

Article

Using AI in International Arbitration: From Predictive Analytics to Automated Awards

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Abstract: Modification International arbitration with the application of artificial intelligence (AI) does not leave all opportunities revolutionary, nor are all material challenges. The given discussion gives an overview of the growing use of AI in the fields of arbitrator selection, collection of evidence, predictive analysis, automation of legal research, and online dispute resolution. It emphasizes the way AI can be used to enhance efficiency, decrease expenses, as well as make better decisions based on advanced data analysis. Moreover, technology can enhance accessibility, include cultural sensitivity into transnational conflicts and strategically contribute to the legal environment. The application of AI in complex scenarios, however, has certain limitations caused by such factors as data shortage, regulatory risk, ethical issues, and technological limitations. Such issues are also complicated by the risk of privacy, algorithmic bias, and differences in terms of legal status of the AI-generated awards. One of the solutions is a hybrid system that would integrate the benefits of AI with the control of human beings, particularly in investment-state arbitrations and digitalization in the post-pandemic world. Nowadays, legal regulations, including the United States Federal Arbitration Act and the New York Convention, are not clear enough in the context of AI-generated awards, which is why they should be updated. In conclusion, the paper highlights the need to have a moderate integration of AI to settle the ethical concerns and utilize its potential to revolutionize international dispute resolution.

Keywords: artificial intelligence; international arbitration; dispute resolution; algorithmic bias; regulatory challenges; hybrid systems; predictive analysis; research automation

1. Introduction

A major change is occurring around international arbitration, based on the new technologies such as AI, digitization and blockchain that are transforming the traditional dispute resolution mechanisms. Stakeholders are increasingly discovering means of using these innovations to enhance efficiency, accessibility, and quality of the arbitration processes. The pandemic caused by COVID-19 hindered the rapid adoption of these technologies by necessitating the implementation of remote and digital solutions to maintain the sustainability of arbitration processes across the world (Eidenmueller et al. 2020). This development shows that the boundary between law and technology is increasingly becoming diffuse, which opens as well as poses challenges to the future of arbitration.

Among the primary trends in the given direction, the emergence of Online Dispute Resolution (ODR) deserves to be mentioned, as this approach implies the use of video conferencing, audio tools, and written collaborative platforms, as well as other digital tools to conduct arbitration, mediation, and negotiations (Alsamhan 2023). ODR enables the parties to settle disputes without meeting each other but still upholding the procedural integrity of conventional arbitration. The fact that these digital platforms are becoming more popular means that the legal profession is catching up with the digital era, but there are still issues of whether they are truly effective and how due process can be enforced in the digital setting.

Artificial intelligence (AI) has emerged as a disruptive technology in the arbitration field beyond mere digitization of the existing processes. Its development is primarily due to large investments and strategic plans abroad. The worldwide AI market is developing at an exorbitant rate and investments in cognitive AI systems are expected to hit USD 98 billion in 2023. The major economies, in particular, the United States and China, are making strenuous efforts in the leadership of AI through national policies, and other developed countries are also enhancing their capacities. This technological competition is also expanding into the legal field, and AI-enhanced technologies

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are already being applied to predict the outcomes of cases, determine arbitrators, and calculate damages, which are among the most important elements of arbitration practice (McLaughlin 2023).

Despite these developments, the possible consequences of AI and other digital solutions in arbitration have not been fully explored, especially in regard to transparency, accountability, and maintenance of human judgment in dispute resolutions. Consequently, the paper examines how technology has transformed international arbitration through the analysis of the existing applications, the opportunities and challenges that still exist. The work, by means of an academic literature review and recent tendencies, will attempt to add to the current debate concerning arbitration in a increasingly digitalized world.

2. The Role of Artificial Intelligence in International Arbitration

The use of AI is already felt in the different phases of international arbitration, and it is already providing new solutions to long-standing procedural and analytical problems. All these are efficiency, accuracy, and accessibility-improving developments in dispute resolution. The most important areas of AI applications in arbitration, such as the arbitrator selection, evidence processing, prediction of the outcome of a case, will be mentioned in this section. Decision support systems and new trends, such as Large Language Models (LLMs) and automated negotiation tools, will also be discussed.

2.1. AI in Arbitrator Selection

Optimized selection of arbitrators is one of the applications of AI that is required in arbitration. The AI-based systems interrogate the massive databases and web-based tools to assess competency, prior decision, and conflict of interest of arbitrators. In analyzing such data, AI tools will be capable of suggesting the most appropriate arbitrators in certain cases, thus making the procedure more transparent and limiting prejudices (Rhim et al. 2019). This kind of technological intervention eliminates time-consuming and subjective appointments of arbitrators as has always been the case and gives more confidence in the arbitration process.

2.2. AI-Assisted Evidence Gathering and E-Discovery

In arbitration, the pretrial process can be a time-consuming process of collecting and analyzing evidence. This is considerably simplified with the help of AI-based e-discovery tool, which performs successful search, categorization, and analysis of extremely large amounts of digital information. They use machine learning and natural language processing (NLP) to find the needed materials of the cases and save much time and expense that could be spent on reading the documents manually (Agus et al. 2023). Such advancements come in handy particularly in complex business litigation cases where large volumes of data must be handled within a limited period and without any errors.

2.3. Predictive Analytics for Case Outcomes

Increasingly, machine learning models are being used to predict the outcome of arbitration relying on data regarding prior cases and prior legal precedent. The International Chamber of Commerce (ICC), and the Permanent Court of Arbitration (Agus et al. 2023) are some of these institutions that have embraced predictive modeling to help the parties in the dispute to come up with the most effective dispute resolution strategies. Although the tools cannot substitute the legal judgment, they offer evidence-based information that improves decision-making and risk evaluation in arbitration.

2.4. Document Analysis and Legal Research Automation

The NLP features of AI systems allow them to analyze legal texts at high speed, extract relevant information, and find the patterns that might be unnoticeable during manual analysis. It is especially useful in cases of international arbitration, when laws and case laws of several jurisdictions need to be considered (Solhchi et al. 2023). AI is also able to eliminate human error when conducting legal research and enables legal practitioners to focus on the strategic steps of case preparation.

2.5. Online Dispute Resolution (ODR) and Remote Arbitration

The COVID-19 pandemic only quickened the process of the adoption of AI-based ODR mechanisms in international arbitration. Initially, ODR platforms were designed to resolve fewer complex disputes, but now they allow conducting hearings remotely, exchanging documents, and even automating negotiations (Ermakova 2023). Such systems guarantee the flow of arbitration processes whilst reducing any logistical hindrance, making the process of dispute resolution easier in the globalized setting.

2.6. Decision Support Systems for Arbitrators

AI can also act as an aid to arbitrators, making available in real time pertinent legal texts, professional norms or industry, and comparative case law. Nonetheless, the existing systems are not intended to substitute human decision-making but supplement it, making sure that ethical and situational factors are at the center of the arbitration decision (Agus et al. 2023).

2.7. Emerging Applications: Large Language Models and Automated Negotiation

The new generation of general-purpose AI (ChatGPT, Gemini (previously Bard), and other LLMs) has created new opportunities in the field of speech recognition and response generation within arbitration environments (Tsvina et al. 2024). Also, expert systems such as the GENIE use rule-based reasoning and multi-attribute analysis to counsel international conflicts (Zelevnikow 2021). Experimental automated agents also show promise in modeling bilateral crisis negotiations (Zelevnikow 2021). The innovations indicate that AI is increasingly becoming involved in procedural and substantive matters of arbitration.

3. The Benefits of AI Integration in International Arbitration

The incorporation of AI into international arbitration has the potential to revolutionize dispute resolution as it has countered the challenges that have always existed in the process of dispute resolution. AI is more efficient, cost-effective, accurate in decision-making, accessible, and fair, which is consistent with the main goals of Alternative Dispute Resolution (ADR). Moreover, its use in arbitration can act as a tactical basis of more extensive innovations in the legal system.

3.1 The Benefits of AI Integration in International Arbitration

One of the greatest advantages of AI in arbitration is that it is possible to automate activities that require a lot of time. Traditional arbitration can be very manual-intensive in terms of legal research and document review, and AI can greatly decrease the manual work. To illustrate, AI-driven technology can scan the entirety of huge legal databases and find and highlight the pertinent case law and outline the pertinent precedents in a fraction of the time it takes human practitioners (Kalalo et al. 2020). This efficiency is also carried to the pre-trial procedure where AI-based e-discovery software will have the ability to rapidly collect, process, and structure digital evidence, reducing time lag and improving the process of preparing the case (Agus et al. 2023). Routine operations can be automated using AI, which allows legal practitioners to focus on the more valuable aspects of arbitration, smoothing out the working process.

3.2. Cost Reduction and Financial Accessibility

The cost of arbitration has been a major impediment to the uptake of arbitration, especially by small companies and individual litigants. In this respect, AI helps to overcome this difficulty as it decreases the need to employ human labor and, therefore, decreases operational costs (Solhchi et al. 2023). The use of automated document reviews, predictive analytics, and AI-powered legal research reduces billable hours without sacrificing the quality of case preparation or even improving it. AI does not merely contribute to cost-saving in arbitration but also meets the fairness criterion of different parties in a dispute so that cost-effectiveness is not achieved at the cost of due procedure (Broyde et al. 2024).

3.3. Improved Decision-Making Through Advanced Data Analysis

The analytical capacity of AI contributes to a high degree of accuracy and consistency of the results of arbitration. Machine learning algorithms and NLP solutions also enable AI systems to process a large volume of legal documents, establish patterns, and predict case outcomes with a high degree of success (Solhchi et al. 2023). These tools present the arbitrators with empirical information to complement human judgment. Although AI does not substitute the discretionary power of arbitrators, it can be a useful decision support tool, minimizing cognitive biases and leading to the improvement of the overall quality of decisions.

3.4. Increased Accessibility Through Assistive Technologies

Arbitration is also becoming more democratic with the help of AI through the provision of user-friendly support systems. Chatbots and virtual assistants powered by AI can take the parties through the complicated arbitration process and explain in real-time the legal terms and procedural requirements (Solhchi et al. 2023). Such tools are especially useful to self-represented litigants or parties in jurisdictions with a weaker legal infrastructure so that the complexity of procedures does not act as a barrier to participation.

3.5. Cultural Sensitivity and Fairness in Cross-Border Disputes

International arbitration usually includes parties of different legal and cultural backgrounds, which also raises the possibility of misunderstandings. The presence of AI frameworks that can examine the cultural information in the stories of disputes reduces these issues by enhancing fairness and flexibility (Tubishat 2024). To give an example, AI will be able to see linguistic shades, ground culturally specific arguments, and even suggest culturally neutral arbitration tactics. Such sensitivity increases the validity of arbitration results, especially in international disputes where neutrality is the most important aspect.

3.6. Strategic Implications for the Broader Legal Ecosystem

In addition to the direct advantages, the implementation of AI to arbitration is also a strategic move to the legal profession in general. Arbitration, which has experienced increasing "judicialization," serves as an ideal testing ground for AI applications before their adoption in formal judicial systems (Broyde et al. 2024). Advances perfected in arbitration, including AI-supported legal analysis, automated case administration, and predictive analytics, can one day be transferred to courts and other ADR processes, leading to system-wide efficiency improvement throughout the legal profession.

4. Challenges and Limitations of AI in International Arbitration

Although there are transformative opportunities of AI in international arbitration, its use is subject to considerable practical, legal, and ethical challenges. These constraints will have to be addressed to make sure that the integration of AI will not derail but rather improve the arbitration process.

4.1. Data Scarcity and Training Limitations

One of the main challenges to successful AI application in arbitration is the insufficient training data. In contrast to court judgments, the awards in international commercial arbitration are usually confidential, which limits the creation of strong AI models (Malhoutra et al. 2022). Even though some initiatives provide the redacted awards, the confidentiality of arbitration processes inherent to any arbitration process hinders the development of extensive datasets that are required to train reliable AI systems (Malhoutra et al. 2022). Such absence of information makes us question the authenticity and the applicability of the AI-derived insights in terms of arbitration.

4.2. Regulatory and Legal Uncertainties

The current legal systems have not adapted to the advent of AI, and it is not clear how the results of arbitration that took place with the assistance of AI can be enforced. As noted by many researchers, "arbitration laws are not mature enough to absorb AI technologies," leaving open questions regarding the validity of AI-generated decisions (Hussain et al. 2023). Such a gap in regulation may discourage the confidence of AI-aided arbitration in jurisdictions whose legal framework does not leave specific guidelines on how to handle algorithmic decision-making. Another problem is that the capacity of technology alters faster than the law.

4.3. Ethical and Legitimacy Concerns

The moral aspect of AI in arbitration is a debatable question. From an Islamic legal perspective, for instance, research suggests that "an artificial intelligence arbitrator (AIA) cannot replace human arbitrators" (Hussain et al. 2023), reflecting broader cultural and philosophical reservations about AI's role in dispute resolution.

4.4. Limitations in Handling Complex Cases

AI systems proved to be more efficient in the environment of more standard disputes, such as investment arbitration, instead of highly complicated business cases that would demand individual assessment (Malhoutra et al. 2022). Even though AI will support the automation of the processes involved in predictable legal aspects, it will not be able to do so with context-specific disputes. This means that AI can only be integrated into the system of human arbitrators, but not as a complete substitute for human arbitrators in complex cases.

4.5. Privacy and Data Protection Risks

Application of AI in arbitration focuses significantly on the aspect of privacy, particularly in cases where arbitration involves a cross-border dispute, since there is no uniformity in data protection laws in different countries. Researchers emphasize the "legal and moral challenges such as ensuring transparency and justice and protecting personal data" when deploying AI (Azab et al. 2024). The issue of jurisdiction in the regulation of data also makes it more challenging to comply with, and strong protection is required to ensure confidentiality and fairness in the process.

4.6. Technological Limitations and the Need for Hybrid Approaches

Although AI is improving, modern technologies cannot be used to completely substitute human arbitrators. Studies indicate that while AI can assist in legal processes, it "still needs to be updated to entirely replace human judges" (Azab et al. 2024). Therefore, the most promising results can be achieved with a hybrid approach, which involves the combination of AI efficiency and human knowledge (Malhoutra et al. 2022).

5. The Evolving Role of AI in International Arbitration: Capabilities, Limitations, and Future Directions

The use of AI in international arbitration is about to change the process of dispute resolution considerably, but its complete automation is still limited by practical and normative restrictions. Although the speed of technological development has increased the number of possible AI applications, the academic and professional community has so far agreed that human arbitrators are unlikely to be fully replaced shortly. From an Islamic legal perspective, "an artificial intelligence arbitrator (AIA) cannot replace human arbitrators," reflecting a broader cross-cultural insistence on retaining human oversight in final decision-making (Hussain et al. 2023). This perspective aligns with ongoing debates in the field regarding whether "emotional human intelligence always outperforms AI, or if AI will, conversely, strengthen the arbitration process" (Ermakova 2023).

5.1. Hybrid Systems: Balancing AI Efficiency with Human Judgment

The way ahead seems to be the best in hybrid forms of arbitration that are calculated to incorporate analytical capabilities of AI but still retain the necessary human judgment. One such emerging framework is the Semi-Automated Arbitration Process (SAAP), which employs AI to "critically evaluate biases and qualitative-in-nature nuances" while ensuring human collaboration in the final analysis (DeShazer 2024). This model exemplifies AI's potential to augment-rather than replace-human arbitrators by enhancing objectivity, identifying latent biases, and promoting greater consistency in legal interpretation across jurisdictions.

5.2. Digital Acceleration Post-COVID-19 and AI's Expanding Role

The COVID-19 pandemic has acted as a catalyst for digital transformation in arbitration, establishing a "new basis for the functioning of the global arbitration system". Procedural shifts such as electronic filing systems, virtual hearings, and digital evidence management are now entrenched, creating a more receptive environment for adoption of AI. As machine learning tools become "widely available" to support arbitrators, their influence on procedural efficiency and decision-making accuracy is expected to grow (Ermakova 2023).

5.3. Investor-State Arbitration as a Testing Ground for AI

Investor-State dispute settlement (ISDS) represents a particularly promising arena for AI integration, with stakeholders actively "speculating on its future role" in this domain (Dar et al. 2023). With the criticisms that ISDS has received, such as inconsistencies in rulings and inefficiencies in procedures, the use of this specialized field can be used as a trial run of higher-level AI application use before its general use in international arbitration.

5.4. Legal and Regulatory Challenges

Although AI has a lot to offer, its smooth transition into arbitration has a lot of legal challenges. Current frameworks remain underdeveloped, as "arbitration laws are not mature enough to absorb AI technologies". For AI to deliver "added value to arbitration," legal systems must evolve to establish clear parameters governing its use, ensuring that human oversight remains central while leveraging AI's capacity for data-driven analysis (Hussain et al. 2023).

6. AI Applications in International Dispute Resolution: Advancements and Implementations

The incorporation of AI into international dispute resolution has brought in revolutionary improvements, increasing efficiency, precision, and strategic decisions. The GENIE system was one of the first innovations that were developed by one of the researchers in this field (Wilkenfield et al. 1995). It was the initial system to combine rule-based logic with multi-attribute analysis to derive advisory solutions to international disputes. Based on this foundation, another scholar then developed an automated negotiation agent that had the capability of engaging in bilateral crisis negotiations with human beings (Kraus et al. 2008). The dispute over fishing rights in the North Atlantic Ocean between Spain and Canada was one of the most interesting examples of using this technology as it demonstrates its experience in practice in conflict situations (Zelevnikow 2021). Excluding the support of negotiations,

AI has also been applied to international arbitration in terms of facilitating the process of procedures and making the decisions. To illustrate, the ICC International Court of Arbitration has already integrated machine learning algorithms into the process of predicting the results of arbitration and helping the parties to form the most effective dispute resolution strategies (Agus et al. 2023). Such predictive analytics can be useful in the process of strategic planning because they assist in the minimization of the uncertainty in complex arbitration cases, since they are founded on information.

Furthermore, AI has greatly improved the management of arbitration evidence using e-discovery tools. They are faster and more accurate than conventional methods of collection, analysis and presentation of digital evidence. Artificial intelligence provides e-discovery that can facilitate the resolution of a case in a better way by speeding up the pre-trial processes. Also, AI may act as a decision support system to arbitrators and provide them with real-time access to the appropriate legal precedents, industry norms, and jurisdiction laws. While these tools enhance arbitrators' understanding of complex cases, the final adjudication remains a human-driven process, ensuring that ethical and contextual considerations are preserved (Agus et al. 2023). The risk of running into cross-cultural communication barriers that can lead to misunderstandings and biased ruling is one of the most significant questions of international arbitration. To counter this, cultural nuance analysis frameworks based on AI have recently been developed, and these systems read through the narratives of the disputes and extract culturally sensitive words and phrases and contextual data. Such systems also promote more diverse and fair arbitration proceedings, especially when parties are not of the same legal and cultural backgrounds since they enable the identification of potential misunderstandings (Tubishat 2024).

In addition to such developments, generalizability and ethical issues in AI in dispute resolution remain lapsed. Although the current applications are effective situations, the literature still lacks determining their transferability to different legal frameworks and dispute resolution. Moreover, the question of automation versus human judgement should also be questioned continuously to make sure that AI is used to augment, but not to replace, the decision-making process that must be conducted in international arbitration. This section has highlighted some of the most important applications of AI in dispute resolutions with a focus on how it has helped in negotiation, arbitration, evidence management, and cultural analysis. The following part will address the issues and constraints, such as ethical aspects and the necessity of jurisdiction models regulating AI application in legal decision-making.

7. Ethical and Regulatory Challenges in AI-Powered International Arbitration

In the existing regulatory framework that cannot keep pace with the rapid advancement of technology, the use of AI in the international arbitration process is operating. Current research highlights that arbitration laws remain "not mature enough to absorb AI technologies," resulting in a misalignment between legal structures and AI capabilities (Hussain et al. 2023). The regulatory gap presents difficulty in the enforcement of AI-assisted or AI-generated arbitral decisions, particularly in cross-border cases in which various jurisdictions may use varying standards in accepting technology-mediated proceedings. AI-based arbitration cannot be valid until there are common sets of legal rules, and in the future, legal and policy frameworks will be required to make AI-based arbitration consistent and predictable.

7.1. Privacy and Data Protection Concerns

One of the most pressing ethical issues of AI-supported arbitration is privacy and data security. Given that confidentiality is a cornerstone of arbitration, the use of AI-which often requires processing vast amounts of sensitive case data-introduces significant legal and moral challenges, including "ensuring transparency and justice and protecting personal data" (Azab et al. 2024). Where international litigation is involved and parties are likely to resort to arbitration as an alternative to avoid litigation spotlight, AI systems should have data protection systems to guarantee confidentiality. Lack of sufficient privacy protection can also imply the loss of trust in arbitration as a dispute resolving mechanism especially in jurisdiction that has strong data governance laws like the General Data Protection Regulation (GDPR) in the European Union.

7.2. Algorithmic Bias and Fairness

The second important ethical consideration is the presence of algorithmic bias according to which AI can reproduce or intensify the biases that already exist in the legal decision-making process. While AI has demonstrated promise in enhancing "efficiency, accuracy, and objectivity" in arbitration, concerns persist regarding its impact on fairness (Solhchi et al. 2023). To mitigate these risks, hybrid models such as the Semi-Automated Arbitration Process (SAAP) have emerged, employing AI to "critically evaluate biases and qualitative-in-nature nuances" while retaining human oversight in final decision-making (De'Shazer 2024). These approaches also highlight that a balance must exist between efficiency of technology and ethical safeguards in order to prevent discriminatory outcomes.

7.3. Cultural and Religious Perspectives on AI in Arbitration

Cross-cultural and religious views also complicate the moral discussion of AI application in arbitration. For instance, Islamic legal scholarship does not inherently oppose AI technologies, provided they "serve humanity," yet maintains that "an artificial intelligence arbitrator (AIA) cannot replace human arbitrators" (Hussain et al. 2023). This perception can be reconciled with more broad-based cross-cultural anxieties about over-reliance on automated systems to adjudicate legal disputes and the desirability of human-level judgment in the interpretation of more subtle and context-sensitive conflicts.

7.4. Determining the Appropriate Scope of AI Integration

One of the main ethical questions of AI-assisted arbitration is the determination of its ideal role. Although AI can "bring added value to arbitration if... appropriately employed," the boundaries of its application remain contested (Hussain et al. 2023). Current scholarship suggests that while AI can enhance legal processes, it is not yet advanced enough to "entirely replace human judges" (Azab et al. 2024). Consequently, the most ethically viable approach involves leveraging AI as a supplementary tool-augmenting human decision-making rather than substituting it-to preserve fairness, accountability, and legitimacy in arbitration.

8. AI-Generated Arbitration Awards: Technical Feasibility and Legal Challenges

8.1. Technical Foundations of AI Arbitration

The technical capacity to produce AI-generated arbitration awards already exists in preliminary forms. Current online arbitration platforms employ tools capable of automatically generating decision proposals, indicating that the foundational infrastructure for AI-driven arbitration is being established (Bernhardt 2021). These systems demonstrate that further advancements could lead to fully automated arbitration processes, where AI not only assists human arbitrators but may eventually replace them in specific contexts.

The viability of AI arbitration hinges on several technical factors, including the system's ability to:

1. Process and analyze legal documents.
2. Comprehend complex legal arguments.
3. Apply relevant laws and precedents, and
4. Render logically reasoned decisions

While existing AI tools excel in structured data processing and rule-based applications, their ability to engage in nuanced legal reasoning-essential for arbitration-remains under development. Advances in machine learning and NLP have enhanced AI systems' capacity to interpret legal texts, a critical requirement for generating legally sound arbitration awards (Bernhardt 2021). However, persistent challenges include contextual understanding, legal interpretation, and adaptability to unpredictable scenarios that may arise during arbitration proceedings.

9. Legal Frameworks Governing AI Arbitration

9.1. Jurisdictional Variations in Legal Recognition

One of the main differences between traditional and digital arbitration is the decision maker. Whereas conventional arbitration relies on human arbitrators appointed by disputing parties, digital arbitration may involve resolution "automatically, i.e., by an agent of artificial intelligence". This shift raises critical legal questions, particularly whether AI systems can satisfy the requirement of an "impartial court" under arbitration laws. Some scholars argue affirmatively, suggesting that AI can meet impartiality standards, such as those outlined in England's Arbitration Law, which mandates a "fair resolution of a dispute by an impartial court without unnecessary delays or costs" (Ermakova et al. 2023).

9.2. The U.S. Federal Arbitration Act (FAA) and AI Arbitration

The FAA is a potentially favorable framework of AI arbitration in the United States. The FAA's core principle-enforcing arbitration agreements "according to their terms"-was reinforced in *AT&T Mobility LLC v. Concepcion*¹, in which the Supreme Court emphasized the role of the FAA to provide simplified dispute resolution. It means that when parties have explicitly agreed to AI arbitration, the agreements can be enforced under FAA. Besides, the preemption doctrine of FAA safeguards AI arbitration agreements against the statutes of other states. The Supreme Court has ruled that "the FAA overrides any state law that specifically discriminates against arbitration provisions" (Broyde et al. 2024). This principle was affirmed in *Perry v. Thomas*², in which the Court affirmed that the FAA preempted a California law that annulled arbitration agreements in wage claims (Broyde et al. 2024). Consequently, parties opting for AI arbitration are selecting an "alternative method for resolving disputes" rather than waiving substantive rights, bolstering the enforceability of AI-generated awards.

9.3. International Enforcement Under the New York Convention

The New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards serves as the cornerstone of international arbitration enforcement. However, its applicability to win AI-generated awards remains uncertain. While AI systems like "ArbBot" can render awards by analyzing precedents, their recognition under the New York Convention might be questionable and not stand the test of the NYC grounds". This uncertainty stems from the convention's drafting in an era when AI arbitrators were inconceivable. Despite these challenges, potential pathways exist for adaptation. The New York Convention could be "interpreted 'technologically'" to accommodate AI-generated awards without requiring a complete overhaul (Treacy 2022). However, national implementation remains a significant hurdle. Legal experts note that "under their internal legislation, local courts might refuse to recognize or enforce awards delivered by machines," even in signatory states. This is largely because most arbitration laws were enacted before AI arbitrators were viable. To enhance enforceability, countries must "promote legal reforms to be more receptive to this reality and foster a more arbitration-friendly environment" (Walters 2024). Such reforms should explicitly recognize AI arbitrators as valid decision-makers under the New York Convention's framework.

9.4. National Legal Reforms and Future Directions

The enforceability of AI-generated awards ultimately depends on domestic legal adaptations. A central question is whether AI systems qualify as an "impartial court" under national arbitration laws. Some jurisdictions, such as England, are beginning to consider AI as meeting impartiality standards (Ermakova et al. 2023). Reform efforts are already underway in certain countries. For example, Egypt is exploring amendments to its Arbitration Act to support AI-driven dispute resolution, recognizing "the significance of technology in improving legal processes" (Azab et al. 2024). There is, however, a temporal lapse between the current laws and the emerging technologies. Most arbitration laws were enacted before the prospect of AI arbitrators, and so they may contain barriers to enforcement (Walters 2024). To overcome these challenges, legal researchers promote the systematic changes aimed at aligning the arbitration frameworks with technological progress. These measures should also make sure that AI arbitration complies with the fundamental principles of arbitration, namely party autonomy, fairness of proceedings, and transparency, and allow the wider acceptance of AI-made awards.

¹ 563 U.S. 333 (2011)

² 482 U.S. 483, 491 (1987)

10. Conclusions

The use of artificial intelligence in the sphere of international arbitration is an opportunity to change the world and a set of challenges at the same time. As evidenced in this paper, artificial intelligence applications, including the use of arbitrator selection, predictive analytics, automated document analysis, and online dispute resolution, have a lot of potential to increase efficiency, lessen the cost of doing business, and better decision-making in cross-border dispute processes. Large language models and decision support systems are artificial intelligence-based tools that provide unmatched opportunities in the processing of large volumes of legal data and, in turn, automate the process that was traditionally labor-intensive. Moreover, the digitalization that followed the pandemic has further supported the idea of arbitration with the use of artificial intelligence, especially in the cases of investor-state disputes, where efficiency and scalability are essential. Nevertheless, the use of artificial intelligence in arbitration is not free of restrictions. The long-standing issues, such as the insufficiency of data, the bias of algorithms, and the ambiguities of regulations, prove the necessity of careful implementation. Moral issues, especially when it comes to fairness, transparency, and cultural sensitivity, lie at the center of impediment to mass adoption. The legal issues are complicated, as in the case of artificial intelligence-based arbitration awards, where the technical feasibility creates complex legal issues, especially during the enforcement of such awards under a regime like the New York Convention or the Federal Arbitration Act in the United States. Even the recognition of decisions made by artificial intelligence is a jurisdictional issue, which further complicates the way to standardization. In the future, a hybrid solution, which is a mix of the analytical capabilities of artificial intelligence and human control, can be the most feasible solution. These systems may help to reduce risks and take advantage of the efficiency offered by artificial intelligence. Moreover, continuous legal changes and collaboration across borders will be needed to fill the regulatory gaps and define the compliance of artificial intelligence with the existing principles of arbitration. The long-term effects of the introduction of artificial intelligence the arbitrator discretion, due process, and legitimacy of arbitral decisions should be discussed in future research, especially in culturally and legally diverse settings. Although artificial intelligence is set to transform international arbitration, its effective adoption would require an ethically sensitive, balanced approach that would accommodate both innovation and the principles of justice. There should be proactive debate among the stakeholders to address this changing environment, where technological development should be used as an aid rather than as a detriment to the fairness and effectiveness of dispute resolution.

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