



Are we ready for Artificial Intelligence to decide International Commercial Arbitration cases?

Tilburg Institute for Law, Technology, and Society (TILT)

Master Thesis

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November 2020

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CHAPTER I – Introduction

1.1 Background

In international commerce, arbitration has become strongly and widely accepted as the method of resolving controversies. Many reasons made arbitration a fast, flexible, confidential, and specialized way to solve commercial controversies in contrast with traditional judicial courts.

The legal and regulatory frameworks for International Commercial Arbitration (ICA) procedures are, in order of importance, international treaties, international arbitration practices, national laws, arbitration rules, and arbitration agreements.¹ For instance, the foremost international treaties are the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York Convention or NYC)² or the European Convention on International Commercial Arbitration.³ Also, many countries adopted as their domestic arbitration law the UNCITRAL Model Law.⁴

Most of the international commercial disputes are litigated before the International Court of Arbitration under the auspices of the International Chamber of Commerce (ICC) or the London Court of International Arbitration (LCIA). Also, parties can resolve their dispute through ad hoc arbitration, which means without the administration of an institution.

According to article 1 (3) of the UNCITRAL Model Law, arbitration is international ‘if the parties to an arbitration agreement have, at the time of the conclusion of that agreement, their places of business in different States or; if the location of arbitration or the commercial relationship is outside the State in which the parties have their places of business.’⁵

Given the rapid globalization, there has been an escalation in the number of international commercial contracts including arbitration clauses. For instance, according to the 2018 International Arbitration Survey Report (IASR), ‘92% of in-house counsel prefer international arbitration for resolving cross-border disputes’.⁶ This increasing globalization is also accompanied by a technological revolution that is disrupting almost every aspect of our lives, including the way to solve disputes. Indeed, the same IASR reveals that more than 60% of participants indicated that the most significant impact to

¹ Margaret Moses, *The Principles and Practice of International Commercial Arbitration* (Cambridge University Press 2008) 5-7

² Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York, 1958) [New York Convention]

³ European Convention on International Commercial Arbitration, Geneva, 21 April 1961 (European Convention on ICA)

⁴ UNCITRAL Model Law on International Commercial Arbitration (United Nations document A140117, annex I) (As adopted by the United Nations Commission on International Trade Law on 21 June 1985) [UNCITRAL Model Law]

⁵ UNCITRAL Model Law, art. 1 (3).

⁶ White & Case, ‘2018 International Arbitration Survey: The Evolution of International Arbitration’ (2018) 6

<<http://www.arbitration.qmul.ac.uk/media/arbitration/docs/2018-International-Arbitration-Survey-report.pdf>> accessed 20 April 2020.

increase arbitration efficiency would be through the implementation of new technologies.⁷

In this sense, new technologies such as Artificial Intelligence (AI) can be used as a tool to solve an arbitration case in a more effective way. The use of AI in ICA has been predicted as improving certain assistants' tasks, for instance, the appointment of arbitrators, legal research, translation of documents, case management, document organization, cost estimations, hearing arrangements, or drafting of repetitive sections of decisions.⁸ But what if the implementation of AI can replace an arbitration decision and enhance ICA efficiency even more?

Undoubtedly, to substitute an arbitration decision with AI is not a simple task. Accomplishing this mission is as complex as the arbitration process itself. Most of the arbitration decisions are extraordinarily unique, fact-specific, confidential, and governed by different laws, consequently, these characteristics of arbitration cases rises the difficulty of a proper AI application. Therefore, achieving this task might represent the greatest revolutionary shift in the history of ICA.

The most relevant aspect that might be improved by implementing AI in ICA is efficiency. This element must be examined from the process and the arbitrator decision approaches. From the process perspective, cost and time will be significantly reduced. For instance, according to the ICC Dispute Resolution 2018 Statistics, the 'average duration of proceedings in cases that reached a final award in 2018 was two years and four months'.⁹ From the arbitrator perspective, predicting decisions more accurately or eliminating arbitrators' biases might also represent a significant improvement. Most of the 'arbitrator's conflicts of interest usually fall into lack of independence or lack of impartiality'.¹⁰ These conflicts could be diminished by implementing AI.

Nevertheless, it is necessary to define what is AI and to determine the field of AI that can develop a program efficient to substitute an arbitrator decision.

According to the author Scherer 'there does not yet appear to be any widely accepted definition of AI even among experts in the field'.¹¹ However, AI is defined by the Oxford Living Dictionaries as 'the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages'.¹² Many AI computer systems are programmed using a family of techniques referred to as machine learning.

⁷ *ibid* 37

⁸ Maxi Scherer, 'Artificial Intelligence and Legal Decision-Making: The Wide Open? Study on the Example of International Arbitration' (2017) Queen Mary University of London, School of Law 2019, 3.

⁹ International Chamber of Commerce, 'ICC Dispute Resolution 2018 Statistics' (2018) 15

¹⁰ *ibid* 6

¹¹ Matthew Scherer, 'Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, And Strategies' (2016) Volume 29, Number 2, Harvard Journal of Law & Technology 2016, 359.

¹² Oxford Living Dictionaries, <https://en.oxforddictionaries.com/definition/artificial_intelligence> accessed 20 April 2020

This machine learning is the system capable of developing a program that potentially replaces arbitrator decisions.

Scherer refers to machine learning as ‘subfield of AI research concerned with computer programs that learn from experience and improve their performance over time.’¹³ Another definition would be ‘the science of getting computers to learn and act like humans do, and improve their learning over time in autonomous fashion, by feeding them data and information in the form of observations and real-world interactions’.¹⁴

These machine learning systems are crucial to analyze the benefits and limitations of replacing arbitration decisions. AI researchers distinguish several types of machine learning. One is supervised learning which requires human interaction: the programmer trains the program by defining a set of desired outcomes for a range of input. Another type is unsupervised machine learning that requires no, or virtually no, human interference. There are no pre-established assumptions or pre-defined outputs.¹⁵ Both approaches are important to determine if its elements would fulfill the characteristics of the arbitrator’s decision and the arbitration process itself.

To substitute arbitrators’ decisions, the machine learning system requires the necessary data to feed the program. In particular, the analysis of the data regarding volume, variety, velocity, and veracity¹⁶ will be crucial to determine whether or not it is feasible to replace arbitration decisions with AI programs. For instance, the volume of data that these programs need against the confidentiality of the arbitration process might be potentially a limitation of the implementation of this technology. After addressing the possibility, or not, to replace arbitrators’ decisions with machine learning programs given the characteristics of both, the following analysis will be to examine if under the existing regulation in ICA a machine learning system can be implemented as the decision-maker in an arbitration process.

Technically, there is no explicit prohibition in the definition of an arbitration agreement that the arbitrator cannot be other than a human. An arbitration agreement including ‘AI could technically be recognized under the definition of article 7 of the UNCITRAL Model Law, and its resulting decisions could be enforced under the New York Convention’.¹⁷

Nevertheless, the mechanism for appointment arbitrators in the UNCITRAL Model Law seem to imply that ‘arbitrator’ is the same as a human.¹⁸ For instance, Article 11 (1) indicates ‘that no person shall be precluded by reason of his nationality from acting as an arbitrator, unless otherwise agreed by the parties’,¹⁹ or Article 12 (1) provides ‘that [w]hen

¹³ Scherer (n 8) 6

¹⁴ Daniel Faggella, ‘What is Machine Learning?’ (February 26, 2020) <<https://emerj.com/ai-glossary-terms/what-is-machine-learning/>> accessed 20 April 2020

¹⁵ Scherer (n 8) 8

¹⁶ Scherer (n 8) 15

¹⁷ Christine Sim, ‘Will Artificial Intelligence Take over Arbitration?’ (2018) Asian Journal of International Arbitration

¹⁸ *ibid*

¹⁹ UNCITRAL Model Law, art. 11 (1)

a person is approached in connection with his possible appointment as an arbitrator....’²⁰ Examining similar cases in domestic law, the Peruvian Arbitration Act, for instance, states ‘that any individual with full capacity to exercise his civil rights may act as an arbitrator’.²¹

For the previous reasons, to use AI systems as a substitute for arbitrator’s decisions, the proper analysis of the current legal framework will be relevant. For this novel technology to be accepted into the ICA framework, its definition should be developed and ‘offered as an option devoid of practical and theoretical uncertainties’.²²

At this point, some experts explore two possible options: ‘the creation of an avant-garde legal framework for arbitration and AI; or the modification of existing international treaties (in addition to national legislation and arbitration rules)’.²³

1.2 Objective and Research Questions

The objective of the thesis is to explore the possibility of replacing arbitrators’ decisions in International Commercial Arbitration (ICA) with Machine Learning Systems (MLS). Since this topic can be analyzed from different perspectives, this thesis aims to focus its attention on the investigation of the arbitration characteristics that can potentially be replaced with this technology and, the current scope of MLS in the ICA legal framework.

Consequently, the thesis will answer the following main **research question**:

To what extent can arbitrators’ decisions, in the context of International Commercial Arbitration (ICA), be replaced by the implementation of Artificial Intelligence such as machine learning systems?

In order to answer this RQ, the following **sub-questions** have been formulated:

1. *What are the nature and characteristics of arbitrators’ decisions and International Commercial Arbitration?*
2. *What are the risks and drawbacks of arbitration, especially regarding arbitrators’ decisions?*
3. *What are Machine Learning Systems and how might their implementation improve arbitrators’ decisions and ICA?*
4. *Does the existing legal framework in ICA allow the implementation of machine learning systems as a replacement of arbitrators’ decisions?*

²⁰ UNCITRAL Model Law, art. 12 (1)

²¹ José De La Jara, Daniela Palma and Alejandra Infantes, ‘Machine Arbitrator: Are We Ready?’ (*Kluwer Arbitration Blog*, 04 May 2017) <<http://arbitrationblog.kluwerarbitration.com/2017/05/04/machine-arbitrator-are-we-ready/>> accessed 20 April 2020

²² Guillermo Argerich, María Noodt and Juan Jorge, ‘Could an Arbitral Award Rendered by AI Systems be Recognized or Enforced? Analysis from the Perspective of Public Policy’ (*Kluwer Arbitration Blog*, 04 February 2020) <<http://arbitrationblog.kluwerarbitration.com/2020/02/06/could-an-arbitral-award-rendered-by-ai-systems-be-recognized-or-enforced-analysis-from-the-perspective-of-public-policy>> accessed 20 April 2020

²³ *ibid*

1.3 Limitations

The thesis aims to analyse the possible implementation of AI as a replacement for the arbitrator decisions in the arbitration process. However, the scope of the thesis will be limited to International Commercial Arbitration (ICA) instead of International Investment Arbitration (IIA). Both present multiple similarities and some legal scholars do not make a proper distinction between them; however, the nature of the claim and the parties are different. While ICA deals with disputes arising out of a commercial contractual obligation, IIA ‘deals with disputes arising under a public treaty between two contracting states’.²⁴ Therefore, to involve AI in ICA would require just an agreement between two private parties instead of a bilateral agreement between states (IIA), which makes the potential implementation of AI in arbitration more feasible under the nature and legal framework of ICA rather than IIA.

Another limitation will be the study of Machine Learning Systems as a subfield of AI. For the purpose of this research, only the techniques used by MLS will be analysed to determine whether or not this technology is capable of fulfilling the requirements of an arbitration decision.

1.4 Methodology and Structure

The research will analyze the implementation of Machine Learning Systems as a replacement for arbitrator’s decisions in the context of ICA. To accomplish this purpose doctrinal legal and comparative research will be conducted.

Chapter II consists of a descriptive introduction of relevant concepts regarding the nature and characteristics of both arbitration decisions and the arbitration proceeding in ICA. Furthermore, the potential drawbacks in the arbitration process focusing on the decision will be examined. To accomplish the study of this chapter a doctrinal legal research will involve the current arbitration regulatory framework and a review of literature on commercial arbitration, with emphases on the existing characteristics and disadvantages in arbitrators’ decisions like fact-specific cases, different applicable law, potential biases of arbitrators, confidentiality, cost, or decision delays.

Chapter III will involve doctrinal research on machine learning systems as a field of AI, in order to develop an interpretation of the technical possibility of implementing machine learning systems as a substitute for arbitrators’ decisions. This doctrinal research will start with defining this technology and how its implementation might enhance the arbitral decision. Then, the existing limitations of its implementation will be studied, taking into consideration the characteristics of arbitrator’s decisions. Specifically, doctrinal research about the data (volume, variety, velocity, and veracity) needed by the machine learning systems to replace the arbitrator’s decisions.

²⁴ Faraz Sagar and Samiksha Pednekar, ‘International Investment Arbitrations and International Commercial Arbitrations: A Guide to the Differences’ (May 15, 2019) <<https://corporate.cyrilamarchandblogs.com/2019/05/international-investment-arbitrations-international-commercial-arbitrations-guide-differences/>> accessed 20 April 2020

Chapter IV will, regardless of the conclusion of *Chapter III*, provide a comparative legal analysis of the existing legal arbitration framework in ICA. This is undertaken in order to determine if a machine learning system can be appointed as an arbitrator to resolve a difference between parties, or if it is necessary to create a new legal framework regulating AI and arbitration or amend the existing regulation.

Finally, *Chapter V* will provide a summary of the findings, answer to the research question, and provides recommendations for future research.

CHAPTER II – Characteristics and Limitations of Arbitration

2.1 Introduction

In order to assess the possibility of substituting an arbitrator decision with the implementation of AI such as MLS, it is essential to first describe the characteristics of the arbitrator's decisions and the arbitration proceeding in ICA. To this end, this chapter will explore some fundamental elements of the arbitrator's decision and the arbitration process itself but will primarily focus on the current drawbacks and limitations of these elements that might be potentially improved with the use of MLS.

It is important to remark that the examination of the following elements of arbitration does not represent a definitive conclusion of whether or not an arbitration decision can be replaced by AI, but is an input for the next chapter in which the elements of the MLS will be deeply analysed to finally conclude if it is feasible to act as a full machine arbitrator in ICA.

2.2 Fundamentals of Arbitration

To begin this chapter a brief overview of what are some of the fundamentals of arbitration is required. Elementary aspects such as the arbitration agreement, arbitral tribunal, and arbitration decision are necessary as an introduction of the characteristics and limitations of ICA for the purpose of the thesis.

2.2.1 The Arbitration Agreement

The arbitration agreement is the foundation stone of arbitration where parties agree to arbitrate, instead of litigate in court, their disputes. The matter of the dispute has to be subject to arbitrability, this means that 'some issues such as family matters, patent regulation, criminal law, and sometimes issues of bankruptcy, are generally not permitted by law to be arbitrated',²⁵ any other subject might be subject to arbitration.

According to the author Moses in the arbitration agreement, 'the parties can select the rules that will govern the procedure, the location of the arbitration, the language of the arbitration, the law governing the arbitration, and, the decision-makers'.²⁶ Basically, in the arbitration agreement, 'the parties can create their own private system of justice'.²⁷

In the same line, an arbitration agreement has a positive and negative jurisdictional impact. On the one hand, the positive effect means that the agreement grants jurisdiction

²⁵ Moses (n 1) 68

²⁶ *ibid* 17

²⁷ *ibid*

to the arbitral tribunal. On the other hand, the negative one is that arbitration excludes the jurisdiction of traditional courts.²⁸

2.2.2 Arbitral Tribunal

In the majority of arbitration cases, the arbitral tribunal or panel involves one or three arbitrators.²⁹ According to article 10 of the UNCITRAL Model Law parties are free to determine the number of arbitrators.³⁰ This choice is generally made in the arbitration agreement or it can be left until after the dispute has arisen (or for decision by an arbitral institution).

As is logical, the arbitral tribunal has obligations to the parties and the arbitration agreement itself. Briefly, some of the duties can be summarized as (a) resolve the parties' dispute; (b) lead the arbitration; (c) be confidential with the matter subject to dispute; (d) try to propose a settlement to the parties; (e) complete the arbitrator's mandate, and (f) be impartial and independent.³¹ At the same time, an arbitrator enjoys some rights and protections such as the right of remuneration, right of cooperation from the parties in the arbitral proceedings, and immunities from civil liability.³²

In general terms, given the nature of arbitration, the role of the arbitral tribunal is normally active. It has a significant margin of discretion regarding the vein in which the procedure will be conducted,³³ always following the obligations above discussed about impartiality, objectivity, and confidentiality, however.

After the final decision is made, the arbitral tribunal's mandate is concluded. Subsequently, compliance with, and enforcement of, the final decision falls into the jurisdiction of the parties and national courts.³⁴

2.2.3 Arbitration decision

The final step for the arbitral tribunal is to render an arbitration decision. There are different types of decisions in ICA such as final, interim, consent, partial or jurisdictional decisions, yet, in the light of the thesis, only final arbitration decisions will have significant importance.

The final decision has to comply with some formal requirements unless parties agreed otherwise. As a way of illustration, under article 31 (1) of the UNCITRAL Model Law a decision 'shall be made in writing and shall be signed by the arbitrators or arbitrators'.³⁵ Other formalities like date, place, and delivery to the parties are also relevant.

²⁸ Matti Kurkela and others, *Due Process in International Commercial Arbitration*, (Second Edition, Oxford University Press 2010) 43

²⁹ Gary Born, *International Commercial Arbitration* (Second Edition, Kluwer Law International 2015) 132.

³⁰ Article 10 (1) of the UNCITRAL Model Law.

³¹ Born (n 29)1986.

³² *ibid* 2018

³³ Kurkela and others (n 26) 181

³⁴ Born (n 29) 279

³⁵ Art. 31 (1) of the UNCITRAL Model Law.

Another important aspect is the reasoning of the tribunal for the final decision. Some scholars argued that as a universal principle unless parties agreed otherwise, arbitrators must set forth the reasons for their final decision.³⁶ This is reflected in article 31 (2) of the UNCITRAL Model Law, where reasoned decisions are the default rule ‘unless the parties agree to the contrary’.

It can be anticipated that unreasoned decisions might increase the chances of machine learning systems to substitute human arbitrations given that the former can predict an outcome more accurately but without an explanation.³⁷ Nevertheless, it is an early stage in the research to make any conclusive assumption given that reasoned arbitration decision is the rule and unreasoned decision an exception.

Overall, this represents some of the basic understandings of arbitration. Nevertheless, for this thesis, it is important to deeply analyse certain characteristics of arbitration and arbitrator decisions, which will play a crucial role in determining potential limitations at the moment of implementing MLS as a substitute for arbitration decisions.

2.3 Elements and limitations in ICA

2.3.1 Confidentiality in arbitration

The first element of arbitration to take into account at the moment of even considering a possible replacement of human arbitration decision by MLS is confidentiality.

According to the author Noussia ‘a fundamental basis for agreeing to arbitration rather than to litigation in public courts is to preserve privacy and confidentiality to the greatest extent possible’.³⁸ In other words, several parties decide to arbitrate instead of litigating in traditional courts due to their wish to maintain the subject matter private.³⁹

In the arbitration agreement parties can decide the confidentiality of the proceeding and the arbitration decision. Once again, parties have the right to decide whether they prefer to maintain the proceeding and decision confidential or not. This right provides the parties’ control of the proceeding from the beginning of the conflict.

Nevertheless, some scholars have identified some circumstances where the right of confidentiality could be jeopardized by public interest, for instance: (i) for the financial condition of a public company; (ii) for shareholders having a legitimate interest in the matter of dispute; (iii) for obligations to reveal information related to the dispute; (iv) for company’s auditors and outside advisors issues or; (v) where the parties must present the decision in a judicial court to either enforce or appeal the award.⁴⁰ These cases of public interest are some examples where parties must cede their wish to maintain their dispute private.

³⁶ Born (n 29) 3039

³⁷ Maxi Scherer, ‘International Arbitration 3.0 - How Artificial Intelligence Will Change Dispute Resolution’ in Klausegger others (ed) *Austrian Yearbook on International Arbitration 2019* (Wien 2019) 503

³⁸ Kyriaki Noussia, *Confidentiality in International Commercial Arbitration* (Springer 2010) 22

³⁹ *ibid* 21

⁴⁰ *ibid* 22-23

As mentioned above, no matter what national legislations or arbitration rules establish regarding confidentiality, parties can agree to preserve their affairs throughout the proceeding or the final outcome in confidentiality. This clarification is relevant because among different legislation and arbitration rules the confidentiality is treated unevenly.

One important aspect of the arbitration proceeding and as a consequence for confidentiality is to determine the seat of the arbitration (*lex loci arbitri*) and the arbitral rules applicable to the case.⁴¹

In regard to this, confidentiality in ICA is not protected equally by different national legislations. Perhaps this is a consequence of the UNCITRAL Model Law, that does not contain any provision about confidentiality. In fact, the circumstances vary among countries. For instance, in England, there is significant development in case law to preserve confidentiality. In the United States, the Federal Arbitration Act or the Uniform Arbitration Act do not enforce confidentiality requirements. On the other hand, ‘in France, a legal amendment of 2011 established the duty of confidentiality for domestic arbitration, but not for ICA unless the parties have agreed to it’.⁴²

Some arbitration rules have a similar approach to arbitration laws. For instance, the LCIA obliges parties to preserve the arbitration and its publication, documents submitted and, the Tribunal deliberations confidential,⁴³ while the ICC does not maintain confidentiality of the arbitration decision unless requested by parties. Finally, the Stockholm Chamber of Commerce (SCC) merely provides confidentiality for private hearings and the arbitration decision.⁴⁴

In conclusion, confidentiality in ICA is presented as a significant advantage for the parties to settle their dispute through arbitration as an alternative to traditional court. Yet, briefly reviewing comparative law or arbitration rules, it is noticed that there is no uniform approach to confidentiality. This irregular approach will be vital later in this research at the moment of examining whether confidentiality in ICA may be a potential limitation for a proper replacement of a human arbitrator decision by MLS.

2.3.2 Complex proceeding

Arbitration in ICA is generally known as a complex procedure where arbitrators have to decide a case after reviewing a significant number of documents, witnesses, facts,

⁴¹ Mayank Samuel, ‘Confidentiality in International Commercial Arbitration: Bedrock or Window-Dressing?’ (*Kluwer Arbitration Blog*, 21 February 2017) <http://arbitrationblog.kluwerarbitration.com/2017/02/21/confidentialityinternational-commercial-arbitrationbedrockwindowdressing/?doing_wp_cron=1593627623.8553340435028076171875> accessed 08 June 2020.

⁴² Marlon Meza-Salas, ‘Confidentiality in International Commercial Arbitration: Truth or Fiction?’ (*Kluwer Arbitration Blog*, 23 September 2018) <http://arbitrationblog.kluwerarbitration.com/2018/09/23/confidentiality-in-international-commercial-arbitration-truth-or-fiction/?doing_wp_cron=1593627561.0728859901428222656250> accessed 08 July 2020.

⁴³ Article 30 of the LCIA rules

⁴⁴ Meza-Salas (n 42)

arguments, hearings, and laws. This makes ICA a unique procedure alien to simple outcomes and moreover, every case is totally unlike the previous one.

ICA proceedings and especially the numbers of facts that the arbitrators have to examine before rendering a decision make ICA a unique process. It can be said that ‘arbitration should not be viewed as a fit-all mechanism. What works for one entity on a particular occasion may not work for another under different circumstances.’⁴⁵ Perhaps, it can be added that not even under similar circumstances does an arbitration decision have the same outcome as in another case.

For instance, ‘in a complex offshore windfarm project arbitration, the parties handed in submissions of more than 10,000 pages without counting hundreds of exhibits with multiple thousands of additional pages’.⁴⁶ Given these complexities, even for three fully dedicated arbitrators, it might be challenging to read, understand, and evaluate all the facts submitted.⁴⁷

Another illustration of how complex the arbitration proceeding can be is that a case can have multiple binary classification tasks like (i) the tribunal has jurisdiction: yes/no; (ii) the parties’ validity entered into a contract: yes/no; or (iii) a party breached the agreement: yes/no. Some legal questions can be resolved by a yes or no answer but the difficulty is to determine a multitude of binary classification tasks in one specific case with limited time.⁴⁸

Summing up, and to be discussed later, the fact that the arbitration proceeding in ICA is complex, fact-specific, or involving a multitude of binary classification tasks, might be a potential limitation for an accurate implementation of the MLS or on the contrary, might simplify the complex proceeding in ICA.

2.3.3 Arbitration Biases

Another relevant advantage of arbitration over conventional litigation is to have the power to appoint the decision-maker. This element has been for years an important flag to promote arbitration, where parties can select from a vast number of experts the one who better suits their particular conflict.

Paradoxically, this also has become one of the largest challenges that parties in an arbitration process face nowadays. Deals with possible biases in the designation of the arbitrator and more seriously at the moment of the arbitration decision represent a contemporary debate in arbitration.

The general provision in the ICC rules establishes ‘that every arbitrator must be and remain impartial and independent of the parties involved in the arbitration.’⁴⁹ Some scholars make the difference between the concepts of impartial and independent; the latter

⁴⁵ Ilias Bantekas, *An Introduction to International Arbitration*, (Cambridge University Press 2015) 18

⁴⁶ Jörg Risse, ‘Arbitration International: An inconvenient truth: the complexity problem and limits to justice’, LCIA, *Arbitration International* (Volume 35, Oxford University Press 2019) 291

⁴⁷ *ibid*

⁴⁸ Scherer (n 8) 17

⁴⁹ Article 11.1 of the ICC Rules

‘related to the personal connection or relationship between the arbitrator and the parties or their counsel-personal, social, and financial’⁵⁰ and, the former to ‘the absence of any bias in the mind of the arbitrator towards a party or the matter in dispute’.⁵¹

In general, it is natural and strategic for parties to have an incentive to appoint arbitrators that are sympathetic to their position before the beginning of the controversy. However, these strategies might also lead to a conflict of interest between arbitrators and a particular party.

The recent growth of law firms and international companies raises the doubt of whether conflicts prevent an arbitrator from being free of bias or not. Generally, if an arbitrator has a important conflict of interest, he or she should reject the appointment as an arbitrator and, if it is a less serious conflict of interest, the arbitrator has to disclose this potential conflict to the parties, so that they can decide whether to challenge the arbitrator’s appointment or not, according to the applicable law.⁵²

Some examples can explain the existing debate around the arbitrator appointment process. By way of illustration, the author Hushka argues that a vicious circle can take place when parties are more likely to appoint an arbitrator that ‘has previously decided in favor of the party, theoretically making a repeated outcome more likely. Therefore, this cycle may give arbitrators an incentive to favor a particular party if the arbitrator desires additional employment opportunities from that party in the future’.⁵³ So, global law firms with multiple arbitration cases during a year would be more likely to select an arbitrator that previously has favored them and the arbitrator would have an incentive to continue this path ensuring future cases as an arbitrator.

There are other examples of when a potential conflict of interest may occur. For instance, courts interpreting The Federal Arbitration Act⁵⁴ in the United States have identified some of them: ‘a prior business relationship between a neutral arbitrator and the victorious party, an ongoing legal dispute between the arbitrator and a party, a father-son relationship between an arbitrator and a party, representation by the arbitrator’s law firm to a party in an unrelated matter or, when the arbitrator is an officer at a company that conducts business dealings with a party that the arbitrator was not involved with’.⁵⁵

To sum up, the present debate about arbitration biases might be reduced to the arbitrator’s appointment, where parties can fall into the above-mentioned vicious circle or the

⁵⁰ Bruno Manzanares Bastida, ‘The Independence and Impartiality of Arbitrators in International Commercial Arbitration’ (2007) *Revista e- Mercatoria*, 3.

⁵¹ Scott Donahey, ‘The UDRP and the Appearance of Partiality’, (2001) Tomlinson Zisko Morosoli & Maser LLP

⁵² Moses (n 1) 131

⁵³ Drew J. Hushka, ‘How Nice to See You Again: The Repetitive Use of Arbitrators and the Risk of Evident Partiality’ (2013) *Arbitration Law Review* 5 Y.B, 326.

⁵⁴ The United States Arbitration Act, 43 Stat. 883, codified at 9 U.S.C. §§ 1-16 (2012) [“Federal Arbitration Act” or the “FAA”].

⁵⁵ Hushka (n 53) 325

arbitrators can fail at the moment to disclose potential conflicts of interests with the parties.

Therefore, according to the spirit of the thesis, a natural solution is that these arbitrators' biases can be completely diminished with the implementation of a third independent mechanism such as MLS. It is an organic solution because with its application a human arbitral tribunal is not even required or at least, not under the existing arbitration framework.

However, as will be discussed, the implementation of this subfield of AI also faces some theoretical and practical issues that might, for the moment, signify an important obstacle to addressing the possibility of the replacement of human arbitrators by MLS including the panel arbitration formation.

2.3.4 Arbitrator's Cultural Background

Besides arbitration biases, another aspect to take into account is that of assessing how the different cultural backgrounds of arbitrators might affect the final decision-making process. In any case, no matter the multicultural background of the arbitral tribunal, arbitrators must evaluate the evidence and the arguments with objectivity and impartiality.

One way to illustrating how two arbitrators can have a dissimilar approach of thinking is by evaluating the framework of Western (Greek) and Eastern (Chinese) systems of thought. On the one hand, Westerners prefer more analytic reasoning focusing 'on attributes of the object to assign it to categories, and a preference for using rules about the categories to explain and predict the object's behavior'.⁵⁶ On the other hand, Easterners prefer holistic thinking, which 'involves an orientation to the context or field as a whole, including attention to relationships between a focal object and the field and a preference for explaining and predicting events on the basis of such relationships'.⁵⁷

However, although it is concluded by Hornikx that overall, in argumentation the cultural differences between Easterners and Westerners 'is scarce',⁵⁸ for the purpose of this thesis any indication of cultural differences that could interfere with the decision-making process may be vanquished by implementing MLS.

Likewise, according to a series of studies, personal values also affect what we believe and what actions we take. For arbitrators this is important because, among them, they give a different ranking to those values. For some arbitrators, freedom is a more important value than privacy, and for others, privacy is above freedom.⁵⁹ These differences of priorities can mean that some arguments can be perceived as more persuasive by some arbitral tribunals than others.

⁵⁶ Jos Hornikx, 'Cultural Differences in Perceptions of Strong and Weak Arguments' Tony Cole (ed), *The Roles of Psychology in International Arbitration* (Chapter 4, Wolters Kluwer 2017)

⁵⁷ *ibid* 83

⁵⁸ *ibid* 83

⁵⁹ *ibid* 85

Concluding, in ICA parties, legal representatives, witnesses, experts, and arbitrators may have different cultural backgrounds. This could have some relevance in the case of the decision-makers as since human beings have a different set of values and way of thinking, these may affect to a greater or lesser degree the final arbitration decision. This natural cultural background among arbitrators might be diminished by using, instead, a ‘neutral’ AI machine.⁶⁰

2.3.5 Costs in arbitration

In ICA almost every arbitration institute follows the definition of costs stated in the UNCITRAL Rules. Article 40 (2) of the mentioned rules refers to arbitration costs as (a) arbitral tribunal fees; (b) arbitrators travel expenses; (c) costs related to experts; (d) costs of witnesses; (e) other costs suffered by the parties and; (f) administrative charges.⁶¹

Overall, the panel arbitrator’s fees are usually calculated by the arbitral institute and not by the arbitrators. The method of calculating them depends on the value of the case: the higher amount of the claim, the higher cost in general, and vice versa.⁶² This method is executed for most international arbitration institutions except for the LCIA, in which the cost is estimated on an hourly basis and not by the amount of the arbitration.⁶³

Nevertheless, in a more diverse and interconnected business world, arbitration cases in ICA have constantly become more complex and time-demanding. This not only increases the number of cases but also the cost. As a consequence, overtime costs established in the UNCITRAL Rules have been rising very rapidly, having parties to assume them and decreasing the arbitration quality in ICA.

According to the 2018 International Arbitration Survey Report (IASR), today’s worst element in the arbitration proceeding is the cost that parties have to spend throughout a case, indeed, the survey confirmed that ‘cost is yet again the most selected option, and by a significant margin’,⁶⁴ in reference at the worst characteristic in ICA nowadays.

Some scholars have identified, among others, lack of certainty and transparency of cost decisions as the current challenges in ICA. In this light, many arbitrators manage cost as a secondary issue and do not pay the attention that it requires. This leads to costs in ICA being completely arbitrary and unpredictable. Some of the solutions are simple as ‘what is needed is not so much any major reform of the existing arbitration rules or guidelines, but more attentive, alert and informed arbitrators willing to discharge their duties in a way that is commensurate to the parties’ expectations and consistent with the best professional standards.’⁶⁵

⁶⁰ Although AI models are presented as neutral, it will be described in Chapter III of this thesis that AI and MLS might be also at risk of biases.

⁶¹ Article 41 (2) of the UNCITRAL Arbitration Rules

⁶² Mika Savola, ‘Awarding Costs in International Commercial Arbitration’ (2017) *Scandinavian Studies in Law* 2017, Vol 63 278.

⁶³ Schedules of Costs of the LCIA Rules (2014).

For instance, the fees of the tribunal members shall be at hourly rates not exceeding £450.

⁶⁴ White & Case (n 6) 7

⁶⁵ Savola (n 62) 318

The irruption of technologies such as AI represents a unique opportunity to reverse negative statistics as reflected in the 2018 International Arbitration Survey Report (IASR) regarding the costs. A priori, implementing MLS as an arbitrator decision substitute (if the cost of the system and its maintenance is not too high) will reduce the high fee of the arbitrator, and with other AI assistants' tools, some other costs will also be significantly reduced. As will be examined in the next chapter, implementing AI in arbitration will significantly reduce the high cost incurred by parties in an ICA proceeding.

2.3.6 Time

Arbitration is known as a quicker alternative mechanism to resolve disputes than traditional courts. However, recently this trend seems to be changing, where cases have been involved in unnecessary delays due to different reasons.

As an example, according to the ICC Dispute Resolution 2018 Statistics 'of the 407 draft final awards submitted to the Court for scrutiny in 2018, 155 draft awards were submitted beyond the above timeframe, of which 68 triggered fee reductions'.⁶⁶

Many factors have affected the length of arbitration proceedings. First, sometimes arbitrators do not manage proceedings efficiently or, as the above survey illustrates, do not provide a decision in a timely manner. In some special cases, some parties waited more than three years for a final decision.⁶⁷ Second, litigation strategies such as inaccurate challenges to arbitrators or overloading submission of documents during the proceeding exemplify techniques implemented by parties to delay the arbitration as much as possible.

No matter if it is by an arbitrator inefficacy, litigation strategy, or another reason, these attitudes undermine confidence in arbitration as an effective dispute resolution mechanism and subsequently, increase parties' budget as well.

Once again, novel technologies like AI can enhance the arbitration proceeding by rendering a decision faster or using assistant's tools to collaborate for example during the evidence stage. However, as will be examined in the next chapter the relevant question is how accurate is a decision issued by an MLS in comparison to a human arbitrator decision?

2.4 Conclusion

This chapter illustrated some of the most relevant characteristics in arbitration regarding the proceeding and the decision. Some elements are currently representing a more severe threat to arbitration efficacy than others. In particular, efficiency is jeopardized in ICA by the complexity of cases, arbitrators' biases, and multicultural backgrounds, cost, and time.

Nonetheless, other intrinsic characteristics of arbitration might be a potential obstacle for the proper implementation of MLS as a substitute for the arbitrator decision. An indisputable illustration is the irregular approach regarding the confidentiality, multiple binary nature of the decisions, fact-specific cases, or complex arbitration proceeding.

⁶⁶ International Chamber of Commerce (n 9) 15

⁶⁷ Moses (n 1) 145

The upcoming chapter will analyze the explained characteristics and limitations in the context of the MLS, to finally conclude, from a practical perspective, whether the substitution of an arbitrator decision using the novel technology of AI is possible or not.

CHAPTER III – MLS and Arbitration

3.1 Introduction

This chapter will now turn to the question of what are Machine Learnings Systems (MLS) and assess whether their implementation can improve the arbitration proceeding to be able to conclude whether it is feasible to have a full replacement of the human arbitrator's decision by MLS. For this purpose, this chapter will first explore in non-technical terms the definition and characteristics of MLS. Afterwards, it will analyze the existing applications of MLS that enhance the ICA efficiency. Finally, it will address, from a technical and practical perspective, the possibility of using an MLS as the decision-maker in ICA.

3.2 Introducing MLS

Computing and digital transformation are some of the biggest revolutions in our lives. Inventions of the previous centuries have been substituted by computerized systems and the world has been adapting to this new digital environment.⁶⁸ Accurate representation of how deeply this transformation is impacting our lives can be seen in some trivial examples like recognizing our friends' faces in photos to more substantive ones such as driving cars automatically or guiding robots in warehouses.⁶⁹

The use and implementation of AI, and specifically MLS, will transform arbitration. The central point is to what extent and when this transformation will occur. Obviously, it is hard to predict an accurate answer but a general understanding of what MLS is and how it works will perhaps contribute to answering the central concern of the thesis.

MLS is considered a branch of AI. The latter is a science that studies intelligent programs and develops machines that can ingeniously resolve human difficulties,⁷⁰ while the former refers to 'computer programs that are able to learn from experience and thus improve their performance over time'.⁷¹

In general, those algorithms or systems can be considered as learners in a functional sense, where 'they are capable of changing their behavior to enhance their performance on some task through experience'.⁷²

⁶⁸ Ethem Alpaydin, *Machine Learning: the new AI*, (The MIT Press 2016), 1

⁶⁹ Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age* (W.W. Norton & Company 2016) 91

⁷⁰ Serokell, 'Artificial Intelligence vs. Machine Learning vs. Deep Learning: What's the Difference' (Medium, 11 April 2020) <<https://medium.com/ai-in-plain-english/artificial-intelligence-vs-machine-learning-vs-deep-learning-whats-the-difference-dccce18efe7f>> accessed 24 August 2020

⁷¹ Harry Surden, 'Machine Learning and Law', (2014) Wash. L. Rev, 87

⁷² *ibid* 89

Improving over time

The main objective of MLS ‘is to build an internal computer model of some complex phenomenon ... that will ultimately allow the computer to make automated, accurate classification decisions to build an internal computer model’.⁷³

Some elements of MLS are to improve its performance over time once it receives more data and, automatically infer information through pattern detection in that data. If these patterns are correct, they will allow the MLS ‘to make predictions about other data that it might see in the future’.⁷⁴

These designs are understood as the rule sets where the internal model is ‘inferred by examining and detecting patterns within data’.⁷⁵ Basically, the MLS examines each new data comparing them with prior examples. For instance, an algorithm might have to analyze several samples of spam emails before it detects a reliable pattern such as the word ‘Viagra’ being a repetitive indication of spam email. Therefore, in order to produce a useful internal model, MLS will need data from an ample number of examples.

To sum up, the main characteristic of these MLS is the capability of improving its performance by recurrently analyzing data in order to notice valuable patterns.⁷⁶

Supervised Programs

Among many types of MLS, the most common ones are supervised, unsupervised, or reinforcement learning techniques. The most developed and used in the legal field are supervised learning techniques⁷⁷ and also were the most commonly used in the AI environment by 95% in 2018.⁷⁸

Supervised learning initiates with a dataset that is labeled by humans according to the scope of interest, in other words, what is mentioned above as the rule sets. The program itself examines the rule sets and regulates the best channel to predict the relevant outcome variable by reference to other accessible features of the data.⁷⁹

Likewise, learning systems refer to adjusting the parameters so the system could make precise predictions on the data/information. It is important to highlight that the goal of these models is not to repeat the rule sets but to make the correct prediction of new examples or cases.⁸⁰ To accomplish that, the rule sets can be optimized to ‘new, never-

⁷³ *ibid* 91

⁷⁴ Toby Segaran, *Programming Collective Intelligence* (O’Reilly 2007) 3

⁷⁵ Surden (n 71) 91

⁷⁶ *ibid* 94

⁷⁷ Horst Eidenmüller and Faidon Varesis, ‘What is an Arbitration? Artificial Intelligence and the Vanishing Human Arbitrator’ (2020) 7. Available at SSRN <<https://ssrn.com/abstract=3629145>> accessed 05 August 2020

⁷⁸ Martin Ford, *Architects of Intelligence* (Packt 2018) 11

⁷⁹ Eidenmüller (n 77) 7

⁸⁰ Alpaydin (n 68) 38-39

before-seen examples’. The process of adaptive and interactive to ‘never-before-seen examples’ allows MLS to create nuanced models of complex phenomena.⁸¹

As a consequence, the author Surden points out that these models ‘are expressly designed to be dynamic and capable of changing and adapting to new and different circumstances as the data environment shifts’.⁸²

3.3 Existing Implementation of MLS

Before addressing the main concern of this study about the possibility of substituting an arbitrator decision with MLS, it is necessary to refer to the existing AI applications (using MLS) that are improving certain fields of arbitration and are collaborating with arbitrators in managing the proceeding.

Some of the previous definitions seem unfamiliar to most of the arbitration community. Nevertheless, they ignore that this novel technology is changing important areas of arbitration. In the following lines, some examples of existing MLS applications in the arbitration proceeding will illustrate how rapidly the shift is occurring and moreover, how some arbitrator's functions can be smoothly replaced by MLS.

3.3.1 Arranging the proceeding

There exist some applications using MLS that are not specifically for arbitrators but could assist them in the scheduling and planning of workload during the process. Two good examples of these tools are Instant Meeting Scheduling (x.ai) and Julie Desk.

1. Instant Meeting Scheduling (x.ai)⁸³: According to the developers this application ‘connects you with all your calendars and coordinates the best time to meet with your guest’.⁸⁴ The relevance is that the arbitrator can integrate different calendars, identify free or busy slots, and automatically schedule a meeting with other members. This smart schedule includes time, people, matter, and location without any human involvement. In an arbitration proceeding, parties, arbitrators, and arbitration institutions can save time arranging all meetings and hearings through x.ai.
2. Julie Desk:⁸⁵ This app using AI enhances the scheduling workload of its users. In the ICA context and given the busy calendar of arbitrators, this AI app can automatically manage and organize all the arbitration hearings.

These MLS examples can be useful as an assistant instrument in scheduling and conducting case management, conferences, and hearings. In complex cases, with multiple parties and different jurisdictions, these could be used to arrange meetings according to

⁸¹ Surden (n 71) 94

⁸² Surden (n 71) 94

⁸³ Instant Meeting Scheduling (x.ai) <<https://x.ai/>> accessed 16 July 2020

⁸⁴ See section ‘How it works’ of X.AI app <<https://x.ai/how-it-works/>> accessed 16 July 2020

⁸⁵ See section ‘How it works’ of Julies Desk app <<https://www.juliedesk.com/how-i-work/>>

arbitrators, parties, or arbitration institute workload.⁸⁶ And more importantly, without human intervention.

3.3.2 Analyzing and grouping documents

Other applications using MLS exist in the legal tech context that could help arbitrators during the decision-making process. Tools for grouping data, live transcription of hearings, data analysis, or document research are an accurate illustration of how arbitrators can reduce their workload using these MLS in complex ICA cases. Some of these tools are the following:

1. eBrevia: is an e-discovery tool for the document review process, that ‘uses advanced machine learning and AI to extract key information from current and legacy contracts within minutes’.⁸⁷ It can analyze more than 50 documents in a short time and can extract the data in multiple languages.⁸⁸
2. ROSS Intelligence: is a legal research application that uses MLS for document analysis, questions, review of case law, find similar languages in other cases, or legal question research.⁸⁹ This application ‘could allow arbitrators to navigate swiftly through submissions, exhibits, and case law and to recognize patterns effortlessly’.⁹⁰
3. Fireflies: is an AI application that records, transcribes, and searches through a conversation in a meeting. It can be integrated with other non-AI applications such as Zoom, Skype, or Microsoft team.⁹¹ For parties, arbitrators, and arbitration institutes, this can be a valuable tool to reduce cost and time during the proceeding.

Arbitrators invest considerable effort in gathering data or analyzing documents and contracts during an arbitration proceeding, increasing time and cost. Nonetheless, existing MLS could significantly contribute to improving the decision-making process for arbitrators. For instance, arbitrators might use these applications for a repetitive section of the decision such as ‘procedural history, applicable rules, or parties analysis of specific issues’.⁹²

3.3.3 Appointment of Arbitrators

As highlighted above, arbitrators’ biases due to lack of independence or impartiality or just to a different cultural background are an existing obstacle in ICA. The current mechanism to challenge an arbitrator lengthens the arbitration process in terms of cost

⁸⁶ Eidenmüller (n 77) 9

⁸⁷ See Ebravia app at <<https://ebrevia.com>> accessed 15 August 2020

⁸⁸ ibid

⁸⁹ See Ross Intelligence app at <<https://www.rossintelligence.com/features>> accessed 15 August 2020

⁹⁰ Eidenmüller (n 77) 10

⁹¹ See Fireflies app at <<https://fireflies.ai/>> accessed 15 August 2020

⁹² Eidenmüller (n 77) 12

and time. Therefore, innovation is required in this field of ICA. Given this, some initiatives like Arbitrator Intelligence⁹³ seem appropriate to tear down those barriers.

Arbitrator Intelligence is a project addressed to international arbitration that analyses critical information about the decision-making process of arbitrators.⁹⁴ With the data collected parties can have unique information about arbitrator selection and future case strategy. The interesting issue of the project is that Arbitrator Intelligence is fed by the arbitration community that has insight and non-public information of the arbitrators.

These types of projects, using data analytic on arbitrators, might collaborate importantly with a potential MLS at the moment to decide who arbitrator suit better (experience, age, language, experience) in a case. Therefore, the technology surrounding MLS might also serve to appoint arbitrators better than humans currently do, which at the end enhances the quality of the case.

3.3.4 Predicting the outcome

Other useful tools for arbitrators are the MLS focused on decision analysis and prediction of the final decision. Specifically, these types of programs allow arbitrators to render decisions of better quality and improve the legitimacy and acceptance of their outcomes.⁹⁵

There have been some studies that support the idea of more accurate outcome predictions rendered by MLS than humans. To offer a significant example, it is appropriate to highlight two pieces of research conducted in judicial court contexts.

The first one is a study conducted in 2016 on decisions held by the European Court of Human Rights (“ECtHR”) about some provisions of the European Convention on Human Rights (hereafter the “Convention”). The output was a binary classification about a violation or not of the provision of the Convention.⁹⁶ The result of the research was 79% accurately predicting the ECtHR outcomes.⁹⁷

The second investigation aimed to predict more than 240,000 justice votes and 28,000 outcomes of the Supreme Court of the United States (‘US Supreme Court’) between 1816 to 2015.⁹⁸ On this occasion, the outcome was also a binary classification ‘as to whether the Supreme Court reversed or affirmed the lower court’s decision’.⁹⁹ Similarly, the MLS predicted with 71.9% accuracy the justice vote and with 70.2% accuracy the outcome of the US Supreme Court.¹⁰⁰

⁹³ See Arbitration Intelligence Project at <<https://arbitratorintelligence.com/>> accessed 15 August 2020

⁹⁴ *ibid*

⁹⁵ Eidenmüller (n 77) 13

⁹⁶ Scherer (n 8) 10

⁹⁷ Nikolaos Aletras and others, ‘Predicting judicial decisions of the European Court of Human Rights: a Natural Language Processing perspective’ (*PeerJ Computer Science* 24 October 2016) <<https://peerj.com/articles/cs-93/>> accessed 20 August 2020

⁹⁸ Daniel Martin Katz, Michael Bommarito and Josh Blackman, ‘A general approach for predicting the behavior of the Supreme Court of the United States’ (*Plos One* 12 April 2017) <<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0174698>> accessed 25 August 2020

⁹⁹ Scherer (n 8) 13

¹⁰⁰ Martin (n 98)

Besides the previous cases, there exist some other applications using MLS to predict outcomes in international arbitration and compare different judicial judgments of several courts.

1. Ravel: is a data-driven research and analytical tool that can, among others, ‘gain insight into how judges think, write, and rule’.¹⁰¹ This may be a powerful tool to obtain information from a previous decision.
2. Arbilex: This application was created for international arbitration for predictive analytics ‘to enhance decision-making by law firms and litigation funds.’¹⁰² The model can ‘quantify uncertainties’ and ‘maximize desirable outcomes’ using predicting data.¹⁰³

These applications close this section of the chapter about the existing tools that assist arbitrators but do not totally replace them. Many of them are using MLS or AI technology to improve the cost, time, and quality of the arbitration proceeding. In conclusion, many startups implementing MLS are creating legal tech tools to replace some mechanical tasks of arbitrators but the central concern as to whether a single MLS can replace an arbitration decision, as is going to be described, is a more complex question.

3.4 Can an MLS substitute an arbitrator decision?

The central concern of this thesis is the possibility of substituting an arbitration decision with an MLS without any human involvement. In the previous part, the existing assistant tools using AI technology were discussed to demonstrate that some mechanical parts of the proceeding can be enhanced. In this section, it will be examined (i) whether there exists any MLS that can assume an arbitrator role and, (ii) given the characteristics of the arbitration decision and proceeding explained in chapter II, whether it is feasible to have an MLS rendering an arbitration decision.

A. Existing MLS arbitrator

To render an MLS arbitration decision without any human interference requires an interrelationship of certain technical and arbitration elements.

From the MLS perspective, an entail of ‘data analyze, identify the patterns, make the necessary pattern connections or, a decision based on the trained model’ is required.¹⁰⁴ From the arbitration process view, ‘managing multiples cases, parties, hearings or appointments at the same time, e-discovery, or a face recognition app able to detect micro-expressions of a witness’¹⁰⁵ is also required. As of today, there is not a single MLS able to merge all these elements in a unique model,¹⁰⁶ but would it be possible over time? In

¹⁰¹ See Ravel Law app at <<https://home.ravellaw.com/products-and-technology>> accessed 20 August 2020

¹⁰² See Arbilex app at <<https://www.arbilex.co/welcome>> accessed 20 August 2020

¹⁰³ Eidenmüller (n 77) 14

¹⁰⁴ Eidenmüller (n 77) 15-16

¹⁰⁵ ibid 15-16

¹⁰⁶ ibid 15-16

my opinion unquestionably, however, as will be analyzed in the following lines there is still a long way to go before achieving the MLS-arbitrator.

B. MLS rendering arbitration decisions?

Regardless of the non-existence of an MLS-arbitrator able to render an arbitral decision, the important issue is to determine whether, with developed technology, an MLS could replace a human arbitrator decision. The objective of this section is to explain the potential challenges, taking into account the ICA standards and the intrinsic elements of MLS in its manner of deciding an arbitration case.

For arbitrators, the fundamental requirement in order to render a binding award is to have access to all the available information of the case, including facts, evidence, contracts, documents, different applicable laws, and case laws. The same occurs with the MLS but its 'information' is 'data'. This element feeds the model and without it, the model cannot work properly.

Using an analogy with baseball, in 2002 the general manager of the Oakland Athletics, a team with the lowest budget in the league and breaking traditional methods, started using all the statistics available of free agent players to predict their future performance of the season. For instance, he discovered that a player with a market value of (\$1M) reached the previous season first base more times than other players with a market value of more than (\$5M). The general manager was able to build a team just using statistics instead of other common baseball variables of that time. This novel method allowed the Oaks to win 20 consecutive games in that season,¹⁰⁷ but of course, without the necessary data this achievement would have been impossible.

As in baseball, the success or failure of an MLS-arbitrator depends, primarily, on the capacity of having access to all the required data of a case. Essentially, the more data, the more improvement. Therefore, a limitation in collecting the data will represent an important barrier for the MLS-arbitrator.

Besides the potential limitation in accessing the necessary data, other aspects will be explored to evidence additional MLS challenges toward a proper MLS-decision. These aspects can be summarized in the possible biases of the machines, incapacity to motivate some outcomes, and the difficulties in duplicating some emotions of a human arbitrator.

In the following paragraphs, an examination will be made of what these limitations are, starting with the confidentiality vs. the Four V's of Big Data, the complexity of replicating an arbitration case for an MLS, MLS neutrality, MLS black-box, and finally, the lack of affinity of MLS with human emotions.

3.4.1 Confidentiality vs. The Four V's of Big Data

The more volume, veracity, variety and velocity of data (Four V's of big data) the better performance of the MLS. The volume might be represented in the number of decisions required to feed the program, the veracity in the trustworthiness of the information (better

¹⁰⁷ See Moneyball film (2011)

illustrated in section 3.4.3), the variety in the diversity of the sources feeding the program and velocity in the frequency of the information received by the MLS. Therefore, a proper implementation of the Four V's of big data the better quality of the potential MLS decision.

Against the Four V's, confidentiality appears as one of the major obstacles. As was discussed in chapter II, one of the greatest advantages of arbitration over traditional courts is the right to maintain the confidentiality of a case, matter, decision, or even arbitrators' names. Paradoxically, this right of the parties can be at the same time an important difficulty to the aim of having an MLS arbitration decision.

The reasonable conclusion is that with insufficient, repetitive and untrustworthy samples, the confidentiality of the cases will limit the MLS room for improvement. The lack of proper development of one of the 4 V's will automatically imply mediocre arbitration decisions and in consequence, an untrustworthy MLS. Hence, an MLS needs to set its rules with a varied, reliable and robust, amount of information. Information in this case means documents, decisions, contracts, and other documents related to an arbitration case.

The question is if this technical issue can be overcome given the existing ICA circumstances. This complex question can only be answered by the ICA community itself. In other words, in the actual context of obtaining the necessary data for an MLS, it requires a global effort from the parties, arbitral institutes, arbitrators, and arbitration startups.

First, the parties have the right to choose if they want a case under complete confidentiality or not. So, it is plausible that for the aim to have an appropriate MLS-arbitrator, some parties agree to disclose some critical information of their case. In the end, it will be for the common benefit of the ICA community, but it is difficult to predict how many parties might agree to yield their right for a common objective.

Second, there exist some initiatives to publish and disseminate information about the cases in ICA. Essentially, these initiatives have been led by the ICC, wherein a note regarding the ICC rules, they proposed that the final decision 'may be published in its entirety no less than two years after the date of said notification'.¹⁰⁸ As of today, it is just a proposal but its realization will collaborate with the sufficient volume of data required by an MLS-arbitrator.

Finally, some startups specializing in the collection of information about the practice of arbitration could also cooperate toward an MLS-arbitrator. This is the case of Dispute Resolution Data ('DRS'), the objective of which is the 'collection and dissemination of

¹⁰⁸ International Chamber of Commerce, 'Note to Parties and Arbitral Tribunals on the Conduct of the Arbitration under the ICC Rules of Arbitration' (1 January 2019) <<https://cdn.iccwbo.org/content/uploads/sites/3/2017/03/iccnote-to-parties-and-arbitral-tribunals-on-the-conduct-of-arbitration.pdf>> accessed 20 August 2020

trusted aggregated case data'¹⁰⁹ of different aspects of the arbitration proceeding from the award to the selection of arbitrator's process.

In conclusion, the volume, veracity, variety, and velocity of information required by an MLS are threatened by confidentiality. In particular, confidentiality is one of the principal reasons why the parties choose arbitration over courts even though it represents an obstacle to the mentioned technology. Despite the previous factors, it is still possible to have relevant data if (i) parties resign their confidentiality right, (ii) the application is made of the ICC proposal regarding the dissemination of the arbitration decisions, and (iii) there is a worldwide spread of initiatives like that presented by the DRS.

3.4.2 Complex cases

The ICA cases normally contain unique facts and a multitude of binary classification, making the arbitration decision an uphill work for the arbitral tribunal. Besides, some 'hidden variables' such as social and economic considerations could affect an arbitration outcome.¹¹⁰ This whole context makes the arbitration decision a complex one and, more notably, tough for an MLS model to duplicate.

A different tale might be a tax or labor decision, where using mathematic formulas is sufficient to set the rules of an MLS and have a precise result.¹¹¹ However, arbitration cases are different, complex, fact-specific, and have hidden variables.

Also, and as was described beforehand, one of the further advantages of an MLS is its capability of detecting and examining valuable patterns across the data received. The problem is that usually, the arbitration outcomes are non-repetitive,¹¹² where the only certain element in arbitration is that every case is different from the previous one. Therefore, it can be anticipated that MLS will have some difficulties in detecting patterns that fulfill the requirement of every single arbitration case.

Overall, it may be said that the complexity of the arbitration cases in ICA might represent an obstacle to the goal of having an MLS render a reliable decision. Perhaps another level of improvement is required for this technology where the main focus must be the flexibility to adapt its system to unique cases or perhaps, the ability to decide multitude yes or no controversies.

3.4.3 MLS neutrality

As was discussed in the preceding chapter, today's arbitration proceeding suffers from a potential bias of the decision-makers. This bias is represented by selecting the same arbitrators, a previous relationship with parties, or for a different cultural background of the arbitral panel. In this scenario, an impartial and independent MLS is presented as a latent solution to diminish this arbitration challenge and consequently, improve the proceeding efficiency.

¹⁰⁹ See Dispute Resolution Data app <http://www.disputeresolutiondata.com/questions_answers> accessed 20 August 2020

¹¹⁰ Eidenmüller (n 77) 17

¹¹¹ *ibid* 17

¹¹² Scherer (n 8) 16

Nevertheless, it is erroneous to affirm that MLS can be completely neutral. Indeed, some researchers have identified various aspects that could conclude that MLS can also lead to biased outcomes.

It can be said that the set of rules of an MLS is only as accurate as the input data (veracity). In particular, the mentioned set of rules can be ‘influenced’ by human purposes. Consequently, the MLS will be supported by those human biases and with the risk of assuming them as correct in future outcomes.¹¹³

The possible MLS unfairness might be denoted in collecting and processing data. This is, once again, related to the data that set the rules of the machine, if you have biased information of previous cases it is likely that the outcome will have biased results.¹¹⁴ To prevent that, a global effort by arbitral institutes, states, arbitrators, or organisms will be necessary to establish some guidelines to set MLS rules.

A practical example of how MLS can have an unfair outcome is the algorithms used by police departments in different cities across the United States. The goal of these programs is to search for past crime information and predict which people or places are more likely for future crimes. A study confirmed that instead of creating a heat map of those zones to prevent crime, the system encouraged the police officer to arrest more people in the “appointed” zones. Moreover, the information of these types of programs is usually classified, so people cannot even know how the algorithms work.¹¹⁵

Certainly, the common impression of an MLS being immune to human biases is not correct. Like human beings, an MLS can also be affected by biases. The difference is that in an arbitration proceeding a party can challenge an arbitrator if they suspect some biases, but in the case of an MLS decision, it will be tougher to demonstrate the machine's unfairness. Even so, biases in MLS can be diminished as long as the person or group of people that will fill the machine feed it with transparent and fair information about the arbitration cases.

3.4.4 MLS Black box

MLS usually introduces some information (inputs) and transforms them into outputs. This process is done through the so-called ‘black-box’ of the MLS.¹¹⁶ According to the authors Rudin and Radin ‘these black-box models are created directly from data by an algorithm, meaning that humans, even those who design them, may not understand how variables are being combined to make predictions’.¹¹⁷

¹¹³ *ibid* 19

¹¹⁴ Michael Veale and Reuben Binns, ‘Fairer machine learning in the real world: Mitigating discrimination without collecting sensitive data’ (2017) *Big Data & Society*, 2.

¹¹⁵ Nizan Geslevich and Yafit Lev, ‘Learning Algorithms and Discrimination’ in Woodrow Barfield and Ugo Pagallo (eds.), *Research Handbook of Artificial Intelligence and Law* (Chapter 4, Edward Elgar Publishing Limited, 2018)

¹¹⁶ *ibid* 5

¹¹⁷ Cynthia Rudin and Joanna Radin, ‘Why Are We Using Black Box Models in AI When We Don’t Need To? A Lesson From An Explainable AI Competition’ (*HDSR* 22 November 2019) <<https://hdsr.mitpress.mit.edu/pub/f9kuryi8/release/5#:~:text=In%20machine%20learning%2C%20these%20black,being%20combined%20to%20make%20predictions>> accessed 25 August 2020

Consequently, the principal problem is that the algorithms used in the black-box models in MLS are highly difficult to explain, especially, how they search, and select among a variety of data. Sometimes it is a mystery even for the developers themselves.¹¹⁸

Although the outcome of an MLS could be exceedingly precise, not being able to explain how it reached the result might be an important obstacle in the context of an arbitration decision. It was argued in the previous chapter that in ICA the default rule for the arbitral tribunal is to explain their decision unless the parties agree to the contrary. In practice, it is normal that in cases that involve a large amount of money, parties want a motivation for the decision, especially for the losing party.

Professor Scherer has identified two main difficulties for MLS using black-boxes to provide legal reasons for their outcomes. First, it is complicated to understand the aspects that led to a specific outcome when using black-box systems. Second, even if some aspects are recognizable in the black-box, it might not be enough for a complete and proper explanation. Scherer explains the second element referring to the ECtHR case, where the study just identified some keyword related to the final outcome.¹¹⁹ Clearly, some fundamental words of a case would not be enough to explain an arbitration decision, that usually has dozens of motivation pages.

Summing up, the inability of MLS to use black-box models to explain or understand the reasons for its outcomes is a barrier to the aim of an arbitration decision without human involvement. Even in the case where some fundamental words from the black-box might be identifiable, it would be an insufficient explanation for the parties. It is natural for parties to request a detailed description of their cases and an MLS incapable of doing so jeopardizes the objective of having an MLS.

3.4.5 Human Emotions vs MLS

The arbitration decision is rendered, usually, by a panel of three persons. These individuals have emotions, necessities, or simple empathy with a party. In specific circumstances, these emotions might affect either positively or negatively the outcome of a case. Two examples could explain the positive or negative impact of human emotions concerning the final decision.

The positive influence may be narrowed to the hearings of witnesses and experts, in this stage of the process, the arbitral tribunal can evaluate directly if their words and expressions are sufficiently reliable to prove a fact. In a face-to-face hearing, the arbitrators have the opportunity of assessing if a person is trying to hide some relevant elements or if they are expressing trustworthy facts of a case.

The negative effect of human emotions toward an arbitration decision can be represented in the Israeli judges' study. This study consisted of the analysis of more than 1,000 judicial rulings in Israel courts, where the remarkable finding was that when the judges

¹¹⁸ Geslevich (n 115) 5

¹¹⁹ Scherer (n 8) 23

took a food break before ruling a judgment they decided ‘differently in cases with similar legal characteristics.’¹²⁰

Both positive or negative effects are an undeniable characteristic of having a human arbitrator. But the open question is, what will happen with an MLS arbitrator? Taking into account the above examples, the direct interpretation of an expert/witness will be affected since an MLS or AI models are not developed ‘enough to understand cultural differences in expressing and reading emotions, making it harder to draw accurate conclusions’.¹²¹ While the negative example will be diminished as an MLS does not have any human emotion/necessity that could disturb a decision.

Regardless of whether it has a positive or negative effect, an MLS without human emotions will be criticized if it cannot interpret correctly an expert or a witness deposition. Clearly, the objective is to have an MLS integrated with other technologies such as facial recognition, which might allow a better understanding of a person’s emotion. However, as of today, there does not exist an MLS able to integrate different technologies in a single machine learning.¹²²

3.5 Conclusion

MLS has the ability to improve its performance over time by analyzing data and identifying valuable patterns across that data. Also, it can adjust its system to never-before-seen data, by interpreting previous patterns. Therefore, for an outstanding implementation of an MLS, it is necessary to collect as much data/information/examples as possible.

Some legal tech projects using MLS are an illustration of how this technology can improve mechanical stages of the arbitration proceeding and moreover, are an example of how gathering some features of these initiatives might collaborate to have a fully MLS-arbitrator able to perform all the arbitrator functions in a unique MLS. Nevertheless, as of today, there does not exist a single MLS able to combine in a single program the necessary technical and practical elements to have an MLS ruling arbitration cases.

Finally, in the event of having the technical conditions for an MLS rendering decisions, it might have to overcome other challenges. First, confidentiality and fewer samples (decisions) in ICA might not allow MLS to receive sufficient data to work appropriately. Second, cases in ICA are unique, complex, and with a multitude of binary classification tasks, which complicates an adjustment of MLS to this ‘nature’ of ICA cases. Third, like human arbitrators, an MLS can also have biased systems, this element is primarily referred to how trustworthy is the data that feed those programs. Likewise, for MLS using black-box models, it is complex to understand and explain the reason for its outcomes, being the legal motivation of a decision a fundamental aspect for parties in ICA. Lastly,

¹²⁰ Shai Danziger, Jonathan Levav, and Liora Avnaim-Pesso, ‘Extraneous factors in judicial decisions’ (2011) PNAS 108

¹²¹ Mark Purdy, John Zealley and Omaro Maseli, ‘The Risks of Using AI to Interpret Human Emotions’ (*Harvard Business Review* 18 November 2018) <<https://hbr.org/2019/11/the-risks-of-using-ai-to-interpret-human-emotions>> accessed 25 August 2020

¹²² See section 3.4 (A)

an MLS might not interpret as good as human arbitrators some witnesses, or expert testimonies.

In conclusion, responding to the main concern of to what extent an MLS can replace an arbitrator decision in the ICA context, it can be argued that it is not feasible given the current characteristics of arbitration and some technical issues that AI and MLS have to surpass.

CHAPTER IV – Legal Framework

4.1 Introduction

Having addressed the extent to which an MLS can substitute an arbitrator's decision and regardless of the abovementioned reasons why its implementation is currently not feasible, this chapter will assess whether the current legal framework in ICA permits an MLS decision in an arbitration dispute. To this end, the chapter will explore, first, the scope of the arbitration agreement, second, the provisions of the UNCITRAL Model Law, and some examples of national arbitration legislation, and finally, the enforceability and recognition of a decision made by an MLS under the New York Convention.

The legal framework in ICA is represented by international treaties, international legal practices, national laws, arbitration rules and, arbitration agreements. This legal architecture is important to determine whether an application of an MLS as an arbitrator can be accommodated within the current legal landscape in ICA. This chapter will explore only international treaties, some national laws, and, the arbitration agreement.

4.2 The Arbitration Agreement

As was described in Chapter II, the Arbitration Agreement is the 'foundation stone of the arbitration where parties agree to arbitrate their present or future disputes'.¹²³ More importantly, in the Arbitration Agreement the parties can decide the rules that will regulate the procedure, location of the arbitration, substantive law, and the appointment of the arbitrators, which is basically the representation of the party autonomy principle.

This principle provides parties the right to decide the most relevant aspect of the arbitration proceeding. Thus, if both parties agree to resolve their commercial issues through a machine using AI instead of a human arbitrator, they are in their right to do so. Parties can produce their private system of justice and there is nothing in the law that can prohibit, for instance, having an MLS as an arbitrator or having a decision without motivation. So, they are in their right to decide what is best according to their conflict interests.

However, as with any other contract, the Arbitration Agreement just has a binding effect between the parties.¹²⁴ To have a wider scope and applicability it has to comply with other elements of the arbitration legal framework. If some parties include an MLS arbitrator in an Arbitration Agreement and at the moment of the decision they desire to enforce it in a foreign country, the MLS-arbitrator has to be allowed under the provisions of the NYC,

¹²³ See section 2.2.1

¹²⁴ Moses (n 1) 5

or if the parties want to execute an agreement in a jurisdiction that bans machines deciding arbitration cases, the content of the agreement will be invalid in that State.

In short, although the parties might agree on lawful provisions in the Arbitration Agreement, the content of the latter has to be interpreted in conjunction with international treaties or national legislations. In the case of parties agreeing to have an MLS acting as the director of the arbitration proceeding, it is necessary to analyze this agreement under the NYC, UNCITRAL Model Law, and some domestic laws to determine whether the current arbitration legal frameworks allow an MLS-arbitrator or not.

4.3 The New York Convention

The New York Convention is a fundamental legal instrument extensively accepted in ICA. It has been ratified by 163 contracting States.¹²⁵ The aim of this convention ‘is to provide common legislative standards for the recognition of arbitration agreements and court recognition and enforcement of foreign and nondomestic arbitral awards’.¹²⁶ In other words, it ensures that a foreign arbitration decision is recognized and enforceable at the same level as a national decision.

To the effect of analyzing the implications of having an MLS ruling arbitration decisions under this international treaty, it is necessary to contextualize the historical moment of the publication of the New York Convention in 1958. It is clear that the advanced technology of that moment cannot be compared with the technological developments of the current era, much less, contemplating a machine executing the duties of a human arbitrator in the 21st century. Therefore, the NYC has to be interpreted as a living instrument capable of accommodating its content to future technological advances,¹²⁷ and, as an international treaty, it has to be understood as taking into consideration ‘the context and the purpose of the Convention’.¹²⁸

Some examples of how some of the provisions were at the forefront of the technology at that time, but in 2020 are part of the past, can demonstrate that the NYC can be technology adaptative to new shifts. The first illustration is article II (2) of the NYC referring to the arbitral clause, where it has to be ‘signed by the parties or contained in an exchange of letters or telegram’.¹²⁹ In relation to this article, the UNCITRAL in 2006, taking into consideration the widely accepted use of electronic commerce (emails and other electronic forms), recommended that the article cannot be applied in an ‘exhaustive way’.¹³⁰ In a similar vein, Article IV (a) establishes that for the recognition and

¹²⁵ ‘Status: Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York, 1958) (the ‘New York Convention’) Commission On International Trade Law’ (*United Nations*) <https://uncitral.un.org/en/texts/arbitration/conventions/foreign_arbitral_awards/status2> accessed October 7, 2020

¹²⁶ The New York Convention

¹²⁷ Eidenmüller (n 77) 34

¹²⁸ International Council for Commercial Arbitration, ‘*ICCA's Guide to the Interpretation of the 1958 New York Convention: a Handbook for Judges*’ (International Council for Commercial Arbitration 2011) 13

¹²⁹ Article II (2) of the New York Convention

¹³⁰ United Nations Commission on International Trade Law: Recommendation regarding the interpretation of article II, paragraph 2, and article VII, paragraph 1, of the Convention on the

enforcement of the decision, the ‘party shall supply duly authenticated original award or a duly certified copy thereof’,¹³¹ nowadays this provision has been interpreted as just accepting the decision being signed by the arbitrators without any requirement of a duly certified copy.¹³²

In short, the NYC as a living instrument is able to adapt to novel technological changes, but always respecting its context and purpose. Taking this into account, to understand how feasible it is to have an MLS as a decision-maker, it is essential to analyze five relevant provisions of this international legal instrument, namely: Article I (2), Article IV, Article V 1(a), Article V 1(d) and, Article V 2(b).

Article I (2) of the NYC

Article I (2) is related to the term ‘arbitral awards’ (in the thesis it is also understood as arbitration decision), specifically, the second prong of the provision states ‘2. The term “arbitral awards” shall include not only awards made by arbitrators appointed for each case but also those made by permanent arbitral bodies to which the parties have submitted’.¹³³ Evidently, the term arbitrators are referred to as human persons, however, it does not contain any limitation as to having an MLS-arbitrator. Indeed, the context of what or who qualifies ‘as an arbitrator has generally been broad – almost anyone can be an arbitrator’.¹³⁴ Given that, the use of arbitrators in this article is not exclusively addressed to human arbitrators.

To reinforce the previous statement, apart from this article, the word ‘arbitrator’ solely appears in Article V 1(b) related to the refusal of a decision ‘if the party against whom the award is invoked was not given proper notice of the appointment of the arbitrator’.¹³⁵ Again, there is no express limitation regarding using an MLS as an arbitrator, just a reference to a procedural step of the proceeding, which in any case, an MLS can comply with if it is properly appointed by the parties. As a consequence, under the preceding provisions and given the purpose of the Convention there does not exist any explicit prohibition to having an MLS rendering a decision.

Article IV of the NYC

This article contains the minimum requirements for a decision to be enforced and recognized in one of the contracting States, in particular, the interested party shall ‘submit (a) the duly authenticated original award or a duly certified copy thereof; (b) the original

Recognition and Enforcement of Foreign Arbitral Awards, done in New York, 10 June 1958, adopted by the United Nations Commission on International Trade Law on 7 July 2006 at its thirty-ninth session. <<https://www.uncitral.org/pdf/english/texts/arbitration/NY-conv/New-York-Convention-E.pdf>> accessed October 9, 2020

¹³¹ Article IV (a) of the New York Convention

¹³² Eidenmüller (n 77) 31

¹³³ Article I (2) of the New York Convention

¹³⁴ Irene Ng and Valeria Benedetti, ‘When the Tribunal Is an Algorithm: Complexities of Enforcing Orders Determined by a Software under the New York Convention’, Katia Fach and Ana Lopez-Rodriguez (eds), *60 Years of the New York Convention: Key Issues and Future Challenges*, (Chapter 8, Kluwer Law International 2019)

¹³⁵ Article V.1(b) of the New York Convention

agreement referred to in article II or a duly certified copy thereof'.¹³⁶ The last part of the provision is easy to comply with since it merely involves the interested party in the submission of the original arbitration agreement. Nevertheless, concerning point (a) of the article, as was clarified above, that certified copy is interpreted as only the signatures of the arbitrators, the doubt is if an MLS is capable of issuing a decision with the corresponding signature.

An MLS may not be capable of fulfilling this requirement of authenticity, an example of this being the online consumer disputes, where the decision is taken from a software without any formalities or signature.¹³⁷ However, the revolutionary idea of having a machine rendering a decision might easily lead to thinking that the AI technology itself will create a way to satisfy this requirement. For instance, the EU Regulation on electronic identification¹³⁸ 'defines an electronic signature as data in electronic form which is attached to or logically associated with other data in electronic form and which is used by the signatory to sign'.¹³⁹ Taking into consideration this provision, it can be argued that an MLS could create a unique e-identification (for instance, a mark or a code) that fulfills the authentication requirements required by the mentioned Article of the NYC. Therefore, an arbitration decision ruled and signed by an MLS may not have difficulties in being recognized and enforced by an interested party in one of the contracting countries of the NYC.

Article V of the NYC

This provision of the NYC contains the possibility of refusing the recognition and enforcement of the decision by the losing party under specific grounds. Just Article V 1(a), Article V 1(d) and, Article V 2(b) of Article V will be examined as they are the only relevant provisions linked to the objective of the present research.

Article V 1(a)

This first provision refers to the arbitration agreement holding that a decision might be refused by the losing party if it 'is not valid under the law to which the parties have subjected it or, failing any indication thereon, under the law of the country where the award was made'.¹⁴⁰ When parties directly indicate the law of which is the country where they desire to resolve the dispute no problem will arise in regard to this article, the difficulties arise when parties do not specify any substantive law in the arbitration agreement. In the latter scenario, different interpretations have been adopted by the doctrine and case law, among others, it is common to use the law of the seat of the

¹³⁶ Article IV of the New York Convention

¹³⁷ Ng (n 134)

¹³⁸ Regulation (EU) No 910/2014 Of The European Parliament And Of The Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (Regulation (EU) on electronic identification)

¹³⁹ Article 3 (10) of the Regulation (EU) on electronic identification.

¹⁴⁰ Article V 1(a) of the New York Convention

arbitration, the place where the decision was signed or the place that governs their previous commercial relationship.¹⁴¹

Nevertheless, under all of the abovementioned interpretations, namely, the law of the seat, signed decision, or commercial relationship, the debate increases when it concerns an MLS. It is the case, that an MLS can be located in a different country to that where the parties are accessing the procedure or it may be complex to determine where the MLS signed a decision or the MLS might be using technologies located in different jurisdictions. This indeterminate place of the MLS might open the door for the losing party to refuse the decision under the content of this Article.

Prima facie, there might not exist a solution for all the cases, it will be more logical to make a case by case assessment. However, one can anticipate that as a latent feasible solution the seat of the arbitration can be considered the place of the company owner/developer of the MLS. For instance, imagine that Microsoft is the developer of the next robot arbitrator, in that scenario the seat of the arbitration might be where the headquarter is (Redmond, the United States). The same analysis can apply to defining where the decision was signed and can be interpreted as to the place where the owner of the MLS is located. Many creative solutions might apply to define the seat of the arbitration or the signed place of the decision but like every new technology, some initials, and recurrent practices will lead the path to determine the proper route for future MLS arbitration cases.

Article V 1(d)

This Article contains a ground for refusing a decision ‘if the composition of the arbitral authority or the arbitral procedure was not in accordance with the agreement of the parties, or, failing such agreement, was not in accordance with the law of the country where the arbitration took place’.¹⁴² Under this provision, when parties agree on having an MLS as the arbitrator of the dispute there is no ground to refuse the decision. The controversial issue occurs when the Arbitration Agreement does not clearly include an MLS as a mechanism to resolve the arbitrations dispute.

First, for the same reasoning as the preceding Article V 1(a) concerning the unknown place of the MLS, it might be difficult to determine which is the country where the MLS took place. Second, since an MLS will be a novel technology in the arbitration community, much disparity might arise among the arbitration agreement clauses used in different cases and jurisdictions. For instance, the wording in an arbitration agreement respecting the MLS-procedure might radically change among various disputes, which in the case of confusion and a non-uniform interpretation might lead to the application of the present Article. To solve the latter, once MLS is widely used, it is suggested that the arbitral authorities create a global MLS arbitration clause to avoid falling into misunderstandings of the terms of the arbitration agreement. Regardless of the previous consideration, the remarkable aspect concerning this provision is that if parties

¹⁴¹ Ng (n 134)

¹⁴² Article V 1(d) of the New York Convention

undoubtedly agree to include an MLS in their arbitration agreement it will be compatible with Article V 1(d) of the NYC.

Article V 2(b)

Lastly, Article V 2(b) may refuse the recognition and enforcement of a decision if ‘the award would be contrary to the public policy of the country’.¹⁴³ This important provision refers to the public policy of the State where the arbitration is being enforced. Therefore, if the implementation of an MLS-arbitrator is contrary to a domestic policy, the particular State might refuse the decision based on this Article. In the next section (Model and National Laws) it will be explained in detail whether the MLS-arbitrator is accepted or not under the scope of different jurisdictions.

Overall, it seems that due to the adaptative technology nature of the NYC, always pursuing its context and purpose, an MLS will have no major obstacles to being accepted under the convention content. Clearly, some challenges have to be overcome but as the MLS technology advances some of the issues will be resolved on the way, and of course, if this technology contributes with justice and fairness, it will probably receive global support from the contracting members of the NYC.

4.4 UNCITRAL Model Law and National Legislations

As in the previous section, this one will discuss whether a fully MLS arbitrator is allowed under the UNCITRAL Model Law and some of the most relevant arbitration domestic laws.

In ICA the Model Law has significant relevance because it sets widely accepted rules among the arbitration community, where the states can either adopt them or modernize their existing arbitration rules. This legislation has been adopted in 83 countries in a total of 116 jurisdictions.¹⁴⁴ Therefore, the Model Law is an extraordinary starting point to evaluate its provision respecting adopting new technologies, in this case, an MLS ruling arbitration decision.

The words ‘arbitrator’ or ‘arbitrators’ can be found 64 times throughout the Model Law. Clearly, the intention of the 1985 legislation and the in 2006 amended version, was to give to these words the value of a human arbitrator. The most relevant Articles referring to these terms are Article 2 (b), Article 11, and Article 12 (1).

Article 2 (b) describes that an ‘arbitral tribunal means a sole arbitrator or a panel of arbitrators’.¹⁴⁵ Article 11 states, in relation to the appointment process, ‘that no person shall be precluded by reason of his nationality from acting as an arbitrator, unless otherwise agreed by the parties’.¹⁴⁶ Meanwhile, Article 12 (1) provides, in relation to

¹⁴³ Article V 2(b) of the New York Convention

¹⁴⁴ ‘Status: UNCITRAL Model Law on International Commercial Arbitration (1985), with Amendments as Adopted in 2006 Commission on International Trade Law’ (*United Nations*) <https://uncitral.un.org/en/texts/arbitration/modellaw/commercial_arbitration/status> accessed October 01, 2020

¹⁴⁵ Article 2 (b) of the UNCITRAL Model Law

¹⁴⁶ Article 11 of the UNCITRAL Model Law

challenging an arbitrator, that ‘when a person is approached in connection with his possible appointment as an arbitrator, he shall disclose any circumstances likely to give rise to justifiable doubts as to his impartiality or independence’.¹⁴⁷ When the mentioned provision points out the terms “nationality” or “person” it seems to imply that it is referring to human arbitrators. The deliberations around this legislation say nothing about having an arbitrator without a human director.¹⁴⁸ Nevertheless, as with the NYC, there does not exist any specific provision prohibiting the use of an MLS as director of the arbitration proceeding and, as was stated, the Model Law is just that, a model of rules that the States use according to their internal necessities and interests. Consequently, every country is free to decide whether to incorporate or not this novel technology as an alternative to solve the arbitration disputes in their national context.

As is natural and depending on the circumstances, every State has different regulations regarding the arbitration process. Like the NYC and Model Law, most of the national legislations are silent¹⁴⁹ as regards to having an MLS acting as an arbitrator. However, as will be seen, some countries explicitly prohibit an arbitrator other than a human person and in contrast, other jurisdictions allow the possibility of having, among humans, legal entities to be the decision-maker of the proceeding.

In the first scenario, the States only allowing a human person to act as an arbitrator, there are a few illustrations. The first one is the French case, where Article 1450 of the Civil Code expressly requires that the decision-maker has to be a natural person. Likewise, Article 1023 of the Dutch Code of Civil Procedure (book four – arbitration) states that ‘any natural person of legal capacity may be appointed as arbitrator. Unless the parties have agreed otherwise with a view to the impartiality and the independence of the arbitral tribunal, no person shall be precluded from appointment by reason of his nationality’.¹⁵⁰ This Dutch provision excludes any other form of arbitrator different to a natural person. Similarly in Scotland, where the Arbitration Scotland Act of 2010, in the Schedule 1-Mandatory Rule 3 expressly provides that ‘only an individual may act as an arbitrator.’¹⁵¹ More interesting is that under this Act ‘the mandatory rules cannot be disapplied by an arbitration agreement’.¹⁵² In England, section 26 (1) of the English Arbitration Act 1996 states ‘that the authority of an arbitrator is personal and ceases on his death’.¹⁵³ This can be interpreted that only natural persons die, as a consequence, only a natural person can be an arbitrator.¹⁵⁴ However, English courts gave a broad interpretation to this provision, for instance, in *Dubai Islamic Bank PJSC vs Paymentech Merchant Services Inc.* (2000

¹⁴⁷ Article 12 (1) of the UNCITRAL Model Law

¹⁴⁸ Eidenmüller (n 77) 39

¹⁴⁹ *ibid* 41

¹⁵⁰ Article 1023 of the Dutch Code of Civil Procedure

¹⁵¹ Schedule 1, Rule 3 of the Arbitration (Scotland) Act 2010

¹⁵² Section 8 (Mandatory Rules) of the Arbitration (Scotland) Act 2010

¹⁵³ Section 26 (1) of the English Arbitration Act 1996

¹⁵⁴ James Hope, ‘Can a Robot Be an Arbitrator?’, Axel Calissendorff and Patrik Schöldstrom (eds), *Stockholm Arbitration Yearbook 2019*, (Chapter 7, Kluwer Law International 2019) pp. 103 – 120

EWHC 288) parties and the court agreed that an arbitrator by a committee or by a board of directors could be valid under the English Arbitration Act 1996.¹⁵⁵

In the second scenario, for States allowing a legal person to perform arbitrator duties, there are also some examples. In Spain, a Court in the case *Sogecable v Auna Telecomunicaciones* issued that accounting firms could be appointed as arbitrator.¹⁵⁶ Similarly, Article 871(1) of the Greek Code of Civil Procedure provides that ‘one or several persons, as well as a court in its entirety, may be appointed as arbitrators’.¹⁵⁷ Finally, the Iranian International Commercial Arbitration Law in its Article 1 (a) states that an arbitrator might be ‘natural person/s or legal entity/ies’.¹⁵⁸ These illustrations, contrary to the first scenario, allow a person different from a human to be appointed as an arbitrator. However, the doubt is if an MLS can be considered as a legal person or legal entity.

Trying to address the last doubt, certain scholars have taken two different routes. First, they compare a robot with an MLS and explain the legal capacity of the former with the ‘e-personality’¹⁵⁹ that the European Parliament suggested in 2017. In particular, that ‘creating a specific legal status for robots in the long run, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons responsible for making good any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently’.¹⁶⁰ Also, in 2017, Saudi Arabia gave for the first time a nationality to a robot.¹⁶¹ This thesis does not assume that an MLS and a robot have the same characteristics but cites this example to illustrate a way of how the MLS arbitrator might have legal capacity.

Second, Professor Eidenmüller suggests that MLS can be considered as a self-driving corporation. The professor argued that ‘this would imply waiving the requirement of human directors for corporations and allowing corporations to be managed exclusively by AI systems’.¹⁶² Therefore, as a self-driving corporation, an MLS can be taken as a third independent party.

In summary, the Model Law and most of the domestic arbitration laws are silent with respect to having a machine as the decision-maker. As with the analysis given about the NYC, there are no explicit restrictions in the use of MLS in arbitration. In the case of the Model Law, it has to be interpreted as a living instrument able to adapt to all types of technological developments. Concerning the national laws, some countries allow a legal

¹⁵⁵ *ibid*

¹⁵⁶ *Sogecable S.A. v. Auna Telecomunicaciones S.A.*, Audiencia Provincial de Madrid, Spain, 29 July 2005, res. 585/2005.

¹⁵⁷ Article 871(1) of the Greek Code of Civil Procedure (as amended by Law 2331/1995)

¹⁵⁸ Article 1 (a) of the Iranian International Commercial Arbitration Law 1997

¹⁵⁹ See Hope (n 154), See also Eidenmüller (n 75)

¹⁶⁰ European Parliament, ‘Texts Adopted - Civil Law Rules on Robotics - Thursday, 16 February 2017’ (europa.eu) <https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051_EN.html?redirect> accessed October 07, 2020

¹⁶¹ Hope (n 154)

¹⁶² Eidenmüller (n 77) 22

person and others only human persons as arbitrators, but every country has its internal procedures to amend an arbitration law. Finally, it has been suggested that an MLS arbitrator might have a legal personality as a robot or as a self-driving corporation.

4.5 Conclusion

Overall, it can be said that regardless of some specific legal restrictions, the existing regulation in ICA allows the implementation of the MLS as a replacement of the current human arbitrator decision. This affirmation is based on the analysis of the scope of the Arbitration Agreement, the New York Convention, UNCITRAL Model Law, and some comparative national legislation.

First, the party autonomy principle represented by the Arbitration Agreement provides parties with the right to decide their own arbitration proceeding, including, without any limitation, the appointment of an MLS holding an arbitration decision.

Second, the NYC as a living instrument and pursuing its content and purpose, is capable of being adaptative to new technological changes. Reviewing its more relevant provisions, it can be concluded that despite some technical issues like the signature of an MLS, there does not exist any particular expression that excludes the recognition and enforcement of an MLS decision under the content of this international treaty.

Third, as with the NYC, the UNCITRAL Model Law is silent on having an MLS-arbitrator. However, as it is a model law it merely sets the general arbitration rules to the member states, and depending on their interests, they can decide whether to adopt them or modify their existing arbitration rules.

Finally, taking a comparative approach to different national arbitration legislation, it can be asserted that some of them explicitly indicate that the arbitrator has to be a natural person while others allow a different entity than a human to act as an arbitrator. Therefore, this analysis serves to offer a global understanding of the most relevant arbitration national laws but it might be assumed that if a fair and effective MLS-arbitrator breaks into the arbitration market, it would be massively adopted by the principal arbitration jurisdictions.

CHAPTER V – Conclusion

Technology is taking a prominent role in almost every aspect of our lives. During the current Covid19 pandemic this premise is having more force than ever, from students of all ages receiving education through a video conference to professionals transforming their homes, using the necessary technological devices, in new workplaces. These shifts are also impacting the legal practice, from traditional contracts being rapidly created and executed using document automation platforms to contracts being automatically enforced with smart contract technology.

Arbitration is not unfamiliar with this technology disruption. In particular, AI is the technology that is improving more relevant aspects of the arbitration proceeding. For instance, successful AI e-discovery tools are helping parties to better target documents during the initial stages of the arbitration proceeding.

In this revolutionary technological environment, the thesis's overall objective was to demonstrate to what extent, in the context of ICA, an arbitrator decision can be replaced by implementing AI, specifically, using MLS technology. This idea of replacement had a particular aim that was to prove that by the application of MLS the arbitration proceeding will be improved in terms of quality, cost, and time.

Nonetheless, before addressing the general objective of the thesis it was essential to assess important elements around the characteristics of ICA and MLS. In particular, which elements will be clearly improved with the application of MLS, which elements in ICA could be an obstacle for the proper implementation of this technology and to finally conclude, whether the implementation of MLS as a replacement of the arbitration decision in the ICA context is technically and practically feasible. In addition, it was necessary to analyze the current arbitration legal framework to evaluate whether the implementation of MLS is accepted or not.

Overall, this thesis has drawn attention to some current arbitration elements that are jeopardizing the quality and the essential nature of the proceeding. This threat might be represented in unnecessary delays of the process, in some cases due to the arbitrator performance, or also, because of potential arbitrators' biases at the moment of rendering the decision or at the time of their appointment, or just for different multicultural background in the arbitral panel. The mixture of these negative elements presents MLS as an attractive solution to overcome some of the described challenging aspects in ICA.

The introduction of MLS as a more efficient solution in the current arbitration proceeding was evaluated from a practical vein as well. An illustration of this was the description of the existing platforms using MLS or AI that are successfully penetrating into the arbitration community. These types of platforms are collaborating with scheduling and planning the workload of arbitrators during the process, data analysis and document research of the documents submitted by the parties, or with analysis and prediction of the decisions. These tools are, in one way or another, making arbitrators' functions easier to carry out, which in the end, improves the quality of the arbitration proceeding.

The research also assessed to what extent the existing characteristics of MLS allow them to render a decision according to the standards and elements of an ICA proceeding. This prime aspect of the thesis yielded an interesting approach of whether it is feasible or not to have MLS deciding arbitration cases.

Confidentiality appears to be the first relevant limitation for the proper implementation of MLS. This vital arbitration element is usually why parties choose to litigate in arbitration over traditional courts but, at the same time, represents an obstacle for MLS. The necessity of having volume, veracity, variety, and velocity in the data that will feed the MLS is essential for a better performance of the machine. However, against these Four V's, confidentiality plays an important role, thus if all the arbitration decisions remain under the umbrella of parties' confidentiality it would be arduous for MLS to have accurate, trustworthy, and sufficient information to improve its performance and render a decision of a high quality.

Another aspect that could restrain the MLS-arbitrator would be the complex characteristics of the arbitration cases and the potential lack of MLS to adapt to these

peculiarities. Normally, arbitrators face complex cases with unique facts and a multitude of binary classifications before rendering a decision. The capacity of MLS to detect and examine valuable patterns across the data might not work as is required when processing unique arbitration cases.

Additionally, the MLS neutrality and opacity might also restrict the efficiency of MLS acting as decision-makers in ICA. On the one hand, the fairness of MLS depends on an important vein in the process of collecting and processing data, therefore if the set of rules is biased the outcome will probably be biased as well. In that scenario, it can be argued that neutrality in MLS is not absolute, it is subject to the criteria of the person who set its rules. On the other hand, the existing problem with the MLS using black-box models is that, on some occasions, they are not capable to explain the reasons for the outcome. This in ICA represents an important barrier since parties (especially the losing party) are usually seeking for a justification of the arbitration final decision.

The final limitation studied for the implementation of MLS was the lack of empathy of these machines in interpreting and understanding different emotions and backgrounds of the parties (including experts or witnesses) involved in a case. Consequently, it was concluded that MLS might not be prepared to emulate human emotions, generally required before ruling an arbitration decision.

The described limitations allow the thesis to conclude that, as of today, MLS is not capable of ruling an arbitration decision with the high quality currently rendered in ICA. This conclusion is reached after analyzing the most relevant elements of the arbitration decision and proceeding, and from the perspective of the current technological development of MLS.

Finally, and regardless that it was determined that MLS cannot render an arbitrator decision given its characteristics and according to the ICA elements, international arbitration treaties, the arbitration agreement and different national arbitration laws were explained, to finally argue that there exists no impediment (with some exceptions) in the current arbitration legal framework for MLS to hold an arbitration decision.

Parties in the Arbitration Agreement can agree on their own private system of justice (to the extent that it does not contravene existing law) and based on the party autonomy principle they could include in their clause an MLS- arbitrator to solve their commercial differences. However, for the Arbitration Agreement to have wider scope and applicability it has to comply with international treaties and national laws. To this end, the thesis assesses the implication of having an MLS-arbitrator under the New York Convention, UNCITRAL Model Law, and some National Legislations.

The NYC nature and purposes make this international treaty a living instrument capable of being adaptable to recent technological advances. Some provisions of the NYC were evaluated to conclude that although some creative solutions regarding MLS might take place in the near future, overall, an MLS decision will be accepted under the convention. Some of the innovative solutions are to have a globally accepted arbitration MLS model clause or to define, in case law or guidelines best practices, what can be understood as the seat of the arbitration in an MLS decision, in which case, it may be the place of the developers of the MLS. But in general, there is no need to have an amendment of the

convention or to create a new one, with the existing NYC provisions an MLS decision could be perfectly recognized and enforced.

From the UNCITRAL Model Law perspective, the analyzed factors yield a similar approach to that of the NYC, these widely accepted rules are silent respect to having an MLS arbitrator and, in any event, the members might use these model rules to set their own internal legislation in accordance with their internal necessities. Therefore, the interpretation of the National Laws was made by a case-by-case assessment. The outcome of this research was that some particular countries exclude other forms of an arbitrator rather than a human person, as is the case of the French Civil Code or Dutch Code of Civil Procedure. Others like Spain accept legal entities to act as arbitrator. However, the main idea is that as the MLS improves its technical tools and starts being an effective solution across the arbitration community, more countries will amend their internal legislation to recognize and accept the MLS-arbitrator.

Therefore, the two main objectives of this thesis were addressed throughout the chapters. First, the current technical characteristics of MLS do not allow them to rule an arbitration decision according to the elements and standards of ICA. Lastly, and regardless of the previous factor, under the current arbitration legal framework, an MLS-arbitrator decision might be accepted and enforced under the NYC and some of the most relevant arbitration national legislations.

Nonetheless, the described findings do not mean that an MLS-arbitrator is not feasible in the near future or some additional measures might be taken to improve the arbitration legal framework surrounding the MLS-arbitrator. The idea of the MLS-arbitrator is to improve the quality of the arbitration proceeding as much as possible; thus, some particular aspects for further study should be considered to close the gap between the current circumstances and the desirable machine rendering arbitration decision:

- A common effort in the arbitration community, where the parties waive their right to confidentiality and disclose important aspects of their arbitration cases. The purpose is that the information will be used to fulfill MLS. For instance, parties may agree that cases with more than 10 years since their publication might be used to feed MLS. This will allow MLS to have more volume, veracity, and variety of data to set its rules.
- To guarantee MLS fairness it is required that the data be collected and processed without any sort of bias. The recommendation is that prestigious arbitration institutes lead MLS projects creating a board together with arbitrators, councils, and scholars, to set guidelines that every MLS should have.
- To fulfill the lack of empathy of the MLS with the emotions transmitted by parties, witnesses, or experts, the MLS might use other technologies such as facial recognition. This might be incorporated in the MLS itself or as an assistant tool.
- In the case of the MLS-arbitrator, most of the legal issues arise from the unknown seat of the arbitration or the indeterminate place where the decision will be signed. To avoid this, the suggestion is that every MLS has a pre-established place from its creation. This might vary depending on the business place of the developers or where the company has its servers. Another reasonable option is that the arbitral

institutes have an alliance with the MLS developers and select the arbitral institute place as the seat of the arbitration.

- Finally, before a massive implementation of the MLS-arbitrator, it should be mandatory to produce guidelines, webinars, conferences, courses, and every educational tool available to teach how the MLS-arbitrator will be implemented. These educational committees must be integrated by lecturers, arbitrators, practitioners, and developers. The idea is to disseminate across the arbitration community a guideline of good practice of the MLS-arbitrator. A specific goal of the committees might be to prepare an MLS arbitration model clause.

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