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Report of Working Group IV (Electronic Commerce) on the work of its sixty-fourth session (Vienna, 31 October–4 November 2022)

Contents

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I. Introduction

1. At its sixty-fourth session, the Working Group commenced work on the topic of the use of artificial intelligence and automation in contracting. That followed a decision by the Commission, at its fifty-fifth session, for work to proceed incrementally on the topic.[1] To that end, the Commission had requested the Working Group:

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

(b) As a second stage, to identify and develop possible new provisions that address a broader range of issues, including those identified by the Working Group at its sixty-third session (A/CN.9/1116, para. 10).[2]

2. The Working Group also finalized work on the explanatory note to the UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services. That followed a decision of the Commission, at its fifty-fifth session, authorizing the Working Group to review revisions to the explanatory note to reflect the deliberations and decisions of the Commission at that session, during which the Commission adopted the Model Law and gave its in-principle approval to the draft explanatory note prepared by the secretariat (A/CN.9/1112).[3]

II. Organization of the session

3. The Working Group, composed of all States members of the Commission, held its sixty-fourth session in Vienna from 31 October to 4 November 2022. The session was attended by representatives of the following States members of the Working Group: Algeria, Argentina, Armenia, Australia, Austria, Belarus, Belgium, Brazil, Canada, Chile, China, Colombia, Czechia, Democratic Republic of the Congo, Dominican Republic, Ecuador, Finland, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kenya, Kuwait, Malaysia, Mexico, Morocco, Panama, Peru, Poland, Republic of Korea, Russian Federation, Saudi Arabia, Singapore, Spain, Switzerland, Thailand, Türkiye, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America and Viet Nam.

4. The session was attended by observers from the following States: Bahrain, Bangladesh, Benin, Bolivia (Plurinational State of), Bosnia and Herzegovina, Burkina Faso, Burundi, Chad, Congo, Costa Rica, Egypt, El Salvador, Estonia, Gabon, Guatemala, Iceland, Jamaica, Jordan, Lebanon, Lesotho, Libya, Lithuania, Madagascar, Malta, Myanmar, Netherlands, Oman, Pakistan, Philippines, Portugal, Qatar, Sierra Leone, Slovakia, Sri Lanka, Sudan, Sweden, Tunisia, Tanzania (United Republic of), Uruguay and Uzbekistan.

5. The session was attended by observers from the Holy See and from the European Union.

6. The session was attended by observers from the following international organizations:

(a) *United Nations system*: International Monetary Fund and World Bank;

(b) *Intergovernmental organizations*: Commonwealth Secretariat, Hague Conference on Private International Law and World Customs Organization;

(c) *International non-governmental organizations*: Baltic and International Maritime Council (BIMCO), Centro de Estudios de Derecho, Economía y Política

[1] *Official Records of the General Assembly, Seventy-seventh Session, Supplement No. 17* (A/77/17), paras. 156–159.
[2] Ibid., para. 159.
[3] Ibid., para. 149.

(CEDEP), China Council for the Promotion of International Trade (CCPIT), China International Economic and Trade Arbitration Commission (CIETAC), Council of the Notariats of the European Union (CNUE), European Law Institute (ELI), European Law Students' Association (ELSA), Grupo Latinoamericano de Abogados para el Derecho del Comercio Internacional (GRULACI), International and Comparative Law Research Center (ICLRC), International Chamber of Commerce (ICC), International Law Institute (ILI), International Union of Notaries (UINL), Istituto Universitario di Studi Europei (IUSE) and Talal Abu-Ghazaleh Global.

7. The Working Group elected the following officers:

Chairperson: Mr. Alex IVANČO (Czechia)

Vice-Chairperson: Mr. Alan DAVIDSON (Australia)

Rapporteur: Mr. Kyoungjin CHOI (Republic of Korea)

8. The Working Group had before it the following documents:

(a) An annotated provisional agenda (A/CN.9/WG.IV/WP.174);

(b) A note by the secretariat containing the revised parts of the explanatory note to the UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services (A/CN.9/WG.IV/WP.175);

(c) A note by the secretariat on provisions of UNCITRAL texts applicable to automated contracting (A/CN.9/WG.IV/WP.176); and

(d) A note by the secretariat on developing new provisions to address legal issues related to automated contracting (A/CN.9/WG.IV/WP.177).

9. The Working Group adopted the following agenda:

1. Opening of the session and scheduling of meetings.
2. Election of officers.
3. Adoption of the agenda.
4. The use of artificial intelligence and automation in contracting.
5. Explanatory note to the UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services.
6. Other business.
7. Adoption of the report.

III. Deliberations and decisions

10. The deliberations and decisions of the Working Group on the use of artificial intelligence and automation in contracting are reflected in chapter IV below. The deliberations and decisions of the Working Group on the explanatory note to the UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services are reflected in chapter V below.

IV. The use of artificial intelligence and automation in contracting

A. Nature and scope of future work

11. The Working Group heard a range of views on the nature and scope of future work. It was recalled that the Commission had agreed that, in discharging its mandate,

the Working Group should proceed on the basis of use cases and business needs.[4] It was suggested that the Working Group should categorize the different types of systems used for contract automation and the different types of actors and sectors of the economy that use them. It was added that the Working Group should address legal issues by reference to identified systems. It was suggested that the distinction between "partly" and "fully" automated contracts should be clarified. It was also suggested that an intersessional meeting could be held under the auspices of the UNCITRAL secretariat to explore those issues further with actors involved in the design, operation and use of automated systems. It was noted that the UNCITRAL secretariat had already carried out a similar exercise in developing the artificial intelligence section of the legal taxonomy (A/CN.9/1012/Add.1).

12. It was suggested that the Working Group should also proceed on the basis of a review of court cases involving the use of automated systems, which might shed light on gaps in existing law and possible solutions to fill those gaps. Reference was made to the case of *B2C2 Ltd. v. Quoine Pte. Ltd.* before the Court of Appeal of Singapore (*Singapore Law Reports*, vol. 2020, No. 2, p. 20), which applied the law of mistake to a contract formed using an automated system. It was noted that the case was significant in that, while the majority and minority judgments differed in the principles to apply, neither judgment expressed any doubt that a valid and enforceable contract had been concluded. It was also noted that the case provided an example of how the issues of attribution and matters relating to state of mind might arise in practice. It was suggested that the secretariat could compile commentary on the case and compare how the issues in that case might have been addressed under the law of other jurisdictions.

13. It was also recalled that the Commission had agreed that the Working Group should be mindful of the specific needs of developing countries.[5] In particular, it was suggested that the Working Group should pay attention to the realities of the market for emerging technologies in developing countries, which was dominated by a small number of foreign companies. It was explained that the situation had implications for the "data sovereignty" of developing countries.

14. The view was reiterated that future work should focus on the entire contract lifecycle. It was noted that UNCITRAL texts on e-commerce excluded from scope contracts with consumers and contracts in regulated markets. However, it was acknowledged that those types of contracts provided practical examples of automated contracting. It was nevertheless noted that particular types of contracts might need to be excluded from the scope of a future instrument. It was also noted that micro, small and medium-sized enterprises were increasingly considered parties deserving special protection alongside consumers, and that it was more appropriate to refer to contracts with weaker parties, which fell within the mandate of UNCITRAL. It was added that it might also be appropriate to distinguish contracts with much stronger parties, such as the operators of large online platforms.

15. The Working Group exchanged views on how to proceed in discharging its mandate. With a view to focusing its deliberations, the Working Group was presented with the hypothetical case of a "smart warehouse" run by a company engaged in international trade, which used automated systems programmed and licensed from third parties to monitor and forecast inventory based on data fed from multiple sensors, and to conclude contracts with third party suppliers to maintain stock levels based on those forecasts.

16. One suggestion was for the Working Group to prepare a restatement of the applicability of UNCITRAL provisions to automated contracting. Another suggestion was to distil principles from existing provisions and to develop additional principles on legal issues not yet addressed. It was added that those principles could eventually serve as a basis for developing legislative provisions. Some doubts were expressed

[4] Ibid., para. 160.
[5] Ibid.

about the feasibility of developing a comprehensive instrument. It was also recalled that States were at different stages of formulating policies and legal responses to artificial intelligence, and that consensus at a national level on those matters was yet to be reached.

17. It was recalled that the Commission had agreed that the Working Group should be guided by the principle of technology neutrality,[6] which should inform the consideration of proposals put to the Working Group and the formulation of definitions used in its work. It was conceded that defining "artificial intelligence" in technology-neutral terms could pose challenges.

18. It was noted that the Working Group could benefit from the work of other organizations that were addressing private law aspects of artificial intelligence, such as the Hague Conference on Private International Law and the European Law Institute. It was suggested that harmonization in the field of automated contracting was important to avoid legal "havens" for automated transactions. While the view was expressed that only a binding instrument could secure harmonization, it was also said that it was premature for the Working Group to consider the final form of its work.

B. Provisions of UNCITRAL texts applicable to automated contracting

19. The Working Group carried out a preliminary assessment of the applicability of selected provisions of UNCITRAL texts to automated contracting on the basis of document A/CN.9/WG.IV/WP.176. In general, it was noted that early UNCITRAL texts presupposed the use of Electronic Data Interchange and similar technology, while subsequent texts took into consideration the prevalent use of the Internet. It was added that current and emerging practices were based on different technologies and might call for a reconsideration of those earlier assumptions.

1. Definitions

20. The view was expressed that the notion of "automated decision-making system" was not currently captured in the definition of "automated message system". It was queried whether a new type of legal relationship could emerge in relation to AI-assisted decision-making that would go beyond the original programmer's intent. This view received support. However, it was also said that, without prejudice to further consideration of the issue, the definition of "automated message system" already included "automated decision-making systems".

21. It was indicated that the reference to "parties" in the definition of "electronic communication" could pose challenges in the context of automated contracting, as electronic communications might be generated by automated systems that are not "parties" to the contract. It was suggested that the matter could be further discussed in relation to the issues of attribution and expression of will.

2. Non-discrimination provisions

22. With regard to the legal recognition of information originating from external sources, it was indicated that the provision contained in article 6 of the UNCITRAL Model Law on Electronic Transferable Records (MLETR) was appropriate for transferable documents and instruments but might need adjustment to apply in a purely contractual setting. It was said that a provision suitable for that setting could refer to continuous, dynamic, and automatic inclusion of data. It was added that such a provision should take into account that data might not be transferred and incorporated in documents, but rather shared by users alone. In response, it was

[6] Ibid.

indicated that article 6 MLETR is a rule specific to the context of instruments that are not contracts, and therefore not applicable to the context of contracting.

23. It was observed that article 12 of the United Nations Convention on the Use of Electronic Communications in International Contracts (ECC) referred to "natural persons", which would exclude reviews carried out by automated systems. On the other hand, it was indicated that article 12 ECC was appropriately phrased as the notion of "person" presupposed the capacity to contract, which machines did not have.

3. Functional equivalence provisions

24. A question was asked whether the point-in-time reference for applying an integrity requirement in the context of automated contracting should be the "final form" of the data message (see art. 8(1)(a) of the UNCITRAL Model Law on Electronic Commerce (MLEC)) or should capture all changes in relevant periods of time (see art. 10(2) MLETR). In response, it was indicated that neither reference was entirely appropriate for automated contracting, and that further discussion was desirable.

25. It was clarified that electronic archiving provisions in the MLEC and the UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services (MLIT) applied for all purposes, rather than mainly for accounting and tax purposes (cf. A/CN.9/WG.IV/WP.176, para. 32).

4. Other enabling provisions

26. It was noted that provisions for determining the time and place of dispatch and receipt of electronic communications presupposed the use of separate "information systems" by the sender and receiver, which might not be the case for technology used in automated contracting, such as distributed ledger systems. It was clarified that the notion of "control" over information systems for the purposes of those provisions referred to the allocation of risk with respect to exchanging electronic transactions, and differed from the notion of "control" over automated systems. It was noted that the provisions on time of dispatch and receipt in the MLEC, which were premised on Electronic Data Interchange technology, were updated in the ECC for use with the Internet technologies (see also para. 19 above). The Working Group was now examining the context of distributed ledger technology and other current technologies and would need to be mindful of the need for technology neutrality.

C. Legal issues not (fully) addressed by existing provisions

27. The Working Group proceeded with an exchange of views on possible new provisions to address legal issues related to automated contracting on the basis of document A/CN.9/WG.IV/WP.177. It was recalled that the document elaborated on issues put forward within the Working Group at its sixty-third session (see A/CN.9/1093, para. 62).

1. "Autonomous" systems

28. The view was expressed that the Working Group should distinguish "autonomous" systems from automated systems. It was recalled that a defining feature of an "autonomous" system was unpredictability, in the sense that the system operated in a non-deterministic manner. It was also recalled that the term "autonomous" should not imply that the system had an independent will, and it was emphasized that the output of an automated system should always be attributed to a person.

2. Attribution

29. Broad support was expressed for addressing the issue of attribution, although it was noted that attribution could be considered a matter of substantive law. Broad support was also expressed for distinguishing attribution and liability. Some doubts

were expressed as to whether the rule according to which a message generated by an automated system to the "originator" of the message or to the person on whose behalf the system was programmed solved the problem of the attribution of a decision of an automated system. The view was expressed that attributing the message to the person on whose behalf the system was operated was preferable, although it was noted that further clarity was needed as to what it meant to "operate" the system and to do so "on behalf of" another person.

30. The view was expressed that developments in the technology and application of automated systems might require a new approach to attribution, and some support was expressed for referring to the notions of "control" and "benefit" (i.e., the person who controls the system and benefits from its operation). A question was raised as to how to deal with the situation in which the output of the system is attributed to a person who does not have capacity to contract, and also how capacity can be evaluated or confirmed.

3. Matters relating to state of mind

31. The point was made that automated systems were capable of processing vast quantities of data beyond human capability and that this could be relevant in addressing matters relating to state of mind (e.g. what a party "knows"). It was added that the processing power of automated systems created an "information asymmetry" between a person using the automated system and a natural person who interacts with the system, which could be relevant to other issues identified, such as the disclosure of information.

4. Pre-contractual disclosure of information

32. The importance of transparency in automated contracting was emphasized. It was suggested that further work on the issue of pre-contractual disclosure of information should focus on identifying the person behind the automated system. It was advocated that a person should be in a position to know whether they are interacting with an automated system and what the system is programmed to do. It was pointed out that a consideration of pre-contractual disclosure of information might not necessarily lead to mandatory provisions but rather clarify the legal significance of that information to the application of other existing rules, such as rules on liability.

5. Liability

33. It was foreshadowed that developing provisions on liability might pose challenges, given the differences in legal traditions. It was suggested that the Working Group should instead focus on the circumstances that might trigger liability. It was added that the Working Group could provide guidance on situations in which things could go wrong, including errors in programming and third-party interference.

6. Contract performance

34. Noting the practical relevance of automation for contract performance, it was suggested that the Working Group could clarify the relationship between "smart contracts" and contract automation. In that regard, it was pointed out that the execution of a smart contract was not always done in performance of a contract and that, consistent with the principle of technology neutrality, a smart contract could be deployed outside a distributed ledger system.

35. The view was expressed that the Working Group should draw a distinction between automated performance and "self-enforcement". It was explained that "self-enforcement" referred not only to the use of automation to apply remedies provided for in the contract (e.g. penalties that are coded into a smart contract), but also to the automated application of remedies provided for outside the contract.

D. Developing principles on legal issues related to automated contracting

1. Non-discrimination

36. The Working Group considered the following principle:

As a general rule, a contract negotiated, concluded or performed by an automated system shall not be denied legal effect, validity or enforceability solely on the grounds that it is automated.

37. It was indicated that the principle was intended as a foundational provision that would legally enable the use of automated contracting and make a policy statement in its support. A question was raised as to whether the principle applied to "autonomous" systems. In response, it was explained that a similar principle existed for automated contracting, and that "automated system" was an all-encompassing term. It was added that there was no consensus yet on the scope of that term.

38. The view was also expressed that there was no reason why such an enabling principle should not be applied to autonomous systems. However, it was noted that applying the principle to autonomous systems may give legal effect to contracts concluded with terms beyond those predicted by the parties. To avoid that outcome, it was queried whether the principle should be complemented by additional principles.

39. It was suggested that the words "as a general rule" were superfluous and should be deleted, and that the word "validity" should be placed before "legal effect". It was also suggested that the principle should be recast along the lines of article 12 ECC by referring to a contract "formed", a term that encompassed both negotiation and conclusion, and that the words "the use of" could be inserted before the phrase "an automated system" to reflect that a person would be using the automated system. It was also questioned whether the principle should apply to the performance of the contract.

2. Compliance with applicable laws

40. The Working Group considered the following principle:

An operator that decides to use an automated system to negotiate, conclude or perform a contract shall ensure that the design and operation of the system complies with the laws applicable to that contracting situation.

41. It was explained that the principle aimed at avoiding circumvention of mandatory rules by using automated systems. In that regard, it was noted that a violation of regulations did not always have contract law consequences. It was added that the sanction for the violation of the principle was unclear. It was suggested that the principle should also cover the notions of renegotiation, amendment and termination of the contract, as well as the "use" of the system.

3. Attribution

42. The Working Group considered the following principle:

(a) Option 1: The output of an automated system shall be attributed to the operator.

(a) Option 2: The operator shall not deny the attribution of the output of an automated system solely on the grounds that it has been produced by automated means.

(b) The operator is the person who controls the automated system and benefits from its operation.

43. It was explained that the principle aimed to fulfil two distinct functions: (i) attribution of the output of the automated system to the operator, and (ii) setting

the conditions for defining the operator. On (i), it was noted that the second option was more in line with existing UNCITRAL provisions.

44. It was indicated that the principle focused on the operator and did not foreclose the liability of other parties, such as developers. In that respect, the distinction between attribution and liability was reiterated (see para. 29 above), and it was observed that attribution was concerned only with linking the output of an automated system to a person, whereas liability was concerned with the legal consequences flowing from that output. It was added that, as an alternative, the principle could focus on the person in control of the system according to the contract, and be complemented by a list of factors relevant to identifying that person. It was suggested that the principle could contemplate the attribution of the output to an organization that did not have capacity to contract.

45. Clarification was sought as to the types of actors that could be considered the "operator", the meaning of the terms "control" and "benefit", and whether those terms applied alternatively or cumulatively. The view was expressed that the terms should apply cumulatively to avoid the situation in which a third party taking unlawful control of the system would be considered the operator and therefore a party to the contract. It was also noted that the third party could be regarded as benefitting from the system and that the term "benefit" should therefore be replaced with the notion of deploying the system for contracting or engaging in trade. It was indicated that control of the system involved determining the parameters for its operation. It was also suggested that "control" did not refer to control over the output of the automated system. It was questioned whether third-party interference with the system should be characterized as an instance of loss of control of the system but rather as an instance of loss of control of data processed by the system.

46. As an alternative, it was suggested that the output of an automated system should be attributed to the person "on whose behalf the system is operated", as indicated in paragraph 213 of the explanatory note to the ECC. In response, the view was expressed that paragraph (b) of the principle was designed to clarify when a person (a third-party service provider) was operating the system on behalf of another person (the party to the contract).

47. It was suggested that the principle could contemplate an exception whereby attribution could be denied in the event of an erroneous output, whether due to system malfunction or third-party interference, if the operator had taken all reasonable measures in the circumstances to prevent that output. In response, it was noted that the notion of "all reasonable measures" would need further elaboration. It was also indicated that erroneous outputs were not a matter of attribution, but rather grounds to deny that the output reflected the will of the operator, which was a matter for other areas of contract law (such as mistake). Support was expressed for distinguishing attribution and matters related to state of mind. In that regard, it was suggested that third-party interference could prevent attribution while system malfunction might call for the application of other contract law rules.

48. Caution was expressed against establishing an exception to attribution that applied only to automated contracts, which departed from the principle of non-discrimination. It was noted that providing a clear rule on attribution would incentivize operators to take all efforts to minimize the risk of erroneous output. It was added that, if the principle were to contemplate an exception in the event of an erroneous output, the Working Group would need to address the issue of allocating the burden of proof for the purposes of establishing liability for the output.

4. Transparency and traceability

49. The Working Group discussed transparency and traceability (A/CN.9/WG.IV/WP.177, paras. 14–20). It was suggested that a new principle based on transparency might require the pre-contractual disclosure of the use of an automated system and the criteria for its operation. It was added that determining the content of information to be disclosed could pose challenges.

50. It was indicated that transparency, explainability and traceability were closely related in addressing the complexity of automated systems. It was added that these notions had multiple implications, such as requirements for the pre-contractual disclosure of information, which built trust in the use of automated systems and promoted predictability as to their legal effects. However, each served a different purpose. It was explained that transparency, which aimed at providing information on the components of the automated system, was complemented by explainability, which provided information on the criteria used for operating the automated system. It was explained that traceability was ultimately a matter of evidence and operated ex post to explain how the automated system operated. It was observed that, as such, traceability could help with allocating liability.

51. Support was expressed for the view that transparency was important in the context of automated contracts. It was reiterated that information disclosed could help with identifying parties in complex systems involving multiple operators not otherwise readily identifiable. It was observed that, as such, transparency could help with applying principles on attribution. It was indicated that transparency applied throughout the entire contract lifecycle. The view was also expressed that pre-contractual disclosure of the use of automated systems would be necessary if a dedicated set of contract law rules was to apply to automated contracts. As an example, it was said that the use of an automated system could have an impact on the application of general contract law rules on force majeure or the "reasonable person" standard.

52. Conversely, support was expressed for the view that transparency found limited application in a commercial setting and was primarily a regulatory matter. In that regard, it was suggested that any information disclosure based on transparency could be limited where business practice did not require it. It was also stated that the Working Group should avoid introducing contract law rules that applied only to automated contracting.

53. It was said that the impact of transparency on general contract law should be carefully considered as it could result in the introduction of new information requirements, which departed from the approach taken in UNCITRAL texts (e.g. art. 5 MLETR). It was also questioned whether transparency was an issue of contract formation, relevant to establishing the existence of an expression of will.

54. It was questioned whether transparency, explainability and traceability could be given meaning in a purely contractual setting. In response, it was noted that a distinction between enabling legal provisions and regulatory matters was not always clear-cut.

55. It was observed that automated contracting commonly occurs within digital ecosystems, including online platforms, that are governed by rules to which the contracting parties have already submitted. Those rules addressed issues related to transparency, explainability and traceability, as well as issues related to attribution and allocation of risk. It was suggested that, as a general principle, those rules should prevail in accordance with party autonomy. It was added that such an approach built on the MLEC, which had been developed in the context of the use of Electronic Data Interchange under interchange agreements, and which acknowledged, in its article 4, that the parties may vary by agreement the provisions of the MLEC on the communication of data messages. It was acknowledged that contract automation also took place in digital ecosystems that were not governed by such rules, as was the case with certain distributed ledger systems.

5. Liability

56. The Working Group was presented with the hypothetical case of the late delivery of goods due to non-performance by an automated system. Different scenarios of contractual and extracontractual liability of the various actors involved in the design, operation and use of the system were illustrated.

57. It was indicated that the use of automated systems posed challenges for establishing causation, and it was suggested that transparency, explainability and traceability could address those challenges. In particular, it was suggested that reversing the burden of proof or introducing presumptions of liability in the event that the operator failed to comply with transparency, explainability and traceability standards could be considered. However, it was also indicated that causation was a matter of evidence that should lie outside the scope of the current work.

58. The question was asked whether contract law rules requiring a determination of state of mind could apply to automated contracts. It was suggested that, under an alternative approach, the operator could assume the risk for the operation of the system. However, it was added that caution should be exercised when interfering with settled fundamental legal principles.

E. Next steps

59. It was noted that, while a discussion on the form of a future instrument was premature (see para. 18 above), the work required for the preparation of legislative texts (such as a treaty or model law) differed from that of other legal texts (such as recommendations), and that therefore it would be useful to discuss the future steps of the work of the Working Group and its possible time frame.

60. It was recalled that one main goal of the work of UNCITRAL was the removal of legal obstacles to international trade, and that such a goal could be more effectively pursued in the context of automated contracting through legislative texts. Accordingly, the view was expressed that, as a working hypothesis, the current project should result in a legislative text. It was therefore suggested that the Working Group should move from a conceptual discussion to the consideration of draft legislative provisions. However, it was also noted that not all legal issues were equally suitable to be addressed in legislative texts and that some should be addressed in explanatory texts instead. It was indicated that the working hypothesis was compatible with the delivery of intermediate work products in the form of legal guidance, such as a restatement of the applicability of UNCITRAL provisions.

61. It was recalled that the Working Group had the possibility to schedule its work on the topics of automated contracting and data provision contracts (A/77/17, para. 22(d) and (e)). It was suggested that both topics should be on the agenda of the sixty-fifth session of the Working Group, instead of a purely alternating arrangement, so that its preliminary findings on both topics could be reported to the Commission in 2023. Broad support was expressed for that suggestion. The view was reiterated that intersessional work should be carried out to identify cases and legal issues arising from the use of automated contracts. To that end, the Working Group considered a revised set of principles, presented by the secretariat during the session, which would serve as the basis for future work (see section F below). The Working Group requested the secretariat to continue to develop the set of principles with a view to putting forward proposals for additional principles on the other legal issues considered during the session.

F. Draft principles

1. Basic concepts

62. The Working Group considered the following concepts as the basis for its future work:

An "automated system" is an "automated message system" within the meaning of article 4(g) of the ECC.

"Automated contracting" is the use of an automated system to form and perform contracts.

An automated system is used to form and perform contracts by generating, sending, receiving or storing "electronic communications" within the meaning of article 4(b) of the ECC.

63. The view was expressed that the definition of "automated message system" accommodated all kinds of techniques, including "machine learning", and that it thus encompassed "autonomous" systems. It was suggested to insert a reference to those techniques in the definition.

64. Support was reiterated for expanding the notion of "automated message system" to cover "automated decision-making systems" (para. 20 above). In response, it was said that the definition of "electronic communication", which was the output of "automated message systems", already covered the outcome of decision-making processes (e.g. an offer or an acceptance), and it was therefore unnecessary to expand the notion. Nevertheless, it was suggested that future work should focus not only on recognizing the output of automated systems, but also on recognizing the processing of data by automated systems to make a "decision".

65. Broad support was expressed for formulating the concepts in technology-neutral terms, and for specifying in explanatory materials that those concepts encompassed a range of settings – including transactions carried out on online platforms, transactions initiated by "smart" devices, and interactions with "smart contracts" deployed in a distributed ledger system – and a range of techniques.

2. Compliance with applicable laws

66. The Working Group considered the following principle, which built on its earlier deliberations (see paras. 40–41 above):

The operator ensures that the design, operation and use of the automated system complies with applicable laws.

67. It was observed that the principle was open to multiple interpretations. On one interpretation, it preserved obligations under other law. On another interpretation, it affirmed that an automated system could not be used to circumvent mandatory rules. On a further interpretation, it imposed special requirements relating to the design, operation and use of automated systems, including the notion of "compliance by design".

68. On the first interpretation, it was suggested that the principle should be reformulated along the lines of article 5 MLETR. It was added that the principle could be expanded to encompass information requirements derived from the notions of transparency, explainability and traceability.

69. On the second interpretation, it was questioned whether the principle was necessary, as mandatory rules applied of their own force. It was observed that, as the principle of attribution treated automated systems as mere tools, any breach of mandatory rules by using an automated system would be treated as a breach of the operator. It was added that affirming the principle of law-compliant automated systems sent an important signal. It was added that the signal would be clearer if it was specified that the principle was concerned with laws applicable in a contractual setting.

70. The view was expressed that the principles could incorporate a requirement for the automated system to use a reliable method, inspired by existing UNCITRAL provisions. The link between reliability and compliance with transparency, explainability and traceability standards was noted.

3. Attribution

71. The Working Group considered the following principle, which built on its earlier deliberations (see paras. 42–48 above):

An electronic communication sent by an automated system is attributed to the person on whose behalf the automated system is operated (the "operator").

The operator is presumed to be the person who controls the automated system and [uses it in the context of commercial activities].

72. It was recalled that the text in square brackets was intended to reformulate the notion of "benefit" in terms found in article 1 MLEC (see para. 45 above). A concern was expressed that the text did not help in addressing the issue of attribution. It was added that it was sufficiently clear that a person on whose behalf a system was operated would "benefit" from the operation of the system.

73. It was explained that the principle was compatible with attributing an electronic communication to multiple persons. However, a concern was expressed that the provision did not adequately accommodate the use of online platforms, for which the platform operator (i) provides an automated system that is used by multiple parties to form and perform contracts, but (ii) retains control of the system without being party to those contracts. It was added that "control" might not be an appropriate condition for a principle of attribution.

74. To address those concerns, and to reinforce the focus of the Working Group on the contractual setting, it was proposed that the principle should refer to "party" (not "person") and that the principle should not refer to "operator", which made the second paragraph unnecessary. Broad support was expressed for that proposal. Recalling earlier deliberations (see para. 55 above), it was added that the principle on attribution was complemented by party autonomy, which could be reflected in the text. It was recalled that, as between the parties to the contract, the platform rules could address attribution.

75. The concern was also expressed that the word "sent" did not accommodate online platforms, where data is "shared" within a single system. It was explained that the word "sent" did not imply that the electronic communication needed to leave the system, and that, in any case, article 10(1) ECC already acknowledged that electronic communications could be exchanged between parties within a single system.

76. The view was expressed that, while the principle was appropriate for automated systems, it was not sufficient for "autonomous" systems, which were used for more than merely sending electronic communications. Recalling earlier deliberations (see paras. 20–21 above), it was proposed that the principle be developed to address the attribution of the decision-making process of the system.

77. In response, it was recalled that "autonomous" systems did not have an independent will (see para. 28 above) and therefore could not "decide". It was queried whether the concern to link the decision-making process to a party was not a matter of attribution but rather of imputing state of mind, such that, e.g. the output of the system could be regarded as an expression of will of the party. Alternatively, it was queried whether the concern was more a matter of the definition of "electronic communication", which did not refer to a "decision" or other actions which a party may use a complex system to perform in a contractual setting. In that regard, the view was expressed that the definition was sufficiently broad to capture the interactions between the contracting parties on an online platform.

4. Fundamental principles

78. The Working Group considered the relationship between the revised set of principles and the fundamental principles underpinning UNCITRAL texts on electronic commerce.

(a) Technology neutrality

79. Recalling that automated contracting was used in a range of settings, and could be supported by all types of technologies and methods (see para. 66 above), it was suggested that a principle should be drafted accordingly, inspired by article 3 of the

UNCITRAL Model Law on Electronic Signatures and drafted along the following lines:

> *Nothing in these principles applies so as to exclude, restrict or deprive of legal effect any technology or method used for automated contracting.*

(b) Non-discrimination

80. The Working Group considered the following principles inspired, respectively, by article 12 and article 8(1) ECC:

> *The formation or performance of a contract is not denied validity or enforceability on the sole ground that an automated system was used.*
>
> *A communication or contract is not denied validity or enforceability on the sole ground that it is in the form of an electronic communication generated, sent, received or stored by an automated system.*

81. It was suggested that the principles could be reformulated in positive terms. In response, it was recalled that the negative formulation was used for non-discrimination provisions in UNCITRAL texts, and that reformulating the principles would have the effect of validating automated contracts that might be invalid on other grounds.

82. It was indicated that the absence of human interaction in contract formation and performance, which was a core element of automated contracting, should be stressed in the principles. In response, it was noted that this element was already captured by incorporating the definition of "automated message system".

83. The question was raised as to whether the reference to a communication "sent, received or stored" was appropriate given how automated systems operated. In that regard, the suggestion was reiterated that reference should be made to the "sharing" of data so as to accommodate online platforms (see para. 75 above). In response, it was noted that the principles referred to a contractual setting that required the exchange of communications on behalf of the contracting party, and that therefore the reference to "sent, received or stored" was appropriate. It was added that the principle and the ECC were drafted in sufficiently broad and technology-neutral terms so as to accommodate online platforms.

84. It was further suggested that a principle relating to the legal recognition of information originating from external sources would be desirable (see para. 22 above).

(c) Functional equivalence

85. It was suggested that the functional equivalence provisions in the ECC should serve as the point of reference for future work. It was indicated that the application of certain requirements of those provisions to automated contracting may need further consideration. It was recalled that one such requirement was integrity (see para. 24 above).

86. A question was asked as to how the requirement for an electronic signature to indicate the party's intention (see, e.g., art. 9(3) ECC) applied to automated contracting. It was indicated that the question raised a fundamental issue of the extent to which the output of an automated system could be regarded as reflecting the will of the party to which that output was attributed. In response, it was said that automated systems were instruments used by a party, and therefore could reflect the will of the party using the system.

5. Principles enabling electronic contracting

87. The Working Group continued its consideration of the application of UNCITRAL provisions on the time and place of dispatch and receipt of electronic communications (art. 10 ECC) (see para. 26 above).

88. The question was raised as to how those provisions applied to distributed ledger systems, given that the information system containing the electronic address could be located in multiple locations and time-zones. It was added that this could pose challenges, e.g. in determining the place of conclusion of the contract and the law applicable to the contract. It was suggested that the concept of "electronic address" would need to be adapted, particularly in the context of online platforms.

89. In response, it was recalled that rules for determining the location of the parties were available (art. 6 ECC). It was indicated that place of business was preferable to information system as the factor for determining the place of dispatch and receipt of electronic communications.

90. It was suggested that, with respect to information originating from external sources, consideration could be given to focusing on the time when data was capable of being processed, rather than when it had been received.

V. Explanatory note to the UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services

91. The secretariat introduced the draft revisions to the explanatory note set out in document A/CN.9/WG.IV/WP.175. It was recalled that the revisions aimed to reflect the deliberations and decisions of the Commission at its fifty-fifth session during which the MLIT was adopted.

92. It was stressed that the revisions did not amend the text of the MLIT. The Working Group was informed of editorial changes to article 5(b) and to the title of article 25 of the MLIT. The Working Group agreed to amend the explanatory note accordingly.

93. The Working Group agreed to the revisions set out in paragraphs 5, 6, 7, 9, 10 and 15 of document A/CN.9/WG.IV/WP.175 without modification. It also agreed that the new text set out in paragraph 7 would be inserted after paragraph 86 (not paragraph 85) of the explanatory note.

94. The Working Group agreed to the revisions set out in paragraph 8 of document A/CN.9/WG.IV/WP.175 with two modifications.

(a) The first was to replace the first sentence of new paragraph 92 with the following text:

> "The relying party may be contractually bound by the operational rules required by article 6, or may be a third party with respect to the relationship between the subscriber and the service provider defined by those operational rules."

(b) The second was to replace "however" with "moreover" in the second sentence of new paragraph 92.

95. On paragraph 11 of document A/CN.9/WG.IV/WP.175, the Working Group agreed to replace paragraph 134 of the explanatory note with the following:

> "The method used to fulfil the rule in article 9 must be reliable in accordance with article 10, paragraph 1, or article 10, paragraph 4. The reliability of the method may be assessed ex-post or evaluated in the context of ex-ante designation. The standard of reliability is not absolute but relative to the specific purpose."

96. On paragraph 12 of document A/CN.9/WG.IV/WP.175, while a view was expressed that paragraph 142 of the explanatory note should be retained without revision, the Working Group agreed that that paragraph needed to be revised. The Working Group agreed to the revisions set out in paragraph 12 of document A/CN.9/WG.IV/WP.175, with the following four modifications.

(a) The first was to replace “that party” in the second sentence of new paragraph 142 with “that or some other party”.

(b) The second was to replace “the reliability of the method” in that sentence with “the method being not as reliable as appropriate”.

(c) The third was to replace the second sentence of new paragraph 144 with the following:

> “The first is that a method proven to achieve identification in fact, by itself or together with further evidence, is deemed to be as reliable as appropriate, and thus satisfies the reliable method requirements in article 9.”

(d) The fourth was to replace “fact-finding” in the final sentence of new paragraph 144 with “the presentation and evaluation of evidence and determination of facts”.

97. The Working Group agreed to the revisions set out in paragraph 13 of document A/CN.9/WG.IV/WP.175, with two modifications.

(a) The first was to delete the words after “signed data message” in the first sentence of new paragraph 187 and insert a cross-reference to paragraph 210 of the explanatory note.

(b) The second was to replace “in respect of information contained in the data message” in the second sentence with “in relation to a data message”.

98. The Working Group agreed to the revisions set out in paragraph 14 of document A/CN.9/WG.IV/WP.175 with one modification to insert “in practice” at the beginning of the second sentence of new paragraph 191.

99. The Working Group agreed to the revisions set out in paragraph 16 of document A/CN.9/WG.IV/WP.175 with four modifications.

(a) The first was to amend new paragraph 210 to align it with paragraph 134, as replaced (see para. 95 above);

(b) The second was to replace “have achieved” with “have been proven to have achieved” in the final sentence of new paragraph 211;

(c) The third was to replace the second sentence of new paragraph 212 with the following:

> “In that regard, article 22(1)(b) in relation to article 16, on the one hand, and article 9(3)(b) ECC, on the other hand, have different levels of detail.”

(d) The fourth was to replace the third sentence of new paragraph 212 with the following:

> “Moreover, the provisions of the Model Law relate to trust services, which provide assurance of data quality, and as such may find application also in the absence of form requirements.”

100. The Working Group agreed to the revisions set out in paragraph 18 of document A/CN.9/WG.IV/WP.175 with four modifications.

(a) The first was to delete “agreed” in the first sentence of new paragraph 225 and to replace “are available” in that sentence with “recognized by both jurisdictions are identical”;

(b) The second was to add “for a particular legal effect” at the end of new paragraph 225;

(c) The third was to delete “agreed” in the first sentence of new paragraph 225 and to replace “are not available” in that sentence with “recognized by both jurisdictions are otherwise than identical”;

(d) The fourth was to insert the following sentence after the second sentence of new paragraph 226:

"For the same reason, the words "level of assurance" should not be interpreted narrowly to exclude levels of assurance that are achieved through the application of criteria for assurance, recognizing that different legal systems may define levels in different ways."

VI. Other business

101. The Working Group was informed that the secretariat had started work on legal issues arising from the use of distributed ledger technology in trade (A/77/17, paras. 22(f), 153, 166–169). Delegations were invited to share with the secretariat names of experts to ensure balanced representation.