General Assembly

**United Nations Commission on
International Trade Law**
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Revised draft legal taxonomy – revised section on artificial intelligence and automation section

Contents

I. Introduction

1. As noted in A/CN.9/1064 (paras. 4–9), the Commission had before it at its fifty-third session a preliminary draft of the legal taxonomy, which included a section on artificial intelligence (AI) and automation contained in A/CN.9/1012/Add.1. The secretariat is revising the preliminary draft to reflect further research and intervening developments, as well as consultations with experts.

2. This document outlines some of the main areas of the section on AI and automation that are being revised. The secretariat expects the draft to be further revised and refined, with a view to producing a "map to guide future work", as suggested at the fifty-third session,[1] that will remain relevant in a dynamic and rapidly changing environment.

3. The Commission is invited to take note of the work done on the legal taxonomy and to authorize its eventual publication as a secretariat product that can continue to be updated as a "living document" in cooperation and coordination with relevant international organizations.

II. Main revisions to A/CN.9/1012/Add.1

A. What is artificial intelligence?

4. The chapter is being revised to cover materials developed within the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the European Union. While those materials are focussed on the ethical use and governance of AI, they contain definitions of "AI systems" that are relevant to a consideration of AI in the trade context. The chapter will make reference to the following:

(a) The draft recommendation on the ethics of artificial intelligence, elaborated by an ad hoc expert group established by the United Nations Educational, Scientific and Cultural Organization (UNESCO) ("draft UNESCO Recommendation"), describes AI systems as "technological systems" or "information-processing technologies that embody models and algorithms" that "have the capacity to process information in a way that resembles intelligent behaviour, and typically includes aspects of reasoning, learning, perception, prediction, planning or control".[2] The draft recommendation expressly eschews any attempt to provide a single definition of AI. It acknowledges that "AI systems are designed to operate with some aspects of autonomy by means of knowledge modelling and representation and by exploiting data and calculating correlations";

(b) Within the European Union, the European Parliament adopted two resolutions in 2020 requesting the European Commission to propose regulations on (i) the ethical use and governance of AI, and (ii) a civil liability regime for AI.[3] To that end, the resolutions define an "AI system" as a software-based system, or a system embedded in hardware devices, that "displays behaviour simulating intelligence" by "collecting and processing data, analysing and interpreting its environment, and by taking action, with some degree of autonomy, to achieve specific goals". The European Commission has since issued a proposed regulation addressing the ethical use and governance of AI, which defines an "AI system" in similar terms to the OECD Recommendation – "software [that] can, for a given set of

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[1] *Official Records of the General Assembly, Seventy-third Session, Supplement No. 17* (A/75/17), part two, para. 75.

[2] SHS/IGM-AIETHICS/2021/APR/4, para. 2.

[3] European Parliament Resolution of 20 October 2020 with Recommendations to the Commission on a Framework of Ethical Aspects of Artificial Intelligence, Robotics and Related Technologies (2020/2012(INL)); European Parliament, Resolution of 20 October 2020 with Recommendations to the Commission on a Civil Liability Regime for Artificial Intelligence (2020/2014(INL)).

human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing real or virtual environments". Unlike the OECD Recommendation (see A/CN.9/1012/Add.1, para. 3) and the resolutions of the European Parliament, the definition in the proposed regulation is limited to AI systems that are developed using specific technologies and techniques, notably "machine learning approaches", "logic- and knowledge-based approaches", and "statistical approaches".[4]

B. Actors

5. The chapter is being revised to cover additional materials on the "AI life cycle" that are relevant to understanding the actors involved in the use of AI and automated systems. The chapter will make reference to the following:

(a) The draft UNESCO Recommendation defines AI actors as any actor involved in at least one stage of the AI system life cycle, which ranges from research, design, and development to deployment and use, including maintenance, operation, trade, financing, monitoring and evaluation, validation, end-of-use, disassembly, and termination;

(b) The four broad categories of AI actors (listed in para. 7 of A/CN.9/1012/Add.1) can be applied to automated systems generally, although the nature and scope of the roles carried out by the various actors do differ for AI systems (e.g., the training of models is peculiar to AI systems using machine learning techniques).

C. Legal regimes

6. The chapter is being revised to cover materials addressing other legal issues related to the use of AI systems, including issues arising earlier in the AI life cycle. It will also more clearly distinguish international initiatives to develop standards on the ethical use of AI, including those referred to in the Secretary-General's *Road Map for Digital Cooperation*.[5] To that end:

(a) The introduction will be revised to address the kinds of legal issues that arise earlier in the AI life cycle, particularly in the development of AI systems, and include additional discussion of the "AI Section" of the *Contract Guidelines on Utilization of AI and Data*, published by the Ministry of Economy, Trade and Industry of Japan;[6]

(b) The discussion of contact law in "AI in trade" will acknowledge that the types of issues addressed in paragraph 11 of A/CN.9/1012/Add.1 are compounded by development and utilization agreements framing "performance parameters" (as that term is used in the Notes on the Main Issues of Cloud Computing Contracts) in abstract terms;

(c) The discussion of contract law in "AI in trade" will also acknowledge that proposals for legislative intervention to impose additional obligations on the operator of the AI system to comply with an emerging body of standards on the ethical use of AI may also have the kind of rebalancing effect referred to in paragraph 13 of A/CN.9/1012/Add.1, even if those proposals and standards are not specifically addressed to the trade context;

(d) The discussion of tort law in "AI in trade" will elaborate on the evidentiary difficulties raised in A/CN.9/1012/Add.1. Evidentiary difficulties regarding causation

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[4] See European Commission, Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts, document COM(2021) 206 final (21 April 2021).

[5] A/74/821, paras. 53–57.

[6] A/CN.9/1012/Add.1, footnote 19.

of harm arising from the use of an AI system may arise in the context of existing tort law, particularly where the allegedly tortious conduct is constituted by a person putting the AI system into operation. For instance, it may be difficult to establish that the output of the AI system was caused by a failing in how the system was programmed, rather than an erroneous input from an external data source or third-party interference with the system;

(e)   The discussion of tort law in "AI in trade" will also address the question as to whether all AI systems should be treated equally for the purposes of proposed new liability regimes (discussed in A/CN.9/1012/Add.1, paras. 16–20), or whether those new liability regimes should apply only to some types of AI systems. A further question arises as to how to differentiate AI system in a manner that promotes legal certainty and predictability. Reference will be made to: (i) the EU Expert Group on Liability and New Technologies, which has found that a strict liability regime may be appropriate for AI systems that cause "significant harm", where the significance of the harm is determined by reference to the potential frequency and severity of harm; and (ii) the resolution of the European Parliament on a civil liability regime for AI, which similarly calls for a strict liability regime to be established for "high risk" AI systems, which it defines as "a significant potential […] to cause harm or damage to one or more persons in a manner that is random and goes beyond what can reasonably be expected".[7]

7.   The discussion of legal issues related "AI to trade" and the negotiation and conclusion of contracts will be reorganized around the following issues:

(a)   The legal validity of electronic and automated contracting;

(b)   Identifying the parties to the contract;

(c)   Determining the intention of the parties to be bound by the contract (and other matters relating to state of mind);

(d)   Identifying the terms of the contract.

8.   With regard to *legal validity*, noting that the output of automated systems takes the form of data messages, and that parties may seek to rely on that output to form a contract, electronic transactions laws in many jurisdictions, including jurisdictions that have enacted the UNCITRAL Model Law on Electronic Commerce (MLEC), recognize contracts formed by the exchange of data messages (i.e. electronic contracts). Moreover, several jurisdictions, including jurisdictions that have incorporated the substantive provisions of the United Nations Convention on the Use of Electronic Communications in International Contracts (ECC) into their law, [8] recognize contracts formed by the interaction of automated systems (or "electronic agents") without human involvement (i.e. automated contracts or algorithmic contracts).[9] The courts in several jurisdictions have acknowledged that Internet bots can be deployed to scrape data from a website in violation of the website terms of

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[7] See footnote 3 above. It is noteworthy that, in its subsequent proposal on the ethical use and governance of AI (footnote 4 above), the European Commission defines "high risk" not by reference to the likelihood or severity of harm or damage, but by reference to the purpose or objectives for which the AI system is deployed, or the tasks that it performs.

[8] Australia, Singapore and Sri Lanka.

[9] The courts in some common law jurisdictions have confirmed the legally valid formation of contracts using automated systems. For England, see High Court of Justice of England and Wales, *Software Solutions Partners Ltd v. Her Majesty's Commissioners for Customs and Excise*, Case No. CO/2220/2005, Judgment, 2 May 2007, [2007] EWHC 971 (Admin); for Singapore, see *Quoine Pte. Ltd. v. B2B2 Ltd.*, Civil Appeal No. 81 of 2019, Judgment, 24 February 2020, *Singapore Law Reports*, vol. 2020, No. 2, p. 20, [2020] SGCA(I) 02, para. 96. Almost all states in the United States have enacted the Uniform Electronic Transactions Act (UETA), which expressly provides that a person may be bound by a contract concluded using an "electronic agent".

use, which presumes that the bot can be used to form a contract with the website owner on those terms.[10]

9.   With regard to *identifying the parties*, legal issues may arise if the applicable law requires the party to be identified or known at the time of contract formation. Any such requirement may be an obstacle for the use of smart contracts deployed on a distributed ledger system that allows pseudonymous participation by users.

10.   A more general legal issue relates to the attribution of the output of automated systems, which in turn determines the party to the contract formed by that output. While there have been calls for AI systems to be conferred legal personality, jurisdictions recognizing automated contracts tend to regard automated systems as mere tools that have no independent will or legal personality. As such, the output is attributed to a person (legal or natural), although not many jurisdictions appear to have legislated to identify which person. For some jurisdictions, legislation, case law or commentary points to the person programming or operating the system, or on whose behalf the system is programmed or operated.[11]

11.   With regard to *determining the intention of the parties to be bound*, the legal recognition of automated contracting does not obviate the requirement of intention, which is a general principle of contract formation and closely connected to the issue of attribution. A question arises as to how the parties manifest their intention if automated systems are used to form the contract. The question is particularly acute for the party operating the automated system, as they will often be unaware of the circumstances of the conclusion of the contract, or that a contract has even been concluded. For jurisdictions that recognize automated contracts, the intention of the party operating the automated system will generally be determined by reference to that party's state of mind, or to the state of mind of the person programming the system at the time of deployment.[12]

12.   A similar approach was taken by the courts of Singapore in the case of *B2C2 Ltd. v. Quoine Pte. Ltd.* ("*Quoine*"), which also addressed other matters relating to state of mind in connection with the formation of an automated contract, namely determining whether one party operated an automated system knew of a mistake made by another party. At first instance, Singapore International Commercial Court noted:

> [Algorithmic programs used to enter into trading contracts] are, in effect, mere machines carrying out actions which in another age would have been carried out by a suitably trained human. They are no different to a robot assembling a car rather than a worker on the factory floor or a kitchen blender relieving a cook of the manual act of mixing ingredients. All of these are machines operating as they have been programmed to operate once activated.

> Where it is relevant to determine what the intention or knowledge was underlying the mode of operation of a particular machine, it is logical to have regard to the knowledge or intention of the operator or controller of the machine. In the case of the kitchen blender, this will be the person who put the ingredients in and caused it to work. His or her knowledge or intention will be contemporaneous with the operation of the machine. But in the case of robots or trading software in computers this will not be the case. The knowledge or intention cannot be that of the person who turns it on, it must be that of the person who was responsible for causing it to work in the way it did, in other

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[10] United States, Court of Appeals for the Second Circuit, *Register.com, Inc. v. Verio, Inc.*, Docket No. 00-9596, Judgment, 23 January 2004, *Federal Reporter, Third Series*, vol. 356, p. 393; European Union, Court of Justice, *Ryanair Ltd. v. PR Aviation B.V.*, Case No. C-30/14, Judgment, 15 January 2015.

[11] A/CN.9/1012/Add.1, footnote 32.

[12] This approach is reflected in comment 3 to article 2.1.1 of the Unidroit Principles of International Commercial Contracts (2016).

words, the programmer. Necessarily this will have been done at a date earlier than the date on which the computer or robot carried out the acts in question.[13]

13.   On appeal, the Court of Appeal of Singapore agreed with this analysis[14] and made the following general remarks on the issue:

> Algorithmic trading is an area of dynamic change, and it might be more appropriate for legislative intervention in due course, if it were thought that a more fundamental redesign of the applicable legal framework is called for. That is certainly not our view at this time and we consider that the existing body of law can be meaningfully adapted to deal with the situation at hand.[15]

14.   In a separate judgment, Mance IJ disagreed with the approach, finding that it was not appropriate to adapt the relevant existing body of law (i.e. the doctrine of unilateral mistake at common law) by shifting the enquiry from the actual state of mind of the parties in light of the circumstances surrounding the formation of the contract (of which they were not aware) to the actual state of mind of the programmer at the time of programming the system. However, the judge did adapt the "more flexible" equitable doctrine of mistake by imputing on the parties the state of mind that they would have had if they were aware of the circumstances surrounding the formation of the contract.

15.   The *Quoine* case indicates that existing contract law rules requiring a determination of state of mind in connection with the formation of a contract may not be sufficiently adapted to the use of automated systems. It also suggests that adapting those rules should be carried out on a rule-by-rule basis, having regard to legal certainty and predictability and the promotion of trade.

16.   With regard to *identifying the terms of the contract*, one legal issue that has been raised in the context of smart "legal" contracts (see para. 24 of A/CN.9/1012/Add.1) is the validity and interpretation of a contract that is memorialized – in whole or in part – in code (i.e., the code of the program deployed on the distributed ledger system) to facilitate the automated performance of the contract. As code is a form of data message, the validity of contracts memorialized in code would ordinarily be covered by laws that recognize electronic contracts (see para. 8 above). However, while the interpretation of the contract might not be problematic for some jurisdictions in which the courts are accustomed to interpreting code in the context of software-related disputes, a question may arise as to whether the contract is sufficiently certain and complete to be valid or enforceable. A question of certainty and completeness may also arise where the operation of the smart "legal" contract depends on "dynamic information" based on an external data source that may change periodically or continuously, such as a market price.

17.   If AI systems represent the next generation of automated systems, a question arises as to whether the features that distinguish AI systems from automated systems (see para. 5 of A/CN.9/1012/Add.1) warrant differentiated treatment of the use of AI in the formation of contracts. Writing extrajudicially, one judge of the Supreme Court of the United Kingdom has queried the ability of English contract law to deal with the issues addressed in the foregoing analysis in the case of AI systems using machine learning techniques that "autonomously generate transactions":

> If there is to be a contract drafted or adapted by machines, there will have to be significant development to our law of contract which will require careful and imaginative consideration. […] Questions about the intention to enter into legal relations, to whom that intention is to be attributed and how the terms of a

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[13] A/CN.9/1012/Add.1, footnote 33.
[14] Ibid., footnote 34.
[15] Ibid., footnote 35.

computer-generated contract are to be recorded to achieve legal validity and interpreted will require innovative thinking.[16]

18.   A similar issue was signalled by the Court of Appeal of Singapore in the *Quoine* case, which stressed on several occasions that the automated system in question in that case was programmed to operate in a "deterministic" manner, in the sense that it would always generate the same output given the same input. While the court did not indicate whether its legal analysis of contract law – specifically, the doctrine of unilateral mistake at common law – as applied to automated contracts would have differed if the system had not been programmed to operate in a "deterministic" manner but rather "to develop its own responses to varying conditions", some commentators have suggested that such systems would necessitate a different approach.[17]

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[16] Lord Hodge, *The Potential and Perils of Financial Technology: Can the Law Adapt to Cope?*, Edinburgh FinTech Law Lecture delivered at the University of Edinburgh, 14 March 2019, available at www.supremecourt.uk/docs/speech-190314.pdf, pp. 12–13.

[17] Vincent Ooi and Kian Peng Soh, "Rethinking mistake in the age of algorithms: Quoine Pte Ltd v B2C2 Ltd", *King's Law Journal*, vol. 31, No. 3 (2020), p. 367. Lord Sales of the Supreme Court of the United Kingdom, writing extrajudicially, has observed that "in future the programs may become so sophisticated and operate so independently that it may be that this process of looking back through them to the minds of those who created them will seem completely unreal": A/CN.9/1012/Add.1, footnote 36.