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

Contents

I. Introduction

1. This document presents the reports of two of the events organized by the Secretariat since the fifty-second session of the Commission (Vienna, 8–19 July 2019) on legal issues related to the digital economy:

(a) The "**Incheon event**" – the inaugural "Incheon Law and Business Forum" held in Incheon, Republic of Korea, on 18 September 2019, co-organized with the Ministry of Justice of Korea and the Incheon Metropolitan City on the theme of *Challenges of Doing Business in the Digital Economy in Asia and the Pacific*; and

(b) The "**taxonomy workshop**" – an expert group meeting held in Vienna on 10–11 March 2020, in collaboration with Unidroit, to advance work on a taxonomy of emerging technologies and their applications.

2. A report on the progress made by the Secretariat in its exploratory work on legal issues related to the digital economy since the fifty-second session is set out in A/CN.9/1012.

II. Report of the Incheon event

A. Overview

3. The Incheon Law and Business Forum ("ILB Forum") is designed to provide a platform for discussing legal and non-legal obstacles faced particularly by businesses in the evolving trade environment and for gathering input of public and private stakeholders on the role of UNCITRAL and its Regional Centre for Asia and the Pacific to facilitate trade through legal harmonization (see also document A/CN.9/1024 on the report of the Regional Centre).

4. The theme of the inaugural ILB Forum was "Challenges of Doing Business in the Digital Economy in Asia and the Pacific", which responded 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".[1] Intended to be a continuation of previous events organized by the Secretariat for the same purpose,[2] the ILB Forum addressed the legal obstacles that diverse business entities, regional organizations, and Governments in Asia and the Pacific encountered in the context of the digital economy and identified possible recommendations and solutions. This report thus supplements document A/CN.9/1012 on legal issues related to the digital economy, which sets out a summary of the exploratory work undertaken by the Secretariat so far.

5. The Forum was the first occasion to discuss UNCITRAL's digital economy agenda in the Asia Pacific region. The ILB Forum was opened by Ms. Anna Joubin-Bret, the Secretary of UNCITRAL, who provided a general overview of

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[1] *Official Records of the General Assembly, Seventy-third Session, Supplement No. 17* (A/73/17), para. 253(b). It was also stressed that discussions should focus on identifying legal obstacles and their possible solutions and avoid privacy and data protection issues.

[2] The three events are as follows: (a) the expert group meeting, co-organized with the Institute for Advanced Judicial Studies (Institut des Hautes Etudes sur la Justice) and the Ministry for Europe and Foreign Affairs of France to discuss legal issues relating to cross-border data flows and artificial intelligence (Paris, 15 March 2019); (b) the workshop on legal issues arising from the use of smart contracts, artificial intelligence and distributed ledger technology, co-organized with the International Institute for the Unification of Private Law (UNIDROIT) under the patronage of the Ministry of Foreign Affairs and International Cooperation of Italy (Rome, 6–7 May 2019); and (c) the regional conference on legal issues relating to the digital economy, co-organized with the Ministry of Information and Communication Technology of Colombia, in cooperation with the Organization for American States (OAS) and the Inter-American Development Bank (Bogota, 5 June 2019).

UNCITRAL's exploratory work on legal aspects related to the digital economy. Comprised of two panels and one roundtable discussion, the Forum was attended by approximately 50 experts from Governments, international organizations, and the business and legal communities. The first panel "New Frontiers in the Digital Economy" addressed recent developments and challenges to diverse stakeholders in the digital economy, while the second panel "The Changing Legal Landscape" focused on the domestic and regional legal obstacles facing businesses in adapting to new technologies, and the need for possible law reform. The Forum concluded with a roundtable discussion on the disruptive impact of emerging technologies on commercial transactions, public policy considerations, and specific legal issues including recommendations for UNCITRAL's existing texts and possible future work. The following provides a summary of the discussions.

B. Summary of the discussions

1. Opportunities

6.   While the discussions eventually focused on identifying structural and legal challenges that businesses faced in transitioning to the digital economy, a widely shared view was that faster connectivity using 5G and the increased use of new technologies, such as artificial intelligence (AI), big data analytics, distributed ledgers (namely blockchain), and cloud computing, provided significant opportunities for businesses and cross-border trade. In that context, a number of new business models using emerging technologies were shared.

7.   It was noted that the digital economy has not only made it possible for businesses to maximize the efficiency of their existing operations using different technological means while also providing new opportunities for landlocked developing countries, rural businesses and women entrepreneurs to actively engage in trade, including in cross-border trade. For example, a representative from a start-up pointed out that the social value created by sharing-economy business models based on blockchain technology and the digitization of assets could eventually promote some of the United Nation's Sustainable Development Goals, such as gender equality, decent work and economic growth, industry, innovation, and infrastructure, and sustainable cities and communities. The Executive Director of the International Think Tank for Landlocked Developing Countries also highlighted the benefits of e-commerce in facilitating cross-border trade in Central Asia.

8.   References were made to research highlighting the economic impact that technologies could bring. For example, it was stated that the economic multiplier value of AI could reach five trillion United States dollars by 2025. The social and commercial benefits of blockchain technology were also lauded. An expert from a global banking firm illustrated how a blockchain-based platform, which provided a simplified channel for digitizing the trade finance process (from issuance of electronic letters of credit to presentation and exchange), had significantly reduced the time required for transactions from eight business days to five hours. That expert estimated that, with global trade volumes likely to increase from 1.1 trillion dollars to 17.1 trillion dollars by 2026, the use of blockchain technology in trade finance could reduce time for exporters by 44 per cent, save 31 per cent in related costs and boost exports by up to 257 billion dollars annually. It was also mentioned that such developments would particularly be useful to micro, small and medium-sized enterprises (MSMEs) in need of access to finance.

9.   The potential of online platforms to settle high-volume, small-value disputes was also highlighted. While UNCITRAL had prepared the Technical Notes on Online Dispute Resolution in 2016, it was suggested that the increased use of digital technology since then and the development of online platforms using AI meant that a renewed attention would be desirable. The potential for using such platforms not only to settle disputes but also to facilitate deal-making and contract performance, as well as to enhance access to justice for big and small businesses alike, was mentioned.

2. Risks

10. While the participants at the ILB Forum generally agreed that the digital economy provided new frontiers for businesses, they also shared some uncertainties about the legal and regulatory environment in which the businesses would be operating. These uncertainties generated risk, which in turn translated into transactional costs as well as liability for businesses.

11. For example, caution was expressed about over-regulation of new technologies, which could inhibit new business models based on those technologies. If businesses were permitted only to operate within a set framework, this would likely obstruct the development and growth of new business models and thus innovation. In that context, a preference for negative regulatory regimes (business could operate unless prohibited to do so) was expressed. Examples were shared of businesses that were successful in some countries but unable to legally operate in others due to the regulatory framework. In sum, caution was expressed for overregulating new technologies and business models based on such technologies as it could hinder their growth and commercial application. Similarly, it was observed that party autonomy should continue to form the basis of trade in the digital economy to allow for flexibility and innovations in coping with new challenges.

12. Another risk that was highlighted was legal fragmentation. It was noted that businesses were often subject to a number of different laws and standards, which was amplified when engaging in cross-border trade. Participants at the ILB Forum called on Governments to take the lead in ensuring that industry standards could apply globally. It was suggested that an international legal framework enabling the use of digital signatures across borders and one addressing restrictions on cross-border data flows and data sharing would be particularly useful. Some expressed support for, and highlighted the importance of, free flow of data in the context of cloud computing and big data processing. For example, it was mentioned that, when businesses were required to set up separate servers in compliance with data localization requirements instead of maintaining a single cloud server, the cost of the operation would be much higher.

13. Issues relating to data ownership or the right to use of data were also discussed. It was stated that, in the absence of harmonized laws across borders, those issues needed to be carefully delineated in individual contracts, adding to costs. This absence in turn rendered it difficult for parties to use standard contract clauses to facilitate international commercial transactions in the digital economy, thus causing uncertainty and lack of predictability.

14. In the same vein, participants urged the development of a common legal taxonomy of key emerging technologies underlying the digital economy, as a common terminology or classification accepted across territories and industries would facilitate a better understanding of the relevant issues.

3. Legal frameworks and gaps – conclusion

15. Efforts by a number of States in the Asia Pacific region to adopt a legal framework to support and to develop digital economy policies and initiatives were shared (Azerbaijan, Bahrain, China, India, Japan, Kazakhstan, Kyrgyzstan, Mongolia, Myanmar, Nepal, Republic of Korea, Tajikistan, Thailand and Uzbekistan). While such efforts varied in terms of infrastructure to support the digital economy, they exemplified the importance that States were placing on those initiatives. It also showed that States were making continued efforts to adapt their policies to the evolving digital economy.

16.   It was generally felt that UNCITRAL's e-commerce texts[3] provided a sound basis for facilitating online transactions and had been particularly successful in the region, with most States in Asia and the Pacific having already adopted them or indicating an intention to do so. In addition, UNCITRAL texts were identified as standards to establish mutual legal recognition mechanisms in the region.[4]

17.   While the applicability of existing UNCITRAL texts to the digital economy was highlighted, different views were expressed on whether they could sufficiently address the diverse legal issues that arise in the digital economy. For example, with regard to trade facilitation, it was suggested that Governments needed to provide a digital ecosystem that connected all the relevant actors involved in cross-border transactions, which included not only buyers and sellers but also customs services and shipping providers. It was highlighted that, while an effective single e-window system assumed that paperless trade would be accepted by all those involved, in practice, paper documents were still required for clearing customs in most jurisdictions and the role that UNCITRAL could play to further facilitate paperless trade was mentioned. Similar questions were raised with regard to AI and blockchain technology, mainly whether any new harmonized standard would need to be developed to address legal issues that could arise from their application in international trade.

18.   In conclusion, the participants of the ILB Forum reiterated that disparities between national legal frameworks and, in some cases, the absence of or unclear legal standards were the key challenges faced by businesses in transitioning to the digital economy. It was stated that developing and harmonizing legal frameworks that facilitated the use of the wide array of emerging technologies would be most desirable and one that could be undertaken by UNCITRAL at an intergovernmental level. It was further emphasized that the principles of technology neutrality, functional equivalence, and non-discrimination, which form the basis of the existing UNCITRAL e-commerce texts, should be the basic principles of any new legal instruments for the digital economy.

III.   Report of the taxonomy workshop

A.   Overview

19.   On 10–11 March 2020, the UNCITRAL secretariat hosted an expert group meeting at the Vienna International Centre, organized with the Unidroit secretariat, to develop a legal taxonomy of key emerging technologies and their applications. The meeting followed on from a workshop organized by the Unidroit and UNCITRAL secretariats on legal issues arising from the use of smart contracts, AI and distributed ledger technology (DLT), which was hosted by the Unidroit secretariat in Rome on 6–7 May 2019.

20.   The expert group meeting opened with an address by Ms. Joubin-Bret, who explained that the discussions at the meeting would be guided by a discussion paper that had been jointly prepared by the UNCITRAL and Unidroit secretariats and circulated to experts prior to the meeting. The purpose of the meeting was not to tackle each technology and application covered by the discussion paper in detail, but rather to identify priority topics to be tackled in future work.

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[3] These include the Model Law on Electronic Commerce (1996), Model Law on Electronic Signatures (2001), United Nations Convention on the Use of Electronic Communications in International Contracts (2005), and the Model Law on Electronic Transferable Records (2017).

[4] For example, article 6 of the Framework Agreement on the Facilitation of Cross-border Paperless Trade in Asia and the Pacific, concluded in 2016 by UN ESCAP and article 14.5 of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, concluded in 2018.

B. Artificial intelligence

21.   Several experts agreed that a distinction between the use of AI *in* trade (e.g., the supply of AI-enabled goods and services) and the use of AI *to* trade (e.g., the use of AI systems to manage supply chains, to market goods and services, and to enter into and perform contracts) was useful. At the same time, some experts noted that the same product could be used both *in* trade and *to* trade, and therefore that the distinction might not always be clear-cut. Several experts endorsed the view that AI marked a second generation for e-commerce for which the rules developed for the first generation (such as in the Model Law on Electronic Commerce) applied but might need to be revised.

22.   Experts explored the **definition** of AI for the purposes of the taxonomy. It was advocated that the taxonomy should not formulate a definition as this could harm technology neutrality. According to this view, the best approach would instead be to set out the distinctive features of AI that warranted new rules. The importance of technology neutrality was reiterated, although it was also remarked that some technology specific rules might be useful.

23.   With respect to **actors**, it was suggested that, from the point of view of extracontractual liability, a distinction should be made between the person who controls the technology and the person who benefits from it. Thus, the concepts of control and benefit would need to be defined.

24.   A query was raised about including persons responsible for the theoretical high-level design of the AI system as actors, as this class was too broad. It was explained that there was not a single designer of a program and that, if this class were to be included for the application of a liability regime, it would be difficult to manage. It was instead advisable to create more specific classes of actors. It was added that the class of persons who monitor the system was not broad enough, as the matter was not only about monitoring, but also about reviewing the data. It was also suggested that the importance of data should be emphasized even more in defining the classes of actors, and that a reference to data should be incorporated into the description of the actor who verifies the AI software and its integration, as well as the actor who deploys the AI system.

25.   It was suggested that the actors involved in an AI system should be divided into three groups on the basis of their participation in the AI lifecycle: first, the developers (including those involved in programming, training and testing the software); second, those who integrate the AI into goods or services; and third, those who use the final product, including through an application user interface. It was added that it was important also to focus on the data provider. It was suggested that the word "operator" should be used instead of "user" to avoid confusion with consumer law. Moreover, the word "operator" provided an opportunity to define different scenarios in which AI was deployed. In this regard, it was noted that some "users" were more passive than others. On the one hand, there were consumers; on the other hand, there were business users which might have a say in the development of the particular AI system. It was pointed out that not all actors in the use of an AI system would be human, with some actors being AI or partly machine- and partly human-driven. It was noted that the meaning of "user" could be different depending on whether the AI system was deployed *to* trade or *in* trade.

26.   With respect to **legal relationships**, it was observed that the discussion paper was primarily concerned with contractual relationships between actors. More challenging questions arose in the "grey zone" between contractual and non-contractual relationships, including the duty to provide updates and data feeds to actors further along the AI lifecycle. It was pointed out that such duties could be the subject of contract (e.g., an end user agreement). It was also noted that a purely contractual approach to the matter might not be enough, as the use of AI engaged other legal regimes such as anti-trust law and financial services regulation. It was noted that the impact of AI on other areas of the law should be acknowledged, but not

elaborated upon in the taxonomy, as these areas of law fell outside the mandate of UNCITRAL. It was suggested that it might be necessary to broaden some of the traditional taxonomies that already existed, rather than to attempt to fit everything into those existing taxonomies.

27. Returning to the distinctive features of AI, several experts agreed that AI was all about the use of algorithms and big data. The challenge of AI being "data-driven" was that it was not possible to check and trace all of the datasets on which an AI system depended. Yet another challenge was dealing with unstructured data.

28. It was highlighted that the speed at which AI technology was developing was also relevant, as was the unpredictability of AI systems. It was pointed out that there was some overlap between several of the distinctive features listed in the discussion paper. For instance, "autonomy" and "unpredictability" were not distinct features but rather unpredictability was the natural consequence of autonomy. Furthermore, it was explained that the "openness" of AI systems was not so much a matter of data dependence as of the fact that AI products might evolve because of updates and their interconnectedness with other devices. A further point was made by several experts that the terms "autonomy" and "learning" were loaded terms that should be avoided in the taxonomy.

29. Some doubts were raised as to whether "opacity", "openness" and "unpredictability" were necessary features of AI. AI was not inherently unpredictable, and it was possible to overcome this issue through improved design and greater transparency.

30. A question was raised whether the disruptive effects of AI were felt most prominently in the operation of AI systems. It was pointed out that legal issues could arise earlier in the AI lifecycle. However, it was added that, from a private law perspective, it probably was appropriate for the taxonomy to focus on legal issues associated with the operation of AI systems.

31. Turning to **legal regimes**, the experts explored the effects of AI on existing contract law regimes. It was noted that contract law was imbued with notions such as knowledge, intention and reasonableness. While applying these notions to the use of AI systems did not present an insurmountable challenge, there was some utility in developing guidelines for translating them in a machine-to-machine ("M2M") environment. It was clarified that a legal regime whereby machines could be liable was not under discussion. As such, experts were invited to express their views on whether existing rules of attribution were usable, and where these should lead in terms of identifying a liable person.

32. It was suggested that the taxonomy should be organized so as to follow the contract lifecycle chronologically, from contract negotiation and agreement to performance and remedies. An additional issue to address was contract interpretation. It was noted that yet another challenge was the imbalance of bargaining power between contracting parties.

33. Experts next explored the effect of AI on existing tort law regimes. It was noted that existing tort law regimes could still be applied to the use of AI systems, but with some adjustments to make them more compatible. Three adjustments were proposed: first, a rule of strict liability in cases where the quantum of damage justified it (referred to as "criticality"); second, the reversal of the onus of proof to counteract evidentiary challenges in light of the complexity and opacity of AI systems; third, a new set of duties to monitor and to inform. It was added that it was important for the victim to be able to claim against a single person for full compensation.

34. A question was raised as to the effectiveness of ethical standards as an alternative, citing difficulties in attracting compliance, let alone enforcement. This problem was accentuated by the difficulty of proving that something wrong was done. It was added that certain ethical standards could be given effect through "safe harbour" regimes.

35.   It was observed that some machines, which were able to outperform humans, were being deployed under supervision of a particular individual (e.g., the use of a diagnostic tool by a medical practitioner). It was queried whether it was fair to impose liability on this individual and whether this might be seen as scapegoating. In response, it was suggested that the benchmark of "correct work" for machines, which was based on human performance, might need to be reconsidered. Another question raised was whether there should be an obligation for machines to learn from their mistakes, to which it was added that this obligation was already becoming part of the law in some jurisdictions.

C.   Data transactions

36.   No questions were raised about the **definition** of "data" given by the International Organization for Standardization. It was suggested that it would be useful to distinguish different "levels" of data. In that respect, data existed at a semantic level (i.e., data that said something about the world), a syntactic level (i.e., data as a code), a physical level (i.e., data stored in a medium or with some physical manifestation), and possibly a structural level (e.g. software or video). It was pointed out that a distinction should be drawn between data that was simply generated and data that was used; data that was used was usually structured and had a meaning ascribed to it.

37.   Some experts referenced the distinction between "provided (or supplied) data" (i.e. data provided by a data subject or by an action taken by that person), "observed data" (i.e. data generated from a person's observations) "derived data" (i.e. data derived from other data) and "inferred data" (i.e. data produced by analytical process). Different legal consequences flowed from this classification. For instance, the "owner" of supplied data was the person supplying the data whereas the "owner" of derived data was the person processing the data. In other words, what was significant was the process of adding value. It was noted that this classification might also be significant for obligations regarding the quality of data. It was added that raw data alone rarely generated value.

38.   It was noted that much of the value in data came from the inferences drawn from it, not the data itself. The inferences themselves might not be data, so that, in the case of personal data, it was not protected by existing personal data protection regimes. It was proposed that the scope of data could be defined more broadly and include the analysis of data as well.

39.   With respect to the **actors** involved in data transactions, it was pointed out that the taxonomy should include third parties who may get access to the data by legal or illegal methods. It was also suggested that the taxonomy should refer to "data subjects"; while this term was used in the context of personal data protection regimes, it was also relevant in a B2B context (e.g., data pertaining to a particular company).

40.   With respect to **legal relationships**, it was proposed that, instead of distinguishing different types of data contracts, the taxonomy should focus on the main obligations involved. This was because the data contracts often involved a mixture of different obligations, such as provision, access and processing. As such, it was preferable to refer to data transactions rather than to data contracts.

41.   With respect to **legal regimes**, experts engaged in a detailed discussion on the property aspects of data. Several experts made the point that, in common law jurisdictions at least, data was not treated as property on the basis that it could not be held to the exclusion of others. It was noted that some rules of property law could nevertheless be applied to data, or that some aspects of data could be treated as if they were property. It was added that the non-rivalrous nature of data should not alone deny it the characterization of property, noting that copyright subsisted in digital works that could readily be reproduced without denying the characterization of copyright as intellectual property. It was added that some aspects of property law could be applied to some aspects of data, and that the conventional wisdom that data

was not property was being challenged by academics and the business world. One justification was that, while a person might not own data produced simply by their own behaviour, when that data was processed by another person so as to generate economic value, that person should enjoy some degree of control over the data akin to property-like rights. It was noted that, in practice, different business models were predicated on an assumption that data could be owned. Of greatest concern was the ability to control and access data. It was added that the language of property was very loaded from a comparative law perspective and that, in an international context, it was preferable to avoid references to "property" and rather to focus on associated rights. At the same time, the application of other legal regimes, such as insolvency law, trust law and succession law, depended on the existence of "property".

42. A point was raised that the value of data was contextual. For instance, the value of data generated by a user on a platform was only useful in the context of that platform. It was noted in response that this phenomenon was true for many assets. For instance, intellectual property did not have value on its own. Another point was raised that protecting all data that was processed would be retrogressive, hindering human endeavours in fields such as scientific and medical research.

43. It was suggested to approach the issue first by determining what attributes data should have, some of which might be similar to property, and then developing appropriate rules to protect those attributes based on the rights that typically made up the "bundle of rights" constituting property. It was added that rights in data risked the same limitations as contractual rights, in the sense of being non-exigible against third parties, if data was not considered property.

44. Several experts flagged the relevance of intellectual property and personal data protection regimes to the discussion. It was emphasized that, while the taxonomy needed to acknowledge the existence and application of those regimes, it was dealing with something different. This approach received broad support from the experts. It was added that existing protections under intellectual property were insufficient for the types of data under discussion. It was suggested that rights in data should be conceived of as a *sui generis* regime, much like trade secrets law. It was noted that the rights with third-party effect that were being considered as part of the joint project between the American Law Institute and European Law Institute to develop principles for a data economy had been inspired by trade secrets law. At the same, several experts questioned the suitability of the substance of trade secrets law to the data economy.

45. Several experts raised questions about the application to data of domestic sale of goods laws as well as the United Nations Convention on Contracts for the International Sale of Goods (CISG). The importance was reiterated of identifying the main obligations under the contract to determine whether it could be regarding as a sales contract. Two special aspects of data transactions were identified: first, that data might continue to be used and transacted after it had been "sold"; and second, that a dataset might not be needed once an AI system had "learned" from it by running it through its algorithm. Some hesitance was expressed about equating data transactions with the sale of goods. At the same time, it was noted that there was merit in developing a set of obligations that could be "implied" into data contracts, which could be inspired by sale of goods law.

D. Digital assets

46. It was stressed that digital assets differed from data. Although digital assets consisted of data, the way in which data was held and in which the asset that it constituted was transferred was designed to avoid "double spending" (i.e., the holder of the asset could not transfer the digital asset twice). As such, digital assets could be enjoyed to the exclusion of others. While there had been much debate about whether digital assets constituted "property", what was needed in the taxonomy was a more "refined" approach to the issue.

47. With respect to **definitions**, it was noted that recent national legislation addressing "digital assets" had been enacted for the purposes of securities regulation, anti-money laundering and taxation. These examples were not apt to addressing the private law aspects of digital assets. Similarly, it was observed that the classification of digital assets as either payment tokens, security tokens or utility tokens had been developed by regulators and was not helpful for addressing the private law aspects of digital assets. It was added that some "hybrid" digital assets could exhibit features of each class. Moreover, the functions of a digital asset could change over time.

48. There was consensus among experts that the taxonomy should draw a clear distinction between "on-chain" (or endogenous) tokens and "off-chain" (or exogenous) assets represented by such tokens. Several experts noted that the real issue in this regard was how a token could represent the exogenous asset and associated rights and claims. It was noted that this issue was not the same for all exogenous assets; for instance, the tokenization of warehouse receipts would likely be less problematic than the tokenization of real estate.

49. It was noted that rules relating to the tokenization of assets should respect the principle of technology neutrality and find functional equivalence with "real world" legal constructs such as negotiable instruments. In this regard, not all legal systems treated bills of lading, bills of exchange or shares as property. Future work on digital assets needed to be cautious of affirming something in the digital world that did not exist in the physical world. It was flagged that there might be a common law and civil law split on the meaning of "off chain" assets. According to common law legal systems, a claim, contractual right or debt security was an "asset", while it might mean different things in some civil law legal systems.

50. Several experts expressed the view that defining digital assets as those that existed on a distributed ledger system would exclude a variety of digital assets that were supported by other systems. In this regard, reference was made to tokens traded in the "Second Life" online platform. Instead, it was suggested that the taxonomy should define the distinguishing features of digital assets, while acknowledging that these features were currently offered by distributed ledger systems. At the same time, it was suggested that there could be merit in developing technology-specific rules, especially for DLT-based cryptocurrencies.

51. Experts considered "tradability" and "transferability" as the distinguishing features of digital assets. It was suggested that another way of framing the distinguishing features of digital assets was to focus on "exclusivity of control" and "singularity", which underpinned the regime for electronic transferable records under the UNCITRAL Model Law on Electronic Transferable Records. It was noted that some trade in digital assets had no equivalence in the physical world. It was added that any rules on trade in digital assets would need to factor in not only the transfer of the data constituting the digital asset but also the rights that the digital asset represented.

52. With respect of **actors** and **legal relationships**, it was suggested that the taxonomy should focus on the issuer, benefactor, addressee and holder of the digital asset. Support was given to using the term "holder" instead of "owner", as it avoided property law connotations. It was acknowledged that the issuer (the counterparty) was not always the system operator, and that the identity of the issuer as either a public or private person was not relevant. Attention was drawn to a law enacted by Liechtenstein in 2019 on tokens and trusted technology service providers, which established a legal framework for transacting in digital tokens. That law described a range of functions that a service provider could perform – including issuing tokens, generating tokens, safeguarding and holding tokens on behalf of another person and exchanging tokens – which could provide a useful reference for defining the actors involved in the use of digital assets. It was stressed that it was not possible to predict how electronic systems supporting digital assets would evolve, and therefore that the taxonomy should take a non-exhaustive approach to identifying actors.

53.   In the case of DLT-based digital assets, a question was raised as to whether node operators should be included as actors. It was added that node operators were nothing more than "blind soldiers". There was consensus among experts that node operators should not be factored into the taxonomy for digital assets. At the same time, it was acknowledged that node operators could be relevant in the application of privacy and data protection laws.

54.   With respect to legal regimes, it was noted that the legal statement released by the UK Jurisdiction Taskforce in November 2019 had already been cited by court decisions in the United Kingdom and Singapore. It had also been referred to in a recent application filed in the High Court of New Zealand by liquidators of the cryptocurrency exchange Cryptopia Limited.

55.   With respect to **legal regimes**, it was agreed that digital assets raised issues for securities law as well as for the law of secured transactions, insolvency law and succession law. It also raised questions as to the application of asset tracing rules, the law of unjust enrichment, and notarial law. It was questioned whether future work should include securities law, noting that the focus should be on private law issues. In this regard, it was noted that recent legislation in Japan to amend fund settlement laws related to securities regulation and not private law issues. It was observed that the issue with the Model Law on Secured Transactions was not whether the exogenous asset fell within scope, but rather whether specific provisions should be devised on taking and enforcing security rights represented by digital tokens. It was added that this was a gap in the MLST. One issue that would need to be addressed in filling this gap was how the existence of the security right could be notified for the purposes of giving it third-party effect.

56.   Returning to property law, it was noted that the question of whether digital assets were "property" only arose with endogenous assets. For exogenous assets, the real issue was the relationship or link with the digital token representing the relevant asset. It was recalled that property law issues might still arise for exogenous assets in some legal systems.

57.   In summing up the discussion, it was observed that the tokenization of assets alone raised a number of legal issues. Based on the exchanges so far, it was suggested that the most feasible way forward to address these issues was to focus on one or two legal regimes that were subject to existing UNCITRAL and Unidroit texts, such as secured transactions and insolvency.

E.   Distributed ledger systems

58.   Experts considered a proposed definition of distributed ledger systems as being "a network of computers ("nodes") each retaining a synchronized record of data (or electronic "ledgers")". It was observed that this definition was too broad and extended beyond the types of distributed ledger systems that were currently deployed. It was suggested that this could be addressed by treating the "qualities" of distributed ledger systems – such as immutability, transparency, auditability and security – as definitional. At the same time, it was noted that some of these qualities were too vague or contestable and thus should not be definitional for legal purposes. It was suggested that, rather than define distributed ledgers by reference to their asserted qualities, the taxonomy should define them by reference to the "tools" that they used, such as cryptography.

59.   It was observed that, while most companies use "permissioned" systems, they were increasingly testing the use of "permissionless" systems. It was therefore suggested that the taxonomy should be open to different systems. In this regard, it was explained that "hybrid" systems were not the result of the merger between permissioned and permissionless systems but rather of a permissioned system tagging on to a permissionless system. It was recommended that the taxonomy should not include "enterprise" systems within scope. It was also recommended that

the taxonomy should take care not to conflate private/public and permissioned/permissionless systems.

60.   It was suggested that, instead of focusing on distributed ledger systems, the taxonomy should focus on platforms. In this regard, there was a spectrum of "architectures" (or models) from distributed systems at one end to centralized systems at the other end. The different features of platforms – open/closed, permissioned/permissionless, centralized/decentralized – were not black and white but rather matters of degree.

61.   It was observed that the chapter of the discussion paper on distributed ledger systems was concerned primarily with their administration and operation. It was observed that, governance issues aside, the use of distributed ledgers did not raise any novel legal issues other than those associated with digital assets and smart contracts. It was added that the use of ledger records as evidence and the identification of the parties could raise legal issues.

62.   After discussion, a consensus emerged among experts that there was little merit in the taxonomy addressing distributed ledgers as a standalone topic, but instead to address distributed ledgers as a means to supporting applications such as digital assets, smart contracts, and online platforms.

F.   Smart contracts

63.   It was proposed that the real focus of the taxonomy should be on AI contracting and automated contracting rather than smart contracts per se. AI contracting was concerned with forming contracts while automated contracting was concerned with performing contracts. There was consensus among experts with this proposal, and thus that the taxonomy should not deal with smart contracts as a standalone topic.

64.   Some frustration was expressed about the confusion perpetuated in legal commentary about smart contracts. As originally conceived, smart contracts were never about contract formation nor the use of AI, but instead about the performance of contract terms. This was how the term was still understood by technologists and, in this sense, no novel legal issue arose. There was a consensus among experts that, to avoid perpetuating confusion, the taxonomy should employ another term. It was noted that the term "AI contracting" was preferable to "algorithmic contracting", as all computer systems used algorithms. It was added that the issue should be disassociated from the use of distributed ledger systems.

65.   It was observed that the "unstoppability" of automated contracts – in the sense that they performed what they were programmed to perform without the possibility of human intervention – posed legal challenges and should therefore be a focus of the taxonomy. It was added that the legal and technical understandings of unstoppability needed to be distinguished. It was further noted that the main disruptive features of smart contracts in a broad sense were self-execution (of contractual terms) and self-enforcement (of contractual remedies).

66.   It was noted that, as far as contract formation was concerned, existing UNCITRAL texts already provided solutions for attributing the acts of automated systems. The real issue here was attributability when AI systems were used. As far as contract performance was concerned, the question was whether the use of automated or AI systems warranted the adaptation of existing contract law rules. A distinction was drawn between "static" and "dynamic" AI systems, with the view being expressed that existing rules on attributability were not sustainable for dynamic systems.

G.   Online platforms and dispute resolution

67.   It was observed that platforms presented new forms of transactions and new ways of doing business. To start with, platforms introduced an intermediary into the picture in the form of the platform operator. It was queried whether online platforms

presented any new legal issues. Platforms were essentially based on a contract with the platform operator which was offered to the user on a take-it or leave-it basis. Nevertheless, it was pointed that there had been a legislative push in some jurisdictions to impose new extracontractual obligations and liabilities on the operators of consumer platforms. Platforms were used not only for consumer transactions, but also for B2B transactions in a wide range of industries. At present, there was no harmonized response to the obligations and liabilities of the operators of these platforms. It was recalled that an attempt to include a duty of disclosure in the Convention on the Use of Electronic Communications in International Contracts had been unsuccessful.

68.	It was suggested that different rules could be applied depending on the size of the platform. In response, it was noted that this was principally a matter of market regulation, which was not a matter for UNCITRAL.

69.	A link was drawn between smart contracts, platforms and dispute resolution. Smart contracts were being deployed on platforms (as demonstrated in the case in Singapore of *B2C2 Ltd. v. Quoine Pte. Ltd*) and encoded with dispute resolution functionalities.

70.	Experts considered the application of UNCITRAL dispute resolution texts to dispute settlement mechanisms incorporated into online platforms. It was noted that not all of these mechanisms qualified as either arbitration or mediation, and were better characterized as "complaints handling" procedures. It was added that, in some jurisdictions, chatbots were being used to propose settlement terms to parties involved in mediation. Important questions arose as to whether principles of arbitration could be applied to AI arbitrators, and whether resulting awards complied with the requirements of the Convention on the Recognition and Enforcement of Foreign Arbitral Awards.

71.	It was observed that humans played an important role in safeguarding values in dispute resolution, and that new ways of safeguarding those values would be needed if new technologies were to be used. An example was given of a blockchain-based dispute resolution tool that used crowd-sourced arbitrators which were rewarded on the basis of whether they agreed with a majority of other arbitrators. Concern was also expressed about the implications of these tools for access to justice, noting that a party's success was dependent on its understanding of the relevant technology.

## H.	Conclusion

72.	The meeting concluded with closing remarks from Ms. Joubin-Bret and Mr. Ignacio Tirado, the Secretary-General of Unidroit. Ms. Joubin-Bret stated that the discussion had helped in narrowing down the topics for future work. In this regard, she noted that the following three workstreams had emerged from the discussion: first, on data transactions, a regime for property-like rights in data and a regime on the rights and obligations of parties to data transactions; second, on AI, legal solutions relating to the use of AI and automated systems to negotiate, form and perform contracts; third, rules relating to the use of digital assets in the areas of security interests and insolvency, with a particular focus on existing UNCITRAL and Unidroit texts. She flagged that a new project on warehouse receipts would offer an opportunity for both organizations to deal head on with the tokenization of assets.

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