Artificial Intelligence Challenges and Opportunities for International Arbitration

By Kathleen Paisley and Edna Sussman

The world is undergoing a technological revolution that will dwarf the industrial revolution and will disrupt virtually every aspect of our business and personal lives, including the manner in which disputes arise and are resolved.

The centerpiece of the current stage of the technological revolution is artificial intelligence (AI), which will affect the manner in which:

- Business is conducted (including block chain, and other disruptive technologies);[1]

- Transactions are entered into (including smart contracts, bitcoin and other distributive mechanisms);[2]

- Disputes are raised and resolved.[3]

In these days of rising concerns about the resources and time it takes to decide disputes, artificial intelligence has the potential not only to reduce the time and cost of resolving disputes, but by increasing predictability and reducing risk, also to discourage unmeritorious claims and to create incentives to settle early. However, at the same time, concerns are raised about the impact that artificial intelligence will have on decision making and access to justice depending on who has access to its benefits, the transparency of, and control over, the arbitral data and algorithms, including publication of awards and potential risks to confidentiality and personal data protection, to name a few.

After a brief introduction to artificial intelligence, we will consider the potential impact of artificial intelligence on international arbitration, with a focus on the potential benefits to be gained from reducing uncertainty; the possibility for making the arbitral playing field more or less level depending on who has access to AI; and the prerequisites to successful implementation of AI, including the potential benefits to AI from increased access to awards.[4]

The debate over how artificial intelligence is implemented in international arbitrations raises some of the same concerns as the wider debate over the benefits versus the risks of transparency versus confidentiality generally and of award publication specifically, but the opportunities created by the widespread application of artificial intelligence to international arbitration will bring this tension to the fore in new and challenging ways.[5] The purpose of this article is to consider a few of them.

What Do We Mean by Artificial Intelligence?[6]

Artificial intelligence, or "AI," is the term coined to describe the general process whereby large amounts of data are combined with powerful iterative data processing systems and intelligent algorithms, thereby enabling the software to learn automatically from patterns or features in the data. The term AI is often used loosely, and encompasses many subjects including machine learning, deep learning, neural pathways, BOTs, cognitive computing, and natural language processing, but it is the software's ability to learn automatically from patterns or features in the data that makes it "intelligent."

It is beyond the scope of this article to discuss AI in depth, but simply put it is a technological means to employ software and data processing systems to digest and analyse large amounts of data using algorithms that allow the software to learn as it goes. The potential breakthrough for AI as it is applied to the law will be, among other things, the use of cognitive computing to allow AI not only to provide simple answers to questions and predictions about results, but also more complex reasoning, and to do so automatically without human intervention.

At its current stage of development, the efficacy of AI is highly dependent on the quality of the data processed and the algorithm applied, which dependencies are key to understanding both the potential benefits and risks from applying artificial intelligence to international arbitration.[7]

With digitalization, virtually every piece of information addressed in a typical arbitration exists in a digital form. This is true of the communications between the parties; between the parties and the institution; among the arbitrators and/or the institution; the evidence (including email communications); the names and details of expert and fact witnesses and their testimony, the transcript, the communications among the arbitrators, draft awards, etc.

We can think of this as the arbitral micro-data, that is, the data that is relevant to a specific dispute and that is addressed by one or both of the parties, the decision maker, and/or the institution in presenting, hearing, and/or deciding a specific case. This can include literally mil-

lions of data points, and the main use of artificial intelligence today is to analyse and use arbitral micro-data more efficiently and effectively.

Then there is the arbitral macro-data, that is, the information about the dispute resolution process and its outcome, which for the most part is contained in the award(s), including who acted as counsel, the arbitrators, the outcome of the dispute, the rationale for the decision, the damages theory, the damages method, the valuation, etc. For ease of reference, we will equate arbitral macro-data with awards as this is the most important piece of information about arbitral outcomes.

While the application of artificial intelligence to arbitral awards is in its infancy and will be a complex process, it is uniformly predicted that over time artificial intelligence will be applied to slice and dice data and to predict trends and outcomes that will forever change the basis on which disputes are brought and the manner in which they are decided. However, this requires access to the arbitral awards containing the necessary information to make these predictions.

How Is AI Applied Today to Arbitral Micro-Data?

The main use of artificial intelligence in arbitration today is to review increasingly vast amounts of digital arbitral micro-data held by parties and their counsel in order to determine what is relevant to the case and then to analyse that data and present it in a more effective manner. This use of AI to process arbitral micro-data has, and will increasingly, help to correct the cost and time problem created by the digital data at issue in complex disputes today—hence, as is often the case, technology may eventually help solve the problem it largely created because of digitization.[8] But the gateway to having these benefits is having access to the systems, the data, and the ability and processing power to use them.[9]

How Will Artificial Intelligence Reduce Arbitral Uncertainty?

Looking forward, one new frontier contemplates expanding the use of AI to analyse arbitral awards to undertake actual legal reasoning and to provide reasoned advice about how companies and legal arguments have fared in the past, how arbitrators have decided issues, and how damages have been approached.

This means that, for example, AI offers the potential of predicting results in advance including, for example:

- Chances of success generally, and with a particular decision maker;

- Likely range of damages generally, and with a specific decision maker;

- Timing to decision before a particular institution, and before a particular decision maker;

- Likely costs to be incurred;

- Likely range of a cost award generally, and with a particular decision maker, and

- Facts about opposing counsel, including their experience in particular matters and before particular decision makers.

When they come to fruition, the common benefit in all of these more advanced uses of AI to predict results in arbitration is that they will reduce the uncertainty inherent in any dispute resolution process. While there are obviously other non-economic factors at play in disputes, reducing the uncertainty about the outcome will both reduce the pursuit of unmeritorious claims and allow disputes to be settled more quickly when they do arise, with the consequent positive economic and social impact.

What Are the Potential Merits of AI in International Arbitration Cases?

When arbitration ensues, AI also holds out the promise of changing the way that cases are prepared, including, among other things, enabling parties to:

- Pick arbitrators based on likely results;

- Make arguments that are more likely to be successful with those arbitrators;

- Reduce the time and cost of legal research and data analytics, and

- Plan more realistic budgets, among many other things.

What Policy Implications Does This Have for the Arbitral Playing Field of the Future?

If AI is widely available at an affordable price, it has the potential of providing more arbitral actors increased access to information about their chances of success, their best strategy for success, what arbitrators to select, and other issues allowing them to participate in the process on a more equal footing at a lower cost through technology.[10] However, this promise of AI will only be realized if all actors have reasonable access to AI systems based on a reliable data set at a reasonable cost, failing which it will have the opposite effect of making the playing field even less level.

It is therefore important to ask ourselves upfront how AI will develop and will it be done in a way that fosters or restricts participation? Who will have access to the necessary systems and data required to use the predictive capacity of AI to reduce litigation/arbitration risk? What will the cost of access be? For which purposes? Will this access effectively be available only to large law firms, litigation funders, corporations, and insurers, or will means be developed to allow this data to be collected and these services to be performed at a cost that permits the benefits to be felt more broadly in both developed and developing countries and by both small and large players in cases

of varying size? Who and how will the algorithms be developed? Who will have access to them? Will access to awards and other arbitral macro-data be open or closed? What impact will this have on data protection and privacy interests?

These are difficult questions. International arbitration repeat-players have previously had unique advantages in picking arbitrators, knowing what arguments to make, and predicting outcomes. This first-hand knowledge based on personal experience will always have significant value, but data that holds various aspects of those experiences when incorporated into a more complete data set and using highly sophisticated technology, computing power, and intelligent algorithms can enable others to capture much of that specialized knowledge.

The insights AI offers already allows companies to search legal data from courts (including the US Supreme Court) and to provide customers with predictions about, among other things, how a particular judge or court is likely to rule on a particular issue, time to decision before that judge or that court, and opposing counsel's success before that judge or court.[11] The AI conclusions are reported to be remarkably accurate and often at a cost significantly lower than the countless hours a young lawyer would have to spend finding and attempting to analyse all the inputs. Thus, AI may serve to revolutionize the current disequilibrium in resources between parties who can afford the many lawyer hours such analysis may require and those who cannot.

But transformation requires not only that access to the necessary AI technology systems be offered at a reasonable cost, but also access to the data across a broad range of disputes. Thus far, the roadblock to the use of AI to undertake reasoning and more sophisticated analysis has been the requirement for manual extraction and organization of the data input by humans, but text analytics is changing that by allowing information to be extracted automatically.[12]

However, this requires the data from which this is extracted—in this case arbitral awards—to be available to be analysed.

> In a cognitive computing paradigm … the knowledge is embodied in the corpus of the texts from which the program extracts candidate solutions or solution elements and ranks them in terms of their relevance to the problem. **This assumes of course that an available corpus of texts contains information relevant to the type of problem.[13]**

This requirement that a sufficient "corpus" of readily available texts exists is not straightforward in the case of arbitral awards for a variety of reasons, including lack of access to awards and the decentralization of the data points, among others.

What Challenges Does AI Face in Using Awards to Predict Results in International Arbitration?

One of the hallmarks of international commercial arbitration is that arbitral awards in commercial cases are not published.[14] In contrast, in investor-State arbitration before the International Centre for the Settlement of Investment Disputes (ICSID), maritime arbitration by the Society of Maritime Arbitrators (SMA), and sports arbitration by the Court of Arbitration for Sport (CAS), unredacted awards are published in many instances.

It is beyond the scope of this article to provide complete information about the practices of international arbitral institutions with respect to the publication of selected awards in a redacted or summary form. The International Court of Arbitration of the ICC (ICC), International Centre for Dispute Resolution (ICDR), Singapore International Arbitration Centre (SIAC), the Stockholm Chamber of Commerce ("Stockholm Chamber"), and the Milan Chamber of Arbitration ("Milan Chamber") publish redacted versions of selected awards usually with party and possibly tribunal permission and typically excluding the names of arbitrator, parties and counsel, and the ICC publishes summaries of cases also excluding the names of parties and arbitrators and has started to separately publish the names of arbitrators sitting in their cases. The LCIA and the Stockholm Chamber, among others, publish selected decisions on arbitrator challenges with the names of the parties, counsel and arbitrators redacted, and the ICDR has recently announced that it will publish international challenge decisions as it has done in the past for domestic decisions.[15] The Hong Kong International Arbitration Centre (HKIAC) and the Swiss Chambers Arbitration Institution (SCAI) do not proactively publish any awards or decisions, but allow for publication to be requested subject to consent requirements.

The following chart provides a useful summary on the publication practices of the commercial arbitration centers:[16]

No publication, but it can be requested	Selected Summaries	Selected awards with Redaction	Full awards
HKIAC, SCAI	ICC	ICC, ICDR (soon to include challenges), LCIA (challenges to arbitrators only), Milan Chamber, SIAC, Stockholm Chamber (including challenges)	ICSID, CAS (appeals from institutional awards only), SMA

Arbitral institutions have also begun to publish studies of the time and cost of proceedings under their rules, and the AAA has conducted a study comparing the length of time in arbitration to U.S. federal courts and the consequent cost to the parties of the longer time to resolution in court.[17]

The growing need for the information contained in arbitral awards has also led several organizations to start developing databases that provide arbitration related information. The three best known at this time are all featured in this issue.

- Arbitrator Intelligence[18] will make available responses to detailed surveys to be completed by arbitration users who will report on their experiences with specific arbitrators. Arbitrator Intelligence has also collected almost 1,400 arbitral awards from jurisdictions around the world, which it intends to make available in some form.

- Dispute Resolution Data[19] collects arbitration-related data from critical sources including most of the major international arbitration institutions.

- Global Arbitration Review Arbitrator Research Tool (GAR ART)[20] provides information about individual arbitrators which includes individual arbitrator's own responses as to their procedural preferences and practices as well as providing names of counsel who have appeared before the arbitrator and arbitrators with whom they have sat on an arbitration panel.

While all this data is helpful in gaining a deeper understanding of the commercial arbitral process, the current lack of access to the full reasoning of the award and the names of the arbitrators, experts, and counsel makes it insufficient for various aspects of AI analysis.

On the other hand, while it is beyond the scope of this article to address how data protection will impact international arbitration, access to awards requires reconciliation with the GDPR and other data protection laws (the application of which may also further increase the importance of confidentiality during the processing of personal data during arbitrations).

This means that, while full unredacted awards would obviously be preferable for AI, data protection and other concerns may favor redaction of personal data. However, even if the names of the parties and any individuals were omitted, the predictive ability of AI would be greatly enhanced if awards were available including the full reasoning and the names of the arbitrator(s), counsel, and experts, who typically could give their permission in advance to disclosure.[21] Of course, parties would have to be able to refuse publication, and public access to awards including arbitrator names raises many other issues, including the potential for increasing the time and cost

of award drafting, issue conflict creeping into commercial arbitration, procedural paranoia increasing and impacting the written product, and further risks of unintentional release of confidential information and data protection concerns.[22]

The currently available data set of unredacted awards including the additional data identification of arbitrators, parties, and counsel is generally limited to those cases where the award is enforced and becomes public or one of the parties makes it public. This means that even where unredacted awards are available, the process of obtaining or accessing them on a continuous basis across hundreds of jurisdictions and many arbitral institutions is cumbersome, time consuming, and expensive. This decentralization of available arbitration awards and the multiple platforms on which awards are lodged creates additional hurdles and may limit the ways that AI can be employed in arbitration in the near term, thus potentially decreasing its efficacy and increasing costs.

Further, to the extent that one key aspect of AI would be geared at predicting future arbitrator behaviour, developing the data is not the only impediment to a meaningful AI analysis because of the impact of the typical three-person tribunals on the predictive ability of AI. For ease of use, the AI expectation may be that the chair was the decision maker and the result attributed to him or her for purposes of predicting results in future cases, whereas in fact the other tribunal members are likely to have had an impact, often a determinative one on the outcome, especially with respect to the reasoning provided. On the other hand, attributing the result equally to all tribunal members would presume that each of them would have reached the same conclusion on his or her own or as chair, which may not the case (again, particularly with respect to the reasoning). The algorithms will no doubt find a solution for this, but it remains a challenge.

The lack of an easily accessible data set, decentralized decision making, and other characteristics of international arbitration may increase the upfront and on-going costs and time required to use AI to predict outcomes in international arbitration. This may slow the adoption rate for AI for international arbitration as service providers grapple with these issues, making it less accurate at least at the outset, and more expensive.

On the other hand, when a full arbitral award is available or can be made available, the material available to process is often more complete than court decisions because arbitrators decide the whole case (unlike US judges where juries often reach the final result) and provide a fully reasoned decision addressing all issues (unlike most lower courts, especially in civil law countries, where court decisions can be sparse).

Moreover, the prevailing use of international arbitration to resolve the vast majority of complex, high value

trans-border disputes means the incentive to make AI work well for international arbitration is very high. This would be expected to create an increased push for arbitral awards to be made more available, which, coupled with the fact that confidentiality may not be as critical to users as previously understood,[23] may further the trend towards transparency of awards.

What Does This Mean for the Future of Artificial Intelligence in International Arbitration?

Whether we like it or not, artificial intelligence is going to play a major role in international arbitration in the near future. The amounts at issue are too high and the benefits from artificial intelligence too great to avoid it.

AI has significant potential benefits for international arbitration, but as members of the international arbitration community we must ask ourselves for whom, at what cost, and how this might impact international arbitration more generally in ways that may not be obvious.

This article only scrapes the surface of the competing concerns raised by the use of AI in international arbitration and the authors expect these questions to lead to healthy debates among the international arbitration community for many years to come, but the potential benefits and risks that artificial intelligence poses for international arbitration merit the debate.

Endnotes

1. *See, e.g.,* Don and Alex Tapscott, Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World (2016); Melanie Swan, Blockchain: Blueprint for a New Economy (2015).

2. *See, e.g,* Andreas M Antonopoulos and Gavin Wood, Mastering Ethereum: Building Smart Contracts and Dapps (2018); Jeff Read, Smart Contracts: The Essential Guide to Using Blockchain Smart Contracts for Cryptocurrency Exchange (2016).

3. *See, e.g.,* Kevin D. Ashley, Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age (2017) (detailed technical discussion of the application of artificial intelligence to legal practice) (hereafter "Ashley"); Richard Susskind, Tomorrow's Lawyers: An Introduction to Your Future (2d ed. 2017).

4. A number of articles have been published recently about the potential uses of AI in international arbitration, including, for example, Paul Cohen and Sophie Nappert, *The March of the Robots*, Global Arbitration Review (Feb. 15, 2017), http://globalarbitrationreview.com/article/1080951/the-march-of-the-robots; Jose Maria de la Jara, Alejandra Infantes, and Daniela Palma, Machine Arbitrator: *Are We Ready?* Kluwer Arbitration Blog (May 4, 2017), http://kluwerarbitrationblog.com/2017/05/04/machine-arbitrator-are-we-ready/ (hereinafter "Machine Arbitrator: Are We Ready?"); Jack Wright Nelson, *Machine Arbitration and Machine Arbitrators*, Youngicca Blog (July 28, 2016), http://www.youngicca-blog.com/machine-arbitration-and-machine-arbitrators/.

5. For a discussion of the pros and cons of publishing commercial arbitration awards *see*, New York City Bar Association, International Commercial Disputes Committee, *Publication of International Awards and Decisions*, February 2014, available at https://www2.nycbar.org/pdf/report/uploads/20072645-Pu blicationofInternationalArbitrationAwardsandDecisions.pdf ("NYCBA Publication of Awards").

6. For an understandable explanation of the technology behind AI, *see* Ashley *supra* fn. 3.

7. The authors note the serious debate about the need for transparency and ethical considerations posed by the application of artificial intelligence generally and to the law specifically, which is being spearheaded by the AI Initiative of the Future Society at the Kennedy School at Harvard, the considerations of which are beyond the scope of this article. *See* ai-initiative.org.

8. The authors note that this is not the same issue as the amount of disclosure, as parties must first apply these processes to their own data before addressing any data from the other side.

9. The coming into force of the European Union General Data Protection Regulation will impact the processing of the personal data at issue in complex disputes. It is beyond the scope of this article to address data protection, except to say that the protection of personal data will become increasingly important to international arbitration. *See* Regulation (EU) 2016/679 of the European Parliament and the Council of 27 April 2016 on the Protection of Natural Persons with regard to the Processing of Personal Data and on the Free Movement of Such Data, and repealing Directive 95/46/EC (General Data Protection Regulation) Official Journal L 119/1 (4.5.2016) (GDPR).

10. These issues are closely related to those made in favour of increased transparency generally that are discussed in the NYCBA Publication of Awards, *supra* fn. 5.

11. *See, e.g.,* M. Hutson, *Artificial Intelligence Prevails at Predicting Supreme Court decisions*, Science Magazine (May 2, 2017), http://www.sciencemag.org/news/2017/05/artificial-intelligence-prevails-predicting-supreme-court-decisions.

12. *See* Ashley *supra* fn. 3 at p. 5.

13. *Id.* (emphasis added).

14. This discussion is derived from the NYCBA Publication of Awards, *supra* fn. 5, published in 2014. The authors note that this discussion is limited solely to publication of awards, not the confidentiality of the process.

15. Caroline Simson, *The American Arbitration Association Sets Agenda For 2018,* Law 360, January 19, 2018, available at https://www.adr.org/sites/default/files/document_repository/AAA_Sets_Agenda_For_2018_Law360.pdf.

16. Source NYCBA Publication of Awards, *supra* fn. 5 (with modifications).

17. Roy Weinstein, *Arbitration Offers Efficiency and Economic Benefits Compared to Court Proceedings*; N.Y. Disp. Resol. Law. Vol. 10 No. 2 (2017); the full study is available at http://go.adr.org/impactsofdelay.

18. *See* Arbitrator Intelligence at www.ArbitratorIntelligence.org and in this issue see, Catherine Rogers, *Arbitrator Intelligence: From Intuition to Data in Arbitrator Appointments*, N.Y. Disp. Resol. Law. Vol. 11, Issue 1 (2018).

19. *See* Dispute Resolution Data at http://www.disputeresolutiondata.com/and in this issue see, Brian Canada, Debi Slate and Bill Slate, *A Data-Driven Exploration of Arbitration as a Settlement Tool: Does Reality Match Perception*? N. Y. Disp. Resol. Law. Vol. 11, Issue 1 (2018).

20. *See* Global Arbitration Review Arbitrator Research Tool at https://globalarbitrationreview.com/arbitrator-research-tool; and in this issue *see* David Samuels, *The Unusual Suspects—Easier to Find with GAR's ART,* N.Y. Disp. Resol. Law. Vol. 11, Issue 1 (2018).

21. Of note in this regard is SIAC, which currently provides in its form appointment document for arbitrators to indicate whether

their names can be included in published redacted awards and provides for the arbitrators to assign any copyright to the institution.

22. For a discussion of the pros and cons of publishing commercial arbitration awards *see*, NYCBA Publication of Awards, *supra* fn. 5, published in 2014; *see also* Kim Landsman, Book Review, *The Rise of Transparency in International Arbitration: The Case for Anonymous Publication of Arbitral Awards*, N. Y. Disp. Resol. Law., Vol. 7, Issue 1 (2014), reviewing a collection of essays compiled by the Milan Chamber of Arbitration and the Law School of the University Carlo Cattaneo-LIUS.

23. Queen Mary School of Law and White & Case, *2010 International Arbitration Survey*, p. 29, available at http://www.arbitration.qmul.ac.uk/docs/123290.pdf ("The responses indicate that confidentiality is important to users of arbitration, but it is not the essential reason for recourse to arbitration."). But the authors note that this could change as data protection compliance becomes more important.

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