

THE DATA-DRIVEN PUBLIC SECTOR: OPPORTUNITIES, RISKS, AND CONSTITUTIONAL SAFEGUARDS

GEORGE-DANIEL NISTOR¹

ABSTRACT

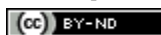
This article examines the emergence of the data-driven public sector from technocratic, socio-political, and legal-ethical perspectives. It argues that the use of data analytics, automation, and predictive systems can improve administrative efficiency, resource allocation, and service delivery, especially in healthcare, budgeting, and urban governance. At the same time, the article highlights the structural risks associated with these systems, including algorithmic bias, administrative opacity, automated inequality, and surveillance-driven chilling effects. Through examples such as the Dutch childcare benefits scandal, the discussion shows that data-driven governance may undermine fundamental rights when accountability and human oversight are weak. The analysis concludes that a sustainable model of digital governance must combine technological capacity with ethical safeguards, transparency, meaningful human control, and constitutional protections for privacy, equality, and democratic participation.

Keywords: data-driven public sector, digital governance, algorithmic bias, surveillance, digital sovereignty

INTRODUCTION

The contemporary era is witnessing a profound transformation in the nature of public authority, characterized by a shift from the traditional reactive bureaucratic model to a proactive, data-centric governance paradigm. This “Data-Driven Public Sector” (DDPS) is not merely a technological update but a fundamental re-engineering of the state’s relationship with its citizenry (van Ooijen et al. 2019). Historically, public administration functioned within a framework that addressed social needs only after they manifested as administrative requests or crises. However, as noted by the Organization for Economic Co-operation and Development (OECD 2019), the integration of high-performance computing, ubiquitous sensors, and sophisticated machine learning algorithms has enabled a move toward anticipatory governance, where the state seeks to predict needs, mitigate risks, and optimize resources before

¹ PhD Candidate at University of Bucharest, Faculty of Sociology and Social Work, Doctoral School of Sociology, Str. Schitu Măgureanu Nr. 9, Sector 5, 010181 Bucharest. E-mail: dannistor99@gmail.com.



problems occur. While this shift promises a more efficient and personalized public sector, it simultaneously introduces systemic risks, including “automated inequality”, pervasive surveillance, and the potential for what scholars describe as “administrative evil”, where ethical responsibility is obscured by algorithmic complexity (Adams and Balfour 1998; Eubanks 2018).

The conceptualization of the data-driven state rests upon the recognition of data as a strategic asset, integral to every phase of the policy cycle – from design and implementation to monitoring and evaluation (van Ooijen et al. 2019). Governments that successfully transition to a DDPS model are theoretically capable of delivering higher public value by promoting evidence-led policy-making and fostering inclusive governance (OECD 2019). Nevertheless, the technical efficiency of such systems cannot be divorced from their socio-political and legal-ethical impacts. A critical discussion of the data-driven state requires a nuanced understanding of three primary perspectives: the technocratic, focusing on optimization; the socio-political, focusing on equity and bias; and the legal-ethical, focusing on rights and sovereignty (Büchi et al. 2020; van Ooijen et al. 2019).

METHODOLOGY

This article employs a qualitative, interdisciplinary methodology situated at the intersection of public administration, legal scholarship, and digital governance studies. The research is primarily based on a doctrinal and conceptual analysis of the literature relevant to the data-driven public sector, drawing on academic books, peer-reviewed journal articles, institutional reports, and policy documents. Rather than relying on empirical fieldwork or original quantitative data collection, the study examines and synthesizes existing sources in order to identify the main opportunities, risks, and normative tensions generated by data-driven governance. The analytical framework is structured around three complementary perspectives – technocratic, socio-political, and legal-ethical – which make it possible to assess the phenomenon not only in terms of efficiency and innovation, but also from the standpoint of equality, accountability, privacy, and constitutional safeguards.

Methodologically, the article combines literature review with comparative illustration. Sources were selected on the basis of their relevance to contemporary debates on digital government, algorithmic decision-making, administrative law, and digital constitutionalism, with particular attention to recent contributions by international organizations such as the OECD and to emblematic case studies discussed in the scholarly literature. The examples of Singapore, Barcelona, healthcare administration, and the Dutch childcare benefits scandal are not treated as exhaustive empirical cases, but as illustrative instances used to test and contextualize broader theoretical claims. This approach allows the article to move from descriptive analysis to critical evaluation, showing how technological modernization in the public sector can produce both administrative gains and constitutional risks. In this sense, the methodology is interpretive and normative: it seeks not only to explain how data-driven governance

functions, but also to assess the legal and ethical conditions under which it can remain compatible with democratic legitimacy and the protection of fundamental rights.

THE TECHNOCRATIC PERSPECTIVE: OPPORTUNITIES FOR OPTIMIZATION AND EVIDENCE-LED GOVERNANCE

From a technocratic viewpoint, the data-driven state represents the pinnacle of rational-legal administration. By leveraging the vast quantities of information generated through digital interactions – frequently referred to as “Big Data” – governments can automate routine tasks, thereby reducing transaction costs and eliminating the friction inherent in traditional structures (OECD 2019; van Ooijen et al. 2019). This optimization is particularly visible in operational efficiency, predictive policy-making, and the evidence-based allocation of public resources.

Operational Efficiency through Task Automation and Digital Infrastructure

The primary promise of the technocratic state is the reduction of administrative burden. By unifying fragmented data systems into a single, secure platform, public agencies can cut analysis cycles from weeks to mere hours, freeing civil servants for higher-value work (Digital Science 2023). Singapore serves as a preeminent global example of this efficiency. Through its “Smart Nation” initiative, the Singaporean government has achieved a state where approximately 99% of its services are accessible online (Smart Nation and Digital Government Office 2024). This digital-to-the-core approach allows for “One Government” responses to complex problems, utilizing a Government Data Architecture (GDA) that operates on the principle of “data sharing by default” among agencies (Smart Nation and Digital Government Office 2024).

The integration of advanced analytics into daily workflows enables “productive governance” (van Ooijen et al. 2019). For instance, the use of predictive scheduling and real-time monitoring in public services allows for dynamic adjustments to staffing and supply chains. In Arizona, water management departments utilized predictive analytics and smart metering to reduce water loss by 28%, while mental health services achieved a 32% improvement in patient access times through automated scheduling (Salvatore 2026). These improvements represent a systemic trend where data-driven decision models act as a catalyst for transforming resource utilization across diverse sectors.

Predictive Policy-Making in Healthcare and Urban Management

The most significant technocratic advancement is the shift toward predictive analytics. By analyzing historical patterns, machine learning algorithms can forecast future events, allowing the state to allocate resources more effectively. In the healthcare sector, this is exemplified by predictive bed management and patient flow models (Altavilla 2026; Luo et al. 2025). These systems decompose the patient flow problem into demand forecasting, resource requirement prediction, and movement modeling from admission to discharge (Hall 2013, as cited in Luo et al. 2025).

Table 1
Impact of Data-Driven Predictive Systems in Healthcare Administration

Healthcare Metric	Impact of Data-Driven Predictive Systems	Statistical Gain	Source
Public Health Service Coverage	Optimization via deep neural networks	20% Increase	(Xue et al., 2024)
Public Health Response Time	Data-driven anticipation of events	30% Decrease	(Xue et al., 2024)
Patient Wait Times	Real-time integration and forecasting	35% Reduction	(Salvatore, 2026)
Bed Utilization Rates	Predictive allocation based on surges	28% Improvement	(Salvatore, 2026)
Hospital Operational Costs	Strategic planning and bottleneck elimination	20% Decrease	(Salvatore, 2026)
Prediction Accuracy	Deep neural networks (DNN) in monitoring	98.6%	(Xue et al., 2024)
ED Length of Stay (LOS)	Active bed management models	Up to 98 min reduction	(Salvatore, 2026)

Source: adapted from Xue et al. 2024 and Salvatore 2026.

In the context of “Smart Cities”, predictive analytics facilitates the management of complex urban infrastructure. Barcelona uses a unified ICT architecture to consolidate systems across 12 areas, including mobility, water, and energy (Ferrer 2024). By deploying over 19,500 smart meters and waste bins with fill-level sensors, the city has transformed into a “network of networks”, where real-time information flow allows for the proactive maintenance of public space (Barcelona City Council 2024). Similarly, the use of deep neural networks to analyze traffic patterns in cities has enabled authorities to identify high-risk areas, optimize traffic light timing, and predict potential accidents before they happen (Xue et al. 2024).

Evidence-Based Resource Allocation and Value for Money (VfM)

The data-driven state replaces “instinct-based” spending with “insight-based” allocation. The International Monetary Fund (IMF 2025) notes that improving the technical efficiency of public spending – maximizing output for a given level of resource use – could provide 30% to 40% more value for money globally. Central budget authorities increasingly use impact assessments and ex-post policy evaluations to determine whether budget measures are effective relative to their objectives (OECD 2025).

In the United Kingdom, frameworks such as the National Institute for Health and Care Excellence (NICE) assess the cost-effectiveness of health technologies using incremental cost-effectiveness ratios (ICER) (NICE 2024). This systematic approach ensures that new spending does not displace existing health benefits and

aligns with the broader goal of Social Cost Benefit Analysis (CBA). The adoption of structured Value for Money (VfM) tools, as seen in the London Borough of Redbridge, enhances transparency and financial oversight, allowing policymakers to evaluate whether the long-term savings of digital programs justify initial capital investments (CIPFA 2025).

THE SOCIO-POLITICAL PERSPECTIVE: RISKS OF ALGORITHMIC BIAS AND AUTOMATED INEQUALITY

While the technocratic lens highlights potential optimization, the socio-political perspective critiques the “hidden” harms inherent in the data-driven model. This critique focuses on the risk that automated systems may replicate historical prejudices and create a “digital poorhouse” that punishes marginalized populations (Eubanks 2018).

The “Black Box” Problem and Administrative Evil

Algorithms often function as “Black Boxes” – opaque systems where the logic behind a decision is hidden from both citizens and administrators (Amnesty International 2021; Hadwick and Lan 2021). This opacity can lead to what Adams and Balfour (1998) describe as “administrative evil”. Administrative evil occurs when public officials perform their professional duties – often with good intentions – while the systemic results of their work contribute to dehumanization or suffering (Adams and Balfour 1998). In the age of automation, this is exacerbated by a culture of “technical rationality”, which elevates the scientific-analytical mindset over ethical deliberation (Balfour et al. 2020).

When a decision-making process is automated, it often undergoes a “moral inversion”, where the efficiency of the system is perceived as an inherent good, masking the harm it may cause to “surplus populations” who do not fit the system’s preferred statistical profile (Adams and Balfour 1998; Balfour et al. 2020). The alibi of “I was just doing my job” is often replaced by “the algorithm flagged it”, creating a gap in accountability where no human takes responsibility for a wrongful denial of benefits (Amnesty International 2021).

Case Study: The Dutch Childcare Benefits Scandal (Toeslagenaffaire)

The Dutch *Toeslagenaffaire* serves as a critical warning of how algorithmic risk assessments can undermine fundamental rights (Hadwick and Lan 2021). In 2021, the Dutch government resigned following revelations that the tax administration had used an algorithmic risk-profiling system that disproportionately targeted migrant families (Amnesty International 2021).

The scandal exposed a “black hole of accountability”, where parents were for years given no answer as to why they were labeled as fraudsters (Amnesty International 2021). This illustrates that statistical probability cannot replace the “best interests of

the child”, which requires contextual sensitivity and individualized judicial oversight (Oxford Human Rights Hub 2021).

Table 2

Main Elements of the Dutch Childcare Benefits Scandal

Element of the Scandal	Findings and Consequences	Source
System Design	Risk-profiling used nationality as a proxy for fraud.	(Amnesty International, 2021)
Human Impact	35,000 families wrongly accused; thousands driven into debt.	(Hadwick & Lan, 2021)
Discriminatory Loop	Non-Dutch nationals flagged more frequently, reinforcing bias.	(Amnesty International, 2021)
Lack of Oversight	Reviews lacked info on why the system generated high scores.	(Amnesty International, 2021)
Institutional Result	Systemic infringement of rights; collapse of the cabinet.	(Hadwick & Lan, 2021)
Legal Lesson	Need for “explainable AI” and human rights-based safeguards.	(Kuźniacki, 2023)

Source: adapted from Amnesty International 2021; Hadwick and Lan 2021; Kuźniacki 2023.

Automated Inequality and the “Digital Poorhouse”

Virginia Eubanks (2018), in her study *Automating Inequality*, argues that automated systems are disproportionately aimed at the poor, creating a modern “digital poorhouse”. These systems, intended to streamline welfare, often act as mechanisms of surveillance and exclusion (Eubanks 2018). Eubanks identifies that while everyone lives under data analytics, the most “invasive and punitive” systems are directed at those who depend on public services.

In Indiana, the automation of welfare services led to more than one million benefit denials in three years, often for minor technical reasons the system was unable to interpret with human nuance (Eubanks 2018). Similarly, in Allegheny County, an algorithm used to predict child abuse was found to use “proxy variables” that effectively predicted which families were poor rather than which children were actually at risk of harm (Eubanks 2018). This “social sorting” reinforces systemic inequality, as the marginalized are treated as “guinea pigs” in a social data experiment (Eubanks 2018).

THE LEGAL-ETHICAL PERSPECTIVE: PRIVACY, SURVEILLANCE, AND SOVEREIGNTY

The third perspective examines the tension between the state’s use of data for the “public good” and the individual’s right to privacy and self-determination. This involves

discussions on data sovereignty and the “chilling effect” of state surveillance (van Ooijen et al. 2019).

Data Sovereignty and Digital Autonomy

As governments move their operations to the cloud, the question of “Digital Sovereignty” has become paramount. This refers to a government’s capacity to exercise autonomy over its digital assets and data, regardless of where the technology is hosted (Government of Canada 2024). A primary risk is the jurisdictional complexity caused by the U.S. CLOUD Act (2018), which allows U.S. authorities to request data from service providers even if stored abroad (Government of Canada 2024).

To address this, some states have proposed the creation of “public data sovereign clouds” that comply with national laws (Salvatore 2026). In Canada, the government has emphasized data residency – the requirement that data be stored within national borders – as a strategy against unauthorized foreign access (Government of Canada 2024). However, “complete digital autonomy” is often impossible due to the interconnected nature of the digital world, forcing states to balance sovereignty with operational efficiency (Government of Canada 2024).

Surveillance and the “Chilling Effect”

Ubiquitous data collection by the state can induce a “chilling effect”, where citizens alter their behavior because they feel constantly monitored (Büchi et al. 2020). Research by Penney (2017, as cited in Büchi et al. 2020) suggests that when individuals believe they are under “dataveillance”, they are more likely to engage in self-censorship, particularly regarding political participation.

Table 3
Dimensions of the Chilling Effect in Data-Driven Governance

Dimension of Chilling Effect	Findings from Empirical Research	Source
Political Expression	Fear of digital traces prevents voicing opinions on sensitive issues.	(Büchi et al., 2020)
Social Behavior	Younger people and women are more likely to self-censor.	(Penney, 2017)
Democratic Process	Surveillance in Zimbabwe/Uganda chilled organizing and mobilization.	(Stevens et al., 2023)
Secondary Effects	Users’ activities are chilled even when only others are targeted.	(Penney, 2017)
Long-term Impact	Erosion of trust in democratic institutions.	(Büchi et al., 2020)

Source: adapted from Büchi et al. 2020; Penney 2017; Stevens et al. 2023.

This “deterrence of routine everyday communication” is problematic for deliberative democracy (Büchi et al. 2020). In authoritarian contexts, surveillance is not just a privacy issue but a direct interference with the rights to freedom of expression and assembly (Stevens et al. 2023).

CRITICAL DISCUSSION: BRIDGING THE GAP THROUGH ETHICS AND CONSTITUTIONALISM

The successful data-driven state is one that aligns its digital transformation with human values. This requires moving beyond “digitalization” toward “digital constitutionalism” – a framework that protects fundamental rights and limits unaccountable power in the algorithmic society (De Gregorio 2022).

The OECD Good Practice Principles for Data Ethics

To guide governments, the OECD developed ten principles for data ethics in the public sector (OECD 2024). These principles ensure that trust is placed at the core of digital services.

Table 4

OECD Good Practice Principles for Data Ethics in the Public Sector

OECD Principle	Strategic Objective for the Public Sector	Source
Integrity	officials must not abuse position or data for profit.	(OECD, 2024)
Trustworthy Access	Awareness of consequences of data mismanagement.	(OECD, 2024)
Ethical Decision-Making	Acknowledge human bias and incomplete data in policy.	(OECD, 2024)
Control of Inputs	Monitor data for AI and adopt risk-based automation.	(OECD, 2024)
Specific Purpose	Justify data usage; ensure data is fit for purpose.	(OECD, 2024)
Defined Boundaries	Monitor if data is used within the intended context.	(OECD, 2024)
Openness & Inclusion	Engage diverse teams to mitigate bias.	(OECD, 2024)
Open Data	Publish open data and source code to foster transparency.	(OECD, 2024)
Individual Control	Enable citizens to freely withdraw consent.	(OECD, 2024)
Proactive Risk Mgmt.	Transparent handling of leaks and regular audits.	(OECD, 2024)

Source: adapted from OECD 2024.

Meaningful Oversight and the Barcelona Model

A key safeguard is the “human-in-the-loop” (HITL) model, where people verify or override automated decisions (Naviant 2024). However, oversight must be “meaningful” – involving a human who has the authority and information to question the algorithm (Digital Future Society 2021). Effective oversight requires that systems

provide “confidence scores” and clear rationales for their outputs, while operators are trained to identify failures and stereotypes (European Data Protection Supervisor 2025).

Barcelona has emerged as a pioneer of a “radical smart city” agenda focused on “technological sovereignty” (Calzada 2018). The city treats data as a “commons” rather than a commodity, using open-source software and decentralized data ownership through the DECODE project (Calzada 2018). By encouraging “platform co-operativism” as an alternative to “platform capitalism”, Barcelona demonstrates that cities can effectively shape a global agenda for ethical data governance (Calzada 2018).

CONCLUSION: THE DATA-DRIVEN SOCIAL CONTRACT

The transition to a data-driven state represents a double-edged sword for 21st-century governance. While the technocratic promise of optimization, predictive healthcare, and smart city infrastructure offers the potential to improve public well-being, the socio-political and legal risks are profound (OECD 2019; van Ooijen et al. 2019). As demonstrated by the Dutch childcare scandal and the research of Virginia Eubanks, without robust ethical and legal frameworks, automated systems can entrench historical biases and lead to systemic administrative evil (Amnesty International 2021; Eubanks 2018).

The future of the data-driven public sector depends not on the quantity of data collected, but on the quality of the governance surrounding it. To navigate this era, governments must embrace “digital constitutionalism”, which involves ensuring transparency, maintaining meaningful human agency, asserting data sovereignty, and protecting fundamental rights (De Gregorio 2022). Ultimately, a “successful” data-driven state is one that uses its technical prowess to enhance – not replace – the democratic values of dignity, fairness, and public trust (OECD 2024).

REFERENCES

- ADAMS, G. B., D. L. BALFOUR. (1998). *Unmasking Administrative Evil*. Thousand Oaks: SAGE Publications.
- ALTAVILLA, C. (2026). Predictive Analytics in Hospital Bed Management. *Health Systems Review* 18: 45–62.
- AMNESTY INTERNATIONAL (2021). *Xenophobic Machine: Discrimination through Unthinking Automation in the Dutch Childcare Benefits Scandal*. London: Amnesty International.
- BALFOUR, D. L., G. B. ADAMS, L. G. NIGRO. (2020). Administrative Evil and the Ethics of Administrative Responsibility. *Public Integrity* 22: 1–15.
- BARCELONA CITY COUNCIL (2024). *Smart City Strategy and Urban Data Infrastructure*. Barcelona: Barcelona City Council.
- BÜCHI, M., N. FESTIC, M. LATZER. (2020). The Chilling Effects of Digital Dataveillance: A Theoretical Model and an Empirical Research Agenda. *Big Data & Society* 7: 1–12.
- CALZADA, I. (2018). (Smart) Citizens from Data Providers to Decision-Makers? The Case Study of Barcelona. *Sustainability* 10: 32–52.

- CIPFA (2025). *Value for Money in Local Government Digital Programmes*. London: Chartered Institute of Public Finance and Accountancy.
- DE GREGORIO, G. (2022). *Digital Constitutionalism in Europe: Reframing Rights and Powers in the Algorithmic Society*. Cambridge: Cambridge University Press.
- DIGITAL FUTURE SOCIETY (2021). *Governing with Algorithms: Meaningful Human Oversight in the Public Sector*. Barcelona: Digital Future Society.
- DIGITAL SCIENCE (2023). *Data-Driven Public Services and the Productivity of Government*. London: Digital Science.
- EUBANKS, V. (2018). *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York: St. Martin's Press.
- EUROPEAN DATA PROTECTION SUPERVISOR (2025). *Guidelines on AI Oversight and Accountability in Public Administration*. Brussels: EDPS.
- FERRER, J. (2024). Smart Urban Governance in Barcelona: Data Infrastructures and Public Value. *Urban Technology Review* 12: 66–84.
- GOVERNMENT OF CANADA (2024). *Digital Sovereignty, Cloud Policy and Data Residency Guidance*. Ottawa: Treasury Board of Canada Secretariat.
- HADWICK, D., N. LAN. (2021). Algorithmic Governance and the Dutch Childcare Benefits Scandal. *European Public Law Review* 27: 201–220.
- HALL, R. (2013). Patient Flow, Bed Management, and Demand Forecasting in Hospitals. *Operations Research for Health Care* 2: 1–12.
- IMF (2025). *Public Spending Efficiency and Value for Money*. Washington, D.C.: International Monetary Fund.
- KUŹNIAK, B. (2023). Explainable AI and Fundamental Rights after the Dutch Benefits Scandal. *Human Rights Law Review*. 23: 1–19.
- LUO, X., Y. CHEN, Z. WANG. (2025). Predictive Models for Patient Flow and Bed Capacity Optimization. *Journal of Health Informatics* 14: 88–107.
- NAVANT (2024). *Human-in-the-Loop Systems in Public Sector Automation*. Boston: Naviant.
- NICE (2024). *Health Technology Evaluation and Cost-Effectiveness Methods Guide*. London: National Institute for Health and Care Excellence.
- OECD (2019). *Hello, World: Artificial Intelligence and its Use in the Public Sector*. Paris: OECD Publishing.
- OECD (2024). *Good Practice Principles for Data Ethics in the Public Sector*. Paris: OECD Publishing.
- OECD (2025). *Evidence-Informed Budgeting and Ex-Post Evaluation in Central Government*. Paris: OECD Publishing.
- OXFORD HUMAN RIGHTS HUB (2021). The Dutch Childcare Benefits Scandal and the Best Interests of the Child. *Oxford Human Rights Hub Blog* 1: 1–4.
- PENNEY, J. (2017). Chilling Effects: Online Surveillance and Wikipedia Use. *Berkeley Technology Law Journal* 31: 117–182.
- SALVATORE, C. (2026). Data-Driven Public Services: Case Studies in Water, Health, and Administrative Efficiency. *Public Sector Innovation Review* 9: 33–58.
- SMART NATION AND DIGITAL GOVERNMENT OFFICE (2024). *Singapore Smart Nation Annual Report*. Singapore: SNDGO.
- STEVENS, D., J. KAKANDE, P. MUBIRU. (2023). Surveillance, Civic Space and Chilling Effects in East Africa. *Information, Communication & Society* 26: 1442–1460.
- VAN OOIJEN, C., B. UBALDI, B. WELBY. (2019). *A Data-Driven Public Sector: Enabling the Strategic Use of Data for Productive, Inclusive and Trustworthy Governance*. Paris: OECD Publishing.
- XUE, H., Y. LI, T. ZHANG. (2024). Deep Neural Networks for Predictive Health Service Optimization in Smart Cities. *International Journal of Medical Informatics* 187: 105–210.