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Preparatory work on the compilation and consolidation of UNCITRAL texts addressing electronic aspects

Note by the Secretariat

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I. About this note

1. This note outlines the preparatory work conducted by the secretariat on consolidating and compiling UNCITRAL texts on electronic commerce. After recalling the background (chapter II), it describes the assumptions and approaches underlying the exercise (chapter III) and presents a detailed outline of a draft consolidated text (chapter IV). It concludes by suggesting a way forward for advancing the exercise (chapter V).

II. Background

2. At its fifty-seventh session, in 2024, the Commission requested the secretariat to conduct a stocktaking exercise to examine all UNCITRAL texts that referred to electronic aspects, including UNCITRAL texts on electronic commerce and other substantive law texts that included provisions on electronic aspects ([A/79/17](#), paras. 296 and 299). The Commission also requested that the stocktaking exercise include a survey of the incorporation by States of UNCITRAL texts on electronic commerce into their domestic legislation and the inclusion of such texts in international commitments concerning paperless trade.

3. The outcome of the stocktaking exercise ([A/CN.9/1226](#), paras. 35–58) and the results of a supporting study by the International and Comparative Law Research Center ([A/CN.9/1234](#), para. 8) were presented to the Commission at its fifty-eight session, in 2025, together with a proposal by the secretariat to carry out preparatory work to consolidate existing UNCITRAL texts on electronic commerce ([A/CN.9/1226](#), paras. 30–34 and 59–64). The Commission requested the secretariat to proceed with consolidating those texts into a single legislative text, including by preparing guidance material on their consistent implementation, adding that the outcome of that work could be submitted to a working group for review at a later stage ([A/80/17](#), para. 242).

III. Methodology

4. Work on preparing a consolidated text, reflected in chapter IV below, has conformed to the approach outlined in the proposal to the Commission and builds on the stocktaking exercise. It has focused on compiling provisions of the following texts (referred to collectively in this note as the “UNCITRAL texts on electronic commerce”):

(a) UNCITRAL Model Law on Electronic Commerce (1996) with additional article 5 bis as adopted in 1998 (MLEC);

(b) UNCITRAL Model Law on Electronic Signatures (2001) (MLES);

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

(d) UNCITRAL Model Law on Electronic Transferable Records (2017) (MLETR);

(e) UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services (2022) (MLIT); and

(f) UNCITRAL Model Law on Automated Contracting (2024) (MLAC).

5. The stocktaking exercise identified provisions on electronic aspects that are included in other UNCITRAL substantive law texts ([A/CN.9/1226](#), annex). While the consolidation exercise has not focused on compiling those provisions, it has been informed by those provisions, including the provisions on electronic negotiable cargo documents included in the United Nations Convention on Negotiable Cargo Documents (“NCD Convention”).

6. Preparatory work has been guided by observations made within the Commission and Working Group IV about the object and purpose of the consolidation exercise:

(a) The Commission recognized the utility of the exercise in ensuring the coherent application of UNCITRAL texts on electronic commerce and identifying any legislative gaps (A/80/17, para. 241), which is particularly pertinent to possible future work on paperless trade facilitation (see also A/CN.9/1264). As work advances on developing a consolidated text, it might be desirable to include annotations that identify corresponding provisions in various UNCITRAL substantive law texts and comment on their interaction with the consolidated text. As such, the consolidated text could contribute to a comprehensive and systematic presentation of the UNCITRAL “approach” to the use of electronic means in international trade, which would not only assist States in enacting those substantive law texts, but also inform work at UNCITRAL on new substantive law texts that refer to electronic aspects, as demonstrated by work within Working Group II on electronic arbitral awards and electronic notices of arbitration;

(b) As previously noted within the Commission (A/79/17, para. 251), Working Group IV considered a proposal to consolidate UNCITRAL texts on electronic commerce at its sixty-sixth session (Vienna, 16–20 October 2023) in the context of its work on the use of artificial intelligence and automation in contracting. It was acknowledged within the Working Group that a consolidated text could support technical assistance activities and provide an opportunity to reaffirm the continued relevance of those texts despite the passage of time and intervening technological developments in trade (A/CN.9/1162, para. 91). It may be noted that this benefit is particularly relevant as the texts continue to be referenced in digital trade agreements,¹ prompting renewed attention on their uptake, which, as demonstrated by the stocktaking exercise, remains uneven;

(c) It was also cautioned within the Working Group that a consolidated text should avoid detracting from encouraging States to join the ECC and avoid redrafting existing provisions (ibid.). In a similar vein, it may be added that a consolidated text should be sensitive to commitments made by States in digital trade agreements with regards to the adoption or enactment of specific texts. It might be desirable for annotations included in the consolidated text (see subpara. (a) above) to identify the provenance of individual provisions. Some adjustments should be expected in order to ensure the internal coherence of the text.

7. Moreover, a consolidation would need to account for the evolution of UNCITRAL texts on electronic commerce over time (see A/CN.9/1226, paras. 30–34). For instance, the ECC updates several provisions of Part I of the MLEC that reflect a shift in focus from the use of electronic data interchange (EDI) and similar technologies to Internet-based technologies, while the MLETR may replace Part II of the MLEC. Such evolution was anticipated when the MLEC was adopted; as stated in its guide to enactment, UNCITRAL “intends to continue monitoring the technical, legal and commercial developments that underline the Model Law” and “might, should it regard it advisable, decide to add new model provisions to the Model Law or modify the existing ones”. Provisions of the ECC on automated contracting have in turn been updated and supplemented by those of the MLAC.

8. Other differences between UNCITRAL texts on electronic commerce are less clear cut and may raise policy questions requiring further consideration. For instance, while provisions of the MLIT on the designation of reliability, by which the reliability of a trust service is assessed before it is used (“ex ante”), and obligations of trust service providers may be seen as updating corresponding provisions of the MLES relating to certification services, other provisions of the MLES (e.g. on enhanced methods for electronic signatures and the obligations of relying parties) were not included in the MLIT, raising questions as to how those other provisions might apply

¹ The term “digital trade agreement” is used to refer to preferential trade agreements containing provisions on electronic commerce or digital trade, or stand-alone agreements on those matters.

in a consolidated text. Similar questions arise with respect to certain functional equivalence rules in the MLEC and the MLETR, which were revised in the MLIT but only in the context of the use of trust services. Some of these issues are earmarked in chapter IV below.

9. Work has also been guided by the experience of the secretariat in carrying out technical assistance activities to support the domestic enactment of UNCITRAL texts on electronic commerce. Regard has also been had to the Commonwealth Model Law on Digital Trade, published by the Commonwealth Secretariat in 2025, which builds upon the UNCITRAL texts on electronic commerce and supports their implementation among Commonwealth member countries in a single omnibus bill, as well as other initiatives to establish enabling legal frameworks for digital trade, such as the Law on Trading with Modern Technological Means of the United Arab Emirates.²

10. By its nature, the consolidated text would compile provisions in existing texts. However, it is conceivable that other legislative texts on electronic commerce (or digital trade) might be added over time. As noted in paragraph 30 of [A/CN.9/1226](#), UNCITRAL texts on electronic commerce form the backbone of digital trade law, yet they do not cover all legal issues related to digital trade. UNCITRAL texts are essentially concerned with electronic transactions. To put it into context, they address matters covered by three articles in the section of the recently concluded Agreement on Electronic Commerce³ on “enabling electronic commerce”. While not all matters covered by that agreement would be amenable to work by UNCITRAL, other matters covered in the section are the subject of ongoing exploratory and preparatory work of the Commission, including in the areas of digital payments ([A/CN.9/1262](#)) and paperless trade ([A/CN.9/1264](#)). Additionally, work being undertaken by Working Group IV on data provision contracts addresses matters covered in other digital trade agreements.⁴

11. With that context in mind, the consolidated text prepared by the secretariat is consistent with a “modular” approach so as to accommodate the potential addition of legislative texts on digital trade that may be developed by UNCITRAL in future, whether on the matters already identified in the preceding paragraph, notably paperless trade (as contemplated in [A/CN.9/1262](#)) or other matters, such as digital platforms ([A/CN.9/1259](#)) and digital assets ([A/CN.9/1260](#)). It has been observed within Working Group IV that the recent work programme of the Working Group has reflected a shift in focus from “electronic commerce” to “digital trade”, which is understood to comprise not only new means of trading (e.g. digital platforms), but also new types of transactions (e.g. data transactions) and new items being traded (e.g. digital assets) ([A/CN.9/1197](#), para. 74). Consistent with that shift, and in contrast to the existing texts on electronic commerce, ongoing work on various topics of digital trade at UNCITRAL is primarily concerned with substantive law issues. The shift in focus would not appear to be an obstacle to adopting a “modular” approach; indeed, such an approach would appear to promote greater coherence in the growing body of international digital trade law, centred on a common notion of data. It would also be in keeping with the central and coordinating role that UNCITRAL plays within the United Nations system in addressing legal issues related to the digital economy and digital trade ([A/74/17](#), para. 211).

² Federal Law By Decree No. 14/2023, presented at the sixty-seventh session of Working Group IV ([A/CN.9/1197](#), para. 73) and references in the joint proposal by the UAE and Spain for possible future work on legal aspects of digital trade, with a special focus on digital platforms ([A/CN.9/1227](#)).

³ The text of the agreement, which resulted from negotiations among members of the World Trade Organization in the Joint Statement Initiative on Electronic Commerce, is contained in the document WT/MIN(26)/42 (27 April 2026).

⁴ The link between work on data provision contracts and cross-border data flows was described to the Commission in [A/CN.9/1117](#), para. 21(a).

IV. Draft consolidated text

12. This chapter presents an outline of a consolidated text on electronic commerce, which is structured as follows:

- (a) General provisions;
- (b) Use of electronic means in general;
- (c) Electronic contracting, including the use of automated systems;
- (d) Electronic transferable records;
- (e) Reliability and trust services;
- (f) Identity management services.

13. Due to the word limit, it does not reproduce the text of all provisions. Those that are reproduced take the form of legislative provisions as found in the UNCITRAL texts on electronic commerce.

A. General provisions

1. Definitions

14. A consolidated text would include a provision that compiles the definitions found in UNCITRAL texts on electronic commerce. Definitions of terms used in the draft are set out in table 1.

Table 1
Definitions

<i>Term</i>	<i>Reference</i>
“Automated system”	MLAC, arts. 1(1)(a) and 1(2)
“Communication”	ECC, art. 4(a)
“Data message”	MLAC, art. 1(b)
“Electronic record”	MLETR, art. 2
“Electronic transferable record”	MLETR, art. 2
“Information system”	MLEC, art. 1(f); ECC, art. 4(f)
“Originator”	MLEC, art. 1(e); ECC, art. 4(d)
“Place of business”	ECC, art. 4(h)
“Transferable document or instrument”	MLETR, art. 2
“Trust service”	MLIT, art. 1(l)
“Trust service provider”	MLIT, art. 1(m)

15. A provision could also be included to streamline provisions that aid the interpretation of certain recurring terms, such as provisions dealing with:

- (a) Determination of a party’s “place of business” (ECC, art. 6; MLETR, art. 14);
- (b) Assessment of the “integrity” of information (MLEC, art. 8(3)(a); ECC, art. 9(5)(a));

(c) References to the law “requiring” a particular paper-based form as including circumstances where the law provides consequences in the absence of that form (ECC, art. 9(2), (3) and (4); MLIT, arts. 9 and 16);⁵

(d) References to the use of a “method” being subject to a reliability requirement (see para. 54 below).

2. Scope of application

(a) General

16. Because they apply to different types of transactions, UNCITRAL texts on electronic commerce contain different provisions on scope of application. While the MLEC applies in the context of “commercial activities”, the MLIT applies also in the context of “trade-related services”, which may encompass transactions with government agencies that are not commercial in nature (e.g. transactions involving customs authorities operating a single window for import and export formalities).⁶ Similarly, the application of the ECC does not depend on the civil or commercial character of the relevant parties or contract, although it does require the parties to have their place of business in different states, thus applying only to international contracts. As a starting point, the scope of application provision of a consolidated text would reflect the broadest of those provisions (MLIT, art. 2(1)).

17. Further consideration could be given to including specific exclusions from scope (e.g. ECC, art. 2).

(b) Saving provisions

18. UNCITRAL texts on electronic commerce commonly feature a variety of saving provisions that clarify when and how the texts apply. Such provisions may clarify the limited application of the text to avoid interference with domestic law requirements, such as those relating to information disclosure (ECC, art. 7 and 13; MLETR, art. 5; MLAC, art. 9) or to reaffirm the enabling nature of the text (ECC, art. 8(1); MLIT, art. 3(1)). They may also preserve the application of mandatory laws on matters that may intersect with the application of the text (MLETR, art. 1(2); MLIT, art. 2(4); MLAC, art. 2(2)), such as those relating to data privacy and protection and the protection of consumers. While such provisions may not always be strictly necessary, they can serve as an important signal to requirements found elsewhere, such as laws regulating specific transactions or the use of particular methods. A consolidated text could reproduce such provisions, as necessary.

Scope of application

1. This Law applies to electronic means used in the context of commercial activities and trade-related services.
2. Nothing in this Law affects the application of any rules of law that may require a person to disclose information or relieves a person from the legal consequences of a failure to do so or of making inaccurate, incomplete or false statements in that regard.
3. Nothing in this Law requires a person to use or accept data messages or to use or accept an identity management or trust service.
4. Nothing in this Law affects the application of any law applicable to data privacy and protection, the protection of consumers, or the design, commissioning, operation or use of automated systems.

⁵ Cf. para. 67 of the explanatory note to the MLETR: *UNCITRAL Model Law on Electronic Transferable Records* (United Nations publication, Sales No. E.17.V.5).

⁶ See para. 104 of the guide to enactment of the MLIT: *UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services* (United Nations publication, Sales No. E.23.V.10).

3. Party autonomy

19. UNCITRAL texts on electronic commerce differ in the extent to which they recognize the ability of the parties to derogate from the provisions of those texts by agreement (A/CN.9/1226, para.19). In general, such an ability is recognized for provisions on electronic contracting and electronic transferable records. However, it tends not to be recognized for functional equivalence provisions, particularly so far as they relate to form requirements constituting mandatory law or engaging public policy,⁷ although the agreement of the parties may still be relevant in applying the reliability requirement to those provisions. The formulation of a party autonomy provision in a consolidated text would therefore require further consideration, including in conjunction with the list of relevant factors for determining reliability. A starting point could be the provision contained in the MLETR (art. 4).

Party autonomy

1. The parties may derogate from or vary by agreement the following provisions of this Law: [...].
2. Such an agreement does not affect the rights of any person that is not a party to that agreement.

4. Interpretation

20. The text would reproduce the general rule on the interpretation of UNCITRAL texts (MLEC, art. 3; MLES, art. 4(1); ECC, art. 3; MLIT, art. 4; MLAC, art. 3).

Interpretation

1. In the interpretation of this Law, regard is to be had to its international origin and to the need to promote uniformity in its application and the observance of good faith.
2. Questions concerning matters governed by this Law which are not expressly settled in it are to be settled in conformity with the general principles on which this Law is based.

B. Use of electronic means in general

1. Legal recognition of data messages

21. The MLEC (art. 5) introduced a general rule giving legal recognition of data messages based on the principle of non-discrimination against the use of electronic means. The rule was supplemented by a rule (art. 5 bis) giving cognizance to the fact that, in an electronic environment, information contained in a paper document may be contained in multiple data messages. A consolidated text would reproduce both rules.

Legal recognition of data messages

1. Information shall not be denied legal effect, validity or enforceability solely on the grounds that it is:
 - (a) In the form of a data message;
 - (b) Not contained in the data message purporting to give rise to such legal effect, but is merely referred to in that data message.

⁷ See para. 21 of the guide to enactment of the MLEC: *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).

22. It would also reproduce provisions of UNCITRAL texts on electronic commerce that apply the general rule to the use of electronic means in specific contexts, including (i) legal proceedings, (ii) contracting, (iii) the life cycle of transferable documents and instruments, and (iv) the provision of identity management and trust services. For the most part, those provisions could be contained in sections of the text dedicated to the relevant context.

23. With regard to legal proceedings, the MLEC introduced a rule on the admissibility of data messages in evidence (art. 9(1)) and the evidential weight of their contents (art. 9(2)). The consolidated text could reproduce the rule on admissibility. Further consideration should be given to whether to retain a special rule on evidential weight.

Admissibility of data messages

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:

- (a) On the sole ground that it is a data message;
- (b) If it is the best evidence that the person adducing it could reasonably be expected to obtain, on the grounds that it is not in its original form.

2. Satisfying paper-based requirements by using data messages

(a) General

24. The text would reproduce the rules found in the various UNCITRAL texts on electronic commerce that allow paper-based requirements to be met in an electronic environment, which are particularly relevant for paperless trade. Those rules apply a functional equivalence approach by prescribing the basic functions of the relevant paper-based requirement such that the requirement is met by using electronic means if those functions are fulfilled (A/CN.9/1226, para. 10). For this reason, they are commonly referred to as “functional equivalence rules”. Significantly, those rules presuppose the existence of paper-based requirements that are established in other law, and which could not otherwise be met by using electronic means.

25. From a review of the UNCITRAL texts on electronic commerce, the following general observations may be made about the functional equivalence rules:

- (a) The rules are concerned with requirements inextricably linked to “offline” phenomena, notably requirements of form and – in the case of the MLETR – possession;
- (b) The basic functions of form requirements are about assuring certain qualities of information contained in a paper document or some other physical medium, particularly its origin and integrity – these qualities presuppose an identifiable person or time associated with an action taken in the life cycle of the document. The basic functions of possession requirements are about assuring the qualities of the document being possessed, namely its controllability – this quality presupposes an identifiable object that can be possessed by an identifiable person;
- (c) Using electronic means to satisfy those requirements is subject to a reliability requirement (i.e., use of a “reliable method”).

(b) Writing requirement

26. The MLEC (art. 6(1)) introduced a functional equivalence rule for a legal requirement that information (or a document containing the information) be in written form. The rule was reproduced in the ECC (art. 9(2)) and the MLETR (art. 8) and is contained in several UNCITRAL substantive law texts.

27. A consolidated text would reproduce the MLEC rule. Annotations identifying the corresponding provisions of other UNCITRAL substantive law texts and their interaction with the consolidated text would be added.

Writing requirement

Where the law requires 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.

(c) Original requirement

28. The MLEC (art. 8(1)) introduced a functional equivalence rule for a legal requirement that information (or a document containing the information) be in its original form. The rule is concerned with assuring the integrity of the information. The rule was reproduced with slight revisions in the ECC (art. 9(4)) but was not retained as a stand-alone rule in the MLETR but integrated into the functional equivalence rule for a legal requirement for a transferable document or instrument (art. 10(1)(b)(iii)).⁸ It is contained in several UNCITRAL substantive law texts.

29. A consolidated text would reproduce the revised ECC rule, with adjustments to streamline references to the reliability requirement and to the assurance of integrity (see para. 15 above).

Original requirement

Where the law requires information to be made available or retained in its original form, that requirement is met by a data message if:

- (a) A method is used to retain 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 made available, that information is capable of being displayed to the person to whom it is to be made available.

30. Further revisions to the rule could be considered in view of developments in UNCITRAL electronic commerce texts since the ECC. In particular, consideration could be given to removing elements relating to requirements to make available and retain information, e.g. by deleting the words “made available or retained” in the chapeau and by deleting paragraph (b) entirely. Those elements are not as much concerned with the originality of information as with procedures for “presenting” and “archiving” information, respectively, which are commonly subject to special requirements prescribed by the authorities to which the information is presented or regulatory authorities.⁹ Removing elements relating to the requirement to retain information would also avoid overlap with the functional equivalence rule for electronic archiving that was introduced in the MLIT (art. 19).

(d) Signature requirement

31. The MLEC (art. 7(1)) introduced a functional equivalence rule for a legal requirement that information (or a document containing the information) be signed. The rule is concerned with assuring the origin of the information, i.e., identifying the person signing the information. A similar rule was included in the MLES (art. 6(1) read with art. 2(a)). The MLEC rule was reproduced with revisions in the ECC (art. 9(3)), and again in the MLETR (art. 9) and MLIT (art. 16). A provision on electronic signatures is contained in several UNCITRAL substantive law texts.

32. A consolidated text would reproduce the revised ECC rule with adjustments to streamline references to the reliability requirement (see para. 15 above). Annotations

⁸ Explanatory note to the MLETR, footnote 5 above, paras. 189–190.

⁹ Explanatory note to the ECC, para. 135.

identifying the corresponding provisions of other UNCITRAL substantive law texts and their interaction with the consolidated text would be added. A consolidated text could provide an opportunity to clarify the interaction between the requirement to “identify” the signatory for the purposes of the functional equivalence rule and the concept of “identification” for the purposes of identity management, which is referred to as “authentication” in some contexts.¹⁰

Signature requirement

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

- (a) To identify the person; and
- (b) To indicate the person’s intention in respect of the information contained in the data message.

(e) Other requirements satisfied by using identity management and trust services

33. The MLIT introduced additional functional equivalence rules for paper-based legal requirements that may be satisfied by electronic means using a trust service, namely:

- (a) The use of electronic seals to satisfy a requirement for a seal (art. 17);
- (b) The use of electronic timestamping to satisfy a requirement for information (or a document containing the information) to be timestamped (art. 18);
- (c) The use of electronic archiving to satisfy a requirement for information (or a document containing the information) to be retained (art. 19); and
- (d) The use of electronic registered delivery services to satisfy a requirement for information (or a document containing the information) to be delivered by registered mail or similar service (art. 20).

34. The MLIT (art. 9) also introduced a functional equivalence rule for satisfying a legal requirement for “offline” identification of a person (based on credentials in paper or other physical form that are presented by the person) by electronic means using identity management services.

35. A consolidated text would reproduce those rules. Further consideration should be given to the extent to which these rules apply regardless of a trust service, and thus whether they can be located alongside the existing functional equivalence rules or whether they should be located in the chapter reproducing the regime for the provision of trust services. This is particularly relevant for rules relating to electronic timestamps and electronic archiving as the relevant rules in the MLIT (arts. 18 and 19) replicate rules in earlier texts for satisfying retention and timestamping requirements (MLEC, art. 10(1), and MLETR, art. 13, respectively) that do not contemplate the use of a trust service.

36. The MLIT (art. 21) also contains a rule on website authentication. As this is not a functional equivalence rule,¹¹ it would presumably be contained in a consolidated text in the chapter reproducing the regime for the provision of trust services.

¹⁰ On the concept of “identifying” the signatory, see para. 117 of the guide to enactment of the MLES, para. 117; on the distinction with “authentication”, see para. 94: *UNCITRAL Model Law on Electronic Signatures with Guide to Enactment* (United Nations publication, Sales No. E.02.V.8).

¹¹ As noted in para. 220 of the guide to enactment of the MLIT, footnote 6 above, website authentication does not satisfy any paper-based of “offline” requirement, even though article 21 is formulated like a functional equivalence rule.

3. Time and place of dispatch and receipt of data messages

37. The MLEC (art. 15) contains rules on the time and place at which a data message is taken to have been sent or received. These rules were revised in the ECC (art. 10) to take into account the use of Internet-based technologies.

38. In contrast to functional equivalence rules, these rules assist in determining time and place in order to apply other laws that are already applicable to data messages, which depend on such a determination. The application of those rules might nevertheless raise uncertainties given the peculiarities of transmitting data messages, which can occur within the same system and routinely involves systems operated by a third party.

39. As a starting point, a consolidated text would reproduce the updated rules in the ECC (art. 10) but retain references to “data messages” instead of “electronic communications”. Consistency with the concepts of dispatch and receipt, as reflected in the functional equivalence provisions on the use of electronic registered delivery services, as introduced by the MLIT (see para. 33 above), as well as similar concepts in other UNCITRAL substantive law texts could be further considered.

4. Attribution of data messages

40. The MLEC (art. 13) introduced a series of rules on the “attribution” of data messages, which were not reproduced in the ECC. The rules are concerned not only with attribution (in the sense of linking a data message to a person as the “originator” of the data message), but also with allocating risk between the parties associated with the use of data messages, which engages matters of substantive law.¹² This might explain why some of the rules – notably paragraphs 3 to 6 of article 13 – have not been widely enacted.

41. The attribution of data messages generated by automated systems (which constitute the “actions” carried out by automated systems) was further considered during work on automated contracting. This resulted in the introduction of a new provision in the MLAC (art. 6), which revised the position reflected in the MLEC (art. 13(1)(b)).¹³ While the rule in the MLAC applies only in a contractual setting, its application to a wide range of actions in the formation and performance of contracts suggests that it could serve as a default rule for the attribution of data messages generated by automated systems within the broader scope of the consolidated text.

42. As a starting point, a consolidated text could reproduce paragraph 1 and 2 of article 13. Consideration could be given to replacing paragraph 2(b) with the rules on attribution contained in the MLAC (art. 6). Consideration could also be given to whether to retain the remaining paragraphs of article 13.

5. Acknowledgment of receipt

43. The MLEC (art. 14) contains rules on the acknowledgment of receipt of data messages. The rules responded to business needs at the time for using systems of acknowledgment of receipt. No such rules were contained in the ECC. Changes in business needs and the exercise of party autonomy, together with the revised rules on time and place of dispatch and receipt, may reduce the need for retaining such rules in a consolidated text.

C. Electronic contracting, including the use of automated systems

1. Legal recognition of electronic contracting

44. The MLEC (arts. 11(1) and 12(1)) introduced provisions applying the general rule on legal recognition (para. 21 above) to the use of electronic means in the specific

¹² Guide to enactment of the MLAC, para. 59: *UNCITRAL Model Law on Automated Contracting with Guide to Enactment* (United Nations publication, Sales No. E.25.V.4).

¹³ *Ibid.*, para. 62.

context of contracting. Those provisions give legal recognition to communications in connection with the formation and performance of a contract, as well as to the contract itself. A simplified provision was included in the ECC (art. 8(1)). The ECC (art. 12) also introduced a specific rule giving legal recognition to contracts formed using an automated system, which was refined and expanded in the MLAC (art. 5). The MLAC also introduced specific rules giving legal recognition to contracts in computer code and the use of dynamic information in contracting, which, while of particular significance to automated contracting, are applicable to electronic contracting more generally.¹⁴

45. A consolidated text would reproduce the provisions of the ECC as supplemented by the MLAC.

Contract formation

1. A contract shall not be denied validity or enforceability on the sole ground that:
 - (a) It is in the form of data messages;
 - (b) The terms of the contract are contained in data messages in the form of computer code; or
 - (c) The terms of the contract incorporate information from a data source that provides information that changes periodically or continuously.
2. A contract formed [or performed] using an automated system shall not be denied validity or enforceability on the sole ground that no natural person reviewed or intervened in any action carried out in connection with the formation [or performance] of the contract.

Communications and actions

1. A communication shall not be denied legal effect, validity or enforceability on the sole ground that it is in the form of a data message.
2. An action in connection with the formation of a contract shall not be denied legal effect, validity or enforceability on the sole ground that the action involves processing data messages containing information from a source that provides information that changes periodically or continuously.
3. An action carried out by an automated system in connection with the formation or performance of a contract shall not be denied legal effect, validity or enforceability on the sole ground that no natural person reviewed or intervened in the action.

2. Satisfying paper-based requirements in electronic contracting

46. The ECC acknowledges that paper-based form requirements apply as much in electronic contracting as they do to other electronic documents. The functional equivalence rules for those requirements would be formulated in a consolidated text so as to apply to the use of electronic means for communications in the formation and performance of contracts (see paras. 27, 29 and 32 above).

3. Attribution of actions

47. The MLAC (art. 6) introduced a provision on the attribution of data messages constituting the “actions” carried out by an automated system in a contractual setting. A consolidated text would reproduce that provision. As noted above (paras. 40–42), consideration could be given to applying the provision outside the contractual setting, within the broader scope of the consolidated text.

¹⁴ Ibid., para. 52.

Attribution of actions carried out by automated systems

1. As between the parties to a contract, an action carried out by an automated system is attributed in accordance with a procedure agreed to by the parties.
2. If paragraph 1 does not apply, an action carried out by an automated system is attributed to the person who uses the system for that purpose.
3. Attribution of an action carried out by an automated system shall not be denied on the sole ground that the outcome was unexpected.
4. Nothing in this article affects the application of any rule of law that may govern the legal consequences of attributing an action carried out by an automated system to a person.

4. Additional provisions

48. The ECC introduced additional provisions dealing with substantive law issues. One provision (art. 11) addresses the legal nature of proposals to conclude contracts using interactive applications (e.g. a website). Another provision (art. 14) addresses the correction of input errors made by a human interacting with an automated system. A consolidated text would reproduce those provisions. For its part, the MLAC (art. 8) introduced an optional provision that addresses unexpected actions carried out by automated systems. A consolidated text would reproduce those provisions.

Invitation to make offers

A proposal to conclude a contract made through data messages which is not addressed to one or more specific parties, but is generally accessible to parties making use of information systems, including proposals that make use of interactive applications for the placement of orders through such information systems, is to be considered as an invitation to make offers, unless it clearly indicates the intention of the party making the proposal to be bound in case of acceptance.

Input errors

1. Where a natural person makes an input error in a data message exchanged with the automated system of another party in connection with the formation or performance of a contract and the automated 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 data message 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 data message; 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.

Unexpected actions carried out by automated systems

1. Unless otherwise agreed by the parties, where an action carried out by an automated system is attributed to a party to a contract, the other party to the contract is not entitled to rely on that action if, in the light of all the circumstances:

(a) The party to which the action is attributed could not reasonably have expected the action; and

(b) The other party knew or could reasonably be expected to have known that the party to which the action is attributed did not expect the action.

2. Nothing in this article affects the application of any rule of law or agreement of the parties that may govern the legal consequences of an action carried out by an automated system.

D. Electronic transferable records

1. Legal recognition of electronic transferable records

49. The MLETR (art. 7) introduced a provision applying the general rule on legal recognition (para. 21 above) to the specific context of electronic transferable records. It also introduced a provision to facilitate the cross-border use of electronic transferable records based on the principle of non-discrimination against geographic origin (art. 19), as well as a provision giving cognizance to the fact that, in an electronic environment, additional information, including dynamic information, may be included in a transferable document or instrument. A consolidated text would reproduce those provisions.

Legal recognition of electronic transferable records

1. A transferable document or instrument shall not be denied legal effect, validity or enforceability on the sole ground that it is in the form of an electronic record.
2. An electronic transferable record shall not be denied legal effect, validity or enforceability on the sole ground that it was issued or used abroad.

Additional information in electronic transferable records

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.

2. Satisfying paper-based requirements by using electronic transferable records

(a) General

50. The MLETR acknowledges that paper-based writing and signature requirements apply as much to electronic transferable records as they do to other electronic documents. The functional equivalence rules for those requirements would be formulated in a consolidated text so as to apply to both (see paras. 27 and 32 above).

51. The MLETR introduces new functional equivalence rule that allow electronic means to be used to satisfy legal requirements associated with dealings in paper-based transferable documents and instruments, which combines original requirement with a “singularity” and “control” requirement.¹⁵ The MLETR also introduces additional functional equivalence rules for legal requirements during the life cycle of a transferable document or instrument, notably timestamping, endorsement and amendment. A consolidated text would reproduce those rules. Further consideration would need be given to the interaction between the rule on timestamping (art. 13) and the rule on electronic timestamping in the MLIT (art. 18), as foreshadowed above (para. 35).

¹⁵ The concept of control as the functional equivalent of possession, but not as determinative of proprietary issues in the context of digital assets, was explored during stream one of the Colloquium on “Harmonizing law in the age of digital trade and finance – digital assets and platforms” (see A/CN.9/1260, paras. 8–16).

Requirement for a transferable document or instrument

Where the law requires a transferable document or instrument, that requirement is met by an electronic record if:

- (a) The electronic record contains the information that would be required to be contained in a transferable document or instrument; and
- (b) A method is used:
 - (i) To identify that electronic record as the electronic transferable record;
 - (ii) To render that electronic record capable of being subject to control from its creation until it ceases to have any effect or validity; and
 - (iii) To retain the integrity of that electronic record.

Possession requirement

1. Where the law requires a transferable document or instrument to be possessed, that requirement is met with respect to an electronic transferable record if a method is used:

- (a) To establish exclusive control of that electronic transferable record by a person; and
- (b) To identify that person as the person in control.

2. Where the law requires possession of a transferable document or instrument to be transferred, that requirement is met with respect to an electronic transferable record through the transfer of control over the electronic transferable record.

Endorsement requirement

Where the law requires the endorsement in any form of a transferable document or instrument, that requirement is met with respect to an electronic transferable record if:

- (a) The information required for the endorsement is included in the electronic transferable record;
- (b) That information is accessible so as to be usable for subsequent reference;
- (c) A method is used:
 - (i) To identify the endorser; and
 - (ii) To indicate the endorser's intention in respect of that information.

Amendment requirement

Where the law requires the amendment of a transferable document or instrument, that requirement is met with respect to an electronic transferable record if a method is used for amendment of information in the electronic transferable record so that the amended information is identified as such.

(b) Change of medium

52. The MLETR (arts. 17 and 18) introduces rules on change of medium, which allows for a transferable document or instrument to be switched between paper and electronic form. As a starting point, a consolidated text would reproduce those rules. Further consideration could be given to revising those rules along the lines of the corresponding provision in the NCD Convention (art. 17).

E. Reliability and trust services

1. Reliability generally

53. With the exception of the written requirement, the functional equivalence rules in UNCITRAL texts on electronic commerce incorporate a “reliability” requirement for the method used to fulfil the relevant function. The requirement was designed to be applied after the fact (or “ex post”), on a case-by-case basis (e.g. by a court in the event of a dispute that impugned the method used).

54. The reliability requirement has evolved over time. For instance, wording to reaffirm the relative notion of reliability has become standardized (the method must be “as reliable as appropriate” for the fulfilment of the functions for which it is used), while a provision preventing the reliability requirement from being needlessly invoked has been developed (applying where the method did in fact fulfil the relevant function). A consolidated text would reflect that evolution.

Reliability of methods generally

For the purposes of this Law, the method shall be:

- (a) As reliable as appropriate for the fulfilment of the functions for which the method is being used, in light of all the circumstances; or
- (b) Proven in fact to have fulfilled the functions by itself or together with further evidence.

2. Reliability where a trust service is used

55. The reliability requirement has also evolved to establish a list of relevant factors for determining reliability, as well as to introduce a mechanism for the ex ante designation of reliability to which additional legal effect is attached (in the form of a presumption of reliability). That evolution is reflected in the MLIT (arts. 22 and 23), which applies the list of relevant factors to methods that use a trust service and provides for the ex ante designation of reliable trust services. Those provisions of the MLIT would be reproduced in a consolidated text. Further consideration should be given to whether and how the list of relevant factors should apply to methods that do not use a trust service (whether or not provided by a third-party trust service provider), in which case it is conceivable that the list would be incorporated into the general provision on reliability outlined above (para. 54).

56. As foreshadowed in [A/CN.9/1226](#) (para. 60), a consolidated text would provide an opportunity to address the interaction between the MLES and MLIT. The MLIT departs from the approach taken in the MLES with respect to electronic signatures in several ways. For example, the MLIT does not contemplate the use of “enhanced” methods for electronic signatures that are associated with a higher level of reliability (cf. MLES, art. 6(3)), which enjoy additional legal effect without the need for designation. Nor does it contemplate the use of electronic signatures to fulfil the function of integrity (cf. MLES, art. 6(3)(d)) or establish obligations for relying parties (cf. MLES, art. 11).

Reliability of methods using trust services

1. In determining the reliability of a method used by a trust service, the circumstances may include [the list of relevant factors set out in MLIT, art. 22].
2. In determining the reliability of the method, no regard shall be had:
 - (a) To the geographic location where the trust service is provided; or
 - (b) To the geographic location of the place of business of the trust service provider.
3. A method used by a designated trust service is presumed to be reliable.

4. Paragraph 3 does not limit the ability of any person:
 - (a) To establish in any other way the reliability of a method; or
 - (b) To adduce evidence of the non-reliability of a method used by a designated trust service.

3. Legal recognition of trust services

57. As trust services essentially involve data messages asserting the qualities of other data (e.g. a certificate related to an electronic signature), the general rule on the legal recognition of data messages would apply. The MLIT (art. 13) introduced a provision applying the general rule in the specific context of trust services, regardless of whether a designated trust service was used. A consolidated text would reproduce such a provision.

Legal recognition of trust services

The result deriving from the use of a trust service shall not be denied legal effect, validity, enforceability or admissibility as evidence on the sole ground that:

- (a) It is in electronic form; or
- (b) The trust service is not a designated trust service.

4. Obligations and liability with regard to the provision of trust services

58. The MLIT (arts. 14, 15 and 24) establishes obligations for trust service providers and subscribers, as well as rules on the liability of the trust service provider for loss caused to the subscriber or the relying party. A consolidated text would reproduce those provisions.

5. Cross-border recognition of trust services

59. As further elaborated in the note on paperless trade ([A/CN.9/1264](#)), UNCITRAL texts on electronic commerce have developed legal mechanisms that allow electronic documents and data, whose qualities are assured in one jurisdiction, to enjoy the same legal effect – and ultimately the same level of trust and acceptance – in another jurisdiction. In that regard, the MLIT (arts. 26 and 27) provides for the cross-border recognition of trust services by applying the principle of non-discrimination against geographic origin in the designation of reliable trust services and the notion of substantial equivalence in the levels of reliability, coupled with a mandate for competent authorities in the respective jurisdictions to cooperate at a technical level. A consolidated text would reproduce those provisions. It would also be complemented by continued cooperation between the secretariat and other organizations in relation to cross-border paperless trade facilitation.

Cross-border recognition of trust services

1. The result deriving from the use of a trust service provided outside [the enacting jurisdiction] shall have the same legal effect in [the enacting jurisdiction] as the result deriving from the use of a trust service provided in [the enacting jurisdiction] if the method used by the trust service offers:
 - (a) At least an equivalent level of reliability, where the reliability levels recognized by such jurisdictions are identical; or
 - (b) Substantially equivalent or higher level of reliability, in all other cases.
2. For the purposes of determining satisfaction of paragraph 1, regard shall be had to recognized international standards.

3. The trust service shall be presumed to satisfy paragraph 1 if the [competent authority] has determined the equivalence, taking into account [the circumstances for determining the reliability of trust services].

Cooperation

1. The [competent authority] may cooperate with foreign entities by exchanging information, experience and good practice relating to trust services, in particular with respect to:

- (a) Recognition of the legal effects of foreign trust services, whether granted unilaterally or by mutual agreement;
- (b) Designation of trust services; and
- (c) Definition of levels of reliability of trust services.

F. Identity management services

60. A consolidated text would reproduce the provisions of the MLIT on (i) the legal recognition of identity management (art. 5), (ii) obligations and liability with respect to the provision of identity management services (arts. 6–8 and 12), (iii) the ex ante designation of reliable identity management services (art. 11), and (iv) cross-border recognition (arts. 25 and 27). It would also reproduce the functional equivalence rule for identity management services (art. 9) and apply *mutatis mutandis* the provision on the reliability of trust services outlined above (para. 55).

V. Way forward

61. In light of the work undertaken by the secretariat to prepare a consolidated text, the Commission may wish to refer the text to Working Group IV for consideration as it finalizes the ongoing work on data provision contracts. In doing so, the Commission may wish to affirm the methodology that has guided preparatory work so far and express views. It may wish to invite the Working Group to consider policy questions raised by the consolidation exercise, including those identified above, with a view to informing the further development of the consolidated text.

62. As detailed in the note on paperless trade ([A/CN.9/1264](#)), the Commission may wish to consider the interaction between the consolidation exercise and possible future work on paperless trade. Consistent with the “modular” approach described in this note (see para. 11 above), it is conceivable that work on paperless trade could form a component of the consolidated text. In that case, a working group could eventually be mandated to review and further develop the text.