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UNIDROIT Principles of International Commercial Contracts and New Frontiers of Blockchain, Smart Contracts and Digital Assets

I Introductory Remarks

The UNIDROIT¹ Principles of International Commercial Contracts² have undeniably emerged as a cornerstone of international business law, influencing the global stage for three decades. Since their inception, they have not only served as a beacon of best practices but have also profoundly influenced national legislators, judges, arbitrators, legal scholars and practitioners worldwide as soft law, general principles of contract law or even applicable rules for international commercial contracts.³

Perhaps most notably, the UNIDROIT Principles have earned their stripes as a cornerstone of *lex mercatoria*, the body of law derived from commercial customs and practices, which transcends national boundaries.⁴ Their application in international commercial arbitrations speaks volumes about their credibility and utility, as they offer a neutral and reliable standards for resolving disputes across diverse legal systems.

As we celebrate the remarkable milestone of their thirty-year anniversary, it becomes evident that their journey is far from over. Instead, it marks just the beginning of their enduring significance in the constantly evolving landscape of international commerce and business world. As we raise a toast to the achievements of the past decades, their ability to remain agile

¹ The International Institute for the Unification of Private Law (hereinafter UNIDROIT) is an independent intergovernmental organization with its seat in Rome. See, UNIDROIT, Purpose, Membership and Origins, <https://www.unidroit.org/about-unidroit/>. The UNIDROIT serves as a key global institution for modernizing, harmonizing and coordinating private, especially commercial law among States. With 65 member states representing diverse legal, economic, political, and cultural backgrounds, it formulates uniform legal instruments, principles and rules to achieve these objectives.

² The UNIDROIT, Principles of International Commercial Contracts from 1994, amended in 2004, 2010 and 2016 (UNIDROIT Principles or Principles). On the background and inspiration of drafting the Principles as part of progressive codification of international trade law see E. Allan Farnsworth, An International Restatement: The Unidroit Principles of International Commercial Contracts, *University of Baltimore Law Review*, Volume 26, Issue 3, 1996, 2.

³ Eckart Brödermann, The Multiple Roles of the UNIDROIT Principles of International Commercial Contracts in Arbitration, Kluwer Arbitration Blog, 2023, <https://arbitrationblog.kluwerarbitration.com/2023/09/13/the-multiple-roles-of-the-unidroit-principles-of-international-commercial-contracts-in-arbitration/>. See also UNIDROIT Principles 2016, Preamble (Purpose of the Principles).

⁴ See Louis Yves Fortier, The New, New Lex Mercatoria, or, Back To The Future, in William W. Park (ed), *Arbitration International*, Oxford University Press 2001, Volume 17 Issue 2, 126.

and responsive to change depends on our collective commitment to scrutinize and refine them in light of the new technologies which are reshaping the world we know today.

The advent of blockchain technology has sparked a revolution comparable in magnitude to the emergence of the internet. At the forefront of this technological change are smart contracts and digital assets, which are going to transform traditional notions of contractual performance, financial transactions and asset representation. With the rise of automated contract execution and the proliferation of cryptocurrencies and digital tokens, our conception of commerce, asset ownership, art and investing, among other things, has experienced a fundamental shift. With the emergence of decentralized technology, it is believed that the Web2 era has come to an end, marking the beginning of a peer-to-peer revolution and the kick-off of the Web3 era.⁵ Be that as it may, the Web3 industry has certainly begun to emerge, attracting tremendous investments.

This essay aims to scrutinize how the UNIDROIT Principles integrate with and adapt to the intricacies of blockchain technology, smart contracts and digital assets. As these innovations become increasingly present in commercial transactions, understanding their intersection with established legal principles becomes paramount. Through this examination, we seek to clarify the role of the UNIDROIT Principles in navigating the complexities of this new reality and ensuring legal coherence and efficacy in the digital era.

II The Short Story on Blockchain, Smart Contracts and Digital Assets

Distributed ledger technology, like blockchain, changes the way we keep records of transactions. Instead of having one central authority overseeing everything, it spreads out the record across many participants in a network. This makes it more trustworthy and transparent because everyone involved has a copy of the ledger, preventing interfering. This ledger does not just track simple transactions, it can handle a wide range of assets, from cryptocurrencies to intellectual property. With blockchain, data is organized into blocks and then added to the chain after being verified by the network, making it even more secure and unchangeable.

⁵ Web3 is often seen as part of an ongoing evolution or revolution in internet technology. It represents a shift towards a more decentralized, peer-to-peer, and user-controlled online environment compared to traditional Web 2.0 models dominated by centralized platforms. Advocates believe that Web3 has the potential to democratize access to information, value and opportunities on the internet.

The blockchain technology is first introduced in 2008, due to the issuance of the Bitcoin WhitePaper⁶, meaning that at the beginning the technology was connected with the first cryptocurrency presented in the world stage. Following the big financial crisis caused by the traditional banking system and financial institutions, the idea behind the Bitcoin was to circumvent intermediaries, big transactional costs transferring money worldwide and embracing peer-to-peer transactions. Bitcoin paved the way for many more cryptocurrencies of different types,⁷ with various characteristics.

On the premises of blockchain technology, digital tokens have also arisen. The predictions are that in the foreseeable future the entire world as we know today will be tokenized and that in this form we will be buying real estate⁸, art, music⁹, cars, shares in companies etc.

Smart contracts are another use of blockchain technology. They are named „smart“ because of digital nature and far more functionality than their traditional paper-based ancestors. It was emphasized that this word does not imply the use of artificial intelligence (AI).¹⁰ Nevertheless, said was the case when the concept was established, today, it is believed that the AI will be the future of smart contracting.¹¹

Often smart contracts are compared with vending machines for food and beverages. They automatically execute the terms of an agreement when certain conditions are met, just like a vending machine dispenses snacks when one puts money and makes a selection. These contracts, introduced by Nick Szabo, cut out the middlemen, making transactions more efficient, especially for simple exchanges like basic consumer interactions, compensation for insured passengers for flight delays or cancellations and trading digital assets. However, while smart contracts work well for straightforward deals, they face challenges in handling more

⁶ Regarding the purpose of Bitcoin, see Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System, 1, <https://bitcoin.org/bitcoin.pdf>.

⁷ Today, there are over 10,000 cryptocurrencies in circulation, with the market cap of \$1.32 trillion, trading volume per a day of \$172 billion, around 420 million users across the globe and approximately 18,000 businesses which accept a form of crypto as payment. The numbers are as to November 2023, see Exploding Topics, How Many Cryptocurrencies are There In 2024?, <https://explodingtopics.com/blog/number-of-cryptocurrencies> and they are constantly changing, progressively or digressively, depending on the market situation.

⁸ Felix Kull, Theodor Nauman, *Real Estate Tokenization - Structure, Performance and Liquidity Implications*, KTH Royal Institute of Technology, Stockholm 2022.

⁹ Ahmad Rabaa'i, Xiaodi Zhu, J.D Jayaraman, Understanding Non-Fungible Tokens (NFTs): Overview, Opportunities, and Challenges, Conference: The 49th Annual Northeast Business & Economics Association Conference At: Portsmouth, New Hampshire, USA.

¹⁰ Nick Szabo, Smart contracts: Building blocks for digital markets, 1996.

¹¹ The integration of AI into these smart contracts is set to take this technological innovation to the next level. AI-driven smart contracts have the potential to disrupt numerous industries and processes, such as insurance, supply chain management, healthcare and real estate. See Medium, The Power of AI-Driven Smart Contracts, 2023, <https://medium.com/@169pi/the-power-of-ai-driven-smart-contracts-40f3bdaaf5b5>.

complex agreements where there are abstract terms or special conditions.¹² This means there is still work to be done to adapt them for broader use, finding a balance between automation and traditional contract practices. The communication between smart contracts and outside (real) world is provided by the oracles.¹³ That balance is currently found in separation of three types of smart contracts: i) a traditional (paper) contract with automatic execution through computer code, ii) a hybrid contract¹⁴ and iii) a contract drawn up exclusively on computer code.¹⁵

From 2015 to 2018, several UNIDROIT Member States proposed a model law covering topic of distributed ledger technology (including blockchain), and digital asset inheritance for inclusion in the 2020-2022 Work Programme. Similarly, a proposal on the legal aspects of smart contracts and artificial intelligence was jointly submitted to UNCITRAL and UNIDROIT.¹⁶ The UNIDROIT has recognised the importance of digital assets and announced that project regarding this field is at the highest level of priority. In May 2023 the UNIDROIT adopted Principles on Digital Assets and Private Law as new instrument for not finding, but establishing the best practices and legal solutions on this matter. The aim has been to fill existing gaps and add legal certainty on matters of private law in the field of digital assets, recognizing at the same time that it is new reality that is difficult to make compatible with the usual timing of transnational law.¹⁷

III The Intersection between UNIDROIT Principles and Blockchain, Smart Contracts and Digital Assets

First and foremost, it should be noted that in tandem with an arbitration clause, which is also recommended in smart contracts and contracts related to digital assets, it is fully possible to apply the UNIDROIT Principles. This is due to the reference to „rules of law“ in diverse arbitration laws based on Article 28 of the UNCITRAL Model Law¹⁸, as well as in various

¹² Dirk Wiegandt, Smart Contracts and the Role of Arbitration, *Journal of International Arbitration* 39-5/2022, ed. Maxi Scherer, Kluwer Law International, 679.

¹³ Oracles are third-party services that provide smart contracts with information from the real world, concerning events or data that trigger the execution of the contracts.

¹⁴ Law Commission, Smart Legal Contracts, 2021, 6, <https://lawcom.gov.uk/project/smart-contracts/>, defines a hybrid smart legal contract as a contractual agreement where certain obligations are articulated in natural language, while others are encoded within a computer program. The execution of some or all contractual obligations is automated through the underlying code. There is also a possibility that the terms of a hybrid contract are primarily written in code with a few natural language terms.

¹⁵ Law Commission, 6.

¹⁶ UNIDROIT, Law & Technology, UNIDROIT Work and Instruments in the Area of Law & Technology, <https://www.unidroit.org/law-technology/>.

¹⁷ UNIDROIT Principles of Private Law and Digital Assets, Foreword, pg. i.

¹⁸ UNCITRAL Model Law on International Commercial Arbitration (1985), with amendments adopted in 2006, Article 28.

institutional arbitration rules¹⁹ and the UNCITRAL Arbitration Rules²⁰, which are often utilized in *ad hoc* arbitrations.

During the drafting of the dispute resolution clause for their smart contract and digital assets related agreements, parties would need to carefully consider all the particulars to ensure enforceability of their contracts. They should definitely opt for arbitration instead of domestic courts to ensure flexibility and quality in deciding matters that are highly novel and require an adequate approach by decision-makers. Additionally, parties should not be concerned about the term „principles“ in the title, because the UNIDROIT Principles go beyond general standards, offering specific, straightforward, and hard-and-fast rules that can be applied similarly to other rules of contract law. The majority of the 211 articles provide clear and predictable solutions, resembling a codification of contract law found in national civil codes or transnational commercial law instruments like the CISG.²¹ This means that they are suitable for lawyers of different legal backgrounds as they represent two legal systems—common law and civil law. Not only are they state-of-the-art in the field of contract law, but they also serve as common ground for legal practitioners. It's important to note that considering the primary sources of investments worldwide for the Web3 industry, which predominantly come from the USA²², American investors and their advisers can be confident that the UNIDROIT Principles align with their expectations and are acceptable from a common law point of view. The same applies to other dominant investors in the industry, such as those from the UK, Germany, Singapore, Australia, Japan, etc.

Their application can be universal, which is advantageous in the context of Web3, which is globalized, cross-border, and conceptualized as borderless. Resorting to a „neutral“ law, the law of a third country foreign to both parties, requires familiarity with its characteristics, often necessitating time-consuming and costly consultations with legal experts from that jurisdiction.²³ It is more cost-effective and time-efficient to choose the UNIDROIT Principles

¹⁹ ICC Arbitration Rules (2021), Article 21; LCIA (2020), Article 22.3; SIAC (2016), Article 31; HKIAC (2018), Article 36 etc.

²⁰ UNCITRAL Arbitration Rules (2021), Article 35.

²¹ UNCITRAL, HCCH, UNIDROIT Legal Guide to Uniform Instruments in the Area of International Commercial Contracts, 74. Sources of the Principles include the CISG, generally recognized principles of European civil law systems, and generally recognized principles of common law systems, including the Uniform Commercial Code and the Restatement (Second) of Contracts. See E. Allan Farnsworth, 3.

²² Top five countries with the most web3 investors are the U.S., the UK, Germany, Singapore and Australia. Most of them are located in the United States. See Thousand Investors, List of 5 large web3 venture capital investors, 2024, <https://www.thousandinvestors.com/product/list-of-the-250-largest-web3-venture-capital-investors-2022/>

²³ Gabriel R. De En Goh, Smart Contract Disputes and Public Policy in the ASEAN+6 Region, *Digital Law Journal*, Vol 3, No 4 (2022), 68.

as the neutral law instead of the national law of a specific country. Perhaps the main advantage of the UNIDROIT Principles is that they are not foreign to anyone.

Considering that Web3 companies involved in blockchain, smart contracts, and digital assets are often small or medium-sized businesses, commonly referred to as startups primarily reliant on external funding, they may not possess extensive knowledge of legal matters or adequate resources for sophisticated legal advice. As recognized at the Joint UNCITRAL/UNIDROIT Workshop held in Rome in 2019, private law could serve as a facilitator for small and medium-sized businesses seeking to leverage these technologies.²⁴ If the contract is based on the Principles, it can be used multiple times with any other party in every jurisdiction, unlike when a contract is tailored to a specific national law and then needs to be reused with different contracting parties. This flexibility is particularly valuable for businesses that seek to enter into contracts with entities and individuals worldwide, especially when concluding contracts based on standard terms and/or for transactions of modest value. The UNIDROIT Principles can indeed serve as facilitators for such businesses, as startups would not necessarily require legal counsel from every jurisdiction involved in the contracts they enter into.

It is wiser to use the Principles rather than foreign law when you are unable to use your own law. Additionally, the novel nature of the subject matter is either not regulated or hardly regulated, leading to legal uncertainty and unpredictability, factors that users of blockchain certainly want to avoid. The Principles are sufficiently flexible to adapt to new circumstances and to contribute to the development of a new *lex mercatoria* in the crypto field, now referred to as *lex cryptographia*.²⁵

Considering the main goals valued by parties in the Web3 industry, such as decentralization, cost and time efficiency, predictability and certainty, the UNIDROIT Principles in conjunction with arbitration clause should be the recommended package for activities involving smart contracts and digital assets users. However, this does not imply that there are no challenges that the UNIDROIT Principles and arbitration might face with blockchain businesses.

²⁴ Joint UNCITRAL/UNIDROIT Workshop, Summary of the Discussion and Conclusions, Rome, 2019, 1.

²⁵ Wright, Aaron, De Filippi, Primavera, Decentralized Blockchain Technology and the Rise of Lex Cryptographia, 2015, <https://ssrn.com/abstract=2580664>.

IV Challenges to the UNIDROIT Principles in the Blockchain Era

Although technology specialists believe that smart contracts will reduce disputes due to automated performance, there is a significant number (possibly even greater) of traditional and novel disputes arising from smart contract transactions.²⁶ Digital assets and blockchain technology in general are raising new questions in private international law and substantive law as well. Recently, a new type of arbitration has emerged under the dispute resolution spotlight, distinguishing between off-chain arbitration (as traditionally known) and on-chain arbitration (conducted directly on the blockchain). Blockchain arbitrations can be facilitated through various platforms in unique ways, such as resolving disputes not only online on the platform but also utilizing cryptocurrencies and game theory for dispute resolution.²⁷ While it is debatable whether such arbitration can be considered arbitration under the New York Convention²⁸ and national arbitration laws, it is evident that they can assist in resolving small and straightforward disputes arising from smart contracts. Furthermore, there are suggestions that blockchain arbitration systems are giving rise to an autonomous blockchain legal order²⁹, independent of the legal systems we typically adhere to. The question now arises as to how decision-makers in blockchain arbitration can apply the UNIDROIT Principles and whether these decision-makers can be even aware of them.

In the future, we can imagine that contracts will be concluded as AI-automated smart contracts between companies established to replace traditional corporate organizations, such as Decentralized Autonomous Organizations (DAOs)³⁰, for transactions involving digital assets, and disputes will be resolved through blockchain arbitration if they arise. In the event of a fully decentralized blockchain ecosystem being the envisioned future, there arises a question about the role of law and legal rules within it, and whether there is room for soft law and legal principles, such as the UNIDROIT Principles. By analyzing the functioning of blockchain arbitration, it is evident that blockchain arbitration does not necessarily need to rely on existing

²⁶ For analysis of those disputes, see Nicolas Delwaide, Resolving Smart Contracts' Disputes Through Arbitration: Thoughts And Perspectives, in Dirk De Meulemeester, Maxime Berlingin, et al. (eds), *Liber Amicorum CEPANI (1969- 2019): 50 Years of Solutions*, Kluwer Law International, 2019, 231-233.

²⁷ On the way how blockchain arbitration function, see e.g. Clément Lesaege, Federico Ast, William George, Kleros Short Paper, 2019, 3-10, <https://kleros.io/whitepaper.pdf>.

²⁸ The Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958), also known as the "New York Convention".

²⁹ Or decentralized legal order, see Maxime Chevalier, From Smart Contract Litigation to Blockchain Arbitration, a New Decentralized Approach Leading Towards the Blockchain Arbitral Order, in Thomas Schultz (ed), *Journal of International Dispute Settlement*, Oxford University Press 2021, Volume 12 Issue 4, 558.

³⁰ For more on DAOs, see Nathan Reiff, Decentralized Autonomous Organization (DAO): Definition, Purpose, and Example, 2023, <https://www.investopedia.com/tech/what-dao/>.

legal frameworks,³¹ which implies that the UNIDROIT Principles may become irrelevant in such arbitrations.

However, if blockchain arbitration becomes suitable³² and relevant for more complex commercial disputes³³, it is necessary for the decision-makers to become more proficient and to have a solid legal background. They will then require unified, neutral and modern rules to apply regardless of the parties' nationalities, and the UNIDROIT Principles can be a solution. Moreover, in the event that a new *lex mercatoria* emerges, this time named *lex cryptographia*, the UNIDROIT Principles ought to be included. They should form part of the international best practices and usages in the cryptocurrency contracting field.

Different states have various approaches to smart contracts and digital assets, ranging from being friendly, indifferent or adversarial. This leads to limitations concerning digital assets in relation to arbitrability, public policy and overriding mandatory rules. In countries that are very strict on cryptocurrencies, the new financial public policy is likely to become more pronounced.³⁴ Given that these questions involve mandatory rules³⁵, the arbitrator must engage in proper conflict of law analysis to determine the applicable provisions. The arbitrator should pay attention to the *lex arbitri* and the countries where it is foreseeable that the award will be enforced (*lex loci executionis*). In contracts related to cryptocurrencies and digital tokens, there will be many mandatory rules (anti-money laundering rules, certain limitations, tax issues, required approvals, securities regulation, etc.) where the arbitrator cannot merely be well-versed in contract law and the UNIDROIT Principles, but must also be competent to address a wide range of issues to render internationally enforceable awards.

Crypto companies typically include arbitration clauses in their terms of use (terms and conditions)³⁶, often published on their respective websites. They must ensure that their

³¹ M. Chevalier, 570.

³² For the overview on the most suitable type of arbitration comparing the complexity and value of the disputes, see Stefan Jovanović, Arbitration in Smart Contracts Disputes: A Look Into the Future, *Belgrade Law Review* 4/23, 777-778.

³³ On opportunities and challenges in one type of the contracts see the analysis Abeer Sharma, Incorporating Kleros in Long-Term Energy Supply Contracts, 2019, <https://blog.kleros.io/incorporating-kleros-in-long-term-energy-supply-contracts/>.

³⁴ E.g. in China, see G. R. De En Goh, 64, or in Greece, see Apostolos Anthimos, Bitcoin and public policy in the field of international commercial arbitration, 2022, <https://conflictoflaws.net/2022/bitcoin-and-public-policy-in-the-field-of-international-commercial-arbitration/>.

³⁵ The UNIDROIT Principles in Article 14 prescribes that nothing in these Principles shall restrict the application of mandatory rules, whether of national, international or supranational origin, which are applicable in accordance with the relevant rules of private international law.

³⁶ UNIDROIT Principles deal with the contracting under standard terms, See UNIDROIT Principles, Arts. 2.1.19.-2.1.22.

arbitration agreement is clearly visible and unmistakably recognized by the other contracting party, as arbitration clauses must be expressly brought to the other party's attention.³⁷ Failure to do so could lead courts to conclude that there is no arbitration agreement, due to one of the parties not being bound by the dispute resolution clause. Special attention should be given if the other party in the contract can be classified as a customer.

When discussing new technology, it is impossible to overlook artificial intelligence. The challenges that the UNIDROIT Principles may face stem from AI-driven smart contracting³⁸, exemplified by smart contracts concluded using artificial intelligence. Specifically, the problem of intent arises, as contract formation traditionally relies on the contracting parties' intent to be bound, a concept often referred to as a "meeting of the minds."³⁹ The question then arises: Is the intent requirement fulfilled if the contract is not formed by the intention of the party(ies) but by the program itself? The UNIDROIT Principles⁴⁰, like domestic laws, provide rules on intent. Analyses suggest that existing contract law does not pose fundamental obstacles to the use of AI systems in contract formation, and the same may hold true for the UNIDROIT Principles. Nonetheless, to ensure that smart contracts concluded by AI are considered valid, parties may find it more convenient to choose the UNIDROIT Principles for greater legal certainty on this matter, given the potentially varied approaches of domestic law.

V Concluding Remarks

During times of crisis, disputes often increase, but similar consequences can also arise when an industry is thriving and experiencing a higher volume of transactions with different players entering the market. To ensure the industry remains „healthy“, we need proper mechanisms for resolving disputes and solutions that enable adjudicators to address them in the most adequate way.

The legal field is traditionally slow to adapt to new settings. In today's globalized world, there is a need for globalized law. The UNIDROIT Principles represent the legal community's

³⁷ Marta González-Ruano, Crypto users' class action will be decided by Singaporean courts despite an arbitration clause, 2023, <https://bacsociety.com/en/crypto-users-class-action-will-be-decided-by-singaporean-courts-despite-an-arbitration/>.

³⁸ UNCITRAL as well recognized that the real focus should be on AI contracting and automated contracting rather than smart contracts *per se* in their explanatory work. See UNCITRAL, Exploratory work on legal issues related to the digital economy – reports of events, 2020, 12.

³⁹ Maarten Herbosch, Contracting with Artificial Intelligence, A Comparative Analysis of the Intent to Contract, *The Rabel Journal of Comparative and International Private Law*, 87, 2023, 672.

⁴⁰ The most importantly as condition for an offer and for contract's interpretation. See UNIDROIT Principles, Arts, 2.1.2 and 4.1.

response to globalization. They offer a solution for blockchain users who intend to apply a legal framework that is not tied to any national legal system and is truly global in nature. These users can appreciate that a decentralized system like blockchain is governed by decentralized legal principles such as the UNIDROIT Principles, without compromising legal certainty, predictability, comprehensiveness and modern approaches to law.

Looking ahead, the next thirty years of UNIDROIT Principles present both opportunities and challenges. It is imperative that we recognize the importance of continuously examining and adapting the Principles to keep pace with emerging institutions and novel phenomena shaping the legal landscape. Moreover, it has been analyzed that the Principles, together with arbitration, form the most suitable package for parties in the blockchain era. Considering that the UNIDROIT Principles can be part of the new *lex cryptographia*, we can raise a toast to their even greater potential application in the future ahead of us.