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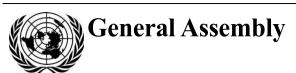   12 September 2022

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**United Nations Commission on
International Trade Law**
Working Group IV (Electronic Commerce)
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Provisions of UNCITRAL texts applicable to automated contracting

Note by the Secretariat

Contents

I. About this note

1. At its fifty-fifth session (New York, 27 June–15 July 2022), the Commission mandated the Working Group to deal incrementally with the topic of automated contracting. As a first stage, it requested the Working Group to compile provisions of UNCITRAL texts that apply to automated contracting, and to revise those provisions, as appropriate (A/77/17, para. 159).

2. The idea of preparing a compilation of UNCITRAL texts as they apply to automated contracting was put forward during the conceptual discussion that took place within the Working Group at its sixty-third session (New York, 4–8 April 2022). It was indicated at the time that such an exercise could provide a useful tool in providing guidance on the use of automated systems in contracting.

3. This note extracts key provisions of UNCITRAL texts on electronic contracting and offers some preliminary remarks on their applicability to automated contracting. It is designed to be read with the note that the secretariat submitted for the sixty-third session of the Working Group (A/CN.9/WG.IV/WP.173). A note on the second stage of the Working Group's mandate is contained in A/CN.9/WG.IV/WP.177.

II. Automated contracting in context

4. Contracts are formed by expressions of will (e.g. offer and acceptance) that evidence an agreement between the parties. UNCITRAL work on electronic commerce has primarily focussed on giving legal recognition to the practice of parties using electronic means to express their will in the formation of contracts, as well as at other stages of the contract life cycle (e.g. negotiation and performance). This note refers to that practice as "electronic contracting".[1]

5. The term "automated contracting" – sometimes referred to as "algorithmic contracting" – essentially refers to the practice of using automated systems for electronic contracting.[2] In other words, automated contracting involves the operation of automated systems that generate and process data messages, including data messages constituting an offer and its acceptance, or action taken in the performance of a contract.[3] Within the Working Group, it has been emphasized that the automated contracting "span[s] the entire contract life cycle, from the pre-contractual stage to contract formation, performance, renegotiation and termination".[4] Automated contracting is distinct from contracts for the supply of the software that runs the automated system. It is also distinct from other uses of automation that are not connected to the formation or performance of contracts.[5]

6. Previous work at UNCITRAL has distinguished "partly" automated contracts (e.g. a natural person ordering through a website) and "fully" automated contracts (e.g. two computers using electronic data interchange (EDI) to send and receive orders, which it refers to as a "fully" automated transaction).[6] The latter type of contracting is sometimes referred to as "M2M contracting". In its note for the sixty-third session, the secretariat identified other use cases of partly and fully automated contracting,[7] including high frequency trading, transactions carried out on online platforms (including websites), transactions initiated by "smart" devices, and interactions with so-called "smart contracts" deployed in a distributed ledger system. Mindful of the decision of the Commission for the Working Group to be guided by the principle of technology neutrality (and its related concept of system neutrality), and to avoid the risk of confusion owing to the unsettled meaning of the

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[1] The term "electronic contracting" is itself not used in UNCITRAL texts.
[2] A/CN.9/WG.IV/WP.173, para. 7; see also A/CN.9/1065, para. 10.
[3] A/CN.9/WG.IV/WP.173, para. 7.
[4] A/CN.9/1093, para. 57.
[5] A/CN.9/WG.IV/WP.173, para. 5.
[6] _United Nations Convention on the Use of Electronic Communications in International Contracts_ (United Nations publication, Sales No. E.07.V.2), para. 104.
[7] A/CN.9/WG.IV/WP.173, para. 11.

term, the secretariat cautions against using the term "smart contract" and an overreliance on use cases involving distributed ledger systems.[8] At the same time, it recognizes the interest that "smart contracts" has attracted in legal commentary.

7. If electronic contracting overcomes physical distance between the parties, automated contracting introduces a certain "remoteness" between the parties and the electronic communications used to negotiate, form and perform contracts. And while electronic contracting ordinarily involves some degree of automation (e.g. the use of computers to communicate without immediate human intervention), the increased sophistication and complexity of automated systems, including artificial intelligence techniques and "smart contracts", are amplifying the remoteness between the parties and their expressions of will, which in turn raises questions as to the validity of actions taken to negotiate, form and perform contracts.

III. Key provisions of UNCITRAL texts

A. Sources

8. At its sixty-third session, the Working Group heard that addressing legal issues related to automated contracting (including through the use of artificial intelligence) is anchored in the past work of UNCITRAL.[9] Broad support was expressed for the view that the provisions of the following UNCITRAL texts supporting electronic contracting provide the starting point for future work on the topic:

(a) The 1996 UNCITRAL Model Law on Electronic Commerce (MLEC);

(b) The 2005 United Nations Convention on the Use of Electronic Communications in International Contracts (ECC); and

(c) The 2017 UNCITRAL Model Law on Electronic Transferable Records (MLETR).

9. The provisions extracted in this note are drawn from those texts. Where relevant, reference is also made to corresponding provisions of the 2022 UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services (MLIT), which was adopted by the Commission at its fifty-fifth session.[10]

B. Definitions

1. "Automated messaging systems"

(a) ECC

> *Article 4(g)*
>
> "Automated message system" means a computer program or an electronic or other automated means used to initiate an action or respond to data messages or performances in whole or in part, without review or intervention by a natural person each time an action is initiated or a response is generated by the system.

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[8] The secretariat has previously indicated that (i) while "smart contracts" are commonly associated with distributed ledger technology, they predate the advent of that technology, and (ii) "smart contracts" should – at most – be conceptualized as instances of the use of automated systems to perform contracts, although they may be deployed without any connection to a contract: see A/CN.9/WG.IV/WP.173, para. 8.

[9] A/CN.9/1093, para. 57.

[10] The text of the model law, as approved by the Commission at its fifty-fifth session, is contained in annex II of A/77/17. The secretariat recognizes that other UNCITRAL texts support electronic contracting. For instance, the United Nations Convention on International Settlement Agreements Resulting from Mediation expressly recognizes that a settlement agreement may be in electronic form.

(b)   Remarks

10.   At the sixty-third session of the Working Group, the view was expressed that the definition of "automated messaging system" in the ECC remains apt to describe the systems that are being used for automated contracting.[11] General support was also expressed for the view that the term covers systems that deploy artificial intelligence techniques.[12] The Working Group may wish to reaffirm that the use of the term and its definition serve as a basis for its work. Further remarks on distinguishing "autonomous contracts" are contained in A/CN.9/WG.IV/WP.177 (paras. 3–4).

2.   "Electronic communications"

(a)   ECC

> *Article 4(b)*
>
> "Electronic communication" means any communication that the parties make by means of data messages.
>
> *Article 4(a)*
>
> "Communication" means any statement, declaration, demand, notice or request, including an offer and the acceptance of an offer, that the parties are required to make or choose to make in connection with the formation or performance of a contract.
>
> *Article 4(c)*
>
> "Data message" means information generated, sent, received or stored by electronic, magnetic, optical or similar means, including, but not limited to, electronic data interchange, electronic mail, telegram, telex or telecopy.

(b)   Remarks

11.   Common to all UNCITRAL texts supporting electronic contracting is the concept of the "data message". The definition of "data message" has essentially remained unchanged throughout those texts.

12.   The ECC uses the term "electronic communication" to denote a particular type of data message, i.e. data messages used by the parties to make a "communication" in connection to the formation or performance of a contract. The MLETR uses the term "electronic record" to denote a record in the form of data messages.

13.   In all texts, the term "data message" is understood to (i) encompass electronic records that are not intended to be communicated, (ii) have a fixed information content, and (iii) be capable of having its content revoked or amended by another data message.[13] Consistent with that understanding, the MLETR acknowledges that an electronic record may be formed by a composite of data messages that are "logically associated with or otherwise linked together so as to become part of the record, whether generated contemporaneously or not". In a similar vein, the 2001 UNCITRAL Model Law on Electronic Signatures defines an "electronic signature" as a particular type of data message which is "affixed to or logically associated with" another data message and is used to "sign" the other data message.

14.   To the extent that automated contracting is electronic contracting using automated systems, the term "electronic communication" would appear to cover the type of data messages that are processed by automated systems. The Working Group may consider whether the use of the term and its definition should serve as a basis for its work.

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[11] A/CN.9/1093, para. 53.

[12] Ibid., para. 54.

[13] *UNCITRAL Model Law on Electronic Commerce with Guide to Enactment 1996 with Additional Article 5 bis as Adopted in 1998* (United Nations publication, Sales No. E.99.V.4), paras. 30 and 32; *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 96.

C. Non-discrimination provisions

15. The provisions of UNCITRAL texts supporting electronic contracting may be divided into two types: (i) non-discrimination provisions; and (ii) functional equivalence provisions. The provisions complement and reinforce one another in providing legal recognition for electronic contracting. In basic terms, non-discrimination provisions are formulated in broad yet negative terms, while functional equivalence provisions are formulated in specific yet positive terms.

16. Non-discrimination provisions give effect to the principle of non-discrimination against the use of electronic means. In the context of electronic contracting, the principle militates against establishing dual regimes whereby different legal requirements apply to a contract depending on whether it is negotiated, formed or performed by "traditional" means (e.g. on paper or in person) or by the use of electronic communications.

17. To the extent that automated contracting is electronic contracting using automated systems, the non-discrimination provisions of UNCITRAL texts that support electronic contracting equally apply to automated contracting. At the sixty-third session of the Working Group, broad support was expressed for the view that future work should be guided by the principle of non-discrimination against the use of electronic means.[14]

1. Provisions on the legal recognition of data messages used in the formation or performance of contracts

(a) MLEC

Article 5

Information shall not be denied legal effect, validity or enforceability solely on the grounds that it is in the form of a data message.

Article 5 bis

Information shall not be denied legal effect, validity or enforceability solely on the grounds that 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.

Article 11(1)

In the context of contract formation, unless otherwise agreed by the parties, an offer and the acceptance of an offer may be expressed by means of data messages. Where a data message is used in the formation of a contract, that contract shall not be denied validity or enforceability on the sole ground that a data message was used for that purpose.

Article 12(1)

As between the originator and the addressee of a data message, a declaration of will or other statement shall not be denied legal effect, validity or enforceability solely on the grounds that it is in the form of a data message.

(b) ECC

Article 8(1)

A communication or a contract shall not be denied validity or enforceability on the sole ground that it is in the form of an electronic communication.

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[14] A/CN.9/1093, para. 71.

(c)   **MLETR**

Article 6

Nothing in this Law precludes the inclusion of information in an electronic transferable record in addition to that contained in a transferable document or instrument.

(d)   **Remarks**

18.   Article 8 of the ECC essentially restates articles 5, 11(1) and 12(1) of the MLEC. To the extent that automated contracting is electronic contracting using automated systems, that provision equally applies to automated contracting. The secretariat has previously indicated that the provision could be modified to expressly recognize contracts in the form of computer code.[15]

19.   While they are formulated differently, article 5 *bis* of the MLEC and article 6 of the MLETR are both relevant to the practice of incorporating information into an electronic record from an external data source. Particularly relevant in the context of automated contracting is the inclusion of dynamic information that changes periodically or continuously, and which may determine the terms on which a contract is formed or how the contract is performed. The secretariat has previously indicated that article 6 could serve as a basis for a new non-discrimination provision to the effect that a contract in electronic form should not be denied validity or enforceability on the sole ground that its terms are identified by incorporation of information from an external data source.[16] The Working Group may wish to consider such a provision in the second stage of its mandate.

2.   **Provisions on the admissibility of data messages in evidence**

(a)   **MLEC**

Article 9(1)(a)

In any legal proceedings, nothing in the application of the rules of evidence shall apply so as to deny the admissibility of a data message in evidence on the sole ground that it is a data message.

(b)   **Remarks**

20.   The ECC does not contain a rule equivalent to article 9(1)(a) of the MLEC on the basis that the admissibility of electronic communication in evidence, like the production of electronic communications to a public authority, raises issues that are not particular to electronic contracting.[17] Conversely, the legal recognition provided by the corresponding provision in article 13 of the MLIT, which applies in effect to electronic communications resulting from the use of a trust service, is extended to their "admissibility as evidence".

21.   The secretariat has previously indicated that the admissibility provision could be reformulated to establish, in positive terms, the conditions for the admissibility of electronic communications in evidence.[18] The Working Group may wish to consider such a provision in the second stage of its mandate.

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[15] A/CN.9/1065, para. 27(a); see also A/CN.9/WG.IV/WP.173, para. 40(a).

[16] A/CN.9/1065, para. 27(c); see also A/CN.9/WG.IV/WP.173, para. 40(b).

[17] *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 13.

[18] See A/CN.9/1065, para. 27(b).

3. Provisions on the legal recognition of contracts formed using automated systems

(a) ECC

> *Article 12*
>
> A contract formed by the interaction of an automated message system and a natural person, or by the interaction of automated message systems, shall not be denied validity or enforceability on the sole ground that no natural person reviewed or intervened in each of the individual actions carried out by the automated message systems or the resulting contract.

(b) Remarks

22. Article 12 of the ECC applies to "partly" and "fully" automated contracting. It embodies a non-discrimination rule intended to make it clear that the absence of human review of, or intervention in, a particular transaction does not by itself preclude contract formation.[19] Article 12 is an enabling provision and does not allow for an automated system or a computer to be made the subject of rights and obligations.[20] As such, it is consistent with the principle that automated systems are mere tools with no independent will or legal personality,[21] a view that has attracted broad support within the Working Group.[22]

23. Article 12 of the ECC applies only to the use of automated systems in the formation of contracts. It has already been suggested within the Working Group that article 12 could be expanded to provide for the legal recognition of the use of automated systems to perform contracts (or other stages of the contract life cycle, for that matter).[23] An example is the use of a "smart contract" that is programmed to execute the terms of a contract by submitting a new data entry to the consensus mechanism of a distributed ledger system without any human review or intervention. The Working Group may wish to consider such a provision in the second stage of its mandate.

D. Functional equivalence provisions

24. In the context of electronic contracting, the functional equivalence approach guides the formulation of provisions that establish the conditions in which data messages forming records and communications used by the parties in connection with a contract satisfy paper-based legal requirements. In broad terms, the functional equivalence provisions of UNCITRAL texts prescribe the functions that are served by various paper-based legal requirements and specify how those functions are fulfilled by data messages, thereby securing equivalent legal treatment for data messages used to form electronic records and electronic communications.

25. The provisions of the MLEC and ECC focus primarily on establishing functional equivalence between data messages and paper-based form requirements (i.e. requirements for a contract or communication to be "in writing", "signed", and "in original form"). The MLETR extends functional equivalence to physical requirements (i.e. requirements for the "possession" of a record).

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[19] *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 210.
[20] Ibid., para. 213.
[21] A/CN.9/WG.IV/WP.173, para. 26.
[22] A/CN.9/1093, para. 56.
[23] Ibid., para. 70. See also A/CN.9/1065, para. 26(b) and A/CN.9/WG.IV/WP.173, para. 22(c).

26. To the extent that automated contracting is electronic contracting using automated systems, the functional equivalence provisions of UNCITRAL texts supporting electronic contracting equally apply to automated contracting.

1. Writing provision

(a) MLEC

Article 6(1)

Where the law requires[24] information to be in writing, that requirement is met by a data message if the information contained therein is accessible so as to be usable for subsequent reference.

(b) ECC

Article 9(2)

Where the law requires that a communication or a contract should be in writing, or provides consequences for the absence of a writing, that requirement is met by an electronic communication if the information contained therein is accessible so as to be usable for subsequent reference.

(c) Remarks

27. The writing provisions in the MLEC and ECC are the same in substance. The term "accessible" requires the information in an electronic communication to be "readable and interpretable", while the term "usable" covers not only use by humans but also computer processing.[25] Accordingly, the MLEC and ECC already recognize contracts in the form of computer code that cannot be understood by humans. However, as noted above (para. 18), there may be merit in clarifying that the writing provision applies to communications and contracts in the form of computer code.

2. Signature provision

(a) MLEC

Article 7(1)

Where the law requires[26] a signature of a person, that requirement is met in relation to a data message if:

    (a) A method is used to identify that person and to indicate that person's approval of the information contained in the data message; and

    (b) That method is as reliable as was appropriate for the purpose for which the data message was generated or communicated, in the light of all the circumstances, including any relevant agreement.

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[24] Article 6(2) of the MLEC clarifies that the requirement may be in the form of (i) a legal obligation for the information to be in writing, or (ii) a law providing consequences for the information not being in writing.

[25] *UNCITRAL Model Law on Electronic Commerce with Guide to Enactment 1996 with Additional Article 5 bis as Adopted in 1998* (footnote 13 above), para. 50; *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 146.

[26] Article 7(2) of the MLEC clarifies that the requirement may be in the form of (i) a legal obligation for a signature, or (ii) a law providing consequences for the absence of a signature.

(b)   ECC

> *Article 9(3)*
>
> Where the law requires that a communication or a contract should be signed by a party, or provides consequences for the absence of a signature, that requirement is met in relation to an electronic communication if:
>
>   (a)   A method is used to identify the party and to indicate that party's intention in respect of the information contained in the electronic communication; and
>
>   (b)   The method used is either: (i) as reliable as appropriate for the purpose for which the electronic communication was generated or communicated, in the light of all the circumstances, including any relevant agreement; or (ii) proven in fact to have fulfilled the functions described in subparagraph (a) above, by itself or together with further evidence.

(c)   Remarks

28.   In the MLIT, the "safety clause" contained in article 9(3)(b)(ii) of the ECC applies not only to electronic signatures but to other functional equivalents resulting from the use of a trust service (e.g. electronic seals, electronic timestamps).

3.   Originality provision

(a)   MLEC

> *Article 8(1)*
>
> Where the law requires[27] information to be presented or retained in its original form, that requirement is met by a data message if:
>
>   (a)   There exists a reliable assurance as to the integrity of the information from the time when it was first generated in its final form, as a data message or otherwise; and
>
>   (b)   Where it is required that information be presented, that information is capable of being displayed to the person to whom it is to be presented.

(b)   ECC

> *Article 9(4)*
>
> Where the law requires that a communication or a contract should be made available or retained in its original form, or provides consequences for the absence of an original, that requirement is met in relation to an electronic communication if:
>
>   (a)   There exists a reliable assurance as to the integrity of the information it contains from the time when it was first generated in its final form, as an electronic communication or otherwise; and
>
>   (b)   Where it is required that the information it contains be made available, that information is capable of being displayed to the person to whom it is to be made available.

(c)   Remarks

29.   Article 8(3)(a) of the MLEC and article 9(5)(a) of the ECC clarify that retaining the integrity of information requires the information to remain "complete and unaltered", apart from the addition of any endorsement and any change arising

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[27] Article 8(2) of the MLEC clarifies that the requirement may be in the form of (i) a legal obligation for the information to be so retained or produced, or (ii) a law providing consequences for the information not being so presented or retained.

in the normal course of communication, storage and display. An expanded provision is found with respect to electronic records in article 10(2) of the MLETR, which applies the integrity requirement not only to information contained in the electronic record at the time of its creation, but also to additional information included during the life cycle of the electronic record.

30. The originality provisions of UNCITRAL texts apply to "electronic originals" (i.e. information originally in electronic form), and are not to be confused with other legal provisions on the use of electronic "copies" of paper-based "originals" (i.e. a data message that reproduces information in a paper communication or record). Electronic transaction legislation in some jurisdictions that enact the MLEC and ECC include additional provisions on the use of electronic copies. For the reasons mentioned earlier (para. 25), the originality provision of the ECC does not apply to a requirement to produce.

4. Retention provision

(a) MLEC

Article 10(1)

Where the law requires that certain documents, records or information be retained, that requirement is met by retaining data messages, provided that the following conditions are satisfied:

    (a) The information contained therein is accessible so as to be usable for subsequent reference; and

    (b) The data message is retained in the format in which it was generated, sent or received, or in a format which can be demonstrated to represent accurately the information generated, sent or received; and

    (c) Such information, if any, is retained as enables the identification of the origin and destination of a data message and the date and time when it was sent or received.

(b) Remarks

31. For the reasons mentioned earlier (para. 25), the ECC does not contain a retention provision. Conversely, article 19 of the MLIT does contain a retention provision (headed "electronic archiving"), which has been reformulated to align it with the other trust service provisions (i.e. a requirement for a "reliable method" and a list of prescribed functions to be fulfilled by that method).

32. The provisions of the MLEC and MLIT are primarily intended to give legal recognition to electronic archiving practices for accounting and tax purposes, rather than for purposes of performing contracts. Accordingly, those provisions may be less likely to find application in the context of automated contracting as functional equivalence provisions. Nevertheless, further to the remarks above (para. 28), the conditions established in those provisions may be relevant for possible new provisions, to be considered by the Working Group in the second stage of its mandate, on the retention of information to address the traceability of actions in connection with automated contracting.[28] They may also be relevant for a possible new provision on the admissibility of data messages in evidence (see para. 13 above).

E. Other enabling provisions

33. UNCITRAL texts contain default rules – including deeming provisions and presumptions – for determining when and where data messages are dispatched and received. The MLEC also contains provisions for attributing data messages. To the

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[28] See A/CN.9/WG.IV/WP.173, paras. 36–37.

extent that automated contracting involves the use of automated systems for processing data messages used in connection with the negotiation, formation and performance of a contract, those provisions equally apply to automated contracting. They may also provide a reference point for the Working Group in addressing other legal issues raised by automated contracting, as contemplated in the second stage of its mandate.

1. Time of dispatch and receipt of data messages

(a) MLEC

Article 15

1. Unless otherwise agreed between the originator and the addressee, the dispatch of a data message occurs when it enters an information system outside the control of the originator or of the person who sent the data message on behalf of the originator.

2. Unless otherwise agreed between the originator and the addressee, the time of receipt of a data message is determined as follows:

(a) If the addressee has designated an information system for the purpose of receiving data messages, receipt occurs: (i) at the time when the data message enters the designated information system; or (ii) if the data message is sent to an information system of the addressee that is not the designated information system, at the time when the data message is retrieved by the addressee;

(b) If the addressee has not designated an information system, receipt occurs when the data message enters an information system of the addressee.

(b) ECC

Article 10

1. The time of dispatch of an electronic communication is the time when it leaves an information system under the control of the originator or of the party who sent it on behalf of the originator or, if the electronic communication has not left an information system under the control of the originator or of the party who sent it on behalf of the originator, the time when the electronic communication is received.

2. The time of receipt of an electronic communication is the time when it becomes capable of being retrieved by the addressee at an electronic address designated by the addressee. The time of receipt of an electronic communication at another electronic address of the addressee is the time when it becomes capable of being retrieved by the addressee at that address and the addressee becomes aware that the electronic communication has been sent to that address. An electronic communication is presumed to be capable of being retrieved by the addressee when it reaches the addressee's electronic address.

(c) Remarks

34. The provisions of the MLEC and ECC on the time of dispatch differ. Article 10(1) of the ECC is based on the understanding that a data message is dispatched when it leaves the sphere of control of the person who sent the data message (i.e. the "originator").[29] The provisions of the MLEC and ECC on the time of receipt are largely similar, although they are formulated in the ECC as a set of presumptions rather that firm rules.[30]

35. Article 10 of the ECC covers cases in which the same information system is used by the originator and addressee, which is relevant in the case of automated

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[29] *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 177.
[30] Ibid., para. 180.

contracting via an online platform. The term "information system" is defined in article 4(f) of the ECC to mean "a system for generating, sending, receiving, storing or otherwise processing data messages" and is intended to cover the entire range of technical means used for transmitting, receiving and storing information.[31] The explanatory note to the MLETR indicates that the term covers distributed ledger systems. Noting the use of "smart contracts" deployed in a distributed ledger system to perform contracts (see para. 21 above), the Working Group may wish to reaffirm the use and definition of the term "information system" in the context of automated contracting.

2. Place of dispatch and receipt of data messages

(a) MLEC

> *Article 15*
>
> 4.   Unless otherwise agreed between the originator and the addressee, a data message is deemed to be dispatched at the place where the originator has its place of business, and is deemed to be received at the place where the addressee has its place of business. For the purposes of this paragraph:
>
>   (a)   If the originator or the addressee has more than one place of business, the place of business is that which has the closest relationship to the underlying transaction or, where there is no underlying transaction, the principal place of business;
>
>   (b)   If the originator or the addressee does not have a place of business, reference is to be made to its habitual residence.

(b) ECC

> *Article 10*
>
> 3.   An electronic communication is deemed to be dispatched at the place where the originator has its place of business and is deemed to be received at the place where the addressee has its place of business, as determined in accordance with article 6.

(c) Remarks

36.   Article 15(3) of the MLEC and article 10(4) of the ECC acknowledge that the information system supporting the receipt of data messages may not be located at the place at which the data message is deemed to be received (i.e. at the addressee's place of business). This rule reflects the principle, articulated in articles 6(4) and 6(5) of the ECC, as well as in article 14 of the MLETR, that the location of communications technology and equipment is of limited value in determining the location of a person's place of business. The Working Group may wish to reaffirm that principle in the context of automated contracting. In doing so, it may wish to note the link between the principle and the identification of relevant connecting factors for the purposes of formulating private international law rules relating to digital assets (i.e. electronic records) stored on distributed ledger systems, an issue that is being considered in other forums, notably within the International Institute for the Unification of Private Law as part of its project on digital assets and private law,[32] and the Hague Conference on Private International Law as part of exploratory work on the private international law implications of the digital economy.

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[31] Ibid., para. 101.

[32] See www.unidroit.org/work-in-progress/digital-assets-and-private-law/ (accessed 12 September 2022).

3. Attribution of data messages

(a) MLEC

Article 13

1. A data message is that of the originator if it was sent by the originator itself.

2. As between the originator and the addressee, a data message is deemed to be that of the originator if it was sent:

    (a) By a person who had the authority to act on behalf of the originator in respect of that data message; or

    (b) By an information system programmed by, or on behalf of, the originator to operate automatically.

3. As between the originator and the addressee, an addressee is entitled to regard a data message as being that of the originator, and to act on that assumption, if:

    (a) In order to ascertain whether the data message was that of the originator, the addressee properly applied a procedure previously agreed to by the originator for that purpose; or

    (b) The data message as received by the addressee resulted from the actions of a person whose relationship with the originator or with any agent of the originator enabled that person to gain access to a method used by the originator to identify data messages as its own.

4. Paragraph 3 does not apply:

    (a) As of the time when the addressee has both received notice from the originator that the data message is not that of the originator, and had reasonable time to act accordingly; or

    (b) In a case within paragraph 3(b), at any time when the addressee knew or should have known, had it exercised reasonable care or used any agreed procedure, that the data message was not that of the originator.

5. Where a data message is that of the originator or is deemed to be that of the originator, or the addressee is entitled to act on that assumption, then, as between the originator and the addressee, the addressee is entitled to regard the data message as received as being what the originator intended to send, and to act on that assumption. The addressee is not so entitled when it knew or should have known, had it exercised reasonable care or used any agreed procedure, that the transmission resulted in any error in the data message as received.

6. The addressee is entitled to regard each data message received as a separate data message and to act on that assumption, except to the extent that it duplicates another data message and the addressee knew or should have known, had it exercised reasonable care or used any agreed procedure, that the data message was a duplicate.

(b) Remarks

37. Article 13 is principally concerned with the authentication of data messages, i.e. whether a data message is actually sent by the purported originator.[33] Paragraphs 3 to 6 set out rules to allocate risk, as between the addressee and originator, of reliance on data messages purportedly sent by the originator by reference to authentication procedure established between them. In the context of automated contracting, authentication may be distinguished from attribution. Authentication is about linking a data message to an automated system (e.g. through the identification of objects) so that it can be said that the data message

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[33] *UNCITRAL Model Law on Electronic Commerce with Guide to Enactment 1996 with Additional Article 5 bis as Adopted in 1998* (footnote 13 above), para. 83.

is sent by the automated system, whereas attribution is about linking the automated system to a person so that it can be said that the sending of the data message is an action of the person (whether or not the person is liable for the legal consequences flowing from that action). As outlined in A/CN.9/WG.IV/WP.177 (paras. 5–10), article 13(2)(b) provides a relevant reference point for the Working Group to address attribution in the second stage of its mandate.

38. The ECC does not contain provisions on attribution. However, the explanatory note to the ECC expresses the view that data messages generated by automated systems should be regarded as originating from the legal entity on behalf of which the system is "operated".[34]

4. Input error

(a) ECC

Article 14

1. Where a natural person makes an input error in an electronic communication exchanged with the automated message system of another party and the automated message system does not provide the person with an opportunity to correct the error, that person, or the party on whose behalf that person was acting, has the right to withdraw the portion of the electronic communication in which the input error was made if:

    (a) The person, or the party on whose behalf that person was acting, notifies the other party of the error as soon as possible after having learned of the error and indicates that he or she made an error in the electronic communication; and

    (b) The person, or the party on whose behalf that person was acting, has not used or received any material benefit or value from the goods or services, if any, received from the other party.

2. Nothing in this article affects the application of any rule of law that may govern the consequences of any error other than as provided for in paragraph 1.

(b) Remarks

39. Along with article 12, article 14 of the ECC deals exclusively with automated contracting. It applies only to the very specific situation in which a natural person interacts with an automated system. It is concerned with human error and not with data processing errors that may affect the operation of an automated system, such as erroneous inputs from external data sources, system malfunction, and third-party interference. It is intended to supplement, but not supplant, existing law dealing with mistake.[35] Article 12 applies only to "partly" automated contracting, and its relevance to automated contracting was questioned within the Working Group at its sixty-third session.[36] The separate issues of mistake and liability for data processing errors have been identified as particular issues that could be considered by the Working Group in the second stage of its mandate (see A/CN.9/WG.IV/WP.177).

F. Scope provisions

1. International contracts

40. Unlike the MLEC, the scope of application of the ECC is confined to international contracts (i.e. contracts between parties whose places of business are in different States). That limitation is a function of the nature of the ECC as a treaty and complement to the United Nations Convention on Contracts for the

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[34] *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 213.

[35] Ibid., para. 250.

[36] A/CN.9/1093, para. 73.

International Sale of Goods (CISG). The experience of the secretariat shows that the provisions of the ECC are often applied by States regardless of the location of the parties, and thus to domestic and international contracting alike. Against that background, the Working Group may wish to leave aside the location of the parties (i.e. the internationality of the contract) when considering the applicability of the ECC provisions that are extracted in this note.

2. Contracts with consumers

41. UNCITRAL texts supporting electronic contracting tend to avoid consumer contracting. One approach to giving effect to this policy is reflected in article 2(1)(a) of the ECC, which excludes from its scope "contracts concluded for personal, family or household purposes". Another approach is taken in the MLEC, which is stated not to override "any rule of law intended for the protection of consumers".[37]

42. The Working Group has heard that transactions with consumers constitute a significant share of automated contracts.[38] It has also heard that the distinction between professional traders and consumers is blurred, particularly in the platform economy, and the involvement of micro and small enterprises has been acknowledged.[39] One prominent use case for automated contracting involves transactions initiated by "smart" devices, including devices that are connected as part of the "Internet of Things".[40] While those devices are operated in a business-to-consumer context (B2C), they are also operated in a business-to-business (B2B) context. Moreover, while the operation of those devices raises specific issues relating to the scope and application of existing consumer protection laws,[41] they also raise fundamental legal issues relating to the formation and performance of contracts that are common in both contexts. Against that background, the Working Group may wish to leave aside the characterization of a party as a "consumer" when considering the applicability of the provisions of the ECC that are extracted in this note. Bearing in mind the decision of the Commission that the Working Group should proceed on the basis of use cases and business needs, it may also wish to take the approach that particular use cases of automated contracting should not be disregarded solely on the grounds that they involve transactions with consumers.

3. Contracts in regulated markets

43. The ECC excludes from its scope of application transactions in a range of regulated financial markets (art. 2(1)(b)). The exclusion is based on the assumption that rules governing those markets already address issues relating to electronic transactions in a manner that allows for their effective worldwide functioning.[42] The MLETR also excludes from scope "securities… and other investment instruments". Conversely, the MLEC is designed to apply to "all relationships of a commercial nature", which encompass transactions in regulated markets.

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[37] See also article 2(4) of the MLIT.

[38] A/CN.9/1093, para. 65.

[39] Ibid.

[40] A/CN.9/WG.IV/WP.173, para. 11. For an earlier discussion of such cases, see address by Christiane Wendehorst to the 2017 UNCITRAL Congress, "Towards a 'digital fitness check' for existing legal instruments", in Modernizing International Trade Law to Support Innovation and Sustainable Development (Vienna, United Nations, 2017), p. 66.

[41] These issues are currently being addressed by a project of the European Law Institute entitled "Guiding Principles and Model Rules on Algorithmic Contracts", which aims to produce, as a first stage, an annotated commentary of existing EU consumer law directives indicating the suitability and the adequacy of such provisions to the use of ADM in consumer contracts".

[42] *United Nations Convention on the Use of Electronic Communications in International Contracts* (footnote 6 above), para. 78.

44.   At the sixty-third session of the Working Group, high frequency trading was identified as a common instance of automated contracting. [43] High frequency trading, which ordinarily refers to the automated trading of financial instruments, takes place in both regulated and unregulated markets. Compare, for instance, the automated trading of securities and other investment instruments (by one estimate,[44] 50 per cent of stock trading volume in the United States of America is driven by high frequency trading) with the automated trading of cryptocurrency (e.g. the transaction considered by the courts of Singapore in the case of *Quoine Pte. Ltd. v. B2C2 Ltd.*).[45] In regulated markets, rules governing high frequency trading have been introduced in some jurisdictions to maintain market stability and fair trading. However, those rules do not generally deal with contract law aspects of high frequency trading. Against that background, the Working Group may wish to leave aside questions of whether a particular use of automation involves a transaction in a regulated market when considering the applicability of the ECC provisions that are extracted in this note. Recalling the decision of the Commission that the Working Group should proceed on the basis of use cases and business needs (see para. 42 above), it may also wish to take the approach that particular use cases of automated contracting should not be disregarded solely on the grounds that they involve transactions in regulated markets.

IV.   Concluding remarks

45.   The provisions of UNCITRAL texts extracted in this note are not designed to establish uniform rules on electronic contracting. Instead, they provide tools to apply existing rules – principally contract law rules sourced in domestic law – to electronic contracting. To the extent that automated contracting is electronic contracting using automated systems, those provisions provide a basic legal framework for automated contracting. The Working Group may wish to consider the merits of restating the applicability of those provisions to automated contracting, thus confirming the legal recognition of automated contracting.

46.   While UNCITRAL texts already address some legal issues specific to the use of automated systems (e.g. article 12 of the ECC), they do not provide a complete answer to legal questions raised in the growing use cases for automated contracting. As elaborated in A/CN.9/WG.IV/WP.177, various legal issues were identified during the sixty-third session of the Working Group that are not (fully) addressed in existing UNCITRAL texts, and the Commission has requested the Working Group to identify and develop possible new provisions that address those issues in the second stage of its mandate.

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[43] A/CN.9/1093, para. 66.

[44] See Nasdaq, "High Frequency Trading", available at www.nasdaq.com/glossary/h/high-frequency-trading (accessed 12 September 2022).

[45] See, e.g., *Quoine Pte. Ltd. v. B2C2 Ltd.*, Civil Appeal No. 81 of 2019, Judgment, 24 February 2020, Singapore Law Reports, vol. 2020, No. 2, p. 20, [2020] SGCA(I) 02.