

Towards AI-Powered Electronic Arbitration for Investment Dispute Resolution :A Comparative Analytical Study

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Abstract

Electronic arbitration has emerged as a significant development in the resolution of investment disputes, driven by rapid technological advancement and the increasing digitalization of international commerce. This study examines the procedural, substantive, and enforcement dimensions of electronic arbitration in investment disputes, with particular emphasis on the

Jordanian legal framework and its interaction with French law and international arbitration instruments. The research analyzes the procedural foundations of electronic arbitration, including the filing of claims, case management, virtual hearings, digital evidence, and the growing role of artificial intelligence in arbitral proceedings. It further explores the application of national law, transnational rules (*Lex Mercatoria*), and integrated approaches adopted by arbitral tribunals in resolving complex cross-border investment disputes.

Using a comparative legal methodology, the study evaluates the enforceability of electronic arbitral awards under the Jordanian Arbitration Law, the Electronic Transactions Law, the 1958 New York Convention, and the 1965 ICSID Convention. Particular attention is given to the requirements for recognition and enforcement, as well as the challenges arising from public policy considerations, procedural integrity, authentication of electronic records, and technical reliability. The study also examines the authority of national courts in reviewing electronic arbitral awards and the extent to which judicial oversight may coexist with the principle of party autonomy.

The findings demonstrate that Jordanian legislation provides a substantial legal basis for recognizing electronic documents, signatures, and arbitral awards; however, practical challenges remain concerning enforcement procedures, evidentiary authenticity, and the regulation of artificial intelligence applications in arbitration. The study concludes that strengthening electronic investment arbitration requires legislative modernization, greater harmonization with international standards, enhanced judicial and institutional capacity, and the development of transparent regulatory frameworks governing digital technologies and AI-assisted decision-support tools. Such measures would improve legal certainty, strengthen investor confidence, and enhance the legitimacy and effectiveness of electronic arbitration in investment dispute resolution.

Keywords: Electronic Arbitration; Investment Disputes; Artificial Intelligence; Digital Evidence; Arbitral Awards; Enforcement; Jordanian Law.

1. Introduction:

1.1 Study Topic: Electronic arbitration in investment disputes represents a transformative development in international dispute resolution, combining traditional arbitral principles with the technical demands of the digital environment. Arbitration centers worldwide have adopted frameworks that integrate artificial intelligence, online filing systems, and virtual hearings to ensure efficiency, accessibility, and enforceability of awards. In Jordan, the Arbitration Law No. 31 of 2001 and the Electronic Transactions Law No. 15 of 2015 provide the statutory foundation for recognizing electronic documents, signatures, and arbitral procedures, while comparative reference to French law and international conventions such as the 1958 New York Convention and the 1965 ICSID Convention highlights the global legitimacy of electronic arbitration (Alhiniti & Abu Zaid, 2026; Born, 2021; Redfern et al., 2015). The study focuses on the procedural and substantive dimensions of electronic arbitration in investment disputes, including the filing of claims, organization of proceedings, digital methods of evidence, and the tribunal's authority to issue interim measures. It also examines the application of national law, transnational rules (*Lex Mercatoria*), and integrated approaches combining both, reflecting the flexibility of arbitral tribunals in adapting to complex cross-border disputes (Schmitthoff, 1968; Al Khaldi et al., 2025). Enforcement procedures are analyzed as the ultimate test of effectiveness, distinguishing between voluntary compliance supported by smart networks and compulsory enforcement requiring judicial *exequatur* orders.

By situating Jordanian practice within comparative frameworks, particularly French law and UNCITRAL instruments, the study highlights both opportunities and challenges in ensuring the integrity, enforceability, and legitimacy of electronic arbitral awards. Issues of nullity, public policy, and technical defects are addressed to underscore the delicate balance between party autonomy and national judicial safeguards (Kalaitsoglou, 2021; Tarawneh & Alhasan, 2024). Thus, the topic provides a comprehensive exploration of how electronic arbitration reshapes investment dispute resolution, bridging legal doctrine, statutory frameworks, and technological innovation to meet the demands of modern commerce.

1.2 Study objectives: The objectives of this study are multifaceted, aiming to provide a comprehensive analysis of electronic arbitration in investment disputes. It seeks to examine the procedural foundations of this system, including the filing of claims, the determination of tribunal mandates, and the adoption of digital evidence mechanisms. The study also explores the application of national law, transnational rules, and integrated approaches, with particular attention to the Jordanian and French frameworks that shape arbitral practice. In addition, it evaluates enforcement procedures of electronic arbitral awards under different legal regimes, identifying both obstacles and requirements for recognition. Another objective is to assess the role of public policy, technical integrity, and judicial safeguards in determining the validity and enforceability of electronic awards, highlighting the delicate balance between party autonomy and national oversight. Finally, the study aims to provide comparative insights into how Jordanian law aligns with international standards, offering recommendations for reforms that could strengthen digital arbitration and enhance its credibility in investment disputes.

1.3 Importance of the study: The importance of this study lies in its contribution to both academic scholarship and practical legal reform. Electronic arbitration is increasingly relied upon in investment disputes due to its efficiency, reduced costs, and adaptability to digital commerce. However, its legitimacy depends on the ability of national legal systems to recognize electronic documents, signatures, and awards without undermining fundamental principles of justice. Jordan's Arbitration Law and Electronic Transactions Law provide a promising framework, but challenges remain in enforcement, particularly regarding authenticity, translation, and compliance with procedural safeguards (Alsheyab, 2023; Tarawneh & Alhasan, 2024).

By comparing Jordanian practice with French law and international conventions, the study underscores the need for harmonization between national and transnational rules. It highlights how electronic arbitration can enhance investor confidence, reduce litigation burdens, and promote Jordan as a competitive seat for international arbitration. Academically, the research fills a gap in literature by linking statutory provisions, judicial practice, and technological innovations in a single analytical framework. Practically, it offers recommendations for strengthening enforcement mechanisms, ensuring public policy compliance, and integrating AI tools responsibly in arbitral proceedings (Born, 2021; Redfern et al., 2015).

1.4 Research Problem: Despite the rapid adoption of electronic arbitration, significant challenges persist in ensuring the enforceability and legitimacy of awards in investment disputes. Jordanian law recognizes electronic documents and signatures, yet courts remain cautious in granting enforcement orders, particularly when issues of authenticity, public policy, or procedural integrity arise (Jordanian Arbitration Law No. 31 of 2001; UNCITRAL, 1958). Comparative practice in France demonstrates greater flexibility, but also emphasizes strict compliance with exequatur requirements and evidentiary safeguards.

The research problem therefore centers on the tension between technological innovation and legal certainty: how can electronic arbitration balance efficiency with the guarantees of due process,

party autonomy, and judicial oversight? This problem is compounded by gaps in transnational rules, which often neglect issues such as contractual capacity and defects of consent, necessitating integrated reliance on national law (Al Khaldi et al., 2025; Aldaoud et al., 2024).

Main Research Question: **To what extent does the Jordanian legal framework, in comparison with French law and international conventions, ensure the enforceability and legitimacy of electronic arbitral awards in investment disputes, while safeguarding public policy and procedural integrity?**

1.5 Study Methodology: This study adopts a comparative legal methodology, combining doctrinal analysis of Jordanian legislation with examination of international instruments and French arbitration law. Primary sources include the Jordanian Arbitration Law No. 31 of 2001, the Electronic Transactions Law No. 15 of 2015, the New York Convention (1958), and the ICSID Convention (1965). Secondary sources consist of scholarly works by Born (2021), Redfern et al. (2015), and recent Jordanian studies (Tarawneh & Alhasan, 2024; Alsheyab, 2023).

The methodology involves:

- Textual analysis of statutory provisions and arbitral rules (UNCITRAL, ICC, WIPO).
- Comparative evaluation of Jordanian and French judicial practice concerning enforcement and nullity.
- Case study review of ICC arbitral awards applying integrated national and transnational rules.
- Critical assessment of doctrinal debates on Lex Mercatoria and electronic evidence.

This approach ensures a comprehensive understanding of electronic arbitration's procedural, substantive, and enforcement dimensions in investment disputes.

2. Literature Review: The literature on electronic arbitration in investment disputes reflects a growing intersection between technological innovation and international legal frameworks. Scholars have emphasized the evidentiary recognition of electronic signatures and documents as a cornerstone of digital arbitration. Alsheyab (2023) compared the Jordanian Electronic Transactions Law of 2015 with the UAE's 2021 legislation, highlighting the importance of authentication and reliability in granting electronic signatures equal legal force. This recognition aligns with broader civil procedure reforms that normalize electronic evidence in judicial practice (Onğanu, 2022).

Enforcement of arbitral awards remains a critical theme. Baldwin, Kantor, and Nolan (2006) examined the limits of ICSID award enforcement, particularly in light of state immunity, while Reece Thomas and Gültutan (2025) analyzed English jurisprudence advocating a teleological approach to balancing enforcement with sovereign protections. Köhler (2026) extended this discussion to sports arbitration, exploring the interaction between CAS awards and the New York Convention. Similarly, Ongenaë (2023) investigated institutional perspectives on electronic arbitral awards, revealing both enthusiasm and caution among arbitral centers.

Comparative studies underscore the role of national courts. Wagner (2025) assessed French judicial practice, noting tensions between simplicity and uncertainty in arbitration validity, while Tarawneh and Alhasan (2024) critically evaluated Jordan's adherence to the New York Convention, identifying procedural and financial obstacles. Foundational works by van den Berg (1981) and Redfern, Hunter, Blackaby, and Partasides (2015, 2023) provide doctrinal grounding for uniform interpretation and practical application of international arbitration law. Born (2021) and Kalaitoglou (2021) further elaborated on the conceptual framework of arbitral awards under the New York Convention, emphasizing the balance between party autonomy and public policy safeguards (Al-Hobabseh, et al., 2026). Primary legal instruments form the backbone of this

scholarship. The New York Convention (1958), the ICSID Convention (1965), and the UNCITRAL Model Laws (1985/2006; 1996) establish the international framework for recognition and enforcement. French law, through Articles 1366–1367 of the Civil Code and Articles 1514–1517 of the Code of Civil Procedure, affirms the evidentiary value of electronic writings and the requirements for exequatur. Jordanian legislation, including the Arbitration Law No. 31 of 2001 and the Electronic Transactions Law No. 15 of 2015 (as amended in 2026), provides the national foundation for digital arbitration. Complementary institutional rules, such as the ICC Arbitration Rules, WIPO Arbitration Rules, and ICANN’s UDRP, illustrate the practical mechanisms for electronic dispute resolution (Froomkin, 2000; Wolff, 2018).

Finally, doctrinal contributions on transnational rules (*Lex Mercatoria*) highlight arbitration’s flexibility in applying unified commercial customs and principles of international law. Schmitthoff (1968) emphasized the adaptability of arbitral tribunals in applying transnational principles, while Alhiniti and Abu Zaid (2026) advanced this discussion by presenting a forward-looking vision for regulatory frameworks in digital arbitration, particularly in the context of artificial intelligence and responsible innovation. ICC jurisprudence, notably Award No. 17/7 (1972), further demonstrates the integrated application of national and international rules. Together, these studies establish a comprehensive foundation for analyzing electronic arbitration in investment disputes, situating Jordanian practice within comparative and international contexts.

2.1 Research Gap: Although existing scholarship has extensively examined the recognition of electronic signatures, the enforcement of arbitral awards, and the comparative role of national courts, significant gaps remain in the literature on electronic arbitration in investment disputes. Much of the current research focuses either on doctrinal analysis of international conventions such as the New York Convention and ICSID Convention, or on comparative studies of national laws in France and Jordan. However, there is limited integration of these perspectives into a unified framework that addresses the unique challenges posed by digital arbitration in investment disputes. Specifically, prior studies have not sufficiently explored how Jordanian law, with its recent amendments to the Arbitration Law and Electronic Transactions Law, interacts with transnational rules and technological innovations such as artificial intelligence in shaping enforceability. Furthermore, while scholars like Alhiniti and Abu Zaid (2026) have advanced visions for regulatory frameworks in digital arbitration, empirical analysis of their practical application in Jordanian courts remains scarce. This gap highlights the need for research that bridges doctrinal theory, comparative practice, and technological realities, thereby providing a comprehensive evaluation of the enforceability and legitimacy of electronic arbitral awards in investment disputes.

The following table; Table (1), organizes the ten most influential academic contributions on electronic arbitration in investment disputes. Each entry highlights the main objective of the study and the specific research gap it addresses. By presenting the literature in a comparative structure, the table not only clarifies how scholarly debates have evolved over time but also reveals the diversity of approaches taken by different jurisdictions and institutions. It underscores areas of consensus, such as the growing recognition of electronic evidence, while also drawing attention to persistent divergences, including challenges in enforcement and the integration of technological innovations like artificial intelligence. This systematic overview situates Jordanian practice within a broader international and comparative context, offering a clear roadmap of how foundational works, doctrinal analyses, and forward-looking studies collectively shape the trajectory of electronic arbitration research.

Table (1): Key Academic References on Electronic Arbitration in Investment Disputes

Reference	Objective	Research Gap Addressed
Alsheyab (2023)	Compares Jordanian Electronic Transactions Law (2015) with UAE legislation (2021), focusing on authentication and reliability of electronic signatures.	Lack of comparative analysis on Arab jurisdictions' recognition of electronic signatures in arbitration.
Onțanu (2022)	Examines evidentiary value of electronic documents in civil procedure reforms.	Limited doctrinal treatment of functional equivalence between paper and electronic evidence in arbitration.
Baldwin, Kantor & Nolan (2006)	Analyzes limits of ICSID award enforcement, especially regarding state immunity.	Insufficient exploration of sovereign immunity constraints in ICSID enforcement.
Reece Thomas & Gültutan (2025)	Studies English jurisprudence advocating a teleological approach to balancing enforcement with sovereign protections.	Need for modern case-based analysis of enforcement vs. sovereignty in common law systems.
Köhler (2026)	Explores CAS awards and their interaction with the New York Convention.	Gap in applying international enforcement frameworks to sports arbitration.
Ongeneae (2023)	Investigates institutional perspectives on electronic arbitral awards.	Limited empirical insights into arbitral institutions' attitudes toward digital awards.
Wagner (2025)	Assesses French judicial practice on arbitration validity and enforcement.	Tension between procedural simplicity and uncertainty in French enforcement practice.
Tarawneh & Alhasan (2024)	Critically evaluates Jordan's adherence to the New York Convention.	Procedural and financial obstacles in Jordan's enforcement of foreign awards.
Born (2021); Kalaitoglou (2021)	Elaborate on conceptual framework of arbitral awards under the New York Convention, balancing autonomy and public policy.	Need for updated doctrinal synthesis on autonomy vs. public policy safeguards.
Alhiniti & Abu Zaid (2026)	Presents forward-looking vision for regulatory frameworks in digital arbitration, emphasizing AI and responsible innovation.	Absence of scholarship on AI integration and future regulatory models in arbitration.

Note: This table summarizes the objectives and research gaps of the most significant studies, providing a structured overview of the scholarly foundations that inform the present research. It highlights how doctrinal, comparative, and institutional perspectives converge to establish a comprehensive framework for analyzing electronic arbitration in investment disputes.

3. Legal Procedures of Electronic Arbitration in Investment Disputes: The procedures of electronic arbitration are founded upon a delicate balance between the technical considerations of the digital environment and the established principles governing investment dispute arbitration. Specialized arbitration centers provide disputing parties with regulatory frameworks that define essential data and procedural requirements to ensure the efficiency of the arbitral process and the legal validity of its award. The initial procedure focuses on defining the mandate of the arbitral tribunal to frame the scope of the dispute and the powers of the arbitrators, alongside structuring logistical aspects such as the language of proceedings, timelines, costs, and digital methods of evidence presentation. Technological means and artificial intelligence have imposed a flexible procedural pattern in the exchange of pleadings and evidence. Oral hearings and witness examinations are conducted through instant messaging programs, while interconnected video communications substitute physical attendance without compromising the guarantees of a fair trial. In this context, a legal issue arises regarding the authority of the electronic arbitral tribunal to issue interim or precautionary measures to protect assets or investment rights pending the final award, and the extent to which such measures are binding upon the Jordanian national judiciary when enforcement is sought. This matter falls under the provisions of Article (22) of the Jordanian Arbitration Law No. 31 of 2001 and its amendments, while continuing to draw guidance from the well-established French legal principles in this regard. This figure illustrates the core steps of electronic arbitration in investment disputes, highlighting the tribunal's mandate, logistical framework, digital exchange of submissions, virtual hearings, provisional measures, enforceability under Jordanian law, and comparative reference to French principles (Alhiniti & Abu Zaid, 2026).

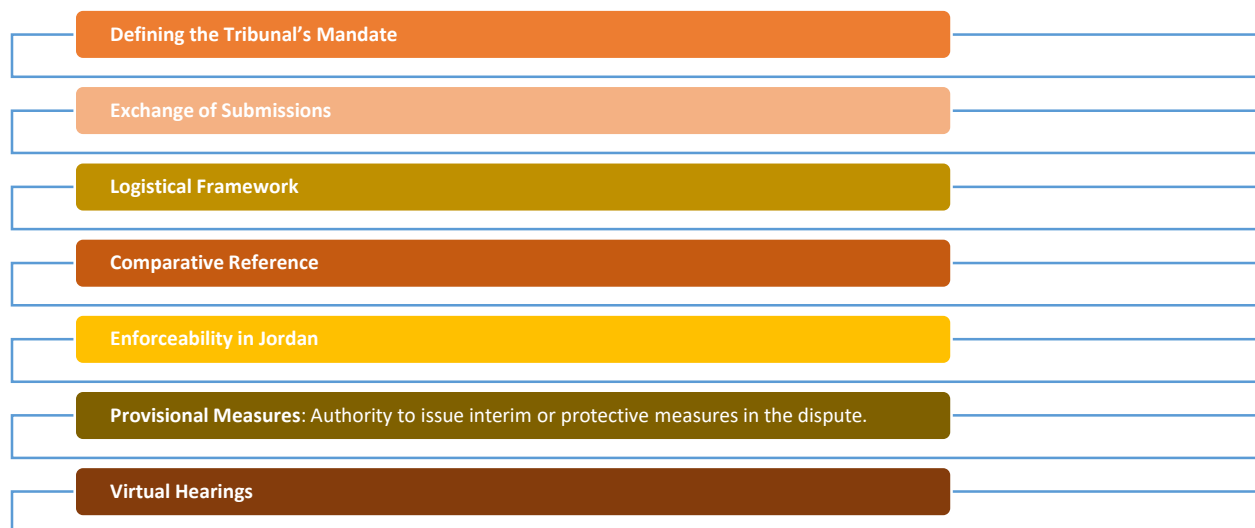


Figure 1: Electronic Arbitration Procedures, by researchers

3.1 Filing the Claim and Commencing Proceedings before the Electronic Arbitral Tribunal:

The procedural rules of arbitration centers are characterized by simplicity, as they provide automated electronic forms for filing the dispute and responding thereto. These rules are binding upon the parties by virtue of the principle of party autonomy, if they do not conflict with the public procedural order of the seat of arbitration or the State of enforcement (Al Maagbeh et al., 2026c).

3.1.1 Submission of the Electronic Arbitration Request and Organization of the Proceedings:

The initiation of the procedural dispute consists of two principal stages: the registration of the request, on the one hand, and the determination of the material and personal scope of the arbitrators' mandate, on the other. The electronic arbitration request is defined as the formal procedure initiated by one of the parties to the investment contract before the designated center to establish the arbitral dispute. Article (4) of the ICC Arbitration Rules has established a strict framework requiring the party seeking arbitration to submit a request to the Secretariat, with the date of receipt considered the commencement of arbitration proceedings. Article (4/3) of the ICC Rules specifies the essential data required in the request, including the names and details of the parties, their digital contact information, an analytical presentation of the nature of the dispute and the circumstances leading to it, identification of the subject matter of the request and the monetary valuation of claims, reference to the arbitration agreement, and specification of the applicable legal rules, seat, language of arbitration, and number of arbitrators. Unlike the historical format of the 1985 UNCITRAL Model Law, the revised 2010 amendments introduced explicit provisions for the notice of arbitration under Article (3), requiring notification of the respondent and submission of any plea of lack of jurisdiction or counterclaim within thirty (30) days pursuant to Article (4) of the UNCITRAL Rules. In the environment of AI-supported electronic arbitration, registration is carried out through interactive online forms provided by arbitration centers, which include party information, digital identity, email addresses, reliable communication channels, facts of the dispute, proposed solutions, and preliminary document review using AI tools Sarah M. (2026). The procedures and tribunal composition are determined by agreement on a sole arbitrator or a panel; in the absence of specification, the default procedural rule of the center provides for a sole arbitrator. Article (5/1) of the Virtual Court Regulations requires attaching a copy of the arbitration agreement and a list of evidence, while the ICC Rules grant parties the option of self-notification or administrative notification through the center, with the respondent obliged to reply within short deadlines ten (10) days in the Virtual Court and twenty (20) days in the WIPO Expedited Arbitration system under Article (9). This demonstrates the tendency of electronic arbitration to shorten procedural timelines compared to traditional arbitration. The organization of the electronic arbitration claim is governed by party autonomy through essential elements such as the language of arbitration, which is determined by the express will of the parties; in its absence, the language of the contract or the tribunal's decision applies, as enshrined in Article (22) of the UNCITRAL Model Law, Article (19/1) of the UNCITRAL Rules (2010), and Article (34/1) of the WIPO Rules. However, Article (12) of the Virtual Court Regulations granted the tribunal unilateral authority to determine the language, which has been criticized in legal doctrine for undermining party autonomy. Regarding timelines, electronic arbitration imposes strict deadlines: Article (25) of the UNCITRAL Rules (2010) stipulates that written submissions must be filed within forty-five (45) days, while Article (24) of the ICC Rules requires the award to be rendered within six months. The WIPO Expedited Arbitration system obliges the tribunal to decide within three (3) months of its constitution, with an additional month for issuing the award (Article 56). Arbitration fees include administrative charges and arbitrators' remuneration, with Article (41/1) of the UNCITRAL Rules (2010) setting objective criteria for fee assessment based on the amount in dispute, complexity, and time spent, a methodology also adopted in Article (60/3) of the WIPO system.

3.1.2 Digital Methods of Evidence in Electronic Arbitration: The proof of digital investment disputes requires the adaptation of traditional evidentiary means to the electronic nature of proceedings. Electronic documents and communications enjoy full evidentiary value once conditions of integrity and reliability are met. Under the Jordanian legislative framework, the

provisions of the Jordanian Electronic Transactions Law No.15 of 2015 grant electronic documents and electronic signatures the same legal force as official and customary documents under the Jordanian Evidence Law No. 30 of 1952, in harmony with Article (9/2) of the United Nations Convention on the Use of Electronic Communications in International Contracts (2005) and Article (20) of the Virtual Court Regulations. Testimony of witnesses may be submitted in written form supported by digital signatures or delivered through virtual conferences (video conferences), provided that identity verification is ensured and witnesses are free from external influence, as affirmed by Article (48) of the WIPO Arbitration Rules and Article (21/1) of the Virtual Court Regulations. Digital investment disputes also necessitate reliance on technical experts, with Article (29) of the UNCITRAL Arbitration Rules (2010) regulating the appointment of independent experts by the arbitral tribunal. Article (55) of the WIPO Rules requires experts to submit their nominations and reports within thirty (30) days, subject to electronic discussion, while the tribunal retains full discretion to adopt or disregard the report. The electronic arbitral tribunal must continuously verify the express consent of the parties to digital evidence and virtual proceedings to safeguard against annulment of the arbitral award when enforcement is sought before the Jordanian national judiciary pursuant to Article (49) of the Jordanian Arbitration Law No. 31 of 2001, or under international instruments such as the 1958 New York Convention, the 1965 Washington Convention (ICSID), and French international arbitration law. Alhiniti, Y., & Abu Alghanam, A. S. (2026).

1.1.3 Artificial Intelligence in Electronic Investment Arbitration: Artificial Intelligence (AI) has become an increasingly important tool in electronic investment arbitration due to its ability to enhance procedural efficiency and support dispute management. AI systems are utilized in case and file management through the organization, categorization, and retrieval of large volumes of arbitral documents, thereby facilitating more efficient case administration. Furthermore, AI-assisted technologies contribute to the analysis of digital evidence by processing extensive datasets, identifying relevant information, detecting patterns, and supporting document review processes that would otherwise require substantial human effort. AI is also increasingly employed in predictive analytics, enabling parties and counsel to assess potential dispute outcomes based on historical arbitral data and established legal trends. In addition, generative AI tools may assist in drafting procedural orders, case management directions, and preliminary legal analyses, thereby reducing administrative burdens and accelerating proceedings. Nevertheless, the growing reliance on AI raises significant ethical concerns relating to algorithmic bias, transparency, explainability, confidentiality, and due process, particularly where automated systems influence procedural or substantive decision-making. Consequently, contemporary arbitral practice emphasizes that AI should remain a supportive instrument rather than a substitute for the arbitrator's independent judgment, as the ultimate responsibility for evaluating evidence, interpreting legal rules, and rendering awards must remain with human decision-makers. Moreover, legal questions arise regarding liability for errors generated by AI systems, especially where inaccurate analyses, hallucinated information, or biased outputs affect the integrity of arbitral proceedings. Therefore, maintaining effective human oversight, transparency requirements, and clear regulatory safeguards remains essential to ensure the legitimacy, fairness, and enforceability of electronic investment arbitration in the age of digital dispute resolution (Ciarb, 2025; Kalaitsoglou, 2021; Puertas, 2024).

4. Applicable Legal Rules before the Electronic Arbitral Tribunal: The electronic arbitral tribunal entrusted with resolving digital investment disputes enjoys a flexible margin of freedom in selecting the substantive legal rules to be applied. Unlike the national judge, who is

bound by the necessity of applying domestic laws pursuant to traditional conflict-of-laws rules (connecting factors) prescribed at the seat of the court, the electronic arbitrator is liberated from this structural constraint due to the transnational nature of arbitration. This grants the tribunal exceptional flexibility to apply national laws, transnational rules, or a combination thereof, thereby ensuring the protection of justice and the stability of investment contracts (Al Maagbeh et al., 20)

4.1 Application of National Law and Its Procedural Implementation: The electronic arbitrator may ensure the application of a specific national law to resolve the digital investment dispute by resorting to the conflict-of-laws approach that attributes the contract to the law of party autonomy (Alayaydeh, E'layan, et al., 2026). The express or implied will of the parties constitutes the fundamental basis for applying national law, as national laws derive their binding force in international trade and investment disputes from the autonomy of the investor and the contracting state or party. This applies equally to explicit stipulations in the electronic contract or to implicit inferences drawn from the circumstances and context of the agreement. However, the challenge of determining the applicable conflict-of-laws methodology arises when the digital contract lacks reference to the governing law. Legal scholarship is divided into three approaches: (1) the mandatory application of the conflict-of-laws rules prevailing at the seat of arbitration (Lex Arbitri); (2) reliance on the law of the state most closely connected to the investment dispute; or (3) application of the rule deemed most appropriate by the arbitrator to safeguard the parties' legitimate expectations. Prevailing doctrinal opinions, consistent with comparative judicial and arbitral practice, favor adopting the law of the seat of arbitration as the primary connecting reference. Nevertheless, national laws were originally designed to govern domestic legal relations, which may render them inadequate in addressing the requirements of cross-border investment in the virtual environment. This limitation often compels arbitral tribunals to resort to transnational rules to ensure fairness and stability in digital investment arbitration. Born, G. B. (2021).

4.1.2 Application of Transnational Rules (Lex Mercatoria): The independence of the electronic arbitration system allows the tribunal not to be strictly bound by national legal frameworks, thereby empowering it to apply transnational rules directly and exclusively, whether based on the agreement of the investors or through the tribunal's own initiative (Alayaydeh, et al., 2026). Transnational rules are defined as a body of established principles, unified commercial customs, and general principles of law that collectively form an autonomous legal order for international commerce (Lex Mercatoria), such as the UNCITRAL Principles and the UNIDROIT Principles of International Commercial Contracts. These rules are applied directly without the need to resort to complex conflict-of-laws mechanisms, thereby ensuring speed and efficiency in resolving digital investment disputes. Prevailing doctrine does not require the existence of an express authorization for amiable composition in order to adopt this direct approach; rather, it suffices that such application aligns with the nature of contemporary investment transactions. This reflects the flexible character of electronic arbitration and its ability to adapt to the transnational legal environment. Schmitthoff, C. M. (1968).

4.2 Integrated (Complementary) Application of National Law and International Rules: Despite the rapid development of standard practices, commercial customs, and model contracts in the digital environment, transnational rules still suffer from substantive gaps, as they overlook essential issues such as contractual capacity, defects of consent, limitation periods, and provisions relating to the representation of legal persons and investment entities (Al Khaldi et al., 2025; Aldaoud et al., 2024; Al-Hussein et al., 2026). This gives rise to the integrated model that relies on parallel application, whereby transnational rules constitute the primary framework governing the dispute, while the arbitrator resorts to national law as a supplementary and residual framework

to fill substantive gaps. Arbitral tribunals under the auspices of the International Chamber of Commerce (ICC) in Paris have consistently applied this combination; in the well-known case (No. 17/7 of 1972), Iranian law was applied to determine the issue of delivery execution as an implied law of the parties' will, complementing commercial customs, while other awards relied on domestic laws to resolve detailed matters such as interest rates and compensation. Arbitral jurisprudence affirms that agreement to apply international rules does not imply the exclusion of national legislation whenever necessary to supplement explanatory gaps, thereby creating a harmonious legislative coexistence between national and international systems (Hazeem, Altarawneh, et al., 2026).

This approach finds legislative grounding in Jordan, where Article (36) of the Jordanian Arbitration Law No. 31 of 2001 and its amendments grants the arbitral tribunal the right to apply the rules chosen by the parties, and in the absence of agreement, to apply the substantive rules of the law deemed most connected to the dispute, taking into account contractual terms and prevailing commercial customs. This mechanism aligns with the Jordanian Electronic Transactions Law No. 15 of 2015, which recognizes the legal validity of will and digital instruments. Similarly, French arbitration law (Article 1511 of the French Code of Civil Procedure) embodies the highest degree of flexibility by granting the arbitrator full freedom to apply the rules of law deemed appropriate, whether national law or transnational rules (*Lex Mercatoria*), without being bound by domestic conflict-of-laws rules, a development that has directly influenced the drafting of international regulations. Furthermore, Article (42) of the Washington Convention on the Settlement of Investment Disputes (ICSID) of 1965 affirms the application of the legal rules agreed upon by the parties, and in the absence of agreement, the tribunal applies the law of the contracting state and relevant international law. The 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards also guarantees the validity of awards based on chosen rules, provided they do not contravene the public policy of the enforcing state. This reflects the integrative methodology between national law and international rules in electronic arbitration. Redfern, A., Hunter, M., Blackaby, N., & Partasides, C. (2015).

4.3 Enforcement Procedures of Electronic Arbitral Awards: The enforcement stage constitutes the true test of the effectiveness of electronic arbitration in resolving investment disputes, since an arbitral award regardless of the authority and evidentiary weight it carries remains merely a legal instrument that requires judicial intervention to confer enforceability and to initiate compulsory execution in cases where the losing party fails to comply voluntarily van den Berg, A. J. (1981).

4.3.1 Voluntary Enforcement and Smart Network Applications: The stage of voluntary enforcement and smart network applications highlights an important aspect of the flexibility of electronic arbitration, as the nature of digital investment transactions presumes self-commitment and voluntary compliance with the awards issued by virtual arbitral centers, whereby contractually bound parties undertake to promptly comply with the operative part of the award without the need for direct judicial intervention. This automated technical mechanism is supported by certain modern arbitral systems enhanced by artificial intelligence and digital networks, enabling automatic and immediate enforcement of decisions. A notable example is found in the policy of the Internet Corporation for Assigned Names and Numbers (ICANN), under which domain name registrars are obliged to cancel or transfer disputed domain names immediately upon issuance of the decision, without recourse to national courts for an enforcement order. This reflects the consistency of such applications with the legal nature of electronic arbitration and underscores the

integration of technical infrastructure with the legal framework to ensure the speed and effectiveness of enforcement Froomkin, A. M. (2000).

4.3.2 Compulsory Enforcement and Issuance of the Exequatur: If the party against whom the arbitral award is rendered refuses voluntary compliance, the prevailing party may apply to the competent court or authority in the State where enforcement is sought, in accordance with the law of that State and the applicable international convention. The nature of the procedure varies depending on whether the award is domestic, foreign, or rendered under the Convention on the Settlement of Investment Disputes between States and Nationals of Other States (ICSID Convention). Specialized legal literature confirms that enforcement of an ICSID award is not limited to recognition of its binding force but is also linked to domestic enforcement procedures and restrictions arising from State immunity (Baldwin et al., 2006). As for foreign arbitral awards not governed by the ICSID regime, the New York Convention refers enforcement to the procedural rules of the State where enforcement is sought, subject to the conditions and grounds expressly provided for in the Convention (UNCITRAL, 1958).

Under the amended Jordanian Arbitration Law No. 31 of 2001, an application for enforcement of an arbitral award is not admissible before the expiry of the period prescribed for filing an annulment action. The application must be submitted to the Court of Cassation and accompanied by the original arbitration agreement or a copy thereof, the original award or a duly signed copy, and a certified Arabic translation of the award. The Court examines the application in chambers and orders enforcement unless it finds a statutory ground for refusal, including violation of public order in the Kingdom or failure to properly notify the award. Academic research concerning Jordan's obligations under the New York Convention supports the conclusion that Jordan has established a framework for recognition and enforcement, although its practical implementation remains affected by procedural and financial obstacles. Nevertheless, the precise wording and requirements of Article 53 derive from the Jordanian legal text itself rather than from academic commentary alone (Tarawneh & Alhasan, 2024).

By way of clarification, enforcement applications under Article 53 in its amended form should not be attributed to the Court of Appeal. Such attribution confuses the definition of the “competent court” for certain arbitration matters with the authority specifically designated to hear enforcement applications after the legislative amendment. Reference must therefore be made to the authentic and currently applicable Arabic text of the law. The Jordanian Electronic Transactions Law No. 15 of 2015, as amended, grants legal validity to electronic information, records, and signatures provided that statutory requirements are satisfied, including accessibility of information, integrity of the record, identification of the source, and reliability of the signature or authentication method. Alsheyab's study examines the 2015 Jordanian Electronic Transactions Law, particularly the legal recognition of electronic signatures and the requirements of verification and authentication in commercial transactions (Alsheyab, 2023). However, the evidentiary validity of electronic records and signatures does not mean that every digital copy of an arbitral award will automatically be accepted by a court. The authenticity of the award, the validity of the signature, the integrity of the electronic record, compliance with translation requirements, and adherence to applicable electronic court-filing rules must still be verified. Furthermore, an academic study published in 2023 cannot, by itself, establish the legal effect of a subsequent Jordanian amendment adopted in 2026. Consequently, this issue must be supported primarily by the amended legislation itself and by the Arbitration Law (Hashemite Kingdom of Jordan, 2015/2026).

Under Articles 1514–1517 of the French Code of Civil Procedure, an international arbitral award may be recognized or enforced in France where the party relying upon it establishes the existence

of the award and where recognition or enforcement is not manifestly contrary to international public policy. The existence of the award is established by producing the original award together with the arbitration agreement, or copies meeting applicable authenticity requirements. Where documents are drafted in a language other than French, a translation may be required in accordance with procedural rules. Compulsory enforcement requires an *exequatur* order issued by the territorially competent Judicial Court, while the Judicial Court of Paris has jurisdiction when the award was rendered abroad. Wagner analyzes this judicial environment through a specific French decision concerning the validity of arbitration and recognition of a foreign award, but such analysis does not replace the official provisions of Articles 1514–1517 when establishing jurisdiction and documentary requirements (Wagner, 2025). In addition, Articles 1366 and 1367 of the French Civil Code provide that electronic writings and electronic signatures possess the same evidentiary value as their paper counterparts, provided that the author can be identified, the integrity of the document is ensured, and the signature relies upon a reliable identification process. Comparative scholarship on electronic evidence supports the principle of functional equivalence between digital and paper documents, but this does not exempt an applicant from complying with the specific recognition and enforcement requirements applicable to arbitral awards (Onțanu, 2022).

Article III of the New York Convention obliges Contracting States to recognize arbitral awards as binding and to enforce them in accordance with the procedural rules of the territory where enforcement is sought. Article IV specifies the principal documents required for recognition and enforcement, including the original arbitral award, the original arbitration agreement, or duly authenticated copies thereof, together with certified translations where necessary (UNCITRAL, 1958). According to the official UNCITRAL status information available at the time of writing, the Convention has 172 State Parties (UNCITRAL, n.d.). Köhler further emphasizes the importance of the Convention in the framework of recognition and enforcement of arbitral awards, although the focus of the study lies primarily on Court of Arbitration for Sport (CAS) proceedings and their interaction with European law (Köhler, 2026). Ongenae examines the validity of electronic arbitral awards, institutional arbitration practices, and the legal and practical concerns associated with them, referring to Article IV of the New York Convention and the UNCITRAL Model Law as relevant legal frameworks (Ongenae, 2023). Accordingly, the article may support academic discussion of electronic awards, but it cannot serve as evidence of legislative or institutional developments that occurred after its publication. In 2026, UNCITRAL issued a recommendation concerning the interpretation of the New York Convention with respect to arbitral awards in electronic form. This recommendation should be understood as interpretative guidance rather than an amendment to the Convention itself. It does not mean that every electronic award or electronic copy automatically satisfies enforcement requirements in all jurisdictions. Requirements relating to authenticity, certification, accessibility, record integrity, translation, and compliance with national procedural rules remain applicable (UNCITRAL, 2026).

Within the framework of the 1965 ICSID Convention, an arbitral award rendered under the Convention is binding upon the parties and is not subject to appeal or any other remedy except those expressly provided for in the Convention itself, pursuant to Article 53. Article 54 requires every Contracting State to recognize the award as binding and to enforce the pecuniary obligations imposed by the award as if it were a final judgment of a domestic court. The party seeking recognition or enforcement must provide a certified copy of the award issued by the Secretary-General of ICSID. Under Article 54(3), enforcement proceedings are governed by the laws applicable to the enforcement of judgments in the State where enforcement is sought, while Article 55 preserves rules relating to State immunity from execution. Contemporary academic analysis

emphasizes the importance of distinguishing between recognition of the award, enforcement of the pecuniary obligation, and attachment or execution measures, while maintaining the protection afforded by State immunity under the applicable law (Reece Thomas & Gültutan, 2025). Accordingly, the enforcement of arbitral awards rests on the interaction of three legal levels: the law of the State where enforcement is sought, the applicable international convention, and the legal rules governing the evidentiary value of electronic documents. In Jordan, a distinction must be drawn between the jurisdiction of the Court of Cassation over enforcement applications and the evidentiary validity of electronic documents, which does not eliminate the requirements imposed by arbitration legislation. In France, the *exequatur* regime for arbitral awards must be distinguished from the general evidentiary rules governing electronic writings and signatures (Al-Hadidi I., 2026). The New York Convention establishes the general framework for recognition and enforcement and identifies the essential documentary requirements, whereas the ICSID Convention creates a special regime based on the binding force of awards and their recognition and enforcement through domestic legal systems, subject to the continuing application of rules concerning State immunity. Therefore, enforcement cannot accurately be described as automatic or immediate, nor can the electronic form of an award alone be regarded as sufficient proof that it is eligible for enforcement (AL-Maaitah J. & AL-Maghrabi J., 2026).

4.3.3 Obstacles to Implementation and Issues of Nullity: National courts may refuse to issue an enforcement order or declare the annulment of an electronic arbitral award only in strictly limited circumstances, most notably when the award violates public policy, as affirmed by Article 49 of the Jordanian Arbitration Law No. 31 of 2001 (as amended) and Article 5(2) of the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards. Likewise, annulment may be justified in cases of technical defects and lack of integrity, where evidence demonstrates a breach of the digital arbitration environment or manipulation of the electronic record or arbitrators' digital signatures, thereby undermining the right of defense or casting doubt on the authenticity of the award. These exceptions reflect a delicate balance between respecting party autonomy in electronic arbitration and safeguarding the fundamental principles of national legal systems, ensuring that enforceability is not granted to awards that compromise public order or procedural integrity Born, Gary B. (2021).

4.3.4 Requirements for the Enforcement of Electronic Arbitral Awards under the 1958 New York Convention: The 1958 New York Convention is widely regarded as the cornerstone of the international legal framework governing the recognition and enforcement of foreign arbitral awards. Article III obliges Contracting States to recognize arbitral awards as binding and to enforce them in accordance with the procedural rules of the State where enforcement is sought, while prohibiting the imposition of substantially more onerous conditions, fees, or charges than those applicable to domestic awards (UNCITRAL, 1958; Kalaitsoglou, 2021). Within this framework, voluntary compliance remains the normal and preferred method of enforcement, since an award acquires *res judicata* effect upon issuance and the parties are expected to perform their obligations in good faith, particularly in ongoing commercial relationships. The ICC Arbitration Rules likewise emphasize the parties' duty to comply with awards without delay (Kalaitsoglou, 2021). Where compliance is refused or delayed, compulsory enforcement becomes necessary. Because arbitral tribunals are private adjudicative bodies lacking coercive state authority, awards are not self-executing and therefore require recognition and an enforcement order (*exequatur*) issued by the competent national court. Article IV (1) of the New York Convention requires the applicant to submit the original award or a duly certified copy, together with the original arbitration agreement or a certified copy, while Article 35(2) of the UNCITRAL Model Law on International

Commercial Arbitration imposes similar documentary requirements. These requirements pose particular challenges in electronic arbitration, as digital systems do not traditionally distinguish between an “original” and a “copy.” Nevertheless, Article 8 of the UNCITRAL Model Law on Electronic Commerce (1996) and Article 9 of the United Nations Convention on the Use of Electronic Communications in International Contracts (2005) adopt the principle of functional equivalence, under which an electronic record satisfies the requirement of an original document whenever a reliable method exists to guarantee the integrity of the information from its creation and to ensure continued accessibility for future reference (Wolff, 2018). Contemporary scholarship therefore supports recognition and enforcement of electronic arbitral awards where the authenticity and technical integrity of both the arbitration agreement and the award can be adequately demonstrated (Wolff, 2018). Once an enforcement application is submitted, the role of the judge is confined to a limited external review of the award rather than a reconsideration of the merits. The court may verify compliance with documentary requirements, the existence and validity of the arbitration agreement, the proper constitution of the tribunal, observance of due process guarantees, and adherence to the scope of the parties’ agreement, but it may not reassess factual or legal findings or substitute its own judgment for that of the arbitrators (Kalaitoglou, 2021). Enforcement may nevertheless be refused where one of the grounds exhaustively provided under the New York Convention or applicable national legislation is established, including invalidity of the arbitration agreement, violation of the right to be heard, excess of arbitral authority, improper constitution of the tribunal, annulment or suspension of the award in the State of origin, or conflict with the public policy of the enforcement State (Althnaibat et al., 2025a).

4.3.5 The Role of the National Judge and His Authority in Enforcing Electronic Arbitral Awards: The role of the competent national judge in issuing an enforcement order for an arbitral award is confined to exercising a limited and external legal review, aimed at verifying the fulfillment of the conditions required for recognition and enforcement. His authority does not extend to re-examining the merits of the dispute or reassessing the arbitral tribunal’s evaluation of facts or interpretation of law. This review consists of ensuring that the applicant has submitted the legally required documents, including the arbitral award, the arbitration agreement, and a certified translation where necessary; verifying the existence and validity of the arbitration agreement; confirming that the tribunal did not exceed its jurisdiction; ensuring the proper constitution of the tribunal; and checking compliance with fundamental procedural guarantees, including due process and proper notification of the parties (Abu Dalou et al., 2026). As to the substance, the judge may not refuse enforcement on the grounds of alleged errors in law or interpretation, nor may he amend the award or substitute his own judgment for that of the arbitrators. Nevertheless, the judge is obliged to refuse recognition or enforcement if one of the grounds exhaustively enumerated in Article V of the New York Convention or in the applicable national legislation is established. These grounds include the invalidity of the arbitration agreement, violation of the right to be heard, excess of arbitral authority, improper constitution of the tribunal, annulment or suspension of the award in the State of origin, or a finding that recognition or enforcement would be contrary to the public policy of the enforcement State. (Born, 2021; Redfern et al., 2023; Kalaitoglou, 2021).

5. Conclusions and Recommendations: Electronic arbitration has become an important mechanism for resolving investment disputes in the digital era. The integration of artificial intelligence and digital technologies has improved the efficiency and accessibility of arbitral proceedings, while also raising legal challenges related to enforceability, transparency, and procedural safeguards. This study emphasizes the importance of maintaining a balance between technological innovation and legal certainty through appropriate legislative and regulatory development.

5.1 Conclusions: This study has demonstrated that electronic arbitration represents a significant evolution in the settlement of investment disputes, combining the flexibility of arbitration with the efficiency of digital technologies. The analysis revealed that contemporary arbitral frameworks increasingly rely on electronic platforms, virtual hearings, digital evidence, and, more recently, artificial intelligence applications to enhance procedural efficiency and reduce the time and cost associated with dispute resolution. At the same time, the effectiveness of electronic arbitration remains closely linked to the legal recognition of electronic documents, signatures, and arbitral awards within national and international legal systems.

The comparative examination of Jordanian law, French law, the New York Convention, and the ICSID Convention indicates that substantial legal foundations already exist for the recognition and enforcement of electronic arbitral awards. Nevertheless, important challenges remain, particularly regarding authentication, digital integrity, public policy review, due process guarantees, and the evidentiary reliability of electronic records. The study further highlights that while artificial intelligence can support case management, evidence analysis, and procedural decision-making, it cannot replace the independent judgment and legal responsibility of arbitrators.

Ultimately, the findings suggest that strengthening electronic investment arbitration requires continuous legislative modernization, harmonization with international standards, and the adoption of clear regulatory safeguards governing the use of artificial intelligence. Such reforms would enhance investor confidence, increase the credibility of electronic arbitral proceedings, and ensure that technological innovation serves the fundamental principles of fairness, transparency, and legal certainty in investment dispute resolution.

5.2 Recommendations: Based on the findings of this study, several recommendations may contribute to strengthening the effectiveness and legitimacy of AI-powered electronic arbitration in investment disputes.

- Develop a comprehensive legal framework for electronic and AI-powered arbitration by introducing explicit provisions governing digital hearings, electronic evidence, electronic arbitral awards, and the responsible use of artificial intelligence in arbitral proceedings.
- Establish clear regulatory and technical standards to ensure transparency, accountability, confidentiality, cybersecurity, and the reliability of electronic documents, digital signatures, and AI-assisted systems used during arbitration.
- Strengthen harmonization between Jordanian law and international arbitration standards, particularly those embodied in the New York Convention, the ICSID Convention, and UNCITRAL instruments, while benefiting from comparative experiences such as the French arbitration model.
- Enhance institutional and professional capacity through specialized training programs for arbitrators, judges, and legal practitioners, and by investing in secure digital infrastructure that supports efficient, fair, and technologically advanced investment dispute resolution.

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