
START TO END? THE EXTENT OF COMPLETE DIGITALISATION OF THE PROCEDURE UNDER MARITIME ARBITRATION

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ABSTRACT

The maritime industry, vital for global trade, encounters complex disputes that are commonly resolved through arbitration. Integration of contemporary cutting-edge technologies, including blockchain, artificial intelligence (AI), and data analytics tools, in maritime arbitration would be largely beneficial for the industry for streamlining the procedure under maritime arbitration. In order to highlight their significance in expediting and streamlining the arbitration procedures, the possible applications of blockchain, data analytics tools, internet platforms, and artificial intelligence have been discussed in the article. The paper then delves into the benefits of technology in transparency, cost-effectiveness, and efficiency, and envisions complete digitization of the arbitration process from the initiation of arbitration to the enforcement of the award. Towards the end, a number of complications have been reviewed, including possible coding flaws in smart contracts, jurisdictional issues, concerns about data security, and certain legal complications among other issues. After a thorough evaluation of the same, a proposition has been put forth suggesting cooperative efforts amongst the stakeholders involved to address the difficulties by issuing guidelines and develop best practices for the effective integration of technology in maritime arbitration.

1.0 Introduction

In the context of contemporary technological developments including blockchain technology, artificial intelligence, data analytics tools, and more, integration of such advancements has increased rapidly across a range of domains. International commercial arbitration is one such notable domain that has evidenced early usage of these technologies in its operational procedures. Maritime disputes make up a significant portion of international commercial arbitration, indicating the importance of the use of the said technologies in this domain.¹

It is pertinent to acknowledge here that maritime arbitration is substantially similar to other types of commercial arbitration, ergo, what sets it apart is the international composition of the parties involved.² Due to the cross-border nature of these agreements stakeholders under maritime operations require an efficient and expedited private dispute resolution system for any issues that may emerge within the scope of the contractual arrangements or otherwise. In view of the same, *complete digitalisation* of the process of maritime arbitration could be proved to be *substantially beneficial* for the parties involved.

2.0 Need for digitalisation of maritime arbitration

Facilitating over 80% of worldwide trade volume and significantly relying on maritime transport, the maritime industry acts as the cornerstone of the global economy. Disputes often emerge in this sector due to the complexities involved, consequently, they are primarily resolved through maritime arbitration.³ Although maritime arbitration is a subset of commercial arbitration, it is distinguished by its particular field of application, which includes the interpretation of charter parties, affreightment contracts, bills of lading, maritime carriage of commodities, etc.⁴ The parties involved in maritime arbitration frequently originate from various countries and navigate comprehensive trade regulations that involve numerous customs and procedures. Consequently, it has contributed to the exponential growth of

¹ Hugh R. Williamson, International Maritime Arbitration: Dispute Settlement without Recourse to the Courts, 7(1), 94, *Ocean Yearbook Online*, <https://doi.org/10.1163/221160088X00075>

² Eva Litina, Theory, Law and Practice of Maritime Arbitration, Volume 60, International Arbitration Law Library Series

³ Review of Maritime Transport 2023, UNCTAD, <https://unctad.org/publication/review-maritime-transport-2023>, Nov 2 2023.

⁴ Hugh R. Williamson, International Maritime Arbitration: Dispute Settlement without Recourse to the Courts, 7(1), 94, *Ocean Yearbook Online*, <https://doi.org/10.1163/221160088X00075>

maritime arbitration since it provides a way to swiftly, effectively, and most importantly, fairly resolve numerous disputes resulting from maritime trade.⁵

The digitalization of maritime arbitration bears particular relevance because of the industry's distinct requirements, even though it shares commonalities with the larger context of digitalizing international commercial arbitration. Speed and efficiency are critical with respect to the disputes in the maritime industry. Thus, the advent of digital platforms has gradually kindled a revolutionary phase in maritime arbitration by permitting the effortless involvement of arbitrators, parties engaged, and attorneys from various geographical locations. Such worldwide reach highlights the role of digitalization in promoting inclusion among the diverse stakeholders engaged in arbitration.⁶

In addition to this, the operational procedures of the maritime industry itself have been subject to a digital transition; consequently, it can be stated that a digitalized arbitration paradigm would be in alignment with the industry's widespread dependence on digital procedures. Thus, the maritime industry could potentially create a harmonious interaction between its core activities and its dispute resolution systems through introducing digitalization in both domains.⁷

In view of the aforementioned aspects, it can be inferred that digitalization in maritime arbitration essentially addresses the *industry's innate need for speedy, equitable and effective dispute resolution*, while taking into account the complexities of the international maritime commerce.⁸ It integrates global stakeholders and corresponds optimally with the industry's growing reliance on digital procedures. By preserving the integrity of its trade operations and commercial transactions, the interaction between digitization and maritime arbitration ensures the industry's optimum efficiency.

3.0 Use of Online Platforms, Blockchain, Artificial Intelligence, Data Analytics tools in maritime Arbitration

Maritime arbitration has the potential of undergoing complete digitalization by employing

⁵ M Goldby, L Mistelis, *The Role of Arbitration in Shipping Law*, (eds) Oxford University Press, 2016.

⁶ Id.

⁷ Accelerating Digitalization Across the Maritime Supply Chain, The World Bank, <https://www.worldbank.org/en/topic/transport/publication/accelerating-digitalization-across-the-maritime-supply-chain>, Oct 25th 2023.

⁸ Id.

online platforms, Blockchain, Artificial Intelligence (AI), and Data Analytics tools. These technological advancements present various methods to streamline every stage of the arbitration process, thereby enabling *complete digital transformation of the procedure from start to finish*. The possibility of practical implementation of such a transition can be understood by assessing the use of each of the mentioned digital tools in maritime arbitration and international commercial arbitration.

3.1 Online Platforms

The global outbreak of COVID-19 necessitated arbitrators, parties, and legal counsels to transform to virtual hearings as a response to travel restrictions, health variables, and the vital need of maintaining social distancing measures. Virtual hearings are characterized through the adoption of video conferencing tools for enabling remote proceedings.⁹ Through this method, the parties and the arbitrators could convene from numerous locations to put forth evidence, question witnesses, and submit their arguments. The efficient and secure completion of such procedures depended on effective coordination. Following the pandemic, virtual hearings have become an increasingly common procedure in international arbitration owing to the numerous advantages they offer, such as cost savings, enhanced scheduling flexibility, participation from any location and heightened efficiency.¹⁰

In a similar vein, the procedure for conducting virtual hearings in maritime arbitration largely resemble those in international commercial arbitration. Here, the use of video conferencing technology enables remote participation, facilitating parties, arbitrators, and witnesses to participate without succumbing to the geographical constraints.¹¹ Therefore, maritime arbitration, like other virtual hearings, can benefit from the reduced costs, enhanced efficiency, and convenience of scheduling that virtual hearings provide.

3.2 Blockchain

Blockchain technology is revolutionising data storage practises and has emerged as a

⁹ Maxi Scherer, Niuscha Bassiri, and Mohamed S. Abdel Wahab, International Arbitration and the COVID-19 Revolution, Kluwer Arbitration Blog, 5:10 pm 22nd Oct 2023, <https://arbitrationblog.kluwerarbitration.com/2020/10/08/international-arbitration-and-the-covid-19-revolution-part-1-of-2/>

¹⁰ Chen, L, Will Virtual Hearings Remain in Post-pandemic International Arbitration?, Int J Semiot Law, <https://doi.org/10.1007/s11196-023-10054-7>

¹¹ Id.

revolutionary force in several industries, including the maritime sector. Blockchain technology, characterised by decentralised, irreversible digital databases, has the potential to completely transform data storage methods owing to its properties of cost-effectiveness, accountability, transparency, and efficiency.¹²

Using smart contracts—self-executing contracts with their terms encoded into a blockchain is one of the principal uses of blockchain technology in maritime arbitration. By automating difficult procedures, these contracts improve maritime commerce's security and efficiency. For instance, smart contracts can automate the whole life cycle of a vessel, from ownership transfer to constructing milestones, removing the need for human intermediaries.¹³ Smart contracts and blockchain technology have numerous potential applications in the maritime sector, but they are not without risks and restrictions. To fully utilise distributed ledger technology and properly handle possible issues in the maritime industry, a well-balanced strategy that combines technological innovation with conventional legal competence is of the utmost importance.¹⁴

3.3 Artificial Intelligence

Artificial intelligence (AI) and its application to international commercial arbitration (ICA) and maritime arbitration, have become one of the prominent issues of discussion within the legal fraternity since the emergence of ChatGPT and other AI platforms. The possible application of AI in maritime arbitration can be divided into two primary categories. The first involves using AI as a tool to aid the parties involved with different aspects of the arbitration process, such as generating documents and estimating possible case outcomes. With the use of AI, human participants can make decisions more effectively and efficiently without having to replace them. The second approach, on the contrary, uses AI in a more revolutionary manner by deploying AI technologies to replace the arbitrator or the tribunal entirely. This paradigm shift redefines the traditional arbitration dynamics by considering AI as the decision-maker and raising concerns about the moral, legal, and practical ramifications of granting AI systems this form of authority.

¹² Giles Xuereb, Blockchain and Smart Contracts in the Shipping Industry: Legal Considerations, Fortior Law. <https://fortiorlaw.com/news/blockchain-and-smart-contracts-in-the-shipping-industry-legal-considerations/>

¹³ Sharath Mulia, Romi Kumari, Blockchain Arbitration: The Future of Dispute Resolution, Fox Mandal, <https://www.foxmandal.in/blockchain-arbitration-the-future-of-dispute-resolution/>

¹⁴ A Look at the Use of Blockchain Technology in the Arbitration Process, Concord Law School. <https://www.concordlawschool.edu/blog/news/blockchain-arbitration/>

3.3.1 AI as a Machine Learning Tool

AI was typically viewed as a component of LegalTech tools before the launch of ChatGPT in November 2022, with no clear requirement for soft law or regulations. AI and international arbitration offer options for cooperation that could be advantageous to the arbitration community. Artificial Intelligence has significant potential uses in document identification, text generation, translation, and transcription.¹⁵

AI can improve legal representation through case analyses, arbitration clause drafting ideas, and second opinions.¹⁶ Additionally, it can help with adjudication services like award preparation and arbitrator appointments. Arbitral institutions can use data-driven insights to automate case administration, assess costs and duration, and present settlement options. Through such use, decisions made by parties involved in maritime arbitration could be better informed.¹⁷ Furthermore, self-regulation in resolving disputes may potentially be made viable through blockchain and AI technologies. AI is therefore viewed as a useful instrument for increasing the effectiveness of arbitration, reducing expenses, and encouraging equitable and transparent decision-making.¹⁸

However, the use of AI technologies in arbitration has made it necessary to consider the ramifications and possible consequences. Concerns over AI's impact on the rule of law and the administration of justice have been raised by arbitrators' use of the technology. The EU AI regulation recognises certain AI platforms as "high-risk" encompassing methods of alternative dispute resolution, that can be applicable to AI use in arbitration.¹⁹ The personal nature of an arbitrator's mandate, known as *intuitu personae*, may limit the tasks that can be assigned to AI systems.

Moreover, AI also raises ethical questions for lawyers that have an impact on their obligations to both the arbitral tribunal and their clients. Given the implications of AI use for

¹⁵ Claire Morel de Westgaver, *Canvassing Views on AI in IA: The Rise of Machine Learning*, Kluwer Arbitration Blog, <https://arbitrationblog.kluwerarbitration.com/2023/07/12/canvassing-views-on-ai-in-ia-the-rise-of-machine-learning/>, Nov 1st 2023.

¹⁶ *Id.*

¹⁷ Lucas Bento, *International Arbitration and Artificial Intelligence: Time to Tango?*, Kluwer Arbitration Blog, <https://arbitrationblog.kluwerarbitration.com/2023/07/12/canvassing-views-on-ai-in-ia-the-rise-of-machine-learning/> Oct 29th 2023.

¹⁸ *Id.*

¹⁹ *Id.*

confidentiality, lawyers may need to inform their clients about its use. Thus, lawyers have an ethical obligation to confirm information produced by AI tools in order to maintain ethics and accountability.²⁰ The increasing application of AI in arbitration raises important questions about transparency and regulatory issues. Legal authorities are investigating new AI-related guidelines, counsel regulations, and disclosure of AI in material contributions to enable efficient use of AI in the legal field. Ergo, even if AI has the potential to be revolutionary, there are issues like bias, hacking, and transparency that need to be resolved for its effective usage.²¹

3.3.2 AI as the Arbitrator

AI can also be used in commercial or maritime arbitrations to completely replace arbitrators or arbitral tribunals in the traditional sense, giving rise to Artificial Intelligence Arbitrators, or ArBots.²² In consideration of the same, it would be pertinent to review a study that was conducted to analyse the usage of ChatGPT as a competent arbitrator or tribunal in maritime disputes. In the study, it had been demonstrated that ChatGPT provides noteworthy advantages in excelling in speed, efficiency, impartiality, cost-effectiveness, and confidentiality. However, ChatGPT was stated to be incompetent to set legal precedents or prove its expertise in maritime issues. It does not have the capability to manage procedural matters, assist with arbitrator appointments, or assess the reliability of witnesses.²³ It also had issues with data scarcity and the potential for false information. The study had recommended clarifying AI's role in arbitration and instituting an automatic right of appeal to resolve some of these concerns.

In consideration of the same, it can be inferred that although AI use may be swift, efficient, and equitable; issues related to legal expertise, management of procedures, and implementation of awards need to be addressed before it can be commonly adopted.²⁴ It is expected that within the next 20 years, completely autonomous ArBots that can conduct entire arbitrations without the need for human interaction may *potentially* become a reality. But there are obstacles to

²⁰ Claire Morel de Westgaver, Canvassing Views on AI in IA: The Rise of Machine Learning, Kluwer Arbitration Blog, <https://arbitrationblog.kluwerarbitration.com/2023/07/12/canvassing-views-on-ai-in-ia-the-rise-of-machine-learning/>, Oct 29th 2023.

²¹ Id.

²² Abhilasha Vij, Arbitration Tech Toolbox: Are We Ready for the ArBot?, Kluwer Arbitration Blog <https://arbitrationblog.kluwerarbitration.com/2021/12/03/arbitration-tech-toolbox-are-we-ready-for-the-arbot/>, Oct 24th 2023.

²³ Kevin Chan, 'A New Era of Maritime Arbitration: Ex Machina Determinations', Vol 40, Issue 5, 521, in Maxi Scherer (ed), Journal of International Arbitration, Kluwer Law International 2023, <https://doi.org/10.54648/joia2023022>

²⁴ Id.

overcome, including those related to explainable AI, transparency, and compliance with the New York Convention. The COVID-19 pandemic has expedited the integration of technology in the realm of dispute resolution, making the creation of ArBots, although *primarily futuristic, an actual possibility*.²⁵ Therefore, even though there may be a possibility wherein AI could be replaced as arbitrators, this may not be incorporated as one of the steps in complete digitalisation of maritime arbitration as this is largely a far-fetched idea that may not yet be practically enforceable.

4.0 Data Analytics Tools

The maritime industry produces large amounts of data, which makes it a useful resource for use of data analytics tools in improving the arbitration procedure. In such instances, data analytics tools are essential because they allow parties and arbitrators to use large datasets to their advantage, to make choices that are more informed and more effective for a better final outcome.²⁶

Data analytics has a number of benefits for maritime arbitration, one of which is its ability to reveal undiscovered insights from previous case laws. These technologies allow for the analysis of previous arbitration procedures in order to identify certain trends and patterns. This empirical analysis strengthens the parties' negotiating strategies and gives them the ability to assess the possibility of their claims being effective. When stakeholders possess a thorough awareness of previous case outcomes, they can make better informed decisions and have more productive settlement negotiations.²⁷

Additionally, data analytics tools have an essential position in damage assessment. Through the use of objective characteristics in data analysis, these technologies create a formalised framework for compensation estimates. This procedure increases the fairness and dependability of the arbitration process by minimising subjectivity and ensuring that awards are supported by factual evidence.²⁸

²⁵ Abhilasha Vij, Arbitration Tech Toolbox: Are We Ready for the ArBot?, Kluwer Arbitration Blog <https://arbitrationblog.kluwerarbitration.com/2021/12/03/arbitration-tech-toolbox-are-we-ready-for-the-arbot/>, Oct 24th 2023.

²⁶ Sea Law Central Team, The Future of Maritime Arbitration: Technology and Innovation, Sea Law Central, <https://sealawcentral.com/maritime-arbitration-law/future-maritime-arbitration-technology-innovation/>

²⁷ Id.

²⁸ Id.

In view of the same, data analytics technologies can be understood to be essential resources for maritime arbitration. The efficiency, transparency, and fairness of the arbitration process are substantially enhanced by their capacity to extract relevant and useful insights from the abundance of data pertaining to the maritime industry. As maritime trade and disputes keep evolving, adopting data analytics cannot merely be considered as an option but an essential requirement to navigate this sector effectively.²⁹

5.0 Scope of Digitalisation from Start to End

In light of the fact that maritime arbitrations, akin to other types of international commercial arbitration, have progressed to adopt contemporary technology; it is possible to integrate the said technology in a way that facilitates the conduct of maritime arbitrations entirely in a digitalized format, from the commencement of proceedings to their eventual conclusion. Thus, the parties would benefit greatly from the integration of Artificial Intelligence (AI), blockchain, data analytics tools, and virtual hearings in an effective manner, which would also make the process more transparent, cost-effective, and efficient.

a. Initiation of Arbitration and Selection of Arbitrator:

The commencement of the arbitration agreement usually marks the beginning of the maritime arbitration process. On blockchain systems, parties have the option to use "smart contracts" to automate and speed up this process. In the event of a dispute, smart contracts guarantee the automatic commencement of arbitration, expediting the procedure.³⁰

AI algorithms that match the competence of the arbitrator with case-specific needs can improve the process of selecting arbitrators. In order to ensure the best fit for the dispute, data analytics technologies can shortlist arbitrators based on prior decisions (contingent on their availability) and specialised knowledge in maritime issues.³¹

b. Pleadings/ Written submission of the Parties:

AI provides models and recommendations to help parties draft pleadings. In order to present a

²⁹ Id.

³⁰ Giles Xuereb, Blockchain and Smart Contracts in the Shipping Industry: Legal Considerations, Fortior Law. <https://fortiorlaw.com/news/blockchain-and-smart-contracts-in-the-shipping-industry-legal-considerations/>

³¹ See discussion supra sub-section 3.0

more accurate argument, data analytics technologies assist in identifying pertinent precedents and case laws. All submissions can be safely stored on blockchain's indelible ledger, ensuring the authenticity of the evidence.³²

c. Virtual Hearings:

Virtual hearings have been increasingly prevalent in maritime arbitration, providing several advantages. Through the use of video conferencing technology, participants in these proceedings from various locations can present evidence, examine witnesses, and present arguments. Blockchain technology offers a tamper-proof and time-stamped record of the hearing, while AI-driven transcription and translation technologies assure accurate records.³³

d. Award and Enforcement:

AI tools could assist arbitrators reaching decisions by analysing the evidence and pertinent legal principles. More consistent awards may emerge from the use of predictive analysis, which can offer insights into possible outcomes.

The arbitral award can be delivered electronically and be signed via blockchain's digital signatures for confidentiality and security. AI could be used in drafting the award, ensuring accuracy and uniformity in language used. Enforcement of awards could benefit from blockchain's transparency. It is simple for parties to confirm the legitimacy and validity of an award through such use. When an award is issued, smart contracts can be used to automatically pay compensation, maintaining timely compliance.³⁴

In conclusion, through such application of technology in maritime arbitration, the digitalised procedure would not just contribute to complying with the advancement of the maritime industry, but it would also position it for a more robust and adaptable future in resolving disputes effectively and fairly.

³² Id.

³³ Wendy Gonzales, Naimeh Masumy, Online Dispute Resolution Platforms: Cybersecurity Champions in the COVID-19 Era? Time for Arbitral Institutions to Embrace ODRs, Kluwer Arbitration Blog. <https://arbitrationblog.kluwerarbitration.com/2020/09/25/online-dispute-resolution-platforms-cybersecurity-champions-in-the-covid-19-era-time-for-arbitral-institutions-to-embrace-odrs/>

³⁴ See discussion *supra* sub-section 3.0

6.0 Issues that may arise due to use of such technologies.

The incorporation of AI, Blockchain, Data Analytics tools, and virtual hearings in the process of maritime arbitration offers an intriguing yet complex landscape. When arbitration first commences, one of the main issues that might emerge is that parties may depend increasingly on Blockchain-based self-executing smart contracts.³⁵ Even though these contracts are automated and efficient, misunderstandings or coding errors might result in disagreements, hence the basis of these digital contracts must be clear and backed by traditional legal agreements. Furthermore, in cross-border maritime disputes, the inherent decentralisation owing to digitization gives rise to concerns about deciding jurisdiction and the governing laws.³⁶

The integration of technology presents novel challenges, with data security and privacy emerging as primary concerns.³⁷ Data security and privacy must always be prioritised, especially when working with trade secrets and confidential documents. The technological proficiency of arbitrators and legal experts also presents a significant problem. Being proficient with AI and data analytics tools is essential in avoiding data misunderstandings or mistakes throughout the arbitration process. Bias in AI algorithms can also be a serious concern, and if they are not properly addressed, they may result in biased arbitration decisions.³⁸ Therefore, to fully utilise the advantages of artificial intelligence (AI), blockchain technology, data analytics tools, and virtual hearings while maintaining the integrity and fairness of the maritime arbitration process, it is imperative to have a comprehensive grasp of these technology-induced difficulties.

Lastly, it is essential to take cognisance of some of the legal complications that may arise through integration of technology in maritime arbitration. New York convention and the UNCITRAL Model Law are some of the pre-eminent legislations that regulate international

³⁵ Julien Rodsphon, Blockchain Technology & AI Arbitration: What May the Future Hold? https://www.ipg-online.org/data/cms_uploads/module_partner/publications/article%20%20arbitration%20and%20AI-blockchain.pdf, Nov 4th 2023.

³⁶ Zhen Qin, The Use of New Technologies in International Arbitration, *The American Review of International Arbitration*, <https://aria.law.columbia.edu/the-use-of-new-technologies-in-international-arbitration/?cn-reloaded=1> Oct 31st 2023.

³⁷ Technology in International Arbitration: Challenges, Avenues, and the Road Ahead, CyberArb, <https://cyberarb.com/technology-in-international-arbitration-challenges-avenues-and-the-road-ahead/#:~:text=Nonetheless%2C%20he%20acknowledged%20that%20the,which%20cannot%20be%20replicated%20online.>

³⁸ *Id.*

commercial arbitrations. Although New York Convention, UNCITRAL Model Law and other pertinent legislations do not explicitly prohibit the use of technology in commercial arbitration proceedings, clearer provisions on integration of technology with arbitration yet needs to be introduced.

7.0 Conclusion

The infusion of AI, Blockchain, data analytics tools, and virtual hearings in maritime arbitration provides numerous advantages, even so, there are downsides to its use as well. In view of the same, it can be inferred that *for optimum and efficient usage of the technologies mentioned above, parties involved must use these digital tools in each stage only where it may be applicable and where it may provide the best possible outcome by taking into account the factual and legal scenario of each case*. Consequently, parties, attorneys, and arbitrators need to work together to resolve these challenges and incorporate technologies at every stage of maritime arbitration in the most effective manner. Further, they could formulate broad policies and guidelines to capitalise on the benefits of such technology while maintaining the fairness and integrity of the arbitration procedure. While adoption of these technologies may be more required for in maritime arbitration, it may synonymously, *mutatis mutandis* be incorporated in general international commercial arbitrations as well. In consideration of the methodical discussion on various aspects of the intersection of technology and maritime arbitration, it can be concluded that *a balance between technology and traditional legal principles is crucial for the effective application of these innovative technologies in the context of maritime arbitration*.