

Automating public governance oversight: evidence from the Federal District of Brazil

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Abstract: This study analyzes how automation can strengthen transparency and governance in Brazil's public sector through the development and application of the LARA (Automatic Administrative Resource Gatherer) system in the Federal District. Adopting a mixed-methods approach, the research combines document analysis, automated data extraction, and content validation across 47 public entities. The findings reveal significant governance gaps: 27.7% of agencies lack formal governance structures, and only 57.4% regularly publish minutes from their Internal Governance Committee (IGC) meetings. These deficiencies result from institutional fragmentation, limited standardization, and insufficient digitization. By integrating artificial intelligence and web scraping, the LARA system demonstrates how automation can modernize oversight and improve monitoring of transparency policies. The results align with international guidelines from the OECD and Brazil's Federal Court of Accounts (TCU), emphasizing the importance of standardization, staff training, and digitized governance processes. The study contributes to digital governance research by proposing a replicable model for automated accountability, applicable to public administrations seeking greater transparency, efficiency, and institutional maturity.

Keywords: digital governance, public sector innovation, transparency, compliance automation.

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Introduction

The concept of governance has gained prominence in both public and corporate spheres, especially after the adoption of the OECD Principles of Corporate Governance in 1999 (Silveira, 2021), which promoted transparency, accountability, strategic direction, and stakeholder engagement. In the public sector, governance has evolved to meet growing demands for integrity, efficiency, and citizen participation in policymaking (Kooiman, 2003; Koppenjan & Klijn, 2004).

In Brazil, significant efforts have been made to incorporate governance principles, focusing on direction, coordination, and institutional arrangements that serve collective interests. The New Public Governance model stresses citizen engagement, transparency, and administrative efficiency (Koppenjan & Klijn, 2004). These values are supported by a strong legal framework, including Law No. 9,613/1998 (anti-money laundering), the Fiscal Responsibility Law (Complementary Law No. 101/2000), and the Anti-Corruption Law (Law No. 12,846/2013), which imposes liability on companies for acts against public administration.

The Brazilian Federal Court of Accounts (TCU) defines public governance as leadership, strategy, and control mechanisms that guide and monitor public management to ensure effective policy implementation and service delivery (TCU, 2020). At the federal level, Decree No. 9,203/2017 established governance policies for direct, autarchic, and foundational administration, highlighting the need to assess demands, identify problems, and prioritize services. It emphasizes strategic leadership, institutional control, and social participation as key elements of government accountability (Peters, 2013). The governance structure includes the Interministerial Governance Committee and Internal Governance Committees (CIGs), which support coordination and oversight.

In the Federal District, governance was formalized through Decree No. 39,736/2019, establishing the Public Governance and Compliance Policy for the executive branch's direct and indirect administration. This decree, aligned with Law No. 12,846/2013, emphasizes integrity and transparency and created the Public Governance Council (CGov) and Internal Public Governance Committees (CIGs). However, for these structures to be effective, they must transcend formalities and operate as active instruments of governance and transparency.

The use of automation and artificial intelligence (AI) in public governance is expanding, especially for transparency and accountability. Recent studies suggest that hybrid intelligence models—combining AI and crowd intelligence—enhance governance by balancing efficiency and social engagement (Liu, Tang, & Collard, 2025). Algorithmic governance and artificial discretion are also being integrated to optimize decisions and oversight (Busuioc, 2020). Web scraping and machine learning are increasingly used to collect and structure public data, improving transparency and efficiency (Mitchel, 2019).

This study aims to assess the transparency and compliance of public entities in the Federal District regarding the publication of Internal Governance Committee (CIG)

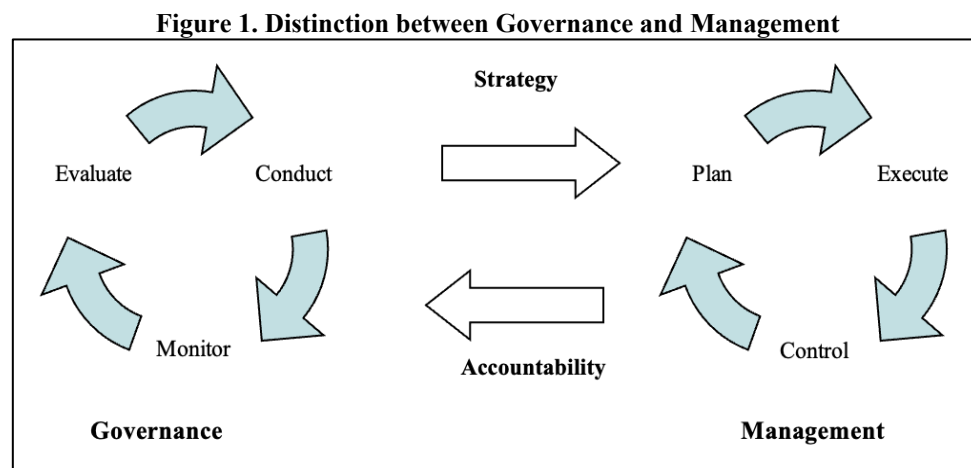
meeting minutes. Specifically, it seeks to: (i) identify agencies that do not publish minutes; (ii) analyze publication frequency; and (iii) propose improvements to institutionalize governance practices. The study contributes to the understanding of active transparency, emphasizing the role of governance and integrity mechanisms and the need for open access to governance records.

1. Literature review

1.1 Governance and forms of disclosure

According to the Federal Court of Accounts (Basic governance framework applicable to public organizations and other entities under TCU jurisdiction, 2020), governance involves leadership, strategy, and control practices that enable public leaders and stakeholders to assess the organization's demands, direct actions, and monitor operations, thereby improving service and policy delivery.

A key distinction is that governance provides direction, while management is responsible for execution. As shown in Figure 1, governance defines the course of action based on evidence and stakeholder interests, whereas management plans, implements, and monitors outcomes, indicators, and risks.



Source: Basic framework of organizational governance
from the Federal Court of Accounts (2020)

In the context of governance, it is essential to conduct a systematic evaluation of the environment, scenarios, alternatives, performance, and both current and projected outcomes, grounded in empirical evidence. Furthermore, the governance process requires the strategic direction, prioritization, and coordination of policies and plans, ensuring that organizational functions are aligned with the needs of stakeholders, including service users, citizens, and society at large. This alignment aims to facilitate the achievement of predefined objectives. Additionally, continuous

monitoring of results, performance, and adherence to policies and plans is necessary, allowing for a comparative analysis against established targets and stakeholder expectations, thereby fostering accountability and informed decision-making (Brazil, 2020).

According to Brazil (2020), governance bodies can be classified into four categories:

(i) External governance bodies: Responsible for oversight, regulation, and control, acting independently from the organizations they monitor. Examples include the National Congress, the Federal Court of Accounts, and high judicial councils; (ii) External governance support bodies: Conduct independent assessments, audits, and monitoring, reporting dysfunctions to higher governance authorities. Examples include independent audit units and mechanisms of organized social control; (iii) Internal governance bodies: Define and monitor organizational strategies and policies, ensure compliance, and take corrective actions when needed. They represent the link between the principal and the agent. Examples include boards of directors and senior management; (iv) Internal governance support bodies: Facilitate communication with stakeholders, conduct internal audits, and evaluate risk management and internal controls. They report issues to senior management. Examples include ombudsman offices, internal audit units, fiscal councils, and various strategic or risk committees.

In the Federal District, Decree No. 39,736/2019 establishes two structures: (i) the Public Governance Council (CGov), a high-level body that advises the Governor on implementing the Governance and Compliance Policy and defines or evaluates strategies and internal policies; and (ii) the Internal Public Governance Committees (CIGs), present in each agency, which function as internal governance support bodies. These committees are required to publish their minutes, reports, and resolutions on their respective institutional websites.

1.2 Public policy evaluation

Public policies are defined as integrated governmental actions aimed at providing goods or services to society, supported by budgetary or financial resources (Public Policy Evaluation: Practical Guide for Ex Post Analysis, 2018). Their evaluation, as a systematic and institutionalized process, verifies the efficiency of public spending and identifies opportunities for improvement in processes and results. Constitutional Amendment No. 109 (2021) made policy evaluation mandatory, as incorporated in Article 37 of the 1988 Constitution, requiring agencies to assess policies and disclose both the object and results.

Evaluations may be ex ante or ex post. In ex ante analysis, the problem is identified, objectives are set, and a design is proposed to reach those goals. Expected costs and benefits are estimated—even when not easily measurable—and made transparent to society (Public Policy Evaluation: Practical Guide for Ex Ante Analysis, 2018). Ex post evaluation assesses whether resources are applied according to the principles of economy, efficiency, and effectiveness (Public Policy Evaluation: Practical Guide for Ex Post Analysis, 2018).

Artificial intelligence (AI) enhances both types of evaluation. According to Valle-Cruz et al. (2020), AI can support all stages of the policy cycle and foster continuous, real-time evaluation. For instance, facial recognition systems combined with government data have been used to assess public security and migration policies.

1.3 Web scraping and digital governance

Web scraping, or "data scraping," is a widely used tool in digital transformation strategies and for automating the processes of collecting and consulting public data for various purposes (Mitchel, 2019). It is a form of data mining that allows the extraction of information from websites, converting it into structured data for further analysis. The most basic form of data collection is manual downloading of pages or copying and pasting content, which can be done by anyone. However, web scraping is generally performed using software that simulates human navigation across multiple websites, extracting specific information (Mitchel, 2019).

Web scraping is an evolving field that shares a common goal with the semantic web, an ambitious initiative still requiring advances in text processing, semantic understanding, artificial intelligence, and human-computer interaction. While web scraping is similar to web indexing (as used by search engines), its purpose differs significantly. Web indexing improves search engine efficiency, whereas web scraping serves a variety of objectives, including online price comparison, weather monitoring, market research, and government data collection (Mitchel, 2019).

A notable application of web scraping in governance is the automated monitoring of public administration data, including open government initiatives, regulatory compliance tracking, and policy impact assessments. Recent research suggests that hybrid intelligence models incorporating web scraping, AI, and citizen participation significantly enhance the quality of public sector decision-making by providing real-time insights into policy effectiveness (Liu et al., 2025).

According to Mitchel (2019), the main web scraping methods include manual copying, suitable for small datasets; text grepping and regular expressions, which use automated pattern recognition implemented in languages such as Python or Perl; DOM analysis, which extracts dynamic client-side content through browser structure inspection; semantic annotation recognition, which retrieves structured data from pages with embedded metadata; and data collection software, specialized tools that identify website structures and automate data extraction, often through APIs.

By combining web scraping with artificial intelligence, modern governance systems can automate data extraction to enhance transparency and accountability. The future of digital governance will increasingly rely on the integration of automation, AI-driven analytics, and collective intelligence to strengthen decision-making and optimize policy implementation (Liu et al., 2025).

1.4 Automation and web scraping in public policy evaluation

The use of automation for evaluating specific public policies, even if partially, is not a new approach. Technological advancements, particularly in artificial intelligence (AI) and machine learning, have facilitated the development of automated systems that enhance data processing, policy assessment, and governance oversight.

Additionally, benchmarking international research has shown that digital governance and transparency are significantly improved when automation is combined with institutional strategies that integrate financial capacity, open data availability, and regulatory frameworks. The study "Analyzing Digital Government Partnerships: An Institutional Logics Perspective" (Gong & Yang, 2024) provides relevant insights into how public-private partnerships and institutional logics influence the success of digital governance models. The research, conducted over five years across 31 provinces in China, identified six key factors that contribute to high digital government performance: (i) Financial Capacity – Governments with strong budgetary capacity can implement advanced automation and transparency systems; (ii) Open Data Provision – The availability and structured release of government data facilitate automation in public oversight; (iii) Market Competition – A competitive digital ecosystem promotes private sector participation in government digital transformation; (iv) Regulatory Environment – A well-regulated environment ensures automation does not compromise ethical or governance standards; (v) Skilled Human Resources – Governments with specialized personnel in data science and AI can better implement automation tools; (vi) Innovation Capacity – Public sector investments in technological innovation enhance the effectiveness of automated transparency mechanisms.

Several automation systems implemented in Brazil's public administration exemplify the growing application of artificial intelligence (AI) in governance and oversight. The BEM-TE-VI system of the Superior Labor Court (TST) employs Word2Vec, AutoML, and XGBoost for managing procedural records, while MIMIR (CAPES) uses neural networks and ensemble algorithms for data disambiguation. The ZELLO chatbot (TCU) integrates LSTM and Named Entity Recognition (NER) to enhance citizen interaction, and AGUIA (ANEEL) applies deep learning and U-Net models to monitor photovoltaic projects. Other initiatives, such as GEMINI (TRT 5th Region), INMETRO's irregularity detection using ResNet and YOLOv3, and Sigma and Sinara (TRF 3rd Region), utilize advanced natural language processing and classification methods to improve judicial standardization and risk analysis. Additionally, Conjur Assistant (TCU) recommends legal theses through LDA, Word2Vec, and Random Forest, while PropLegis (STN) identifies legislative patterns using topic modeling (LDA, NMF) and ensemble learning. Systems such as GEOCONTROLE (TCU) and ALICE (CGU & TCU) employ convolutional neural networks and web scraping to monitor public works and procurement processes. Complementary platforms—including AGATA, COVIDATA, PLACC, and the AI-based Personnel Act Selection (TCU)—rely on BERT, XGBoost, and hierarchical clustering to enhance risk-based analysis and compliance monitoring.

Collectively, these automation systems reflect an emerging AI-driven governance model that promotes transparency, efficiency, and evidence-based decision-making in public management, reinforcing continuous evaluation and institutional accountability (*Decision TCU-Plenary 1,139, 2022*).

Recent studies demonstrate how web scraping has become an essential methodological tool for extracting and analyzing public data in different areas of governance and policy evaluation. Portela et al. (2023) applied the technique to assess the judicialization of cannabidiol-based products in Brazil by analyzing technical reports issued by the Judiciary's Technical Support Centers (NatJus). In the health sector, Anacleto et al. (2022) used web scraping to collect public data on 556 thoracoabdominal aortic aneurysm repair procedures performed between 2008 and 2019, while Wolosker et al. (2021) conducted a similar study on 37,424 carotid artery stenosis interventions in Brazil's public health system. Afonseca et al. (2022) analyzed global datasets of running events to compare long-distance training patterns before and during the COVID-19 pandemic, whereas Lin and Kant (2021) employed social media scraping to study citizen participation and empowerment based on Facebook interactions. Fonseca (2019) used web scraping to investigate the autonomy of the Brazilian Federal Court of Accounts (TCU) by examining federal transfers to municipalities between 2005 and 2014. Similarly, Assis and Gomide (2021) extracted open data on city council expenditures in Belo Horizonte from 2017 to 2020 to support analyses of public transparency and accountability.

Collectively, these studies show that web scraping and automation are transforming public policy evaluation by providing scalable access to judicial, epidemiological, financial, and social data. The integration of artificial intelligence and automated extraction techniques enhances the capacity for data-driven decision-making, real-time monitoring, and transparency in governance (Portela et al., 2023; Anacleto et al., 2022; Afonseca et al., 2022; Wolosker et al., 2021; Lin & Kant, 2021; Fonseca, 2019; Assis & Gomide, 2021).

1.5 Open data and participatory transparency

According to OECD recommendations, under the "Accountability" axis, the criterion of "Participation" is included. The OECD prescribes that participation is characterized by encouraging transparency and stakeholder involvement at all stages of the political and policy cycle to promote accountability and the public interest, particularly by fostering transparency and open government, including ensuring access to information and open data, along with timely responses to information requests (...) (OCDE, 2017).

The publication of government data in open format is a way to promote active transparency in Public Administration, whereby government agencies and entities voluntarily make public data available to society without the need for prior requests. According to the Open Knowledge Foundation (OKF), "data is open when anyone can freely use, reuse, and redistribute it, subject only to the requirement to attribute the source and share under the same license." Therefore, when data is produced,

collected, or held by public authorities and made available in open format, it is considered open government data. Open data is complete, primary, up-to-date, accessible, and machine-readable. Identification of the user is not required to access it; it is provided in non-proprietary formats and free of licenses (Costa & Netto, 2025).

1.6 Integrity models: from existence to institutionalization

According to Costa & Netto (2025), two factors are fundamental for the effectiveness of governance and integrity models: existence and institutionalization.

The existence criterion represents the structural foundation of a governance and integrity model. It includes the human and material resources allocated to a given instance, as well as the formal procedures established by laws, regulations, or norms (Costa & Netto, 2025). These elements ensure the creation of a minimum structure necessary for the functioning of integrity mechanisms.

On the other hand, the institutionalization criterion reflects the highest level of maturity within the model. Based on the existing resources and established formal procedures, each instance must demonstrate its ability to operate effectively, generate expected outcomes, and integrate with its target audience (Costa & Netto, 2025). This process involves not only implementation but also continuous monitoring and improvement of integrity mechanisms.

According to Costa and Netto (2025), the effectiveness of governance and integrity models depends on two interrelated dimensions: existence and institutionalization. The first dimension refers to the structural foundation of governance, including the creation and organization of integrity bodies, the definition of workflows, the establishment of integrity plans and ethical guidelines, and the implementation of risk management policies and procedures.

The second dimension, institutionalization, represents a more advanced stage of maturity in which these structures become operational and produce measurable outcomes. It includes the publication of integrity bodies' reports, the implementation of risk management for integrity processes, awareness campaigns, periodic performance assessments, and the documentation of strategic committee meetings and integrity program reports.

Together, these stages demonstrate the transition from formal compliance to effective institutionalization, ensuring that governance and integrity mechanisms function as dynamic and accountable systems within public administration.

2. Research methodology

2.1 Identification and selection of the universe

Considering the research question, all budgetary units listed in the 2023 Annual Budget Law (LOA 2023) were selected, along with Public Companies and Mixed-

Economy Corporations. Thus, a total of 47 organizations and entities, including direct administration bodies, autarchies, public foundations, public companies, and mixed-economy corporations, were selected. Subsequently, the LARA automation was used to identify the existence of Internal Governance Committees (CIG) and their outputs, specifically the minutes.

Given the increasing reliance on artificial intelligence (AI) and automated decision-making systems in public administration, it is essential to ensure that these technologies operate with accountability and transparency. The concept of algorithmic accountability (Busuioc, 2020) is particularly relevant in the context of public governance, as it emphasizes the need for mechanisms to explain and audit algorithmic decisions, particularly when they impact compliance with public transparency policies.

2.2 LARA bot: automating governance data collection

The LARA (Automatic Administrative Resource Gatherer) bot is a Python-based automation tool designed to search for and verify the availability of Internal Governance Committee (CIG) meeting records across government agencies in the Federal District. The implementation integrates several Python libraries, including Requests for HTTP requests, BeautifulSoup for HTML parsing, pandas for handling Excel data, and additional utilities for text processing.

The process begins with the `read_excel_data` function, which reads an Excel file containing agency-specific data and their corresponding CIG meeting records. The data is structured into a dictionary, where each key represents an agency acronym, and its value is a boolean indicating whether the agency has CIG meeting records.

To search for these records online, the `search_link_cig` function constructs Google search queries tailored to identify web pages related to Internal Governance Committees. Using HTTP requests, the function retrieves search results, and BeautifulSoup parses the HTML content to extract relevant links. These extracted links are systematically stored in a dictionary, categorized by agency acronyms.

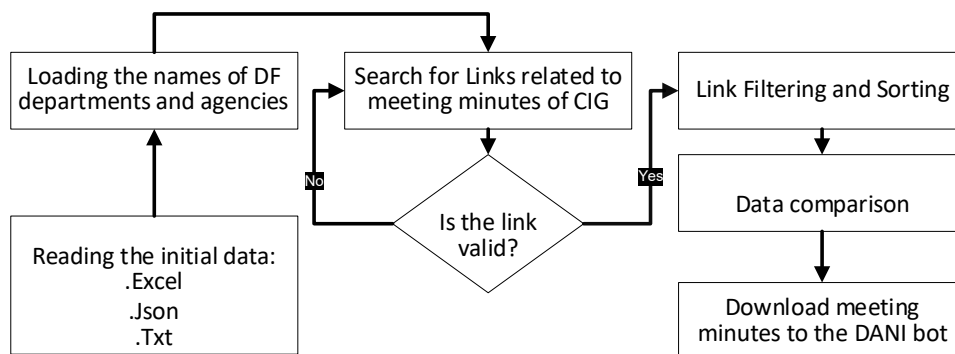
Following data collection, the `compare_maps` function performs a comparative analysis between the extracted web data and the original Excel dataset. This step verifies whether the CIG meeting records found online correspond to the information stored in the database. The function also generates statistical insights, assessing the accuracy and reliability of the automated searches.

To validate the links found, two filtering functions are used: `filter_webpage_type1` and `filter_webpage_type2`. These functions make new HTTP requests to the found links and analyze the HTML content of the pages to determine if they actually contain CIG meeting minutes. The first function checks if the minutes are directly accessible on the page, while the second function verifies if navigation to another page is required to locate the minutes.

Finally, the program reads the list of agencies from a file, performs searches for each agency, and evaluates the accuracy of the results. Statistics on the total number of agencies, the number of correct results, and the percentage of accuracy are printed.

Links that did not pass the filters are categorized and stored separately for further analysis. This entire process is summarized in Figure 2 below.

Figure 2. LARA bot activity diagram



Source: Author's own work

The increasing adoption of automated systems in public governance necessitates a structured approach to ensuring algorithmic accountability (Busuioc, 2020). While LARA effectively enhances transparency by automating the retrieval of governance records, it is essential to address key concerns associated with black-box algorithms and algorithmic bias. The risks associated with opaque decision-making systems underscore the need for Explainable AI (XAI) to enhance the interpretability of automated decisions (Busuioc, 2020).

In the application of this study, LARA's automated classification of governance records must be continuously monitored to ensure accuracy and impartiality. Additionally, it is essential to establish audit mechanisms to verify whether potential biases compromise transparency outcomes. To align with international best practices in AI accountability, the adoption of clear regulatory frameworks for algorithmic governance is recommended (Liu, Tang, & Collard, 2025).

Additionally, LARA employs advanced techniques to optimize data processing and analysis, including: (i) handling Excel files for reading and processing structured data; (ii) applying Web Scraping, which involves HTTP requests, HTML document analysis, and automated data extraction; (iii) utilizing regular expressions for keyword detection, content filtering, and data validation; and (iv) data mapping and comparison to ensure the accuracy and reliability of the collected information.

The selected data will ultimately be used by another automation tool called DANI, which will be the subject of another study.

3. Results

The budgetary distribution of agencies and entities within the direct administration, autarchies, and public foundations of the Federal District, as reported by the Transparency Portal of the Federal District (n.d.), reveals a diversified structure

reflecting distinct institutional responsibilities and funding priorities. Agencies with budgets up to 100 million BRL (21 in total) focus on agriculture, environmental protection, urban development, public security, social services, and education. This group, which includes universities, regulatory bodies, and specialized foundations, demonstrates a decentralized allocation of resources that supports targeted policies and localized service delivery.

Those with budgets between 100 and 500 million BRL (14 agencies) operate in strategic sectors such as economic development, communication, culture, housing, and research. Institutions like the Secretariat of Communication, the General Prosecutor's Office, and the Civil and Military Police exemplify a greater financial focus on essential infrastructure, security, and productive activities.

Agencies with budgets ranging from 500 million to 1 billion BRL (7 entities) are responsible for social development, justice, transportation, and public works—areas critical to citizen welfare and urban mobility. The Secretariat of Justice and Citizenship, the Department of Transit, and the Brasília Metro Company manage large-scale operations that require substantial investment and coordination capacity. Finally, entities with budgets exceeding 1 billion BRL (5 in total) represent the sectors with the greatest fiscal and social relevance, including education, economy, health, and transport. The Secretariats of Education, Economy, Health, and Transport and Mobility, together with the Urbanization Company of the New Capital (NOVACAP), account for the highest concentration of financial resources, reflecting their structural importance in sustaining public policy implementation and essential service provision.

4. Discussion

4.1 Transparency gaps and LARA findings

On the transparency pages of certain agencies and entities within the direct administration, autarchies, and public foundations, the information is not consistently available. One possible explanation is that some agencies, despite holding government secretariat status, have their budgets incorporated into larger administrative structures, such as the Secretariat of State for International Affairs.

This raises important questions regarding budgetary transparency and administrative efficiency. Empirical studies on shared service centers (SSCs) suggest that centralizing administrative functions does not necessarily lead to cost reductions or increased efficiency (Elston & Dixon, 2020). Research on English local governments found that the adoption of SSCs did not significantly decrease administrative intensity over time, highlighting that structural complexity may counteract expected gains from centralization.

In this context, the budgetary structure observed in the Federal District could benefit from an in-depth evaluation of how resource consolidation affects administrative performance and accountability. Understanding whether administrative

centralization leads to efficiency improvements or creates additional bureaucratic challenges is critical for ensuring transparency and effectiveness in public governance.

Thus, further analysis should explore: (i) the degree to which agencies with incorporated budgets maintain operational autonomy; (ii) whether consolidated financial structures influence service delivery effectiveness; (iii) how accountability mechanisms can ensure transparency in budget execution across decentralized agencies.

Given these considerations, future research could apply longitudinal methodologies similar to Elston & Dixon (2020) to track budgetary evolution and its impact on administrative efficiency and transparency over time.

Table 1 presents the results obtained by the LARA automation applied to 47 agencies of the Federal District. The analysis segmented these agencies into five groups based on key governance indicators, including the issuance of Internal Governance Committee ordinances, the designation of committee members, and the publication of meeting minutes. This classification provides a structured assessment of institutional compliance, transparency, and adherence to governance standards within the public administration.

The largest group, representing 57.4 percent of the agencies, consists of 27 institutions that demonstrated full compliance. These agencies issued CIG ordinances, appointed members, and published meeting minutes for the years 2024 and 2025. Within this group, the LARA Bot achieved 74.07 percent accuracy in identifying ordinances and member designations, and 77.78 percent accuracy in detecting published meeting records.

At the opposite end, 13 agencies—accounting for 27.7 percent—showed no evidence of governance infrastructure. They had not issued CIG ordinances, had not designated members, and had not published any transparency records.

Partial compliance was observed in two intermediate groups. Group 3 includes three agencies, or 6.4 percent of the total, which had issued ordinances and designated members but had not published any meeting records. The bot's accuracy for this group was 33.3 percent. Group 4 comprises four agencies, or 8.5 percent, which had a complete governance structure and published meeting minutes, although only for periods prior to 2024. In this group, the bot achieved 100 percent accuracy. Group 2 was defined in the classification but remained empty, with no agencies falling into the category of having issued ordinances while lacking both member designations and meeting records.

These findings underscore the importance of strengthening governance mechanisms across all public institutions. Special attention should be directed toward the agencies in groups 1 and 3, which either lack foundational governance elements or exhibit low levels of transparency. Enhancing compliance in these segments is essential for improving institutional performance, ensuring accountability, and rebuilding public trust.

Table 1. Results obtained by LARA application on the 47 agencies of the Federal District

Group	Description	Agencies	% of Total	Bot LARA Accuracy
1	No CIG ordinance, no members defined, no transparency records available.	13	27.7%	Not applicable
2	CIG ordinance issued, no members defined, no meeting records.	0	0%	Not applicable
3	CIG ordinance issued, members defined, but no meeting records.	3	6.4%	33.3% accuracy
4	CIG ordinance issued, members defined, meeting minutes published, but only before 2024.	4	8.5%	100% accuracy
5	Full compliance: CIG ordinance issued, members defined, and meeting minutes published for 2024 and 2025.	27	57.4%	74.07% accuracy for ordinances and member definitions. 77.78% accuracy for CIG meeting records.

Note: (a) CIG minutes were confirmed by the LARA Bot; (b) last minutes published in 2020; (c) last minutes published in 2021; (d) last minutes published in 2022; (e) last minutes published in 2023.

Source: Authors

The LARA bot achieved an overall accuracy of 73.53% in identifying issued CIG ordinances and defined members (25 correct identifications out of 34 agencies in groups 3, 4, and 5, which had CIG ordinances and member definitions in active transparency).

4.2 Strategic recommendations for governance reform

Research on governance, integrity, and transparency in the Federal District reveals persistent structural challenges that undermine accountability and the effectiveness of control mechanisms. Data from the LARA automation system indicate that several agencies fail to comply fully with governance guidelines, mainly due to the absence of Internal Governance Committees (CIGs), lack of published meeting minutes, and limited data accessibility. These findings point to the urgent need for standardized governance frameworks, staff training, and digital transformation to mitigate fragmentation in institutional practices.

Miller and Keiser (2021) emphasize that automation in public governance affects not only efficiency but also citizens' perceptions of neutrality and fairness in decision-making. Their research highlights the importance of algorithmic accountability and transparency to ensure that automated systems strengthen, rather than reproduce, bureaucratic inefficiencies. In this context, LARA's findings reinforce the need for

structured oversight mechanisms to support data integrity and compliance monitoring.

Standardized governance models—such as the Basic Governance Framework of the Federal Court of Accounts (TCU, 2020) and the OECD Guidelines on Public Governance—offer structured principles to enhance institutional maturity and policy coherence. Continuous professional development is also essential: 27.7% of the agencies analyzed lack any formal governance structure, weakening supervision and transparency. Training programs developed with institutions such as the National School of Public Administration should focus on compliance, digital governance, and open data management to strengthen institutional capacity.

Despite legal requirements for active transparency, only 57.4% of the entities regularly publish CIG meeting minutes. Promoting the digitization of administrative records through standardized systems—such as the Electronic Information System (SEI)—and establishing periodic audits and compliance indicators are necessary measures to guarantee accessibility and accountability (Law No. 12,527/2011).

Broader challenges remain related to coordination, policy coherence, and resource constraints (Peters, 2013). Excessive institutional segmentation and bureaucratic rigidity hinder the implementation of integrated policies, while political transitions and economic crises affect continuity and public trust. Investing in digital governance, inter-agency coordination, and professional training can mitigate these issues, improving efficiency, transparency, and citizen engagement.

To advance these goals, an action plan is proposed for the Federal District, prioritizing transparency, process standardization, capacity building, and information digitization. Key actions include: (i) creation of a centralized digital platform for publishing governance documents, coordinated by the Secretariats of Economy and Information Technology within six months; (ii) standardization of governance guidelines by the General Comptroller's Office and the Secretariat of Planning within four months; (iii) continuous training by the School of Government and the National School of Public Administration within eight months; and (iv) implementation of periodic audits by the Court of Accounts and the Comptroller's Office to ensure sustained oversight.

A cost-benefit analysis, led by the Secretariat of Economy and specialized consultants over a three-month period, will evaluate the financial and institutional impacts of these measures. To ensure continuity, a permanent governance committee coordinated by the Governor's Office will oversee implementation. Indicators will include reductions in processing time and costs, greater transparency through document digitization, and improved public confidence in government performance. Finally, sustainability will be ensured through regulatory formalization, stable financing, and periodic reviews every two years to incorporate technological innovations and international best practices. Together, these actions aim to institutionalize integrity and governance practices, leading to a more transparent, efficient, and reliable public administration in the Federal District.

5. Conclusion

The analysis conducted in this study reveals significant discrepancies in the adherence of agencies and entities within the Federal District to the provisions of Decree No. 39,736/2019. The results indicate that 27.7% of the agencies fall into Group 1, demonstrating total non-compliance, as they fail to meet the criteria for the existence and institutionalization of governance and integrity models. Group 3 (6.4%) issued ordinances to establish Internal Governance Committees (CIGs) and designated members but have not published meeting minutes, thus only partially fulfilling the existence criterion. Group 4 (8.5%) formally instituted CIGs with designated members and published meeting minutes, but the lack of updates for 2024 means they meet only the existence requirement, falling short of institutionalization. In contrast, 57.4% of agencies classified in Group 5 demonstrate full compliance, having issued ordinances, designated members, and maintained updated meeting minutes for 2024 and 2025, fully meeting the established criteria.

These results highlight substantial shortcomings in compliance with governance regulations, as many agencies still lack the fundamental structures necessary to ensure effective transparency and accountability. To systematically assess transparency and adherence to regulatory directives, the Automatic Administrative Resource Gatherer (LARA) was implemented to automate the identification and verification of CIG meeting minutes, proving to be an essential tool for evaluating agency compliance. However, despite its utility, the study reveals several challenges and opportunities for improvement in governance mechanisms, particularly regarding the institutionalization of practices, enforcement of regulations, and digital capacity building.

To address these deficiencies, it is essential to standardize transparency mechanisms across all public agencies by implementing uniform annual governance reports and developing a centralized digital dashboard for monitoring compliance. Ensuring that governance-related documents are published in structured, machine-readable formats would further enhance automated data analysis and oversight efficiency. Strengthening enforcement mechanisms within Decree No. 39,736/2019 is equally crucial to guarantee stricter compliance with governance requirements. Establishing regular compliance audits and governance assessments could mitigate existing regulatory gaps and reinforce institutional accountability.

Additionally, continuous training programs for public officials, developed in collaboration with institutions such as the National School of Public Administration, would improve adherence to governance principles. These programs should include periodic workshops on digital governance, transparency, and compliance best practices. Recognizing and incentivizing agencies that exemplify good governance practices could further encourage the broader adoption of transparency standards.

Incorporating artificial intelligence and data-driven governance mechanisms can also enhance public administration oversight. Developing a Governance and Integrity Index would provide a valuable tool for monitoring institutional maturity,

while integrating AI technologies into evaluation processes could ensure continuous assessment of compliance and adherence to best practices. Promoting citizen engagement through accessible oversight platforms would reinforce public trust in governmental institutions. Furthermore, mandating the digitization of governance records through electronic document management systems would standardize and optimize transparency across administrative processes.

Although the methodology employed in this study demonstrated high efficiency in collecting and analyzing governance and transparency data, some limitations should be acknowledged. The primary limitation is the reliance on search engines to identify and extract CIG meeting minutes. Since LARA uses automated Google queries to locate relevant links, its accuracy may be affected by changes in indexing algorithms, access restrictions imposed by government websites, and inconsistencies in data publication formats. To mitigate this issue, future research should explore the integration of government APIs to enable more direct and structured data retrieval.

Another limitation is the predominantly quantitative nature of the transparency assessment, which focuses on verifying the existence and institutionalization of CIGs based on the publication of meeting minutes, without analyzing the qualitative aspects of those records. Incorporating natural language processing techniques and manual content analysis could provide deeper insights into the quality and impact of governance deliberations.

Furthermore, while the current version of LARA relies on rule-based web scraping, integrating machine learning models could improve the system's ability to classify and validate documents, reducing the risk of false positives and negatives. Lastly, since the study was limited to the Federal District, its generalizability to other regions is constrained. However, the methodological framework is scalable and adaptable for implementation in other states and countries, facilitating comparative studies in digital governance.

Despite these limitations, the proposed methodology remains a robust and innovative approach to assessing transparency and institutional compliance. The identified challenges do not compromise the validity of the findings but rather point to potential improvements in design and scope. The study underscores the urgent need to modernize governance frameworks in the Federal District. Implementing standardized transparency measures, leveraging automated monitoring tools, and fostering a culture of accountability are critical steps toward transforming public administration into a more efficient, accessible, and responsive system.

Future research should explore the qualitative dimensions of CIG deliberations and expand the analytical framework to other public sectors and regions. By adopting these strategies, public institutions can achieve higher governance standards, ensure greater compliance with transparency requirements, and enhance government accountability, ultimately fostering a more open and efficient public administration.

Conflict of Interest Statement

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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