

International Commercial Arbitration in the Digital Era: Balancing Efficiency and Compliance in Online Arbitration

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Abstract

In the post-epidemic era, the normalization of remote working has accelerated the process of online and offline integration and development of international commercial arbitration. This article focuses on the application of online arbitration in the field of international commercial arbitration. It aims to explore how to effectively give full play to its efficiency advantages and avoid compliance risks to promote the in-depth application of online arbitration. By combining the development process of online arbitration, it can be seen that it has gradually changed from a simple online conference tool to a comprehensive dispute settlement platform. Efficiency improvement and cost reduction are its core advantages. However, online arbitration also faces significant compliance risks. It mainly includes procedural justice questions raised by the digital environment and the difficulties in the execution of rulings caused by differences in the degree of acceptance in different jurisdictions. In response to this, China applies rule innovation, technology support and other models, walking out on a unique balanced road. Finally, the article puts forward the three-dimensional proposal of establishing unified standards at the transnational level, promoting the transnational application of blockchain and artificial intelligence technology, and keeping the ethical bottom line of technology application. Hope to build an efficient, fast, stable and reliable online arbitration global ecology.

Keywords

online arbitration, efficiency enhancement, compliance challenges

1. Introduction

Since the global outbreak of COVID-19 in 2020, a profound “digital transformation” has been taking place in the field of international commercial arbitration. During the epidemic, the physical distance has isolated arbitration institutions, arbitrators and parties. All participants need to change the original arbitration procedure and mode. Therefore, a new Internet-based arbitration method has been explored - Online Dispute Resolution (ODR). Although this change is forced to occur in the objective environment, it did not disappear because of the gradual elimination of the external conditions of the epidemic, but gradually tended towards normalization.

Traditional arbitration relies heavily on offline hearings. This is not only an institutional guarantee of procedural justice, but also an important means to control the authenticity of evidence and the norms of conduct.

The rise of online arbitration has changed the status quo, and the convenience it brings is self-evident. More and more arbitration institutions take the initiative to adopt digital tools such as video conferencing, electronic delivery, and cloud deposit [1]. The embedding of artificial intelligence, big data and other cutting-edge technologies has further amplified the efficiency dividend.

However, behind the empowerment of technology, the risk of compliance is increasingly prominent. From the protection of the rights and interests of the parties to the execution of disputes, online arbitration has been questioned by many. The lack of unified standards and the differences in basic technologies also hinder the sustainable development of online arbitration. How to keep the bottom line of the enforceability of the ruling under the framework of the New York Convention while releasing technical efficiency, and achieve a dynamic balance between efficiency and compliance, has become an urgent issue for discussion.

2. The Evolution and Current Situation of Online Arbitration

Online dispute resolution is not purely a product of the epidemic era, and its small-scale successful practice can be traced back to 2011. Modria, which was headquartered in Palo Alto, California, at that time, tried to provide online dispute resolution for enterprises involving more disputes. Developed the world's first end-to-end online arbitration platform, successfully resolved more than 60 million disputes for eBay and PayPal [2]. This proves that technical intervention has a positive impact on improving arbitration efficiency and reducing costs. Nowadays, with the integration of digital technologies such as artificial intelligence, “online arbitration” has also evolved from simple “online mediation” to “intelligent arbitration”. In practice, two main technical application models have been formed.

Table 1: Comparison of Major Online Arbitration Models

	Tech-Assisted	Fully Online
Core Features	Uses video conferencing platforms (e.g., Zoom/Webex) and electronic document exchange to replace certain offline procedures.	Relies on electronic data, artificial intelligence, automatically generated clauses, and smart contract enforcement.
Application Scenarios	Virtual hearings conducted by most traditional arbitral institutions.	Data asset disputes, virtual property disputes in the metaverse, and high-frequency low-value e-commerce transactions.
Advantages	Low cost, easy implementation, and preservation of the procedural fairness associated with traditional arbitration.	Automated enforcement, with blockchain technology ensuring that awards are tamper-proof and automatically executable, significantly shortens the arbitration cycle.
Limitations	Still dependent on human arbitrators for fact-finding and lacks data immutability.	Requires highly advanced technological infrastructure and faces stringent compliance challenges such as privacy protection.

Among them, the application of generative artificial intelligence is an important driving force to promote this transformation [3].

At present, the application of generative artificial intelligence in international commercial arbitration mainly includes the following three aspects: (1) Legal search. There have been some practical cases of applying artificial intelligence to assist legal retrieval at home and abroad. For example, OpenAI, Doubao, Deepseek and other models can master legal knowledge and analytical skills based on deep learning of existing databases. It shows strong retrieval ability in some specific fields [4]. (2) Document drafting and content induction. Based on a large number of sample corpus, the artificial intelligence model can realize the drafting of the preliminary draft of the ruling, proxy opinion, contracts, agreements and other legal documents. The content of the generated document is complete and coherent, and it is not easy to have problems such as missing content. It is convenient for arbitrators, lawyers, etc. to refer to and use directly [5]. (3) Case management and transcript production. Use artificial intelligence to manage the overall process of arbitration cases, and replace various matters that originally required manual coordination and follow-up with automated procedures. It can greatly reduce the complicated work pressure of the arbitration participants and focus more on dispute resolution. Now, most artificial intelligence can realize real-time transcription and automatically generate the trial transcript, which reduces the clerk's record work [5].

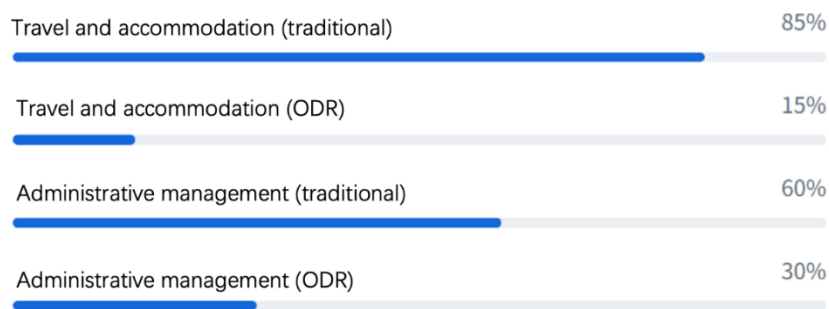
In such a technological application environment, many arbitration courts have begun to explore the establishment of a full-process online digital arbitration platform, including analysis, consultation, mediation and arbitration. For example, this year, the Hong Kong International Arbitration Center announced that it would open its case summary database free of charge from July 1, and in-depth cooperation with Jus Mundi, an internationally renowned legal technology platform, using Jus AI technology to help generate and share case summaries. In addition, the Shanghai International Arbitration Center has also built a digital and intelligent platform. It is convenient for the parties to inquire about the case and calculate the cost, and also provides the arbitrator with convenient functions for online case handling, such as schedule management and electronic file.

The development of online arbitration is reshaping the delivery of traditional legal services through automated processes.

3. Analysis of the Efficiency Improvement of Online Arbitration

The length of the procedure is a major weakness of traditional international commercial arbitration [6]. The parties often go all the way to the arbitration place because they need to attend offline hearings. This has resulted in high travel and time costs, and also prolonged the cycle of dispute settlement. Online arbitration breaks the constraints of space. Using virtual technology can make arbitration faster, cheaper and shorter in time [7].

Figure 1: Comparison of Cost Structures Between Traditional and Online Arbitration



China's practice provides strong support. Shenzhen International Arbitration Court (SCIA) has built a multilingual automatic translation system and high-definition video connection function on the online platform that meets the needs of actual work, which is known as a model of "smart arbitration". Its first "synchronous electronic delivery" was also a great success. In 2024, the online filing rate will reach 100%, 20230 times will be delivered electronically (+63.46% year-on-year), and 180,714 Chinese and English arbitration documents will be intelligently generated [8]. The efficiency is improved by 40%, saving more than 150,000 hours of time and cost for the parties... Online arbitration has opened up a wide space for efficiency improvement and reduced the cost of dispute resolution.

4. Online Arbitration Compliance Challenge

The compliance risk faced by online arbitration stems from the lag of legal regulation and the in-depth application of cutting-edge technology. This also reflects the urgent problem of coordination between the application of science and technology and the conviction of the law in online arbitration. It is specifically reflected in two aspects: First, the issue of procedural justice, the fairness of the ruling formation process is questioned; Second, the degree of recognition of online arbitration varies from different jurisdictions, and there are difficulties in implementation.

4.1 The Digital Dilemma of Procedural Justice

Procedural justice is one of the key points of contention in online arbitration. Changes in the rules of evidence and the lack of code of conduct for arbitrators have constrained the sustainable development of online arbitration.

The traditional international commercial arbitration system mainly relies on paper evidence. Most of the evidence in the online arbitration environment exists in the form of electronic data [7]. This has had a certain impact on the mature, stable, predictable and transparent legal environment provided by the New York Convention [9]. Because electronic evidence may be tampered with and is not easy to be discovered. Without strict technical means and technical specifications, it is likely to affect its integrity and authenticity [7]. It makes the arbitral tribunal fall into a passive dilemma, as it is difficult to confirm the three natures of evidence [10]. The parties only need to question that the other party's evidence has not been notarized or there is a possibility of tampering, which is enough to shake its proof.

The compliance challenge of online arbitration is not limited to the expression of evidence, but also extends to the behavior of "people" themselves. When the arbitration procedure is transferred from a relatively formal offline arbitral tribunal to a flexible online conference space, the professional code of conduct of arbitrators has also become blurred with the emergence of new scenarios. The increase in interference from the outside directly affects the justice of the arbitration procedure [11]. For example, in the process of an online arbitration court hearing of an equity dispute by the Chengdu Arbitration Commission, the "Wandering" behavior of an arbitrator during an online hearing has triggered legal disputes across the three jurisdictions. The arbitrator was disconnected and reconnected many times during the online trial. Obviously, he did not pay attention to the trial situation, and even confessed that he was "catching up with the high-speed rail and the signal was not good" under the question of the chairman of the arbitral tribunal. This is exactly the reason why the video court cannot provide a complete and real sense of the scene [12].

Regarding this case, the intermediate people's court in mainland China did not accept the party's objections. It is held that the arbitrator's misconduct constitutes merely a procedural irregularity, insufficient to affect the adjudication of substantive issues. However, during the enforcement phase, the Hong Kong courts refused to enforce the ruling on the grounds that it violated public policy and "shocked their conscience." It is held that, in the absence of the necessary attention to the adjudication of the case on the part of the arbitrator, fairness and justice cannot be realized. US courts, however, held the opposite view, arguing that the procedural flaws did not reach the level of influencing public policy. The reasons are as follows: The other two arbitrators participated in the hearings throughout, thereby maintaining procedural continuity; The party's attorney did not immediately lodge a strong protest during the trial; Both parties submitted written statements following the hearing, thereby remedying potential procedural defects.

The conflicting viewpoints across the three legal jurisdictions illustrate that the development of online transnational arbitration urgently requires updated codes of conduct for arbitrators or related guidelines. It prescribes how arbitrators are to perform their duties diligently, impartially, and efficiently in an online environment, and establishes specific standards [13]. For example: etiquette protocols for online hearings; response timeframes and content requirements for asynchronous communication; and red lines to prevent the procedural rights of litigants from being compromised by the technical conveniences involved. This is not merely an ethical imperative, but the cornerstone of procedural compliance that ensures the sustainable development of online international arbitral awards.

4.2 Legal Uncertainty in Cross-Border Enforcement

The difficulty of execution is also a major legal challenge facing online arbitration. In today's booming cross-border e-commerce, online arbitration platforms connect parties from different jurisdictions. The different attitudes and regulations of different jurisdictions towards online arbitration make international commercial arbitration face inevitable difficulties in execution [1].

Austria directly clarified the legality of online arbitration. Through the Supreme Court Case No. 18ONc3/20s, Austria recognized the discretion of the arbitral tribunal to decide on online arbitration. Even if one party raises an objection, the arbitral tribunal still has the right to decide on online arbitration. It reflects the positive attitude of the court to respect and support the execution of online arbitration. The United States adheres to the principle of judicial review in favor of arbitration to promote international commercial transactions. When faced with an application for online arbitration execution, the U.S. court will conduct a review that is "in favor of arbitration". When the online arbitration link actually affects the procedural rights of the parties and causes serious consequences, it will be regarded as a reason for refusal to recognize and enforce [14].

Such differences in legal positions are likely to make the online arbitration award of cross-border commercial contract disputes completely different from the direction of execution. For example, in a cross-border commercial contract dispute, one party may request the execution of an online arbitration award based on Austrian legal practice. Even if the other party doubts whether to reach an agreement on online arbitration, the other party may, based on the practice of U.S. courts, on the grounds that it is not conducive to international commercial transactions or international arbitration, require the court to refuse to recognize and enforce the results of online arbitration. This uncertainty may lead to a deadlock in the arbitration process at the final stage due to the execution of the dispute, thus invalidating all the results of the online arbitration. Difficulties in execution can be regarded as the core and ultimate challenge of online arbitration compliance, always threatening the effectiveness of online arbitration.

5. Exploration From the Perspective of China

Facing the characteristics of the efficiency advantage and compliance risk of online international arbitration, China's practice has explored a unique balance scheme, trying to strike a fine balance between the efficiency advantage of digital empowerment and the compliance bottom line of procedural justice.

In terms of technical perfection, considering that electronic evidence is easy to be tampered with and lost, the three major Internet courts in Hangzhou, Guangzhou and Beijing have built "judicial blockchain" and "Netcom legal chain" respectively [15]. By applying blockchain technology, the processing of digital evidence can be carried out in a safe and traceable environment. The authenticity and credibility of the data are ensured, so as to achieve the goal of de-falsifying and restoring the truth [16]. This proves that the determination of the authenticity of electronic evidence has always been a difficult point in judicial practice, but blockchain deposit is technically verified through the whole life cycle of electronic data from generation, storage to transmission, systematically building a complete chain of evidence authenticity, and realizing the organic integration of technical means and legal theory [17].

Secondly, in terms of rule construction, the Shanghai International Arbitration Center issued standardized online arbitration procedures such as *Guidelines for Online Arbitration*, *Instructions for the Use of Digital Intelligent Platforms*, *Confidentiality Statement of Online Trials* and *Statement on the Processing of Personal Information of Dispute Resolution Service Users* and so on. The relevant rules of online arbitration have been basically improved [14]. Take the *Online Arbitration Guidelines* as an example, while authorizing the use of efficient tools, China's arbitration institutions set rigid terms. To protect the reasonable and legitimate rights and interests of the parties. *The Online Arbitration Guidelines* encourage the use of online arbitration mode to improve the efficiency of dispute resolution. However, the parties must fill in and sign the corresponding Online Arbitration Confirmation as required, that is, make explicit consent before the arbitral tribunal can determine the online hearing [19]. So as to ensure that efficiency is improved without compromising the procedural autonomy of the parties and the procedural control of the arbitral tribunal. The newly revised *Arbitration Law* in 2025 also specifically stipulates that arbitration activities can be carried out online through the information network, except for those who clearly disagree. It reflects the protection of the rights of the parties. Regarding the issue of the code of conduct of arbitrators in online trials, *the Online Arbitration Guidelines* put forward the requirements of court discipline, environmental norms, instrument dress and other aspects to maintain the seriousness of the procedure.

The above-mentioned Chinese plan not only embraces technological dividends, but also adheres to the bottom line of procedures, providing a "Chinese sample" that is both innovative and stable for global online arbitration governance.

6. Future Outlook and Recommendations

In conclusion, online arbitration has broad application value in the international commercial field due to its unique advantages in efficiency. While certain risks exist regarding compliance, practice in China has nonetheless demonstrated the feasibility of striking a balance between the two sides. Looking ahead, the following measures may facilitate the further refinement of international commercial online arbitration.

Promote the establishment of unified online arbitration norms or guidelines that are universally recognized internationally [16]. Standards should be unified within a multilateral framework, spearheaded by

organizations such as ISO, UNCITRAL, and ICC, who should actively promote the formation of internationally recognized standards and codes of conduct for online arbitration and enhance the transparency of online arbitration proceedings and the enforceability of awards. China also possesses the capability to serve as a rule-maker for new frameworks, translating its sound practices into a distinct Chinese discourse that integrates into these emerging regulatory systems. The newly revised *Arbitration Law of 2025* also supports domestic arbitration institutions in strengthening exchanges and cooperation with overseas arbitration institutions and relevant international organizations, and actively participating in the formulation of international arbitration rules. The integration of Chinese wisdom can foster the development of online international commercial arbitration into a more stable, credible, and organic system.

Promote the deep, cross-border application of technologies such as blockchain and artificial intelligence. The immutable and fully traceable characteristics of blockchain technology help ensure the authenticity of evidence, safeguard data sovereignty and prevent the excessive cross-border leakage of domestic data. Promote the international application of blockchain, and establish a foundation of trust for cross-border electronic evidence preservation and verification. To facilitate the smooth transfer of evidence during cross-border law enforcement and to ensure the accurate retrieval and effective use of evidence in international judicial cooperation [15]. Only in this way can online adjudication be endowed with reliable and rigorous safeguards. Also, arbitration institutions in all countries should, in accordance with international standards, promote the compatibility assessment of domestic blockchain systems to ensure the alignment of their technology with international standards [16].

Uphold the ethical boundaries of technology application. The application of technologies such as artificial intelligence should be kept within certain limits [19]. Technology can only assist referees; it cannot replace human officials. An arbitral award must undergo careful consideration and discussion by the arbitral tribunal. The final decision-making authority must never be ceded to artificial intelligence models. While acknowledging the efficiency improvements that modern technology brings to legal retrieval, document organization, and evidence analysis, it is essential to assess the security and accuracy of these technological methods.

By promoting unified international rules and deepening the transnational, reliable application of blockchain, and adhering to the ethical core of “technical assistance and human refereeing”, Online arbitration cannot only be more efficient and convenient, but also win universal recognition and execution worldwide with its solid credibility, which ultimately serves the new order of more inclusive and fair international commercial arbitration.

7. Conclusion

Online arbitration is an important development direction for international commercial arbitration in the digital age. It can effectively enhance the efficiency of dispute resolution, reduce the costs of cross-border transactions, and drive the digital transformation of international commercial dispute resolution mechanisms. However, it still faces greater compliance challenges in terms of procedural justice, data security and cross-border ruling enforcement. This article believes that the key to the future development of online arbitration lies in achieving a balance between efficiency and compliance. By improving the coordination mechanism of international rules and promoting the standardized application of technologies such as blockchain and artificial intelligence, strengthening technical ethics and the protection of the rights of the parties, and building a more efficient, transparent and reliable digital arbitration system.

There are still certain limitations in this article. For example, the comparative analysis of the differences between different jurisdictional systems is not sufficient. There is also a lack of empirical research on the long-term effect of emerging technologies in arbitration practice. In the future, we can further combine specific cases and cross-border practices. Delve deeply into issues such as the harmonization of online arbitration rules, technological governance, and international collaborative regulation, with a view to fostering the continuous improvement of the global online arbitration ecosystem.

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