understand AI as a phenomenon simultaneously technical, political and organizational. This framework expands predominantly instrumental interpretations of the digitization of the State and repositions technology at the center of classic debates on equity, accountability and state autonomy.

From a methodological point of view, the integrative review oriented towards the construction of conceptual models made it possible to synthesize heterogeneous contributions in a coherent analytical framework. The proposed multidimensional matrix, by crossing transversal dimensions and strategic sectors, operates as an instrument of theoretical integration and orientation for future research, overcoming isolated sectoral or normative approaches.

In the practical plan, the findings indicate that the adoption of AI in the public sector requires more than technological investments. Consistent results depend on robust regulatory arrangements, public data infrastructure, development of internal technical capabilities and mechanisms for protecting rights. In contexts marked by institutional and social inequalities, such as the Brazilian one, the uncritical incorporation of algorithmic systems can deepen existing vulnerabilities, reinforcing the need for governance policies, democratic supervision and digital sovereignty.

The outlined research agenda suggests three priority directions: the strengthening of governance and algorithmic auditing models; the investigation of distributive impacts and bias mitigation strategies; and the study of the organizational and labor conditions of the digital transformation of the State. Such fronts indicate opportunities for comparative empirical research, institutional evaluations and regulatory design analyses capable of informing more responsible and inclusive public policies.

This study, however, presents limitations inherent to the strategy adopted. As an integrative review, the work privileges conceptual synthesis at the expense of direct empirical tests, in addition to relying on the selected temporal and documentary cut-off. Future research can deepen the propositions presented here through case studies, quantitative analyses or comparative investigations between different levels of government.

The proposed agenda must be read in a phased manner, with initial priority given to enabling topics, governance, contestability, interoperability and prevention of technological lock-in, without which the expansion of AI in the public sector tends to reproduce institutional inequalities and existing structural dependencies.

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RESEARCH DATA AVAILABILITY

The data set that supports the results of this study is available upon request to the authors.

CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

ARTIFICIAL INTELLIGENCE USAGE

The OpenAI artificial intelligence tool (ChatGPT) was used to assist with the technical and grammatical review of the text and the standardization of references. The study design, analysis, interpretation of the results, and final writing are the responsibility of the authors.