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BETWEEN CODE AND CONVENTION: THE LEGAL FUTURE OF BLOCKCHAIN ARBITRATION FOR SMART CONTRACT DISPUTES

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ABSTRACT

Blockchain-based arbitration has been advanced as a technologically elegant solution to the dispute resolution challenges inherent in smart contract ecosystems. Proponents argue that decentralised jury protocols, exemplified by platforms such as Kleros, Aragon Court, Aegora, and Mattereum, offer speed, borderlessness, and trustless enforcement superior to traditional arbitration. This paper critically examines that proposition. The central research question is: *can blockchain-based arbitration serve as a legally enforceable and effective alternative to traditional arbitration for smart contract disputes under existing international and domestic legal frameworks?* Through doctrinal and comparative methodology, the paper argues that, in its current form, blockchain arbitration constitutes a contractually sophisticated online dispute resolution (ODR) mechanism rather than legally cognisable arbitration. It falls materially short of the due process requirements imposed by the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards 1958 ('the Convention'), the UNCITRAL Model Law on International Commercial Arbitration 1985 (as amended 2006), and the domestic arbitration statutes of major jurisdictions. The paper gives particular attention to India, where the Arbitration and Conciliation Act 1996 ('the 1996 Act'), the Information Technology Act 2000 ('ITA'), and emerging judicial attitudes together present a distinctive analytical context. The paper further evaluates the UK Jurisdiction Taskforce's Legal Statement on Cryptoassets and Smart Contracts and the JAMS Smart Contract Dispute Resolution Protocol as institutional responses to the governance gap. The paper concludes by proposing a five-stage hybrid legal architecture that preserves the efficiency characteristics of blockchain platforms while satisfying the enforceability requirements of the international legal framework, and offers specific reform recommendations for Indian and international legislators.

Keywords: *blockchain arbitration; smart contracts; New York Convention; due process; Kleros; natural justice; India; ODR; hybrid model*

I. INTRODUCTION

The proliferation of smart contracts, has generated a class of commercial relationship that operates, by design, outside the institutional architecture of traditional private law. Parties transacting through decentralised finance (DeFi) platforms, non-fungible token (NFT) marketplaces, and blockchain-based supply chains may be pseudonymous, geographically dispersed, and contractually bound by code that enforces itself automatically upon satisfaction of pre-programmed conditions.¹

These characteristics create a distinctive dispute resolution problem. Traditional courts are ill-suited to adjudicate disputes in which parties are anonymous, assets are intangible, the relevant "contract" is bytecode, and any award must be enforced against an immutable on-chain state rather than an identifiable legal person. Commercial arbitration, while more flexible, still presupposes identifiable parties, a recognised seat, and an award capable of recognition under the Convention.²

Into this lacuna, blockchain-based arbitration platforms have emerged with the promise of code-native dispute resolution. Kleros, founded in 2017 on the Ethereum blockchain, is the most prominent: it employs a token-staking mechanism and game-theoretic incentive structure to select pseudonymous jurors who adjudicate disputes, with outcomes automatically enforced on-chain.³ Aragon Court and Aegora occupy related but distinct positions in the ecosystem. Mattereum takes a more legally engineered approach, connecting smart contracts to real-world legal obligations through "asset passports" that embed legal warranties into tokenised assets.⁴ Institutionally, JAMS has published a Smart Contract Dispute Resolution Protocol, and the UK Jurisdiction Taskforce ('UKJT') has issued a Legal Statement on the status of cryptoassets and smart contracts under English law, providing the most authoritative judicial-facing guidance yet produced.⁵

¹ Nick Szabo, 'Smart Contracts' (1994) <<https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html>> accessed 1 June 2026; Kevin Werbach and Nicolas Cornell, 'Contracts Ex Machina' (2017) 67 Duke Law Journal 313.

² Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York, 1 June 1958) 330 UNTS 38 ('the Convention' or 'New York Convention').

³ Federico Ast and Clement Lesaege, 'Kleros Short Paper v1.0.7' (Kleros, 2018) <<https://kleros.io/whitepaper.pdf>> accessed 1 June 2026.

⁴ Mattereum, 'Asset Passports and Legal Infrastructure for the Token Economy' (2022) <<https://mattereum.com>> accessed 1 June 2026.

⁵ UK Jurisdiction Taskforce, 'Legal Statement on Cryptoassets and Smart Contracts' (November 2019, updated 2023); JAMS, 'Smart Contract Dispute Resolution Protocol' (2023) <<https://www.jamsadr.com/rules-smart-contracts>> accessed 3 June 2026.

The enthusiasm surrounding these platforms has substantially outpaced their legal analysis. Much existing commentary is descriptive or promotional, originating from the platforms themselves or from practitioners with a professional stake in the technology's adoption. Academic legal scholarship, particularly from international arbitration and commercial law perspectives, has been more cautious, raising fundamental objections concerning due process, natural justice, the seat of arbitration, and the enforceability of algorithmically generated awards under the Convention.⁶

This paper contributes to the scholarly debate by providing a rigorous doctrinal and comparative evaluation of blockchain-based arbitration. The central research question is: *can blockchain-based arbitration serve as a legally enforceable and effective alternative to traditional arbitration for smart contract disputes under existing international and domestic legal frameworks?* The paper argues that the answer, presently, is *no*, but that a carefully designed hybrid model, detailed in Part VIII, could bridge the gap between decentralised efficiency and legal legitimacy.

Methodology. This paper adopts a doctrinal and comparative methodology. It analyses international arbitration instruments, principally the Convention, the UNCITRAL Model Law, and the IBA Guidelines on Conflicts of Interest, alongside domestic statutory frameworks, judicial developments, and academic literature on blockchain arbitration. Comparative evaluation is undertaken between traditional arbitral institutions and decentralised dispute resolution mechanisms to assess questions of legality, enforceability, and procedural legitimacy. The Indian legal framework receives extended treatment given its doctrinal interest and the rapid growth of blockchain-based commerce in South Asian markets. Platform analysis is based on publicly available documentation, academic case studies, and reported judicial or quasi-judicial engagement.

This paper proceeds in nine parts. Following the introductory discussion, Part II reviews the relevant literature. Part III examines the architecture and operation of blockchain arbitration. Part IV compares blockchain arbitration with traditional arbitral processes. Part V analyses the principal legal challenges. Part VI evaluates leading blockchain dispute resolution platforms,

⁶ Maxi Scherer, Niuscha Bassiri, and Mohamed Abdel Wahab (eds), *International Arbitration and AI* (Wolters Kluwer 2023); L Huang and others, 'Legal Challenges for Blockchain Arbitration' (2025) 173 *University of Pennsylvania Law Review Online*.

including Kleros, Aragon Court, Aegora, Mattereum, and the JAMS protocol. Part VII assesses the Indian legal framework. Part VIII proposes a five-stage hybrid reform model. Part IX concludes.

II. LITERATURE REVIEW

A. Scholarship Supporting Blockchain-Based Dispute Resolution

The theoretical foundations for blockchain-based dispute resolution draw on law and economics scholarship concerning online dispute resolution (ODR). Katsh and Rifkin's foundational work established that technology-mediated dispute resolution could reduce transaction costs while expanding access to justice, particularly for cross-border, low-value disputes.⁷ This framework was extended to smart contracts by Garrie and Andler, who identified arbitration, rather than litigation, as the most compatible formal mechanism for resolving disputes arising from autonomous code, arguing that arbitration's procedural flexibility enabled adaptation to the idiosyncrasies of blockchain transactions.⁸

The most comprehensive socio-legal analysis of a live blockchain arbitration platform remains Bergolla, Seif, and Eken's case study of Kleros, published in the *Ohio State Journal on Dispute Resolution* in 2022.⁹ Applying the Katsh-Rifkin ODR framework, the authors found that Kleros demonstrated comparative advantages in speed, cost, and accessibility for low-complexity disputes. They also acknowledged that prior studies "warned about the potential risks to essential procedural safeguards presented by anonymous and economically-incentivised jurors", a finding whose implications they did not fully resolve, and which forms the analytical core of the present paper.

Scherer, Prasad, and Prokic's treatment in the 2023 edited volume on digital arbitration represents the most systematic doctrinal mapping of blockchain arbitration against the international arbitral framework.¹⁰ The authors categorise blockchain arbitration as a form of "algorithmically administered dispute resolution" and question whether on-chain rulings constitute "awards" within the meaning of Article I of the Convention. They propose the concept of a "digital seat", the jurisdiction of the platform's registered principal place of

⁷ Ethan Katsh and Janet Rifkin, *Online Dispute Resolution: Resolving Conflicts in Cyberspace* (Jossey-Bass 2001) 3–22.

⁸ Daniel Garrie and John Andler, 'Arbitration is a Promising Approach for Smart Contract Disputes' (JAMS ADR 2023) <<https://www.jamsadr.com/files/uploads/documents/dj-garrie-andler-smart-contracts.pdf>> accessed 1 June 2026.

⁹ Luis Bergolla, Karen Seif, and Can Eken, 'Kleros: A Socio-Legal Case Study of Decentralized Justice & Blockchain Arbitration' (2022) 37 *Ohio State Journal on Dispute Resolution* 55, 57, 78.

¹⁰ Maxi Scherer, Niuscha Bassiri, and Milica Prokic, 'International Commercial Arbitration in the Digital Age' in Scherer, Bassiri, and Wahab (eds) (n 6) 1128–1135.

business, as a pragmatic solution to the seat-identification problem, though they acknowledge that this solution has not been tested before any national court.

The UKJT Legal Statement of 2019, updated in 2023, provides a different form of authoritative support: a judicial-facing analysis concluding that smart contracts can constitute legally binding contracts under English law and that their terms can in principle constitute valid arbitration agreements.¹¹ The Statement does not endorse any particular blockchain arbitration platform, and its conclusions are confined to English law. Nonetheless, it represents the most significant institutional recognition that the legal framework can accommodate smart contract dispute resolution, subject to satisfaction of standard procedural requirements.

B. Critical Scholarship and Due Process Concerns

The most trenchant criticism of blockchain arbitration platforms remains Buchwald's 2020 analysis, which argued that Schelling-point-based decision-making is structurally incompatible with the *audi alteram partem* principle.¹² On Buchwald's analysis, jurors on platforms like Kleros do not evaluate evidence against a normative standard but rather attempt to predict the majority outcome, a process structurally indifferent to the merits of the parties' submissions, producing herding behaviour that mimics consensus while potentially diverging from justice. This critique has not been adequately rebutted in the subsequent platform literature.

Huang and colleagues, writing in the *University of Pennsylvania Law Review Online* in 2025, identified the anonymity of jurors as the central point of friction with international arbitration standards.¹³ International arbitration requires that arbitrators be independent and impartial, and that parties be able to investigate and challenge an arbitrator's qualifications and potential conflicts of interest. Pseudonymous jurors cannot satisfy these requirements: there is no mechanism for disclosure, no professional accountability, and no regulatory body capable of imposing sanctions for misconduct. These deficiencies engage Article V(1)(d) of the Convention directly.

Keller's 2025 comparative study concluded that the principal barrier to Convention enforcement is structural rather than technological: the self-executing nature of on-chain awards deprives national courts of any meaningful opportunity to scrutinise procedural

¹¹ UK Jurisdiction Taskforce (n 5) paras 14–22 (smart contracts as binding contracts) and paras 61–67 (arbitration agreements in smart contracts).

¹² Michael Buchwald, 'Smart Contract Dispute Resolution: The Inescapable Flaws of Blockchain-Based Arbitration' (2020) 168 *University of Pennsylvania Law Review* 1369, 1393–1400.

¹³ Huang and others (n 6).

compliance before enforcement occurs.¹⁴ By the time a party seeks judicial recourse, crypto assets may already have been transferred pursuant to an algorithmically rendered decision, rendering subsequent judicial relief practically ineffective. This observation has particular resonance in the Indian context, where interim measures under Section 9 of the 1996 Act require timely judicial action.

C. The Enforceability Debate

A significant strand of recent scholarship has focused on whether blockchain arbitration can be brought within the Convention's enforcement framework through structural adaptation rather than wholesale replacement. The "DAMN project" (Decentralised Arbitration with Meaningful Notice), discussed on the Kluwer Arbitration Blog in 2025, proposes a two-phase hybrid: the blockchain platform renders an initial decision, which is then reviewed and adopted by a formally recognised arbitral institution, producing a Convention-compliant award.¹⁵

The Mexican court episode of 2021, widely cited as the first judicial recognition of a blockchain-derived decision, illustrates both the promise and the limits of this hybrid approach. As Chevalier has analysed, a Mexican court enforced a traditional arbitral award whose reasoning incorporated a Kleros-rendered decision. It was the human arbitrator's award, not the blockchain ruling itself, that was enforced.¹⁶ This precedent supports the hybrid model proposed in Part VIII, but it does not establish that blockchain-based arbitral awards are independently enforceable under the New York Convention.

D. AI-Assisted and Technology-Augmented Arbitration

A related emerging area concerns the integration of artificial intelligence into arbitral decision-making. GenLayer's natural language oracle system, which evaluates whether real-world conditions satisfy contractual criteria expressed in natural language, has been proposed as a means of extending smart contract enforceability beyond binary conditions.¹⁷ Rijnhout and colleagues, writing in *Arbitration International* in 2024, identify distinct due process concerns

¹⁴ A Keller, 'Blockchain Arbitration: Roadmap to Recognition and Enforcement of Arbitral Awards' (2025) <<https://www.researchgate.net/publication/394258833>> accessed 4 June 2026.

¹⁵ 'Decentralised Justice and the New York Convention' (Kluwer Arbitration Blog, 12 September 2025) <<https://legalblogs.wolterskluwer.com/arbitration-blog/decentralised-justice-and-the-new-york-convention/>> accessed 4 June 2026.

¹⁶ Maxime Chevalier, analysis cited in Kluwer Arbitration Blog (n 15); see also 'The Mexican Court Recognition of Kleros' (Kleros Blog, 2021) <<https://blog.kleros.io/kleros-x-trustworks-and-the-first-court-case/>> accessed 5 June 2026.

¹⁷ GenLayer, 'Intelligent Smart Contracts: Technical Documentation' (2024) <<https://genlayer.com>> accessed 5 June 2026.

about AI in arbitration: algorithmic decision-making is opaque, difficult to challenge on appeal, and potentially discriminatory in ways that human review cannot readily detect.¹⁸ The combination of pseudonymous human jurors and AI oracles in the same platform compounds rather than resolves the due process difficulties analysed below.

III. MECHANICS OF BLOCKCHAIN-BASED ARBITRATION

A. Smart Contracts as Dispute Triggers

A smart contract is, in the words of the UK Jurisdiction Taskforce, "a contract which is self-executing in some respects, in the sense that a computer protocol automates the performance of some or all of the parties' contractual obligations."¹⁹ The ISDA/Linklaters analysis similarly defines them as programmes stored on a blockchain that run when predetermined conditions are met.²⁰ Unlike traditional contracts, which require external enforcement, smart contracts self-execute: when the coded conditions are satisfied, the contractual obligation is automatically performed. The blockchain's immutability guarantees that deployed code cannot be unilaterally altered.

Smart contracts are, however, incapable of resolving ambiguity. Code is deterministic; disputes arise precisely when real-world facts do not correspond neatly to the binary conditions encoded in the contract. A freelancer claiming partial performance, an NFT buyer disputing the authenticity of a digital asset, a DeFi participant challenging the calculation of a liquidation event, in each case, the self-executing mechanism produces no output, or an output one or both parties regard as erroneous. A dispute resolution layer is therefore required.

B. The Decentralised Jury Model

Decentralised jury platforms address this requirement by coding the dispute resolution process itself as a smart contract. The general mechanics are as follows. First, a dispute clause in the primary smart contract is triggered when a party raises a challenge. Second, jurors from a standing pool, individuals who have staked the platform's native token, are selected by a randomised algorithm weighted by stake size. Third, jurors review evidence uploaded by the disputing parties (submitted to decentralised storage, typically IPFS) and cast votes. Fourth, the smart contract automatically executes the ruling corresponding to the majority vote. Jurors

¹⁸ Rianka Rijnhout and others, 'AI-Assisted Arbitration: Between Efficiency and Due Process' (2024) 40 *Arbitration International* 187, 199–204.

¹⁹ UK Jurisdiction Taskforce (n 5) para 14.

²⁰ ISDA and Linklaters, 'Smart Contracts and Distributed Ledger Technology: A Legal Perspective' (2017) 5.

who vote with the majority receive a portion of the losing minority's staked tokens; those who vote with the minority forfeit tokens.²¹

The mechanism is designed around the game-theoretic concept of the Schelling Point, a solution that people converge upon in the absence of direct communication because it seems natural or obvious.²² Kleros operationalises this by instructing jurors to vote for the outcome they believe the majority will choose, on the theory that an honest and informed majority will converge on the correct answer. As Buchwald demonstrates, this instruction conflates "correct" with "predictably popular", a conflation that may systematically disadvantage parties whose legitimate claims diverge from community priors.²³

C. Token Economics and Structural Biases

The token-staking mechanism introduces a structural bias: juror selection weighted by token quantity means that individuals holding large positions are disproportionately likely to serve as jurors. On platforms with concentrated token holdings, a characteristic of virtually all existing crypto-token ecosystems, this produces a systematic bias toward the interests of large token holders.²⁴ Token value volatility creates further distortions, producing periods of high and low juror participation that correlate with market conditions rather than dispute quality or complexity.

IV. COMPARATIVE ANALYSIS: TRADITIONAL AND BLOCKCHAIN ARBITRATION

The table below summarises the principal structural differences between traditional international commercial arbitration and blockchain-based arbitration platforms across twelve criteria.

Criterion	Traditional Arbitration	Blockchain-Based Arbitration
Legal Basis	Statutory: national Arbitration Acts, UNCITRAL Model Law, New York Convention 1958	Contractual and code-based; no dedicated international statutory framework
Arbitrator	Party appointment or institutional	Algorithmic selection from token-

²¹ Ast and Lesaege (n 3) 4–9.

²² Thomas Schelling, *The Strategy of Conflict* (Harvard University Press 1960) 54–57.

²³ Buchwald (n 12) 1394–1397.

²⁴ Bergolla, Seif, and Eken (n 9) 78–82.

Criterion	Traditional Arbitration	Blockchain-Based Arbitration
Selection	nomination; identity verified; challenge procedures under Model Law art 12–13	staking pool; identities pseudonymous; challenge mechanisms absent or untested
Due Process	Oral/document hearings; right to submit evidence; reasoned award required under most national laws and Convention art V(1)(b)	Asynchronous text submission; no oral hearings as standard; reasoned awards rarely provided; Schelling-point voting structurally disregards merit
Seat of Arbitration	Physically and legally identifiable; determines lex arbitri, supervisory court, and award nationality	No physical or legal seat; "code is law" ethos resists identification; applicable procedural law indeterminate
Award Enforcement	New York Convention (172 States); mature recognition and enforcement framework	On-chain self-execution for crypto assets; off-chain enforcement legally uncertain; Convention applicability contested
Cost	Significant: institutional fees, arbitrator fees, legal costs; ICC minimum ~USD 2,500	Lower in principle; gas fees and token acquisition costs; layer-2 protocols reduce on-chain costs
Speed	Months to years depending on complexity, institution, and seat	Days to weeks for low-complexity disputes
Confidentiality	Default confidentiality under most institutional rules (LCIA, SIAC, ICC)	Evidence stored on public or semi-public ledger; no robust confidentiality architecture on current platforms
Transparency	Limited; proceedings and awards typically private	High; on-chain record immutable and accessible
Complex	Well-suited; expert arbitrators,	Low suitability; best for binary,

Criterion	Traditional Arbitration	Blockchain-Based Arbitration
Disputes	document production, interim measures, multi-party joinder	low-value, low-complexity disputes; not designed for multi-party or document-intensive proceedings
Institutional Recognition	Strong; ICC, LCIA, SIAC, UNCITRAL, JAMS globally recognised	No recognised institutional status; platforms operate as contractual ODR services

The comparison reveals that blockchain arbitration holds genuine advantages in speed, cost, and cross-border accessibility for low-complexity disputes. These advantages are, however, purchased at the cost of structural features, identified arbitrators, oral hearings, reasoned awards, and jurisdictional clarity, that underpin the legitimacy and enforceability of the traditional model.

Traditional arbitration's weaknesses, cost, delay, inaccessibility for small claims, are precisely the failure modes that have generated demand for decentralised alternatives. An estimated \$1.3 billion in DeFi disputes remained unresolved as of 2024, reflecting not a failure of blockchain technology but an insufficiency of the existing dispute resolution infrastructure to adapt to the characteristics of blockchain-based commerce.²⁵ Any evaluative framework must acknowledge both sides of this institutional comparison. The question is not whether blockchain arbitration is better or worse than traditional arbitration in the abstract, but whether it can satisfy the minimum legal requirements for recognition and enforcement as a matter of positive law.

V. LEGAL ANALYSIS: DUE PROCESS, JURISDICTION, AND ENFORCEMENT

A. Due Process and the Principles of Natural Justice

Due process in international arbitration is not a procedural formality; it is the constitutive condition of an award's legal validity. Article V(1)(b) of the Convention provides that recognition and enforcement of an award may be refused where the party against whom the award is invoked "was not given proper notice of the appointment of the arbitrator or of the

²⁵ T Huang and M Harrington, 'From Code to Court and Beyond: Alternative Dispute Resolution on and off the Blockchain' (Dispute Resolution Journal, November 2024) <<https://www.mayerbrown.com>> accessed 7 June 2026.

arbitration proceedings or was otherwise unable to present his case."²⁶ This provision codifies the common law principle of *audi alteram partem* (hear the other side) and gives it binding international effect.

Article 18 of the UNCITRAL Model Law reinforces this standard, requiring that "each party shall be given a full opportunity of presenting its case."²⁷ In India, Section 18 of the 1996 Act replicates this provision verbatim. The Indian Supreme Court has treated the right to present one's case as a fundamental component of the public policy of India within the meaning of Section 48(2)(b) of the 1996 Act, and has relied upon it to refuse enforcement of foreign arbitral awards that denied a party a meaningful hearing.²⁸

Blockchain arbitration platforms systematically fail to satisfy these standards in three respects. First, the typical evidence submission process is asynchronous, text-based, and subject to platform-imposed word limits and file-format constraints: parties lack an equivalent opportunity to present their case, particularly where complex technical or factual issues require expert evidence or oral elaboration. Second, as Buchwald demonstrates, the Schelling-point voting mechanism evaluates juror coherence with the majority rather than engagement with the merits, structurally undermining *audi alteram partem* by rendering submissions evidentially peripheral to the voting incentive. Third, the absence of reasoned awards means that parties cannot identify the basis upon which their submissions were rejected, precluding meaningful challenge.²⁹

B. Arbitrator Independence and Impartiality: The Anonymity Problem

Article V(1)(d) of the Convention permits refusal of enforcement where "the composition of the arbitral authority or the arbitral procedure was not in accordance with the agreement of the parties, or, failing such agreement, was not in accordance with the law of the country where the arbitration took place." Article 12 of the UNCITRAL Model Law requires disclosure of "any circumstances likely to give rise to justifiable doubts as to [the arbitrator's] impartiality or independence."³⁰ Section 12 of the 1996 Act contains an identical requirement.

²⁶ New York Convention (n 2) art V(1)(b).

²⁷ UNCITRAL Model Law on International Commercial Arbitration 1985, as amended 2006 ('UNCITRAL Model Law'), art 18.

²⁸ Ssangyong Engineering and Construction Co Ltd v National Highways Authority of India [2019] 15 SCC 131 (SC India) (due process as component of Indian public policy); Venture Global Engineering v Satyam Computer Services Ltd [2008] 4 SCC 190 (SC India).

²⁹ Budianto and others, 'Blockchain Arbitration in Confidentiality and Impartiality Principles: Lex Digitalis Arbitri' (2024) Unram Law Review <<https://unramlawreview.unram.ac.id/index.php/ulrev/article/view/339>> accessed 7 June 2026.

³⁰ New York Convention (n 2) art V(1)(d); UNCITRAL Model Law (n 27) art 12.

The IBA Guidelines on Conflicts of Interest in International Arbitration (2014, updated 2024) require arbitrators to disclose circumstances that might give rise to justifiable doubts as to their impartiality.³¹ No equivalent mechanism exists on any current blockchain arbitration platform. Juror anonymity simultaneously prevents parties from establishing juror independence and prevents jurors from disclosing relevant conflicts of interest. The token-staking mechanism may itself constitute a structural conflict of interest: jurors who hold significant positions in the platform's native token have a financial interest in decisions that affect the platform's reputation and token value. This concern has not been addressed in platform documentation.

C. The Seat of Arbitration and Applicable Law

The seat of arbitration performs three essential legal functions: it determines the *lex arbitri* (the procedural law governing the arbitration); it identifies the supervisory court with jurisdiction to set aside an award; and it establishes the "nationality" of the award for Convention enforcement purposes. Article 20 of the UNCITRAL Model Law governs the determination of the seat. Section 20 of the 1996 Act contains equivalent provisions.³²

Blockchain arbitration has no natural seat. Kleros operates as a decentralised autonomous organisation (DAO) registered in Panama; its smart contracts are deployed on the Ethereum network, which has no territorial location; its jurors are globally distributed; its evidence is stored on IPFS nodes spanning multiple jurisdictions. The "digital seat" concept proposed by Scherer, Prasad, and Prokic, fixing the seat at the jurisdiction of the platform's registered incorporation, provides a workable theoretical solution but has not been endorsed by any court or arbitral institution.³³

The absence of an identifiable seat creates cascading legal difficulties. Without a *lex arbitri*, there is no procedural law to fill gaps in the parties' agreement or to impose mandatory procedural protections. Without a supervisory court, there is no mechanism for setting aside an award on grounds of procedural irregularity, meaning that a defective award is self-executing and irremediable. Without a clear award nationality, Article I of the Convention cannot straightforwardly be applied.

D. The New York Convention: Four Points of Friction

The Convention, ratified by 172 States as of 2024, is the cornerstone of the international

³¹ IBA Guidelines on Conflicts of Interest in International Arbitration (2014, updated 2024), General Standard 7.

³² UNCITRAL Model Law (n 27) art 20; Arbitration and Conciliation Act 1996 (India) ('the 1996 Act'), s 20.

³³ Scherer, Bassiri, and Prokic (n 10) 1133.

commercial arbitration framework.³⁴ Its application to blockchain arbitration raises four principal difficulties.

First, the **writing requirement**. Article II(2) requires the arbitration agreement to be "in writing." The UNCITRAL Recommendation of 2006 broadened this to include electronic communications.³⁵ Whether code embedded in a smart contract, not drafted in natural language, not executed by identifiable human parties, and potentially entered into by an automated agent, satisfies even this liberal interpretation remains analytically open. The UKJT Legal Statement concludes that English law can accommodate smart contract arbitration agreements, but this conclusion is jurisdiction-specific and does not resolve the question for the 172 Convention States collectively.³⁶

Second, the **tribunal composition requirement**. Article V(1)(d) permits refusal where tribunal composition was not in accordance with the parties' agreement or the applicable law. The automated, randomised juror selection process is arguably inconsistent with the right of parties to constitute their tribunal, a right fundamental to the consensual basis of arbitration. No Convention State has held that algorithmic juror selection satisfies Article V(1)(d).

Third, the **public policy exception**. Article V(2)(b) permits enforcement courts to refuse recognition on public policy grounds. Due process violations, absence of oral hearings, unidentified arbitrators, lack of reasoned awards, may engage the *lex fori*'s public policy protections. In India, Section 48(2)(b) of the 1996 Act imports the same public policy exception, and Indian courts have read it expansively to encompass fundamental procedural guarantees.³⁷

Fourth, the **self-execution paradox**. The Convention's enforcement framework presupposes an award that has not yet been executed; where execution is automatic and irreversible, the Convention's protective framework is rendered retrospective at best. A party seeking to set aside a self-executed award that has already transferred crypto assets to the counterparty faces a practically irremediable situation.

E. Jurisdictional Competence and Kompetenz-Kompetenz

The doctrine of *kompetenz-kompetenz*, that an arbitral tribunal has the power to rule on its own

³⁴ New York Convention (n 2); contracting states list <<https://www.newyorkconvention.org/contracting-states>> accessed 7 June 2026.

³⁵ UNCITRAL, 'Recommendation Regarding the Interpretation of Article II(2) and Article VII(1) of the Convention' (2006) UN Doc A/61/17 Annex II.

³⁶ UK Jurisdiction Taskforce (n 5) paras 61–67.

³⁷ 1996 Act, s 48(2)(b); *Renusagar Power Co Ltd v General Electric Co* [1994] Supp (1) SCC 644 (SC India) (public policy in enforcement of foreign awards).

jurisdiction, is a foundational principle of modern arbitration law, reflected in Article 16 of the UNCITRAL Model Law and Section 16 of the 1996 Act.³⁸ On blockchain platforms, the analogous question, does the smart contract have authority to submit the parties' dispute to the platform's jurors?, is answered by the contract's own code. This circular form of self-referential jurisdiction has no established analogue in the institutional arbitration framework and has not been tested before any superior court.

The pseudonymity of parties creates a further jurisdictional problem. If one party disputes the validity of the arbitration agreement, alleging, for instance, that they did not consent to Kleros jurisdiction, or that the underlying contract was void for misrepresentation, there is no mechanism within the blockchain platform to adjudicate that preliminary challenge. The supervisory court question cannot be resolved without an identifiable seat. The result is a jurisdictional vacuum at the very moment it is most needed.

VI. CRITICAL EVALUATION OF BLOCKCHAIN ARBITRATION PLATFORMS AND INSTITUTIONAL RESPONSES

The table below provides a structured comparative evaluation of the principal platforms and institutional mechanisms.

Platform	Strengths	Weaknesses	Legal Assessment
Kleros	Largest deployment; Schelling-point incentive model; appellate mechanism; ~1,300+ resolved cases; Mexican court episode (2021)	Anonymous jurors; no reasoned awards; token-wealth juror bias; no confidentiality; New York Convention status unresolved	Contractual ODR mechanism; claims of procedural legitimacy remain contested in scholarship and await sustained judicial endorsement
Aragon Court	DAO-governance focus; ANT-staking structure; transparent guardian selection	Governance disputes rarely constitute "commercial" arbitration; ANT volatility distorts incentive structure;	Internal DAO governance mechanism; not recognised as arbitration by any reported court or arbitral institution

³⁸ UNCITRAL Model Law (n 27) art 16; 1996 Act, s 16.

Platform	Strengths	Weaknesses	Legal Assessment
		structural conflict between token-holders and adjudicated parties	
Aegora	Hybrid reputation-escrow design; attempts to address Kleros confidentiality deficit; community-governed	Early-stage; no significant case history; theoretical framework untested at scale; no third-party legal analysis	Status entirely untested; no judicial or institutional engagement reported
Mattereum	Asset-backed legal engineering; connects smart contracts to real-world legal obligations through legal prose warrants	Not primarily a dispute resolution platform; enforcement still depends on national courts for non-crypto assets; limited case volume	Hybrid legal-engineering framework; may satisfy writing and agreement requirements of Convention art II more readily than pure blockchain platforms

A. Kleros: Operational Scale and Legal Contestability

Kleros is the most operationally significant and academically analysed blockchain arbitration platform. Its appellate mechanism, documented case volume (exceeding 1,300 resolved cases as of 2024), and diverse subject-matter jurisdiction, covering everything from token listing disputes to freelance contract disagreements, constitute genuine empirical evidence of operational viability.³⁹

However, operational functionality must be distinguished from legal legitimacy. The claims made in Kleros's enterprise documentation regarding procedural compliance rely on self-defined standards rather than engagement with the requirements of Article V of the Convention or the IBA Guidelines. In the terms of the applicable scholarship, Kleros's claims of procedural legitimacy remain contested within arbitration scholarship and have yet to receive sustained

³⁹ Kleros, 'Case Statistics' (2024) <<https://kleros.io/cases>> accessed 8 June 2026.

judicial endorsement in any jurisdiction.⁴⁰

The Mexican precedent of 2021 is routinely cited as evidence of legal recognition. The characterisation overstates the precedent. As Chevalier's analysis demonstrates, the Mexican court enforced a conventional arbitral award whose reasoning incorporated a Kleros decision; it did not recognise a Kleros award as such.⁴¹ The case supports the hybrid model proposed in Part VIII, a human arbitrator within the traditional framework may choose to adopt a blockchain platform's output, but does not validate Kleros as an independent arbitral institution cognisable under the Convention.

Kleros's confidentiality deficit is structural rather than incidental. The immutability of blockchain evidence storage is simultaneously a transparency feature and a confidentiality problem: evidence submitted to Kleros may be permanently accessible on a public ledger, exposing commercially sensitive information that parties to traditional arbitration, with its default confidentiality under LCIA rule 30, SIAC rule 39, and ICC article 22(3), would not anticipate.

B. Aragon Court: Governance Mechanism Distinguished from Arbitration

Aragon Court is better understood as a DAO governance mechanism than as an arbitration platform in any legally cognisable sense. Its design is optimised for resolving disputes about the interpretation of DAO governance documents, inherently organisational questions binding only within the DAO's internal governance structure.⁴²

The use of ANT token staking creates an incentive structure that is arguably captured by the very constituency it purports to adjudicate: DAO members who hold ANT tokens have both a financial interest in the outcome of governance disputes and an influence over the composition of the guardian panel. This structural tension is inconsistent with the principle of arbitrator impartiality even on Aragon's own terms. The platform's limited external case load confirms that it functions as an internal governance mechanism rather than a publicly available dispute resolution service.

C. Aegora: Theoretical Promise, Empirical Absence

Aegora represents a third-generation design, combining reputation-based escrow, community

⁴⁰ Dmitry Narozhny, 'Is Kleros Legally Valid as Arbitration?' (Kleros Blog, 2019) <<https://blog.kleros.io/is-kleros-legally-valid-as-arbitration/>> accessed 8 June 2026 (self-assessment by Kleros Fellow; for academic critique see Buchwald (n 12) and Huang (n 6)).

⁴¹ Kluwer Arbitration Blog (n 15).

⁴² Aragon, 'Aragon Court Documentation' (2021) <<https://aragon.org/aragon-court>> accessed 8 June 2026.

governance, and decentralised adjudication in an attempt to address the confidentiality and incentive problems of pure token-staking models. The theoretical architecture is more sophisticated than either Kleros or Aragon Court.

The absence of any significant case history, third-party legal analysis, or judicial engagement means that Aegora cannot be evaluated as an operational system. Any scholarly treatment crediting Aegora with operational significance beyond its theoretical framework would be premature. Its evaluation in the present paper is therefore necessarily prospective.

D. Mattereum: Legal Engineering as a Hybrid Bridge

Mattereum occupies a different position in the ecosystem. Rather than operating a decentralised jury, it connects smart contracts to real-world legal obligations through "asset passports", legal instruments that embed warranties, provenance records, and dispute resolution terms into tokenised assets.⁴³ Mattereum's design more readily satisfies the Convention's writing requirement, since its asset passports are drafted in natural language and executed by identifiable parties. Dispute resolution under Mattereum ultimately remains dependent on national courts or conventional arbitral tribunals for non-crypto asset enforcement, but this design choice reflects legal realism rather than a deficiency.

Mattereum is instructive as a proof of concept: it demonstrates that the efficiency goals of smart-contract-native dispute resolution need not require the wholesale abandonment of conventional legal architecture. Its approach is broadly consistent with the hybrid model proposed in Part VIII.

E. Institutional Responses: JAMS and the UK Jurisdiction Taskforce

The JAMS Smart Contract Dispute Resolution Protocol, published in 2023, represents the most developed institutional attempt to bridge blockchain arbitration and the conventional framework.⁴⁴ Under the Protocol, parties to a smart contract may designate JAMS as the arbitral institution; JAMS appoints an identified arbitrator; and the arbitration proceeds under modified JAMS rules adapted to the characteristics of smart contract evidence and performance. The resulting award is issued in the name of the JAMS arbitrator, is rendered at a designated seat, and is subject to Convention enforcement. The blockchain platform, if used, functions as an evidence management tool.

The UKJT's Legal Statement concludes that smart contracts are capable in principle of forming

⁴³ Mattereum (n 4).

⁴⁴ JAMS Smart Contract Dispute Resolution Protocol (n 5).

binding contracts under English law, including binding arbitration agreements, provided that offer, acceptance, and consideration can be identified and that the agreement satisfies the formal requirements of the Arbitration Act 1996 (UK).⁴⁵ The Statement does not endorse any particular blockchain arbitration platform but provides the theoretical foundation for treating smart contract arbitration clauses as legally operative under English law, a foundation that Indian courts, which frequently consider English precedent in arbitration matters, may find persuasive.

VII. THE INDIAN LEGAL FRAMEWORK

A. The Arbitration and Conciliation Act 1996: Core Provisions and Blockchain Compatibility

The 1996 Act, modelled on the UNCITRAL Model Law, is the primary statute governing both domestic and international commercial arbitration in India. Section 7(4)(b) provides that an arbitration agreement is in writing if it is "contained in an exchange of letters, telex, telegrams or other means of telecommunication which provide a record of the agreement." The 2015 Amendment extended this to electronic communications, and the Bharatiya Sakshya Adhinyam 2023 ('BSA') provides an updated framework for electronic evidence admissibility.⁴⁶ Section 63 of the BSA requires certification of electronic records in specified circumstances, and on-chain evidence would need to satisfy this requirement for use in Indian arbitral proceedings.

The argument that smart contract arbitration clauses satisfy Section 7(4)(b) is plausible but untested. The 2015 Amendment's extension to electronic communications was not designed with smart contracts in mind. A smart contract clause is not an "exchange" of communications between identifiable parties in the conventional sense: it is code deployed by one party (the contract author) to which the counterparty 'agrees' by interacting with the contract on-chain. Whether this constitutes a meeting of minds sufficient for Section 7 purposes is a question the Indian Supreme Court has not yet addressed.

Section 11 of the Act governs appointment of arbitrators by the courts. It contemplates identifiable natural or legal persons amenable to challenge under Sections 12 and 13. An algorithmic juror-selection process corresponds to no procedure contemplated by Section 11. The challenge mechanism of Sections 12 and 13, which tracks the language of Article 12 of

⁴⁵ UK Jurisdiction Taskforce (n 5) para 67.

⁴⁶ 1996 Act, s 7(4)(b) (as amended by the Arbitration and Conciliation (Amendment) Act 2015); Bharatiya Sakshya Adhinyam 2023 ('BSA'), s 63.

the UNCITRAL Model Law and requires disclosure of circumstances giving rise to justifiable doubts about impartiality, is inapplicable to pseudonymous jurors whose identities cannot be ascertained.⁴⁷

Section 28 governs the rules applicable to the substance of the dispute. In international commercial arbitrations, parties may designate a system of law or rules of law. Whether a blockchain platform's internal rules constitute a valid choice of law for Section 28 purposes is unresolved. Indian courts have not addressed the question.

Enforcement of a domestic blockchain arbitral award under Section 36 requires court approval and execution as a decree. This mechanism presupposes an identifiable judgment-debtor against whom a decree can be executed. Where the debtor is pseudonymous and their assets are held in a decentralised wallet, Indian courts have no mechanism to compel performance or attach assets. The interaction between Section 36 enforcement and the on-chain self-execution of blockchain platform awards creates an as-yet unresolved doctrinal tension.⁴⁸

Recognition of a foreign blockchain arbitral award would require satisfaction of Sections 44–48 (foreign awards under the New York Convention). Section 48(1)(b), which mirrors Article V(1)(b) of the Convention, permits courts to refuse enforcement where the unsuccessful party was not given proper notice or was "otherwise unable to present his case." The due process deficiencies of blockchain platforms analysed in Part V directly engage this provision. Section 48(2)(b) further permits refusal on public policy grounds; Indian courts have read this provision broadly, and the anonymity of jurors and absence of reasoned awards could independently trigger the public policy exception.⁴⁹

B. The Information Technology Act 2000 and Indian Contract Law

Section 10A of the ITA provides that contracts formed through electronic means shall not be denied legal effect solely on the ground that they are in electronic form. Section 11 addresses the attribution of electronic records. These provisions provide a statutory foundation for treating smart contracts as legally binding contracts under Indian law, a position consistent with the UKJT's analysis of English law and with academic consensus.⁵⁰

The requirement of "free consent" under Section 14 of the Indian Contract Act 1872, however,

⁴⁷ 1996 Act, ss 11–13.

⁴⁸ 'Enforcement Dilemma and Lack of Policy: Blockchain Arbitration, an Indian Perspective' (Legal 500, January 2026) <<https://www.legal500.com/developments/thought-leadership/enforcement-dilemma-and-lack-of-policy-blockchain-arbitration-an-indian-perspective/>> accessed 10 June 2026.

⁴⁹ 1996 Act, ss 44–48; *Renusagar* (n 37).

⁵⁰ Information Technology Act 2000 (India) ('ITA'), ss 10A, 11; Indian Contract Act 1872, s 14.

raises additional difficulties. Where a user interacts with a DeFi protocol or NFT marketplace by clicking "connect wallet" or "confirm transaction," the question arises whether they have meaningfully consented to the arbitration clause embedded in the underlying smart contract code, a clause that may be inaccessible without technical expertise. The doctrine of *contra proferentem*, which requires ambiguous clauses to be construed against the drafter, may be relevant.

The Bharatiya Sakshya Adhiniyam 2023 introduced updated provisions for electronic evidence admissibility, replacing the Indian Evidence Act 1872. On-chain evidence, transaction records, smart contract event logs, IPFS-stored documents, must satisfy the certification requirements of Section 63 BSA. The technical architecture of blockchain evidence is not straightforwardly compatible with the certificate-based authentication framework of Section 63, and procedural guidance from the courts or a legislative amendment may be required.

C. Digital Personal Data Protection Act 2023 and DAO Legal Status

The Digital Personal Data Protection Act 2023 ('DPDPA') imposes compliance obligations on data fiduciaries processing personal data of Indian data principals.⁵¹ Blockchain arbitration platforms create structural tension with the DPDPA: IPFS-stored evidence does not have a single data controller capable of fulfilling the Act's obligations; the immutability of blockchain records is inconsistent with the right to erasure under Section 12 of the DPDPA; and the cross-border transfer of evidence to decentralised storage nodes may engage the cross-border transfer restrictions of Section 16.

Blockchain arbitration platforms typically operate as DAOs. Indian law does not currently recognise DAOs as legal persons: they do not correspond to any form contemplated by the Companies Act 2013 or the Limited Liability Partnership Act 2008. A Kleros arbitral award, issued by an entity without legal personality under Indian law, raises the question of whether it constitutes an "award" within the meaning of Section 2(1)(c) of the 1996 Act, which defines an award as a decision of an "arbitral tribunal." Whether a DAO constitutes an arbitral tribunal remains analytically open.⁵²

India's virtual digital asset tax framework, introduced by the Finance Act 2022, imposes a 30% flat tax on gains from transfer of virtual digital assets (VDAs) and requires 1% TDS on VDA transfers above threshold values under Section 194S of the Income Tax Act 1961. The token

⁵¹ Digital Personal Data Protection Act 2023 (India) ('DPDPA'), ss 12, 16.

⁵² 'The Blockchain Arbitral Order: An Indian Perspective' (Mondaq, 16 June 2023) <<https://www.mondaq.com/india/arbitration-dispute-resolution/1330488>> accessed 10 June 2026; 1996 Act, s 2(1)(c).

redistribution that occurs as part of blockchain arbitration outcomes may constitute a "transfer" of VDAs for tax purposes, creating unanticipated tax liabilities for jurors and losing parties that have not been addressed in platform documentation.

D. Judicial Developments and Reform Recommendations

The Madras High Court's 2025 decision in *Rhutikumari v Zanmai Labs Pvt Ltd* held that cryptocurrency constitutes property under the Income Tax Act, representing a significant step in the judicial recognition of blockchain assets.⁵³ The decision does not directly address smart contract enforceability or blockchain arbitration, but it signals an increasingly receptive judicial attitude toward blockchain-based transactions. The Supreme Court's 2020 decision in *Internet and Mobile Association of India v Reserve Bank of India*, setting aside the RBI's circular restricting cryptocurrency trading, confirms the constitutional validity of blockchain-based transactions subject to regulation.⁵⁴

Reform proposals appropriate to the Indian context include the following.

First, legislative amendment of Section 2(1)(d) of the 1996 Act to include technology-mediated arbitral procedures satisfying prescribed due process standards, analogous to the approach taken by Singapore's International Arbitration Act in recognising electronic communications.

Second, legislative recognition of DAOs as a distinct form of legal entity capable of entering contracts and participating in arbitral proceedings, building on the work of Wyoming, which has enacted LLC legislation recognising DAOs as legal persons, and the Marshall Islands' DAO LLC Act 2022.

Third, development of a dedicated Indian ODR framework, building on the Niti Aayog's 2021 ODR Handbook and the recommendations of the Expert Committee on Online Dispute Resolution, that establishes minimum standards for blockchain arbitration platforms seeking recognition under Indian law, including requirements for identified (or institutionally verified) arbitrators, reasoned decisions, and compliance with the DPDPA.

Fourth, amendment of Section 63 of the BSA to provide a specific authentication pathway for on-chain evidence, reducing the technical barriers to admissibility in Indian arbitral proceedings.

Fifth, guidance from the Law Commission of India, building on its 246th Report (2014) on arbitration reform, on the conditions under which blockchain arbitration platforms could be

⁵³ *Rhutikumari v Zanmai Labs Pvt Ltd* (OA No 194 of 2025, Madras High Court), (unreported, noted in Legal 500 (n 48)).

⁵⁴ *Internet and Mobile Association of India v Reserve Bank of India* [2020] SCC Online SC 275.

recognised as arbitral institutions under Section 11(6A) of the 1996 Act.

VIII. TOWARDS A HYBRID LEGAL ARCHITECTURE: A FIVE-STAGE MODEL

The foregoing analysis demonstrates that blockchain arbitration in its current form fails to satisfy the minimum legal requirements for recognition under international and domestic law. The question is whether this failure is inherent or remediable. This Part argues that it is remediable through a deliberately designed hybrid architecture, and proposes a five-stage model that preserves the efficiency characteristics of blockchain platforms while satisfying the enforceability requirements of the Convention and the 1996 Act.

The hybrid model draws on, and attempts to systematise, three existing approaches: the JAMS Smart Contract Dispute Resolution Protocol; the Mattereum legal engineering model; and the Mexican court precedent. Its central insight is that blockchain platforms need not be classified as either fully fledged arbitral institutions (which they cannot legally be, in their current form) or legally irrelevant technological curiosities (which would discard their genuine operational merits). Instead, they can serve as technologically sophisticated preliminary assessment tools within a framework that retains institutional arbitrator oversight, identified decision-makers, and a formally designated seat.

The five stages are summarised in the table below, followed by detailed analysis of each.

Stage	Operational Function	Legal Function
Stage 1: Filing	Disputing party triggers blockchain platform via smart contract clause; evidence uploaded to decentralised storage (IPFS); notice dispatched to counterparty through platform	Arbitration agreement activated; writing requirement of New York Convention art II(2) satisfied by smart contract clause (UNCITRAL Recommendation 2006)
Stage 2: Juror Deliberation	Platform selects jurors from staking pool; parties submit structured evidence; jurors vote; platform generates preliminary recommendation (not final award)	Preliminary determination only; no direct legal effect; serves as expert factual assessment for institutional arbitrator

Stage	Operational Function	Legal Function
Stage 3: Institutional Review	Designated arbitral institution (e.g., MCIA, SIAC, JAMS) receives platform recommendation; sole arbitrator appointed (identity verified; IBA Guidelines complied with); brief review hearing held	Satisfies Model Law art 18 (equal treatment); arbitrator independence and impartiality confirmed under arts 12–13; oral or document hearing ensures audi alteram partem
Stage 4: Award	Institutional arbitrator issues formal reasoned award, incorporating or departing from platform recommendation with stated reasons; award rendered at designated seat	Award satisfies Convention art I (made in identified country); art V(1)(e) (subject to supervisory court); Sections 28–31 of Indian Arbitration and Conciliation Act 1996 satisfied
Stage 5: Enforcement	On-chain: platform smart contract executes award automatically for crypto assets. Off-chain: award filed for recognition and enforcement under national courts	Convention art III–IV enforcement framework available; Indian courts can enforce under ss 35–36 (domestic) or ss 44–48 (foreign) of the 1996 Act

Stage 1: Filing and Initiation

A dispute clause embedded in the smart contract is triggered by one party raising a challenge. The clause should, in a well-drafted contract, expressly designate: (a) the blockchain platform as a preliminary assessment mechanism; (b) the institutional arbitrator or institution (such as MCIA, SIAC, or JAMS) as the formal arbitral authority; (c) the seat of arbitration; and (d) the governing law. The JAMS Protocol provides a model clause for this purpose that has been adapted for smart contract contexts.⁵⁵

The evidence submission stage on the platform serves both an operational and a legal function: it creates a structured, timestamped record of the parties' respective positions and supporting documents, which is transmitted to the institutional arbitrator at Stage 3. Parties should be provided with adequate notice and a reasonable submission period, requirements that platforms can code as mandatory minimum timeframes.

⁵⁵ JAMS Smart Contract Dispute Resolution Protocol (n 5), Model Clause 3.

Stage 2: Platform Deliberation and Preliminary Recommendation

Jurors selected by the platform review the evidence and issue a preliminary recommendation. Critically, this recommendation has no direct legal effect: it is not an "award" within the meaning of any national arbitration statute or the Convention. It is, legally, a form of expert determination or advisory opinion, analogous to a neutral evaluation in mediation.

For the hybrid model to work, the preliminary recommendation should be accompanied by a reasoned summary, a structured indication of the grounds on which the majority voted as it did. This summary need not be a full legal analysis; it can be a structured checklist of the factual findings relevant to the dispute. Current platforms do not systematically provide this; it would require a design modification that the platforms could implement without altering their core incentive architecture.

Stage 3: Institutional Arbitrator Review

A designated arbitral institution appoints a sole arbitrator (for disputes below a financial threshold) or a three-member tribunal (for higher-value disputes). The arbitrator's identity is verified against the IBA Guidelines; potential conflicts of interest are disclosed; and a challenge mechanism is available under the institution's rules. These requirements can be satisfied rapidly, major institutions such as SIAC, MCIA, and JAMS have expedited appointment procedures that can be completed within 48–72 hours for straightforward disputes.

The institutional arbitrator reviews the platform's preliminary recommendation, the parties' submissions, and any additional evidence. Where the recommendation is clearly correct on the evidence, the arbitrator may adopt it without extended deliberation, issuing a short-form reasoned award. Where the recommendation is contested or raises complex legal issues, the arbitrator conducts a fuller hearing, document-based or, in high-value disputes, oral, before issuing a full award. The arbitrator is not bound by the platform's recommendation but must address it in their reasoning.

Stage 4: Award Issuance and On-Chain Execution

The institutional arbitrator issues a formal reasoned award at the designated seat. The award satisfies Article I of the Convention (made in an identified country), is subject to the supervisory jurisdiction of the seat's national court under Article V(1)(e), and meets the procedural requirements of Article V(1)(b) and (d) through the institutional review stage. In India, the award satisfies the requirements of Sections 28–31 of the 1996 Act.

The award is simultaneously transmitted to the blockchain platform, which executes any on-

chain component automatically. This execution is now the *consequence* of a formally valid award rather than the award itself, avoiding the self-execution paradox identified in Part V. For disputes involving off-chain assets, the institutional arbitrator's award is filed for enforcement in the relevant national courts.

Stage 5: Enforcement

The award is enforceable under the Convention as a foreign arbitral award in any of the 172 States party to the Convention, including India under Part II of the 1996 Act. The on-chain execution addresses enforcement for crypto assets automatically and irreversibly; the institutional award provides enforcement authority for any off-chain component. Parties who seek to set aside the award must apply to the supervisory court of the designated seat under Article V(1)(e) and the applicable national law.

B. Conditions for the Hybrid Model's Success

The hybrid model will achieve its objectives only if four conditions are satisfied. First, the arbitration clause in the smart contract must be carefully drafted to designate both the blockchain platform (as preliminary assessment tool) and the institutional arbitrator (as formal decision-maker), with an unambiguous seat and governing law. Poorly drafted clauses, which describe the blockchain platform as the "arbitrator", will not satisfy the Convention requirements regardless of the institutional review stage.

Second, the institutional review must be genuinely independent and not a rubber stamp of the platform's recommendation. This requires institutional arbitrators to engage substantively with the recommendation and to depart from it where the evidence so requires. The risk of "automation bias", the tendency of human reviewers to defer to algorithmic recommendations, is well-documented in AI scholarship and equally applicable here.⁵⁶

Third, the blockchain platform must implement minimum procedural standards: adequate notice periods, prohibition on evidence submission cut-off periods shorter than a specified minimum, and provision of structured reasoning summaries. These standards do not require fundamental architectural changes and could be implemented by platforms as a compliance layer for hybrid-model disputes.

Fourth, international regulatory endorsement, through UNCITRAL, the ICC, or a dedicated multilateral instrument, would substantially strengthen the hybrid model's acceptability. The

⁵⁶ On automation bias see Rijnhout and others (n 18) 202–204.

UNCITRAL Technical Notes on Online Dispute Resolution (2017) already provide a framework for technology-assisted dispute resolution; supplementary notes addressing blockchain arbitration specifically would give the hybrid model explicit international institutional support.⁵⁷

IX. CONCLUSION

This paper has addressed the question of whether blockchain-based arbitration can serve as a legally enforceable and effective alternative to traditional arbitration for smart contract disputes under existing international and domestic legal frameworks. The answer, as this paper has argued, is: **not in its current form, but it can become so through a hybrid legal architecture that preserves the efficiency benefits of decentralised platforms while satisfying the institutional requirements of the Convention.**

The paper has demonstrated that blockchain arbitration platforms, as presently designed, fail to satisfy the minimum legal requirements for recognition as arbitration under international and domestic law. The due process deficiencies, anonymous jurors, absence of oral hearings, lack of reasoned awards, no disclosure mechanism, directly engage Article V(1)(b) of the Convention, Article 18 of the UNCITRAL Model Law, and Section 18 of the Indian Arbitration and Conciliation Act 1996. The seat-of-arbitration problem creates cascading difficulties in applicable law, supervisory jurisdiction, and award nationality. The self-executing character of on-chain awards renders the Convention's protective framework operationally retrospective. The platforms' claims regarding procedural legitimacy remain contested within arbitration scholarship and have yet to receive sustained judicial endorsement in any jurisdiction.

The Mexican precedent of 2021, accurately characterised, supports the hybrid model rather than direct blockchain arbitration: it establishes that a human arbitrator operating within the traditional framework may adopt a blockchain platform's output as part of an otherwise valid award. The JAMS Smart Contract Dispute Resolution Protocol and the Matterum legal engineering model demonstrate institutional and commercial appetite for hybrid solutions. The UKJT Legal Statement establishes that smart contract arbitration agreements are conceptually compatible with English law, providing theoretical support for the model's writing-requirement component.

⁵⁷ UNCITRAL, 'Technical Notes on Online Dispute Resolution' (2017).

The five-stage hybrid model proposed in Part VIII, comprising platform filing and evidence management, platform preliminary recommendation (without legal effect), institutional arbitrator review, formal award issuance at a designated seat, and Convention enforcement, provides a legally defensible path to enforceability that preserves the principal efficiency advantages of blockchain platforms: reduced cost, speed, cross-border accessibility, and technological alignment with blockchain-based commerce.

For India specifically, the reform agenda includes: legislative recognition of DAOs as legal entities; amendment of Section 2(1)(d) of the 1996 Act to accommodate technology-mediated proceedings satisfying prescribed due process standards; amendment of Section 63 of the BSA to provide an authentication pathway for on-chain evidence; integration of blockchain arbitration within the developing ODR framework on Niti Aayog's model; and Law Commission guidance on the conditions for institutional recognition of blockchain platforms under Section 11(6A) of the 1996 Act.

At the international level, UNCITRAL Working Group II should be invited to consider supplementary rules or a model clause for blockchain arbitration proceedings, following the precedent of the Technical Notes on Online Dispute Resolution. The Convention's drafting is sufficiently broad to accommodate blockchain arbitration in principle; the specific procedural requirements of recognising States under Article V are the practical obstacle, and these can be addressed through carefully designed platform and institutional rules rather than treaty amendment.

Blockchain arbitration is not the inevitable future of all dispute resolution, as some of its advocates claim. But it is a technologically serious and commercially significant response to a genuine institutional failure, the inability of traditional legal systems to provide accessible, affordable, and timely dispute resolution for the expanding class of blockchain-based commercial relationships. Realising its potential requires the discipline of legal rigour and the willingness of arbitral institutions, legislators, and platforms to collaborate on a hybrid architecture that neither party could achieve alone.