

---

# DISPUTE RESOLUTION JOURNAL®

A Publication of the American Arbitration Association®-  
International Centre for Dispute Resolution®

---

November-December 2024

Volume 78, Number 4

**Editor's Note: ADR and Blockchain**

*Victoria Prussen Spears*

**From Code to Court and Beyond: Alternative Dispute Resolution On and Off the Blockchain**

*Jennifer Huang and Brendan Harrington*

**Considering the London Court of International Arbitration Rules, With the Seat of Arbitration in London**

*Louise Woods, Ciara Ros, and Alexandra "Xara" Kaye*

**Recent Arbitration-Related Decisions in the U.S. Court of Appeals for the Fifth Circuit**

*Odean L. Volker*

**Russia: Investment Protection and Arbitration—Part II**

*Volodymyr Yaremko, Vadym Miller, and Vladlena Lavrushyna*

**How to Avoid a Pyrrhic Victory in International Arbitration—Part III**

*Elizabeth Farrell and Bartek Rutkowski*

**Arbitration of Patent Disputes: A Comparison of the Law in the United States, Switzerland, and Australia—Part III**

*Turki Alkaladi*

**The View from Europe: What's New in European Arbitration?**

*Stephan Wilske, Björn P. Ebert, Matthew Brown, Stefanie Pfisterer, and Borja Álvarez Sanz*

---

# Dispute Resolution Journal®

A Publication of the American Arbitration Association®-  
International Centre for Dispute Resolution®

---

Volume 78, Number 4

November-December 2024

- 311 Editor's Note: ADR and Blockchain**  
*Victoria Prussen Spears*
- 315 From Code to Court and Beyond: Alternative Dispute Resolution On and Off the Blockchain**  
*Jennifer Huang and Brendan Harrington*
- 327 Considering the London Court of International Arbitration Rules, With the Seat of Arbitration in London**  
*Louise Woods, Ciara Ros, and Alexandra "Xara" Kaye*
- 343 Recent Arbitration-Related Decisions in the U.S. Court of Appeals for the Fifth Circuit**  
*Odean L. Volker*
- 349 Russia: Investment Protection and Arbitration—Part II**  
*Volodymyr Yaremko, Vadym Miller, and Vladlena Lavrushyna*
- 357 How to Avoid a Pyrrhic Victory in International Arbitration—Part III**  
*Elizabeth Farrell and Bartek Rutkowski*
- 367 Arbitration of Patent Disputes: A Comparison of the Law in the United States, Switzerland, and Australia—Part III**  
*Turki Alkaladi*
- 389 The View from Europe: What's New in European Arbitration?**  
*Stephan Wilske, Björn P. Ebert, Matthew Brown, Stefanie Pfisterer, and Borja Álvarez Sanz*

# From Code to Court and Beyond: Alternative Dispute Resolution On and Off the Blockchain

Jennifer Huang and Brendan Harrington<sup>1</sup>

---

In this article, the authors explore the role of alternative dispute resolution in smart contract disputes, with a focus on the United States.

---

Smart contracts are a revolutionary step in the digital and legal worlds. While not every smart contract is a legal contract, a smart contract is often a streamlined, digital expression of consent that happens to be stored on a blockchain. The growing popularity of smart contracts raises the question of not whether disputes will arise from their use but how breaches of smart contracts will be resolved. Users of smart contracts have already identified arbitration as a mechanism well suited to the novel needs of blockchain disputes. This article explores the role of alternative dispute resolution (ADR) in smart contract disputes, with a focus on the United States.

Despite their appellation, smart contracts are neither smart nor always—or even often—legally binding contracts. A smart contract is a computer program or transaction protocol that automatically executes certain actions once certain terms are met. A useful analogy is to that of the vending machine: once the dual terms of a certain amount of currency and the push of a button are met, the program (i.e., the smart contract) automatically executes by dispensing an item.

---

<sup>1</sup> The authors are associates in the New York office of Mayer Brown LLP. Mayer Brown summer associates Sébastien Deligne, Vasili Sgourakis, and Jane Tullis assisted in the preparation of this article.

Smart contracts consist of a series of conditional “if-then” statements in lines of code, which automatically enforce the contract’s terms. They have the potential to replace traditional contracts in many different contexts. In the insurance industry, for instance, certain policy agreements could be automated through the use of a smart contract. To give a simple example, the code for a smart contract could be written to provide for automatic payment in case of a flight cancellation. Once a cancellation is posted, the smart contract would self-execute by making a payment directly to the policyholder, bypassing the cumbersome traditional claims process entirely. This is precisely how smart contracts are designed to operate: independently from human intervention.<sup>2</sup> The simplicity and binary nature of smart contracts distinguish them from traditional legal contracts. There is no artificial intelligence involved in smart contracts; they are essentially self-executing agreements, with their terms directly written into lines of code.<sup>3</sup>

### **Smart Contracts: A Troika of Decentralization, Immutability, and Anonymity**

Proponents of smart contracts tout that they increase efficiency and cut administrative costs by reducing the need for human intervention. In the travel insurance example above, once the flight is canceled, the corresponding funds will transfer from one party to another—without the need for further action by any party. For that reason, smart contracts have become increasingly common in both the cryptocurrency and non-fungible token markets, which are both similarly skeptical of human intervention.

---

<sup>2</sup> See Chandrika Sharma, *Blockchain Arbitral Award: Potential Challenges in Recognition and Enforcement Under the New York Convention*, 16 *Revista Română de Arbitraj* 85, 92 (2022) (internal citations omitted).

<sup>3</sup> See *Rensel v. Centra Tech Inc.*, 2018 WL 4410110 at \*10 (S.D. Fla. June 14, 2018) (citing Tsui S. Ng, *Blockchain and Beyond: Smart Contracts*, Am. Bar. Assoc.: Bus. L. Today (Sept. 28, 2017)).

Smart contracts are often used to “constrain[] how” these digital assets “can be sold or transferred.”<sup>4</sup>

Smart contracts, stored on a blockchain, differ from traditional contracts in three fundamental aspects, discussed in turn below:

1. Decentralization,
2. Immutability, and
3. Anonymity (in principle).

Transactional data has historically been stored in one place, such as a government or bank server. By contrast, blockchain technology spreads that data across many servers and computer hardware owned by ordinary users. All transactional information is permanently recorded and accessible to all parties, regardless of where they are located geographically or their status as a consumer or not.<sup>5</sup> This decentralization of information is meant to reinforce the data’s credibility.<sup>6</sup> As with physical chains, if one link is weak, the entire chain can break. Blockchain technology is designed to make every link so strong that the chain cannot break. The main function of this technology is to transfer money between parties directly, removing the need for an intermediary such as a bank or government to be involved in the transaction.<sup>7</sup>

Because blockchain technology decentralizes data across many computers, altering the data becomes impossible. This ensures that blockchain is immutable. Once a block (i.e., a

---

<sup>4</sup> *Hermès Int’l v. Rothschild*, 654 F. Supp. 3d 268, 274 (S.D.N.Y. 2023).

<sup>5</sup> How does blockchain work?, Stanford Online, <https://online.stanford.edu/how-does-blockchain-work>).

<sup>6</sup> Orna Rabinovich-Einy & Ethan Katsch, *Blockchain and the Inevitability of Disputes: The Role for Online Dispute Resolution*, 2019 J. Disp. Resol. (2019) (quoting Leslie Lamport, *The Part-Time Parliament*, 16 ACM Transactions on Comput. Sys. 133, 155-57 (1998)).

<sup>7</sup> Pietro Ortolani, *The Impact of Blockchain Technologies and Smart Contracts on Dispute Resolution: Arbitration and Court Litigation at the Crossroads*, 24 Uniform Law Review, 430, 431 (2019).

transaction) is added to the chain, it cannot be erased or taken off the chain.<sup>8</sup>

Another key component of blockchain technology is the presumption that its users are anonymous.<sup>9</sup> Transactions take place between two cryptographic keys rather than two individuals.<sup>10</sup> While this feature of blockchain is designed to guarantee privacy and non-discrimination, it can also be a means for users to hide their identity—to criminal ends, for example.<sup>11</sup> It is worth noting that the long-held myth of anonymity in blockchain transactions has been busted by the pioneering work of Sarah Meiklejohn and other researchers.<sup>12</sup> As explored further below, the presumption of anonymity nonetheless poses issues in the context of dispute resolution.

## Off-Chain and On-Chain Disputes

Conflicts arising from smart contracts are typically categorized into “off-chain” disputes and “on-chain” disputes.

Off-chain disputes occur outside the blockchain ledger and involve issues that are not directly recorded or resolved on the blockchain. These disputes can arise from a variety of issues, such as disagreements over the terms of a contract that is related to a blockchain transaction but not encoded in a smart contract, or issues with off-chain services that interact with the blockchain, such as exchanges or wallet providers. Off-chain disputes are typically resolved through traditional legal systems or ADR methods, such as arbitration or mediation. The resolution process for

---

<sup>8</sup> Stanford Online, *supra* note 5.

<sup>9</sup> Reggie O’Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 *N.C Banking Inst. J.* 177, 191 (2017).

<sup>10</sup> Maxime Chevalier, *From Smart Contract Litigation to Blockchain Arbitration*, 12 *J. of Int’l Disp. Settlement* 558 (2021) (citing Nataliia Filatova, *Smart Contracts from the Contract Law Perspective: Outlining New Regulative Strategies*, 28 *Intl’l J. L. and Tech.* 217 (2020)).

<sup>11</sup> See Rabinovich-Einy & Katsch, *supra* note 6, at 8.

<sup>12</sup> See generally Andy Greenberg, *Tracers in the Dark: The Global Hunt for the Crime Lords of Cryptocurrency* (Doubleday 2022).

off-chain disputes is not governed by the blockchain protocol and involves human intervention.<sup>13</sup> In sum, off-chain disputes only differ from other non-blockchain disputes in their subject matter.

On-chain disputes, by contrast, refer to controversies arising out of transactions or interactions that occur directly on a blockchain. These disputes are inherently tied to the immutable and transparent nature of blockchain technology. Since all transactions on a blockchain are recorded on a public ledger and cannot be altered once confirmed, on-chain disputes typically revolve around the execution of smart contracts, the transfer of digital assets, or the interpretation of encoded rules within the blockchain protocol. The resolution of on-chain disputes often relies on the underlying code and consensus mechanisms of the blockchain itself. For example, as discussed below, a smart contract may include built-in dispute resolution mechanisms that automatically enforce the terms agreed upon by the parties involved.

The dispute resolution mechanisms for off-chain and on-chain disputes differ significantly. Off-chain dispute resolution allows for more flexibility and human discretion, as it can take into account a wider range of factors and nuances that may not be captured by code.<sup>14</sup> On-chain dispute resolution, by contrast, is automated and enforced by the code running on the blockchain, which is executed by the network's nodes. This code-driven approach aims to minimize the need for trust between parties and reduce the potential for human error or bias. However, it ignores the potential human bias at the coding stage, and it can be inflexible, as it strictly adheres to the predefined rules of the smart contract or protocol.

---

<sup>13</sup> See Dirk Wiegandt, *Blockchain, Smart Contracts and the Role of Arbitration*, 39 *J. Int'l Arb.* 671, 687-89 (2022).

<sup>14</sup> *Id.* at 688.

## **ADR Is Poised to Become the Future of Dispute Resolution for On-Chain Disputes**

On-chain arbitration covers a range of procedures and constructs, from using blockchain technology to enhance traditional off-chain procedures to more radical departures from traditional forms of ADR.<sup>15</sup> On one end of the spectrum, on-chain disputes can rely primarily on traditional dispute resolution mechanisms (an on-chain dispute is submitted to a court or arbitrator). On the other end, wholly blockchain-based ADR mechanisms can exist (an on-chain dispute is submitted to a protocol such as Kleros, described below). The case study described below falls somewhere in between, providing for a human arbitrator but mandating use of the Kleros protocol.

Many of arbitration's existing advantages over litigation also make arbitration an ideal means of dispute resolution for blockchain disputes. For example, in the novel and dynamic world of blockchain and cryptocurrency, the parties' ability to appoint subject matter specialists as arbitrators in an arbitration can better meet the parties' needs than a generalist judge in a litigation who may be unfamiliar with burgeoning new technologies. Additionally, in contrast to U.S. litigation, parties in arbitration can easily agree to provide for privacy and confidentiality—two of blockchain technology's defining characteristics.<sup>16</sup> Arbitration can also provide a one-stop multijurisdictional resolution to a dispute—critical for smart contracts, which frequently involve cross-border dealings. Still, traditional dispute resolution mechanisms may require some retooling to specifically suit on-chain disputes.

### **On-Chain Dispute Resolution Services Face Nascent Challenges**

Because smart contracts are written predominately or entirely in code, arbitration agreements must be carefully placed to ensure

---

<sup>15</sup> See *id.* at 680-87.

<sup>16</sup> *Id.* at 685-86.



proper notice for parties. U.S. courts, for example, will enforce arbitration agreements only if notice of the same was “reasonably conspicuous.”<sup>17</sup> In the absence of actual notice, for digital contracts, the U.S. Court of Appeals for the Second Circuit “look[s] to the design and content of the relevant interface to determine if the contract terms were presented to the offeree in [a] way that would put her on inquiry notice of such terms.”<sup>18</sup> In making a similar determination under Florida law, the U.S. District Court for the Southern District of Florida considered how a particular cryptocurrency token was acquired. Since one of the plaintiffs had purchased the token by sending Ether, a cryptocurrency, directly through a smart contract, the court concluded that the arbitration clause contained in a separate Token Sale Agreement was unenforceable.<sup>19</sup> To avoid a similar outcome, clickwrap agreements can help ensure the enforceability of an arbitration agreement in on-chain disputes, although the inquiry remains fact-intensive.<sup>20</sup>

The ever-evolving nature of new technology poses other concerns. Because companies dealing in blockchain and cryptocurrency need to react to new developments in the space, parties may find themselves subject to competing and incompatible

---

<sup>17</sup> *Meyer v. Uber Techs. Inc.*, 868 F.3d 66, 76 (2d Cir. 2017) (finding that Uber app’s notice of its Terms of Service, which included an arbitration clause, was “reasonably conspicuous” under California law).

<sup>18</sup> *Starke v. SquareTrade Inc.*, 913 F.3d 279, 289, 295 (2d Cir. 2019) (finding that offeree was not on notice under New York law by being “presented with several documents including the Pre-Sale [Terms & Conditions], the body of the subsequent email, and the Post-Sale [Terms & Conditions], none . . . specifically identified as the ‘Service Contract’ governing the purchase, and all containing different sets of terms”).

<sup>19</sup> See *Rensel v. Centra Tech Inc.*, 2018 WL 4410110 at \*14 (S.D. Fla. June 14, 2018).

<sup>20</sup> See, e.g., *Sgouros v. TransUnion Corp.*, 817 F.3d 1029, 1033-34 (7th Cir. 2016) (“Courts around the country have recognized that [an] electronic ‘click’ can suffice to signify the acceptance of a contract,” and that “[t]here is nothing automatically offensive about such agreements, as long as the layout and language of the site give the user reasonable notice that a click will manifest assent to an agreement.”); *Meyer*, 868 F.3d at 75 (citing *Fteja v. Facebook Inc.*, 841 F. Supp. 2d 829, 837 (S.D.N.Y. 2012) (collecting cases)).

arbitration agreements. For instance, third-party applications that provide users an avenue to purchase cryptocurrency commonly update their terms and conditions, potentially resulting in conflicting arbitration clauses and raising the question of which clause controls.<sup>21</sup>

Ultimately, resorting to a centralized, traditional ADR mechanism such as arbitration (and seeking enforcement of arbitration agreements through courts) runs contrary to the peer-to-peer ethos of blockchain technology, which prizes decentralization and anonymity. Traditional ADR mechanisms can also countervail some of the efficiency gained through the use of smart contracts in the first place.

### The Unique Needs and Culture of Blockchain Dispute Resolution Have Generated Innovative New Online ADR Mechanisms

Several digital platforms have recently created their own blockchain-based dispute resolution systems. One such platform is Kleros, which describes itself as “a decentralized arbitration service for the disputes of the new economy.”<sup>22</sup> Kleros’ online arbitration mechanism operates pseudo-democratically. First, individuals anonymously register for fields of expertise and are assigned accordingly to a specific digital “court.” They then stack tokens (cryptocurrency) on cases. The highest bidders become jurors, the decision-makers who will decide the outcome of the dispute. Parties present limited evidence to the jurors, who then vote anonymously and secretly. Jurors who voted in line with the majority decision are financially rewarded with more tokens. The jurors’ decision, the equivalent of an arbitration award in a traditional dispute, is then automatically enacted through a smart contract.<sup>23</sup> Unlike in arbitration, an unlimited number of appeals is available—but each appeal doubles the number of

---

<sup>21</sup> See *Johnson v. Maker Ecosystem Growth Holdings Inc.*, No. 20-cv-02569-MM, 2020 WL 13836392, at \*1 (N.D. Cal. Sept. 25, 2020).

<sup>22</sup> Kleros, <https://kleros.io/>.

<sup>23</sup> Wiegandt, *supra* note 13, at 682-84.

jurors, plus one. Thus, each appeal becomes increasingly costly to the appellant, becoming a natural check on the number of appeals available.<sup>24</sup>

One noteworthy weakness of this system is that jurors can claim fields of expertise while ultimately maintaining anonymity. Kleros does not require any proof of a juror's competency or expertise, relying on the token reward system to encourage jurors to vote in their area of expertise.<sup>25</sup> Nor does Kleros control for bias or conflicts.<sup>26</sup> Further, there is no assurance that the jurors are not minors, as anyone who can purchase a Kleros token can register. Jurors staking the most coins have a better chance to be assigned to a case, leading to a natural bias toward wealthier jurors and provoking the question of whether that is the kind of dispute resolution mechanism parties should hope for. Indeed, as the arbitration world grapples with the relative lack of diversity among its ranks, blockchain arbitration faces a similar question of how to address the lack of socioeconomic diversity in a system where the highest bidders are most likely to become jurors.

The flip side of Kleros' pseudo-democratic incentives system is that the process may succumb to mob justice.<sup>27</sup> Or, the incentives system based on paying only those who voted with the majority may spur jurors to vote based on how they think other jurors will vote, rather than voting neutrally and impartially.<sup>28</sup> Real-life arbitrators are paid no matter the outcome of the dispute, notwithstanding any hidden economic incentives in building a strong reputation in order to become a sought-after arbitrator. Since blockchain arbitration is anonymous, the hidden

---

<sup>24</sup> Clément Lesaege, William George & Federico Ast, Kleros: Long Paper v2.02, Kleros 1, 28 (2021), <https://kleros.io/yellowpaper.pdf>.

<sup>25</sup> Wiegandt, *supra* note 13, at 684.

<sup>26</sup> *Id.*

<sup>27</sup> Paul Cohen & Sophie Nappert, *ROBOTS REDUX: Blockchain, AR and Quantum Computing Explained to Lawyers, Their Impact on the Arbitral Process, and Why the Time to Act Is Now*, 1, 7 (2019), [www.researchgate.net/publication/335776761\\_ROBOTS\\_REDUX\\_Blockchain\\_AR\\_and\\_Quantum\\_Computing\\_Explained\\_to\\_Lawyers\\_Their\\_Impact\\_on\\_the\\_Arbitral\\_Process\\_and\\_Why\\_The\\_Time\\_To\\_Act\\_Is\\_Now](http://www.researchgate.net/publication/335776761_ROBOTS_REDUX_Blockchain_AR_and_Quantum_Computing_Explained_to_Lawyers_Their_Impact_on_the_Arbitral_Process_and_Why_The_Time_To_Act_Is_Now).

<sup>28</sup> *Id.*

economic incentives could be to vote based on game theory or to participate in as many proceedings as possible in order to maximize the probability of a payout, no matter the quality of the decision.

Another key benefit of international arbitration over litigation is the ease of enforcement in 172 countries (at the time of publication) under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards, commonly known as the New York Convention. The New York Convention requires signatory states to give effect to private agreements to arbitrate and to recognize and enforce arbitration awards made in other signatory states.<sup>29</sup> The recognition of digital awards under the New York Convention is hotly contested due to the Convention's territoriality requirements.<sup>30</sup> Specifically, Article I of the New York Convention provides that signatory states' obligation to recognize and enforce foreign arbitral awards applies to awards made in the territory of a signatory state.<sup>31</sup> When a blockchain award is made on the blockchain itself, the decentralized nature of blockchain can lead to the conclusion that the award is not made in any state, posing a roadblock at the enforcement stage.<sup>32</sup>

However, recognition is only as important as the need for enforcement. Since purely on-chain arbitration awards are executed through a smart contract, no enforcement of the award is necessary if both wallets have enough cryptocurrency. An arbitration award would thus result in a simple transaction to transfer the awarded amount.

---

<sup>29</sup> U.N. Convention on the Recognition and Enforcement of Foreign Arbitral Awards, art. I (1), June 10, 1958, 4739 U.N.T.S. 330 [hereinafter New York Convention].

<sup>30</sup> Chevalier, *supra* note 10 (internal citations omitted).

<sup>31</sup> New York Convention, *supra* note 29.

<sup>32</sup> Chevalier, *supra* note 10.

## A Case Study in Use of the Kleros Protocol

Kleros produced the first online dispute resolution award to be enforced.<sup>33</sup> The dispute arose out of a real estate lease agreement between two private parties. The agreement contained an arbitration clause that provided for a sole arbitrator and express instructions for the arbitrator to use the Kleros protocol. The dispute thus proceeded with the landlord under the lease agreement commencing arbitral proceedings, filing a claim via email for termination of the contract, payment of past due rents plus interest, and eviction of the tenant. Electronic notice was sent to the defendant, who filed its response and exhibited a digitized copy of a manuscript receipt allegedly issued by the landlord. The arbitrator then drafted the procedural order and submitted the dispute to Kleros, along with the evidence presented by each party.

Kleros ran the dispute through its protocol, and within 11 months, the three jurors had unanimously reached a decision, finding that the defendant had failed to pay rent. Each juror provided its reasoning: the first juror noted that no bank deposit receipt was submitted into evidence, while the lease agreement required proof of payment to be accompanied by such receipt; the second juror found the signature on the payment receipt exhibit to be questionable; and the third juror cited both of these reasons to justify its decision. The arbitrator then rendered the arbitral award consistent with the jurors' decision, ordering eviction and payment of the past due rents plus interest, giving electronic notice to both parties. The award was not appealed, and the smart contract's terms did not provide for automatic execution of the award through the smart contract itself.<sup>34</sup> Instead, the landlord sought recognition and enforcement of the arbitral award before Mexican courts, pursuant to the Mexican Civil Code. The court recognized the award and ordered the defendant to comply within five business days.<sup>35</sup>

---

<sup>33</sup> Sharma, *supra* note 2, at 89.

<sup>34</sup> Sharma, *supra* note 2, at 90-91.

<sup>35</sup> Sharma, *supra* note 2, at 90 (internal citations omitted).

## **Blockchain Arbitration Promises Both Solutions and Challenges Ahead**

International arbitration has developed a transnational “arbitral legal order,” a means of resolving international disputes with no (or limited) involvement from national courts.<sup>36</sup> International arbitration is constantly reinventing itself, shifting with the times when it comes to diversity, transparency, delays, and costs. The next frontier, the creation of a blockchain arbitral order,<sup>37</sup> can provide solutions to some of these issues, while introducing new challenges. Decentralization guarantees public information for every actor in the chain. Smart contracts are automatic and nearly costless. The simplified proceedings based on protocols such as the Kleros protocol are fast, relative to other dispute resolution mechanisms, and stand to become faster over time. Disputes may be resolved in mere days, though factors such as a high number of parties or a prolonged search for jurors may elongate the process. Nevertheless, while on-chain arbitrators (jurors) can come from all over the globe, anonymity prevents any verification of qualifications or the absence of conflicts. Financial incentives can skew decision-making away from neutrality or tip the scales in favor of those with more resources to buy tokens. These should not be interpreted as roadblocks to the development of blockchain arbitration but, rather, as an invitation to join the brainstorming chain toward new, improved systems of ADR.

---

<sup>36</sup> Emmanuel Gaillard, *Transcending National Legal Orders for International Arbitration*, in *International Arbitration: The Coming of a New Age?*, 371, 373 (Albert Jan van den Berg ed., 2013).

<sup>37</sup> See Chevalier, *supra* note 10.