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Draft provisions on automated contracting

Note by the Secretariat

Contents

	<i>Page</i>
I. About this note	2
II. Revised principles	2
A. Background	2
B. Text and remarks	3
III. Towards consolidated provisions on electronic transactions	12
Annexes	
I. Table of concordance between UNCITRAL texts on electronic commerce	15
II. Sample provision	18



I. About this note

1. This note presents a further revised set of draft principles on automated contracting (chapter II) which incorporate the deliberations and decisions of the Working Group at its sixty-fifth session ([A/CN.9/1132](#), paras. 52–85). It also offers some reflections on how the principles relate to the two-stage mandate of the Working Group to revise and develop provisions on automated contracting, and puts forward a proposal as to how the Working Group might proceed with discharging the second stage of its mandate (chapter III).

II. Revised principles

A. Background

2. The mandate of the Working Group is concerned with revising and developing provisions on automated contracting. Specifically, the Commission has requested the Working Group:

“(a) As a first stage, to compile provisions of UNCITRAL texts that apply to automated contracting, and to revise those provisions, as appropriate;

“(b) As a second stage, to identify and develop possible new provisions that address a broader range of issues, including those identified by the Working Group at its sixty-third session”.¹

3. Deliberations within the Working Group have focussed primarily on the provisions of the 1996 UNCITRAL Model Law on Electronic Commerce (MLEC) and the 2005 United Nations Convention on the Use of Electronic Communications in International Contracts (ECC). Reference has also been made to the other UNCITRAL texts on electronic commerce, namely the 2001 UNCITRAL Model Law on Electronic Signatures (MLES), the 2017 UNCITRAL Model Law on Electronic Transferable Records (MLETR) and the 2022 UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services (MLIT).

4. The idea of formulating “principles” on automated contracting stems from the deliberations of the Working Group at its sixty-fourth session. At that session, a suggestion was made “to distil principles from existing provisions [of UNCITRAL texts] and to develop additional principles on legal issues not yet addressed”, on the basis that “those principles could eventually serve as a basis for developing legislative provisions” ([A/CN.9/1125](#), para. 16). As a “working hypothesis”, it was suggested that work on the topic should result in a legislative text, and that this objective was compatible with the delivery of intermediate work products in the form of legal guidance, such as a restatement of the applicability of existing UNCITRAL provisions (*ibid.*, para. 60).

5. By the close of its sixty-fourth session, the Working Group had formulated a set of draft principles on the legal recognition of contracts formed or performed using an automated system, compliance of automated systems with applicable laws, and attribution of the output of automated systems (see [A/CN.9/1125](#), paras. 62–90). At its sixty-fifth session, the Working Group considered a revised set of principles (the “first revision”) prepared by the UNCITRAL secretariat (see section III of [A/CN.9/WG.IV/WP.179](#)) and agreed that the secretariat should prepare a further revised set of principles for consideration at its sixty-sixth session (see [A/CN.9/1132](#), para. 92). The further revised set of principles is set out in the next section of this chapter. A proposal for the Working Group to progress to developing provisions on the basis of those principles follows (chapter III).

¹ *Official Records of the General Assembly, Seventy-seventh Session, Supplement No. 17 (A/77/17)*, para. 159.

B. Text and remarks

Principle 1. Use of automated systems in contracting

(a) Automated systems used in contracting are deterministic or non-deterministic systems capable of carrying out actions, without the necessary review or intervention of a natural person, for the purpose of forming or performing contracts. Automated systems are used throughout the contract life cycle, including in the formation and performance of contracts.

(b) Automated systems can be used to form contracts by processing data messages that constitute communications in connection with the formation of contracts, such as an offer or acceptance of an offer. Automated systems can be used to perform contracts by processing data messages that constitute an action in connection with the performance of a contract.

(c) The terms of a contract that is formed or performed using automated systems can be contained in data messages, including computer code and data messages that are logically associated, whether generated contemporaneously or not.

Notes on revised text

6. At its sixty-fifth session, the Working Group agreed to delete principle 1 of the first revision and to incorporate the definition of “automated system” contained therein into principle 2 ([A/CN.9/1132](#), para. 59). Principle 1 of the present revision thus reproduces principle 2 of the first revision with the definition of “automated system” inserted in the beginning of paragraph (a). The word “necessary” has been inserted before “review” to avoid any implication that an automated system ceases to fall within the definition on grounds alone that the system is subject to human oversight (*ibid.*, paras. 58(b) and 60). For consistency with existing UNCITRAL texts, the wording of paragraph (c) has been slightly amended to refer to the terms of the contract being “contained in” data messages.

Additional remarks

7. The first sentence of paragraph (a) defines the concept of “automated system”. The reference to “deterministic or non-deterministic systems” is designed to clarify that the term “automated system” encompasses AI systems, and more specifically “weak” AI systems that are recognized in theory and deployed in practice ([A/CN.9/1132](#), para. 55). However, it also encompasses the more “unsophisticated” systems that would not ordinarily be described as exhibiting “intelligence”. The wording is designed to cover systems that operate either deterministically or non-deterministically, as well as systems that have both deterministic and non-deterministic operations ([A/CN.9/1132](#), para. 60). The term “deterministic” has been used in the Working Group to describe a system that always generates the same output given the same input ([A/CN.9/1093](#), para. 55). Such a system has also been described as a “rule-based system” (*ibid.*). Conversely, a “non-deterministic” system has been described as operating in a “stochastic” manner (*ibid.*).

8. Unlike the ECC, the definition in paragraph (a) does not define an automated systems as a “computer program” in acknowledgment that automated systems comprise hardware and software components ([A/CN.9/1132](#), para. 58(a)).

9. The term “processing” is used in paragraph (b) to refer to the system generating or sending data messages (i.e., outputs) and receiving data messages (i.e., inputs).

10. The term “action” is used in paragraphs (a) and (b). At the sixty-fifth session, it was suggested that the term should be replaced with a term that reflects the use of automated systems in decision-making processes that might not involve any physical act. The term “action” is drawn from the ECC (arts. 4(g) and 12), where it is used to refer to a process performed by the automated system without reference to any physical act or any physical equivalent in paper-based or in-person contracting.

11. Principle 1 expressly refers to “formation” and “performance” as stages of the contract life cycle. Consistent with the approach taken in the ECC, the concept of “formation” encompasses pre-contractual negotiations and the conclusion of a contract, and the concept of “performance” encompasses non-performance and the exercise of remedies provided for under the contract ([A/CN.9/1132](#), para. 61).

Principle 2. Legal recognition

(a) A contract is not to be denied validity or enforceability on the sole ground that an automated system was used in its formation.

(b) An action in connection with the formation of a contract is not to be denied validity or enforceability on the sole ground that it was carried out by an automated system.

(c) An action in connection with the performance of a contract is not to be denied validity or enforceability on the sole ground that it was carried out by an automated system.

(d) Information referred to in a data message containing the terms of a contract shall not be denied legal effect, validity or enforceability on the sole ground that the data message containing the information is generated by an automated system after the formation of the contract.

Notes on revised text

12. Principle 2 reproduces paragraphs (a) and (b) of principle 3 of the first revision. It splits paragraph (b) of principle 3 of the first revision into two paragraphs (i.e., paragraphs (b) and (c) of the present revision) so that formation and performance are addressed separately ([A/CN.9/1132](#), para. 65(a)).

13. Paragraph (a) has been retained so that the principle recognizes the validity and enforceability not only of “actions” in connection with a contract, but of the contract itself. This reflects the approach taken in the MLEC and ECC, which give legal recognition not only to “information” (in the context of commercial activities) and “communications” (in connection with the formation and performance of a contract), respectively, but also to “contracts”.

14. Paragraph (d) is new. Supplementing paragraph (c) of principle 1, it proposes a new rule for the consideration of the Working Group on the legal recognition of dynamic information used in automated contracting, which picks up on the deliberations of the Working Group at its sixty-fourth session ([A/CN.9/1125](#), para. 22). Dynamic information refers to information from an external data source that changes periodically or continuously (e.g., information on market price or on the location of an object). In the context of automated contracting, dynamic information is particularly relevant as it may trigger an automated action carried out in performance of a contract. The concept and terminology of the new rule is drawn from article 5 *bis* of the MLEC (which deals with the incorporation of information into a data message by reference), article 13 of the ECC (which refers to electronic communications (i.e. data messages) “containing” the terms of a contract), and article 6 of the MLETR (which deals with the inclusion of additional information in an electronic record).² Paragraph (d) does not preclude the application of other law that may deny the legal effect, validity or enforceability of a contractual term comprising dynamic information on other grounds (e.g., legal requirements regarding the incorporation and certainty of terms).

² The explanatory note to the MLETR states that such additional information could consist of dynamic information, i.e. “information that may change periodically or continuously, based on an external source”: *UNCITRAL Model Law on Electronic Transferable Records* (United Nations publication, Sales No. E.17.V.5), para. 58

Additional remarks

15. Read with the definition of “automated system” in paragraph (a) of principle 1, the effect of principle 2 is to prevent a contract or an action taken in the formation or performance of a contract from being denied validity or enforceability on grounds alone that no human reviewed or intervened in the conclusion of the contract or in the relevant action. It does not preclude the application of other law that may require human review or intervention for particular contracts or for particular actions. Principle 2 would extend to giving legal recognition to a contract that is formed without the actual knowledge or awareness of the parties at the time of contract formation, but would not deny a finding that, in a particular case, the lack of knowledge or awareness evidenced a lack of intention to be bound.

16. The term “action” is discussed above (para. 10). In the context of principle 2, particularly relevant are actions that constitute a “communication” within the meaning of the ECC (i.e. “any statement, declaration, demand, notice or request, including an offer and the acceptance of an offer”) or the outcome of some other decision-making process for which an automated system might be used in a contractual setting.³ Accordingly, principle 2 would give legal recognition to a rejection of a claim made in connection with the performance of a contract for insurance that is generated and sent by an automated system, but would not preclude the application of other law that denies the validity of that refusal on other grounds.

17. At the sixty-fifth session of the Working Group, it was suggested that the principle should refer not only to “actions” but also to “decisions” ([A/CN.9/1132](#), para. 65(b)). The Working Group may wish to consider whether the term “action” is sufficiently broad to cover the outcome of decision-making processes in a contractual setting, which could include the “acceptance” of an offer in the formation of a contract, or the “rejection” of a claim or “designation” of a place, time, object or amount in connection with the performance of a contract. Contrary to earlier deliberations within the Working Group (see [A/CN.9/1125](#), paras. 28, 69, 77 and 86; [A/CN.9/1093](#), para. 56), reference to “decisions” could imply that automated systems have an independent will capable of “making” decisions (as opposed to generating the outcome of a decision-making process deployed by the decision-maker), and could obscure the distinction between outcomes generated by an automated system (e.g., sometimes referred to as “AI-generated decisions”) and outcomes generated by a human with the assistance of an automated system (e.g., sometimes referred to as “AI-assisted decisions”).

Principle 3. Technology neutrality

Nothing in these principles requires the use of a particular method in automated systems.

Notes on revised text

18. Principle 3 reproduces paragraph (c) of principle 3 of the first revision, which has been redrafted based on article 9(1) of the ECC ([A/CN.9/1132](#), para. 65(d)).

Additional remarks

19. Principle 3 restates the principle of technology neutrality as it applies to automated systems used in contracting.

20. The principle reinforces the technology-neutral definition of “automated system”. It does not preclude the application of other law requiring a particular method to be used (or not to be used). The term “method” is widely used in existing

³ [A/CN.9/WG.IV/WP.179](#), para. 41.

UNCITRAL texts, and encompasses the various technologies and techniques implemented by automated systems.⁴

Principle 4. Attribution

- (a) A data message generated or sent by an automated system is attributed to the person on whose behalf the automated system is operated.
- (b) Notwithstanding paragraph (a), as between the parties to a contract, a data message generated or sent by an automated system is attributed in accordance with any procedure agreed to by the parties for that purpose.
- (c) If an automated system is operated on behalf of multiple parties, a data message generated or sent by the automated system is attributed in accordance with the operational rules of the system.
- (d) This principle does not deal with the legal consequences that may flow from a data message that is attributed to a person under this principle.

Notes on revised text

21. Principle 4 reproduces principle 4 of the first revision. It has been revised to reflect the proposals put forward in the Working Group at its sixty-fifth session ([A/CN.9/1132](#), para. 70).

22. Paragraph (a) has been revised to remove the policy statement that automated systems are tools with no independent will or legal personality. Paragraph (b) reproduces paragraph (c) of the first revision. Paragraph (c) reformulates paragraph (b) of the first revision and addresses the specific situation in which both parties use a third-party system to form and perform contracts. Paragraphs (b) and (c) are not mutually exclusive; paragraph (b) is formulated so as to apply to situations in which a third-party system is used, in which case the operational rules of the system may embody the procedures agreed to by the parties. The term “operational rules” and the link with contractual agreements is informed by the work of the Working Group in preparing the MLIT.

Additional remarks⁵

23. Principle 4 reflects the approach, reflected in existing UNCITRAL texts and the 2021 UNESCO Recommendation on the Ethics of Artificial Intelligence (UNESCO recommendation), that automated systems are tools with no independent will or legal personality, and thus that output of an automated system is attributable to a person and not to the system itself. The explanatory note on the ECC, referred to within the Working Group at its sixty-fifth session ([A/CN.9/1132](#), para. 69) elaborates with respect to automated systems addressed in article 12 of the ECC:

Article 12 of the [ECC] is an enabling provision and should not be misinterpreted as allowing for an automated message system or a computer to be made the subject of rights and obligations. Electronic communications that are generated automatically by message systems or computers without direct human intervention should be regarded as “originating” from the legal entity on behalf of which the message system or computer is operated. Questions relevant to agency that might arise in that context are to be settled under rules outside the Convention.

24. The concept of “attribution” is concerned with linking the output of an automated system to a person so that it can be said that the output is an action of the

⁴ See, e.g., *UNCITRAL Model Law on Electronic Signatures with Guide to Enactment 2001* (United Nations publication, Sales No. E.02.V.8), para. 107; *UNCITRAL Model Law on Electronic Transferable Records* (United Nations publication, Sales No. E.17.V.5), para. 122.

⁵ For earlier remarks on paragraph (b), see [A/CN.9/WG.IV/WP.179](#), para. 47. For earlier remarks on paragraph (d), see [A/CN.9/WG.IV/WP.179](#), para. 48.

person (A/CN.9/1125, para. 44). Attribution presupposes not only identifying the person but also the system, which in practice can be done by identifying some digital object deployed within the system to initiate the action in connection with the formation or performance of the contract, such as a so-called “smart contract”, persistent script or bot. Attribution is not concerned with liability (i.e. identifying the person who bears the legal consequences flowing from that output) (ibid.) or authentication (i.e., verifying that a data message processed by an automated system was generated or sent by a particular person or thing connected to the system). Nor is it concerned with whether a person operating an automated system on behalf of another person is acting as agent for the other person for the purposes of the law of agency. Principle 4 is not concerned with substantive law (A/CN.9/1132, para. 69).

25. Principle 4 is thus of limited scope, so much so that it might be regarded as stating the obvious. However, it reaffirms an important element in establishing a legal framework for the use of AI and automation in contracting (see A/CN.9/1132, para. 69). As noted in the UNESCO recommendation:

[W]hen developing regulatory frameworks, Member States should, in particular, take into account that ultimate responsibility and accountability must always lie with natural or legal persons and that AI systems should not be given legal personality themselves. To ensure this, such regulatory frameworks should be consistent with the principle of human oversight and establish a comprehensive approach focused on AI actors and the technological processes involved across the different stages of the AI system life cycle.⁶

26. Linking the output of an automated system to a natural or legal person is not a novel concept, nor is it unique to the contractual setting. In the context of intellectual property, for instance, linking outputs generated by AI system to natural or legal persons is required to establish the authorship or inventorship of a natural or legal person (although the analysis is sometimes conflated with questions related to creativity, ingenuity and other policy considerations which are specific to the IP context).

27. In situations in which a party itself operates the system to form and perform contracts, the output of the system is attributed to that party (i.e., the party can be said to operate the system on its own behalf). In situations in which a party uses a system operated by a third-party service provider, the words “on behalf of” come into play. Those words are frequently used in the MLEC and ECC. Like those texts, principle 4 does not elaborate on the factors relevant to determining whether a person operating an automated system does so “on behalf of” another person. Control over the operational parameters of the system in connection with its use in the formation and performance of contracts is likely to be a relevant factor, as is the benefit derived from that use (A/CN.9/1125, paras. 42–46). However, caution has been expressed within the Working Group about relying on “control” as a decisive factor in attribution, noting that the term is open to different meanings. As noted above (para. 24), principle 4 does not require an enquiry as to whether the person operating the system acts as an agent of another person.

Principle 5. Intention, knowledge and awareness of the parties

Where the law requires the presence of intention, knowledge or awareness of a person in connection with the formation or performance of a contract, that requirement is met in relation to the use of an automated system (whether deterministic or non-deterministic) having regard to the design and operation of the system, as appropriate, unless otherwise required by law.

⁶ UNESCO, *Records of the General Conference, Forty-first Session, Vol. 1* (Paris, 2022), annex VII, para. 68.

Notes on revised text

28. Principle 5 reproduces principle 5 of the first revision. It has been revised to reflect the deliberations of the Working Group during its sixty-fifth session (A/CN.9/1132, paras. 71–77).

29. Deliberations during the sixty-fifth session revealed some uncertainty about the scope of principle 5, which in turn raised questions about the need to retain it. The revisions to principle 5 seek to clarify its scope. First, the text has been redrafted to align more closely with functional equivalence provisions of existing UNCITRAL texts to avoid any implication that different rules of contract law should apply to automated contracting (see A/CN.9/1132, para. 77). Second, the words “as appropriate, unless otherwise required by law” have been inserted to avoid any implication that existing laws relating to the determination of questions of law or fact, such as the rules of evidence, should be displaced (ibid., para. 76). Third, the omnibus term “state of mind” has been replaced with an express reference to the states of mind that play a prominent role in contracting (ibid., para. 72).

Additional remarks

30. The state of mind of the parties can play an important role in contracting. For example, several provisions of the United Nations Convention on Contracts for the International Sale of Goods (CISG) require the presence of intention, knowledge or awareness of a party. A question arises as to how these requirements are transposed to automated contracting in the absence of human review or intervention.

31. Principle 5 seeks to distil a common approach from the cases explored during the intersessional event which involved an enquiry into the state of mind of the parties in order to satisfy the requirements of existing law.⁷ Significant cases include the *Thornton* case and *Lucky Betting Ticket* case, which involved establishing the existence of an offer or acceptance of an offer by a party operating an automated machine as required by the law of contract formation, and the *Quoine* case, which involved establishing the knowledge of a contracting party as required by the law of mistake. The approach distilled from those cases is that the state of mind of a person with respect to actions carried out by an automated system essentially flows from the design of the system (i.e. how it is programmed) and the circumstances in which it is operated. Information on the design and operation of the automated system, including its hardware and software components, is therefore key to support the use of automated systems in contracting. The availability of this information is addressed in principle 6.

32. Principle 5 complements article 11 of the ECC, which supports the possibility of establishing the intention of a party in relation to a contract proposal generated by an automated system by reference to “all the circumstances”.⁸

33. Principle 5 is designed to apply whether state of mind is to be determined subjectively (e.g. what the person actually intends or knows) or objectively (e.g. what the person ostensibly intends or knows).

Principle 6. Legal consequences of erroneous data messages

(a) A party to a contract cannot rely on a data message that is attributed to another party to the contract if:

(i) the data message was generated or sent by the automated system in a manner that the other party did not anticipate or could not reasonably be

⁷ A similar approach has recently been adopted in Guernsey, where the law establishes a rebuttable presumption that a party intends to be bound if an automated system acts on behalf of the person for the purpose of forming a contract: Electronic Transactions (Electronic Agents) (Guernsey) Ordinance, 2019, sect. 3.

⁸ *United Nations Convention on the Use of Electronic Communications in International Contracts* (United Nations publication, Sales No. E.07.V.2), para. 206.

expected to have anticipated, having regard to the operational rules of the system and operations logs; and

(ii) the relying party knew or could not have been unaware that the data message was generated or sent in such a manner, having regard to information disclosed by the other party.

(b) Nothing in this principle affects the application of any rule of law or agreement of the parties that may govern the legal consequences of a data message other than as provided for in paragraph (a).

(c) Nothing in this principle affects the application of any rule of law that may require a person to disclose information on the design or operation of an automated system, or provides legal consequences for disclosing inaccurate, incomplete or false information, or for failing to do so.

Notes on revised text

34. Paragraph (a) of principle 6 reproduces principle 6 of the first revision. It has been revised to reflect the deliberations of the Working Group during its sixty-fifth session ([A/CN.9/1132](#), paras. 78–81). It has been broken down into two subparagraphs to identify the two conditions that need to be established.

35. It is assumed that the party other than the relying party will seek to avoid the legal consequences of erroneous outputs, and should therefore bear the burden of establishing the conditions in both subparagraphs (i) and (ii) of paragraph (a). The Working Group may wish to clarify whether this assumption is correct, and whether it needs to be reflected more clearly in the text. The wording in subparagraphs (i) and (ii) of paragraph (a) have been modified to align more closely with other UNCITRAL texts, notably the CISG. This clarifies that both conditions can be established either objectively or subjectively.

36. By virtue of the reference in subparagraph (i) to data messages generated or sent “in a matter that was not anticipated or could not reasonably have been anticipated by the other party”, the principle applies to a range of situations, including:

(a) situations involving errors in programming;

(b) situations brought about by third party interference; and

(c) situations in which the system is operating properly but nevertheless generates an output that the person using the system did not expect (which is particularly relevant for non-deterministic systems) ([A/CN.9/1132](#), para. 79).

37. A suggestion was made at the sixty-fifth session to limit the principle to data messages generated “by an error”. That suggestion has not been reflected in subparagraph (i) pending further clarification from the Working Group as to which types of “error” are to be covered by the principle. The term “error” has multiple connotations in the context of automated systems,⁹ and is apt to confusion with the legal concept of “mistake”. The secretariat has previously suggested using “data processing error” as an omnibus term, which includes the situations listed in the preceding paragraph, as well as erroneous inputs from external data sources, including the types of human-made “input errors” referred to in article 14 of the ECC (although principle 6 does not address the same issue).¹⁰ The Working Group may wish to consider this issue at its sixty-sixth session.

38. Paragraph (b) has been inserted to clarify that principle (a) does not preclude the application of other solutions to rectify automated transactions affected by error under other law (e.g., the law of mistake) or under the operational rules of the system underpinned by contract (e.g., rules governing transactions on high-frequency trading platforms; see [A/CN.9/1132](#), para. 79). Consistent with the principle of party autonomy,

⁹ [A/CN.9/WG.IV/WP.179](#), para. 41.

¹⁰ *Ibid.*, para. 29.

paragraph (b) would also preserve any allocation of risk agreed between the parties that is associated with transactions affected by error. The Working Group may wish to consider whether paragraph (b) should be recast as a stand-alone principle, in which case paragraph (d) of principle 4 would be rendered redundant and could be omitted.

39. Paragraph (a) has been further revised to address the relevance of information on the design and operation of the system. Specifically:

(a) The words “having regard to the operational rules of the system and operations logs” have been inserted in subparagraph (i) to signal that these matters may be relevant to establishing the existence of an “error”. The availability of information to explain the ex post operation of an automated system is a central concern of “traceability” ([A/CN.9/1125](#), para. 50);

(b) The words “having regard to information disclosed by the other party” have been inserted in subparagraph (ii) to signal that this information may be relevant to establishing what the relying party knew or should reasonably have known. The ex ante disclosure of this type of information is a central concern of “transparency” in the operation of automated systems ([A/CN.9/1125](#), para. 50).

40. Paragraph (c) has been inserted to complement these further revisions. It is based on article 5 of the MLETR and articles 7 and 13 of the ECC. Together, these revisions clarify that principle 6 does not prescribe the content of transparency and traceability requirements, but it does signal how those requirements might be relevant in a contractual setting.

41. The Working Group may wish to consider whether further provision should be made to give effect to transparency and traceability in the use of automated systems in contracting. Some support has been expressed within the Working Group to establish a positive obligation to disclose information on the use of an automated system and on its operational parameters (see, e.g., [A/CN.9/1125](#), para. 49), which would complement the applications of the other principles. Other rules can be envisaged without requiring disclosure, such as a rule restating the applicability of existing provisions of UNCITRAL texts to the retention and admissibility in evidence of information relating to the operation and use of the system.

Additional remarks¹¹

42. In principle, the party on whose behalf an automated system is operated bears the risk of the output of that system. Principle 6 builds on an approach, suggested within the Working Group during the preparation of the ECC, according to which a party should not be required to bear the risk of data messages that are generated on its behalf by an automated system in a manner that the party could not have reasonably anticipated.¹² Those earlier deliberations within the Working Group were focused on “erroneous” messages (as to the meaning of “erroneous”, see discussion in paragraph 37 above regarding the concept of “error”). In lay terms, principle 6 deals with the “unintended consequences” of automated contracting. If principle 5 is about applying concrete requirements of contract law to the context of automated systems, principle 6 gives effect to the more abstract concept that the design and operation of the automated system is a manifestation of the will of the party.

43. The drafting of principle 6 draws on article 13(5) of the MLEC, which is part of a regime for allocating risk of reliance on data messages sent between the parties. Article 13(5) refers to one party being entitled to act on the assumption that a data message is what the other party “intended to send”, unless the party knew or should have known that the transmission resulted in any error in the data message as received. In effect, article 13(5) is not so much about the attribution of the data message to the other party, but rather about the ability of the first party to rely on the content of the data message and the act of its transmission. To avoid confusion with the concept of

¹¹ See also remarks in [A/CN.9/WG.IV/WP.179](#), para. 50.

¹² Explanatory note on the ECC, footnote 8 above, para. 230; [A/CN.9/484](#), para. 108.

“intention” as used in principle 5, principle 6 uses the term “anticipated” not “intended”.

44. The effect of principle 6 is that a party is not “bound” to an erroneous data message within the limits of the contractual relationship. It does not break the link between the party and the data message (i.e., attribution; see also [A/CN.9/1125](#), para. 47) but rather the link between the party and the legal consequences flowing from the data message (e.g., liability). As such, the party may avoid being held to a contract (under existing law) if the erroneous data message is claimed to constitute an offer or acceptance in the formation of the contract. Similarly, the party may avoid being held liable for breach of contract (under existing law) if the erroneous data message is claimed to constitute an action in breach of the contract.

45. Principle 6 does not deal with the legal consequences that would flow but for the erroneous data message, which remain a matter for other law. The Working Group has heard suggestions to consider addressing other aspects of liability, including reversing the burden of proof and introducing presumptions of liability in the event that the operator fails to comply with transparency and traceability standards ([A/CN.9/1125](#), para. 57). At the same time, it has also heard that extracontractual liability should be avoided (an issue that is particularly engaged in the context of contract performance), and that work should not focus on relations with third-party providers of services used in automated contracting (e.g., liability of software vendors for errors in programming or system operators) ([A/CN.9/1093](#), para. 61). So far, a conclusive view has not been expressed within the Working Group. Accordingly, the Working Group may wish to consider this issue further at its sixty-sixth session.

46. By its very nature, principle 6 is medium-specific; it only applies to automated contracts. As such, it differs from the other principles, as well as the approach generally applied in UNCITRAL texts, which seek to ensure that the same substantive law applies to contracting regardless of medium, thereby avoiding a “duality” of legal regimes. Yet as observed during the sixty-fifth session, article 14 of the ECC deals with substantive law issues, albeit with limited scope ([A/CN.9/1132](#), para. 80). While principle 6 does not address the same issue as article 14 of the ECC, similar policy reasons may justify a departure from the general approach. Specifically, the Working Group may feel that, given the higher risk of automated transactions being affected by error, a principle specific to automated contracting is warranted.

Principle 7. Compliance with applicable laws

The person on whose behalf the automated system is operated ensures, within any limitations on the use of the system disclosed to the person by the system operator, that the design, operation and use of the automated system in contracting complies with all applicable laws.

Notes on revised text

47. Principle 7 reproduces principle 7 of the first revision. It has been revised to reflect the deliberations of the Working Group during its sixty-fifth session ([A/CN.9/1132](#), paras. 82–85).

48. The word “all” has been inserted to emphasize that the principle is concerned not only with laws that apply to automated systems (e.g., regulations implementing standards on ethical use of AI), but also laws that apply to commercial activities regardless of whether an automated system is used (e.g., laws on data privacy and protection) ([A/CN.9/1132](#), para. 82). For the latter case, the words “in contracting”, which are used in principle 1, have also been inserted to clarify that the principle is concerned with laws that are applicable to the particular commercial activities of the person on whose behalf the system is operated, and not all possible commercial activities for which the system might be used. This is particularly relevant for third-party systems.

49. The words “within any limitations on the use of the system disclosed by the system operator” are inspired by a suggestion made at the sixty-fifth session that the system operator should inform the user of any limitation to the usage of the automated system ([A/CN.9/1132](#), para. 85). A similar duty of disclosure is imposed on identity management and trust service providers under the MLIT. Mindful that the principles do not establish duties on a third-party system operator, and that it has been suggested for the Working Group not to focus on relations with third-party providers of services used in automated contracting (see para. 45 above), the Working Group may wish to consider whether it is appropriate for the limitations disclosed by the system operator to confine the scope of the duty under principle 7. In other words, if a system is designed for particular transactions, the person on whose behalf the system is operated is only obliged to ensure compliance with laws that are applicable to those transactions.

50. The Working Group may wish to clarify whether “all applicable laws” includes the terms of a contract whose performance is automated, such that the principle effectively requires the automated system to comply with those terms.

51. The “complexity” of automated systems, particular those that operate non-deterministically, has been emphasized at several sessions of the Working Group”. Consistent with the principle of technology neutrality, an automated system should not be exempt from the application of a legal requirement on the basis of the complexity of the methods it uses.

*Additional remarks*¹³

52. Principle 7 does not establish stand-alone requirements regarding the design, operation or use of an automated system. However, it establishes a stand-alone duty to comply with such requirements under other law (see [A/CN.9/1132](#)), which would supplement any duty to comply with those requirements arising from their own force of law. The Working Group may wish to clarify that this reflects the intended operation of the principle.

III. Towards consolidated provisions on electronic transactions

53. The revised principles presented in chapter II of this note are essentially normative statements that apply the concepts and approaches underpinning the provisions of existing UNCITRAL texts on electronic transactions (e.g., technology neutrality, non-discrimination, functional equivalence, and party autonomy) to automated contracting. In their current form, the principles are not formulated as provisions in the usual drafting style of legislative texts prepared by the Working Group.

54. As noted above (para. 2), the Commission has requested the Working Group to revise existing provisions and to develop new provisions. The revised principles not only restate or clarify the application of the substantive provisions of the MLEC and ECC that the Working Group identified as the starting point for its work ([A/CN.9/1093](#), para. 69), but also deal with issues that are not addressed in those texts. Recalling the working method suggested within the Working Group (see para. 4 above), the principles therefore serve as a basis for fine-tuning those existing provisions, as well as a basis for new provisions on automated contracting. In view of the progress made by the Working Group, the secretariat takes the view that the “principles” can now be recast as “provisions”.

55. One option for the Working Group to discharge the second stage of its mandate is to create a new stand-alone legislative text containing provisions that apply only to automated contracting. However, as automated contracting is essentially the use of automated systems for electronic contracting,¹⁴ the full suite of substantive provisions of the MLEC and ECC would also apply, which would add to the patchwork of

¹³ See also remarks in [A/CN.9/WG.IV/WP.179](#), para. 51.

¹⁴ For a discussion on the concept of “automated contracting”, see [A/CN.9/WG.IV/WP.176](#), paras. 4–7.

UNCITRAL texts on electronic transactions. For that reason, a more sensible option might be to incorporate the provisions on automated contracting into a text consolidating the substantive provisions of the MLEC and ECC, thus creating a single, unified, and updated legislative text on electronic transactions.

56. The table in annex I offers a snapshot of how a new consolidated text might be structured, while the sample provision in annex II shows how the updated provisions of that text might look. The Working Group may wish to consider using the opportunity to incorporate the substantive provisions of the MLETR (dealing with electronic transferable records) and the MLES and MLIT (dealing with electronic signatures and other trust services) in the consolidated text, consonant with earlier deliberations within the Working Group on techniques for enacting the MLETR in jurisdictions whose laws already contain provisions on electronic transactions (see [A/CN.9/897](#), paras. 54–57).

57. From the point of view of the UNCITRAL secretariat, a consolidated legislative text on electronic transactions would make a significant contribution to the modernization and harmonization of the law in the digital economy on several levels, while also clarifying the interaction of existing UNCITRAL texts (see [A/CN.9/897](#), para. 60).

(a) On one level, the new text would account for changes in trade practices in the three decades since the adoption of the MLEC. It has already been pointed out in the Working Group that provisions of earlier UNCITRAL texts like the MLEC presupposed the use of Electronic Data Interchange (EDI) and similar technology, whereas subsequent texts like the ECC took into consideration the prevalent use of the Internet ([A/CN.9/1125](#), para. 19), and that the drafters of the ECC took the opportunity to update provisions of the MLEC to reflect that shift (*ibid.* para. 26). More recent texts like the MLETR and MLIT have been developed with digital ledger technology and online platforms in mind, and effectively update the provisions on electronic trade documents in part two of the MLEC and the regime for electronic signatures in the MLES, respectively. The progressive updating of UNCITRAL texts on electronic transactions texts is being reflected at the national level. For instance, domestic electronic transactions laws based on the MLEC have been updated in over 30 States to reflect the updated provisions of the ECC, even though the ECC applies only to international contracts;

(b) On another level, the new text would pre-empt fragmented national legal responses to emerging technologies by providing an authoritative restatement of the applicability of the (updated) provisions of UNCITRAL texts. Exploratory work carried out by the secretariat reveals that several jurisdictions are revising their laws – including electronic transactions legislation that is based on or influenced by UNCITRAL texts – to respond to so-called “smart contracts”¹⁵ and other uses of automation in contracting.¹⁶ Some new legislation departs from the principle of technology neutrality, which has been the bedrock of UNCITRAL’s work in the area of electronic

¹⁵ On the use of the term “smart contract”, see para. 6 of [A/CN.9/WG.IV/WP.176](#) and accompanying footnotes.

¹⁶ In Guernsey, the electronic transactions legislation was updated in 2019 to make specific provision for the legal recognition of “electronic agents”, including a rebuttable presumption of intention to be legally bound (see footnote 8 above). The updates were introduced with a view to providing greater legal certainty and to enhancing the appeal of Guernsey to promoters of businesses based on the new technologies: *Official Report of the States of Deliberation of the Island of Guernsey*, vol. 7, No. 24, p. 1822. In Mozambique, a new legal regime for commercial contracts has been introduced by the adoption of Decree-Law No. 3/2002 of 25 May 2022, which makes specific provision for the legal recognition of “smart contracts” (defined as computer code for the automatic performance of a contract), and renders the programmer liable for damages caused by a failure in the performance of the contract. In a side event during the fifty-sixth session of the Commission, delegates heard that several Caribbean States are carrying out a gap analysis of their respective electronic transactions legislation to identify possible updates designed to increase foreign direct investment flows.

commerce, or implies that the provisions of existing UNCITRAL texts are not applicable to “smart contracts”;

(c) On yet another level, the new text would facilitate technical assistance activities. The UNCITRAL secretariat has previously outlined to the Commission how the current patchwork of existing texts in the area of electronic commerce can create an obstacle to the adoption of those texts (see [A/CN.9/1065](#), para. 17). Although legislation based on or influenced by these texts has been implemented in around 100 States worldwide, work continues to promote the adoption, implementation of these texts, particularly in developing States. A consolidated text – which could be used not only as a model law on electronic transactions, but also as a model implementing law for the ECC – would assist the engagement of national authorities in taking the necessary policy decisions and legislative action.

58. At a time when digital trade is the focus of various international initiatives, the development of a new consolidated text presents an opportunity for the Working Group and UNCITRAL to reaffirm the fundamentals of the MLEC well into the twenty-first century, consistent with UNCITRAL’s central and coordinating role within the United Nations system in addressing legal issues related to the digital economy and digital trade ([A/75/17](#), part 2, para. 76). The year 2026 marks the thirtieth anniversary of the adoption of the MLEC, and presents a realistic timetable for the finalization of the new text. According to that timetable, the Working Group would prepare the text, in parallel with its work on data contracts, with a view to finalizing work at its seventieth session, expected to take place in the second half of 2025, and submitting the text for adoption by the Commission at its fifty-ninth session in 2026. The Working Group may wish to consider recommending this approach to the Commission.

Annex I – table of concordance between UNCITRAL texts on electronic commerce

Part A. Legal recognition

<i>Provision</i>	<i>MLEC</i>	<i>MLES</i>	<i>ECC</i>	<i>MLETR</i>	<i>MLIT</i>	<i>Proposal for consolidated text</i>
Legal recognition of information and communications in the form of data messages	Arts. 5 and 5 bis	-	Art. 8(1)	-	-	Retain arts. 5 and 5 bis MLEC. See also remarks in A/CN.9/WG.IV/WP.176 , para. 18.
Legal recognition of transferable documents or instruments in the form of data messages	-	-	-	Art. 7	-	See para. 56.
Legal recognition of contracts formed by data messages	Art. 11(1)	-	Art. 8(1)	-	-	Retain art. 8(1) ECC, combine with art. 12 ECC, and revise to incorporate principles 2 and 7. Principle 1(b) and the second sentence of principle 1(a) can be incorporated into an explanatory note.
Legal recognition of contracts performed by data messages	Art. 12(1)	-	Art. 8(1)	-	-	Ibid.
Legal recognition of contracts formed using automated systems	-	-	Art. 12	-	-	Ibid.
Admissibility of data messages in evidence	Art. 9	-	-	-	Art. 13	Retain art. 9 MLEC. See also remarks in A/CN.9/WG.IV/WP.176 , paras. 20–21.

Part B. Functional equivalence provisions

<i>Provision</i>	<i>MLEC</i>	<i>MLES</i>	<i>ECC</i>	<i>MLETR</i>	<i>MLIT</i>	<i>Proposal</i>
Writing requirement	Art. 6(1)	-	Art. 9(2)	Art. 8	-	Retain art. 9(2) ECC and revise to incorporate principle 1(c). See also remarks in A/CN.9/WG.IV/WP.176 , para. 27.
Endorsement and amendment requirements (for transferable documents and instruments)	-	-	-	Arts. 15 and 16	-	Retain arts. 15 and 16 MLETR.
Signature requirement	Art. 7(1)	Art. 6(1)	Art. 9(3)	Art. 9	Art. 16	Retain art. 9(3) ECC.
Seal requirement	-	-	-	-	Art. 17	See para. 56.
Timestamp requirement	-	-	-	Art. 13	Art. 18	Ibid.

<i>Provision</i>	<i>MLEC</i>	<i>MLES</i>	<i>ECC</i>	<i>MLETR</i>	<i>MLIT</i>	<i>Proposal</i>
Originality requirement	Art. 8(1)	-	Art. 9(4)	-	-	Retain art. 9(4) ECC. See also remarks in A/CN.9/WG.IV/WP.176 , paras. 29–30.
Retention requirement	Art. 10(1)	-	-	-	Art. 19	No proposal to include provision. See also remarks in A/CN.9/WG.IV/WP.176 , paras. 31–32.
Delivery requirement	-	-	-	-	Art. 20	See para. 56.
Possession requirement (for transferable documents and instruments)	Art. 17(3)	-	-	Art. 11	-	Ibid.

Part C. Other enabling provisions

<i>Provision</i>	<i>MLEC</i>	<i>MLES</i>	<i>ECC</i>	<i>MLETR</i>	<i>MLIT</i>	<i>Proposal</i>
Technology neutrality	-	Art. 3	-	-	Art. 3	Include provision incorporating principle 3, possibly combined with art. 9(1) ECC.
Time of dispatch and receipt of data messages	Art. 15(1) and (2)	-	Art. 10(1) and (2)	-	-	Retain art. 10(1) and (2) ECC. See also remarks in A/CN.9/WG.IV/WP.176 , paras. 34–35.
Place of dispatch and receipt of data messages	Art. 15(4)	-	Art. 10(3)	-	-	Retain art. 10(3) ECC. See also remarks in A/CN.9/WG.IV/WP.176 , para. 36.
Acknowledgment of receipt of data messages	Art. 14	-	-	-	-	No proposal to include provision.
Attribution of data messages	Art. 13(1) and (2)	-	-	-	-	Retain art. 13(1) and (2) MLEC and revise to incorporate principle 4. Principle 4(d) can be incorporated into an explanatory note. See also remarks in A/CN.9/WG.IV/WP.176 , paras. 37–38.
Transmission error	Art. 13(5)	-	-	-	-	Retain art. 13(5) MLEC and revise to incorporate principle 6(a).
Input error	-	-	Art. 14	-	-	Retain art. 14 ECC. See also remarks in A/CN.9/WG.IV/WP.176 , para. 39.
Invitations to make offers by data messages over public information system	-	-	Art. 11	-	-	Retain art. 11 ECC.

<i>Provision</i>	<i>MLEC</i>	<i>MLES</i>	<i>ECC</i>	<i>MLETR</i>	<i>MLIT</i>	<i>Proposal</i>
State of mind	-	-	-	-	-	Recast principle 5 as a new provision.
Compliance with applicable laws	-	-	-	-	-	Recast principle 7 as a new provision.

Part D. General provisions

<i>Provision</i>	<i>MLEC</i>	<i>MLES</i>	<i>ECC</i>	<i>MLETR</i>	<i>MLIT</i>	<i>Proposal for consolidated text</i>
Scope of application	Art. 1	Art. 1	Arts. 1 and 2	Art. 1	Art. 2	Retain art. 1 MLEC
Definitions	Art. 2	Art. 2	Art. 4	Art. 2	Art. 1	Revise the definition of “automated message system” to incorporate principle 1(a). Revise the definition of “data message” to incorporate principle 1(c).
Interpretation	Art. 3	Art. 4	Art. 5	Art. 3	Art. 4	Retain art. 4 MLIT
Party autonomy	Art. 4	Art. 5	Art. 3	Art. 4	Art. 3	Retain art. 4 MLEC
Information requirements	-	-	Arts. 7 and 13	Arts. 5 and 6	-	Retain arts. 7 and 13 ECC and revise to incorporate principle 6(c).

Annex II – sample provision

Article [X]. Legal recognition

1. Information shall not be denied legal effect solely on the grounds that:
 - (a) it is in the form of a data message; or
 - (b) it is not contained in the data message purporting to give rise to such legal effect, but is merely referred to in that data message.
2. A communication, contract or electronic transferable record shall not be denied validity or enforceability on the sole ground that it is in the form of data messages.
3. A contract shall not be denied validity or enforceability on the sole ground that an automated system was used in its formation.
4. A communication or other action in connection with the formation or performance of a contract shall not be denied validity or enforceability on the sole ground that it was carried out by an automated system.
5. Information referred to in a data message containing the terms of a contract shall not be denied legal effect, validity or enforceability on the sole ground that the data message containing the information is generated by an automated system after the formation of the contract.
