CHAPTER 7

Can a Robot Be an Arbitrator?

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§7.01 INTRODUCTION

The first article in the 2019 issue of *Svensk Juristtidning* is an article by the new professor of procedural law at Uppsala University, Professor Eric Bylander, entitled *Den datoriserade domaren* (Eng. 'The Computerised Judge).[1] Professor Bylander recounts a story of a Norwegian judge who received an email – not from a disgruntled litigant as she had first thought, but from a friend – with the ominous title *Eders tid er snart forbi* (Eng. 'Your Time Is Soon Over'). The email turned out to contain an article about artificial intelligence (AI) and about how the so-called 'machine learning' is threatening to challenge human jobs in many different areas, even in the legal profession.

Can a robot replace a judge? Or more specifically for the purposes of this chapter, can a robot replace an arbitrator?

Professor Bylander points out that a robot certainly *can* replace a judge. Sweden apparently had a form of justice once upon a time which involved the throwing of dice.[2] If that was all that judges had to do, then robots could easily replace them.

However, the real question is not whether robots can replace judges, but whether they *should*. Can robots undertake the very human task of judging law, which as

* Particular thanks are due to Veronica Burachevskaya, formerly an Associate at Vinge, and to Niklas Berntorp, a Senior Associate at Vinge, for invaluable ideas and suggestions in relation to this chapter.

1. Eric Bylander, *Den datoriserade domaren*, Svensk Juristtidning, 1 (2019). That article in Svensk Juristtidning is a written version of Professor Bylander's installation lecture on 12 Nov. 2018, which was held to mark his installation as Professor of Procedural Law at Uppsala University on 16 Nov. 2018.
2. Birger Wedberg, *Tärningkast om liv och död – Rättshistoriska skisser*, 9–38 (Norstedt 1935) (Eng. 'Throw of the dice for life or death – legal history notes').

Professor Bylander reminds us was defined by the Romans as *ars boni et aequi* (Eng. 'the art of the good and the equitable')? [3]

Professor Bylander ends his article in Svensk Juristtidning by stating that he will devote forthcoming studies to considering what is uniquely human in the art of judging. Meanwhile, this chapter will consider the particular considerations that apply in this context in relation to *arbitrators*. It is appropriate to start by considering whether or not robots would be eligible to sit as arbitrators under current legislation.

§7.02 REQUIREMENTS IMPOSED BY CURRENT LEGISLATION

In line with the requirement of party autonomy, arbitration laws generally give very wide discretion to parties to appoint arbitrators of their choice. Nevertheless, a number of arbitration laws require an arbitrator to be a natural person, and some also require the arbitrator to have full legal capacity.

It is not possible to provide a detailed survey within the ambit of this chapter, but it may be sufficient for present purposes to give some examples.

[A] The UNCITRAL Model Law

Article 11(1) of the UNCITRAL Model Law provides: 'No person shall be precluded by reason of his nationality from acting as an arbitrator, unless otherwise agreed by the parties'.[4] This wording suggests that the arbitrator is expected to be a natural person, but there is no specific provision in that regard.

[B] Sweden

Section 7 of the Swedish Arbitration Act of 1999 provides: *Var och en som råder över sig själv och sin egendom kan vara skiljeman* (Eng. 'Any person who possesses full legal capacity in regard to his actions and his property may act as an arbitrator').[5]

The Government Bill that preceded the Act pointed out that, as part of upholding the principle of party autonomy, the parties should have wide discretion to decide who should be able to be an arbitrator.[6] It was noted that the UNCITRAL Model Law has no limitations in this regard, stating only in a non-mandatory provision that a person's nationality should not prevent him from being an arbitrator. On the other hand, it was noted that several European arbitration laws did limit the choice of arbitrators to persons who had full legal capacity.

3. Digests I.I.I., *Nam, ut eleganter Celsus definit, ius est ars boni et aequi* (Eng. 'And, to use Celsus' elegant definition, law is the art of the good and the equitable').
4. UNCITRAL Model Law on International Commercial Arbitration 1985 (with amendments as adopted in 2006).
5. An English translation of the Swedish Arbitration Act of 1999 can be found on the website of the SCC Arbitration Institute, http://www.sccinstitute.com.
6. Proposition 1998/99:35, *Ny lag om skiljeförfarande*, 80 (Swedish government bill).

Accordingly, the Swedish government considered that it was appropriate to rule out the appointment of persons who, by reason of their low age or reduced mental health, did not have full legal capacity. The government considered that the position was somewhat less clear in relation to persons who had been declared bankrupt and thus lacked legal capacity in relation to their property. It was noted that such an arbitrator might be more easily influenced than others by reason of his or her economic circumstances, and that issues might therefore arise in such a situation regarding such arbitrator's impartiality. It was noted that this was in a different category than the question of legal capacity as such, and the government questioned whether this should be an absolute ground for disqualification. Nevertheless, the government decided that it was important for the rule to be stated as clearly and simply as possible, particularly in order that the rule could be applied to arbitrators from other countries. Accordingly, it was decided that the simple rule should be that arbitrators needed to possess full legal capacity over their actions and their property.

Although the issue does not appear to have been subject to closer analysis by the legislature, commentators have stated that it follows from the requirements on arbitrators that only a natural person can be an arbitrator under Swedish law. It has further been stated that, if the parties have appointed an organisation as arbitrator, that will probably be interpreted as an agreement that such organisation shall appoint a natural person to be the arbitrator.[7]

[C] England

There is no express provision in English law that requires an arbitrator to be a natural person. However, section 26(1) of the English Arbitration Act 1996 provides that '[t]he authority of an arbitrator is personal and ceases on his death'. Since only natural persons can die, this wording suggests that the arbitrator is assumed to be a natural person.

It seems therefore to be assumed in English law that an arbitrator should be a natural person, although somewhat surprisingly the issue has not generated much discussion. However, Mustill and Boyd have stated:[8]

> the person appointed as arbitrator must be a natural person. A limited company, possessing only corporate personality, cannot validly be appointed [footnote]. Nor can a group of people, such as a partnership firm, be nominated to act as an arbitrator.
> [Footnote] We can cite no authority for this proposition, but it must surely be correct.

Crowther v. Rayment [2015] EWHC 427 (Ch)

This passage has also been the subject of judicial comment. In *Crowther v. Rayment* [2015] EWHC 427 (Ch), the English court was asked to appoint an arbitrator in respect

7. Stefan Lindskog, *Skiljeförfarande*, II:0-2.1.5 (2C ed., Zeteo, Norstedts Juridik 2018).
8. Michael J. Mustill and Stewart Boyd, *The Law and Practice of Commercial Arbitration in England*, 247 (2nd ed., Lexis 1989).

of an alleged arbitration arising out of a lease agreement for a property in France. Several questions arose, including whether there was an arbitration agreement, whether there was a sufficient connection to England and Wales, and whether there had been 'a failure in the procedure for the appointment of an arbitral tribunal' pursuant to section 18 of the English Arbitration Act 1996.

The judge, Mr Justice Andrew Smith, found that there was not a valid arbitration agreement.[9] In coming to this conclusion, the judge stated, *inter alia*, as follows:

> 30. First, [the arbitration agreement] refers to the decision of the Agent, that is to say Royal Villas Europe. The legal nature of Royal Villas Europe is not clear from the evidence, but it was not suggested that it is the trading name or other title of a specific natural person. Only a natural person, not a legal person or a group of persons such as a firm, can be an arbitrator: Mustill & Boyd (loc cit) [2nd edn, 1989] at p.247. If the last sentence is an arbitration agreement, it must somehow be construed so as to provide (directly or indirectly) for the appointment of a natural person as arbitrator, and I consider this further below (at paras 40-42). But the very fact that the dispute provision can be given effect as an arbitration clause only by adopting a rather contorted interpretation to meet this requirement itself indicates that the parties did not intend to make an arbitration agreement.

The judge went on to decide that he was also not satisfied that there was a sufficient connection with England and Wales to make it appropriate for him to exercise powers under section 18 of the Act.

Further, the judge considered that it was not possible to give meaning to the dispute provision:

> 41. The lessors submit that there has been 'a failure in the procedure for the appointment of an arbitral tribunal' because of the message that Fox Williams received on their voicemail from Mrs Gimbert on 6 June 2014: she said that 'Royal Villas Management [had] closed' and she refused to conduct an arbitration herself. Would a procedure for the appointment of a tribunal have failed in these circumstances if the dispute provision had provided (as Mr Quirk first submitted) that Mrs Gimbert should be arbitrator? To my mind it strains the literal meaning of section 18 to say that it has. Rather, the parties themselves have appointed an arbitrator in the arbitration agreement, and if the appointee refuses the appointment, it might be said that neither party should be compelled to accept an arbitrator to whom he did not agree. However, I can also see force in an argument that the section should be given a more generous interpretation in order to support arbitral processes. I did not receive submissions about this question, and, as I shall explain, it does not arise on the interpretation of the dispute provision that in the end the lessors invited me to adopt; and in those circumstances I say no more about it.
> 42. How then would the dispute provision work if it is taken to have provided for arbitration? As I have said, only a natural person can be an arbitrator, and the lessors sought a meaning for the dispute provision that accommodates

9. The alleged arbitration agreement stated: 'In the event of any dispute between the Lessor and the Lessee regarding proposed deductions from the deposit, then the Agent's decision shall be final and binding on all parties.' The Agent was referred to in the agreement as *Royal Villas Europe, c/o Mrs Janette Gimbert, Royal Villas Management Ltd, Reg no 168380, Reg Office, 2 Kastoras Street, CY 10987 Nicosia, Cyprus*.

> this. As I have said, their first suggestion was that on its true construction it provides for Mrs Gimbert to be the arbitrator because the address given for the Agent was 'c/o Mrs Janette Gimbert'. However, in the course of the hearing Mr Quirk rightly acknowledged that this is too fragile a basis for this interpretation. Instead he relied on the statement in Mustill & Boyd (loc cit) at p.247 that where an arbitration agreement provides there is to be a reference to an association, 'it is usual to read the agreement as if the reference were to persons nominated by the association from amongst its members'. This is said about the position where an arbitration agreement provides for reference to a trade association, and the meaning of 'members' in this context is tolerably clear. However, Mr Quirk submitted that a comparable approach should be taken in this case: he accepted that the intention could not have been that Royal Villas Management Ltd should make an appointment from its 'members' in the usual sense of that term in relation to a limited company, that is to say its shareholders, but he submitted that the evinced intention was that the company should nominate a director to be the arbitrator.
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> 43. I cannot give this meaning to the dispute provision, and to my mind the very fact that the lessors are driven to make this submission underlines that the dispute provision cannot be understood to provide for arbitration. However, their argument takes the lessors to another problem: they never asked Royal Villas Management Ltd to nominate a director to be arbitrator, and so, in my judgment, have not shown that the procedure for appointing an arbitrator has failed. I recognise that Mrs Gimbert apparently said that 'Royal Villas Management closed', but it is not clear quite what she meant by that vague statement: there is no evidence that persuades me that the company has been put into liquidation or otherwise ceased to exist.

Various other issues were raised and considered by the judge. In all the circumstances, the judge decided that he did not have any power to make an order under section 18 of the Act.

Dubai Islamic Bank PJSC v. Paymentech Merchant Services Inc. [2000] EWHC 288 (Comm)

It is also of interest in this context to note the English case of *Dubai Islamic Bank PJSC v. Paymentech Merchant Services Inc.* [2000] EWHC 288 (Comm). This case concerned arbitration pursuant to the regulations of the VISA credit card international regulations, which provided for two tiers of arbitration: first by the VISA International Arbitration Committee and second by VISA's International Board of Directors.

The VISA International Arbitration Committee was based in California, USA, but in the case at hand VISA's International Board of Directors took its relevant decision at a meeting in London, England. The regulations did not make any provision regarding the applicable substantive law or regarding the place or seat of arbitration.

The question for the court was whether the seat of arbitration was in London, and the court found that the seat was not in London. However, no suggestion was made by either party that arbitration by a committee or by a board of directors was not valid under English law.

[D] Scotland

At common law in Scotland, it was previously possible for a legal person to be an arbitrator.[10] However, in the Arbitration (Scotland) Act 2010, the Scottish legislature has expressly provided that only natural persons with legal capacity can be arbitrators.

See the Arbitration (Scotland) Act 2010, Schedule 1:

- Mandatory Rule 3:[11] 'Only an individual may act as an arbitrator.'
- Mandatory Rule 4: 'An individual is ineligible to act as an arbitrator if the individual is — (a) aged under 16, or (b) an incapable adult (within the meaning of section 1(6) of the Adults with Incapacity (Scotland) Act 2000 (asp 4)).'[12]

[E] France

In France, Article 1450 of the French Civil Code expressly requires that the arbitrator must be an individual: 'Only a natural person having full capacity to exercise his or her rights may act as an arbitrator. Where the arbitration agreement designates a legal person, such person shall only have the power to administer the arbitration.'[13]

[F] Italy

In Italy, case law apparently provides that an arbitration agreement providing for a corporate entity to be arbitrator is void.[14]

10. *See Bremner v. Elder* (1875) 2 R. (HL) 136 regarding the appointment of an unincorporated body as arbitrator, and *Wm Dixon Ltd v. Jones, Heard & Ingram* (1884) 11 R. 739 regarding the appointment of a firm as arbitrator.
11. Section 8 of the Act provides that the 'mandatory rules' listed, including rule 3, cannot be modified or disapplied (by an arbitration agreement, by any other agreement between the parties or by any other means) in relation to any arbitration seated in Scotland.
12. Interestingly, the original draft Bill had this as a default rule, so that it would have been open to the parties to agree that a minor or an incapable adult could act as an arbitrator, but it is suggested in the Commentary to the Act that the craftsman was persuaded by the Chartered Institute of Arbitrators that no acceptable circumstance could exist in a Scottish-seated arbitration where parties might do so (*see* Professor Fraser Davidson, Hew R. Dundas and David Bartos, *Arbitration (Scotland) Act 2010*, 110 (W. Green, 2010)). It is also suggested in the Commentary that an award made by such an arbitrator might well be unenforceable by reason of the public policy exception at Article V(2)(b) of the New York Convention (*see* Professor Fraser Davidson, Hew R. Dundas and David Bartos, *id.*).
13. *See* https://sccinstitute.com/media/37105/french_law_on_arbitration.pdf. The original French language text is as follows: *La mission d'arbitre ne peut être exercée que par une personne physique jouissant du plein exercice de ses droits. Si la convention d'arbitrage désigne une personne morale, celle-ci ne dispose que du pouvoir d'organiser l'arbitrage.*
14. *See* references in Professor Fraser Davidson, Hew R. Dundas and David Bartos, *supra* n. 12, 109, referring in particular to Case No. 123365 (November 1999) and Case No. 258717 (August 1962).

[G] Other Jurisdictions

The position in the USA, Germany, and Belgium is apparently somewhat unclear.[15]

There is no doubt much more that can be said on this subject in relation to other jurisdictions, but a comprehensive overview is beyond the scope of this chapter. One additional point that is worth stressing is that stipulations regarding the arbitrator's qualifications are generally also based on the assumption that the arbitrator will be a natural person. For example, in China Article 13 of the PRC Arbitration Law stipulates that, where an arbitration commission is to appoint an arbitrator, the arbitrator shall be fair and honest and shall meet at least one of the following requirements: (1) at least eight years' experience in arbitration; (2) at least eight years' experience as a lawyer; (3) at least eight years' experience as a judge; (4) work in legal research or teaching and have a senior professional academic title; (5) have knowledge of law or work in economic, or trade or other professions, and have a senior professional title or equivalent professional attainment.[16]

[H] Conclusions

It is left largely unexplained in most of the above-mentioned legislative provisions as to why it is thought to be important for an arbitrator to be a natural person. It appears merely to be assumed to be an obvious requirement.

The arbitrator is generally seen as having a personal mandate or 'mission' (to use the French word).[17] The arbitrator is personally accountable to the parties, and it is widely recognised – not least in the debate about the role of tribunal secretaries – that the core tasks of an arbitrator cannot be delegated to others.[18]

15. *See* references in Professor Fraser Davidson, Hew R. Dundas and David Bartos, *supra* n. 12. Note, however, that Gary Born has suggested, without reference to authority, that 'most developed jurisdictions permit juridical persons to serve as arbitrators, although in practice this is unusual' (Gary B. Born, *International Commercial Arbitration*, Vol. II, p. 1745 (2nd ed., 2014)). Gary Born adds a comment that the New York Convention does not impose any requirement for arbitrators to be natural persons, and that Contracting States that introduce such a requirement might arguably violate their obligations under Article II of the New York Convention to recognise agreements to arbitrate (Gary B. Born, *International Commercial Arbitration*, Vol. I, p. 293 (2nd ed., 2014)).
16. *See* Fan Yang, *Foreign-related arbitration in China, Commentary and Cases*, Vol. I, s. 5.105, p. 182 (Cambridge, 2016).
17. *See* Constantine Partasides, *The Fourth Arbitrator? The Role of Secretaries to Tribunals in International Arbitration*, Arbitration International, Vol. 18, No. 2 (2002): 'It is axiomatic to say of an arbitrator's mission that it is "intuitu personae". A party's choice of arbitrator is, of essence, personal.'
18. *See*, for example, Article 24(2) of the 2017 SCC Rules: 'The Arbitral Tribunal may not delegate any decision-making authority to the administrative secretary.' *See also* para. 145 of the ICC's Note to Parties and Arbitral Tribunals on the Conduct of the Arbitration under the ICC Rules of Arbitration (1 Mar. 2017): 'Under no circumstances may the arbitral tribunal delegate decision-making functions to an Administrative Secretary. Nor should the arbitral tribunal rely on the Administrative Secretary to perform any essential duties of an arbitrator.'

Thus, in the case of a sole arbitrator, it is generally assumed – and as noted above, in many jurisdictions it is required – that the sole arbitrator is a natural person who is personally accountable for his or her actions and decisions.

In the case of a three-person tribunal, there are three such natural persons, and here the internal dynamics and deliberations between the different members of the tribunal are often of decisive importance. Parties often consider it important to have a say in appointing one of the members of the tribunal precisely because they hope that their chosen candidate will be able to play a key role in such deliberations.[19]

However, it should be noted that there are various dispute resolution mechanisms where the decision-maker does not need to be a natural person. For example, under Swedish stock exchange listing rules companies that want to be listed on such markets agree that potential breaches of certain rules are to be referred to and determined by a disciplinary committee.[20] The committee will indeed consist of a number of natural persons, but the mandate or 'mission' to solve the dispute lies with the committee as an independent body rather than certain individuals. The members of the committee can be replaced from time to time and not all members take part in every case. It is also common in expert determination for a professional firm, not a single individual, to be appointed, and the firm then designates an individual to act as the expert.[21]

19. The Berwin Leighton Paisner 2017 International Arbitration Survey ('*Does Fortune Favour The Brave?*') found *inter alia*:

    - 79% of those who responded felt that party appointments give a party greater confidence in the arbitration process;
    - 66% considered retention of party appointments to be desirable;
    - 55% of those who sat as arbitrators said that they had experience of a party-appointed arbitrator who tried to favour the appointing party by some means;
    - 52% felt that party appointments increase the risk of partisan arbitrators;
    - 15% felt that a party-appointed arbitrator owes an additional duty to the party.

20. *See*, e.g., Rule Book for Issuers, Nasdaq Stockholm, 2019. Available on https://business.nasdaq.com/list/Rules-and-Regulations/European-rules/nasdaq-stockholm/index.html. Regarding the legal status of such disciplinary committees and their decisions, *see* Johan Munck, *Självregleringen på värdepappersmarknaden*, 3 Juridisk Tidskrift 553, 557 (2006–2007) and Stefan Lindskog, *supra* n. 7, 0-2.1.5.

21. *See* John Kendall, Clive Freeman and James Farrell, *Expert Determination*, s. 8.2 (4th ed., 2008), regarding expert determination in England & Wales:

    > 8.2.1 An expert need not be an individual person. A firm, such as a firm of accountants which has been appointed auditors to a company, can be an expert. Even a company can be an expert. It is usual, for instance, in trust deeds used in the capital markets to provide that disputes about remuneration of the trustee are to be resolved by a merchant bank acting as an expert.
    >
    > 8.2.2 The courts do not appear to have been troubled by the notion of an issue being determined by an expert other than an individual. This may demonstrate one of the essential features of expert determination, namely that it need not be a personal process. It certainly underlines the court's policy of giving effect to the contract between the parties rather than seeking to establish general rules about who is qualified to act as an expert.

Thus, although it remains an important feature of arbitration that the authority to be the decision-maker is a 'personal mandate', this has not been deemed necessary in some other types of dispute resolution procedure.

§7.03 ARE ROBOTS ELIGIBLE TO SIT AS ARBITRATORS?

A robot is, of course, not a natural person. Thus, it seems fairly clear that – at least in those jurisdictions which specifically require arbitrators to be natural persons – a robot does not have the necessary qualifications to be an arbitrator.

The discussion generally concerns the issue of whether legal entities can act as arbitrators, and there has been, as yet, very little discussion regarding robots. Nevertheless, since robots do not have legal capacity, and since robots cannot take personal responsibility for their actions or omissions, it is clear that robots cannot act as arbitrators under the above-mentioned legislation.

However, there have been suggestions by some that robots should be given some form of legal personality. In a resolution in 2017, the European Parliament urged the European Commission to propose what it called 'electronic personality' for sophisticated electronic robots:[22]

> 59. [The European Parliament] … [c]alls on the Commission, when carrying out an impact assessment of its future legislative instrument, to explore, analyse and consider the implications of all possible legal solutions, such as:
>
> […]
>
> f) 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.[23]

It can also be added that – in what was presumably a marketing stunt – 'Sophia the robot' was granted Saudi Arabian citizenship on 25 October 2017, becoming the first robot ever to have a nationality.[24]

For the time being, it seems clear that robots will not be given legal personality, but we can expect that this issue may be revisited as robots become more and more sophisticated.

§7.04 SHOULD ROBOTS BE ALLOWED TO SIT AS ARBITRATORS?

As noted at the start of this chapter, the real question is not whether robots can replace judges or arbitrators, but whether they *should*.

22. European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)).
23. However, in an open letter to the European Commission published on 5 Apr. 2018, a group of 'artificial intelligence and robotics experts' opposed the idea of giving robots legal personality. The European Commission, in a press release dated 25 Apr. 2018, has now outlined its future strategy to address artificial intelligence, without reference to giving robots legal personality.
24. Wikipedia, *Sophia (robot)*, https://en.m.wikipedia.org/wiki/Sophia_(robot) (accessed 5 Mar. 2019).

The obvious problem with allowing robots as arbitrators is that the robot is not ultimately responsible for its actions. At least under today's technology, the robot is controlled by its programmer.

One of the major concerns about having a robot arbitrator is the concern that there is somebody else – possibly a large corporation – that more or less secretly controls the robot's decision-making process.

Alternatively, the so-called 'machine learning' – by which the robot actually learns by absorbing large amounts of data – may result in the robot making certain decisions for itself. In such instances, it is the algorithm that is responsible for the robot's actions.

However, as Hannah Fry reminds us in, *Hello World. How to Be Human in the Age of Machine*, an algorithm is the product of its inputs, and those inputs have their origin in human decisions about how the algorithm should be constructed.[25] By way of an example, the great chess player Gary Kasparov was famously beaten by IBM's computer 'Deep Blue' in May 1997, and the key to Deep Blue's success was apparently the IBM engineers' decision to design Deep Blue to appear more uncertain that it was, which ended up unnerving Kasparov.[26]

Algorithms can be divided into two main categories: rule-based algorithms and machine-learning algorithms.

[A] Rule-Based Algorithms

Traditional rule-based algorithms are based on a series of rules, and such algorithms can be broadly categorised in four further basic categories:[27]

(1) Prioritisation: making an ordered list.
(2) Classification: picking a category.
(3) Association: finding links.
(4) Filtering: isolating what is important.

However, rule-based algorithms are only as good as the rules they are based on. If the rules are bad, then the results produced by the algorithm will be bad. Under the heading, *Artificial Intelligence Meets Natural Stupidity*, Hannah Fry refers to an example of a computerised 'budget tool' that was introduced by the Idaho Department of Health and Welfare, which she describes as 'shoddy human work wrapped up in code'.[28] For reasons that seemed unexplained, the 'budget tool' automatically slashed

25. An algorithm is defined as, 'A step-by-step procedure for solving a problem or accomplishing some end especially by a computer.' *See* Hannah Fry, *Hello World. How to Be Human in the Age of Machine*, 8 (W. W. Norton & Company 2018) by reference to the Merriam-Webster dictionary. Hannah Fry is Associate Professor in the mathematics of cities at University College London. She has also hosted talks and documentaries, including for TED and for the BBC.
26. Hannah Fry, *supra* n. 25, 5–7.
27. Hannah Fry, *supra* n. 25, 8–10.
28. Hannah Fry, *supra* n. 25, 16–19.

welfare benefits, and it was only after a lengthy class action that the source of such problems was finally uncovered.

[B] Machine-Learning Algorithms

By contrast, to rule-based algorithms, machine-learning algorithms, instead of being rule-based, are inspired by how living creatures learn. The algorithm gives the computer data, a goal and feedback when it is on the right track, and the computer is then left to work out the best way of achieving the goal. Machine-based algorithms can be remarkably good at solving problems, but the downside is that it is often not possible for humans to determine how the algorithm arrives at its decision:

> […] if you let a machine figure out the solution for itself, the route it takes to get there often won't make a lot of sense to a human observer. The insides can be a mystery, even to the smartest of living programmers.[29]

In the context of decision-making, this results in the unsatisfactory situation where it is not possible to provide reasons for the decision.

[C] The Requirement of Reasons

Many arbitration laws and rules require the arbitrators to state the reasons upon which the award is based. *See*, e.g., Article 31(2) of the UNCITRAL Model Law.

However, it is notable that the Swedish Arbitration Act of 1999 does not require any reasons to be given, although the Arbitration Rules of the Stockholm Chamber of Commerce (the 'SCC Rules') do impose such a requirement.

The requirement to give reasons is generally stated to be non-mandatory, but where there is such a requirement and the parties agree to dispense with it, it is important for there to be clear evidence of such agreement and for this to be clearly recorded in the award itself.

Where there is a requirement under the arbitration law and/or the applicable arbitration rules to give reasons, the question arises as to whether a failure to give reasons for all or part of the decision constitutes a valid ground for seeking to set aside the award.

Courts generally set a rather low standard for the requirement to give reasons, partly because of the general policy requirement to ensure that arbitral awards are generally enforceable, and partly because it is recognised that arbitrators are not required to be legally trained and it would therefore be wrong to impose the same standards as may be required of a judge.

In the English case *Bremer Handelsgesellschaft mbH v. Westzucker GmbH (No. 2)* [1981] 2 Lloyd's Rep 130 and 132, Donaldson LJ stated:

> All that is necessary is that the arbitrators should set out what, on their view of the evidence, did or did not happen and should explain succinctly why, in the light of

29. Hannah Fry, *supra* n. 25, 11.

> what happened, they have reached their decision and what that decision is. Where [an] … award differs from a judgment is that the arbitrators will not be expected to analyse the law and the authorities. It will be quite sufficient that they should explain how they reached their conclusion.

Similarly, in *Navigation Sonamar Inc. v. Algoma Steamships Limited* (1994) XIX YCA 256, Superior Court of Quebec (Rapports Judiciaires de Québec 1987, 1346), an attempt to set aside an arbitral award for lack of reasons was refused, taking account not only what was expressly stated but also what was implicit in the award. The court held that the arbitrators could not be criticised for expressing themselves as commercial men and not as lawyers.

In NJA 2009 p. 128 (*Soyak II*), the Swedish Supreme Court decided that only a total lack of reasons would be sufficient to constitute grounds to set aside an award. This was a case under the SCC Rules in which one of the parties sought to set aside the award on the basis of a lack of reasons. The Supreme Court stated, *inter alia*, as follows:

> There can be different reasons for a provision in the arbitration agreement that the award should contain reasons. In the absence of more precise provisions concerning that should be included in the reasons, the parties can also have more or less extensive expectations regarding how the arbitral tribunal should explain its decision making. However, the question of what the parties with or without justification expected and what can be said to be good practice amongst arbitrators must be distinguished from whether the arbitral tribunal's reasoning is so lacking that it constitutes a ground for setting aside the award.
>
> The provision of sufficient reasoning in an arbitral award constitutes a guarantee of legal certainty, since it forces the arbitral tribunal to analyse the legal issues and the evidence. However, the value of having full reasoning for the outcome must be balanced, as regards set-aside grounds, against the interest of having finality. Determination of a challenge to an arbitral award does not provide room to judge the substance of the arbitral tribunal's decisions. For that reason, and since a qualitative judgment of the reasoning would give rise to significant difficulties in drawing the line between procedure and substance, it follows that only a total lack of reasons, or reasons that in the circumstances must be considered to be so insufficient that they can be equated with a lack of reasons, can be sufficient to constitute a procedural irregularity. On the other hand, where there is such a serious procedural irregularity it can be presumed that the lack of reasons has affected the outcome of the award.[30]

[D] Reasons by Algorithm

Would reasons by way of algorithm be acceptable in arbitration?

If it is not possible to understand how the algorithm reached its decision, then it is presumably difficult to say that there are 'reasons'. Nevertheless, it is presumably possible for an algorithm to be designed to give some reasoning, and as can be seen

30. Unofficial translation from the original Swedish text.

above even rudimentary reasoning is generally thought to be sufficient to avoid a challenge to an arbitral award on this ground.

However, such a situation would hardly be considered satisfactory for the human parties involved – at least for those who lost the arbitration. It is often said that reasons are written for the benefit of the losing party, and it is a fundamental part of this idea that the losing party must be able to understand why his or her arguments did not succeed in persuading the arbitrator.

[E] What Arbitrators Actually Do

It is also important to consider the fact that arbitrators perform a number of different tasks in the course of an arbitration. Their role is not simply to decide the legal or factual issues in the case.

Such tasks include:

- Legal ethics: considering whether it is necessary to make disclosures.
- Case management: deciding requests for extensions of time, deciding document requests, drafting procedural orders, communicating and discussing procedural issues with the arbitral institution, etc.
- Practical arrangements: organising the practicalities of the proceedings.
- Negotiations and deliberations within a three-person tribunal.
- Running the hearing and listening diligently to the evidence, including evaluating how witnesses are reacting and answering questions.
- Reviewing, analysing, and summarising the parties' arguments.
- Deciding the issues in the case.
- Evaluating issues that give discretion to the arbitrators, such as the apportionment of costs.
- Drafting the award.

Many of these tasks require the so-called 'people skills'. They require human interaction, and the success of the arbitrator often depends on winning the parties' trust and demonstrating that their submissions are being heard and properly considered. In practice, such 'people skills' are at least as important as the actual decision-making.

[F] The Problems of 'People Skills': Where Algorithms Can Help

Most humans probably want their problems to be considered and determined by other humans.

On the other hand, there can be problems with 'people skills', since people can all-too-easily find themselves being influenced by conscious or unconscious bias. Hannah Fry devotes one of her chapters to the use of AI in the criminal justice system, and she comes to the following somewhat-worrying conclusion:

> Numerous … studies have come to the same conclusion: whenever judges have the freedom to assess cases for themselves, there will be massive inconsistencies. Allowing judges room for discretion means allowing there to be an element of luck in the system.[31]

However, this is an area where algorithms could potentially play a valuable role. Properly designed algorithms could help judges and arbitrators to recognise their human faults and unconscious biases. To quote Hannah Fry again:

> […] Injustice is built into our human systems. […] Having an algorithm – even an imperfect algorithm – working with judges to support their often faulty cognition is, I think, a step in the right direction. At least a well-designed and properly regulated algorithm can help get rid of systematic bias and random error. You can't change a whole cohort of judges, especially if they're not able to tell you how they make their decisions in the first place.
>
> Designing an algorithm for use in the criminal justice system demands that we sit down and think hard about exactly what the justice system is for. Rather than closing our eyes and hoping for the best, algorithms require a clear, unambiguous idea of exactly what we want them to achieve and a solid understanding of the human failings they're replacing. It forces a difficult debate about how a decision in a courtroom should be made. That's not going to be simple, but it's the key to establishing whether the algorithm can ever be good enough.[32]

Hannah Fry is referring to the criminal justice system, but similar considerations apply to the possible use of AI to assist arbitrators in international arbitration.

Paul Cohen and Sophie Nappert made much the same point in their seminal article, *The March of the Robots*:[33]

> Do we want flawlessly logical, entirely dispassionate outcomes? Unanswerable legal reasoning? A search for the truth (whatever that may mean)?
>
> And what is the place of equity and empathy – which presumably, even hugely sophisticated machines can't replicate – in the arbitral decision making of the future?
>
> Technology also causes us to rethink the intuitu personae nature of the arbitrator's mandate and how much of it can be relinquished. It had been said that writing one's own awards is the safeguard of intellectual integrity and that arbitrators who confer this task on an assistant are no longer performing their decision-making role. How much more so if they are led through the process and through true or false testimony through a computer programme?
>
> We are on the cusp of a time where technology in arbitration goes from being merely utilitarian to truly transformative.
>
> […]
>
> With the progress of artificial intelligence programmes such as Watson, it is likely that on the current trajectory, a computer would be able to serve as a fact-finder

31. Hannah Fry, *supra* n. 25, 53.
32. Hannah Fry, *supra* n. 25, 77–78.
33. Paul Cohen and Sophie Nappert, *The March of the Robots*, Global Arbitration Review, (15 Feb. 2017), https://globalarbitrationreview.com/article/1080951/the-march-of-the-robots (accessed 5 Mar. 2019).

> and arbitrator on its own within the next two decades: sifting through the applicable law more thoroughly, assessing the credibility of witness evidence more accurately, and deliberating a great deal more quickly than human arbitrators. Why, then, might parties object to the use of such a machine to decide their disputes?
>
> One answer is that we have a reflexive preference for human control, irrespective of the knowledge that such control is limited and fallible. We can see this in the common fear of flying even though, statistically, the chance of dying in a plane is vanishingly small and the chance of dying in a car accident 500 times greater. Nevertheless, the notion of being at the mercy of a pilot and onboard machinery stokes the fear of helplessness.
>
> Presumably, it would remain the parties' choice whether to use a non-human arbitrator when one becomes feasible. Given our predilection and preference for human interaction, parties may well decline the opportunity to have their dispute decided by a computer programme, even at the risk of having more fallible humans potentially decide it 'wrongly'.
>
> An interesting scenario might present itself if one party were willing to use a machine as an arbitrator, but another were not. Would the arbitral institution be able to impose a non-human arbitrator on an objecting party, or would that constitute an abuse of the process? It might be that parties and institutions adopt a hybrid approach, with parties appointing humans and a computer serving as the third member.
>
> Less radically, a human tribunal might consult with a computer programme as a supplement to, or check on, their decisions. The computer might therefore perform a role similar to the one for which tribunals use (and occasionally abuse) tribunal secretaries. This kind of approach might provide a happy medium between those who insist on human interaction in an arbitral proceeding and those willing to place their faith in the less fallible, but less palatable, prospect of 'robot justice'.

If I may offer a personal observation, I find it difficult to imagine that robots will be allowed to sit as arbitrators any time soon, and probably not in my lifetime. But I appreciate that there is a natural desire for humans to consider that they have special skills that cannot readily be replaced by machines. The reality may be that machines may in many respects be more reliable.

By analogy, several types of car – including my own – already have a limited form of self-driving function. I like to think that I am a better 'driver' than the car, and of course the current law firmly makes me responsible when I am sitting in the driver's seat, even when the car is in control.[34] It is important to remember, however, that

34. The law in this area may, of course, change in the future. *See*, for example, a progressive proposal that has been presented to the Swedish government regarding the issue of liability during the testing of self-driving vehicles, in which it is suggested that criminal liability should be borne by the organisation that applies for the permit to test the vehicle: *Vägen till självkörande fordon– försöksverksamhet* SOU 2016:28, p. 14:

> The trials shall be capable of including tests in which the automated driving system handles all driving functions including safety-critical functions. In such tests the automated driving system is to be regarded as the vehicle driver. When the vehicle is in self-driving mode, criminal liability shall be borne by whoever applied for the permit. The test organisation is responsible for ensuring that the vehicle can be operated safely. A regulation on criminal liability shall be incorporated in the new trial legislation.

human error is a cause of many traffic accidents. The assistance of computerised warning systems is greatly to be welcomed if it helps to make driving safer. Nevertheless, the ultimate responsibility will continue to rest with the human driver, at least for the foreseeable future.

In a similar way, arbitrators should welcome the assistance that new technologies can provide. Many arbitrators increasingly use electronic documents instead of hard-copy binders at hearings, thus saving considerable cost and making travel much easier. A further future step is for technology to perform some of the potential tasks of the tribunal secretary, such as proof reading and checking cross-referencing.

In time, technology may also be able to conduct legal research, or to summarise large amounts of documentation. This could also offer considerable assistance to arbitrators, with the presumed advantage of 100% accuracy that a human could not hope to emulate.

Technology might also help arbitrators to counteract their conscious or unconscious biases. For example, could technology assist arbitrators in dispassionately determining reasonableness, assessing quantum, choosing appropriate interest rates, or apportioning legal costs? Such possible programs would obviously need to be treated with great caution, but if used much in the same way as current arbitrators use pocket calculators, then they could potentially have a role to play.

Nevertheless, arbitrators must be careful not to delegate any of their core responsibilities. It is relevant to note the International Chamber of Commerce (ICC) guidance in this respect:

> 184. The tasks entrusted to an administrative secretary shall in no circumstances release the arbitral tribunal from its duty to personally review the file. Under no circumstances may the arbitral tribunal delegate its decision-making functions to an administrative secretary. Nor shall the arbitral tribunal rely on an administrative secretary to perform on its behalf any of the essential duties of an arbitrator.
>
> 187. A request by an arbitral tribunal to an administrative secretary to prepare written notes or memoranda shall in no circumstances release the arbitral tribunal from its duty personally to review the file and/or to draft any decision of the arbitral tribunal.[35]

§7.05 CONCLUSION

Much of what has been discussed in this chapter lies in the future.

For now, we can be certain that a robot most certainly cannot replace an arbitrator. Even if the legislative requirements were to allow it, the technology is not yet sufficiently developed.

To quote the late Professor Stephen Hawking, in his posthumous book, *Brief Answers to the Big Questions*, 2018:

A highly automated vehicle can also be driven by a physical driver on certain routes. On those occasions on which the vehicle is driven manually it is the physical driver who bears the criminal liability, as is the case with vehicles at lower levels of automation.

35. *See* paras 184 and 187 of the ICC's Note to Parties and Arbitral Tribunals on the Conduct of the Arbitration under the ICC Rules of Arbitration (1 Jan. 2019).

> At the moment computers have an advantage of speed, but they show no sign of intelligence. This is not surprising because our present computers are less complex than the brain of an earthworm, a species not noted for its intellectual powers. But computers roughly obey a version of Moore's Law, which says that their speed and complexity double every eighteen months. It is one of these exponential growths that clearly cannot continue indefinitely, and indeed it has already begun to slow. However, the rapid pace of improvement will probably continue until computers have a similar complexity to the human brain. Some people say that computers can never show true intelligence, whatever that may be. But it seems to me that if very complicated chemical molecules can operate in humans to make them intelligent, then equally complicated electronic circuits can also make computers in an intelligent way. And if they are intelligent they can presumably design computers that have even greater complexity and intelligence.
>
> This is why I don't believe the science-fiction picture of an advanced but constant future. Instead, I expect complexity to increase at a rapid rate, in both the biological and the electronic spheres. Not much of this will happen in the next hundred years, which is all we can reliably predict. But by the end of the next millennium, if we get there, the change will be fundamental.[36]
>
> […]
>
> We stand on the threshold of a brave new world. It is an exciting, if precarious, place to be, and we are the pioneers.
>
> When we invented fire, we messed up repeatedly, then invented the fire extinguisher. With more powerful technologies such as nuclear weapons, synthetic biology and strong artificial intelligence, we should instead plan ahead and aim to get things right the first time, because it may be the only chance we will get. Our future is a race between the growing power of our technology and the wisdom with which we use it. Let's make sure that wisdom wins.[37]

Hannah Fry optimistically ends her book by envisaging a world in which humans will work together with machines in the future:

> This is the future I'm hoping for. One where the arrogant, dictatorial algorithms that fill many of these pages are a thing of the past. One where we stop seeing machines as objective masters and start treating them as we would any other source of power. By questioning their decisions; scrutinizing their motives; acknowledging our emotions; demanding to know who stands to benefit; holding them accountable for their mistakes; and refusing to become complacent. I think this is the key to a future where the net overall effect of algorithms is a positive force for society. And it's only right that it's a job that rests squarely on our shoulders. Because one thing is for sure. In the age of the algorithm, humans have never been more important.[38]

The future world may turn out to be very different from our expectations, and this sort of analysis is likely to date rather quickly.

I expect that future generations of humans will still prefer to appoint human arbitrators. However, future 'descendants' of 'Sophia the robot' may not agree.

36. Stephen Hawking, *Brief Answers to the Big Questions*, 161–162 (Penguin 2018).
37. Stephen Hawking, *supra* n. 36, 195–196.
38. Hannah Fry, *supra* n. 25, 202–203.