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Exploratory work on legal issues related to the digital economy – reports of events

I. Introduction

1. This document presents the reports of three events organized so far by the Secretariat on legal issues related to the digital economy, namely:

(a) The “**Paris event**” – a meeting of experts on data flows and artificial intelligence, organized with the Institute for Advanced Judicial Studies and the Ministry for Europe and Foreign Affairs of France and held in Paris on 15 March 2019;

(b) The “**Rome event**” – a workshop on legal issues arising from the use of smart contracts, AI and distributed ledger technology, organized with Unidroit under the patronage of the Ministry of Foreign Affairs and International Cooperation of Italy and held in Rome on 6–7 May 2019; and

(c) The “**Bogota event**” – a regional conference on legal issues relating to the digital economy, organized with the Ministry of Information and Communication Technology of Colombia and held in Bogota on 5 June 2019.

2. As noted in the annex to document [A/CN.9/981](#) (work programme of the Commission), these events were organized pursuant to a request by the Commission at its fifty-first session in 2018 for the Secretariat to “compile information on legal issues related to the digital economy, including by organizing, within existing resources and in cooperation with other organizations, symposiums, colloquiums and other expert meetings”. A synthesis of the events is provided in that annex.

3. The reports of the three events offer detail on the issues raised by experts, as well as insights and recommendations on possible future steps. In this regard, several overarching themes have emerged:

(a) The law has a role to play in creating certainty for business in the digital economy and predictability in commercial transactions. Greater certainty means reduced costs and risk for business;

(b) The law can foster the use and development of the tools of the digital economy – such as data, digital assets, artificial intelligence systems, smart contracts, distributed ledger technology (DLT, including blockchain) and other emerging technologies – and should not be used as an obstacle to such use and development;



(c) Work at an international level to develop a harmonized response to legal issues could pre-empt fragmented national legal responses, an obstacle to cross-border trade;

(d) Given the fast pace at which technology is being developed, any future work should respect the principle of technology neutrality, specifically the need to avoid regulating a particular technology such as DLT, and the need for any new instrument to be “future-proof”. Other relevant principles include party autonomy and transparency;

(e) Future work should focus above all on the disruptive impact of emerging technologies on commercial transactions.

4. The Secretariat has received expressions of interest from several Member States in hosting similar events in the future on legal issues related to the digital economy.

5. Moving forward, the Secretariat will concentrate its exploratory work on several lines of enquiry, including (a) the development of a taxonomy of key emerging technologies and applications driving the digital economy, such as AI, smart contracts, digital assets and digital ledgers, and (b) an appraisal of existing UNCITRAL instruments to determine how they apply to those technologies and applications, particularly with regard to automated transactions.

6. The exploratory work undertaken by the Secretariat is taking place amid a range of other initiatives within the United Nations system and other international organizations and forums that are looking at different aspects of the digital economy, including the use of artificial intelligence, smart contracts, and distributed ledger technology, as well as cross-border data flows. Within the United Nations system, these initiatives include:

(a) The United Nations Secretary-General’s high-level panel on digital cooperation, which was appointed in July 2018 to consider the question of the ways people work together to address the social, ethical, legal and economic impacts of digital technologies in order to maximize their benefits and minimize their harm. The Secretariat met with the panel secretariat in January 2019 and submitted information addressing the relevance of UNCITRAL’s past and ongoing work to digital cooperation. The panel handed down its report in June 2019, which refers to UNCITRAL’s work;

(b) The Intergovernmental Group of Experts on E-Commerce and the Digital Economy, established under the United Nations Conference on Trade and Development to analyse trends and developments in e-commerce and the digital economy with a view to generating policy recommendations to enhance development gains. The group held its third session in April 2019;

(c) The United Nations Global Survey on Trade Facilitation and Paperless Trade, which is a joint project of the five United Nations regional commissions that publishes periodic reports enabling countries and development partners to better understand and monitor progress on trade facilitation, support evidence-based public policies, share best practices and identify capacity building and technical assistance needs. The UNCITRAL secretariat has provided input into this initiative. The 2019 global report will be available shortly.

7. The Secretariat will continue to coordinate its exploratory work with these other organizations and forums. A potential upshot of this work would be to establish UNCITRAL as a “clearing house” for legal issues related to digital trade.

II. Report of the Paris event

A. Overview

1. On 15 March 2019, the UNCITRAL secretariat, together with the Institut des Hautes Études sur la Justice and the Ministry for Europe and Foreign Affairs of

France, held a meeting of experts to discuss legal issues relating to cross-border data flows and artificial intelligence. The meeting was attended by 32 experts from France and beyond, and focused on the following topics: (a) the definition of data; (b) the use and quality of data; (c) data ownership; (d) data storage and localization; (e) use of artificial intelligence; and (f) regional developments.

2. The Secretary of UNCITRAL opened discussions by reminding experts that the meeting was in furtherance of an exploratory mandate conferred by UNCITRAL on its secretariat to compile information on legal issues related to the digital economy. She thanked those experts who had submitted scoping papers to the organizers, which had helped to frame the programme for the meeting. The organizers also offered thanks to the Organization for Economic Co-operation and Development and its Directorate for Legal Affairs for hosting the meeting.

B. Summary of discussions

3. On the **definition of data**, several experts pointed to existing definitions, such as that developed by the International Organization for Standardization and International Electrotechnical Commission. According to that definition, data is a “re-interpretable representation of information in a formalized manner suitable for communication, interpretation or processing”. It was noted that UNCITRAL instruments in the area of e-commerce equate data with information in an electronic context. Some experts emphasized the fact that data was in essence digital, digitized or digitizable. One expert noted the challenges of finding an all-embracing definition of “data”.

4. Other experts queried the need to define data, with one warning of establishing a static definition that does not account for the dynamism of data and its evolutive use. Another expert noted that the definition of data depended on whether the purposes of the definition was for use in technical or legal regulation. Several experts highlighted that it was more important to focus on the use of data rather than on defining it, highlighting that it is how data is used that gives it value. In this regard, a number of experts identified a typology of data, distinguishing raw data from aggregated data, public data from private data, and personal data from non-personal data.

5. On the question of the **use and quality of data**, a couple of experts highlighted that regulation needs to account for the function that data serves. In this regard, one expert noted that data governance needed to recognize that data can serve as capital, as a raw material, as the product of labour, as infrastructure, and as an extension of self.

6. Several experts advocated for a focus on the contract as the tool for regulating the use of data. In this regard, reference was made to the ongoing joint project of the American Law Institute and European Law Institute for the development of principles for the data economy, which is looking at different types of data transactions, such as contracts for the supply of data, for access to data sources, for toleration of processing, and for the processing of data. Some experts suggested that there is merit in UNCITRAL considering a revision of the United Nations Convention on Contracts for the International Sale of Goods, which does not cover data transactions, or the development of a separate framework for data transactions.

7. One expert referred to the development of codes of conduct in the EU and elsewhere regarding the processing of data in the agricultural sector. These codes show substantial similarity with the principles and solutions developed for the processing of personal data, suggesting the emergence of common international standards for the processing of both personal and non-personal data.

8. Several experts emphasized the importance of data sourcing and data accessibility for international commerce. In this regard, one expert noted the importance of data structuring and the need for data generators – and data users – to have visibility as to how data is processed. For this expert, these were technical issues and matters for contractual arrangements between the parties. Another expert drew a link with trust services to promote data quality.

9. Experts engaged in a lively discussion on **data ownership**. Most experts speaking on this topic opposed the extension of property rights to data. For some, there was no social or economic need for such rights. For others, creating ownership in data raised complex questions, such as identifying a titleholder for machine-generated data or open data. One expert emphasized the need for a common vocabulary when speaking about data ownership, particularly on account of differences between legal systems regarding the concept of “property”. For that expert, it was important to focus on what exactly property would entail in terms of the bundle of rights to be conferred with respect to data (e.g., right to access data, to use data, to dispose of data, and to destroy data). Another expert expressed the view that control over data was more important than ownership. In that regard, beyond control exercised in a contractual context, the law could conceivably recognize a limited right of control over data held by a third party in cases where a person has been involved in the generation of that data (so-called “co-generated data”).

10. Some experts identified the negative impact of **data localization** requirements on cross-border data flows. At the same time, a number of experts recognized that these requirements are a reaction to laws in other countries requiring disclosure of foreign-held data to public authorities. Yet another issue highlighted was laws granting public authorities access to the locally-held data of foreign companies.

11. Several experts expressed concerns that a form of “cyber-colonialism” was taking place in Africa owing to the fact that the vast majority of data generated there was being stored outside Africa, and were therefore not accessible to companies located in Africa.

12. One expert noted that **data storage** posed no significant difficulties given existing technical requirements regarding data security. It was simply a matter of applying those requirements. Another expert made reference to the benefits of electronic archiving services, which are currently not covered by existing EU law on trust services.

13. Several experts recalled the link between the development and **use of artificial intelligence** (AI) on the one hand and the free flow of data and data quality on the other hand. One expert drew attention to recent decisions in the EU and France in which the court analysed the algorithms of online intermediary platforms to identify control in the contractual relationships between the platform and its service providers.

14. Another expert rejected the conferral of separate legal personality on AI systems (e.g. robots), and raised the issue of attributability of acts performed by such systems. “Operation” of the system as a basis for attribution, as suggested in the explanatory notes of Article 12 of the United Nations Convention on the Use of Electronic Communications in International Contracts, was identified as a possible starting point for developing relevant rules. The expert also suggested establishing a presumption of attribution in the case of a dispute.

15. A number of experts raised the issue of transparency in the operation of AI systems and the “black box” problem (i.e., the inability to correlate inputs and outputs for a particular AI system). At the same time, the need to maintain secrecy of AI algorithms was emphasized. One expert highlighted a possible solution – advanced by the French data protection authority (the Commission Nationale de l’Informatique et des Libertés) – of having a trusted third party “open” the black box to ascertain whether the AI system complies with certain standards of conduct.

16. As with the use of data, several experts recognized the role of contracts in regulating the operation of AI systems. One expert suggested the development of standard terms for inclusion in B2B contracts on sharing information regarding the use of AI systems in the performance of the contract.

17. The Secretary of UNCITRAL concluded the meeting with a summary of discussions, and thanked the experts for their participation.

II. Rapport de la réunion de Paris¹

A. Introduction

1. Le 15 mars 2019, le secrétariat de la CNUDCI, en partenariat avec l'Institut des hautes études sur la justice et le Ministère français de l'Europe et des Affaires étrangères, a tenu une réunion d'experts à Paris pour examiner des questions juridiques concernant l'échange transfrontalier de données et l'intelligence artificielle. Une trentaine d'experts de France et d'ailleurs ont assisté à la réunion, qui était axée sur les sujets suivants : (a) la définition juridique des données ; (b) l'utilisation et la qualité des données ; (c) la propriété des données ; (d) le stockage et localisation des données ; (e) l'utilisation de l'intelligence artificielle ; et (f) les approches régionales.

2. La secrétaire de la CNUDCI a ouvert les débats en rappelant aux experts que la réunion relevait du mandat exploratoire conféré au secrétariat par la Commission en vue de « compiler des informations sur les questions juridiques liées à l'économie numérique ». Elle a tenu à remercier les experts qui avaient soumis des notes de cadrage aux organisateurs, notes qui ont aidé à préparer le programme pour la journée. Les organisateurs ont remercié également l'Organisation de coopération et de développement économiques et sa Direction des affaires juridiques d'avoir mis à disposition leurs locaux pour la réunion.

B. Compte-rendu des discussions

3. S'agissant de la **définition juridique des données**, plusieurs experts ont indiqué que des définitions du concept de « donnée » existaient déjà, comme celle développée par l'Organisation internationale de normalisation et la Commission électrotechnique internationale, selon laquelle une donnée est une « représentation ré-interprétable de l'information présentée d'une façon systématique adaptée à la communication, à l'interprétation ou au traitement ». On a fait observer que les instruments de la CNUDCI dans le domaine du commerce électronique présentaient la donnée comme synonyme d'une information dans un contexte électronique. Quelques experts ont mis l'accent sur le fait que la donnée est, en substance, numérique, numérisée ou numérisable. Un expert a signalé les difficultés à en trouver une définition complète.

4. D'autres experts se sont interrogés sur la nécessité d'une définition, l'un d'entre eux mettant en garde contre une définition statique qui ne tiendrait pas compte du dynamisme des données ni de leur utilisation évolutive. Un autre expert a noté que la définition dépendait de son utilisation, à des fins techniques ou juridiques. Plusieurs experts ont préconisé que l'accent soit mis sur l'utilisation de la donnée plutôt que sur sa définition, dans la mesure où sa véritable valeur découle de l'utilisation qui en est faite. À cet égard, nombre d'experts ont établi une typologie qui différencie les données brutes des données agrégées, les données publiques des données privées, et les données à caractère personnel des données à caractère non-personnel.

5. S'agissant de **l'utilisation et de la qualité des données**, quelques experts ont souligné que la réglementation devait tenir compte de la fonction que les données remplissent. À cet égard, un expert a noté que la gouvernance des données devait reconnaître les fonctions de capital, de matière première, de productivité du travail, d'infrastructure et d'extension de soi que la donnée pouvait remplir.

6. Plusieurs experts ont recommandé que l'accent soit mis sur le contrat en tant que moyen de réglementation des données. À ce sujet, on a fait référence au projet joint de l'Institut européen du droit et de l'American Law Institute sur l'élaboration de principes pour une économie des données, qui examine différents types de transactions de données, comme les contrats de fourniture de données, d'accès aux données, de tolérance de traitement, et de traitement de données. Selon quelques

¹ This informal translation has been prepared by the UNCITRAL secretariat.

experts, une révision de la Convention des Nations Unies sur les contrats de vente internationale de marchandises mériterait d'être envisagée, puisque ce texte ne s'applique pas aux transactions de données. Une autre option serait d'envisager l'élaboration d'un cadre distinct pour ces transactions de données.

7. Un expert a fait référence aux chartes de bonne conduite, notamment au sein de l'Union européenne, élaborées pour le traitement de données dans le secteur agricole. On a dit qu'il y avait une similarité substantielle entre les termes de ces chartes et les principes et solutions développés pour le traitement de données à caractère personnel, suggérant ainsi l'émergence de standards internationaux communs pour le traitement des deux types de données.

8. Certains experts ont souligné l'importance du *sourcing* et de l'accessibilité des données dans le commerce international. À cet égard, un expert a noté qu'il importait de structurer les données et souligné le besoin pour les générateurs de données, ainsi que les utilisateurs, d'avoir une visibilité quant au traitement des données. Pour cet expert, ces questions et sujets techniques pourraient être réglés conventionnellement. Selon un autre expert, un lien avec les services de confiance pourrait être établi en vue de promouvoir la qualité des données.

9. Le débat sur la **propriété des données** fût animé. La plupart des experts intervenant sur ce sujet se sont opposés à ce que les droits de propriété soient étendus aux données. Certains ont estimé que de tels droits n'étaient nécessaires ni sur le plan social, ni sur le plan économique. D'autres étaient d'avis que créer une propriété des données soulèverait des questions complexes, comme celles ayant trait à l'identification du titulaire du droit sur une donnée générée par une machine ou sur les données ouvertes. Un expert a insisté sur la nécessité d'un vocabulaire commun pour parler de la propriété des données, étant données les différences dans les systèmes juridiques quant à la notion de « propriété ». Pour cet expert, le plus important était de cerner l'ensemble des droits rattachés à une donnée (par ex., le droit d'accès, le droit d'exploitation, le droit de cessation, et le droit de détruire). Selon un autre expert, le contrôle des données était plus important que la propriété. Outre les droits attachés aux données du fait d'un contrat, la loi pourrait consacrer un droit de contrôle limité sur les données au bénéfice de la personne ayant participé à leur création (« données cogénérées »).

10. Quelques experts ont fait remarquer qu'imposer une **localisation des données** avait des effets négatifs sur les flux transfrontaliers de données. En même temps, un certain nombre d'experts ont expliqué que cette obligation était une réaction à des lois étrangères exigeant que les données détenues à l'étranger soient révélées aux autorités publiques. On a signalé aussi le problème découlant des lois qui autorisent aux autorités publiques d'accéder aux données des entreprises étrangères mais détenues localement.

11. Plusieurs experts ont exprimé leur préoccupation face à l'émergence d'une sorte de « cyber-colonialisme » en Afrique, en raison du fait que la grande majorité des données générées en Afrique n'y sont pas stockées, avec pour conséquence que les entreprises africaines n'y ont pas accès.

12. Un expert a fait observer que le **stockage des données** ne posait aucune difficulté importante étant données les exigences techniques qui sont actuellement de mise pour sécuriser les données. Un autre expert a mentionné les avantages des services d'archivage électroniques, qui ne sont actuellement pas traités par la réglementation européenne en vigueur sur les services de confiance.

13. Quelques experts ont rappelé le lien entre le développement et l'utilisation de l'**intelligence artificielle** d'une part, et la qualité et les libres flux de données d'autre part. Un expert a attiré l'attention sur des décisions de justice récentes dans l'Union européenne et en France dans lesquelles le juge avait analysé les algorithmes utilisés par les plateformes en ligne d'intermédiation afin de caractériser le contrôle dans les relations contractuelles entre la plateforme et son fournisseur.

14. Un expert s'est dit contre l'idée d'octroyer une personnalité juridique distincte aux systèmes d'intelligence artificielle (comme par exemple les robots) et a soulevé la question de l'imputabilité des actions réalisées par ces systèmes. Un éventuel point de départ pour l'élaboration de règles répondant à cette question serait de considérer l'« exploitation » du système comme facteur d'imputabilité, conformément à la note explicative sous l'article 12 de la Convention des Nations Unies sur l'utilisation de communications électroniques dans les contrats internationaux. Selon cet expert, l'on pourrait également prévoir une présomption d'imputabilité en cas de litige.

15. Plusieurs experts ont évoqué la transparence dans l'exploitation des systèmes d'intelligence artificielle et le problème de la « boîte noire » (à savoir l'impossibilité d'établir un lien entre les données qui entrent dans le système et celles qui en sortent, pour un système donné). En même temps, on a mis l'accent sur la nécessité de protéger la confidentialité des algorithmes. Un expert a mis en exergue une solution possible – avancée par l'autorité française de protection des données (la Commission nationale de l'informatique et des libertés) – selon laquelle c'est un tiers de confiance qui devrait « ouvrir » la boîte noire pour vérifier si le système respecte des normes de conduite.

16. Tout comme pour l'utilisation des données, plusieurs experts ont reconnu le rôle du contrat dans la régulation de l'exploitation des systèmes d'intelligence artificielle. Un expert a proposé que des dispositions types à inclure dans les contrats B2B soient élaborées sur le partage d'informations concernant l'utilisation des systèmes d'intelligence artificielle pendant la phase d'exécution du contrat.

17. Le secrétaire de la CNUDCI a clôturé la réunion en résumant les discussions, et en remerciant les experts pour leur participation.

III. Report of the Rome event

A. Overview

1. On 6–7 May 2019, the UNCITRAL secretariat joined with the International Institute for the Unification of Private Law (Unidroit) to hold a workshop in Rome on legal issues arising from the use of smart contracts, artificial intelligence (AI) and distributed ledger technology (DLT, including blockchain) under the patronage of the Ministry of Foreign Affairs and International Cooperation of Italy. The workshop was the product of similar exploratory work being conducted by the Unidroit secretariat, which focusses on specialized areas of work of Unidroit, including capital markets and secured transactions.

2. The workshop was attended by around 50 experts from academia, government, legal practice and other international institutions, and featured five panels. Several common themes emerged from the various panel discussions:

(a) The law has a role to play in creating certainty for business in the digital economy and predictability in commercial transactions;

(b) The law can foster the use and development of AI systems, smart contracts, DLT, and other emerging technologies, and should not be used as an obstacle to such use and development;

(c) Work at an international level to develop a harmonized response to legal issues could pre-empt fragmented national legal responses, an obstacle to cross-border trade;

(d) Given the fast pace at which technology is being developed, any future work should respect the principle of technology neutrality, specifically the need to avoid regulating a particular technology such as DLT, and the need for any new instrument to be “future-proof”;

(e) Future work should focus above all on the disruptive impact of emerging technologies on commercial transactions.

3. The workshop concluded with an outline for possible coordinated future work programme for consideration by UNCITRAL and Unidroit, building on the views expressed during the workshop. This work programme could comprise: (a) developing a legal taxonomy of key emerging technologies and applications driving the digital economy, such as AI, smart contracts, digital assets and digital ledgers, and an appraisal of existing UNCITRAL, Unidroit and other instruments to determine how they apply to them; (b) a review of these existing instruments with a view to adapting them to use of emerging technologies; (c) a review of liability and risk allocation issues arising from the use of AI systems; and (d) an analysis of the legal issues arising from the tokenization of assets or of particular documents of title. It was noted that issues such as insolvency, conflict of laws, institutional frameworks, the role of platforms, enforcement mechanisms, and dispute resolution could provide the groundwork for this analysis.

4. The view was expressed that a joint follow-up event should be organized by UNCITRAL and Unidroit to fine-tune the scope of possible future work.

B. Summary of discussions

5. **Panel I** considered how AI, smart contracts and DLT are positioned within the existing legal landscape.

6. It was noted that the use of smart contracts raised a number of legal issues, including formal validity, the translation into code of “soft” concepts such as reasonableness and good faith, and the enforceability of certain self-executing remedies in the event of default or other event.

7. Some fundamental features of AI were identified for the purposes of legal analysis: (a) algorithms are the DNA of AI; (b) AI needs data to operate, which can be sourced from sensors, oracles or user input; and (c) AI “learns”. It was also noted that the use of AI systems raises issues of attribution and liability (risk allocation), as well as issues of discrimination with respect to decision making.

8. It was emphasized that, when analysing digital assets supported by DLT, a distinction should be drawn between permissioned and unpermissioned (or permissionless) ledgers, as well as between “endogenous” and “exogenous” assets. For endogenous assets (i.e., assets constituted on a distributed ledger), the point was made that an important factor in the legal characterization of a digital asset is the purpose that the asset serves. This guides determinations as to what proprietary rights and interests subsist in the asset, which in turn impacts other areas of law such as insolvency, transfer, succession, securitization, custodianship, and choice of law. With respect to endogenous assets (i.e., assets not constituted, but rather recorded, on a blockchain), parallels were drawn with past work of Unidroit on intermediated securities and of UNCITRAL on security interests.

9. **Panel II** focussed on possible future work of UNCITRAL and Unidroit in the areas of AI and the custody of digital assets.

10. With regards to AI, the issue of transparency of algorithms used in AI systems and the issue of contracting for intelligent products and services were highlighted. On the first issue, it was suggested that work could be carried out on developing rules for testing the results of algorithmic decision-making to ensure compliance with certain legal standards (so-called “outcome transparency”). A question was raised as to the possible role of trusted third parties in carrying out these tests. On the second issue, it was suggested that, against a backdrop of relatively weak obligations and limitation of liability clauses found in standard contract, work could be carried out on developing model contractual clauses to guarantee a minimum level of assurance for users.

11. With regards to the custody of digital assets, the discussion focussed in particular on issues encountered in fintech and the use of cryptocurrencies. It was suggested that further work in this area pay heed to the distinction between the legal relationship between investor and digital asset (i.e., where the investor acquires and disposes of digital assets directly) and the legal relationship between investor and intermediary/custodian (including online platforms). It pointed out that, for exogenous assets, a situation of “double intermediation” can arise wherein an asset is traded on a blockchain by participants acting on behalf of an offline investor.

12. The panel suggested that further work could look at the nature of any regulatory or supervisory body, intermediary risk (i.e., the risk of creditors claiming against digital assets held by the intermediary in the event of default by the intermediary), and the rights of investors in the event of insolvency of the intermediary. The view was expressed that it was preferable to address insolvency in a broader digital assets project rather than to address it by updating existing UNCITRAL texts on insolvency (which do not contemplate digital assets).

13. For directly held digital assets, a particular issue to be addressed was that of “control” over digital assets and the subsistence of property rights and interests in digital assets, an issue touched on in panel I. Another issue identified was that of settlement finality for financial transactions involving the acquisition of digital assets.

14. **Panel III** analysed how existing legal provisions apply to smart contracts. Reference was made in particular to UNCITRAL model laws on e-commerce, the Electronic Communications Convention, the Unidroit Principles of International Commercial Contracts, and various EU directives. The panel identified three different levels of intervention: (a) hard law regulation; (b) non-binding standards; (c) influencing the practices and procedures of individual parties, including through the development of model contract provisions.

15. The prevailing view was that smart contracts do not operate in a normative vacuum, in the sense that general principles of contract law are already applicable. At the same time, it was felt that guidance is needed as to how these principles apply.

16. Moreover, the view was expressed that there is scope to update existing legislative instruments so as to adapt them to the specific features of AI that enable smart contracts. In this regard, an example was given of article 12 of the Electronic Communications Convention, which deals with the formation of contracts using “automated message systems”. The point was made that smart contracts and AI are not so much about *automated* systems, but *autonomous* systems, the difference being that autonomous systems involve machine “learning” and less predictability as to the outcome of the process. It was added that rules are needed to address the validity of actions and transactions of autonomous AI systems.

17. Recalling discussions in panel I on AI, some doubt was cast on the feasibility of addressing issues of attribution and liability (risk allocation) relating to the operation of AI systems. Here too, the point was made that existing general principles of law are applicable and would equally merit guidance as to how they apply.

18. **Panel IV** identified different use cases for DLT, smart contracts and AI in financial transactions (i.e., their application in fintech). First, the use of DLT for commodity sales, for which the main legal issues arise from the tokenization of exogenous assets. Second, the use of permissioned DLT in finalizing rights to payment (e.g., receivables). Third, the use of AI and smart contracts in enforcing security interests. Concern was voiced about bundling DLT, platforms, smart contracts and AI together, with the point being emphasized that DLT and platforms represent different organizational and business models, whereas smart contracts and AI represent different forms of technology that could be, but need not be, incorporated into those models.

19. The panel then proposed possible projects for UNCITRAL and Unidroit to address these use cases. One proposal was to develop a taxonomy of legal issues arising from digital assets, or alternatively of legal issues arising from the tokenization of documents of title, such as bills of lading and warehouse receipts, taking into account the work of UNCITRAL in developing the Model Law on Electronic Transferable Records. Another proposal was to develop a practice guide on applying existing law to emerging technologies, addressing in particular rights to payment using DLT and its interrelationship with prudential regulation. Yet another proposal was to study the property dimensions of digital assets, the location of digital assets, and the nature of trading on platforms.

20. **Panel V** considered issues of liability and remedies.

21. At the outset, it was noted that the liability of AI systems raises complex questions of public policy. It was explained that there is no agreement on the concept of “wrong” with respect to the operation of AI systems; it could refer to the system causing damage or injury, system malfunction, or the system producing discriminatory outcomes. Further to the discussion on panel II, the desirability of algorithm transparency was reaffirmed, which needs to be balanced against legitimate interests in protecting intellectual property rights and trade secrets.

22. The panel considered different types of liability regimes for AI systems, noting that the analysis should proceed on the basis of use cases. To that end, a taxonomy of entities involved in the operation of AI systems was identified, including manufacturers (hardware and software producers), users (keepers and AI system operators) and the AI system itself. It was suggested that strict liability on the part of the producers is appropriate, possibly in conjunction with mandatory liability insurance, where there is a risk of frequent or severe harm arising from the operation of the AI system. Conversely, fault-based liability might be appropriate where there is a lower risk of harm. It was pointed out that strict liability could promote accountability and transparency also in AI systems. It was also pointed out that it is

inappropriate to impose strict liability on the user of the AI system if the user has no control over the system.

23. As an alternative, the view expressed in panel III was reiterated that there might be merit in analysing how existing general principles of law are applicable to the operation of AI systems. In this regard, reference was made to product liability law. Either way, the point was made that disparities in national laws governing tort liability create obstacles to the flow of trade.

24. The panel discussed a proposal to confer legal personality on autonomous robots. The prevailing view was that this is not an appropriate approach for dealing with liability.

25. The panel considered issues relating to the settlement of disputes arising out of the use of DLT and AI systems, including adducing evidence, interpreting code embedded in smart contracts (a matter also addressed in panel I), and enforcing court-ordered remedies. In this regard, the immutability of DLT was not regarded as a barrier to enforcement.

26. The panel concluded by identifying three different levels of intervention: (a) updating existing legislative instruments on automated systems (i.e., the Electronic Communications Convention) so as to adapt their rules of legal validity to address autonomous systems and to expand them to address attribution; (b) developing new rules on liability (risk allocation) in contractual and extra-contractual matters involving the operation of AI systems; and (c) developing a deeper set of substantive and procedural rules governing self-execution of smart contracts and remedies.

IV. Report of the Bogota event

A. Overview

1. On 5 June 2019, the UNCITRAL secretariat, together with the Ministry of Information and Communications Technology (MINTIC), held a regional conference on legal issues relating to the digital economy in Latin America. The conference was attended by 146 experts from Colombia and the region, as well as representatives from the Organization of American States, and featured panels dealing respectively with the following topics: (a) identity management and trust services; (b) cross-border data flows; (c) smart contracts and artificial intelligence (AI); and (d) paperless trade facilitation. The conference was the third in a series of events organized by the UNCITRAL secretariat in furtherance of an exploratory mandate conferred by UNCITRAL on its secretariat to compile information on legal issues relating to the digital economy (the first having been held in Paris in March 2019 and the second having been held in Rome in May 2019). The conference also served to engage with the region on topics on the current work programme of UNCITRAL in the area of electronic commerce.

2. There was a general agreement among panellists that further work of UNCITRAL on legal issues related to cross-border aspects of identity management (IdM), data flows and paperless trade facilitation would be beneficial, as would further work to analyse the legal issues associated with smart contracts and AI. Panellists emphasized the role of past and future work of UNCITRAL in establishing a legal environment to implement regional free trade agreements, and the need for this work to respect the core principles of technology neutrality, functional equivalence and non-discrimination.

B. Summary of discussions

3. On **identity management and trust services**, panellists explained how electronic transaction laws have evolved in the region. Panellists recognized the continued importance of the three core principles that have guided UNCITRAL's

work in the area of electronic commerce – i.e., the principle of technology neutrality, functional equivalence and non-discrimination – and the influence of these principles in the development and implementation of national identity management and trust service regimes (including electronic signature regimes). At the same time, panellists noted legal divergences between national regimes, which prevent cross-border interoperability in the region. Some countries in the region have not incorporated UNCITRAL texts on electronic signatures into their national law while others have done so with significant modifications.

4. The conference coincided with a review of digital citizenship services in Colombia. Under a proposed new model, these services will comprise the following three basic services: (a) an interoperability service (exchange of information between public entities); (b) a digital authentication service (validation of identity and protection against digital fraud); and (c) a digital citizen folder service (knowledge of data held by public entities). Among other things, digital citizenship services will allow citizens to access public services and other formalities online.

5. Panellists noted that the proposed new model for digital citizenship services in Colombia has taken into account legal developments in Peru and the Alianza del Pacífico. The conference was informed that Peru has implemented a unique national identification system for public services, which has created a national platform for electronic identity authentication based on the use of publicly-issued credentials. The system incorporates three different levels of assurance and involves the interaction between authentication service providers, attribute providers, online service providers and users (the citizen).

6. On the evolution of electronic signature legislation in the region, panellists referred to the Alianza del Pacífico Digital Agenda Group, which was established to implement a roadmap for implementing, developing and deepening specific issues in accordance with the telecommunications and electronic chapter of the Commercial Protocol of the Alianza del Pacífico. They also referred to the 2018 Declaration of Puerto Vallarta, which defines a common framework for the implementation and cross-border recognition of advanced forms of electronic signatures within Alianza del Pacífico countries with a view to facilitating trade and electronic transactions.

7. Panellists discussed a number of challenges, particularly in relation to data security and the rights, obligations and liabilities of service providers and users, including in cases of data security breach. Panellists reported misconceptions about the automatization of IdM processes arising from the lack of user-friendly interfaces, and noted the trust deficit in data management. They also noted concerns about fraud and lack of control over an individual's online profile. Panellists drew attention to disparities among the various economic sectors in terms of the use of technology. The sophistication of the financial and private health sectors was compared with the simplicity of the agriculture sector. Disparities also existed between users by virtue of the fact that not all people have access to the internet. Panellists agreed that legislation regulating IdM must contemplate all realities.

8. On **cross-border data flows**, panellists pointed to existing definitions of “data”, such as that developed by the International Organization for Standardization and International Electrotechnical Commission. According to that definition, data is a “re-interpretable representation of information in a formalized manner suitable for communication, interpretation or processing”. This definition was illustrated through the data processing cycle – from its generation to its entry into the economy to its subsequent use for marketing – in order to demonstrate the monetary value of data.

9. Panellists noted that, while data is usually processed under contract, most of the time these contracts are entered into by data suppliers involuntarily. Panellists identified the need for better understanding of the rights and obligations of parties to data transactions. Under current legal frameworks in the region, there is limited ability to control third parties down the data processing chain and there are no sanctions against third parties for using data for purposes other than those for which consent was given. Panellists queried the suitability of traditional remedies given the

non-rivalrous and non-fungible nature of data. In this regard, a query was raised whether the creation of new rights in data could be a solution.

10. Panellists pointed to the potential to invoke property and privacy to challenge the use of data mining by commercial actors to feed algorithms. It was added that it is very difficult to apply these concepts when the data is behavioural of companies or consumers. These situations raised questions such as the extent to which a user has given its consent to a website compiling data through the use of cookies, and the extent to which the user can prevent that data from being transmitted to third parties in cases where the data is being transmitted for purposes other than those agreed to by the user.

11. Panellists continued the debate by noting other challenges in regulating data, such as diversity in the nature of data, the content of data, the platforms used to exchange data, the actors involved along the data processing chain (private and public sector), the location of the data (cloud storage, storage in another country), differences in technologies, and issues of prior consent. Some panellists, representing the views of the private sector, provided the example of companies using cloud services to host client data. The point was made that clients do not trust the cloud, and that there was a need for greater transparency and control. The view was expressed that clients should be kept informed of how their data is being used, where their data is, and their rights when data is transferred across borders.

12. Panellists referred to existing legal frameworks that regulated data transactions at a local level. At the same time, they agreed that there was a lack of adequate regulation dealing with cross-border data transactions. At a high level, panellists drew attention to the electronic commerce chapter of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the digital trade chapter of the Agreement between United States, Mexico and Canada (USMCA), both of which were concluded in 2018. Among other things, the digital trade chapter of USMCA provides for the free flow of data across borders. Like the CPTPP, it obliges the parties to maintain a legal framework governing electronic transactions that is consistent with the UNCITRAL Model Law on Electronic Commerce, and contains rules on electronic signatures that reflects principles in the UNCITRAL Model Law on Electronic Signatures. However, panellists underscored the absence of a comprehensive international legal regime applicable to (non-personal) data transactions. The view was expressed that the United Nations Convention on Contracts for the International Sale of Goods does not apply to non-tangible goods such as data. It was also noted that the framework for the free flow of non-personal data in the European Union had a limited focus on abolishing data localization requirements and promoting data portability. It was suggested that the CPTPP might provide the foundation for a Latin American legal framework on data flows, noting that several states in the region are already party to the CPTPP.

13. It was noted that the contract is an appropriate tool to regulate the use of data. In this regard, reference was made to the ongoing joint project of the American Law Institute and European Law Institute for the development principles for the data economy. This project is studying different types of data transactions, such as contracts for the supply of data, for access to data sources, for toleration of processing, and for the processing of data. It was noted that the joint ALI/ELI project includes a study of a limited right of a data supplier to enforce contractual limitations against a third-party contractor down the data processing chain ("leapfrogging"). Panellists emphasized the utility of this project, and called for further studies on the effective control of data, the obligations of parties to data transactions, and remedies for non-compliance.

14. Panellists engaged in a discussion on legal gaps relating to data generated by artificial intelligence processes. It was noted that limited protection existed for algorithms under existing copyright and patent regulations. Emphasis was placed on the need to harmonize and provide a more secure legal framework for data. At the

same time, it was recognized that AI is still in the early stages of development and that technological developments could provide a solution.

15. Panellists observed that the Latin American region is influenced by legal developments in Europe and the United States. In this regard, the EU and US take different approaches to the regulation of consumer protection and personal data protection. Legal divergences also exist in the treatment of monopolies for data processing and security. Some panellists argued that a pragmatic solution at the international level to dealing with the divergent approaches between jurisdictions would be for authorities to exchange legal information on cross-border data flows under legal assistance treaties. This exchange could also facilitate cross-border enforcement. Other panellists reflected on the possibility of exploring industry self-regulation, such as the development of codes of conduct.

16. On **smart contracts and AI**, panellists made reference to national projects involving the use of blockchain technology to support the registration of land titles and the use of smart contracts in public procurement. It was noted that some countries have enacted legislation that defines smart contracts, establishes requirements for smart contracts, and recognizes their enforceability. Other countries have created pilot projects for online courts for hearing internet-related disputes which recognize the legal validity of evidence stored on the blockchain.

17. Panellists noted concerns in the region that smart contracts could adversely affect some professional groups, in particular notaries. However, efforts to modernize the provision of notarial services, such as legislation allowing notaries to issue certificates using electronic signatures, would go some way to alleviate these concerns and even provide new opportunities for the profession.

18. Panellists agreed on the need for a legal framework governing smart contracts from formation to enforcement. There is considerable uncertainty as to several legal aspects of smart contracts, such as the expression of consent, conditions for validity, liability, performance and excuses for non-performance (hardship, force majeure), remedies for non-performance, and enforcement. There is also a need to understand the relation between smart contracts and AI agents.

19. It was acknowledged that some UNCITRAL instruments facilitate the use of smart contracts in international transactions. Reference was made to article 12 of the Electronic Communications Convention dealing with automated message systems. It was added that any further work to develop a legal framework governing smart contracts should be guided by the principles of functional equivalence, non-discrimination, good faith, party autonomy, legal security, transparency, accountability, due process, and access to justice.

20. On **paperless trade facilitation**, panellists welcomed the trend in trade negotiations towards forging greater synergy between provisions on customs and administration and trade facilitation on the one hand and e-commerce and the digital economy on the other.

21. Panellists agreed that blockchain technology impacts several international trade business processes, including transport, customs, and port operations. Examples were given of paperless trade facilitation in the region, such as the issuance of custom clearances in electronic form, electronic programmes for risk management, and the implementation of the programme of authorized economic operators under the WTO Trade Facilitation Agreement (TFA).

22. As for challenges, panellists agreed that UNCITRAL texts provide the basic principles and solutions to implement trade facilitation obligations under international free trade agreements. It was noted that several countries in the region are working on establishing national committees on trade facilitation, as required by the TFA. The objective of these committees is to create a “community system” featuring a single window for operators and computerized customs clearance systems. Once implemented, these committees will facilitate international trade operations online as well as the interoperation with other national committees.

23. At the regional level, panellists referred to the experience of custom administrations in Alianza del Pacífico States and reaffirmed the view that paperless trade improves traceability and security. One of the challenges of the Alianza del Pacífico is the interoperability of the single window for foreign trade. Currently, customs administrations in the region are processing phytosanitary certificates, certificates of origin and customs declarations in electronic form. Effort are underway to expand this positive experience to the Andean Community and MERCOSUR.
