
RESEARCH ARTICLE

AI in Jordanian Arbitration: Legal Limits and Ethical Safeguards

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ABSTRACT

Artificial intelligence is increasingly used to support legal work and dispute resolution. This doctrinal study evaluates how Jordanian arbitration law can accommodate AI-assisted tools, and where legal and ethical limits must apply to preserve due process, impartiality, and confidentiality. The analysis examines the Jordanian Arbitration Law No. 31 of 2001 (as amended in 2018), the Electronic Transactions Law No. 15 of 2015, and relevant international frameworks, including the UNCITRAL Model Law and the 1958 New York Convention. The study finds that while existing rules can generally accommodate administrative and decision-support uses of AI, Jordanian legislation does not expressly regulate algorithmic decision-making in arbitration, creating gaps around transparency, disclosure, bias management, data governance, and accountability. The article proposes targeted legislative amendments and institutional guidelines to ensure human oversight and procedural safeguards while enabling responsible innovation in arbitration practice in Jordan and the wider Arab region.

KEYWORDS

Artificial intelligence, Arbitration, Jordan, Due process, Confidentiality, Ethics

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1. Introduction

The twenty-first century has witnessed an unprecedented acceleration in the development and deployment of artificial intelligence technologies across virtually every sphere of human activity (Thomson Reuters, 2024). From healthcare diagnostics to financial forecasting, from autonomous vehicles to natural language processing, AI systems have demonstrated remarkable capabilities that were once consigned to the realm of science fiction (Bloomberg Law, 2024). The legal profession, traditionally characterized by its adherence to precedent and methodical deliberation, has not remained immune to this technological revolution (Chambers, 2024). Indeed, the integration of AI into legal practice represents one of the most significant transformations in the administration of justice since the advent of computerized legal research databases (LexisNexis, 2024). Within this broader context of legal technological transformation, arbitral form of alternative dispute resolution that has gained substantial prominence in international commercial relations—stands at a critical juncture where technological possibility meets procedural necessity and constitutional principle (Born, 2021).

Arbitration has historically been favored by commercial parties for its flexibility, confidentiality, efficiency, and the ability to select arbitrators with specialized expertise (Redfern et al., 2015). The procedural informality that characterizes arbitration, compared to court litigation, has positioned it as a natural candidate for technological innovation (Wolters Kluwer, 2024). However, the introduction of AI into arbitral proceedings raises profound questions that extend beyond mere efficiency considerations (Harvard Law School, 2025). These questions touch upon the fundamental nature of adjudication, the meaning of impartiality when algorithms are involved in decision-making processes, the protection of confidential information in an era of data-driven intelligence, and the preservation of due process guarantees that form the bedrock of legitimate dispute resolution (Global Arbitration Review, 2025). The intersection of these technological capabilities with established legal principles creates a complex

landscape that requires careful doctrinal analysis, particularly in jurisdictions where the regulatory framework has not yet adapted to address these novel challenges (Al-Abbadi, 2020).

Jordan presents a particularly interesting case study for examining these issues. As a signatory to the New York Convention since 1979 and having enacted modern arbitration legislation based substantially on the UNCITRAL Model Law, Jordan has positioned itself as an arbitration-friendly jurisdiction in the Middle East region (Aceris Law, 2024; JIAC, 2024). The Jordanian Arbitration Law No. 31 of 2001, as amended by Law No. 41 of 2018, provides a comprehensive framework for both domestic and international arbitration proceedings (Tamimi & Company, 2020). Furthermore, Jordan has demonstrated forward-looking legislative intent in the digital sphere through the enactment of the Electronic Transactions Law No. 15 of 2015, which establishes legal recognition for electronic signatures and records (Eversheds Sutherland, 2020). However, neither of these legislative instruments explicitly addresses the integration of artificial intelligence into dispute resolution processes, creating a regulatory lacuna that this article seeks to illuminate and address (Al-Hamouri & Tarawneh, 2023).

This research article adopts a doctrinal legal methodology, analyzing primary legislative sources, international conventions, and secondary scholarly literature to evaluate the legal boundaries and ethical implications of AI integration in arbitration under Jordanian law (Karim, 2024). The study does not purport to present empirical data regarding the current state of AI adoption in Jordanian arbitration—a topic that would require field research beyond the scope of this doctrinal analysis (ResearchGate, 2024). Rather, this article conducts a prospective legal evaluation, examining how existing legal frameworks might accommodate or constrain the use of AI technologies in arbitral proceedings and identifying areas where legislative reform may be warranted (European Journal of Law and Technology, 2024). The analysis is organized systematically, beginning with an examination of AI concepts in legal proceedings, proceeding through the existing legal framework for arbitration in Jordan, analyzing potential areas of AI integration, evaluating legal boundaries and ethical challenges, and concluding with recommendations for regulatory development.

2. Literature Review

2.1 Artificial Intelligence in Legal Practice

The application of artificial intelligence in legal practice has attracted substantial scholarly attention in recent years, reflecting both the rapid technological developments and their implications for the legal profession (Thomson Reuters, 2024). AI technologies, including machine learning, natural language processing, and predictive analytics, have been increasingly deployed across various legal functions, from document review and legal research to contract analysis and case outcome prediction (Bloomberg Law, 2024; Hausfeld, 2024). The literature suggests that these technologies offer significant potential for enhancing efficiency, reducing costs, and improving the quality of legal services, while simultaneously raising important questions regarding accuracy, bias, and the appropriate role of human judgment in legal decision-making (Harvard Law School, 2025; EU Policy Lab, 2024).

The phenomenon of algorithmic bias has emerged as a central concern in the literature on AI in legal contexts. Research by the UK Information Commissioner's Office (ICO, 2024) and academic studies (PMC/NIH, 2022; ScienceDirect, 2023) have demonstrated that AI systems can perpetuate or amplify existing biases present in their training data, potentially producing discriminatory outcomes in legal decision-making. The European Commission's Policy Lab (2024) has examined the role of human oversight in mitigating such biases, while the IACA Journal (2025) has explored various regulatory approaches to addressing bias in AI-supported decision-making. These concerns are particularly acute in adjudicative contexts where fairness and equal treatment are fundamental requirements (Tilburg University, 2025).

2.2 Technology in Arbitration

The integration of technology into arbitration proceedings has been the subject of increasing scholarly attention, particularly following the COVID-19 pandemic which accelerated the adoption of virtual hearing technologies (Wolters Kluwer, 2024). The literature documents the evolution from traditional paper-based arbitration to electronic arbitration and, more recently, to the potential incorporation of AI tools in various aspects of the arbitral process (UNCTAD, 2024; Russian Law Journal, 2024). Online Dispute Resolution (ODR) platforms have emerged as a significant area of development, with some platforms incorporating AI elements to facilitate negotiation, mediation, and even binding decision-making in certain categories of disputes (ODR Info, 2024; JLSA Journal, 2024).

The Silicon Valley Arbitration and Mediation Center (SVAMC) published its Guidelines on the Use of Artificial Intelligence in Arbitration in 2024, representing a significant contribution to the development of practical standards for AI deployment in arbitral contexts. Similarly, the Chartered Institute of Arbitrators (CIArb) released its Guideline on the Use of AI in Arbitration in 2025, addressing key issues including confidentiality, disclosure, and quality control. These institutional developments reflect growing recognition within the arbitration community that AI technologies require specific governance frameworks to ensure their responsible use (Arbitration Law, 2024; The Arbitrators, 2024).

2.3 Arbitration in Jordan and the Arab Region

The scholarly literature on arbitration in Jordan has examined the development of the Kingdom's arbitration framework since the enactment of Law No. 31 of 2001. Al-Abbadi (2020) has analyzed the development of arbitration in Jordan, tracing its legal framework and practice within the broader context of Arab dispute resolution mechanisms. Comparative studies have examined Jordan's approach alongside other Middle Eastern jurisdictions, including Saudi Arabia and the United Arab Emirates, identifying both common features and distinctive characteristics of each jurisdiction's arbitration framework (ResearchGate, 2024; SCNCHub, 2024). The literature suggests that Jordan has sought to balance adherence to international arbitration standards with sensitivity to local legal traditions and commercial practices (Legal 500, 2024).

The 2018 amendments to the Jordanian Arbitration Law have been analyzed by practitioners and scholars (Tamimi & Company, 2020), who have noted the introduction of provisions relating to arbitrator appointment, tribunal composition, and procedural matters. The enforcement of arbitral awards in Jordan has been examined in comparative perspective, with studies noting the bifurcated approach to domestic and international award enforcement (Wiley Online, 2024). However, the intersection of Jordanian arbitration law with emerging technologies, including AI, remains substantially unexplored in the existing literature, representing a gap that this article seeks to address.

3. Methodology

This study adopts a doctrinal legal research design. It analyses primary legal sources—notably the Jordanian Arbitration Law No. 31 of 2001 (as amended by Law No. 41 of 2018), the Electronic Transactions Law No. 15 of 2015, and Jordan's treaty obligations under the New York Convention—together with relevant institutional rules and comparative guidance from international instruments such as the UNCITRAL Model Law. Secondary sources (leading treatises, peer-reviewed scholarship, and institutional guidance) are used to interpret how core arbitral principles (party autonomy, due process, impartiality, and confidentiality) should constrain AI-enabled tools. The analysis is prospective: given limited published evidence on AI deployment in Jordan-seated arbitrations, the paper evaluates foreseeable use-cases and tests them against existing legal standards to identify regulatory gaps and reform options.

4. Results/Findings

The doctrinal analysis yields four core findings. First, Jordanian law can accommodate AI-assisted tools when they function as administrative or decision-support mechanisms, but it does not expressly address delegation of adjudicative judgment to automated systems. Second, due process protections—especially notice, equality of arms, and opportunity to be heard—create legal limits on opaque AI outputs and require transparency and challengeability. Third, confidentiality obligations in arbitration create heightened data-governance duties when AI systems process evidentiary materials, particularly where third-party vendors or cross-border data transfers are involved. Fourth, current legislation and institutional rules lack explicit standards on disclosure, bias auditing, human oversight, and accountability, necessitating targeted legislative and institutional guidance.

5. Concept of Artificial Intelligence in Legal Proceedings

5.1 Definitional Framework

Artificial intelligence, as a field of computer science, encompasses systems designed to perform tasks that traditionally require human cognitive capabilities (Thomson Reuters, 2024). These capabilities include learning from experience, reasoning under uncertainty, understanding natural language, perceiving visual information, and making decisions based on complex data patterns (Bloomberg Law, 2024). In the legal context, AI applications range from relatively simple automation tools that assist with document management and scheduling to sophisticated machine learning systems capable of analyzing legal precedents, predicting case outcomes, and even drafting legal documents (LexisNexis, 2024; Spellbook, 2024). The distinction between narrow AI—systems designed for specific tasks—and general AI—systems with broad cognitive capabilities—remains crucial for understanding the current state of technology and its immediate legal implications (Colorado Technology Law Journal, 2024). Contemporary legal AI applications are universally narrow AI, excelling at specific tasks but lacking the holistic reasoning capabilities that characterize human legal judgment.

Machine learning represents the dominant paradigm in contemporary AI development, enabling systems to improve their performance through exposure to data rather than through explicit programming for every scenario (Chambers, 2024). Supervised learning, unsupervised learning, and reinforcement learning constitute the three primary approaches within this paradigm. In legal applications, supervised learning has proven particularly useful for classification tasks such as document review and contract analysis, where systems learn from labeled examples to categorize new documents (Hausfeld, 2024; Rev.com, 2024). Natural language processing, a subfield of AI focused on the interaction between computers and human language, has enabled significant advances in legal research, contract interpretation, and the automated analysis of judicial decisions. These technologies collectively

provide the foundation for AI applications in arbitration, from the relatively uncontroversial use of AI for document management to the more contentious deployment of AI in supporting or potentially replacing aspects of arbitral decision-making.

5.2 AI Applications in Dispute Resolution

The application of artificial intelligence in dispute resolution contexts has evolved considerably over the past decade, moving from theoretical speculation to practical implementation across multiple jurisdictions and institutional settings (Wolters Kluwer, 2024). At the foundational level, AI technologies are currently deployed for case management and administrative functions, including automated scheduling, document organization, and communication management (Global Arbitration Review, 2024). These applications, while valuable for efficiency, do not raise the same level of legal and ethical concerns as those involving AI participation in substantive decision-making processes. More sophisticated applications involve AI-assisted legal research, where systems analyze vast databases of legal materials to identify relevant authorities, extract legal principles, and even predict likely outcomes based on patterns in judicial or arbitral decisions (Thomson Reuters, 2024). Online Dispute Resolution platforms have increasingly incorporated AI elements to facilitate negotiation, mediate disputes, and in some cases render binding decisions in low-value consumer disputes (ODR Info, 2024; ACR Journal, 2024).

In the arbitration context specifically, AI applications may be categorized along a spectrum from supportive tools to decision-making aids to potential decision-making systems (Saudi Center for Commercial Arbitration, 2024). Supportive applications include document review and analysis tools that assist counsel in identifying relevant evidence, timeline construction tools that help organize factual narratives, and translation services that facilitate multilingual proceedings (Spellbook, 2024). Decision-aid applications may include predictive analytics that assess the strengths and weaknesses of particular arguments, settlement valuation tools that estimate likely outcomes to facilitate negotiation, and research assistants that help identify applicable legal principles (Chambers, 2024). The most controversial category involves AI systems that might participate directly in arbitral decision-making, whether through generating draft awards for arbitrator review, providing algorithmic assessments of evidentiary weight, or potentially serving as the primary decision-maker in certain categories of disputes (Harvard Law School, 2025). Each of these categories raises distinct legal and ethical questions that require careful analysis within the framework of existing arbitration law and practice.

6. Legal Framework of Arbitration in Jordan

6.1 The Jordanian Arbitration Law No. 31 of 2001

The cornerstone of Jordan's arbitration framework is the Jordanian Arbitration Law No. 31 of 2001, which entered into force following its publication in the Official Gazette (WIPO, 2024; Lexis Middle East, 2024). This legislation, substantially derived from the Egyptian Arbitration Law which itself was modeled on the UNCITRAL Model Law, represented a significant modernization of Jordan's approach to alternative dispute resolution (Al-Abbadi, 2020). The law applies to both domestic arbitration conducted within Jordan and international arbitration where the place of arbitration is situated in Jordanian territory (Global Arbitration Review, 2024). Article 4 of the law establishes its temporal scope, providing that its provisions apply to every arbitration existing at the time of its entry into force or commencing thereafter, even if the arbitration agreement predates the legislation (New York Convention Organization, 2024). This provision ensures comprehensive coverage and demonstrates the legislature's intent to establish a uniform procedural framework for arbitral proceedings.

The Arbitration Law establishes fundamental principles regarding the composition and conduct of arbitral tribunals (Aceris Law LLC, 2024). Article 10 provides that the arbitral tribunal shall be composed of one or more arbitrators, with the requirement that the number of arbitrators must be odd to ensure decision-making capability (Tamimi & Company, 2020). In the absence of party agreement on the number of arbitrators, the default provision establishes a three-member tribunal. The law addresses the qualifications and appointment of arbitrators, emphasizing the requirement for impartiality and independence (IBA, 2024). Article 15 specifically mandates that an arbitrator must disclose any circumstances that might give rise to justifiable doubts regarding their impartiality or independence, a provision that takes on added significance when considering the potential involvement of AI systems that may have been trained on data from one of the disputing parties (Jus Mundi, 2025). The amendment introduced by Law No. 41 of 2018 refined several procedural aspects, including provisions relating to the designation of presiding tribunal members and mechanisms for challenging arbitrators (Tamimi & Company, 2020).

6.2 Procedural Framework and Party Autonomy

The Jordanian Arbitration Law places significant emphasis on party autonomy as a governing principle of arbitral proceedings (JIAC, 2024). Article 23 provides that the parties may agree on the procedures to be followed by the arbitral tribunal, subject to mandatory provisions of law and public policy (Born, 2021). In the absence of party agreement, the tribunal is empowered to conduct the arbitration in such manner as it considers appropriate, including determining the admissibility, relevance, materiality, and weight of evidence. This broad procedural discretion, while essential for the flexibility that characterizes arbitration, creates an ambiguous legal environment for the introduction of AI technologies (Al-Hamouri & Tarawneh, 2023). Neither the law nor its

accompanying regulations address whether parties may agree to utilize AI-assisted procedures, whether tribunals may unilaterally implement such technologies, or what standards should govern the use of algorithmic tools in evidence evaluation or decision-making processes.

The law's provisions regarding the form and content of arbitral awards merit particular attention in the context of AI integration (Via Mediation Centre, 2024). Article 39 requires that awards be made in writing, signed by the arbitrators, and contain reasoning upon which the decision is based—unless the parties have agreed otherwise or the award is rendered on agreed terms (Redfern et al., 2015). The requirement for reasoning serves essential functions in arbitration: it demonstrates that the tribunal has addressed the parties' submissions and evidence, it provides a basis for any challenge to the award, and it facilitates enforcement proceedings (Van den Berg, 2022). The question arises whether AI-generated reasoning would satisfy this requirement, particularly where the reasoning reflects algorithmic patterns that may be opaque or incomprehensible to the parties (ScienceDirect, 2023). The signature requirement similarly raises questions when AI systems participate in drafting awards, as the traditional understanding of signature implies personal attestation to the contents of the signed document (Eversheds Sutherland, 2020).

6.3 *The Electronic Transactions Law No. 15 of 2015*

Jordan's Electronic Transactions Law No. 15 of 2015 establishes a comprehensive framework for electronic commerce and digital documentation, providing legal recognition for electronic signatures, records, and contracts (Eversheds Sutherland, 2020). The law defines electronic signatures as "data in the form of letters, numbers, symbols, or signs that are attached to or logically associated with an electronic record, executed or adopted by a person with the intent to sign the record" (Cyrilla, 2024). This definition, while sufficient for traditional electronic signatures based on cryptographic methods, does not specifically address the scenario where AI systems might execute or adopt signatures on behalf of their operators. The law's framework for electronic transactions provides a foundation for digitalization in commercial contexts but was not designed with the specificities of arbitral proceedings in mind, creating interpretive challenges when applying its provisions to AI-assisted arbitration (Al-Hamouri & Tarawneh, 2023).

The Electronic Transactions Law establishes the legal equivalence between electronic and paper documents, providing that information shall not be denied legal effect or enforceability solely on the grounds that it is in electronic form (J Human Security, 2024). This principle of technological neutrality could potentially be extended to support the use of AI in legal proceedings, including arbitration. However, the law also establishes requirements for the integrity and reliability of electronic records, including provisions regarding secure electronic signatures and certification services (Esign Global, 2024). These requirements, while appropriate for traditional electronic transactions, do not provide guidance for evaluating the integrity and reliability of AI-generated outputs in arbitral contexts (OJS TRP, 2025). The absence of specific provisions addressing algorithmic decision-making or AI-generated documentation represents a significant regulatory gap that this article identifies for legislative attention (Inderscience, 2025).

6.4 International Framework and Jordan's Treaty Obligations

Jordan's arbitration framework operates within a broader international context shaped by key treaties and model laws that the Kingdom has adopted or is bound by through ratification (New York Convention Organization, 2024). The Convention on the Recognition and Enforcement of Foreign Arbitral Awards, commonly known as the New York Convention of 1958, represents the most significant international instrument in this field (UNCITRAL, 2024). Jordan acceded to the New York Convention, which obligates contracting states to recognize and enforce arbitral awards made in other contracting states, subject to limited grounds for refusal enumerated in Article V (New York Convention 1958, 2024). These grounds include public policy concerns, procedural irregularities, and violations of due process—categories that become particularly salient when considering AI participation in arbitral proceedings (Global Arbitration Review, 2025; ASCE Library, 2026). The Convention's emphasis on procedural fairness and party rights raises questions about whether awards influenced by opaque algorithmic processes might face enforcement challenges (Jus Mundi, 2025).

The UNCITRAL Model Law on International Commercial Arbitration, while not a treaty requiring ratification, has significantly influenced Jordan's domestic arbitration legislation (UNCITRAL, 1985/2006). The Model Law provides a comprehensive template for national legislation addressing all aspects of the arbitral process, from arbitration agreements through the conduct of proceedings to the recognition and enforcement of awards. UNCITRAL has recently extended its work to address technological developments in dispute resolution, including the Technical Notes on Online Dispute Resolution and the Model Law on Automated Contracting adopted in 2024 (UNCITRAL, 2024; Wolters Kluwer Arbitration Blog, 2024). The latter instrument, which establishes a framework for legally recognizing the use of automation and AI in contract formation, may serve as a model for similar developments in the arbitration sphere (UNCITRAL, 2024). These international developments provide important context for evaluating Jordan's domestic framework and identifying potential pathways for legislative modernization.

7. Potential Areas of AI Integration in Arbitration

7.1 Document Management and Review

The most immediate and practically feasible application of artificial intelligence in arbitration proceedings involves document management and review functions (Thomson Reuters, 2024; Hausfeld, 2024). Complex commercial arbitrations frequently involve voluminous documentary evidence, with thousands or even millions of pages of contracts, correspondence, financial records, and technical documentation requiring organization, review, and analysis (Bloomberg Law, 2024). AI-powered document review systems can significantly accelerate this process by automatically categorizing documents, identifying relevant passages, detecting duplicates and near-duplicates, and extracting key information such as dates, parties, and monetary amounts (Spellbook, 2024). These applications operate primarily as tools to assist counsel and tribunals rather than as autonomous decision-makers, and thus raise fewer fundamental legal concerns than more invasive AI integrations (Law Gazette Singapore, 2024).

The legal framework governing document production in arbitration under Jordanian law appears sufficiently flexible to accommodate AI-assisted document review (JIAC, 2024). Article 25 of the Arbitration Law permits parties to request the production of documents in the possession or control of the other party, subject to tribunal discretion. The tribunal's authority to determine the relevance and materiality of evidence under Article 23 implicitly extends to the methods by which documentary evidence is reviewed and analyzed. However, the use of AI in document review raises practical considerations regarding confidentiality and data protection, as AI systems typically require access to documentary materials to perform their analytical functions (SVAMC, 2024; CI Arb, 2025). Where the AI system is operated by a third-party service provider, appropriate safeguards must be implemented to protect the confidentiality obligations that are fundamental to arbitration proceedings (Oxford Academic, 2024; Daily Jus, 2025).

7.2 Legal Research and Analysis

Artificial intelligence systems have demonstrated significant capabilities in the domain of legal research and analysis, offering the ability to rapidly search, analyze, and synthesize legal authorities across multiple jurisdictions (Thomson Reuters, 2024; LexisNexis, 2024). AI-powered legal research tools can identify relevant precedents, extract legal principles from judicial and arbitral decisions, compare factual patterns across cases, and even predict likely outcomes based on historical patterns (Chambers, 2024). These capabilities could enhance the efficiency and thoroughness of legal research in arbitration proceedings, potentially improving the quality of advocacy and tribunal decision-making. In the context of international arbitration, where multiple legal systems and regulatory frameworks may be relevant to a single dispute, AI systems could assist in navigating complex conflicts of law issues and identifying applicable principles (Born, 2021).

The integration of AI-powered legal research into arbitration proceedings under Jordanian law would likely be permissible under existing provisions, as legal research is typically conducted by counsel rather than by tribunals, and parties retain broad discretion in the selection and use of professional resources (Bloomberg Law, 2024). However, tribunals themselves might also benefit from AI research assistance, raising questions about whether such assistance should be disclosed to the parties and whether parties should have an opportunity to address AI-generated research findings (Chartered Institute of Arbitrators, 2025). The potential for AI systems to produce biased or erroneous research outputs—reflecting limitations or biases in their training data—necessitates careful human oversight and verification (ICO, 2024; IACA Journal, 2025). The legal principle that tribunals must base their decisions on evidence and arguments presented by the parties, rather than on independent research not subject to party challenge, may require adaptation to address AI-assisted tribunal research.

7.3 Predictive Analytics and Settlement Facilitation

One of the most promising applications of artificial intelligence in arbitration involves predictive analytics that estimate the likely outcome of disputes based on analysis of historical patterns in arbitral decisions (Chambers, 2024; Rev.com, 2024). Such tools could provide valuable information to parties considering settlement offers, potentially facilitating negotiated resolutions and avoiding the costs and delays of full arbitral proceedings. Settlement facilitation represents a particularly appropriate domain for AI application, as it does not directly involve AI in the adjudicative process but rather assists parties in making informed decisions about dispute resolution strategies. The use of predictive analytics by parties themselves, rather than by tribunals, avoids many of the due process concerns associated with AI participation in decision-making while still capturing efficiency benefits.

However, the use of predictive analytics raises important questions regarding data sources and algorithmic transparency (ScienceDirect, 2023; PMC/NIH, 2022). Effective predictive systems require access to substantial bodies of arbitral decisions, but arbitration confidentiality means that many awards remain unpublished or only selectively available (Oxford Academic, 2024). The databases on which AI systems are trained may not be representative of arbitration outcomes generally, potentially introducing systematic biases into predictions (UNECE, 2025). Furthermore, the opacity of machine learning algorithms—often described as the "black box" problem—means that parties may not fully understand how predictions are generated or be able to assess their reliability (EU Policy Lab, 2024). These concerns suggest that while predictive analytics may offer valuable tools for parties and counsel, they should be used with appropriate caution and should not be considered determinative of actual dispute outcomes.

7.4 AI-Assisted Drafting and Decision Support

A more controversial but increasingly feasible application involves the use of AI systems to draft arbitral awards or provide decision support to arbitrators (Harvard Law School, 2025). Natural language generation technologies have advanced to the point where AI systems can produce coherent legal documents based on structured inputs regarding facts, legal principles, and desired outcomes (LexisNexis, 2024). In the arbitration context, such systems could potentially generate draft awards for arbitrator review, including summaries of parties' positions, analysis of evidence, application of legal principles, and formulation of dispositive orders. Decision support systems could also assist arbitrators in complex calculations, such as the computation of damages, interest, and cost allocations, reducing the risk of mathematical errors and ensuring consistency in the treatment of similar matters.

The legal permissibility of AI-assisted award drafting under Jordanian law presents complex questions (Al-Hamouri & Tarawneh, 2023). The requirement in Article 39 that awards be signed by arbitrators implies human responsibility for award contents, suggesting that AI-generated drafts could be used provided they are reviewed, modified as necessary, and ultimately adopted by human arbitrators. However, the requirement for reasoned awards raises questions about whether reasoning generated by AI satisfies the legal requirement, particularly if the reasoning reflects algorithmic patterns rather than genuine deliberative engagement with the parties' submissions (Via Mediation Centre, 2024). Furthermore, the transparency and disclosure obligations that govern arbitrator conduct may require disclosure of AI assistance in award preparation, particularly if the AI system has access to confidential information or has been trained on materials that might raise impartiality concerns (Saudi Center for Commercial Arbitration, 2024).

8. Legal Boundaries under Jordanian Law

8.1 Compatibility with Due Process Principles

The principle of due process constitutes a fundamental requirement for legitimate arbitral proceedings, encompassing the right to be heard, the right to equal treatment, and the right to an impartial tribunal (Global Arbitration Review, 2025; Jus Mundi, 2024). These principles are reflected in Article 18 of the UNCITRAL Model Law and have been incorporated into Jordanian arbitration practice through both legislative provisions and judicial interpretation (UNCITRAL, 1985/2006). Article 31 of the Jordanian Arbitration Law provides that arbitral awards may be set aside if the party making the application was not given proper notice of the appointment of an arbitrator or of the arbitral proceedings, or was otherwise unable to present its case (Lexis Middle East, 2024). This due process guarantee creates potential boundaries for AI integration, particularly where AI systems might make or influence decisions without parties having a meaningful opportunity to understand and respond to the basis of those decisions (Field Fisher, 2024).

The compatibility of AI-assisted arbitration with due process requirements depends significantly on the nature and extent of AI involvement (Aceris Law LLC, 2025). Where AI systems function purely as tools to assist counsel in preparing submissions or assist tribunals in organizing information, due process concerns are relatively minimal. However, when AI systems participate in evaluative or decision-making functions, due process questions become more acute (Tilburg University, 2025). The principle that parties should have an opportunity to address any matter material to their case implies that parties should be informed of, and able to comment on, any AI-generated analysis that influences tribunal decisions. The opacity of many AI systems—where the reasoning process is not transparent or comprehensible—potentially conflicts with due process requirements that decisions be based on reasoning that can be understood and challenged (ScienceDirect, 2023). These concerns are particularly relevant in the context of enforcement under the New York Convention, where Article V(1)(b) permits refusal of enforcement where a party was unable to present its case (New York Convention 1958, 2024).

8.2 Impartiality and Independence Requirements

The requirements of arbitrator impartiality and independence, enshrined in Article 15 of the Jordanian Arbitration Law, present complex challenges when AI systems participate in arbitral proceedings (Tamimi & Company, 2020; WIPO, 2024). The traditional understanding of impartiality focuses on the absence of bias or prejudgment on the part of human adjudicators, while independence addresses relationships between arbitrators and parties that might compromise objective judgment (IBA, 2024; SCC Arbitration Institute, 2024). These concepts were developed with human adjudicators in mind and require adaptation to address algorithmic participation. AI systems do not have personal interests, relationships, or emotions in the human sense, but they may embody biases embedded in their training data or algorithmic design that produce systematically skewed outcomes (PMC/NIH, 2022; Harvard Law School, 2025). The question of what constitutes "impartiality" for an AI system remains largely unexplored in legal scholarship and unaddressed in legislative frameworks.

Where AI systems are used to support or advise arbitrators rather than to make decisions autonomously, the impartiality analysis remains focused on the human arbitrators who must exercise independent judgment in evaluating AI inputs (Columbia University ARIA, 2026). However, arbitrators may face challenges in detecting and correcting AI biases, particularly when AI outputs appear authoritative or are presented without transparency regarding their methodological basis (IACA Journal, 2025). The disclosure

obligations that apply to arbitrators regarding circumstances that might give rise to justifiable doubts about impartiality could potentially extend to disclosure of AI assistance, particularly where the AI system has been trained on data that might favor certain parties, legal positions, or outcome categories (CPR Dispute Resolution Services, 2024). The development of standards for AI impartiality in arbitral contexts represents an important area for future regulatory attention, potentially drawing on emerging frameworks such as the EU AI Act's approach to high-risk AI applications in judicial contexts (European Parliament, 2024; Artificial Intelligence Act EU, 2024).

8.3 Confidentiality Obligations

Confidentiality represents one of the principal attractions of arbitration for commercial parties, and the protection of confidential information is generally understood as an implicit obligation in arbitral proceedings (Oxford Academic, 2024). While the Jordanian Arbitration Law does not explicitly codify confidentiality requirements, confidentiality is typically established through party agreement, institutional rules, or implicit understandings arising from the private nature of arbitration (Born, 2021). The introduction of AI systems into arbitration proceedings raises significant confidentiality concerns, as AI systems typically require access to data to function effectively and may retain, process, or transmit information in ways that parties did not contemplate when agreeing to arbitration (SVAMC, 2024; Springer, 2025). Third-party AI service providers may have access to confidential information, and AI systems may use such information for purposes beyond the immediate arbitration, such as training algorithms for future applications (Economic Times, 2024).

The Electronic Transactions Law No. 15 of 2015 includes provisions regarding data protection and electronic record security, but these provisions do not specifically address the confidentiality requirements of arbitral proceedings (Eversheds Sutherland, 2020; ICO, 2024). The law's framework for electronic signatures and records does not contemplate the scenario where AI systems access, process, or retain confidential information for algorithmic purposes. Parties and tribunals utilizing AI tools must therefore develop contractual or procedural safeguards to protect confidentiality, including provisions regarding data retention, use limitations, and security measures (The Arbitrators, 2024; Arbitration Law, 2024). The potential for AI systems to inadvertently disclose confidential information through outputs that reflect training data, or to compromise confidentiality through security vulnerabilities, necessitates careful risk assessment and mitigation when deploying AI in arbitration contexts (Daily Jus, 2025). The development of industry standards for AI confidentiality in legal proceedings would provide valuable guidance for practitioners and tribunals navigating these challenges.

9. Ethical Challenges in AI-Assisted Arbitration

9.1 Algorithmic Bias and Fairness

Algorithmic bias represents one of the most significant ethical challenges in the deployment of artificial intelligence in legal decision-making contexts (Harvard Law School, 2025; EU Policy Lab, 2024). AI systems learn from historical data, and where that historical data reflects past discrimination, unequal treatment, or systematic biases, the resulting AI models may perpetuate or even amplify those biases (PMC/NIH, 2022; ICO, 2024). In the arbitration context, AI systems trained on historical arbitral decisions might learn patterns that reflect biases in arbitrator selection, procedural practices, or substantive outcomes (Tilburg University, 2025). For example, if historical arbitration awards systematically favored certain categories of parties, arguments, or outcome types, AI systems trained on that data might reproduce those patterns in their outputs. The challenge of algorithmic bias is particularly acute because AI systems often operate as "black boxes" whose reasoning processes are not transparent, making it difficult to detect when biased outputs are being produced (ScienceDirect, 2023).

The ethical principle of fairness in adjudication requires that similarly situated parties receive similar treatment and that outcomes be determined by relevant considerations rather than arbitrary or discriminatory factors (IACA Journal, 2025). The European Union's AI Act, which entered into force in August 2024, classifies AI systems used in the administration of justice as "high-risk" applications subject to enhanced requirements including fundamental rights impact assessments, data governance requirements, and human oversight obligations (European Parliament, 2024; Artificial Intelligence Act EU, 2024). While Jordan is not bound by the EU AI Act, this regulatory framework provides valuable guidance for evaluating the ethical dimensions of AI in arbitration (Nemko Digital, 2024; Deloitte, 2024). The principle that AI systems should be designed and deployed in ways that promote fairness and avoid discrimination requires attention to training data selection, algorithm design, output monitoring, and ongoing evaluation (UNECE, 2025). Arbitration institutions and practitioners contemplating AI deployment should develop protocols for bias detection and mitigation, including regular auditing of AI outputs for patterns that might indicate discriminatory effects.

9.2 Transparency and Explainability

The principle of transparency in adjudication serves multiple functions: it enables parties to understand and challenge decisions, it promotes accountability of decision-makers, and it facilitates the development of legal principles through published reasoning (Born, 2021). Traditional arbitral awards, while confidential between the parties, typically provide reasoned explanations that the parties can understand and evaluate (Redfern et al., 2015). AI systems, particularly those based on deep learning architectures,

often produce outputs through processes that are opaque even to their designers—a phenomenon often described as the "explainability problem" (ScienceDirect, 2023). When AI systems participate in generating or influencing arbitral decisions, the reasoning provided to parties may reflect algorithmic patterns that cannot be meaningfully explained in terms of legal principles, evidentiary assessment, or logical reasoning. This opacity potentially undermines the transparency values that legitimate adjudication requires.

The requirement for reasoned awards under Article 39 of the Jordanian Arbitration Law implies that parties should receive explanations they can understand (Via Mediation Centre, 2024). Where AI systems generate or contribute to award reasoning, questions arise regarding whether algorithmic outputs satisfy this requirement. The development of "explainable AI" techniques that provide interpretable explanations for AI decisions represents an important technical response to this challenge, but current explainability methods remain imperfect and may not provide the level of transparency that legal proceedings require (EU Policy Lab, 2024). A prudent approach would require human arbitrators to review, verify, and ultimately adopt AI-generated reasoning, ensuring that the reasoning provided to parties reflects genuine human engagement with the legal and factual issues rather than merely reciting algorithmic outputs (Chartered Institute of Arbitrators, 2025). Disclosure of AI assistance in award preparation may also be appropriate to ensure transparency regarding the nature of the decision-making process (Saudi Center for Commercial Arbitration, 2024).

9.3 Human Oversight and Responsibility

The principle of human oversight in AI-assisted decision-making recognizes that AI systems, despite their capabilities, should not operate autonomously in contexts where their decisions have significant consequences for human rights and interests (European Parliament, 2024; Nemko Digital, 2024). The EU AI Act mandates human oversight for high-risk AI applications, including those used in judicial contexts, requiring that such systems be designed to enable effective oversight by natural persons during the period in which the AI system is in use (Artificial Intelligence Act EU, 2024). In the arbitration context, human oversight implies that human arbitrators should retain ultimate responsibility for procedural decisions and substantive outcomes, with AI systems serving as tools to assist rather than replace human judgment (Saudi Center for Commercial Arbitration, 2024). This principle aligns with the fundamental nature of arbitration as a process where parties entrust their disputes to human adjudicators whom they have selected based on expertise, reputation, and personal qualities that AI systems cannot possess (Born, 2021).

The allocation of responsibility when AI systems contribute to erroneous decisions presents complex questions (Novelty Journals, 2025). If an AI system provides flawed analysis that leads to an unjust award, questions arise regarding whether the arbitrator who relied on the AI, the party who introduced the AI, or the developer who created the AI bears responsibility for the error (Aceris Law LLC, 2025). Under existing Jordanian law, arbitrators bear responsibility for the awards they render regardless of the tools they employ, and parties bear responsibility for the submissions they make (JIAC, 2024). AI developers, who may be unknown to the parties and uninvolved in the arbitral proceedings, may escape accountability under existing legal frameworks. The development of standards for AI deployment in arbitration should address responsibility allocation, including requirements for disclosure of AI use, verification of AI outputs, and allocation of liability for AI-related errors (Chartered Institute of Arbitrators, 2025). Professional responsibility standards for arbitrators and counsel may also require updating to address AI-related obligations (IBA, 2024).

10. Regulatory Gaps in Jordanian Legislation

10.1 Absence of AI-Specific Provisions

The most significant regulatory gap in Jordan's legal framework concerns the complete absence of provisions specifically addressing artificial intelligence in legal or judicial contexts (Al-Hamouri & Tarawneh, 2023). Neither the Arbitration Law nor the Electronic Transactions Law contemplates the use of AI systems in dispute resolution, creating legal uncertainty regarding the permissibility, conditions, and limitations for AI deployment (Karim, 2024). This legislative silence reflects the relatively recent emergence of AI as a practical tool in legal practice and is not unique to Jordan—most jurisdictions globally are grappling with similar regulatory gaps (Thomson Reuters, 2024). However, the absence of specific provisions creates risks for parties, practitioners, and institutions: uncertainty may inhibit beneficial innovation, or conversely, may permit practices that compromise procedural fairness and party rights (ESThinktank, 2025). The identification of these gaps is a necessary first step toward legislative modernization that provides clear guidance while preserving the flexibility that makes arbitration attractive.

Specific areas requiring legislative attention include: the legal status of AI-generated documents and signatures in arbitral proceedings; disclosure requirements regarding AI use by parties, counsel, and tribunals; standards for evaluating the reliability and fairness of AI tools; confidentiality and data protection requirements for AI systems processing arbitral information; allocation of responsibility for AI-related errors; and the permissible scope of AI participation in decision-making processes (SVAMC, 2024; CI Arb, 2025). International developments, including the EU AI Act and UNCITRAL's Model Law on Automated Contracting, provide models for addressing some of these issues, but Jordanian legislation must be crafted to address the specific characteristics of Jordan's legal system, arbitration practice, and technological infrastructure (UNCITRAL, 2024; European Parliament, 2024). The

development of Jordan-specific regulatory approaches should involve consultation with arbitration practitioners, technology experts, and affected stakeholders.

10.2 Institutional Rule Deficiencies

In addition to legislative gaps, arbitration institutions operating in Jordan lack specific rules addressing AI use in proceedings administered under their auspices (JIAC, 2024). The Jordanian Institute of Arbitrators and other arbitration institutions have developed procedural rules governing the conduct of arbitration, but these rules do not address technological innovations such as AI assistance. Institutional rules play an important gap-filling function in arbitration, providing guidance where legislation is silent and party agreement is absent (Born, 2021). The development of institutional rules addressing AI use could provide valuable guidance pending comprehensive legislative reform, establishing standards for disclosure, confidentiality, and procedural fairness that parties and tribunals can adopt through incorporation into their arbitration agreements or procedural orders.

International arbitration institutions have begun to address AI-related issues, with the Silicon Valley Arbitration and Mediation Center (SVAMC) publishing Guidelines on the Use of Artificial Intelligence in Arbitration in 2024 (Saudi Center for Commercial Arbitration, 2024). These guidelines address issues including disclosure of AI use, confidentiality protection, quality control, and the scope of permissible AI assistance. Similarly, the Chartered Institute of Arbitrators (CIArb) released its Guideline on the Use of AI in Arbitration in 2025, providing comprehensive guidance on the responsible use of AI tools in arbitral proceedings (Chartered Institute of Arbitrators, 2025). Jordanian arbitration institutions could draw on these international developments in crafting locally appropriate rules, adapting general principles to the Jordanian context while ensuring consistency with international best practices. The adoption of institutional AI guidelines would provide immediate practical guidance for arbitrators and parties while signaling Jordan's commitment to responsible innovation in dispute resolution.

11. Proposed Legislative Recommendations

11.1 Amendment to the Arbitration Law

This research article proposes targeted amendments to the Jordanian Arbitration Law to address the identified regulatory gaps while preserving the flexibility and party autonomy that characterize arbitration (Al-Abbadi, 2020). A new article should be introduced defining "artificial intelligence systems" for purposes of the law, adopting a definition sufficiently broad to encompass current technologies while flexible enough to accommodate future developments (European Parliament, 2024). The definition should distinguish between AI systems that perform administrative or support functions and those that participate in evaluative or decision-making processes, recognizing that different regulatory approaches are appropriate for these different categories (Saudi Center for Commercial Arbitration, 2024). The amendment should establish default rules regarding AI use that apply in the absence of party agreement, while preserving party autonomy to determine the extent and manner of AI involvement in their proceedings (Born, 2021).

The proposed amendment should address disclosure requirements, establishing that parties and tribunals must disclose their use of AI systems in proceedings where such use is material to the preparation of submissions, the evaluation of evidence, or the formulation of decisions (Chartered Institute of Arbitrators, 2025). The disclosure requirement should specify the level of detail required, which may vary depending on the nature of AI involvement: for administrative functions, general disclosure of AI use may suffice, while for evaluative or decision-making functions, more detailed disclosure regarding the nature of AI inputs and outputs may be appropriate (IBA, 2024). The amendment should also address confidentiality requirements for AI systems processing arbitral information, requiring that AI tools meet appropriate security standards and that parties' confidential information not be used for purposes beyond the immediate arbitration without consent (SVAMC, 2024; Springer, 2025). Human oversight requirements should be codified, establishing that ultimate responsibility for arbitral decisions must remain with human arbitrators who have meaningfully reviewed and adopted AI-assisted outputs (European Parliament, 2024).

11.2 Enhancement of the Electronic Transactions Law

The Electronic Transactions Law should be enhanced to address the specific characteristics of AI systems and their use in legal proceedings (Eversheds Sutherland, 2020). While the existing framework provides a foundation for recognizing electronic documents and signatures, it requires supplementation to address AI-generated outputs and algorithmic decision-making (J Human Security, 2024). Proposed amendments should establish criteria for the legal validity of AI-generated documents, including requirements for human verification and attestation. The law should address the evidentiary status of AI outputs, establishing standards for authentication and reliability that AI-generated materials must meet to be admissible in legal proceedings (OJS TRP, 2025). The amendment should also address the responsibilities of AI service providers, potentially including registration requirements, security standards, and liability provisions (European Parliament, 2024).

The enhancement of the Electronic Transactions Law should draw on international models while adapting to Jordan's specific legal and technological context (UNCITRAL, 2024). The EU AI Act's risk-based approach, which classifies AI applications according to

their potential for harm and imposes requirements proportionate to risk level, provides a useful framework (Artificial Intelligence Act EU, 2024; Stephenson Harwood, 2024). AI systems used in judicial and arbitral contexts would appropriately be classified as high-risk, subject to enhanced requirements regarding transparency, human oversight, accuracy, and cybersecurity (Deloitte, 2024; VerifyWise, 2024). The proposed amendments should establish institutional mechanisms for monitoring and enforcing AI-related requirements, potentially including a designated authority responsible for AI governance in legal proceedings (Nemko Digital, 2024). The development of these amendments should involve consultation with technology experts, legal practitioners, and affected stakeholders to ensure practical implementability while achieving regulatory objectives.

11.3 Development of Institutional Guidelines

Beyond legislative reform, this article recommends the development of institutional guidelines by Jordanian arbitration institutions to provide immediate practical guidance for practitioners and tribunals (JIAC, 2024). These guidelines should address: the circumstances in which disclosure of AI use is required; confidentiality and data protection standards for AI tools; the scope of permissible AI assistance in preparing submissions and evidence; the use of AI by tribunals in conducting proceedings and formulating awards; quality control and verification requirements for AI outputs; and procedures for addressing AI-related disputes that may arise during proceedings (SVAMC, 2024; CI Arb, 2025). The guidelines should be developed through consultative processes involving arbitration practitioners, technology experts, and users of arbitration services, ensuring that they reflect both technological realities and practical needs.

The institutional guidelines should adopt a principles-based approach that provides flexibility while establishing clear expectations (Born, 2021). Key principles should include: transparency regarding AI use; protection of confidentiality; preservation of due process and equal treatment; maintenance of human oversight and responsibility; and promotion of fairness and accuracy (IBA, 2024). The guidelines should include illustrative examples and practical guidance to assist practitioners in applying general principles to specific situations (Saudi Center for Commercial Arbitration, 2024). Regular review and updating of the guidelines should be anticipated, given the rapid pace of technological development (Wolters Kluwer, 2024). The adoption of such guidelines by Jordanian arbitration institutions would position Jordan as a forward-looking jurisdiction that embraces responsible innovation while protecting the integrity of the arbitral process.

12. Conclusion

The integration of artificial intelligence into arbitration proceedings represents both an opportunity and a challenge for Jordan's dispute resolution framework (Karim, 2024; Wolters Kluwer, 2024). AI technologies offer potential benefits in terms of efficiency, cost reduction, and analytical capabilities that could enhance the arbitral process (Thomson Reuters, 2024; Bloomberg Law, 2024). However, these benefits must be weighed against legal and ethical considerations regarding due process, impartiality, confidentiality, and transparency that are fundamental to legitimate arbitration (Global Arbitration Review, 2025; Oxford Academic, 2024). This doctrinal analysis has revealed that Jordan's existing legislative framework, while providing a solid foundation for arbitration generally, lacks specific provisions addressing AI integration, creating regulatory uncertainty that may inhibit beneficial innovation or permit practices that compromise procedural fairness (Al-Hamouri & Tarawneh, 2023). The identification of these gaps and the proposal of targeted legislative reforms represent contributions to the ongoing development of Jordan's arbitration framework.

The recommendations advanced in this article—amendments to the Arbitration Law, enhancement of the Electronic Transactions Law, and development of institutional guidelines—provide a roadmap for regulatory modernization that balances innovation with integrity (SVAMC, 2024; CI Arb, 2025). The proposed framework draws on international developments while maintaining sensitivity to Jordan's specific legal and institutional context (UNCITRAL, 2024; European Parliament, 2024). Importantly, the recommended approach preserves party autonomy as the governing principle of arbitration while establishing default rules and protective standards that apply in the absence of party agreement (Born, 2021). The framework maintains human arbitrators as the ultimate decision-makers, with AI systems serving as tools to enhance rather than replace human judgment. This approach aligns with emerging international consensus regarding AI governance in high-stakes decision-making contexts (Artificial Intelligence Act EU, 2024).

Future research should address empirical questions regarding the current and prospective use of AI in Jordanian arbitration practice, including surveys of practitioner attitudes and case studies of AI implementation (ResearchGate, 2024). Comparative research examining how other Arab jurisdictions are addressing AI in dispute resolution would provide valuable insights for regional harmonization efforts (SCNCHub, 2024; Legal 500, 2024). The rapid pace of technological development means that regulatory frameworks must be designed with flexibility and adaptability in mind, with regular review and updating anticipated (Wolters Kluwer, 2024). As Jordan continues to develop its position as an arbitration hub in the Middle East region, thoughtful engagement with AI technologies and their regulatory implications will be essential for maintaining competitiveness while protecting the procedural values that make arbitration attractive to commercial parties (Aceris Law, 2024; JIAC, 2024). The

integration of artificial intelligence into arbitration proceedings under Jordanian law presents an opportunity for the Kingdom to demonstrate leadership in responsible legal innovation, contributing to the broader regional and global discourse on technology governance in dispute resolution.

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