



Constitutional Governance of Artificial Intelligence

-A Foresight Vision for the Algerian Case-

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Abstract

As Machine Intelligence tools continue to evolve and exert increasing influence over public life, the need for constitutional frameworks capable of keeping pace with these developments has become ever more pressing particularly in relation to the protection of digital rights and the safeguarding of the rule of law within digital environments. While the Algerian Constitution currently lacks explicit provisions regulating the use of artificial intelligence or formally recognizing digital rights, several comparative constitutional experiences such as those of Italy, Canada, and Spain have begun to address this emerging reality. These constitutions have introduced principles such as the right to data protection, algorithmic transparency, and institutional oversight of AI applications within public administration, offering a potential roadmap for constitutional innovation in Algeria

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I- Introduction:

Today, the global community is witnessing rapid technological transformations driven by the advancement of artificial intelligence systems, which have assumed a central role across diverse aspects of life. The impact of artificial intelligence is no longer confined to industrial or computational domains; rather, it has extended into sensitive sectors such as the judiciary, public administration, political decision-making, and even the private lives of individuals. This widespread integration raises critical questions regarding the capacity of traditional legal frameworks-most notably constitutional texts-to adapt to these changes and to safeguard individual rights against potential risks.

Within this context, a novel and complex concept has emerged in constitutional scholarship: the "constitutional governance of artificial intelligence." This concept transcends the mere regulation of AI technologies, aiming instead to establish a comprehensive constitutional framework that governs their use in accordance with the fundamental principles underpinning the rule of law, including respect for human dignity, separation of powers, transparency, accountability, and the protection of fundamental rights and freedoms.

This issue holds particular significance for countries undergoing institutional and constitutional reforms, such as Algeria, which is endeavoring to modernize its political and legal systems in alignment with global developments. These challenges raise important questions about the national constitutional framework's ability to assimilate technological advancements and to formulate a constitutional model that regulates the deployment of cognitive simulation technologies without compromising the core principles of democratic governance.

Accordingly, this study seeks to address the following research question: To what extent can constitutional governance effectively regulate the use of artificial intelligence in a manner that ensures the protection of fundamental rights and freedoms? This inquiry will be pursued through descriptive, analytical, and prospective methodologies, organized into two main sections:

first: Theoretical Framework for the Constitutional Governance of Artificial Intelligence

seconde: Constitutional Governance of Artificial Intelligence in Algeria in Light of International Standards

II-Theoretical Framework for the Constitutional Governance of Artificial Intelligence:

Addressing the topic of constitutional governance of intelligent technologies necessitates establishing a clear theoretical foundation. This includes defining the nature of these systems and their applications, exploring the constitutional challenges they pose, and clarifying the role of constitutional law in managing such transformations and regulating the interaction between digital reasoning systems and the state.

Accordingly, this section examines the theoretical underpinnings and essential concepts related to the constitutional oversight of smart technologies.

II.1. Machine Intelligence and Contemporary Constitutional Challenges

Machine intelligence constitutes one of the most pressing challenges confronting modern constitutional systems. Its expanding role across both public and private domains raises critical questions about the capacity of constitutional frameworks to adapt and respond to the legal implications arising from the use of automated decision-making technologies.

1. Definition of Cognitive Computing and Its Legal Applications

Cognitive computing refers to advanced systems and software capable of replicating human-like behaviors such as reasoning, analysis, learning, and decision-making. The term encompasses a broad spectrum of technologies, and its definition often varies depending on the disciplinary lens of the researcher.

From an information technology perspective, such systems are typically viewed as "a branch of computer science dedicated to building machines that can perform tasks requiring human-like intelligence (Russell Stuart , 2016, p. 1034) ", such as natural language processing, visual recognition, and independent decision-making. Though deeply technical, this definition emphasizes the mimetic capabilities of computational intelligence and its growing influence in sensitive domains of human activity.

In the legal domain, scholarly discourse has increasingly addressed the regulatory and functional dimensions of algorithmic systems. Some researchers conceptualize these technologies as computational mechanisms capable of autonomously gathering and processing data to issue decisions that may carry legal consequences without requiring direct human involvement (Hildebrandt, 2016, p. 88).

This perspective raises fundamental questions about legal accountability and the legitimacy of decisions made by automated decision-making technologies. Another school of thought defines machine intelligence as "a cumulative and evolving technology that learns from data and adjusts its behavior over time, thus transforming into an active participant in legal processes rather than remaining a passive tool" (Martin, 2020, p. 17).

This perspective necessitates a reassessment of well-established constitutional concepts, such as the principles of legality and the subjection of public authority to the law. Definitions of smart technologies have also diversified across various international organizations concerned with the governance of emerging innovations. Some of the most prominent definitions include:

The Organization for Economic Co-operation and Development (OECD) describes algorithmic systems as information technologies grounded in models and algorithms that facilitate learning and the execution of cognitive tasks—such as analysis and decision-making—within digital or physical domains. These systems exhibit varying degrees of autonomy and employ techniques like machine learning (including deep and reinforcement learning), planning, searching, and logical representation to process data and represent knowledge.

UNESCO defines computational intelligence as a machine-based system that generates specific outputs—such as recommendations or decisions—based on data, designed to meet explicit or implicit objectives, thus influencing either physical or virtual environments.

The European Union refers to an intelligent automation system as a computational framework that operates with different levels of autonomy and may demonstrate adaptive behavior following deployment. These systems process data to produce outputs—ranging from predictions and content to decisions—that may influence both digital and physical realms.

From these definitions, it is evident that digital reasoning systems have transcended their role as mere technological tools, becoming influential entities within the legal and institutional environment. This transformation underscores the pressing need for precise regulatory frameworks that ensure their compliance with constitutional principles. It also highlights the necessity of evolving legal and constitutional doctrines to accommodate the distinctive characteristics and accelerated progression of such technologies.

2. Constitutional Challenges Posed by Cognitive Computing

The widespread adoption of cognitive computing presents numerous constitutional challenges, largely due to the autonomous—sometimes independent—nature of these systems, as well as their profound impact on the core principles of constitutional governance, such as the separation of powers, the protection of fundamental rights and freedoms, and the assurance of transparency and accountability.

Foremost among these challenges is the principle of constitutional legality. Complex questions emerge about the legitimacy of decisions made autonomously by automated decision-making technologies, especially when such decisions have administrative or judicial effects that directly impact individuals. Ascribing legal responsibility becomes increasingly difficult in instances of error or deviation in decision-making, thereby threatening the foundational principle that all exercises of public authority must be grounded in the law (Theresa, Ted, & Hon. Howard A. Schmidt, 2014, p. 133).

The second major challenge concerns the protection of privacy and personal data, both of which are enshrined as fundamental constitutional rights in numerous contemporary constitutions. Smart technologies, particularly those that operate through automated decision-making mechanisms, rely extensively on the collection, aggregation, and analysis of large volumes of personal and behavioral data. This intensive data dependency raises serious concerns about potential infringements on individual privacy, especially in the absence of robust legal safeguards and adequate mechanisms for judicial oversight. Without such protections, the deployment of machine intelligence in sensitive domains could undermine constitutional guarantees related to personal autonomy and data confidentiality (Sandra Wachter, 2017, p. 78).

Algorithmic systems also give rise to constitutional concerns related to the principle of equality and non-discrimination. Some automated decision-making technologies may unintentionally reflect or amplify societal biases present in the datasets on which they were trained. This can result in discriminatory outcomes, particularly in high-stakes areas such as employment recruitment, access to financial services, or judicial proceedings. Such risks highlight the urgent need to evaluate these computational intelligence tools through a constitutional lens, ensuring they do not violate the state's obligation to uphold equal treatment and prevent systemic discrimination (Virginia, 2019, p. 45).

This challenge is particularly serious given the constitutional obligation to guarantee equal opportunities and safeguard rights without discrimination.

II. 2. Constitutional Governance as a Mechanism for Regulating Machine Intelligence

In light of the challenges posed by cognitive computing to the legal order, constitutional governance emerges as a foundational framework that aims to reconcile technological advancement with the preservation of constitutional values. It serves as an essential safeguard, ensuring that the integration of smart technologies into public life remains aligned with constitutional legality and the protection of fundamental freedoms.

1. The Concept and Components of Constitutional Governance

The concept of constitutional governance is a relatively novel construct in contemporary legal theory, developed in response to the ongoing transformations experienced by modern states amidst rapid technological advancements, particularly the growing influence of automated decision-making technologies within legal and administrative spheres.

Constitutional governance refers to a structured set of institutional mechanisms that ensure all public authorities, decisions, and activities—including those involving digital reasoning systems—

are subject to constitutional norms. Chief among these are the principles of constitutional legality, the separation of powers, and the safeguarding of rights and liberties.

Some scholars define constitutional governance as “an institutional framework that organizes the conduct of public affairs in accordance with constitutional limitations, reinforcing legitimacy, transparency, and accountability, while guarding against power abuse and algorithmic bias introduced through modern digital tools” (Craig, 2018, p. 112)

Meanwhile, other scholars argue that constitutional governance transcends the conventional framework of regulating public authorities, also encompassing the regulation of the interaction between the state and technology. They emphasize that technology has evolved into an inseparable component of decision-making processes, necessitating its incorporation into the realm of constitutional duties and obligations (Hildebrandt, *Smart Technologies and the End(s) of Law*, 2016, p. 65).

Constitutional governance rests on a set of fundamental pillars that shape its conceptual and regulatory framework. The foremost of these is the principle of the rule of law, which mandates that all actors, including intelligent systems, be subject to the constitution and its binding norms (Craig p. , 2018, p. 45).

The principle of the separation of powers also stands as a crucial element, especially in light of the potential challenges presented by integrating AI into judicial or legislative processes, where questions of decision-making independence and institutional oversight come to the forefront (Yeung, 2018, p. 511.513).

Additionally, the principle of transparency and accountability plays a vital role, requiring the disclosure of algorithmic decision-making mechanisms and the provision of effective legal remedies to challenge or review such decisions (Sandra Wachter, *Transparent, Explainable, and Accountable AI for robotics*, 2017, p. 03).

From the perspective of protecting fundamental rights, constitutional governance imposes the obligation to respect constitutional guarantees such as the right to privacy, freedom of expression, and equality before the law, especially when deploying AI technologies in legally or socially sensitive areas, to prevent any unlawful infringement upon these rights (Mantelero, 2018, p. 439).

From the foregoing, it becomes clear that constitutional governance represents the optimal framework for regulating the relationship between technology and law. Rather than rejecting artificial intelligence, it integrates AI within a legal structure that safeguards human dignity and ensures that AI does not evolve into a parallel or substitute authority for the state.

2. Constitutional Principles Framing Artificial Intelligence

Artificial intelligence presents a genuine challenge to the constitutional framework, necessitating its regulation within a set of constitutional principles aimed at balancing technological advancement with the protection of rights and freedoms. Foremost among these principles is the principle of constitutional legality, which requires that any technological practice with legal effects must rest upon a clear and well-defined legal basis. This implies the need for legislating the use of AI across various domains of public life (Gregorio, 2022, p. 112) .

Additionally, the principle of equality demands that algorithmic systems must not produce discrimination based on gender, color, or opinion, thus necessitating the evaluation of algorithmic outputs from the standpoint of neutrality and non-bias (Gordon, 2019, p. 89).

Furthermore, the principle of privacy protection constitutes a fundamental cornerstone, given the unprecedented capabilities of smart technologies to collect and analyze personal data and

behaviors (Carsten, 2024, p. 03). This mandates the establishment of clear constitutional boundaries to prevent unlawful infringements on individual privacy.

The principle of transparency also requires the availability of mechanisms that clarify the foundations upon which decisions made by algorithmic systems are based, thereby ensuring individuals' rights to understand and challenge such decisions (LILIAN & MICHAEL , 2017, p. 16).

Finally, effective judicial oversight remains an essential safeguard for preserving the independence of constitutional institutions and ensuring that digital reasoning systems are held accountable when violations or harm arise from their use (Christopherr, Dan Jerker , Fred , Orla, & Christopher , 2017, p. 05).

Collectively, these principles enable the construction of a constitutional model capable of absorbing digital transformations while preserving the essence of the rule of law, grounded in the protection of rights and the maintenance of a balance of powers.

III- Constitutional Governance of Intelligent Automation in Algeria in Light of International Guidelines

In response to the rapid development of machine intelligence, the urgent need has emerged for establishing effective constitutional controls over such technologies.

Constitutional governance stands as the central tool to ensure that the evolution of digital reasoning systems aligns with foundational constitutional principles and the safeguarding of rights and freedoms

In pursuit of an effective model, this section reviews leading international experiences to project a constitutional vision suitable for the governance of algorithmic systems in Algeria.

III.1. International Guiding Principles

Given the global awareness of the challenges posed by computational intelligence, international efforts have been mobilized to develop guiding principles that ensure these systems evolve in a manner consistent with human rights and democratic values. These principles have served as an initial reference framework for regulating the global use of automated decision-making technologies.

1. Organization for Economic Co-operation and Development (OECD): Initial Framework for AI Governance

In a significant move toward establishing an international normative framework for intelligent technologies, the OECD Council adopted in 2019 a Recommendation on Artificial Intelligence, the first of its kind at the intergovernmental level.

This recommendation aims to strike a careful balance between encouraging technological innovation on the one hand, and ensuring compliance with fundamental human values and ethical principles on the other foremost among them respect for human rights, the rule of law, and transparency.

The document has served as a key reference in shaping national and regional regulatory models, profoundly influencing the development of the European AI Act, as will be detailed in the next section.

The exceptional international weight of this recommendation lies in the commitment of 47 countries to its content, establishing it as a normative benchmark that cannot be overlooked in any legislative initiative concerning smart technologies at both national and international levels. In its

pursuit of promoting a responsible and trustworthy approach to AI, the OECD articulated a reference framework based on five fundamental principles,

forming the foundation for effective governance of intelligent automation, alongside five specific recommendations for policymakers.

-Principles Adopted by the OECD for Governing Emerging Technologies

At the forefront of these principles is the affirmation of the role of intelligent systems in promoting inclusive and sustainable development, thereby enhancing human well-being and preserving the environment.

The framework also emphasizes respect for human values, compliance with privacy rights and human dignity, and adherence to the rule of law.

It underscores the ethical dimension by calling for transparency and explainability of algorithmic systems, ensuring a deeper understanding of their operational mechanisms and limitations.

Additionally, the principles stress the importance of ensuring the safety and resilience of smart technologies, providing tools to confront or mitigate potential risks, particularly in scenarios where harm could occur.

Finally, the framework reaffirms the principle of accountability, advocating for clear practices in risk management, safeguarding fundamental rights, combating bias, and adhering to ethical standards and responsibility in innovation (OECD, 2019).

-OECD Recommendations for an Effective National AI Legislation

The Organisation for Economic Co-operation and Development (OECD) did not limit its contribution to offering a broad definition of intelligent automation and its guiding principles.

It advanced further by proposing concrete policy recommendations aimed at helping national lawmakers craft effective, adaptable, and future-oriented legislation.

These recommendations are structured around five main pillars, reflecting the strategic and collaborative approach required to address the complex governance challenges posed by automated decision-making technologies:

- **Strengthening Research and Development:** The OECD underscored the necessity of sustained investment in scientific research related to machine intelligence, with an emphasis on open-source software and the use of unbiased, privacy-conscious datasets. These efforts are essential to promote inclusive innovation and the ethical sharing of knowledge.

- **Establishing an Integrated Digital Ecosystem:** It advocated for the development of robust digital infrastructure, technical standards for intelligent systems, and mechanisms for secure data exchange. This ecosystem should be harmonized with both national and international policies to ensure equitable and sustainable technological growth.

- **Fostering a Supportive Policy Environment:**

The OECD recommendations highlight the importance of formulating public policies that not only encourage innovation but also promote the safe, ethical, and widespread adoption of cognitive computing tools. Enhancing public confidence in these technologies is identified as a core policy objective.

- **Building Human Capacities and Supporting Social Transformation:**

Acknowledging the transformative effects of computational intelligence on labor markets, the OECD emphasized the need to equip individuals with the necessary digital skills and to support vulnerable populations through re-skilling programs and expanded social protection mechanisms.

- Encouraging International Cooperation: Finally, the OECD stressed the importance of global coordination among governments, organizations, and institutions to establish common technical standards and ensure the responsible and trustworthy deployment of smart technologies across borders.

2. The Impact of UNESCO's 2021 Recommendation on AI Ethics

UNESCO's Recommendation on the Ethics of Artificial Intelligence places human rights, human dignity, and environmental sustainability at the heart of its ethical framework. The document emphasizes that the development and deployment of digital reasoning systems must be grounded in principles that promote fairness, transparency, and privacy protection, ensuring that such systems serve humanity rather than undermine its values (UNESCO, unesdoc.unesco, 2021, p. 10).

The Recommendation sets out core ethical principles that should guide the development and deployment of cognitive computing technologies. These include transparency, accountability, continuous human oversight, safety, fairness, and inclusiveness. In addition, it underscores the necessity for algorithmic processes to remain interpretable and responsible, with a primary objective of minimizing potential risks to both societal structures and the natural environment (Allahrakha, 2024, p. 25)

-Principles for the Ethical Development and Use of AI Systems

UNESCO outlined eleven strategic policy domains that governments and stakeholders in smart technologies should address to ensure their ethical governance. These domains encompass crucial aspects such as data governance, education and digital literacy, environmental sustainability, gender equality, cultural diversity, and the promotion of peaceful, just, and inclusive societies. Each area represents a cornerstone for embedding ethical values into the design, deployment, and oversight of intelligent systems (UNESCO, unesdoc.unesco, 2021, pp. 11-12).

To promote an ethically grounded framework for the governance of intelligent automation, UNESCO has emphasized the importance of addressing a broad spectrum of interconnected policy priorities. Among these is the necessity of conducting ethical evaluations that consider the implications of automated decision-making technologies on human rights and sustainable development. Equally essential is the development of accountable regulatory architectures capable of overseeing the deployment of such systems. Effective data protection and governance mechanisms are also deemed critical, particularly in safeguarding individual autonomy and informational integrity. Furthermore, the organization highlights the need for fostering international cooperation to harmonize standards and ethical practices across jurisdictions.

Environmental sustainability features prominently, urging stakeholders to assess and minimize the ecological footprint of digital reasoning systems. In parallel, the principles of gender parity and cultural inclusivity are seen as foundational to ensuring equitable access and representation. Advancing academic research and integrating AI literacy into education systems are proposed as strategic tools for empowering future generations.

UNESCO also calls attention to the influence of cognitive computing on media ecosystems and public opinion formation, advocating for mechanisms to preserve information integrity. From an economic perspective, there is a call for critical inquiry into the transformations occurring within labor markets and economic models as a result of automation. Finally, intelligent technologies are

envisioned as instrumental in enhancing healthcare and social service infrastructures, provided their integration is guided by ethical oversight and societal benefit (the United Nations Educational & the United Nations Educational, 2021, p. 25).

-The Ethical Impact of AI

The Recommendation places strong emphasis on the necessity of continuous ethical evaluation of smart technologies, particularly in terms of their effects on marginalized populations, vulnerable groups, and ecological systems. This evaluative process is not merely technical but inherently democratic, as it calls for meaningful public engagement to ensure that the voices of those most affected are heard and reflected in regulatory outcomes. By incorporating participatory mechanisms, the ethical governance of algorithmic systems becomes more inclusive and legitimate, reinforcing the imperative that technological progress must align with societal values and justice (Research & EPRS, 2020, p. 6).

UNESCO warns against the risk of AI exacerbating social and economic inequalities and stresses the need for transparent decision-making processes and effective risk management mechanisms to uphold human rights.

-Data Governance Policies

In the realm of data governance, the Recommendation underscores the urgency of adopting comprehensive strategies that uphold privacy and ensure ethical data stewardship. This includes encouraging the responsible utilization of open-access datasets, while simultaneously mandating rigorous documentation protocols to enhance traceability and accountability. Robust oversight mechanisms must be established to regulate every stage of data management—from collection and storage to processing and deployment—thereby reinforcing the ethical foundation of intelligent automation systems.

Historical precedents, such as the controversy surrounding Amazon's algorithmic recruitment platform—which exhibited a bias favoring male applicants—highlight the serious risks posed by inadequately supervised intelligent systems. Such incidents reinforce the necessity of establishing ethical governance models capable of anticipating discriminatory outputs and ensuring that automated decision-making technologies operate within inclusive and rights-respecting parameters (Jeffrey, 2018).

3. The European Experience in AI Governance

The European Union has emerged as a global frontrunner in constructing an integrated regulatory vision for managing advanced algorithmic systems. From an early stage, European institutions acknowledged the imperative of establishing legal controls that preserve fundamental constitutional guarantees while simultaneously encouraging technological innovation. This proactive stance has resulted in a robust framework of legislative measures and strategic guidelines designed to strike a delicate balance between digital advancement and the safeguarding of individual freedoms and democratic values (European, 2021).

At the heart of the European Union's legislative strategy is the Artificial Intelligence Act, regarded as the first international initiative to present a unified legal architecture for regulating intelligent automation technologies. This proposed regulation delineates the obligations of system developers and providers, particularly in sectors deemed high-risk, ensuring the protection of essential rights including personal privacy, equality, non-discrimination, and procedural fairness through accessible avenues for appeal (European Union, 2016).

A key illustration of the European Union's advanced legal approach to regulating data practices influenced by intelligent automation is the General Data Protection Regulation (GDPR). This regulatory framework has set a global benchmark by imposing strict obligations related to informed consent, transparency, and the preservation of individual rights. It integrates foundational principles such as accountability and impartiality to ensure that algorithmic processes respect human dignity. Notably, Article 22 of the Regulation grants individuals the explicit right to be protected from decisions made solely by automated means—including profiling—when such decisions bear significant legal or similar consequences (EUROPEAN, 2021).

The European Union Artificial Intelligence Act, formally enacted in July 2024, marks a historic milestone as the first enforceable international legislative instrument dedicated specifically to governing intelligent automation technologies. Built on a tiered risk-based model, the regulation aims to ensure that the integration of algorithmic systems into public and private sectors aligns with core human rights and societal safety imperatives (europa, 2023).

The European Union's regulatory framework classifies intelligent systems into four distinct risk tiers, each subject to tailored legal obligations. Technologies deemed to pose an unacceptable risk—such as social scoring mechanisms or real-time biometric surveillance in public areas—are strictly banned. High-risk systems, typically deployed in critical domains like healthcare, education, and employment, are subject to rigorous requirements concerning data integrity, human supervision, transparency, and explainability. Limited-risk applications are permitted under the condition that users are clearly informed of AI interaction. In contrast, minimal-risk systems, with negligible implications for individual rights, remain largely outside the scope of regulatory control (European, europa.eu/topics, 2023).

In dealing with high-risk algorithmic technologies, the European legislative framework imposes a comprehensive set of procedural and substantive safeguards spanning the entire development and deployment lifecycle. These include the obligation to implement proactive risk assessment protocols, ensure data accuracy and integrity, maintain detailed technical records, and establish clear procedures for human oversight and intervention. Transparency is a central requirement; particularly in terms of system design and function disclosure. To ensure compliance, the European Commission has created a centralized regulatory body—the AI Office—working in conjunction with national supervisory agencies. Furthermore, individuals are granted the right to lodge complaints in cases of rights violations resulting from the use of intelligent automation systems (European, europa.eu, 2023).

The European legal framework adopts a stringent enforcement mechanism to ensure adherence to its provisions. Violations of the AI Act may lead to significant financial sanctions, potentially amounting to €35 million or 7% of the global annual revenue of the offending entity—whichever is greater—depending on the gravity of the infringement. The Act introduces a graduated implementation schedule spanning three years: prohibitions on inadmissible systems are to be enforced within six months; obligations concerning general-purpose cognitive technologies become binding after one year; and full regulatory compliance for high-risk systems is mandated within a two- to three-year window from the date of formal adoption (EUROPEAN T. E., 2021)

III.2. Toward a Constitutional Vision for AI Governance in Algeria

Despite the increasing number of global initiatives addressing artificial intelligence—such as those led by the European Union, UNESCO, and the Economic and Social Council—most of these efforts remain within the domain of ethical guidelines or technical recommendations. They often lack the binding force and institutional authority characteristic of constitutional frameworks. This underscores the necessity for a dedicated constitutional approach that aligns with the principles of

governance, ensures the protection of fundamental rights and freedoms, upholds the separation of powers, and maintains constitutional legitimacy in light of the changes introduced by AI technologies.

Several European nations have already initiated steps towards establishing constitutionally grounded governance for AI. For instance, in 2018, Germany's federal government introduced the "AI Strategy," which highlighted the importance of advancing AI technologies while ensuring they align with fundamental rights like human dignity, data protection, and transparency. This strategy underscores the necessity of shaping future AI policies in accordance with constitutional principles (Federal, 2020) .

In a similar vein, Austria's National AI Strategy, introduced in 2021, emphasized the critical role of maintaining the rule of law and safeguarding fundamental rights. The strategy also highlighted the need for transparency and accountability in the deployment of AI systems (Federal Ministry for Climate Action, 2021).

Both cases illustrate an increasing awareness that AI should not function in isolation from legal frameworks. Instead, it must be integrated into the broader context of constitutional principles—a foundation that Algeria could consider in its efforts to establish a constitutionally based AI governance framework.

1. Assessing Algeria's Constitutional Framework and Its Adaptability to AI Governance

A detailed examination of Algeria's 2020 Constitution reveals the absence of specific provisions addressing artificial intelligence or its governance. Nevertheless, the text embodies foundational principles that could be interpreted to accommodate future regulatory frameworks for intelligent technologies. The preamble—recognized as an essential constitutional component—emphasizes the state's dedication to safeguarding individual freedoms, ensuring social justice, and promoting equality, all of which should underpin forthcoming AI legislation. Article 34 affirms the inviolability of human dignity and the right to a private life—both essential protections as automated systems become more integrated into public administration and daily activities. Additionally, Article 54 enshrines the right to digital privacy and data confidentiality, establishing a constitutional basis for rights-centered oversight of intelligent digital systems (Presidential Decree, 2020).

These constitutional guarantees indicate that Algeria's legal framework possesses the potential to respond adaptively to emerging digital realities. If interpreted with a forward-looking lens, and supported by precise legislative initiatives and regulatory instruments, these principles could serve as a foundation for aligning technological advancement with constitutional norms ensuring both innovation and the preservation of legal and democratic integrity.

2. Practical Proposals for Establishing Effective Constitutional AI Governance in Algeria

Establishing a constitutionally anchored framework for the governance of intelligent technologies in Algeria requires the adoption of comprehensive legal and institutional reforms, ensuring that innovation aligns with the rule of law and the preservation of fundamental rights.

As a foundational step, Algeria should adopt targeted legislative measures governing the deployment of smart technologies in sensitive domains, explicitly anchored in constitutional values. In parallel, the establishment of an autonomous national authority is advisable—one empowered to evaluate the alignment of algorithmic systems with legal and constitutional mandates. This institution should be entrusted with oversight responsibilities, including assessment, monitoring, and issuing advisory opinions to ensure responsible and lawful integration of such technologies.

Concurrently, it is crucial to cultivate constitutional literacy among actors in the digital ecosystem—ranging from developers to policymakers. This may be accomplished through the integration of constitutional principles into curricula within technical and scientific education. Additionally, judicial oversight should be strengthened by enhancing the role of constitutional courts in reviewing AI-related legislative measures, thereby safeguarding core constitutional protections and democratic integrity.

Looking forward, the prospect of a constitutional amendment introducing a general principle for the governance of emerging technologies may be worth exploring. Such an inclusion would provide a foundational reference point for shaping national digital strategies and reinforce legal certainty in navigating the age of intelligent automation.

IV-Conclusion

The foregoing analysis reveals that cognitive computing has become a defining challenge for contemporary constitutional systems, compelling urgent legal reflection on how existing constitutional principles can adapt to this technological shift. Addressing this challenge requires more than ethical intentions—it demands the establishment of a constitutional framework that guarantees both the protection of fundamental rights and the encouragement of innovation rooted in public interest. This study has demonstrated the importance of developing a holistic constitutional vision—one that does not treat digital transformation as an exception to the legal order, but rather integrates it into the fabric of constitutional legitimacy.

- Results

Most constitutions around the world do not yet contain explicit references to algorithmic systems, despite their growing impact on civil liberties.

International bodies have proposed ethical guidelines for managing smart technologies, but these often lack binding legal authority.

Some legal systems have begun interpreting existing constitutional norms in ways that accommodate the governance of digital reasoning tools.

There is a growing demand for legal safeguards ensuring individuals can understand, contest, and appeal decisions made by automated systems.

Principles such as algorithmic transparency, institutional accountability, and digital equity are becoming essential to future legal frameworks.

Effective governance of machine intelligence requires active coordination between governmental institutions and private actors, domestically and globally.

Anticipating constitutional reforms has become an urgent necessity to ensure human dignity remains protected in the face of accelerating technological change.

- Propositions

Introduce explicit constitutional clauses addressing the implications of intelligent technologies for fundamental freedoms and democratic structures.

Establish a comprehensive national legislative framework that regulates algorithmic systems based on the principles of fairness, transparency, and accountability.

Strengthen judicial and administrative oversight mechanisms concerning automated decision-making, particularly those with significant legal or social impact.

Create an independent constitutional authority to evaluate the conformity of AI applications with human rights and constitutional standards.

Support interdisciplinary academic research exploring the intersection of AI technologies and constitutional law.

Develop a national digital literacy strategy that raises public awareness of algorithmic rights and promotes responsible use of smart technologies.

Promote international cooperation to formulate harmonized legal frameworks for AI governance that respect national sovereignty while encouraging global ethical standards.

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