Research Article

Shuo Feng and Wei Shen*

Selecting arbitrators by AI: theoretical analysis and institutional responses

https://doi.org/10.1515/ijld-2025-2018
Received March 22, 2025; accepted August 28, 2025; published online October 28, 2025

Abstract: The rapid development and widespread application of artificial intelligence (AI) are profoundly shaping the evolution of dispute resolution mechanisms, including arbitration, while offering novel solutions to longstanding challenges in the current arbitration system. Rooted in the principle of party autonomy, the arbitration system entitles disputing parties to select arbitrators by mutual agreement. In practice, however, this framework has given rise to issues such as malicious delay tactics by parties, difficulties in appointing qualified arbitrators, all of which undermine the fairness and efficiency that are foundational to arbitration. While AI-assisted arbitrator selection can address these aforementioned problems, it also raises concerns from a rule of law standpoint. Key issues include algorithmic manipulation that impairs party autonomy, data collection practices that infringe on arbitrators' data privacy, and tensions between computational rationality and the emotional or normative dimensions inherent arbitration. To address these concerns, inclusive legislation should create room for the integration of AI into arbitration; concurrently, industry regulation and arbitration soft law should be leveraged to demystify "black box algorithms" and standardize AI-driven arbitrator selection processes. These measures will help safeguard the credibility of arbitration and foster the healthy development of the arbitration system in the age of AI. The convergence of AI and arbitration further prompts critical reflection on the transformation of the legal discourse system amid technological advancement. In this context, the law should adopt an inclusive yet prudent stance toward technological progress, both preserving space for ongoing innovation while establishing boundaries to prevent technology from fundamentally upending the existing legal system and social order. This balanced approach – pursuing stability through reform and

***Corresponding author: Wei Shen**, Shanghai Jiao Tong University Law School, Shanghai, P.R. China, E-mail: shenwei@sjtu.edu.cn
Shuo Feng, International Law School of Shanghai University of Political Science and Law, Shanghai, P.R. China, E-mail: fengshuo@shupl.edu.cn

advancing development through change – should serve as the guiding principle for the evolution of the arbitration system in the AI era.

Keywords: artificial intelligence (AI); arbitrator selection; international commercial arbitration; arbitration law; algorithm

1 Introduction

According to the *International Arbitration Survey: The Path Forward: Realities and Opportunities in Arbitration* issued by Queen Mary of London and White & Case in 2025, the development of artificial intelligence (AI) technology has profoundly affected the evolution of the arbitration system, including but not limited to its impact on the selection of arbitrators. Arbitration, as a dispute settlement mechanism based on party autonomy, allows the parties to choose arbitrators to settle disputes by agreement (van den Berg 1981: 284–287). However, in arbitration practice, parties with conflicting interests often become deadlocked over the selection of arbitrators, leaving the arbitration tribunal in a state of inaction. This not only directly impairs the efficiency of the arbitration process but also undermines its impartiality. Moreover, given that parties typically lack sufficient knowledge of arbitrators' professional expertise and background, they often face difficulties in selecting arbitrators who are well-suited to the case. This gap not only creates opportunities for arbitration institutions to intervene in the arbitrator selection process for rent-seeking purposes but also undermines the fundamental impartiality of arbitration.

In recent years, the international arbitration community has been exploring the application of AI technology to assist parties in arbitrator selection. By leveraging AI's deep learning capacities and its inherent impartiality, free from personal biases, this initiative aims to enhance the fairness and efficiency of arbitrator appointments. Against the backdrop of broader discussions on AI computing power and institutional modernization in China (Hong and Hu 2025), this trend has also become a key consideration in the ongoing reform of China's arbitration system and the revision of its Arbitration Law. Nevertheless, the rapid development and adoption of AI technology has also exposed a host of challenges in arbitration practice. Consequently, how to address these issues to facilitate the sound development of "AI + arbitration" model has emerged as a pressing concern in the field (Lindquist and Dautaj 2021).

This article focuses on the selection of arbitrators by AI and the rest of the article proceeds as follows. Section 2 elaborates on the value of selecting arbitrators by AI, beginning by identifying the practical constraints in the current arbitrator selection process and then discussing how the use of AI can enhance the professionalism and

efficiency of the selection process for the parties involved. Section 3 examines the risks associated with selecting arbitrators by AI, focusing on how algorithmic manipulation may impact party autonomy, how data profiling could infringe upon arbitrators' right to privacy, and the limitations of AI's computational rationality in fully assessing arbitrators' qualifications. Section 4 explores the improvement of relevant rules for the application of AI in arbitrator selection from a legal perspective, while also emphasizing, from the standpoint of transforming the paradigm of legal discourse, that the rule of law in the age of AI should be accommodating and prudent, with the aim of promoting a harmonious relationship between law and technology.

2 Value of the AI-assisted arbitrator selection

In arbitration practice, the selection of arbitrators is often delayed owing to the conflicting interests between the parties involved. Concurrently, the parties' recurring lack of professional expertise further impedes the appointment of arbitrators who possess the requisite qualifications to resolve the disputes at hand. By contrast, leveraging AI for arbitrator selection can significantly enhance both the professionalism and efficiency of this process, which in turn underscores the practical value of AI in arbitration proceedings.

2.1 Practical bottleneck in the arbitrator selection

Fairness and efficiency are fundamental values that demand careful balancing in any dispute resolution mechanism including arbitration (Waincymer 2015). The fairness and efficiency of arbitration proceedings are heavily contingent on the selection of arbitrators. There is a growing need to elevate the overall quality and credibility of arbitration primarily by expanding the diversity of the arbitrator pool and safeguarding the impartiality of arbitrator selection process. In practice, however, the selection of arbitrators confronts a range of challenges, which can be broadly classified into three categories.

2.1.1 The delay or malicious appointment of arbitrators

If the parties abuse their rights during the appointing arbitrators, the fairness and efficiency of the arbitration proceedings can be severely undermined. Although the principle of good faith is explicitly enshrined in the rules of many leading arbitration institutions, problematic practices such as intentional delays or malicious

appointments remain widespread in contemporary arbitration (Yu and Shore 2003). For instance, a party may deliberately select an arbitrator who appear favourable to its position but whose involvement ultimately compromises the impartiality and efficiency of the proceedings. Such tactics are often employed to prolong the process, pressure the counterparty into a settlement, evade contractual or legal obligations, or lay the groundwork for challenging the enforcement or validity of the award at a later stage.

Furthermore, in pursuit of strategic advantage and to pressure the opposing party into concessions, parties frequently introduce intricate additional conditions for the selection of arbitrators in dispute resolution clauses, which impede the constitution of the arbitral tribunal (Ahmed 2010). While these clauses ostensibly safeguard the parties' rights and interests in the appointment process, the overly stringent and numerous requirements often make it impractical to identify a suitable arbitrator who satisfies all stipulated criteria. Consequently, such clauses can significantly hinder the efficient formation of the tribunal.

To address the potential for malicious abuse in the selection of arbitrators by the parties, Article 32 of the *Arbitration Law of the People's Republic of China* (hereinafter referred to as the "Arbitration Law") specifically provides that: "If the parties fail to agree on the method of formation of the arbitration tribunal or to select the arbitrators within the time limit specified in the rules of arbitration, the arbitrators shall be appointed by the chairman of the arbitration commission." Similarly, the Article 26.4 of *China International Economic and Trade Arbitration Commission (CIETAC) Arbitration Rules* states: "If the procedure of forming the arbitral tribunal agreed by the parties is manifestly unfair or unjust,or if a party abuses its rights in a way that results in undue delay of the arbitral proceedings, the Chairman of CIETAC may determine the procedure of formation of the arbitral tribunal or appoint any member of the arbitral tribunal."

These legal and institutional mechanisms are designed to prevent the parties from unduly impeding the smooth progress of arbitration through deliberate delays in the appointment of arbitrators. Although the existing Chinese arbitration laws and institutional rules have established measures to address situations where parties fail to appoint arbitrators in a timely manner, the current provisions still lack sufficient enforceability and practical effectiveness. Consequently, parties may continue to engage in the malicious appointment of arbitrators or employ procedural tactics to delay the arbitration process, thereby undermining its overall efficiency (Yeung 2022).

2.1.2 Challenges in the appointment of qualified arbitrators

The *Arbitration Law* mandates that Chinese arbitration institutions establish a relatively closed list of arbitrators to regulate the procedures for arbitrator selection

and the formation of arbitration tribunals. Nonetheless, parties often have limited understanding of the available arbitrators and face challenges in identifying the most suitable candidates, which ultimately undermines both the efficacy and efficiency of dispute resolution. Under the current selection mechanism, insufficient information disclosure and low transparency compel parties to rely primarily on limited public sources when evaluating an arbitrator's background and professional competence (Pislevik 2018). This information asymmetry hinders the parties' ability to make well-informed selections and introduces greater uncertainty into the arbitration process.

Pursuant to the *CIETAC Arbitration Rules*, once arbitration proceedings are initiated, the arbitrators must be selected from the list of arbitrators provided by the CIETAC, However, the information available in this list may not comprehensively reflect each arbitrator's professional background and prior case experience. Similarly, under the Arbitration Rules of the Hong Kong International Arbitration Centre (HKAC), arbitrators included in the Panel are required to possess extensive domain expertise and arbitration experience. Nevertheless, the actual information disclosure may still fall short of enabling parties to fully evaluate an arbitrator's competence and suitability for a particular dispute.

The deficiencies in the current arbitrator information consultation system primarily stem from infrequent updates, limited scope of disclosure, and difficulties in accessing relevant information. These shortcomings hinder the parties' ability to conduct a comprehensive evaluation of arbitrators, thereby undermining the scientificity and rationality of the selection process. The Arbitration Rules of the International Chamber of Commerce Arbitration Court (ICC) provide for the selection of appointed arbitrators from a curated roster of professionals to safeguard the arbitrators' expertise and independence (Dasteel 2021). Although such a database exists, the level of information transparency and accessibility remains constrained. Therefore, the introduction of AI technology holds considerable potential for enhancing transparency (Cheng et al. 2025). By leveraging data mining and analytical capabilities, AI could integrate and update arbitrator information in real time, thereby generating more comprehensive and accurate arbitrator profiles. Building on this, the use of AI systems may further elevate information transparency and assist parties in better understanding and selecting suitable arbitrators.

2.2 Enhancing arbitrators' professionalism

A key advantage of arbitration as an alternative dispute resolution mechanism, distinct from litigation, lies in the professionalism of arbitrators. This professionalism encompasses both expertise and ethical conduct. Professional expertise refers to

the arbitrator's deep understanding of the specific industry involved in the dispute, while ethical professionalism entails the arbitrator's independence and impartiality (Kumra 2023). Unlike judges in litigation proceedings, who possess broad legal knowledge, arbitrators often bring specialized backgrounds that allow for a more nuanced comprehension of industry-specific disputes, thereby enabling more precise and efficient resolution.

To fully leverage the professional advantages of arbitrators, it is essential for the parties to comprehensively assess arbitrator-related information and appoint suitable candidates. Effectively addressing the insufficient transparency of arbitrator information requires the establishment of an integrated arbitrator information and evaluation system through innovative AI technologies. Such an AI system could update arbitrators'' professional background and historical case records in real time, while big data analysis would provide more complete information to the parties (Florescu 2024). This approach would not only help reduce information asymmetry and enhance the scientificity and rationality of the parties' choice, but also improve the fairness of the arbitration procedure.

To enhance the professional of arbitrators, both technical and legal measures can be implemented. On the one hand, a rigorous training and evaluation system may be established to ensure that arbitrators constantly enhance their expertise and practical skills. On the other hand, AI technology can be employed to conduct professional assessment of arbitrators and identify the most suitable candidates for specific disputes through algorithm-driven data analysis (Shih and Chang 2024). This approach can improve the accuracy of the professional evaluations and reduce the influence of human subjective bias. By strengthening arbitrators' capabilities and ethical standards, and incorporating AI-supported professional assessment, the arbitration process can be further optimized to provide more efficient and impartial dispute resolution services to the parties.

Within the practice of the American Arbitration Association (AAA), the application of AI to arbitrator selection constitutes a significant advancement in enhancing the professionalism and precision of the appointment process. AI tools are utilized to analyze extensive datasets, including arbitrators' historical case experience, specialized practice areas, procedural efficiency metrics, and past adjudicative outcomes, thereby enabling a more refined and data-informed matching process between arbitrator profiles and case-specific requirements. This approach mitigates traditional selection challenges such as information asymmetry and subjective bias, while improving the overall quality and suitability of arbitrator appointments. By leveraging AI's capacity to process complex variables at scale, the AAA can be better positioned to ensure that appointed arbitrators possess the requisite expertise and demonstrated impartiality (Evans et al. 2024).

2.3 Enhancing arbitrator selection efficiency through AI

The appointment of arbitrators constitutes one of the critical stages in arbitration proceedings. However, in practice, there are instances where parties abuse their appointment rights to maliciously select arbitrators, leading to delays or even deadlock in the procedure. The introduction of AI technology can enhance the efficiency of the arbitrator selection in individual cases and mitigate procedural delays caused by such malicious appointments.

Leveraging historical case data and arbitrators' professional background, AI systems can help identify and mitigate potential conflicts of interest, thereby enhancing the transparency and impartiality of the selection process (Broyde and Mei 2024). This not only improve the efficiency of arbitrator appointments but also reduce disputes and delays stemming from malicious selection practices. Through algorithmic analysis of large datasets, AI'ss predictive and recommendation functions are capable of generating optimal recommendations for the parties, further increasing both the efficiency and impartiality of the selection process.

Under the roster of arbitrators' system, the efficiency of arbitrator selection system can be improved through the application of AI technology. For instance, commercial arbitration institutions typically require, under their applicable rules, that arbitrators be selected from a provided list. However, the information available within such panels is often insufficient to ensure balanced utilization or to fully assess the professional suitability of arbitrators.

AI technology can further facilitate the real-time updating and evaluation of arbitrators' professional qualifications and historical case records, while intelligent algorithms can optimize the allocation and utilization efficiency of arbitrators. Such as system may assess each arbitrator's, current case load, automatically adjust appointments, and prevent over-concentration or under-utilization of any individual arbitrator – thereby maximizing overall efficiency (Stefer and Fricke 2025). In doing so, AI not only enhances the effective distribution of cases but also promotes equitable engagement of arbitrators and helps ensure that the professional capabilities of each arbitrator are employed to their fullest potential.

The introduction of AI technology into the judicial system holds the potential to enhance operational efficiency and support decision-making processes. However, it is also essential to address accompanying legal risks and concerns regarding impartiality. By improving capabilities in information screening and processing, AI can reduce human intervention and increase transparency and objectivity in judicial operations. Nevertheless, the utilization of AI must carefully balance efficiency with the imperatives of judicial fairness, ensuring that its application in arbitration and other legal proceedings genuinely serves to improve the effectiveness of dispute resolution and safeguard the integrity of outcomes.

According to the *Chartered Institute of Arbitrators (CIArb) Guideline on the Use of AI in Arbitration (2025)*, the integration of AI into arbitrator selection contributes a substantial contribution to enhancing procedural efficiency in arbitration proceedings. By automating the evaluation of arbitrator qualifications, historical case-related data, and expertise matching, AI reduces the time required for the selection process and minimizes the need for manual intervention. This technology facilitates more objective and consistent selection processes while maintaining ongoing compliance with the principle of procedural fairness and institutional standards. Such efficiency gains help accelerate the overall arbitration timeline and optimize resource allocation for all the parties in the proceedings (CIArb 2025).

3 Risks in AI-assisted arbitrator selection

As a product of the technological revolution, AI is bound to create friction with existing legal systems. The use of AI in selecting arbitrators may lead to algorithmic manipulation impairing party autonomy, data collection and utilization infringing upon arbitrators' data privacy rights, and computational rationality potentially failing to comprehensively assess arbitrators' qualifications, thus undermining the professionalism, impartiality, and suitability of arbitrator appointments.

3.1 Algorithmic manipulation's impact on party autonomy

The selection of arbitrators should uphold the principle of party autonomy. However, AI systems, guided by algorithms, are susceptible to manipulation by arbitration institutions, algorithm designers, or owner due to the "black box algorithms" effect. This may distort the genuine intent of the parties, violate the principle of party autonomy (Dou and Dou 2025), and perpetuate the issues previously highlighted. Given the opaque decision-making logic of algorithm operations, it is challenging to promptly detect and effectively correct potential biases in the arbitrator selection process. Furthermore, accountability becomes increasingly complex and ambiguous. In the event of an erroneous selection outcome, assigning responsibility is difficult, as it remains unclear whether liability should fall upon the algorithm's designer, operator, or the arbitration institution (Herbosch 2025).

The term "black box algorithms" refers to the phenomenon wherein the internal operation logic, parameter setting, and decision-making process of AI algorithms remain opaque or only partially transparent to external users in data processing. Due to its application and commercial value, AI technology inevitably incorporates the value preference of its developers and users (Kwong 2017). These embedded values can

influence the fairness of the arbitrator selection process and may even introduce systemic bias. To mitigate algorithmic bias, one proposed approach involves enhancing the transparency of AI systems through code regulation – employing legal technification to reduce the impact of bias on the selection of arbitrators.

Nevertheless, machine learning often depends on extensive datasets for self-learning and adaptation, and its inherently adaptive nature makes it challenging to anticipate algorithmic behavior across diverse scenarios (McManus 2017). Even if an algorithm performs effectively during the training phase, its decision-making process may become unstable or unpredictable when encountering unforeseen contexts in real-world applications. This inherent uncertainty implies that, despite embedding legal requirements into the algorithm's code, it remains difficult to reliably predict or control the system's actions under varied practical conditions. The use of big data and algorithms without sufficient transparency, accountability mechanisms, and fairness-oriented design may therefore pose significant challenges with broader societal implications.

In addition, regulating algorithmic bias faces significant challenges in terms of liability attribution. The inherent lack of transparency caused by the "black box algorithms" complicates the process of assigning responsibility when errors occur. In the selection of arbitrators. Effective technical regulation hinges on ensuring algorithmic transparency, auditability, and accountability, yet each of these dimensions presents considerable practical difficulties. Algorithmic transparency is often constrained by commercial interests and protections of trade secrets, which if not properly addressed, can further complicate accountability mechanisms (Rowe and Prior 2022). While algorithmic auditing can help identify biases and deviations, the self-evolving nature of machine learning systems makes consistent monitoring and liability tracing increasingly complex.

The self-learning and adaptive nature of algorithms causes their behavior to evolve over time, which increases the difficulty of audit consistency and effectiveness. Furthermore, a major challenge in the attribution of responsibility lies in accurately allocating accountability among relevant actors and preventing staff and arbitrators within arbitration institutions from shifting blame for their own errors onto the designers, developers, or operators of the algorithms. Although the use of algorithms in selecting and appointing arbitrators has yielded gains in efficiency and convenience, the inherent "black box algorithms" issue and the resulting deficits in accountability and transparency remain critical problems that require resolution (Wang 2024).

3.2 Erosion of arbitrator data privacy through data profiling

Upon appointment, arbitrators are required to disclose certain information to the arbitration institution, However, the use of AI analysis often necessitates the

collection of additional data. In many cases, AI may also construct detailed profiles of arbitrators through large-scale online data collection, potentially infringing upon their right to privacy without adequate safeguards (Slobogin 2025). As data sharing becomes increasingly prevalent, robust protection of arbitrator and case-related information has grown ever more critical. Confidentiality is a cornerstone of commercial arbitration's appeal. The widespread adoption of AI technology, however, heightens the risk of misuse of personal data, such as family details, inaccurate negative records, or evaluative content, which, if improperly disclosed, could harm an arbitrator's career and personal reputation. Furthermore, AI-generated arbitrator profiles may incorporate biases or inaccuracies, jeopardizing not only individual privacy but also casting doubt on the fairness of arbitrator selection and ultimately undermining the integrity of arbitral decisions (Raub 2018).

At the same time, expanded data sharing increases exposure to data breaches and cyber threats. If sensitive arbitration information is accessed or leaked through cyber attacks, the confidentiality essential to arbitration could be severely compromised. Coupled with the inherent biases and opacity of AI algorithms, these vulnerabilities may also perpetuate discrimination and prejudice in both the selection of arbitrators and the outcomes of awards. Therefore, while benefiting from technological advances, it is imperative to strengthen data governance and enhance transparency throughout the arbitration process.

With the increasing integration of AI in arbitration, ensuring the privacy and security of arbitrators and case data has become increasingly critical. During the AI-assisted screening of arbitrators, the confidentiality of personal information and case-related data must be rigorously protected. It is also important to note that an arbitration process relying on AI technology may involve external inputs – meaning that those who develop or operate the technical systems could be situated outside the traditional arbitration framework.

To safeguard privacy, arbitration agreements should incorporate explicit confidentiality obligations to enhance data protection. The involvement of external technical personnel must be subject to rigorous vetting, including an assessment of their qualifications and prior project experience to verify their competence in handling sensitive information. Furthermore, contracts would include detailed provisions on confidentiality and data security, specifying liability and penalties for any breaches (Ajunwa and Kamer 2024). Access to sensitive data shall be restricted to authorized and reputable external personnel only.

It is necessary to mandate that arbitration data protection agencies establish and uphold stringent data protection standards. Key responsibilities should include establishing standards for data encryption and storage, conducting regular reviews and updates of security protocols, continuously monitoring data access, overseeing the security protocols for data storage and transmission, as well as responding to and

tracking anomalies in real time. These measures are critical to ensuring end-to-end security of data throughout the arbitration process.

While technological progress advancements are highly significant for improving the efficiency of arbitration proceedings, the absence of systematic and standardized data management measures may still adversely affect data protection and privacy security. For instance, the *Guidelines for Data Arbitration of Shanghai Arbitration Commission* provide an institutional guarantee for data-related data disputes within procedural frameworks. However, these guidelines have yet to comprehensively cover norms governing the storage, usage, and deletion of data throughout its processing lifecycle, which may give rise to concerns regarding full lifecycle data management. The lack of a clear protocols for the use and storage of specific types of data could lead to unavoidable legal risks pertaining to data privacy and security. Likewise, in the absence of explicit data deletion measures, the potential risks of data leakage and unauthorized use remain significant and cannot be overlooked (Cinnamon 2025).

3.3 Limitations of computational rationality in assessing arbitrator qualifications

While AI's value judgments are primarily grounded in computational rationality (Governatori and Rotolo 2008), the role of an arbitrator extends beyond professional knowledge and technical competence to include nuanced emotional intelligence, which plays a significant part in resolving disputes. The authority granted to arbitrators selected by the parties is intended to foster mutual trust and facilitate dispute settlement. If AI were to assume complete control over the entire process, it would likely struggle to capture the interpersonal rapport and trust that develops between arbitrators and the parties. This could effectively transform arbitration into a judge-allocation mechanism resembling litigation, thereby diminishing the distinct advantages of the arbitration system.

Arbitration, as a quasi-judicial activity endowed with adjudicative authority, relies not only on rational interest balancing but also incorporates value judgments shaped by emotional and moral considerations. If AI were to assume complete control over the arbitration process, it would risk undermining human agency, thereby preventing arbitrators from engaging the moral and emotional dimensions essential to effective dispute resolution. In such a scenario, the distinctive advantages of arbitration – such as flexibility, mutual trust, and human discernment – could be significantly diminished (Schwing 2020). Although AI possesses considerable capabilities in data processing and analytical tasks, it cannot fully replicate the human capacity for empathetic understanding and ethical judgment (Zhao and Ren 2025), which remain indispensable in addressing complex legal and relational disputes.

Algorithms depend on extensive datasets to render decisions; however, their decision-making processes often lack transparency and may embed the subjective intentions and biases of their designers and operators. As a result, AI may struggle to ensure complete fairness and impartiality in the selection of arbitrators (Elyamany 2024). Furthermore, algorithms are ill-equipped to accurately assess the significance of the emotional connection between arbitrators and the parties – a crucial element in many dispute resolutions. While intelligent digital platforms deliver personalized services through data collection, analysis, and behavioral modeling, they inevitably reflect underlying algorithmic and commercial priorities.

When deployed in arbitration, AI operates primarily through computational logic, which falls short in effectively navigating complex interpersonal emotions and trust-based dynamics (Lu 2022). This inherent computational rationality may erode the parties' confidence in the arbitrators and dilute the distinctive advantages offered by the arbitration system. When examining the impact of algorithmic decision-making on the selection of arbitrators, it is necessary to acknowledge its limitations in terms of transparency, impartiality, and the management of emotional and trust-based relationships. The algorithmic encoding of legal rules has facilitated the digitalization of judicial reasoning and enforcement, yet it often overlooks the affective and ethical dimensions inherent in social interactions. Despite AI's strengths in data processing and analytical tasks, it remains inadequate in assessing the holistic qualities of arbitrators – such as emotional intelligence, interpersonal skills, and other nuanced attributes that resist straightforward quantification (Elyamany 2024). This over-reliance on computational rationality may fail to capture the very elements that underlie mutual trust and human-centric judgment, which are central to the arbitration process.

While computational rationality may enhance procedural efficiency, it reveals inherent limitations in addressing complex interpersonal dynamics and emotional trust (Swisher 2024). It is therefore essential that intelligent systems strive to balance technological capability with human values, and efficiency with justice, in both design and application. Incorporating ethical considerations and human-centered perspectives can render the decision-making process more comprehensive and equitable. Moreover, strengthened oversight and evaluation mechanisms for AI systems are necessary to safeguard and enhance the overall effectiveness and integrity of the arbitration system.

4 Adjusting the system for the AI-assisted arbitrator selection

In response to both the potential benefits and inherent risks of AI-enabled arbitrator selection, a balanced regulatory approach must be applied within a rule-of-law

framework. Efforts should center on refining relevant normative systems: legislation should delineate a legal space for the application of AI in arbitration, while industry self-regulation and soft law mechanisms (e.g., guidelines, codes of conduct) should be leveraged to mitigate risks and standardize AI-related practices. On a conceptual level, it is essential to uphold an inclusive yet prudent legal stance toward AI development and facilitate the transformation of legal discourse paradigm in the AI era.

4.1 Creating legal space for AI applications in arbitration

The design of an arbitration system is shaped by legislator's perceptions of arbitration's value and their balancing of competing values. Legislative choices are influenced by culture contexts, social conventions, and the level of socioeconomic development. Endowed with high flexibility and party autonomy, arbitration, driven in part by technological progress, has emerged as a robust safeguard for substantive justice in commercial disputes, while also serving as an expansive testing ground for innovative rules within the framework of diversified dispute resolution mechanism (Shen and Yu 2016). In this era of transformative change, the adaptability of arbitration legislation assumes particular importance. Moreover, legislative flexibility should also reflect the ethical challenges of AI innovation, balancing openness with safeguards for responsible governance (Mao and Xu 2025). As AI becomes increasingly integrated into the arbitrator selection process, both the current *Arbitration Law* and local-level arbitration legislation must afford adequate flexibility to accommodate future advancements in AI technology and its evolving application in arbitration proceedings.

Against the backdrop of unprecedented changes in the world in a century, the international commercial arbitration system is undergoing reshaping driven by structural shifts, technological evolution, and growing cultural diversity. Reforms within the system are driving its adaptive development, which is manifested in several pivotal trends: a heightened emphasis on efficiency without compromising substantive and procedural fairness; a gradual relaxation of public policy restrictions amid the increasing deepening intertwinement of public and private interests; and the expanding authority of arbitration institutions, which now often precedes strict adherence to the principle of party autonomy (Liu and Feng 2024).

China's arbitration system also faces a crucial window of opportunity for reform. Such reform must prioritize reducing excessive administrative intervention in arbitration, in alignment with the requirements of a comprehensive rule-of-law framework. The modernization of China's arbitration system should be oriented toward the goals of Chinese-style modernization, striving to refine the institutional

framework of arbitration and enhance systemic support through inclusive legislation. The significance of inclusive legislation lies in its capacity to provide a legal structure and institutional space that accommodate technological progress and innovation within the arbitration field. This approach can effectively respond to the uncertainties and regulatory challenges introduced by technological advancements. By embracing legal inclusiveness, a flexible environment can be established to adapt to rapidly evolving technologies, such as the integration of AI in arbitration (Chen 2021).

Inclusive legislation has been widely recognized and applied in the realm of international commercial arbitration. For example, the *UNCITRAL Model Law on International Commercial Arbitration* provides an open-ended framework allowing countries to make targeted adjustments and introduce new technologies on a case-by-case basis. This legislative framework reserves sufficient latitude for countries to adapt their laws in judicial practice in light of their specific national conditions and technological progress. The application of AI into arbitration proceedings holds significant potential to enhance efficiency and fairness, as evidenced by applications such as intelligent arbitrator screening, automated award documents generation, intelligent evidence analysis. However, this integration is accompanied by a suite of technical and ethical challenges that demand clear legislative guidance and safeguards. Inclusive legal provisions can facilitate the proactive application of AI, combine innovation with the rule of law, and enable continuous adaption throughout the process of development (Moreira and Zhang 2025).

4.2 Piercing AI's "black box algorithms" with regulations

Inclusive legislation has garnered broad recognition and implementation within the domain of international commercial arbitration. A paradigmatic example is the *UNCITRAL Model Law on International Commercial Arbitration*, which establishes an open legal framework enabling countries to incorporate context-specific adaptations and adopt emerging technologies. This legislative design affords nations ample flexibility to align their judicial practices with domestic socioeconomic conditions and technological advancements. The integration of AI into arbitration proceedings offers considerable potential to enhance efficiency and fairness, as exemplified by applications such as algorithm-assisted arbitrator screening, automated award generation, and AI-driven evidence analysis. However, the adoption of AI in this context also introduces a spectrum of technical and ethical challenges that necessitate clear legislative guidance and robust safeguards. Inclusive legal provisions can facilitate the responsible deployment of AI, harmonize innovation with the rule of law, and enable continual evolution throughout the development process (Moreira and Zhang 2025).

Government support plays an essential role in the governance of AI in arbitration. Specifically, the government can formulate and periodically revise policies that align with current technological capabilities and societal imperatives, thereby establishing a legal framework conducive to the development and application of AI algorithms. Concurrently, it can offer necessary financial and resource support to arbitration associations, ensuring these bodies are equipped to conduct fair, neutral, and comprehensive algorithm reviews and arbitral proceedings. Such support may encompass the training of technical personnel, the allocation of research funding, and the provision of institutional backing. The independence and impartiality of arbitration associations are instantiated in their capacity to resist external pressures and maintain objectivity in evaluating algorithmic systems. Government assistance is vital to safeguarding the operational autonomy and functional effectiveness of these associations, enabling them to fulfill their duties in a principled and sustainable manner.

Government funding and resource assistance are essential prerequisites for arbitration associations to execute fair, neutral, and comprehensive algorithmic assessments and arbitral processes. This includes the training of technical personnel, the allocation of research resources, and sustained financial support. Such governmental backing further reinforces the independence and impartiality of arbitration associations, ensuring their work in algorithm governance remains free from external interference (Li et al. 2023). Beyond this, the role of independent auditing and supervision is crucial in upholding the fairness and transparency of AI systems, thereby providing reliable safeguards for the healthy development of AI.

To ensure the fairness and transparency of AI algorithms in arbitration, the establishment of industry-wide large-scale governance models represents an indispensable step. Such models not only constitute a technological breakthrough but also embody a concrete manifestation of governance paradigms. Leveraging such models, arbitration associations can conduct comprehensive audits and certifications of algorithms based on unified industry standards, assessing dimensions such as algorithmic fairness, operational transparency, and functional effectiveness. This standardized auditing mechanism will help elevate the overall quality of algorithmic governance across the arbitration sector (Miao 2025).

Technical regulation and legal regulation function in a mutually complementary manner, collectively ensuring the effectiveness of AI governance in arbitration (Hars 2021). Technical supervision primarily focuses on ensuring the transparency and audibility of the algorithm development process. This entails utilizing information technology tools to document and monitor the entire phase of algorithmic system development, from design and training to deployment, guaranteeing that adherence to established technical specifications and industry standards. In this context,

arbitration associations play an essential role as technical reviewers, conducting professional evaluations to verify algorithmic transparency and procedural compliance.

Legal supervision, by the contrast, centers on the normative governance and safeguard mechanisms of algorithm application. This includes establishing robust legal frameworks that delineate the responsibilities and obligations of stakeholders associated with the development and use of algorithms, thereby ensuring that AI technologies operate within lawful and compliant boundaries. It is therefore imperative to systematically categorize the risk levels of AI technologies developed in arbitration and formulate detailed guidelines governing their development, deployment, and usage. Such measures ensure that the advancement and application of AI align with legal norms and are capable of proactively mitigating potential risks and threats to the integrity of arbitral proceedings.

4.3 Regulating AI application by arbitration soft law

As an emerging technology, the regulatory framework for AI remains under exploration. At the legislative level, there is still limited specialized legislation with mandatory binding force enacted by national legislatures. A notable example is the *Artificial Intelligence Act* issued by the EU in May 2024, which stands as the world's first comprehensive law dedicated to AI regulation. It introduces mechanisms such as risk-based classification, rules for general-purpose AI models, and regulatory sandboxes to foster innovation. However, following its enactment, many companies have raised objections, arguing that the overly stringent regulatory requirements could hinder industrial development (Blackman 2025). Consequently, on a global scale, the formation of legal norms in the field of AI is still in a phase where various industries largely rely on soft law for governance. This approach seeks to balance regulatory oversight and technological advancement as effectively as possible. Arbitration, as a mechanism for resolving private disputes rooted in the principle of party autonomy, places greater emphasis on soft law as a means to reconcile the interests of all involved parties. Therefore, the use of soft law to regulate the application of AI in arbitration represents a pragmatic and contextually appropriate response, which reflects broader approaches to integrating soft and hard laws in AI governance (Xiao and Sun 2025).

The transparency of information disclosure and the standardized application of AI play a central role in modern arbitration proceedings. At present, mandatory legal provisions in the relevant fields fail to fully regulate information disclosure and AI application mechanisms, leading to practical deficiencies. The Soft law of international commercial arbitration refers to rules of conduct, guiding principles, or

standards formulated by international organizations and arbitration institutions. Although not legally binding in a strict sense, these instruments exert tangible practical influence and are applied to address procedural gaps. As well as mitigate conflicts and divergences prevalent in international commercial arbitration (Kaufmann-Kohler 2010).

Soft law in arbitration holds significant potential to play a vital role in the field of international commercial arbitration. By leveraging the functions of arbitration soft law, it becomes feasible to ensure that arbitration proceedings operate within a structured legal framework while maintaining adaptability to changes brought about by emerging technologies. As a form of non-mandatory code of conduct and guidance developed by international organizations and arbitration institutions, arbitration soft law has gained broad recognition and preference due to its low cost of formulation, high adaptability, and capacity to accommodate the individualized needs of the parties. Soft law in commercial arbitration helps fill the procedural gaps left by hard law instruments such as national arbitration statutes and institutional arbitration rules. It contributes to enhancing the efficiency of arbitration proceedings, promotes harmonization and development in international commercial arbitration, and offers sound reference standards for the supervision of arbitral procedures.

The application of AI represents a pivotal innovative approach to enhancing the efficiency and impartiality of arbitration. While AI has demonstrated considerable potential in areas such as arbitrator selection and case management, its deployment is accompanied by challenges concerning data privacy and ethical considerations (Cheng and Liu 2023). It is therefore essential to regulate the use of AI through the development of specialized arbitration guidelines. These should address, among other aspects, algorithm transparency, protection of data privacy, and mechanisms for securing informed consent from the parties involved.

Specifically, arbitration institutions should establish transparency rules governing the use of AI algorithms to ensure their fairness and impartiality, while implementing stringent privacy protection measures to safeguard the security of arbitrator and case-related data processed by AI systems (Cheng et al. 2024). Furthermore, when AI is utilized in the selection of arbitrators, explicit and informed consent must be obtained from the parties to guarantee their comprehensive understanding of both the procedure and outcomes. By embedding these specific guidelines within arbitration soft law, the responsible and ethically grounded application of AI technology in arbitration proceedings can be effectively promoted.

The application of arbitration soft law should emphasize practical applicability and adaptability. During its formulation, full consideration should be given to the specific needs of different cases and parties, with flexible and instructive operational guidelines developed to ensure compatibility with rapidly evolving arbitration

environments and technological advancements. Building on robust theoretical foundations and thorough practical validation, clear and actionable operational standards can be established, thereby enhancing the overall efficiency and fairness of arbitration proceedings (Korzun 2023).

Soft law instruments, such as the *Silicon Valley Arbitration and Mediation Center (SVAMC) Guidelines on the Use of Artificial Intelligence in Arbitration*, provide essential guidance without the rigidity of statutory regulations, enabling the arbitration community to respond proactively to technological advancements while upholding ethical standards and procedural fairness. This guideline emphasizes the need for participants to understand the capabilities and limitations of AI tools, protect confidential information, and avoid delegating decision-making authority to AI systems. In the realm of arbitrator selection, soft law helps mitigate risks such as algorithmic bias, lack of transparency, and privacy violations by promoting transparency, encouraging disclosure of AI use where appropriate, and ensuring human oversight (SVAMC 2024). By fostering a culture of responsible innovation, soft law not only enhances the efficiency and credibility of AI-enabled arbitrator selection but also preserves the core values of arbitration, including autonomy, impartiality, and fairness, in an evolving technological landscape.

The analysis of current practices and international experience reveals that international arbitration institutions have demonstrated the substantial potential of arbitration soft law in areas such as AI-assisted arbitrator screening. Nevertheless, these initiatives also face ongoing challenges including data privacy protection and ethical governance. Against this background, arbitration soft law can function as a flexible and effective regulatory instrument to ensure that the application of AI technology in arbitration remains transparent and guided by well-defined operational standards. By actively incorporating advanced international practices, such as those reflected in the *UNCITRAL Arbitration Rules*, China's mainstream arbitration institutions can align their relevant rules and norms with global standards. This convergence will enhance the credibility and international influence of China's arbitration system, thereby further promoting the standardization and efficiency of arbitration procedures.

5 Transformation of legal discourse paradigm for technological innovation

The integration of AI into arbitrator selection represents an inevitable trend in the evolution of arbitration systems and the development of the arbitration industry amid the ongoing global technological revolution. While it is imperative to address

attendant risks through regulatory refinement and legal adaptation, it is even more critical to accurately delineate the dynamic relationship between law and technology, and to clarify the discourse paradigm through which the legal system responds to technological innovation in the AI era (Cheng and Pei 2025).

Historically, pivotal technological breakthroughs have consistently driven transformative changes in the means of production, expanded the scope of labor objects, and reshaped labor structures. These developments have not only exerted a profound impact on human living conditions but have also fundamentally reconfigured modes of production. Such paradigm shifts, in turn, have necessitated continuous adjustments to social structures and institutional frameworks (Schweller 2004).

On the one hand, the relentless advancement of technology perpetually expand the scope of legal regulation (Bennett 2012). Technological progress enhances human productive capability and continually pushes the boundaries of human activity – whether in economic, social, or private spheres. Since law functions as a normative framework governing human interactions and social relations, its regulatory domain naturally evolves in tandem with the expansion of these spheres of activity. On the other hand, technological advancement also contributes to the maturation of legal cognition. Sustained exploration and innovation in the natural sciences have deepened humanity's understanding of the inherent laws governing the evolution of the objective world. This enhanced understanding, in turn, has facilitated the refinement of legal criteria for evaluating objective phenomena, thereby laying a more robust empirical foundation for nuanced and evidence-based juridical decision-making.

Moreover, the complexity and rapid evolution of technology have prompted a paradigm shift in the value orientation of law toward "humility". The ongoing development of technology has transformed it into an increasingly intricate and expansive system, characterized by multifaceted interdependencies across its constituent elements. These interconnections frequently give rise to cascading effects, whereby a change in one factor can trigger a chain of reactions that propagates throughout the entire technological ecosystem. This inherent technological complexity, in turn, propels societal development toward greater intricacy (Matwyshyn 2007).

As a universal normative mechanism for regulating social relations and maintaining social order, law should not be altered impulsively. Modifying even a single legal relationship may introduce systemic risks and unintended consequences. Law inherently possesses a degree of lag relative to social change. When confronted with novel situations and phenomena arising from technological progress, the law ought to refrain from both preemptive prohibition and hasty endorsement. Instead, law

ought to embrace a posture of a humility, striving to carefully balance the dynamic interplay between technology, legal frameworks, and economic imperatives.

Rooted in the dialectical relationship between law and technology, the authors argue that in the AI era, the legal system should address emerging issues, including the integration of AI in arbitration, through an inclusive yet prudent regulatory approach. It is essential to construct an open legal discourse system that aligns with contemporary technological and societal developments, enabling adaptive and forward-looking governance of technological innovation. Such a shift also resonates with recent findings in AI ethics research, which reveal the pluralistic and evolving discourse structures shaping governance debates (Qiu et al. 2025).

5.1 Legal inclusivity and technology

The law's inclusivity toward technological advancement constitutes a foundational prerequisite for ensuring that technological innovation and its application are both legitimized and facilitated within a legal framework (Podgor 2018). An inclusive legal regime not only cultivates an adaptive ecosystem for technological development but also balances the dynamic interplay between technological progress, social norms, public welfare, and individual rights.

The law's inclusivity underpins the encouragement and promotion of technological innovation and research development (R&D) activities within the bounds of the law. By implementing proactive policy instruments – including tax incentives, financial support mechanisms, and targeted preferential measures – the law creates an enabling environment for technological innovation. For instance, many jurisdictions have formulated entrepreneurship and innovation policies, that offer preferential treatments (e.g., R&D tax deductions or exemptions) to incentivize enterprises to invest in and engage in technological innovation initiatives.

These policies have stimulated corporate innovation, attracted substantial investment and talent, and accelerated progress within the technology industry. At the same time, the protection afforded by intellectual property laws remains crucial for the sustainable development of technological innovation (Smith 2013). By enforcing strong intellectual property protections, such as patents, copyrights, and trademarks, the legal system ensures that innovators can secure reasonable returns on the outcomes of their innovative work, thereby encouraging continued investment in technological research and development.

The inclusiveness of the law is further demonstrated through its support for the application and commercialization of technology. Technological innovation requires more than theoretical and experimental results; it must also be implemented in production and daily life to generate economic value and social benefits. On one

hand, the law ensures the sustainability and safety of technological applications by establishing appropriate norms and standards. On the other hand, it safeguards intellectual property rights, facilitating the commercialization of technological innovations (Peng 2019). Through the protection of intellectual property such as patents, companies can gain a competitive market advantage, attract investment, and secure customer trust. By providing these essential guarantees, the inclusiveness of the law encourages enterprises to dedicate greater resources and effort to technological development.

The inclusiveness of the law allows technological development to operate within established social norms under a legal framework, thereby balancing the interests of all parties involved. By instituting appropriate rules and regulatory mechanisms, the law ensures that technological progress remains within permissible boundaries. This flexible legal structure reconciles the freedom of technological innovation with the protection of human dignity and fundamental values. Furthermore, the law facilitates the establishment of dedicated technology ethics committees or similar bodies to evaluate and oversee the ethical and social implications of technological advancements.

The mission of such institutions is to ensure that technological applications comply with legal and ethical standards, thereby preventing the potential misuse of technology. Accordingly, in the field of AI, several countries have established AI ethics committees to evaluate ethical and social concerns arising from the use of AI technologies. Through these regulatory and evaluative mechanisms, the inclusiveness of the law helps to ensure that technological advancement aligns with the broader interests of humanity (Cheng and Nasirov 2025).

Furthermore, in the digital era, the law plays a crucial role in balancing technological progress with the protection of individual rights, particularly in the areas of personal privacy and data security. As technology continues to evolve, the collection and utilization of personal information have become increasingly pervasive. In response, the inclusiveness of the law necessitates the enactment of comprehensive privacy and data protection regulations to prevent the abuse and unauthorized exploitation of personal data.

5.2 Prudence of law towards technology

The law serves as a regulatory and supervisory framework for technological innovation, ensuring that such innovation aligns with the public interest and addresses societal needs. Specifically, it imposes regulations on the licensing and certification of emerging technologies, mandating that innovators conduct security assessments, ethical evaluations, and compliance verifications. These procedural requirements

are instrumental in safeguarding the alignment of both the innovation process and its outcomes with legal provisions and ethical principles. Furthermore, the law ought to establish robust intellectual property regulatory regimes and policies to protect the rights of innovators, incentivize investment in innovation initiatives, and secure the fruits of innovative endeavors. By safeguarding innovators from the infringement of their legitimate interests, the law underpins the sustainable advancement of technological innovation.

Meanwhile, the law should develop a structured legal framework for safety governance and risk mitigation to address potential threats that technological progress may pose to human life and health. It must also formulate specific standards and norms to steer innovation toward sustainable development goals. In domains such as environmental protection and energy, legislation can introduce emissions benchmarks alongside energy conservation and emission reduction policies. These regulatory measures guide technological innovation toward clean energy solutions and a low-carbon economy, thereby providing institutional support for ecological sustainability.

In addition, the law regulates and safeguards the application of technology to prevent the infringement of public rights and interests. Notably, it ensures the security and compliance of technological applications, upholds the protection of personal privacy and data security, and defends the legitimate rights of consumers. To this end, targeted privacy protection and data security laws and policies should be established to curb the misuse or leakage of personal information. In the realm of internet and mobile applications, the law imposes obligations on technology companies to implement requisite security measures, thereby preventing violations of users' personal data and privacy (Hutchinson 2022).

The law must formulate and enforce relevant laws and policies to safeguard consumer rights while ensuring the quality and safety of technological products and services. In sectors such as electronics manufacturing and e-commerce, technology companies bear legal liabilities to provide accurate and reliable product information which not only guarantees product quality and safety but also ensures the protection of consumer rights throughout the entire lifecycle of purchase and usage.

The law provides strategic guidance and coordinated governance for technological development, thereby ensuring the rational application of technology and the maximization of social welfare. In particular, by formulating science and technology (S&T) policies and planning frameworks, the law guides the optimal allocation and utilization of S&T resources – an essential function that underpins technological innovation and industrial upgrading.

The law should establish strategic planning systems sand policy frameworks for technological advancement, clearing delineating key priority areas and development objectives. Governments may leverage these legal foundations to launch innovation-

driven strategic initiatives, which incentivize both fundamental research in critical fields. Such measures are instrumental in enhancing the contribution of technological innovation to economic growth and social progress.

Furthermore, the law ought to facilitate the optimal allocation and efficient utilization of S&T resources, while promoting the integration of technological innovation with industrial development. For instance, in the areas of technology transfer and intellectual property protection, legislation may establish targeted policies and institutional mechanisms to streamline the transfer of S&T achievements from research institutions to industrial entities. Concurrently, such legal frameworks should strengthen the protection of these achievements and support their practical application in industrial contexts, thereby bridging the valley of death between academic research and market-oriented innovation (Perlman 2024).

Finally, the law needs to strengthen supervision and regulation of technology enterprises and research institutions, while simultaneously promoting the cultivation and introduction of technology talents. Specifically, the law could formulate targeted support policies, offer preferential treatments and incentives for technological innovation and entrepreneurship, and thereby attract and retain outstanding science and technological talents, ultimately fostering the sustainable development of science and technology.

5.3 Legal inclusivity and prudence in the "AI + arbitration"

In the current era of AI, it is essential to uphold the legal principles of inclusiveness and prudence in the context of technological advancement. Accordingly, legislative and regulatory frameworks must be carefully designed to achieve a balance between these two values, particularly within the domain of AI-assisted arbitrator selection. This entails creating rules that are flexible enough to accommodate innovative applications of AI, such as data-driven arbitrator matching, bias detection, and case outcome prediction, while simultaneously instituting robust safeguards that ensure fairness, transparency, and the protection of parties' autonomy.

A thoughtfully constructed legal approach will encourage the responsible deployment of AI tools, enhancing the efficiency and accuracy of arbitrator appointments without undermining human oversight or ethical accountability. By harmonizing technological empowerment with foundational legal and procedural guarantees, such a framework supports the evolution of arbitration into a more sophisticated, yet still trustworthy, mechanism of dispute resolution. In doing so, it reaffirms the role of law as a stabilizing force that both enables progress and preserves core principles of justice.

Under China's current arbitration legislation, support for online arbitration and AI in arbitration has been explicitly affirmed through revisions to the *Arbitration Law*, thereby creating space for the integration of AI with arbitration practices. Concurrently, the *Legislation Law of the People's Republic of China* has granted local legislatures corresponding authority to enact rules. In the local arbitration laws of Shanghai and Hainan, emphasis has been placed on advancing the integration of AI with arbitration, aiming to leverage AI's value while focusing on synergy between AI applications in arbitration, data privacy protection, and technical oversight – efforts that collectively promote inclusive legislative development.

From the perspective of industry regulation, China is actively fostering the establishment of arbitration associations, shifting its arbitration framework from administrative oversight to industry self-regulation. This transition further reinforces respect for arbitration's autonomy, independence, and professionalism. Such a shift not only addresses regulatory gaps in overseeing AI in arbitration under inclusive legislative frameworks but also enables specialized regulatory experimentation. By doing so, it prevents AI adoption in arbitration from being unduly constrained by overly rigid rules, ultimately realizing an effective balance between technological innovation and regulatory stability (Migliorini and Wang 2025).

In terms of soft law application, relevant Chinese arbitration institutions have begun regulating AI-assisted arbitrator selection through revisions to arbitration rules or the issuance of specialized guidelines. For example, the CIETAC has adopted a prudent strategy for AI integration. Its *Guidelines on the Use of Artificial Intelligence Technology in Arbitration* clearly states: AI application in areas such as arbitrator selection, document processing, and legal research is encouraged to improve procedural efficiency and reduce dispute resolution costs; at the same time, a robust safeguard mechanism is established to address potential risks (CIETAC 2025). The guidelines strongly emphasize the principle of party autonomy, allowing participants to jointly agree on the way AI is used, and clearly stipulate that human arbitrators shall still bear ultimate responsibility for all awards. This framework demonstrates significant prudence: it requires comprehensive risk assessment, strengthens data security standards, emphasizes compliance with applicable laws and regulations, and ensures the principles of confidentiality, due process, and equal treatment throughout the process.

In this manner, AI serves as a valuable tool to improve the procedural accuracy and operational consistency of arbitrator appointment processes, while preserving the essential role of human discernment and ethical judgment in upholding the integrity of arbitral justice. This balanced approach ensures that technological adoption complements rather than supplants the core human elements fundamental to fair dispute resolution.

6 Conclusions

Through an in-depth analysis of AI's practical value in arbitrator selection, that is, enhancing values of the arbitrators' professionalism, optimizing appointment process, and strengthening procedural fairness, this article preliminarily reveals the broad application prospects of AI technology in arbitration. However, institutional concerns such as algorithmic manipulation, data privacy risks, and limitations of computational rationality should not be overlooked. In response to these challenges, this article puts forward three adaptive strategies: first introducing inclusive legislative provisions to embed institutional flexibility into arbitration laws, thereby accommodating technological advancements; establishing an industry-specific model supervision mechanism to improve algorithmic transparency; and third, developing arbitration-specific soft law instruments to regulate the application of AI in arbitration practice.

The integrated approach, combining inclusive legislation, regulatory oversight of industry-specific large language models (LLMs), and arbitration soft law, jointly lays a solid legal foundation and establishes an effective governance framework for the application of AI technology in arbitration. Flexible provisions within arbitration law enable timely identification of, and response to, technological changes and emerging challenges. Specifically, through enhanced information transparency and "cognitive justice" facilitated by industry LLMs, coupled with neutral supervision co-implemented by arbitration associations and government authorities, and guided by concrete rules and standards under soft law, the fair and rational use of AI technology in arbitration proceedings can be effectively safeguarded. This, in turn, underpins the development of a scientific and well-structured institutional system for AI-assisted arbitration.

The integration of AI and arbitration also prompts deeper reflection on the transformation of legal discourse in the AI era. This issue not only bears on the future of arbitration but also relates to the broader evolution of the legal system as a whole. Continuous technological advancement will inevitably drive fundamental changes across social institutions, including the legal sector. A critical challenge worthy of in-depth deliberation, therefore, lies in balancing the inherent stability of legal systems with the dynamism brought about by technological innovation. In essence, the law should adopt an inclusive yet prudent stance toward technological progress: preserving room for innovation while setting clear boundaries to prevent technology from fundamentally disrupting existing legal institutions and social order. Reform amid stability, and development amid change, should serve as guiding principle for the evolution of arbitration systems in the AI era.

References

Ahmed, Masood. 2010. Arbitration clauses: Fairness, justice and commercial certainty. *Arbitration International* 26(3). 409–420.

Ajunwa, Ifeoma & Austin Kamer. 2024. Data privacy by contract. *Cardozo Law Review* 45(5). 1436–1491.

Bennett, Belinda. 2012. Expanding horizons: Scientific frontiers, legal regulation, and globalization. *Indiana Journal of Global Legal Studies* 19(2). 507–532.

Blackman, James. 2025. Major European enterprises urge EU to 'stop the clock' on AI act. https://www.rcrwireless.com/20250704/policy/stop-clock-ai-act-eu (accessed 6 September 2025).

Broyde, Michael J. & Yiyang Mei. 2024. Don't kill the baby! the case for AI in arbitration. *New York University Journal of Law and Business* 21(1). 119–174.

Chen, Yihua. 2021. Revision of China's arbitration law: A new chapter. *Asian Dispute Review* 23(4). 156–163.

Cheng, Le & Xiuli Liu. 2023. From principles to practices: The intertextual interaction between AI ethical and legal discourses. *International Journal of Legal Discourse* 8(1). 31–52.

Cheng, Le & Jahongir Nasirov. 2025. Promoting trust and security in the digital domain: A discourse analysis of legal constructs. *International Journal of Legal Discourse* 10(1). 13–34.

Cheng, Le & Jiamin Pei. 2025. Legal discourse in transition: Technology, methodology, and sociology. *International Journal of Legal Discourse* 10(1). 1–11.

Cheng, Le, Jing Han & Jahongir Nasirov. 2024. Ethical considerations related to personal data collection and reuse: Trust and transparency in language and speech technologies. *International Journal of Legal Discourse* 9(2). 217–235.

Cheng, L., X. Gong & Y. Zhao. 2025. Big data versus big GPU: Evolving requirements and governance dynamics of AI training data. *International Journal of Digital Law and Governance* 2(1). 13–38.

CIArb. 2025. Guideline on the use of AI in arbitration (2025). www.ciarb.org/media/m5dl3pha/ciarb-guideline-on-the-use-of-ai-in-arbitration-2025-_final_march-2025.pdf (accessed 7 September 2025).

CIETAC. 2025. Guidelines on the use of artificial intelligence technology in arbitration. https://www.cietac.org/articles/33749 (accessed 7 September 2025).

Cinnamon, Molly. 2025. You have the right to be deleted: First amendment challenges to data broker deletion laws. *Georgetown Law Technology Review* 9(2). 492–537.

Dasteel, Jeff. 2021. Arbitration agreements that discriminate in the selection and appointment of arbitrators. *Richmond Journal of Global Law and Business* 11(4). 383–406.

Dou, L. & X. Dou. 2025. Towards just AI: Challenges and solution framework for algorithmic discrimination in judicial system. *International Journal of Digital Law and Governance* 2(1). 39–81.

Elyamany, Nashwa. 2024. The de-legitimation of machine learning algorithms (MLAs) in "The Social Dilemma" (2020): A post-digital cognitive-stylistic approach. *International Journal of Legal Discourse* 9(1). 59–92.

Evans, David L., Stacy Guillon & etal Ralph Losey. 2024. Dispute resolution enhanced: How arbitrators and mediators can harness generative AI. *Dispute Resolution Journal* 78(1). 57–92.

Florescu, Cristina Ioana. 2024. The interaction between AI (artificial intelligence) and IA (international arbitration): Technology as the new partner of arbitration. *Romanian Arbitration Journal* 18(1). 42–73.

Governatori, Guido & Antonino Rotolo. 2008. A computational framework for institutional agency. *Artificial Intelligence and Law* 16(1). 25–52.

Hars, Andras. 2021. AI and international law-legal personality and avenues for regulation. *Hungarian Journal of Legal Studies* 62(4). 320–344.

Herbosch, Maarten. 2025. Liability for AI agents. *North Carolina Journal of Law and Technology* 26(3). 391–458.

Hong, T. & M. Hu. 2025. Opportunities, challenges, and regulatory responses to China's AI computing power development under deepseek's changing landscape. *International Journal of Digital Law and Governance* 2(1). 83–105.
Hutchinson, Christophe Samuel. 2022. Potential abuses of dominance by big tech through their use of Big Data and AI. *Journal of Antitrust Enforcement* 10(3). 443–468.
Kaufmann-Kohler, Gabrielle. 2010. Soft law in international arbitration: Codification and normativity. *Journal of International Dispute Settlement* 1(2). 283–300.
Korzun, Vera. 2023. Enforcing soft law in international investment arbitration. *Vanderbilt Journal of Transnational Law* 56(1). 1–66.
Kumra, Divya. 2023. Independence and impartiality of an arbitrator. *International Journal of Law Management and Humanities* 6(1). 254–261.
Kwong, Katherine. 2017. The algorithm says you did it: The use of black box algorithms to analyze complex DNA evidence. *Harvard Journal of Law and Technology* 31(1). 275–302.
Li, Jian, Xintong Cai & Le Cheng. 2023. Legal regulation of generative AI: A multidimensional construction. *International Journal of Legal Discourse* 8(2). 365–388.
Lindquist, Derick H. & Ylli Dautaj. 2021. AI in international arbitration: Need for the human touch. *Journal of Dispute Resolution* 2021(1). 39–64.
Liu, Xiaohong & Shuo Feng. 2024. International commercial arbitration in the context of great changes: Global trends and China's response. *Social Sciences in China* 2024(12). 63–82.
Lu, Sylvia. 2022. Data privacy, human rights, and algorithmic opacity. *California Law Review* 110(6). 2087–2147.
Mao, Q. & M. Xu. 2025. Navigating the ethical landscape of AI innovation: Challenges and opportunities. *International Journal of Digital Law and Governance* 2(1). 197–221.
Matwyshyn, Andrea M. 2007. Technology, commerce, development, identity. *Minnesota Journal of Law, Science and Technology* 8(2). 515–550.
McManus, Spencer. 2017. Machine learning and fintech. *Georgetown Law Technology Review* 1(2). 428–435.
Miao, Michelle. 2025. Rule by algorithm. *Columbia Journal of Transnational Law* 63(3). 690–749.
Migliorini, Sara & Chitian Wang. 2025. The 'law of code': The EU and China's converging legal discourse on regulating algorithms. *International Journal of Legal Discourse* 10(1). 1–11.
Moreira, Joao Ilhao & Jiawei Zhang. 2025. GhatGPT as a fourth arbitrator? The ethics and risks of using large language models in arbitration. *Arbitration International* 41(1). 71–84.
Peng, Shin-yi. 2019. The rule of law in times of technological uncertainty: Is international economic law ready for emerging supervisory trends? *Journal of International Economic Law* 22(1). 1–27.
Perlman, Andrew M. 2024. The legal ethics of generative AI. *Suffolk University Law Review* 57(2). 345–364.
Pislevik, Stefan. 2018. Precedent and development of law: Is it time for greater transparency in international commercial arbitration? *Arbitration International* 34(2). 241–260.
Podgor, Ellen S. 2018. Recognizing inclusiveness. *UMKC Law Review* 86(3). 577–582.
Qiu, J., L. Cheng & J. Huang. 2025. Charting the landscape of artificial intelligence ethics: A bibliometric analysis. *International Journal of Digital Law and Governance* 2(1). 135–167.
Raub, McKenzie. 2018. Bots, bias and big data: Artificial intelligence, algorithmic bias and disparate impact liability in hiring practices. *Arkansas Law Review* 71(2). 529–570.
Rowe, Elizabeth A. & Nyja Prior. 2022. Procuring algorithmic transparency. *Alabama Law Review* 74(2). 303–364.
Schweller, Randall L. 2004. International relations and scientific progress: Structural realism reconsidered. *Perspectives on Politics* 2(2). 427–428.
Schwing, Mel Andrew. 2020. Don't rage against the machine: Why AI may be the cure for the 'moral hazard' of party appointments. *Arbitration International* 36(4). 491–507.

Shen, Wei & Tao Yu. 2016. The (IR) relevance of ADRs in resolving financial disputes: An empirical assessment and roadmap of Shanghai. *Hong Kong Law Journal* 46(3). 1017–1054.
Shih, Sean & Eric Chin-Ru Chang. 2024. The application of AI in arbitration: How far away are we from AI arbitrators? *Contemporary Asia Arbitration Journal* 17(1). 69–90.
Slobogin, Christopher. 2025. Data-driven police profiling. *University of Louisville Law Review* 63(3). 489–519.
Smith, Henry E. 2013. Property as platform: Coordinating standards for technological innovation. *Journal of Competition Law and Economics* 9(4). 1057–1089.
Stefer, Dominik & Victoria Fricke. 2025. From algorithms to awards: Exploring the technological and legal boundaries of AI's contributions to the work of arbitrators. *Arbitration International* 41(1). 49–70.
SVAMC. 2024. Guidelines on the use of artificial intelligence in arbitration. https://svamc.org/wp-content/uploads/SVAMC-AI-Guidelines-First-Edition.pdf (accessed 6 September 2025).
Swisher, Keith. 2024. Algorithmic judicial ethics. *Wisconsin Law Review* 2024(4). 1289–1332.
van den Berg, Albert Jan. 1981. *The New York arbitration convention of 1958: Towards a uniform judicial interpretation*. Hague: Kluwer Law and Taxation Publishers.
Waincymer, Jeffrey. 2015. Promoting fairness and efficiency of procedures in international commercial arbitration – identifying uniform model norms. *Contemporary Asia Arbitration Journal* 3(1). 25–64.
Wang, Qian. 2024. Creation is not like a box of chocolates: Why is the first judgment recognizing copyrightability of AI-generated content wrong? *GRUR International* 73(8). 772–777.
Xiao, Y. & X. Sun. 2025. Integration of soft and hard laws: Profiling legal protection for "AI for All". *International Journal of Digital Law and Governance* 2(1). 223–252.
Yeung, Man Sing. 2022. Selection of arbitrators: How choices may be made that are in the best interests of both parties. *Asian Dispute Review* 24(4). 160–167.
Yu, Hong-Lin & Laurence Shore. 2003. Independence, impartiality, and immunity of arbitrators – US and English perspectives. *International and Comparative Law Quarterly* 52(4). 935–968.
Zhao, Y. & Z. Ren. 2025. The alignment of values: Embedding human dignity in algorithmic bias governance for the AGI era. *International Journal of Digital Law and Governance* 2(1). 169–195.