

Research Article

THE ROLE OF ARTIFICIAL INTELLIGENCE IN CONSTITUTIONAL ADJUDICATION: COMPARATIVE INSIGHTS FROM GENERAL JUDICIAL PRACTICE

**Tareq Al-Billeh*, Tawfiq Khashashneh, Noor Issa Alhendi,
Mohammed Al-Shabatat and Georgette Al-Billeh**

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Tawfiq Khashashneh, Noor Issa Alhendi,
Mohammed Al-Shabatat
and Georgette Al-Billeh

ABSTRACT

Background: *The growing integration of artificial intelligence (AI) into judicial systems represents one of the most significant contemporary developments in the administration of justice. While AI technologies are increasingly employed in areas such as case management, legal research, document analysis, and procedural automation, their use within constitutional adjudication raises distinct legal and institutional concerns. Constitutional courts perform a unique function that extends beyond ordinary dispute resolution, as they are entrusted with safeguarding constitutional supremacy, protecting fundamental rights, and preserving the balance between state powers. Consequently, the incorporation of AI into constitutional justice requires careful examination of its implications for judicial independence, constitutional interpretation, procedural fairness, and the legitimacy of constitutional review.*

Method: This study adopts a comparative analytical methodology, focusing on selected jurisdictions that represent different models of constitutional review and varying levels of judicial digitalisation. The comparative framework is limited to jurisdictions that demonstrate identifiable institutional practices or regulatory approaches concerning the use of AI in judicial systems. The study examines the experiences of the European Union (EU) and selected EU Member States, particularly Estonia, as examples of rights-oriented and digitally advanced governance models, alongside the United States as a representative decentralised common-law system. In addition, selected Arab jurisdictions, including the United Arab Emirates (UAE), Saudi Arabia, Jordan, and Egypt, are analysed to assess emerging regional approaches to judicial digital transformation. The selection of jurisdictions is based on three criteria: (1) the existence of identifiable AI-related judicial or regulatory initiatives, (2) diversity in constitutional review models, and (3) the availability of legislative or institutional frameworks relevant to judicial digitalisation. The study further analyses constitutional principles, judicial practices, regulatory instruments, and selected judicial decisions relevant to AI-assisted adjudication.

Results and Conclusions: The study demonstrates that AI technologies are increasingly employed in constitutional and judicial environments to support administrative and analytical functions, including legal data processing, case classification, precedent retrieval, workload management, and assistance with drafting legal memoranda. However, comparative analysis confirms that AI remains limited to an assistive role and cannot replace constitutional judges in exercising constitutional interpretation or value-based judicial reasoning. Constitutional adjudication inherently depends on contextual analysis, balancing of constitutional principles, and the protection of fundamental rights, all of which require human judicial discretion. The findings further indicate that the scope and legitimacy of AI integration are significantly influenced by constitutional structures, regulatory safeguards, and institutional capacities within each jurisdiction. The study concludes that the responsible integration of AI into constitutional courts requires a balanced regulatory framework that promotes judicial efficiency and technological innovation while safeguarding constitutional guarantees, judicial independence, transparency, due process, and public confidence in constitutional justice.

1 INTRODUCTION

Contemporary judicial systems are undergoing profound transformation due to rapid digitalisation and the accelerated development of artificial intelligence (AI).¹ Across different legal systems, courts increasingly employ algorithmic technologies in areas such as case management, legal research, document processing, predictive analytics, and

¹ Klaus Schwab, *The Fourth Industrial Revolution* (Crown Business 2017).

procedural administration.² These developments form part of a broader transition toward digital justice systems intended to improve efficiency, accessibility, and institutional performance. However, the integration of AI into judicial functions also raises fundamental legal and constitutional concerns relating to transparency, accountability, procedural fairness, judicial independence, and the preservation of human-centred adjudication.³

These concerns become particularly significant within the field of constitutional adjudication. Constitutional courts occupy a unique institutional position within modern constitutional democracies, serving as guarantors of constitutional supremacy, protectors of fundamental rights, and arbiters of the separation of powers. Unlike ordinary judicial bodies, constitutional courts engage in interpretative reasoning that requires balancing competing constitutional principles, evaluating proportionality, and resolving politically and socially sensitive disputes. Consequently, constitutional adjudication involves normative and value-based reasoning that cannot be reduced to purely technical or algorithmic processes.⁴

The growing use of AI technologies in judicial environments has, therefore, generated important debates concerning the constitutional limits of automated or semi-automated judicial assistance. While AI systems improve procedural efficiency, legal data analysis, precedent retrieval, and judicial administration, their use in constitutional justice raises distinct concerns about the legitimacy of algorithmic assistance in constitutional interpretation and rights adjudication. This issue is especially relevant given the increasing reliance of public institutions on automated decision-making technologies and the corresponding need to ensure that technological innovation remains compatible with constitutional guarantees and fundamental rights.⁵

Comparative experience demonstrates that approaches to judicial digitalisation and AI integration vary significantly across jurisdictions, depending on constitutional structure, legal tradition, institutional capacity, and regulatory philosophy. In China, “smart court” initiatives have introduced advanced digital infrastructures to enhance procedural

- 2 CEPEJ, *European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their Environment* (Council of Europe 2019); CEPEJ, *Possible Uses of AI in the Judicial Systems* (CEPEJ (2021) 11 final, Council of Europe 2021). See also Richard Susskind, *Online Courts and the Future of Justice* (OUP 2019); Tania Sourdin, ‘Judge v Robot? Artificial Intelligence and Judicial Decision-Making’ (2018) 41(4) UNSW Law Journal 1114, doi:10.53637/ZGUX2213; Aleš Završnik, ‘Criminal Justice, Artificial Intelligence Systems, and Human Rights’ (2020) 20 ERA Forum 567, doi:10.1007/s12027-020-00602-0.
- 3 Johnny Hernán Tupayachi Sotomayor, ‘The Application of Artificial Intelligence in Constitutional Processes for the Protection of Fundamental Rights’ (2024) 16(22) Revista Oficial del Poder Judicial 499, doi:10.35292/ropj.v16i22.1015.
- 4 Andrew Coan and Harry Surden, ‘Artificial Intelligence and Constitutional Interpretation’ (2025) 96(2) University of Colorado Law Review 413, doi:10.2139/ssrn.5018779.
- 5 Mizuki Hashiguchi, ‘Constitutional Rights of Artificial Intelligence’ (2024) 19(2) Washington Journal of Law, Technology & Arts 25.

management and judicial efficiency.⁶ In the United States, debates surrounding algorithmic systems have primarily focused on issues of due process, transparency, judicial discretion, and algorithmic bias within judicial decision-making.⁷ Within the EU, regulatory efforts have concentrated on establishing rights-based safeguards governing the use of AI technologies through ethical and legal frameworks designed to protect fundamental rights and ensure human oversight.⁸ Estonia, as one of the most digitally advanced European states, provides an important example of institutional digitalisation and the integration of e-governance integration within judicial administration.⁹

In the Arab region, judicial digital transformation has accelerated in recent years. The UAE has implemented extensive digital court services and electronic litigation systems,¹⁰ while Saudi Arabia has expanded integrated judicial digital platforms, including the “Najiz” system, to facilitate judicial procedures and remote access to justice.¹¹ Jordan and Egypt have also introduced varying levels of judicial automation and electronic litigation services as part of broader digital governance reforms. Nevertheless, the use of AI technologies in constitutional adjudication within Arab constitutional courts remains limited, both institutionally and normatively.¹²

Despite the expanding body of scholarship on AI in judicial systems, the specific relationship between AI and constitutional adjudication remains comparatively underexplored in the legal literature. Existing studies frequently address AI applications within civil, criminal, or administrative justice, while insufficient attention has been devoted to the distinctive constitutional dimensions of algorithm-assisted adjudication. Limited research has examined the compatibility of AI-assisted judicial functions with the requirements of constitutional interpretation, constitutional legitimacy, judicial independence, and the protection of fundamental rights.¹³

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- 6 George G Zheng, ‘China’s Grand Design of People’s Smart Courts’ (2020) 7(3) *Asian Journal of Law and Society* 561, doi:10.1017/als.2020.20.
 - 7 Rachel F Adler and others, ‘A User-Centered Approach to Developing an AI System Analyzing US Federal Court Data’ (2023) 31(3) *Artificial Intelligence and Law* 547, doi:10.1007/s10506-022-09320-z.
 - 8 Susan Wright, ‘Artificial Intelligence in Legal Translation at the Court of Justice of the European Union’ (2025) 14 *International Journal of Language and Law* 120, doi:10.14762/jll.2025.120.
 - 9 Agne Limantė and Monika Sukytė, ‘Comparative Insights and Future Directions of AI in the Courts of the Baltic States’ (2025) 33 *International Journal of Law and Information Technology* eaf002, doi:10.1093/ijlit/eaf002.
 - 10 Anteneh Teferi and Natasha Ridge, ‘Understanding the Criminal Justice System of the United Arab Emirates’ [2025] *AI Qasimi Foundation*, doi:10.18502/aqf.0230.
 - 11 Fahad Abdullah Moafa and Hamad Salem Almarri, ‘Artificial Intelligence in the Saudi Judiciary Before Judgment: The Guidance Phase and Its Regulatory Framework’ (2025) 38(12s) *International Journal of Applied Mathematics* 196, doi:10.12732/ijam.v38i12s.1367.
 - 12 Mohamed Hussien Mohamed Hela and others, ‘The Contribution of Digital Transformation to the Development of the Judicial Procedural System’ (2025) (3) *Science of Law* 58, doi:10.55284/z01hrt52.
 - 13 Agnė Juškevičiūtė-Vilienė, ‘Artificial Intelligence and the Constitutional Right of Access to Justice’ (2020) 93 *Acta Universitatis Lodzianis* 117, doi:10.18778/0208-6069.93.08.

This study, therefore, examines the extent to which AI technologies may contribute to the work of constitutional courts without undermining the guarantees of constitutional justice. Specifically, the study addresses the following research question: To what extent can artificial intelligence contribute to the functioning and development of constitutional courts while preserving constitutional guarantees, judicial independence, and the human-centred nature of constitutional adjudication?

Several subsidiary questions arise from this inquiry: What are the principal applications of AI technologies within judicial systems? What constitutional and legal challenges accompany the integration of AI into judicial processes? How do different constitutional systems regulate or approach AI-assisted judicial functions? To what extent are Arab judicial systems institutionally and legally prepared for the integration of AI? Can AI meaningfully contribute to constitutional adjudication without affecting judicial discretion and constitutional interpretation?

Methodologically, the study adopts a comparative analytical approach focusing on selected jurisdictions that represent different models of constitutional review and varying levels of judicial digitalisation. The comparative scope is limited to jurisdictions where identifiable legislative, institutional, or judicial developments concerning AI in judicial systems are evident. The selected jurisdictions were chosen according to three principal criteria: (1) the existence of AI-related judicial or regulatory initiatives; (2) diversity in constitutional review structures and legal traditions; and (3) the availability of relevant legal and institutional materials concerning judicial digital transformation.

The study argues that AI should be understood not as a substitute for constitutional judges, but rather as a supportive technological instrument whose legitimacy depends upon strict compliance with constitutional guarantees, judicial independence, transparency, procedural fairness, and meaningful human oversight. Accordingly, the integration of AI into constitutional justice must remain carefully limited to assistive and administrative functions, while the core interpretative authority of constitutional adjudication remains vested exclusively in human judges.¹⁴

2 METHODOLOGY

This study adopts a comparative analytical legal methodology to examine the role of artificial intelligence (AI) in constitutional adjudication and its implications for constitutional justice, judicial independence, and fundamental constitutional guarantees. Given the interdisciplinary nature of the subject, situated at the intersection of constitutional law, judicial governance, and digital technologies, the research combines doctrinal legal analysis with

14 Inna M Bernaziuk, 'Artificial Intelligence in Justice: Constitutional and Legal Aspect' (2025) 2 Analytical and Comparative Jurisprudence 130, doi:10.24144/2788-6018.2025.02.16 [in Ukrainian].

comparative institutional evaluation to provide a comprehensive assessment of the constitutional dimensions of AI integration into judicial systems.

The principal methodological approach employed in this study is the comparative legal method. This approach enables examination of different constitutional and judicial systems in terms of their institutional and regulatory approaches to AI-assisted judicial functions. Rather than attempting to compare judicial systems in their entirety, the study focuses on how selected jurisdictions regulate or implement technological tools within judicial environments, particularly regarding courts exercising constitutional review.

To ensure methodological coherence, the study distinguishes between supranational regulatory frameworks and national constitutional systems. In this regard, the European Union is examined primarily as a supranational normative and regulatory framework that influences standards on AI governance, judicial digitalisation, and the protection of fundamental rights, rather than as a unified constitutional adjudicative model comparable to national constitutional courts. In contrast, the United States, Estonia, and the selected Arab jurisdictions are analysed as national constitutional systems characterised by distinct legal traditions, institutional structures, and models of constitutional review.

The selection of jurisdictions included in the comparative analysis is based on several methodological considerations. First, the selected jurisdictions demonstrate identifiable institutional or regulatory initiatives concerning the use of AI within judicial systems. Second, they represent different constitutional and legal traditions, thereby allowing a broader comparative understanding of how constitutional systems respond to technological transformation. Third, these jurisdictions provide sufficient legislative, judicial, and institutional materials to conduct meaningful comparative legal analysis. Within this framework, Estonia was selected as a digitally advanced state with extensive e-governance infrastructure and progressive judicial digitalisation policies, while the United States was included due to the significant constitutional debate surrounding algorithmic decision-making, due process, judicial discretion, and transparency. The European Union was included because of its influential rights-based regulatory approach to AI governance. In addition, selected Arab jurisdictions, namely the UAE, Saudi Arabia, Jordan, and Egypt, were included to assess emerging regional experiences in judicial digital transformation and institutional preparedness for AI integration.

The study further employs a descriptive-analytical approach to clarify the conceptual foundations of artificial intelligence and to distinguish between automated decision-making systems and assistive AI technologies used in judicial contexts. This analytical framework also examines the institutional nature of constitutional courts and the distinctive characteristics of constitutional adjudication as a form of value-oriented judicial reasoning that relies heavily on constitutional interpretation, balancing of rights, and normative assessment.

The analytical dimension of the research focuses on evaluating the constitutional implications of integrating AI into judicial functions. Attention is given to the potential impact of AI technologies on judicial independence, procedural fairness, equality before the law, transparency, accountability, and the requirement of reasoned constitutional judgments. The study additionally examines constitutional and legal concerns associated with algorithmic systems, including algorithmic bias, opacity in “black box” systems, discriminatory risks, and the limitations of automated legal reasoning in constitutionally sensitive disputes.

The research relies primarily on doctrinal legal analysis, supported by constitutional texts, judicial decisions, regulatory frameworks on AI and digital governance, institutional reports, ethical guidelines, and selected judicial decisions relevant to algorithmic adjudication and judicial digitalisation. Furthermore, the study incorporates relevant international and regional instruments on AI governance and judicial ethics to strengthen the empirical and legal foundations of the comparative analysis.

The study adopts a normative constitutional perspective that treats AI not as a substitute for constitutional judges but as an assistive technological tool whose legitimacy depends on preserving meaningful human judicial oversight and maintaining the constitutional guarantees underpinning the rule of law and constitutional justice.

3 DISCUSSION

The integration of artificial intelligence (AI) into judicial systems represents a major institutional transformation affecting not only judicial administration but also broader conceptions of legal reasoning, adjudicative authority, and access to justice. Within the specific context of constitutional adjudication, this transformation raises particularly complex legal and constitutional questions because constitutional courts exercise functions that extend beyond ordinary dispute resolution. Constitutional courts are entrusted with safeguarding constitutional supremacy, protecting fundamental rights, preserving the separation of powers, and maintaining constitutional balance within the state. Consequently, the incorporation of AI into constitutional judicial work cannot be evaluated solely by technical efficiency but must also be examined in light of constitutional legitimacy, judicial independence, and the normative nature of constitutional interpretation.¹⁵

15 D Drozd, 'Judicial Independence and the Use of Artificial Intelligence in Courts' (2023) 99(2) Law and State 15, doi:10.51634/2307-5201_2023_2_15.

3.1. The Concept of Artificial Intelligence and Its Relation to Constitutional Courts

Artificial intelligence is generally understood as a group of computational systems capable of performing tasks associated with human cognitive functions, including learning, reasoning, pattern recognition, natural language processing, and predictive analysis. Contemporary legal scholarship increasingly defines AI systems as data-driven technologies capable of generating predictions, classifications, recommendations, or analytical outputs through algorithmic processing of large datasets.¹⁶ In judicial contexts, AI technologies are commonly employed in functions such as document review, legal information retrieval, case classification, procedural automation, and predictive analytics.¹⁷

Within constitutional adjudication, however, the role of AI remains significantly more limited due to the distinctive nature of constitutional reasoning. Constitutional courts do not merely apply legal rules mechanically; rather, they engage in interpretative and value-oriented reasoning, including proportionality analysis, balancing constitutional principles, protecting fundamental rights, and resolving politically sensitive constitutional disputes.¹⁸ Constitutional interpretation frequently requires contextual assessment, normative judgement, and constitutional balancing that cannot be reduced to statistical modelling or automated pattern recognition.¹⁹

For this reason, AI technologies within constitutional courts are generally understood as assistive instruments rather than autonomous adjudicative actors. Their primary function is to support judicial work by organising legal materials, identifying relevant precedents, facilitating legal research, analysing jurisprudential trends, and improving administrative efficiency.²⁰ The ultimate authority for constitutional interpretation and judicial reasoning nevertheless remains vested exclusively in human judges.²¹

Comparative judicial practice demonstrates that different jurisdictions have adopted varying approaches toward AI integration within judicial systems. In China, “smart

16 AD (Dory) Reiling, ‘Courts and Artificial Intelligence’ (2020) 11(2) *International Journal for Court Administration* 1, doi:10.36745/IJCA.343.

17 Md Abdul Malek, ‘Criminal Courts’ Artificial Intelligence: The Way It Reinforces Bias and Discrimination’ (2022) 2(1) *AI and Ethics* 233, doi:10.1007/s43681-022-00137-9.

18 Badruzzaman Nawawi and Roswati Nurdin, ‘Neo-Siyasah: Reconstructing Constitutional Sovereignty in the Age of Artificial Intelligence’ (2025) 8(2) *Jurnal Al-Dustur* 195, doi:10.30863/aldustur.v8i2.10529.

19 Ilija Jovanov, ‘Application of Artificial Intelligence in Criminal Court Proceedings and the Possible Ethical Dilemmas’ (2025) 1(2) *UKLO Proceedings* 33, doi:10.20544/aisc.1.2.25.p03.

20 Miquel Julià Pijoan, ‘The Implementation of the Right to Understand Court Rulings through Artificial Intelligence: Boundaries and Opportunities’ (2025) 43 *Revista de Internet, Derecho y Política* 1, doi:10.7238/idp.v0i43.433076.

21 Antonio D’Aloia, ‘Artificial Intelligence, Fundamental Rights, Constitutional Democracy’ (2025) 55 *Teoría y Realidad Constitucional* 101, doi:10.5944/trc.55.2025.45030.

court” initiatives have introduced extensive technological infrastructures designed to improve judicial efficiency through automated document processing, intelligent legal databases, digital litigation systems, and algorithm-assisted procedural management. Although these systems primarily operate within ordinary courts, they illustrate an expansive model of judicial digitalisation characterised by strong institutional reliance on technological governance.²²

In contrast, the European approach has generally emphasised human oversight, transparency, and the protection of fundamental rights. The European Commission for the Efficiency of Justice (CEPEJ) adopted the European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their Environment, which established core principles governing AI use in judicial contexts, including respect for fundamental rights, non-discrimination, quality and security of data, transparency, impartiality, and user control. Similarly, the EU’s regulatory framework, particularly Regulation (EU) 2024/1689 (EU Artificial Intelligence Act, or AI Act), classifies certain AI systems used in the administration of justice as high-risk applications that requires strict safeguards, human supervision, transparency obligations, and accountability mechanisms.

Estonia provides a distinct model of gradual judicial digitalisation within a highly developed e-governance environment. Estonian judicial reforms have focused primarily on improving administrative efficiency and facilitating access to judicial services while preserving meaningful human judicial control over legal interpretation and adjudication. This reflects a cautious integration model in which technology supports, rather than replaces, judicial decision-making.²³

In the United States, constitutional and legal debates concerning AI in judicial processes have emerged primarily in connection with algorithmic risk assessment tools used within criminal justice systems. One of the most prominent examples is *State v. Loomis*, in which concerns were raised regarding transparency, due process, and defendants’ inability to examine the internal logic of proprietary algorithmic systems used in sentencing proceedings. Although the case did not directly concern constitutional adjudication, it significantly influenced broader legal debates on algorithmic accountability, explainability, and procedural fairness within judicial systems.²⁴

In *Mobley v. Workday*, the plaintiff challenged the use of AI-driven hiring systems, alleging algorithmic discrimination in employment screening. The case raises constitutional and statutory concerns regarding equal protection and disparate impact

22 Zheng (n 6).

23 Shakaib Aleem Arshad and others, ‘AI Judges and Robotic Justice: Are Pakistani Courts Ready for the Future?’ (2025) 4(3) ACADEMIA International Journal for Social Sciences 1039, doi:10.63056/acad.004.01.0427.

24 *State v Loomis* 2015AP157-CR (Supreme Court of Wisconsin, 19 May 2016) <<https://law.justia.com/cases/wisconsin/supreme-court/2016/2015ap000157-cr.html>> accessed 3 April 2026.

when automated decision-making systems exclude protected groups (such as older applicants). The court allowed claims to proceed, indicating that AI systems used in employment decisions may be subject to anti-discrimination scrutiny even without human intent. Although not a ruling by a constitutional court, it reflects broader constitutional concerns about fairness and equality in AI systems.²⁵

The integration of AI into judicial systems has also expanded within several Arab jurisdictions. The UAE has implemented digital court systems and AI-assisted judicial services to enhance procedural efficiency and facilitate electronic litigation.²⁶ Saudi Arabia has similarly expanded digital judicial services through the “Najiz” platform, which provides integrated electronic judicial procedures and remote litigation services.²⁷ Jordan and Egypt have also undertaken gradual judicial digitalisation initiatives through electronic filing systems, remote hearings, and procedural automation measures. Nevertheless, the application of AI technologies in constitutional adjudication remains institutionally limited across the region.

Despite the administrative and procedural advantages of AI technologies, their use in constitutional justice raises substantial constitutional concerns. One of the most significant challenges relates to algorithmic bias. AI systems depend heavily on the quality and representativeness of the data on which they are trained. Consequently, biased or incomplete datasets may reproduce discriminatory patterns or institutional inequalities, thereby undermining constitutional guarantees of equality and non-discrimination.²⁸

Additional concerns arise from the opacity of certain algorithmic systems, particularly so-called “black box” models whose internal reasoning processes remain inaccessible even to system operators. Such opacity creates serious tension with constitutional principles requiring transparency, reasoned judicial decisions, and the ability of litigants to challenge judicial reasoning effectively.²⁹ In constitutional adjudication, where judicial legitimacy depends substantially upon publicly reasoned justification,

25 *Mobley v Workday, Dobrivoje Milicevic* 1-23-42763 (US Bankruptcy Court ED, 17 November 2023) <<https://www.courtlistener.com/docket/67660423/mobley-v-workday-inc/>> accessed 3 April 2026.

26 Tetiana Lotysh, ‘Application of Artificial Intelligence in Motivating Court Decisions in Criminal Proceedings: International Experience and Prospects for Ukraine’ (2024) 1(27) *ScienceRise: Juridical Science* 52, doi:10.15587/2523-4153.2024.301533 [in Ukrainian].

27 Dalia Kadry Ahmed Abdel Aziz, ‘Justice in the Age of Artificial Intelligence: A Comparative Study of the Legal Framework for Forensic Evidence in Saudi Arabia and Global Practices’ (2024) 3(8) *Ecounism* 8043, doi:10.62754/joe.v3i8.5431.

28 Channarong Intahchomphoo and others, ‘References to Artificial Intelligence in Canada’s Court Cases’ (2020) 20(1) *Legal Information Management* 39, doi:10.1017/s1472669620000080.

29 PR Biju and O Gayathri, ‘The Indian Approach to Artificial Intelligence: An Analysis of Policy Discussions, Constitutional Values, and Regulation’ (2024) 39(5) *AI and Society* 2321, doi:10.1007/s00146-023-01685-2.

the use of non-explainable algorithmic systems may threaten procedural fairness and public confidence in constitutional justice.³⁰

These concerns have contributed to the emergence of the concept of “responsible AI” within judicial governance frameworks. Responsible AI emphasises principles such as explainability, transparency, accountability, human oversight, fairness, and non-discrimination.³¹ Within constitutional adjudication, these safeguards are especially critical because constitutional courts directly affect fundamental rights, democratic legitimacy, and the constitutional order itself.³²

Accordingly, the integration of AI into constitutional courts must remain subject to strict constitutional limitations. While AI technologies may legitimately support administrative and analytical judicial functions, constitutional interpretation and normative constitutional reasoning must remain the exclusive responsibility of human judges. The legitimacy of AI-assisted constitutional justice, therefore, depends not replacing judicial reasoning but on preserving meaningful human oversight while using technological tools to improve procedural efficiency, access to justice, and institutional effectiveness.

3.2. The Role of Artificial Intelligence in Supporting the Constitutional Judge

Artificial intelligence (AI) is increasingly integrated into judicial environments as a supportive technological instrument designed to assist judges in managing complex legal information and improving procedural efficiency. In constitutional adjudication, the significance of AI lies primarily in its ability to enhance the informational and analytical capacities of constitutional judges rather than its ability to replace judicial reasoning itself.³³ Constitutional courts frequently operate within complex normative environments involving extensive constitutional jurisprudence, comparative legal materials, legislative history, doctrinal scholarship, and competing constitutional principles. In this context, AI technologies may help improve the organisation, accessibility, and analysis of legal information necessary for constitutional decision-making.³⁴

30 Olesya Kozakevich, 'Legal Challenges of Our Time: Can Artificial Intelligence Replace a Judge' (2025) 2 Slovo of the National School of Judges of Ukraine 63, doi:10.37566/2707-6849-2025-2(51)-6 [in Ukrainian].

31 Caroline Müller Bitencourt and Luisa Helena Nicknig Martins, 'Artificial Intelligence in the Constitutional Accounting Control Bodies of Brazilian Public Administration' (2023) 10(3) Revista de Investigacoes Constitucionais 1, doi:10.5380/rinc.v10i3.93650.

32 Vicko Taniady and Steven Theonald Siahaan, 'Artificial Intelligence and the Constitutional Court: A New Path of Making Independent Decisions?' (2023) 3(2) Jurnal Kajian Pembaruan Hukum 157, doi:10.19184/jkph.v3i2.41726.

33 Raphael Souza de Oliveira, Amilton Sales Reis Jr and Erick Giovani Sperandio Nascimento, 'Predicting the Number of Days in Court Cases Using Artificial Intelligence' (2022) 17(5) PLoS ONE 1, doi:10.1371/journal.pone.0269008.

34 Pei Yee Tan, 'The Need for Artificial Intelligence in Solving Unsolved Criminal Cases and Sentencing in Malaysia' (2023) 3(3) Asian Journal of Law and Policy 89, doi:10.33093/ajlp.2023.7.

AI-supported systems are already employed in several jurisdictions to facilitate legal research, identify relevant precedents, classify cases, analyse jurisprudential trends, and assist with managing judicial workloads. Such technologies can process substantial quantities of legal texts in short periods, thereby reducing administrative burdens and enabling judges to focus more directly on substantive constitutional analysis. In practical terms, AI may support constitutional courts through functions such as automated legal search, semantic analysis of judicial precedents, identification of doctrinal inconsistencies, and analytical mapping of constitutional jurisprudence.³⁵

From a functional perspective, AI in constitutional adjudication may be understood as a judicial decision-support mechanism that operates primarily during the preparatory and administrative stages of judicial work. Its role is essentially auxiliary and informational. AI systems may assist judges by organising constitutional jurisprudence, highlighting interpretative developments, identifying comparative constitutional approaches, and facilitating access to relevant legal materials. However, these technologies do not engage in constitutional interpretation in the legal sense, nor do they have the authority to resolve constitutional disputes independently.³⁶

This distinction between support and substitution is constitutionally significant. Constitutional adjudication is not merely a technical process of rule application, but a normative activity requiring constitutional balancing, contextual reasoning, proportionality assessment, and interpretation of fundamental rights within dynamic political and social contexts. The legitimacy of constitutional courts depends substantially on human judicial reasoning that can publicly justify constitutional conclusions through transparent, reasoned judgments. Consequently, AI technologies cannot replace the interpretative authority vested in constitutional judges.³⁷

Comparative practice demonstrates that most judicial systems continue to adopt a cautious approach toward AI integration within adjudicative functions. Within the European legal framework, the principle of meaningful human oversight has emerged as a central safeguard governing the use of AI in judicial systems. The European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their Environment emphasises that AI tools must remain compatible with fundamental rights, judicial independence, and procedural fairness.³⁸ Similarly, the EU Artificial Intelligence Act identifies AI systems used in the

35 Melinda Szappanyos, 'Artificial Intelligence: Is the European Court of Human Rights Prepared?' (2023) 11(1) *Acta Humana* 93, doi:10.32566/ah.2023.1.6.

36 Vahid Bakoei Ketrimi, Javad Taghizadeh and Morteza Nejabatkhah, 'Independence of the Supreme Constitutional Court of Egypt' (2021) 5(1) *Journal of Comparative Law* 49.

37 Mehmet Fatih Sert, Engin Yıldırım and İrfan Haşlak, 'Using Artificial Intelligence to Predict Decisions of the Turkish Constitutional Court' (2022) 40(6) *Social Science Computer Review* 1416, doi:10.1177/08944393211010398.

38 Fernando Esteban de la Rosa, Pablo Cortés and Nuria Marchal Escalona (eds), *Digitalization and Artificial Intelligence in Courts: Opportunities and Challenges* (OUP 2025) doi:10.1093/9780198918752.001.0001.

administration of justice as high-risk applications that require strict safeguards regarding transparency, accountability, and human supervision.³⁹

In Estonia, judicial digitalisation policies have focused primarily on improving administrative efficiency and facilitating judicial access to legal information while preserving human control over legal reasoning and adjudicative discretion. Estonian e-governance reforms illustrate a model of technological integration in which AI serves as a complementary instrument that supports judicial administration rather than replacing judicial authority.⁴⁰

The United States presents a different but equally important experience. American legal debate concerning AI in judicial contexts has largely focused on algorithmic risk assessment systems used in criminal proceedings, particularly COMPAS.⁴¹ In the *State v. Loomis* (2016), the Wisconsin Supreme Court addressed constitutional concerns arising from the use of algorithmic risk assessment tools during sentencing proceedings.⁴² Although the court permitted limited use of the system, substantial concerns were raised regarding transparency, due process, and litigants' inability to examine the internal logic of proprietary algorithms. The case became a major reference point in discussions concerning algorithmic accountability and the constitutional implications of AI-assisted judicial processes.⁴³

One of the most serious constitutional challenges associated with the integration of AI into judicial systems concerns algorithmic bias. AI systems are heavily dependent on the datasets used during training and operation. Where such data reflects existing social inequalities or institutional biases, algorithmic outputs may reproduce or amplify discriminatory patterns. This concern directly implicates constitutional guarantees of equality before the law and non-discrimination, particularly where algorithmic outputs influence judicial assessments or legal recommendations.⁴⁴

A further constitutional concern relates to the opacity of certain algorithmic systems, commonly described as the "black box" problem. Many advanced AI models operate

39 Abdulaziz Abdulrhman Mohammed Alkhalifa, 'Legal Challenges of AI and Automation in the Workplace' (2025) 8(2) *Access to Justice in Eastern Europe* 203, doi:10.33327/AJEE-18-8.2-a000104.

40 Andrii Petrovskyi, Bohdan Kyrdan and Kateryna Kutsyk, 'Implementation of Artificial Intelligence in Civil Proceedings: Experience of EU Countries' (2025) 30(1) *Scientific Journal of the National Academy of Internal Affairs* 45, doi:10.63341/naia-herald/1.2025.45.

41 Ana Farič and Ivan Bratko, 'Machine Bias: A Survey of Issues' (2024) 48(2) *Informatica* 205, doi:10.31449/inf.v48i2.5971.

42 *State v Loomis* 2015AP157-CR (n 24).

43 Ahmed M Khawaldeh, 'Generative AI Hallucinations and Legal Liability in Jordanian Civil Courts: Promoting the Responsible Use of Conversational Chat Bots' (2025) 38(2) *International Journal for the Semiotics of Law* 381, doi:10.1007/s11196-024-10199-z.

44 Žaklina Spalevic and Miloš Ilić, 'Artificial Intelligence in the Court Justice System' (2024) 48(3) *TEME* 745, doi:10.22190/teme240110042s.

through complex computational processes that remain difficult to interpret even for system developers. In constitutional adjudication, such opacity runs counter to the constitutional requirement that judicial decisions be reasoned, transparent, and open to public scrutiny.⁴⁵ Constitutional legitimacy depends significantly upon the ability of litigants and society to understand the reasoning underlying judicial decisions. Excessive reliance on opaque algorithmic outputs may therefore undermine procedural fairness and weaken public confidence in constitutional justice.⁴⁶

Concerns also arise regarding the potential long-term impact of AI on judicial independence. Although AI systems are formally designed as assistive technologies, persistent institutional reliance on algorithmic recommendations may gradually influence judicial behaviour and constrain independent legal reasoning. This risk is particularly sensitive in constitutional adjudication, where judges must frequently engage in principled constitutional balancing and normative interpretation that cannot be reduced to predictive or statistical analysis.⁴⁷

For these reasons, contemporary regulatory approaches increasingly emphasise the concept of “responsible AI” in judicial governance. Responsible AI frameworks generally require explainability, accountability, transparency, non-discrimination, cybersecurity protections, and meaningful human oversight. These safeguards are particularly important within constitutional courts because constitutional adjudication directly affects democratic legitimacy, constitutional rights, and the institutional balance of powers.⁴⁸

Accordingly, the proper role of AI in constitutional adjudication should be understood as supportive rather than determinative. AI technologies may significantly improve judicial efficiency, legal research, consistency of information management, and institutional accessibility. Nevertheless, constitutional interpretation and authoritative constitutional reasoning must remain the exclusive responsibility of human judges. The central constitutional challenge is, therefore, not whether AI should be incorporated into judicial systems, but how such integration can occur without compromising judicial independence, procedural fairness, constitutional legitimacy, and the normative foundations of constitutional justice.

45 Sojida Murodova, ‘The Black Box Problem in Administering Justice: Risks of Opaque Algorithms in Legal Decision-Making’ (2025) 3(6) *International Journal of Law and Policy* 1, doi:10.59022/ijlp.331.

46 Anca Parmena Olimid, Cătălina Maria Georgescu and Daniel Alin Olimid, ‘Legal Analysis of EU Artificial Intelligence Act (2024): Insights from Personal Data Governance and Health Policy’ (2024) 7(4) *Access to Justice in Eastern Europe* 120, doi:10.33327/AJEE-18-7.4-a000103.

47 Oleksandr Shevchuk and others, ‘Problems of Legal Regulation of Artificial Intelligence in Administrative Judicial Procedure’ (2023) 13(3) *Juridical Tribune* 348, doi:10.24818/TBJ/2023/13/3.02.

48 Rafael Bustos Gisbert, ‘A European Constitutionalist Facing Artificial Intelligence: Methodological Reflections by a Newcomer’ (2024) 131 *Revista Española de Derecho Constitucional* 149, doi:10.18042/cepc/redc.131.05.

3.3. International Legal and Regulatory Frameworks Governing AI in the Judiciary

The regulation of artificial intelligence (AI) within judicial systems has emerged as one of the central legal challenges accompanying contemporary digital transformation.

The increasing reliance on algorithmic systems in judicial administration, legal analysis, and procedural management requires the establishment of legal and institutional safeguards to ensure compatibility with constitutional principles and fundamental rights.⁴⁹ This issue is of particular significance in constitutional adjudication, where judicial decisions directly affect constitutional legitimacy, individual rights, the separation of powers, and the rule of law. Consequently, the use of AI in judicial environments cannot remain solely a matter of technological policy or administrative efficiency; it must instead be governed by clear constitutional and regulatory frameworks that preserve judicial independence, due process, transparency, and accountability.⁵⁰

Comparative legal practice demonstrates that approaches to regulating AI in judicial systems differ substantially according to constitutional traditions, regulatory philosophies, and institutional models of governance. Among the most developed regulatory approaches is the European rights-based model, which treats AI governance primarily as a constitutional and human rights issue rather than merely a technological matter.⁵¹ Within the EU, the AI Act establishes a comprehensive regulatory framework for AI systems and classifies certain applications used in the administration of justice as “high-risk” systems. Under this framework, AI applications that affect judicial processes are subject to strict legal obligations regarding transparency, explainability, data quality, human oversight, cybersecurity, and risk management.⁵²

The European approach is further reinforced through ethical and institutional instruments developed within the broader European legal space. Particularly significant is the European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their Environment, adopted by the European Commission for the Efficiency of Justice (CEPEJ). The Charter identifies five foundational principles governing the use of AI in judicial systems: respect for fundamental rights, non-discrimination, quality and security of data, transparency and impartiality, and user control. These principles reflect a broader European

49 Michał Kowalski, 'The Impact of Artificial Intelligence on the Future Functioning of Administrative Courts' (2024) 53(6) *Prawo i Więź* 173, doi:10.36128/PRIW.VI53.988.

50 Mohit Sharma, 'India's Courts and Artificial Intelligence: A Future Outlook' (2023) 15(1) *LeXonomica* 99, doi:10.18690/lexonomica.15.1.99-120.2023.

51 Thomas Gremsl and Elisabeth Hödl, 'Emotional AI: Legal and Ethical Challenges' (2022) 27(2) *Information Polity* 163, doi:10.3233/IP-211529.

52 Oksana Kukuruz and Ruslan Pakhomov, 'Permissible Limits of Artificial Intelligence Use in the Administration of Justice: Political and Legal Aspects' (2024) 93 *Politology Bulletin* 82, doi:10.17721/2415-881x.2024.93.82-93 [in Ukrainian].

commitment to ensuring that technological innovation remains subordinate to constitutional guarantees and human rights protections.

The EU has adopted one of the most comprehensive legislative frameworks governing artificial intelligence through the AI Act. The regulation establishes a rights-based approach to AI governance and is particularly relevant to the functioning of constitutional courts because it emphasises the protection of fundamental rights, transparency, accountability, and human oversight. Article 14 of the AI Act expressly requires that high-risk AI systems be subject to effective human oversight to prevent automated systems from undermining human judgment or constitutional guarantees. The article states that AI systems must be designed to enable natural persons to “fully understand the capacities and limitations of the AI system and remain able to oversee its operation.” This provision is particularly important in constitutional adjudication because it confirms that judicial authority cannot be delegated entirely to automated systems. In addition, Article 10 of the AI Act requires the use of high-quality datasets and the implementation of measures to reduce algorithmic bias and discriminatory outcomes. Such safeguards are closely linked to constitutional principles of equality before the law and the guarantee of a fair trial. Article 13 further imposes transparency obligations by requiring AI systems to operate in a sufficiently transparent manner for users to interpret and understand their outputs. Collectively, these provisions demonstrate that the EU seeks to balance technological innovation with the preservation of constitutional justice and judicial independence.⁵³

Judicial practice within the European legal order has also helped shape standards on algorithmic governance and digital rights. The jurisprudence of the Court of Justice of the European Union (CJEU), particularly in cases concerning data protection and automated decision-making, has reinforced principles relating to transparency, proportionality, and individual rights in technologically mediated processes. Although these cases do not directly concern constitutional courts, they significantly influence the normative environment governing AI use within judicial systems more broadly.⁵⁴

In contrast, the regulatory approach in the United States remains comparatively decentralised and jurisprudence-driven. Rather than adopting a unified federal legislative framework governing AI in judicial systems, American regulation has largely developed through judicial decisions, institutional guidelines, and constitutional litigation concerning algorithmic tools. One of the most influential judicial precedents in this context is *State v. Loomis*, which examined the constitutional implications of using COMPAS algorithmic risk

53 Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) [2024] OJ L 2024/1689 <<https://eur-lex.europa.eu/eli/reg/2024/1689/oj/eng>> accessed 3 April 2026.

54 Navneet Kaur and Manpreet Kaur, ‘Role of Artificial Intelligence in the Indian Courts’ (2024) 6(1) *International Journal of Law, Policy and Social Review* 17.

assessment software during sentencing proceedings. Although the court permitted limited use of the system, it emphasised that algorithmic outputs could not replace judicial discretion and that judges must remain aware of the system's limitations and potential biases. The case became a major reference point in debates concerning due process, explainability, procedural fairness, and algorithmic accountability.⁵⁵

The United States has not yet enacted a unified federal law specifically regulating the use of artificial intelligence within constitutional courts. Nevertheless, constitutional principles and judicial ethical guidelines provide an important legal framework governing the use of AI in judicial decision-making. The Fifth and Fourteenth Amendments to the United States Constitution guarantee due process of law and equal protection, which impose constitutional limitations on the use of automated systems in judicial proceedings. These constitutional safeguards require that judicial decisions remain subject to human reasoning, fairness, and procedural transparency. In practice, American judicial institutions have increasingly issued ethical and procedural guidance concerning the use of generative AI within courts. The National Center for State Courts emphasised that judicial authority must remain vested exclusively in judges, not in artificial intelligence systems. Judicial guidance further stresses that AI may serve as a supportive technological tool but cannot replace judicial discretion or independent legal reasoning. Similarly, the Supreme Court of Virginia issued guidance on the responsible use of generative AI within the judicial system, requiring human supervision of AI-generated outputs and prohibiting exclusive reliance on automated decision-making in judicial matters. These developments indicate that the American approach focuses on preserving constitutional guarantees and judicial accountability while permitting limited technological innovation within the administration of justice.⁵⁶

China represents a substantially different regulatory and institutional model characterised by strong state-led technological implementation and extensive judicial digitalisation initiatives. Chinese “smart court” reforms have incorporated AI technologies into case management, legal information systems, document processing, online dispute resolution, and procedural administration. These reforms are designed primarily to enhance efficiency, consistency, and institutional capacity within the judiciary. However, comparative legal scholarship has raised concerns about the limited transparency of algorithmic systems, the scope of state control over judicial digital infrastructures, and the relative weakness of procedural safeguards and judicial accountability mechanisms when measured against constitutional rule-of-law standards.⁵⁷

55 *State v Loomis* 2015AP157-CR (n 24).

56 Thomson Reuters Institute and National Center for State Courts AI Policy Consortium for Law and Courts, *Principles and Practices for Using AI Responsibly and Effectively in Courts: A Guide for Court Administrators, Judges, and Legal Professionals* (NCSC 2025) <<https://ncsc.contentdm.oclc.org/digital/collection/ctadmin/id/2659/>> accessed 3 April 2026.

57 Changqing Shi, Tania Sourdin and Bin Li, ‘The Smart Court – A New Pathway to Justice in China?’ (2021) 12(1) International Journal for Court Administration 1, doi:10.36745/ijca.367.

China has adopted an extensive regulatory framework concerning artificial intelligence through the Interim Measures for the Management of Generative Artificial Intelligence Services (2023). These measures require AI providers to ensure that AI systems comply with legal and ethical standards, avoid discriminatory practices, protect public interests, and maintain the accuracy and reliability of the content they generate. The regulation also emphasises the necessity of state supervision and human oversight over AI technologies. The Chinese legal approach is particularly relevant because China has developed advanced “smart courts” and AI-assisted judicial systems to improve judicial efficiency and drive digital transformation. The Supreme People’s Court of China has promoted the integration of artificial intelligence into judicial administration, case management, and online litigation systems. However, despite the extensive use of judicial technologies, Chinese regulations continue to require that judicial authority remain under human supervision and within the framework of legality. Consequently, the Chinese model reflects an attempt to combine judicial modernisation with institutional control and legal oversight.⁵⁸

Estonia presents another important comparative model. As one of the world’s most digitally advanced governance systems, Estonia has pursued gradual integration of technological tools within public administration and judicial services. Estonian judicial digitalisation emphasises administrative support, accessibility, and procedural efficiency while maintaining mandatory human judicial oversight over adjudicative functions. This model reflects a cautious and rights-conscious approach in which technology supplements judicial work without displacing judicial authority or constitutional responsibility.⁵⁹

Despite this technological orientation, Estonian legal policy continues to emphasise that final judicial authority must remain vested in human judges. The use of AI within judicial systems is therefore treated as an assistive mechanism rather than a substitute for judicial reasoning. Estonian reforms also stress procedural fairness, transparency, and public trust in digital justice systems. Accordingly, Estonia provides an important comparative example of how constitutional justice may incorporate technological innovation while preserving fundamental legal safeguards and judicial accountability.⁶⁰

Within the Arab region, regulatory frameworks governing AI in judicial systems remain comparatively underdeveloped and fragmented. Nevertheless, several states have introduced extensive judicial digitalisation initiatives as part of broader national digital transformation strategies. The UAE has adopted an advanced legislative approach toward artificial intelligence and digital governance. One of the most relevant legal instruments is Federal Decree-Law No. 45 of 2021 on the Protection of Personal Data, which establishes safeguards concerning automated processing and the protection of individual rights.

58 ‘China - Generative AI Services Management’ (*Regulations.ai*, 15 August 2023) <<https://regulations.ai/regulations/china-2023-7-generative-ai>> accessed 3 April 2026.

59 Nele Siitam, ‘IT and AI at National Courts. Some Examples from Estonia’ (2025) 26(4) ERA Forum 663, doi:10.1007/s12027-025-00861-9.

60 *Estonian Ministry of Justice* <<https://www.justdigi.ee/en>> accessed 3 April 2026.

Article 18 of the law provides protection against decisions based solely on automated processing when such decisions produce legal or significant effects on individuals. This provision is particularly significant for constitutional justice because it reinforces the principle that judicial decisions must remain subject to meaningful human review and legal accountability.⁶¹ The UAE has also adopted broader strategic frameworks, including the UAE Artificial Intelligence Strategy 2031 and the UAE AI Charter, which promote ethical AI, responsible innovation, transparency, and human-centred governance. These policies support the modernisation of judicial systems while emphasising the importance of preserving public trust, procedural fairness, and institutional accountability. Consequently, the Emirati approach reflects an attempt to integrate advanced technologies into judicial administration without compromising constitutional guarantees or the principles of justice.⁶² The UAE has implemented advanced electronic litigation systems, digital court services, and AI-supported judicial administration mechanisms to enhance efficiency and accessibility. Saudi Arabia has similarly expanded digital judicial services through integrated platforms such as “Najiz,” which facilitate electronic filing, remote hearings, and procedural management.⁶³ Saudi Arabia has introduced important legal and ethical frameworks governing artificial intelligence and data protection, particularly through the Personal Data Protection Law (PDPL) issued under Royal Decree No. M/19 of 2021 and amended by Royal Decree No. M/148 of 2023.⁶⁴ The law establishes principles concerning the lawful processing of personal data, transparency, accountability, and the protection of individual rights. These principles are highly relevant to the judicial sector because AI systems operating within courts may process sensitive judicial and personal information. In addition to the PDPL, the Saudi Data and Artificial Intelligence Authority (SDAIA) adopted the Principles and Controls of AI Ethics, which emphasise fairness, transparency, privacy protection, accountability, and human oversight in the use of artificial intelligence. These

- 61 UAE Federal Decree-Law no (45) of 2021 ‘Concerning the Protection of Personal Data’ (adopted 20 September 2021) [2021] Official Gazette 712 <<https://uaelegislation.gov.ae/en/legislations/1972>> accessed 3 April 2026.
- 62 ‘UAE Cabinet adopts National Artificial Intelligence Strategy 2031’ (*Emirates News Agency*, 21 April 2019) <<https://www.wam.ae/en/article/hszr8hoo-uae-cabinet-adopts-national-artificial>> accessed 3 April 2026; UAE Cabinet, *UAE National Strategy for Artificial Intelligence 2031* (National Program for Artificial Intelligence 2018).
- 63 UAE Federal Decree-Law no (46) of 2021 ‘On Electronic Transactions and Trust Services’ (adopted 20 September 2021) [2021] Official Gazette 712 <<https://uaelegislation.gov.ae/en/legislations/1539>> accessed 3 April 2026; ‘Procedural Guide for the Electronic Litigation Service’ (*Najiz Platform, Saudi Ministry of Justice*, 20 August 2020) <https://laws.moj.gov.sa/ar/legislation/myVO-TMtIwgPSdkK_pOfjw> accessed 3 April 2026; ‘Saudi Data and Artificial Intelligence Authority’ (*Riyadh Region Municipality*, 2026) <<https://alriyadh.gov.sa/ar/content/saudi-Data-and-AIAuthority>> accessed 3 April 2026; Jorge Castellanos Claramunt, ‘Human Rights, Vulnerability and Artificial Intelligence: An Analysis in Constitutional Perspective’ (2024) (14) *Deusto Journal of Human Rights* 33, doi:10.18543/djhr.3187.
- 64 *Digitizing the Courts: Egypt Government Portal* <<https://digital.gov.eg/>> accessed 3 April 2026; Regulation no 95 of 2018 ‘On the Use of Electronic Means in Civil Judicial Procedures’ (Jordan) [2018] Official Gazette 5529 <<http://adaleh.info/Art.aspx?Typ=2&Id=1202>> accessed 3 April 2026.

ethical principles are directly connected to constitutional justice because they seek to ensure that automated systems do not undermine legal safeguards, judicial impartiality, or procedural fairness. The Saudi regulatory approach reflects an effort to modernise judicial and governmental systems while maintaining legal and ethical protections consistent with the rule of law.⁶⁵ Egypt and Jordan have also introduced various electronic litigation systems and judicial digitalisation initiatives.

Despite these developments, most Arab jurisdictions have not yet adopted comprehensive legislative frameworks that specifically regulate the use of AI in judicial or constitutional adjudication. Existing reforms remain focused primarily on procedural digitalisation and administrative automation rather than substantive AI-assisted adjudicative functions. Consequently, AI governance within Arab judicial systems remains largely implicit, fragmented, and institutionally transitional. Judicial precedents directly addressing algorithmic adjudication or constitutional implications of AI remain scarce across the region, reflecting the relatively early stage of technological integration into judicial institutions.

From a comparative perspective, the absence of a unified global regulatory model for AI in judicial systems remains evident. Instead, three broad regulatory patterns can be identified. The first is the European rights-based regulatory model, emphasising constitutional safeguards, human oversight, and the protection of fundamental rights.⁶⁶ The second is the American jurisprudential and oversight-based approach, which relies heavily on constitutional litigation and judicial scrutiny of algorithmic systems.⁶⁷ The third is the Chinese state-driven implementation model, which prioritises efficiency, technological integration, and institutional digitalisation under centralised governance structures.

This comparative landscape demonstrates that the regulation of AI in judicial systems remains an evolving area of law and governance. The principal challenge confronting constitutional systems today is no longer whether AI technologies should be integrated into judicial environments, but rather how legal and constitutional frameworks can ensure that such integration is consistent with judicial independence, constitutional legitimacy, procedural fairness, transparency, and the protection of fundamental rights. In the context of constitutional adjudication, these safeguards are indispensable because constitutional courts occupy a unique institutional role in preserving the constitutional order and maintaining public confidence in the rule of law.

65 Saudi Arabia Royal Decree no M/19 of 2021 'Personal Data Protection Law (PDPL)' amended by Royal Decree no M/148 of 2023 <<https://regulations.ai/regulations/saudi-arabia-2021-09-personal-data-protection-law-pdpl>> accessed 3 April 2026.

66 Case C-413/23 P *European Data Protection Supervisor v Single Resolution Board* (CJEU, 4 September 2025) ECLI:EU:C:2025:645 <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:62023CJ0413>> accessed 3 April 2026.

67 'The Court and Constitutional Interpretation' (*Supreme Court of the United States*, 2026) <<https://www.supremecourt.gov/about/constitutional.aspx>> accessed 3 April 2026.

3.4. Prospects for Developing Constitutional Courts in the Era of Artificial Intelligence

The future development of constitutional courts in the era of artificial intelligence (AI) reflects a broader transformation in judicial governance, institutional design, and legal decision-making within increasingly digital societies. The issue is no longer confined to the technical possibility of integrating AI into judicial systems but rather concerns the extent to which constitutional adjudication itself may be reshaped by data-driven technologies, digital infrastructures, and algorithm-assisted analytical tools. Consequently, discussions concerning the future of constitutional courts must address not only technological efficiency, but also the preservation of constitutional legitimacy, judicial independence, democratic accountability, and the normative foundations of constitutional interpretation.⁶⁸

Contemporary developments suggest the gradual emergence of an “assisted adjudication” model within judicial systems. Under this model, AI technologies function primarily as advanced analytical and administrative support mechanisms operating within broader judicial ecosystems. Rather than replacing constitutional judges, AI systems increasingly contribute to the informational environment in which constitutional adjudication takes place. This includes facilitating access to constitutional jurisprudence, organising legal materials, analysing comparative constitutional trends, managing judicial workloads, and supporting procedural administration. Such technologies may significantly enhance the institutional capacity of constitutional courts, particularly in jurisdictions experiencing increasing litigation complexity and growing constitutional caseloads.⁶⁹

Nevertheless, constitutional adjudication remains fundamentally distinct from ordinary forms of legal decision-making. Constitutional courts do not merely apply predefined legal rules mechanically; they engage in value-oriented interpretation, including proportionality analysis, balancing competing constitutional rights, protecting democratic structures, and resolving politically sensitive disputes. Constitutional interpretation frequently requires contextual judgement, historical understanding, ethical reasoning, and assessment of constitutional principles within evolving societal conditions. For this reason, AI systems, regardless of their analytical sophistication, remain incapable of independently exercising the normative and interpretative authority that defines constitutional adjudication.⁷⁰

68 Carlo Colapietro and Alessandro Moretti, 'L'Intelligenza Artificiale nel dettato costituzionale: opportunità, incertezze e tutela dei dati personali' (2020) 3 BioLaw Journal 359, doi:10.15168/2284-4503-713.

69 Anna Fine and Shawn Marsh, 'Judicial Leadership Matters (yet Again): The Association between Judge and Public Trust for Artificial Intelligence in Courts' (2024) 4(1) Discover Artificial Intelligence 44, doi:10.1007/s44163-024-00142-3.

70 Noila Nurmamatova, 'Digital Transformation in Constitutional Courts: Opportunities and Risks' (2025) 5(4) Jurisprudence 30, doi:10.51788/tsul.jurisprudence.5.4./mfe4662.

Comparative developments illustrate different trajectories concerning the future integration of AI into judicial institutions. Estonia provides one of the clearest examples of gradual and institutionally cautious judicial digitalisation. Through its advanced e-governance infrastructure and interconnected public digital systems, Estonia has demonstrated how digital technologies may improve procedural efficiency, accessibility, and judicial administration while preserving meaningful human judicial control over adjudicative functions. The Estonian model reflects a technologically advanced yet constitutionally restrained approach, in which AI serves as a supportive instrument subordinate to judicial authority.⁷¹

China, in contrast, illustrates a more expansive and state-driven model of judicial technological integration. Chinese “smart court” initiatives employ AI technologies extensively in case management, online dispute resolution, legal information processing, automated document generation, and procedural administration. These reforms demonstrate the significant institutional potential of AI in managing judicial workloads and improving administrative efficiency on a large-scale. At the same time, comparative legal scholarship continues to raise concerns regarding transparency, accountability, procedural safeguards, and the compatibility of highly centralised technological governance with constitutional rule-of-law standards.⁷²

Within the European legal framework, future developments concerning AI in constitutional and judicial systems are likely to remain linked to rights-based regulatory safeguards. The EU’s AI regulatory approach emphasises human oversight, explainability, accountability, and the protection of fundamental rights. Through instruments such as the AI Act and the ethical principles developed by the European Commission for the Efficiency of Justice (CEPEJ), European institutions have consistently maintained that judicial AI systems must remain subordinate to constitutional guarantees and meaningful human supervision. This approach reflects a broader European constitutional understanding that constitutional interpretation and the balancing of rights cannot be delegated to autonomous algorithmic systems.⁷³

In the case concerning large-scale digital surveillance and automated data processing by intelligence agencies, the European Court of Human Rights (ECtHR) held that bulk interception regimes must be accompanied by strong legal safeguards to comply with Article 8 of the European Convention on Human Rights, which guarantees the right to privacy. The

71 Heru Setiawan and others, ‘Digitalization of Legal Transformation on Judicial Review in the Constitutional Court’ (2024) 4(2) *Journal of Human Rights, Culture and Legal System* 263, doi:10.53955/jhcls.v4i2.263.

72 Rachel E Stern and others, ‘Automating Fairness? Artificial Intelligence in the Chinese Courts’ (2021) 59(3) *Columbia Journal of Transnational Law* 515.

73 Giovanni De Gregorio and Oreste Pollicino, ‘The European Constitutional Way to Address Disinformation in the Age of Artificial Intelligence’ (2025) 26(3) *German Law Journal* 449, doi:10.1017/glj.2025.24.

case is particularly significant in the context of AI governance, as modern surveillance systems increasingly depend on algorithmic filtering and automated data analysis. The Court emphasised that proportionality, necessity, and effective oversight constitute essential constitutional safeguards for regulating digital technologies and protecting individual rights and freedoms in the digital age.⁷⁴

In the United States, future developments are likely to continue evolving through constitutional litigation, judicial scrutiny, and institutional oversight rather than through centralised legislative regulation. American legal debates concerning AI in judicial systems increasingly focus on issues of procedural fairness, algorithmic transparency, due process, equal protection, and judicial accountability. The ongoing controversy surrounding algorithmic risk assessment systems underscores the broader constitutional concern that AI technologies may indirectly shape judicial reasoning and institutional behaviour if insufficient safeguards are in place.⁷⁵

Within the Arab region, prospects for AI integration into constitutional adjudication remain associated with broader processes of judicial digital transformation and state modernisation. The UAE and Saudi Arabia have made substantial progress in judicial digitalisation through electronic litigation systems, digital judicial services, and integrated procedural platforms such as “Najiz.”⁷⁶ Egypt and Jordan have also advanced in electronic filing systems, remote hearings, and digital judicial administration. However, the transition from procedural digitalisation toward AI-assisted constitutional adjudication remains institutionally limited throughout the region. Existing reforms largely focus on administrative efficiency rather than substantive adjudicative support or algorithm-assisted constitutional analysis.⁷⁷

The future role of constitutional judges is therefore likely to evolve in response to increasingly sophisticated digital legal environments. Constitutional judges may interact more extensively with AI-assisted systems capable of conducting comparative legal analysis, identifying jurisprudential trends, organising constitutional materials, and facilitating procedural management. However, this evolution does not alter the essential constitutional nature of judicial authority. The legitimacy of constitutional adjudication continues to depend upon human interpretative reasoning, public justification, constitutional balancing, and normative assessment grounded in constitutional values rather than algorithmic prediction.⁷⁸

74 *Big Brother Watch v United Kingdom* Apps nos 58170/13, 62322/14 and 24960/15 (ECtHR, 25 May 2021) <<https://hudoc.echr.coe.int/eng?i=001-210077>> accessed 3 April 2026.

75 Dario Martire, ‘Artificial Intelligence and the Constitutional State’ (2022) (2) *Diritto Pubblico* 397, doi:10.1438/104988.

76 UAE Federal Decree-Law No (46) of 2021 (n 63); ‘Procedural Guide for the Electronic Litigation Service’ (n 63); Castellanos Claramunt (n 63).

77 Regulation no 95 of 2018 (n 64).

78 Abraham Bechara and others, ‘Inteligencia Artificial y su incidencia en el debido proceso’ (2024) 20(1) *Juridicas CUC* 436, doi:10.17981/JURIDCUC.20.1.2024.20.

At the same time, expanding AI integration within judicial systems generates persistent structural challenges that constitutional systems must address proactively. These include ensuring algorithmic transparency and explainability, preventing discriminatory or biased outcomes, maintaining judicial independence, protecting data privacy, safeguarding procedural fairness, and establishing clear institutional accountability for AI-assisted judicial processes. Such concerns reveal an important tension between technological capability and constitutional readiness, particularly in legal systems where institutional safeguards governing AI remain underdeveloped.⁷⁹

Accordingly, the responsible integration of AI into constitutional courts requires a multidimensional governance framework combining constitutional regulation, institutional safeguards, judicial training, technological expertise, ethical oversight, and procedural accountability mechanisms. Without such safeguards, AI technologies risk undermining rather than strengthening constitutional justice by weakening transparency, reducing judicial autonomy, or compromising public trust in judicial institutions.⁸⁰

Overall, comparative developments suggest that the future trajectory of constitutional courts will likely entail the emergence of a technologically assisted adjudicative environment in which AI serves as an analytical and administrative infrastructure supporting judicial work, while leaving ultimate interpretative authority exclusively in human hands. The central constitutional challenge will therefore not be technological adoption itself, but rather the preservation of the constitutional identity, legitimacy, and human-centred nature of constitutional adjudication within increasingly data-driven judicial systems.⁸¹

3.5. Practical Applications of Artificial Intelligence in Constitutional Judiciary

The examination of practical applications of artificial intelligence (AI) in judicial systems is essential to understanding the realistic scope and constitutional limits of integrating technology into constitutional adjudication. Although the most advanced uses of AI currently occur in ordinary courts, administrative judicial services, and procedural management systems, these experiences remain highly relevant to constitutional courts, as they illustrate how digital technologies may reshape judicial infrastructures, legal research practices, and institutional decision-support environments. At the same time, they also demonstrate the constitutional limitations

79 Carlo Casonato, 'Artificial Intelligence and Constitutional Law: First Considerations' (2019) 21 *Diritto Pubblico Comparato ed Europeo* 101, doi:10.17394/93043.

80 Paul Nemitz, 'Constitutional Democracy and Technology in the Age of Artificial Intelligence' [2018] *Philosophical Transactions of the Royal Society A*, doi:10.1098/rsta.2018.0089.

81 Tareq Al-Billeh, 'Legal Framework for Protecting the Right to Private Life in the Digital Space: The Extent to Which Jordanian Constitution and Legislation Takes into Account International Requirements' (2024) 11(1) *Revista de Investigaciones Constitucionales* e258, doi:10.5380/rinc.v11i1.90631.

that arise when algorithmic systems approach functions traditionally associated with judicial reasoning and constitutional interpretation.⁸²

From a functional perspective, AI applications in judicial systems can be classified into three principal categories: legal information processing systems, procedural automation mechanisms, and analytical or predictive support tools. This functional classification provides a clearer analytical framework for assessing which applications may be compatible with constitutional adjudication and which remain constitutionally problematic.⁸³

The first category concerns legal information processing and jurisprudential analysis. AI-supported legal databases and intelligent search systems are increasingly employed to process large volumes of judicial decisions, legislative materials, doctrinal scholarship, and comparative legal sources. These technologies facilitate legal research by identifying relevant precedents, detecting jurisprudential patterns, organising legal materials, and accelerating access to judicial information. In the United States, major legal research platforms increasingly rely on AI-assisted technologies capable of semantic legal analysis and advanced jurisprudential retrieval. Although such systems do not exercise judicial authority directly, they significantly influence the informational environment within which judicial reasoning takes place.⁸⁴

Within constitutional adjudication, these technologies may assist constitutional judges in identifying constitutional precedents, comparing interpretative approaches, analysing doctrinal developments, and mapping constitutional jurisprudence across different legal systems. Constitutional courts often engage with extensive historical, comparative, and doctrinal materials, particularly in cases involving proportionality analysis, constitutional balancing, and fundamental-rights interpretation. AI-supported legal research systems may therefore improve the efficiency and comprehensiveness of constitutional judicial preparation without affecting the substantive authority of constitutional judges.⁸⁵

The second category involves procedural automation and judicial administration. This area currently represents the most widespread and institutionally accepted form of AI-related judicial digitalisation. Courts in numerous jurisdictions increasingly employ digital systems for case registration, document management, electronic filing, hearing scheduling, remote litigation, procedural notifications, and judicial workflow administration. These technologies contribute significantly to reducing procedural delays, improving accessibility, and enhancing institutional efficiency.⁸⁶

82 De Gregorio and Pollicino (n 73).

83 Nemitz (n 80).

84 Tülay Turan and Ecir Uğur Küçükşille, 'Summarization and Prediction of Turkish Constitutional Court Decisions with Explainable Artificial Intelligence and a Hybrid Natural Language Processing Method' (2025) 13 IEEE Access 59766, doi:10.1109/ACCESS.2025.3556725.

85 Eduardo Martín Acosta Yparraguirre, 'The Artificial Intelligence and the End of the Constitutional Rule of Law and Democracy... or Not?' (2024) 27 Eunomia 137, doi:10.20318/eunomia.2024.9004.

86 Alaa Abdul Hussein Taher Al-Shuwaili, 'The Role of Artificial Intelligence in Constitutional and Legislative Rules in Iraq and Egypt' (2024) 69 Journal of the Iraqia University.

Several comparative experiences illustrate this development. The UAE has implemented advanced electronic litigation systems and digital judicial platforms designed to facilitate remote access to judicial services and improve procedural administration. Saudi Arabia has similarly expanded digital judicial services through integrated electronic systems such as the “Najiz” platform, which supports electronic filing, digital communication, and online procedural management.⁸⁷ Jordan and Egypt have also introduced electronic litigation mechanisms and judicial digitalisation initiatives modernise court administration and improve access to justice.⁸⁸

Although these applications are primarily administrative rather than adjudicative, they indirectly affect constitutional courts by improving the broader judicial infrastructure within which constitutional adjudication operates. Enhanced procedural management may reduce institutional burdens, accelerate constitutional litigation procedures, and improve judicial access to legal materials and litigant submissions. Nevertheless, these technologies remain supportive tools and do not directly participate in constitutional interpretation or judicial reasoning.⁸⁹

The third category concerns analytical and predictive AI systems, which constitute the most controversial and constitutionally sensitive area of judicial AI application. Certain jurisdictions, particularly in the United States, have experimented with algorithmic systems that analyse historical judicial data to identify patterns, estimate litigation risks, or predict judicial outcomes. Such technologies rely on statistical modelling and machine-learning techniques designed to infer future judicial behaviour from prior case patterns.⁹⁰

However, predictive systems raise substantial constitutional concerns when considered in relation to constitutional adjudication. Constitutional courts do not merely resolve disputes according to recurring factual patterns; they frequently interpret constitutional principles within evolving political, social, and ethical contexts. Constitutional reasoning often requires normative balancing, democratic sensitivity, and contextual judgment that cannot be reduced to predictive algorithms or statistical correlations. Consequently, predictive AI systems remain fundamentally incompatible with autonomous constitutional decision-making.⁹¹

87 Egidija Tamošiūnienė and others, ‘The Possibility of Applying Artificial Intelligence in the Delivery of Justice by Courts’ (2024) 17(1) *Baltic Journal of Law and Politics* 207, doi:10.2478/bjlp-2024-0010.

88 Marija Ampovska, ‘Judicial Responses to AI-Generated Works: A Comparative Case Law Analysis on Copyright’ (2025) 62(3) *Review of European and Comparative Law* 107, doi:10.31743/recl.18615.

89 Kareem Sayed Aboelazm and others, ‘Robotic Judges: A New Step Towards Justice or the Exclusion of Humans?’ (2024) 4(4) *Journal of Lifestyle and SDGs Review* e02515, doi:10.47172/2965-730x.sdgsreview.v4.n04.pe02515.

90 Shokhjakhon Abudusattorov, ‘Artificial Intelligence, Personal Data, And Digital Surveillance: Uzbekistan’s Constitutional Path to Balance’ (2025) 5(8) *International Journal of Law and Criminology* 71, doi:10.37547/ijlc/volume05issue08-13.

91 Nur Aqilah Khadijah Rosili and others, ‘A Systematic Literature Review of Machine Learning in Court Decisions’ (2021) 10(4) *IAES International Journal of Artificial Intelligence (IJ-AI)* 1091, doi:10.11591/IJAI.V10.I4.PP1091-1102.

The constitutional concerns associated with predictive judicial technologies became particularly visible in American legal debates surrounding algorithmic risk assessment tools such as COMPAS. Judicial and academic criticism focused on issues of transparency, algorithmic bias, due process, and litigants' inability to meaningfully challenge opaque computational outputs. These debates demonstrated the broader constitutional risks that may arise when algorithmic systems begin to influence judicial assessments or institutional behaviour.⁹²

Another important technological development concerns natural language processing (NLP) systems. NLP technologies enable automated analysis, summarisation, translation, and classification of legal texts. In multilingual legal environments such as the EU, these systems facilitate access to legal materials across different languages and legal traditions, thereby supporting comparative legal analysis and judicial cooperation. Constitutional courts may benefit from NLP technologies when analysing comparative constitutional jurisprudence, legislative histories, doctrinal materials, and multilingual legal sources. Nevertheless, NLP systems remain limited in their capacity to understand contextual constitutional meaning, normative interpretation, and constitutional balancing.⁹³

Taken together, comparative practice demonstrates that AI technologies within judicial systems function primarily as support infrastructures rather than autonomous adjudicative mechanisms. Their principal contribution lies in improving efficiency, accessibility, information management, and procedural organisation. However, the applicability of AI technologies to constitutional courts remains necessarily differentiated according to functional suitability and constitutional permissibility.⁹⁴

Certain applications, particularly legal research systems, procedural administration technologies, jurisprudential databases, and analytical support tools, may be integrated into constitutional judicial work with relatively limited constitutional risk. In contrast, predictive adjudication systems and automated decision-making technologies remain fundamentally incompatible with the normative and interpretative character of constitutional adjudication. Constitutional courts exercise authority grounded not merely in technical legal analysis, but in constitutional legitimacy, public reasoning, democratic accountability, and human judgement.⁹⁵

92 Omar Caramaschi, 'Constitutionalism in Front of Artificial Intelligence: New Challenges, What Solutions?' (2025) 7(1) *Rivista Italiana di Informatica e Diritto* 29, doi:10.32091/RIID0204.

93 Bin Wei and others, 'A Full-Process Intelligent Trial System for Smart Court' (2022) 23(2) *Frontiers of IT & Electronic Engineering* 186, doi:10.1631/FITEE.2100041.

94 Belina Annery Herrera-Tapias and others, 'Algorithmic Discrimination and Explainable AI in the Judiciary: A Case Study of the Constitutional Court of Colombia' (2025) 257 *Procedia Computer Science* 1227, doi:10.1016/j.procs.2025.03.164.

95 Jeffry Tarantang and Ibnu Elmi Pelu, 'Neo-Digitalism in the Legal System: Adapting Law to Technological Developments' (2024) 9(2) *Jurnal Ilmu Hukum Tambun Bungai* 519, doi:10.61394/jihtb.v9i2.495.

Accordingly, the integration of AI into constitutional courts requires a selective and constitutionally constrained model of technological adoption. The relevant criterion should not be technological capability alone, but rather compatibility with constitutional guarantees, judicial independence, transparency, due process, and meaningful human oversight. AI technologies may legitimately enhance the institutional capacity of constitutional courts, but they cannot replace the interpretative reasoning that defines constitutional adjudication itself.⁹⁶

The practical experience of AI deployment within judicial systems reveals an important structural distinction between procedural efficiency and constitutional judgment. While AI technologies may significantly strengthen administrative and analytical capacities, constitutional adjudication remains inherently dependent upon human interpretative authority. The future legitimacy of AI-assisted constitutional justice, therefore, depends upon maintaining this distinction and ensuring that technological integration remains subordinate to constitutional principles rather than determinative of constitutional outcomes.⁹⁷

3.6. Challenges of Implementing Artificial Intelligence in Constitutional Courts

The integration of AI into constitutional adjudication presents a set of complex and interrelated ethical, legal, and institutional challenges that distinguish it from its use in administrative or procedural judicial contexts. Unlike routine judicial functions, constitutional adjudication directly involves interpreting constitutional norms, protecting fundamental rights, and resolving disputes concerning the structure of the state and the limits of public power. As a result, the introduction of AI into constitutional courts raises concerns that extend beyond technical performance and efficiency, reaching into the core principles of constitutional justice, judicial legitimacy, and the rule of law.⁹⁸

From an ethical and constitutional standpoint, one of the most significant challenges concerns algorithmic bias. AI systems operate on historical datasets that may reflect pre-existing social, institutional, or systemic inequalities. When such data is used in training or operational processes, there is a risk that these biases are reproduced or even amplified in algorithmic outputs. In the context of constitutional courts, this raises direct concerns about

96 I Ketut Sukewati Lanang Putra Perbawa, 'Application of Artificial Intelligence as Evidence in Indonesian Courts' (2021) 5(2) *International Journal of Social Science and Business* 180, doi:10.23887/ijssb.v5i2.36185.

97 Michele Francaviglia, 'L'intelligenza Artificiale Nell'attività Amministrativa: Principi e Garanzie Costituzionali Nel Passaggio Dalla Regola Agendi Alla Regola Algoritmica' (2024) 17 *Federalismi.it* 114.

98 Muhammad Jefri Kurniawan and Ruli Purwanto, 'The Revolution of Public Administration in the Era of Artificial Intelligence: Legal Challenges and Constitutional Implications' (2025) 5(1) *Fortiori Law Journal* 1, doi:10.47200/flj.v5i01.3050.

the principle of equality before the law and non-discrimination, both of which constitute foundational elements of constitutional justice. The use of biased or unbalanced data may therefore compromise the neutrality expected of judicial reasoning, even where AI systems are formally limited to advisory functions.⁹⁹

Connected to this issue is the problem of transparency and explainability, often described in the literature as the “black box” phenomenon. Many advanced AI systems operate through complex machine-learning models whose internal reasoning processes are not easily interpretable by users, including legal professionals. In constitutional adjudication, this opacity creates a fundamental tension with the requirement that judicial decisions must be reasoned, intelligible, and open to scrutiny. The legitimacy of constitutional courts depends not only on the correctness of outcomes but also on the transparency of reasoning. Accordingly, any reliance on non-explainable algorithmic outputs may undermine procedural fairness and weaken public confidence in constitutional justice.¹⁰⁰

A further constitutional concern relates to judicial responsibility and accountability. Although AI systems are formally designed as assistive tools, their increasing influence on legal research, analysis, and recommendation processes raises questions about the attribution of responsibility for judicial outcomes. If judicial reasoning is partially shaped by algorithmic suggestions or predictive outputs, it becomes necessary to determine whether accountability remains exclusively with the judge or whether it is indirectly shared with the designers, developers, or operators of such systems. This diffusion of responsibility presents a significant challenge to traditional doctrines of judicial accountability, particularly in constitutional courts where decisions have far-reaching normative and institutional consequences.¹⁰¹

From a legal perspective, the absence or incompleteness of specific regulatory frameworks governing the use of AI in judicial and constitutional contexts constitutes another major challenge. In many jurisdictions, particularly in several Arab legal systems, there is currently no explicit legislation governing the admissibility, limits, or oversight of AI in judicial decision-making. This creates a degree of normative uncertainty that may affect both the legitimacy and consistency of judicial practice. Even in more advanced regulatory environments, such as the EU, the legal approach remains highly precautionary, requiring strict compliance with principles of transparency, human

99 Asbudi Dwi Saputra, Hartono Tasir Irwanto and Nurisnah Nurisnah, 'Measuring Judicial Accountability in the Algorithmic Era: Juridical Implications of Using Judicial Assistants and Black Box Risks in Constructing Judgment Arguments' (2025) 7(2) SIGn Jurnal Hukum 958, doi:10.37276/sjh.v7i2.570.

100 Tareq Al-Billeh and others, 'The Risks of Using Artificial Intelligence on Privacy and Human Rights: Unifying Global Standards' (2024) 31(2) Jurnal Media Hukum 333, doi:10.18196/jmh.v31i2.23480.

101 Kasper Lippert-Rasmussen, 'Algorithmic and Non-Algorithmic Fairness: Should We Revise Our View of the Latter Given Our View of the Former?' (2025) 44(2) Law and Philosophy 155, doi:10.1007/s10982-024-09505-4.

oversight, risk assessment, and the protection of fundamental rights, particularly under frameworks such as the EU Artificial Intelligence Act.¹⁰²

An additional legal dimension concerns data protection and privacy. AI systems deployed within judicial environments necessarily process large volumes of sensitive personal and legal data, including case files, judicial records, and litigant information. Without adequate safeguards, such processing may lead to risks of unauthorised data use, breaches of confidentiality, or violations of privacy rights. In constitutional terms, this raises concerns about the rights to privacy and the protection of personal data as fundamental rights, thereby reinforcing the need for strict legal and institutional safeguards governing data handling in AI-enabled judicial systems.¹⁰³

The District Court of The Hague invalidated the SyRI algorithmic system used by the Dutch government to detect welfare fraud. The Court found that the system violated the right to privacy under Article 8 of the European Convention on Human Rights (ECHR) because it lacked transparency, accountability, and proportionality. This case is considered a landmark decision in Europe against opaque governmental AI systems, reinforcing constitutional principles of due process and data protection.¹⁰⁴

At the institutional and societal level, the implementation of AI in constitutional courts also raises issues of legitimacy, trust, and public perception. Judicial legitimacy in constitutional systems is linked to public confidence in the independence, impartiality, and human-centred nature of judicial reasoning. The introduction of opaque or poorly understood algorithmic tools may undermine this confidence, particularly in contexts where digital literacy remains limited. Furthermore, disparities in technological infrastructure and institutional capacity between jurisdictions may lead to unequal levels of AI adoption, thereby creating asymmetries in judicial modernisation and potentially widening the gap between advanced and developing legal systems.¹⁰⁵

Comparative practice illustrates these challenges in concrete terms. The controversies surrounding algorithmic risk assessment tools, such as Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) in the United States, highlight concerns about transparency, due process, and perceived algorithmic bias in

102 Directorate General for Communication, 'EU AI Act: First Regulation on Artificial Intelligence' (*European Parliament*, 19 February 2025) <<https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence>> accessed 3 April 2026.

103 Otavio Morato de Andrade and Marco Antônio Sousa Alves, 'Using Explainable AI to Reduce Opacity and Address Bias in Algorithmic Models' (2024) 13(1) *Revista Thesis Juris* 3, doi:10.5585/13.2024.26510.

104 Case no C-09-550982-HA ZA 18-388 (District Court of the Hague, 5 February 2020) ECLI:NL:RBDHA:2020:865 <<https://uitspraken.rechtspraak.nl/details?id=ECLI:NL:RBDHA:2020:1878>> accessed 3 April 2026.

105 Christoph Engel, Lorenz Linhardt and Marcel Schubert, 'Code Is Law: How COMPAS Affects the Way the Judiciary Handles the Risk of Recidivism' (2025) 33(2) *Artificial Intelligence and Law* 383, doi:10.1007/s10506-024-09389-8.

judicial contexts. In the EU, in contrast, regulatory developments emphasise a precautionary and rights-based model that prioritises human oversight, accountability, and compliance with fundamental rights in the deployment of AI systems within justice environments. Estonia offers a further example of a gradual and controlled approach, in which AI technologies are introduced incrementally under strict institutional supervision, with a clear emphasis on preserving human judicial authority.¹⁰⁶ Taken together, these challenges demonstrate that the integration of AI into constitutional courts is not merely a technical or administrative reform, but a matter of constitutional design and institutional legitimacy. The effective governance of AI in this context requires a carefully balanced framework that reconciles technological innovation with the preservation of judicial independence, procedural fairness, constitutional accountability, and the normative integrity of constitutional adjudication.¹⁰⁷

Accordingly, any sustainable model for integrating AI into constitutional courts must be based on three interdependent pillars. The first is the establishment of clear and coherent legal frameworks governing the use of AI in judicial contexts. The second is the development of transparent, explainable, and auditable AI systems that comply with constitutional and human rights standards. The third is the strengthening of institutional capacity through continuous judicial training and the development of technological literacy among judges. Equally important is preserving a clear conceptual distinction between AI as an assistive tool and human judges as the sole bearers of constitutional interpretative authority, thereby ensuring that technological innovation enhances rather than undermines the legitimacy of constitutional justice.

4 CONCLUSION

This study has examined the evolving role of artificial intelligence (AI) in constitutional courts through a comparative legal and analytical framework. The analysis demonstrates that AI is progressively reshaping judicial environments by improving legal research capacities, enhancing case management systems, and supporting the organisation and analysis of judicial precedents. However, despite these functional contributions, AI remains strictly confined to an assistive role, as constitutional adjudication continues to depend fundamentally on human interpretative authority grounded in constitutional principles, normative reasoning, and value-based judicial judgment.

The comparative examination of international legal and institutional experiences reveals the absence of a unified global model for integrating AI into judicial and constitutional

106 Muhammad Atif Khokhar, Attiya Anees and Muhammad Waqas Gujjar, 'From Judges to Algorithms: The Future of Corporate Adjudication in AI-Driven Courts' (2025) 3(2) *The Critical Review of Social Sciences Studies* 1794, doi:10.59075/3jvaxr72.

107 Francaviglia (n 97).

systems. Instead, three principal regulatory and institutional approaches can be identified. The EU adopts a rights-based regulatory model that prioritises transparency, human oversight, accountability, and the protection of fundamental rights. China represents a state-driven, efficiency-oriented model characterised by extensive deployment of “smart court” technologies and large-scale judicial digitalisation. The United States, in contrast, reflects a jurisprudence-driven, case-law-oriented approach in which regulatory control over algorithmic systems emerges primarily through judicial decisions and constitutional litigation rather than through centralised legislation. Within this comparative framework, several Arab jurisdictions, including the UAE, Saudi Arabia, Egypt, and Jordan, are still in a transitional phase in which judicial digital transformation is advancing primarily at the procedural and administrative levels, while the integration of AI into constitutional adjudication remains limited and institutionally undeveloped.

A central finding of this study is that the integration of AI into constitutional courts is constrained not only by technological limitations but also by fundamental constitutional and normative considerations. Algorithmic bias, opacity in decision-making processes, and accountability deficits raise serious concerns regarding the compatibility of AI systems with constitutional requirements such as equality before the law, due process, judicial independence, and the obligation to provide reasoned judicial decisions. These challenges underscore that constitutional adjudication involves forms of normative reasoning and constitutional balancing that cannot be replicated by, or delegated to, algorithmic systems.

From a policy and governance perspective, the study highlights that any sustainable integration of AI into constitutional justice requires a carefully structured and constitutionally grounded regulatory framework. Such a framework must include clear legal rules governing the use of AI in judicial contexts, enforceable ethical standards that ensure transparency, explainability, fairness, and non-discrimination, and mandatory human oversight in all AI-assisted judicial processes. In addition, institutional capacity-building, continuous judicial training, and the development of adequate digital infrastructure are essential prerequisites for the responsible and effective use of AI in judicial systems.

The study further emphasises that the functional scope of AI within constitutional courts must remain clearly limited to supportive and auxiliary tasks, particularly in legal research, precedent analysis, jurisprudential mapping, and procedural management. Any form of autonomous decision-making or algorithmic substitution of judicial reasoning is incompatible with the normative structure of constitutional adjudication and poses risks to judicial independence and the integrity of constitutional interpretation.

At the theoretical level, this research contributes to the broader discourse on the relationship between law, technology, and constitutional governance by conceptualising AI not as a replacement for judicial reasoning, but as an epistemic support system that modifies the informational and analytical environment of constitutional courts without

altering their normative core. This conceptual distinction is essential for preserving the balance between technological innovation and constitutional legitimacy.

In conclusion, the future of constitutional justice is likely to evolve towards an assisted-judgement model in which artificial intelligence serves as a supportive analytical infrastructure, while ultimate interpretative authority remains vested exclusively in human judges. The principal challenge is, therefore, not the adoption of AI as such, but the development of robust constitutional safeguards to ensure that technological innovation operates strictly within the boundaries of constitutional justice, the protection of fundamental rights, and the preservation of judicial independence.

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AUTHORS INFORMATION

Tareq Al-Billeh*

Ph.D (Law), United Arab Emirates University, Al Ain, United Arab Emirates

albilleh.tareq@gmail.com

PhD (Law), Applied Science Private University, Amman, Jordan

t_billeh@asu.edu.jo

<https://orcid.org/0000-0001-7171-6004>

Corresponding author, responsible for Conceptualisation; Data curation; Formal Analysis; Funding acquisition; Methodology; Project administration; Resources; Supervision; Writing – review & editing.

Tawfiq Khashashneh

Ph.D (Law), Applied Science Private University, Amman, Jordan

t_khashashneh@asu.edu.jo

<https://orcid.org/0009-0001-2104-3654>

Co-author, responsible for Conceptualisation; Data curation; Formal Analysis; Methodology; Resources; Software; Writing – original draft.

Noor Issa Alhendi

Ph.D (Law), United Arab Emirates University, Al Ain, United Arab Emirates

n_alhendi@uaeu.ac.ae

<https://orcid.org/0000-0003-4133-1888>

Co-author, responsible for Conceptualisation; Formal Analysis; Investigation; Resources; Validation; Visualisation; Writing – review & editing.

Mohammed Al-Shabatat

Ph.D (Law), Applied Science Private University, Amman, Jordan

m_alshabatat@asu.edu.jo

<https://orcid.org/0009-0007-5729-6681>

Co-author, responsible for Investigation; Funding acquisition; Resources; Validation; Visualisation; Writing – review & editing.

Georgette Al-Billeh

Ph.D (Business Administration), Business Administration, Luminos Technical University, Amman, Jordan

georgettebilleh21@gmail.com

<https://orcid.org/0009-0009-5121-730X>

Co-author, responsible for Conceptualisation; Data curation; Funding acquisition; Methodology; Resources; Validation; Visualisation; Writing – review & editing.

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АНОТАЦІЯ УКРАЇНСЬКОЮ МОВОЮ

Дослідницька стаття

РОЛЬ ШТУЧНОГО ІНТЕЛЕКТУ В КОНСТИТУЦІЙНОМУ СУДОЧИНСТВІ: ПОРІВНЯЛЬНИЙ ОГЛЯД ЗАГАЛЬНОЇ СУДОВОЇ ПРАКТИКИ

**Тарек Аль-Біллек*, Тауфік Хашашне, Нур Ісса Альхенді,
Мохаммед Аль-Шабатат та Жоржетт Аль-Білле**

АНОТАЦІЯ

Вступ. Усе більша інтеграція штучного інтелекту (ШІ) у судові системи є одним із найважливіших сучасних явищ у сфері здійснення правосуддя. Хоча технології ШІ дедалі частіше використовуються у таких сферах, як управління судовими справами, юридичні дослідження, аналіз документів та автоматизація процедур, їх застосування у сфері конституційного судочинства породжує особливі правові та інституційні виклики. Конституційні суди виконують унікальну функцію, що виходить за межі звичайного врегулювання спорів, оскільки вони відповідають за забезпечення верховенства права та дотримання норм Конституції, захист основних прав і свобод та підтримання балансу між гілками влади. Відповідно, інтеграція ШІ в конституційне правосуддя потребує ретельного аналізу її впливу на судову незалежність, тлумачення Конституції, процесуальну справедливість та легітимність конституційного контролю.

Методи. У дослідженні застосовано порівняльно-аналітичну методологію, що зосереджується на окремих юрисдикціях, які представляють різні моделі конституційного контролю та різні рівні цифровізації судової системи. Порівняльний метод обмежується юрисдикціями, які демонструють чітко визначені інституційні практики або регуляторні підходи щодо використання ШІ в судових системах. Дослідження охоплює досвід Європейського Союзу та окремих держав-членів, зокрема Естонії, як приклади правозахисної та цифрової розвиненої моделі управління, а також Сполучених Штатів як представника децентралізованої системи загального права. Крім того, аналізуються окремі арабські юрисдикції, зокрема Об'єднані Арабські Емірати, Саудівська Аравія, Йорданія та Єгипет, з метою оцінки нових регіональних підходів до цифрової трансформації судової системи. Вибір юрисдикцій ґрунтується на трьох критеріях: (1) наявність ініціатив щодо використання ШІ у судовій або регуляторній сфері, (2) різноманітність моделей конституційного контролю, (3) наявність законодавчих або інституційних меж цифровізації судової системи. В дослідженні також аналізуються конституційні принципи, судова практика, регуляторні інструменти та окремі судові рішення, пов'язані із застосуванням ШІ в судочинстві.

Результати та висновки. Дослідження показує, що технології ШІ дедалі частіше використовуються в конституційних і судових системах для підтримки адміністративних та аналітичних функцій, зокрема для обробки даних, категоризації справ, пошуку прецедентів, управління навантаженням судів та допомоги у підготовці юридичних документів. Водночас підтверджується, що ШІ залишається лише

допоміжним інструментом і не може замінити суддів від час тлумачення або ціннісно-орієнтованого суддівського розсуду. Конституційне судочинство за своєю природою ґрунтується на контекстуальному аналізі та забезпеченні балансу між конституційними принципами і захистом основних прав і свобод, що зумовлює необхідність людського суддівського розсуду. Результати свідчать, що обсяг і легітимність інтеграції ШІ здебільшого залежать від конституційних структур, регуляторних гарантій та інституційної спроможності кожної юрисдикції. Також було з'ясовано, що відповідальна інтеграція ШІ в конституційні суди потребує збалансованої регуляторної системи, здатної одночасно забезпечити ефективність правосуддя та технологічні інновації, а також створити умови для дотримання конституційних гарантій, судової незалежності, прозорості, належної правової процедури та довіри суспільства до конституційного правосуддя.

Ключові слова: штучний інтелект; конституційні суди; цифрове правосуддя; електронне судочинство; цифрова трансформація; технологічні інновації.

ABSTRACT IN ARABIC*

مقال بحثي

دور الذكاء الاصطناعي في القضاء الدستوري: رؤية مقارنة من الممارسة القضائية العامة

طارق البله*, وتوفيق الخشاشنة, ونور عيسى الهندي, ومحمد الشباطات, وجورجيت البله

الملخص:

الخلفية:

يمثل التزايد في إدماج الذكاء الاصطناعي (AI) داخل الأنظمة القضائية أحد أهم التطورات المعاصرة في إدارة العدالة. وعلى الرغم من أن تقنيات الذكاء الاصطناعي تُستخدم بشكل متزايد في مجالات

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مثل إدارة القضايا، والبحث القانوني، وتحليل الوثائق، وأتمتة الإجراءات، فإن استخدامها داخل القضاء الدستوري يثير إشكاليات قانونية ومؤسسية متميزة. إذ تضطلع المحاكم الدستورية بوظيفة خاصة تتجاوز مجرد تسوية النزاعات، كونها مسؤولة عن حماية سمو الدستور، وصون الحقوق والحريات الأساسية، والحفاظ على التوازن بين سلطات الدولة. وبناءً عليه، فإن إدماج الذكاء الاصطناعي في العدالة الدستورية يتطلب دراسة دقيقة لانعكاساته على الاستقلال القضائي، وتفسير الدستور، وضمانات المحاكمة العادلة، وشرعية الرقابة الدستورية.

المنهجية:

تعتمد هذه الدراسة منهجية تحليلية مقارنة تركز على عدد من النظم القضائية المختارة التي تمثل نماذج مختلفة للرقابة الدستورية ومستويات متفاوتة من التحول الرقمي القضائي. ويقتصر الإطار المقارن على الولايات القضائية التي تُظهر ممارسات مؤسسية أو تنظيمية واضحة تتعلق باستخدام الذكاء الاصطناعي في النظم القضائية. وتتناول الدراسة تجربة الاتحاد الأوروبي وبعض الدول الأعضاء، وخاصة إستونيا، بوصفها نماذج للحكومة الحقوقية المتقدمة رقمياً، إضافة إلى الولايات المتحدة كنموذج لنظام القانون العام اللامركزي. كما تشمل الدراسة بعض النظم العربية، بما في ذلك دولة الإمارات العربية المتحدة، والمملكة العربية السعودية، والأردن، ومصر، بهدف تحليل الاتجاهات الناشئة في التحول الرقمي القضائي على المستوى الإقليمي. وقد تم اختيار هذه النظم بناءً على ثلاثة معايير: (1) وجود مبادرات قضائية أو تنظيمية تتعلق بالذكاء الاصطناعي، (2) تنوع نماذج الرقابة الدستورية، (3) توفر أطر تشريعية أو مؤسسية مرتبطة بالتحول الرقمي القضائي. كما تقوم الدراسة بتحليل المبادئ الدستورية، والممارسات القضائية، والأدوات التنظيمية، وبعض القرارات القضائية ذات الصلة باستخدام الذكاء الاصطناعي في المجال القضائي.

النتائج والاستنتاجات:

تُظهر الدراسة أن تقنيات الذكاء الاصطناعي تُستخدم بشكل متزايد في البيئات الدستورية والقضائية لدعم الوظائف الإدارية والتحليلية، بما في ذلك معالجة البيانات القانونية، وتصنيف القضايا، واسترجاع السوابق القضائية، وإدارة عبء العمل، والمساعدة في صياغة المذكرات القانونية. ومع ذلك، يؤكد التحليل المقارن أن الذكاء الاصطناعي يظل محصوراً في دور مساعد، ولا يمكنه أن يحل محل القضاة الدستوريين في ممارسة التفسير الدستوري أو في إصدار الأحكام القائمة على القيم. إذ إن القضاء الدستوري يعتمد بطبيعته على التحليل السياقي، والموازنة بين المبادئ الدستورية، وحماية الحقوق والحريات الأساسية، وهي مهام تتطلب تقديراً قضائياً بشرياً. كما تشير النتائج إلى أن نطاق وشرعية إدماج الذكاء الاصطناعي يتأثران بشكل كبير بالبنية الدستورية، والضمانات التنظيمية، والقدرات

المؤسسية داخل كل نظام قضائي. وتخلص الدراسة إلى أن الإدماج المسؤول للذكاء الاصطناعي في المحاكم الدستورية يتطلب إطاراً تنظيمياً متوازناً يحقق التوازن بين تعزيز كفاءة القضاء وتشجيع الابتكار التكنولوجي، وبين حماية الضمانات الدستورية، واستقلال القضاء، والشفافية، وضمانات المحاكمة العادلة، وتعزيز ثقة الجمهور في العدالة الدستورية.

الكلمات المفتاحية:

الذكاء الاصطناعي، المحاكم الدستورية، العدالة الرقمية، القضاء الإلكتروني، التحول الرقمي، الابتكار التكنولوجي