



ADVANCING ACCESS TO JUSTICE IN E-COMMERCE TRANSACTIONS THROUGH BLOCKCHAIN-BASED ONLINE DISPUTE RESOLUTION: LEGAL FRAMEWORK AND FUTURE DIRECTIONS

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Article Information:

Article Type:
Research Article

Manuscript Received:
30 April 2026

Final Revision Received:
25 May 2026

Published Online:
31 August 2026

Keywords:
Blockchain Technology,
Online Dispute Resolution
(ODR), Procedural
Fairness, Customer Trust,
Cross-Border E-
commerce, Smart
Contracts, Decentralized
Justice, Legal Recognition,
Sustainable Development
Goals, Access to Justice

The presence of a critical issue called 'trust deficit' in cross-border e-commerce transactions due to shortcomings of the current mechanisms for resolving disputes is evident. The aim of this article is to investigate Blockchain-Based Online Dispute Resolution (BODR) as a mechanism that could be used to enhance procedural justice and trust in cross-border e-commerce transactions. Based on investigation of some key features of the blockchain technology (including decentralized structure, immutability, and transparency), it is possible to reveal how BODR can offer tamper-proof record-keeping, impartiality, and enforcement of decisions through smart contracts. By analyzing new platforms such as Kleros and Jur, the current research has shown that BODR applies the basic requirements of procedural justice – transparency, impartiality, accessibility, and reason-giving. It was established that BODR corresponds substantively to the UN Sustainable Development Goal 16 (SDG 16) -access to justice for all. Nevertheless, there are still many obstacles on the way to be overcome: there is no legal recognition of decentralized awards; the balance of algorithmic automation and human interaction; the digital divide. In this regard, the current article will analyze how the legal framework and policy solutions can be used to overcome the above barriers. They include harmonization of international law standards, adoption of hybrid dispute resolution methods, proper design of interfaces, and education of users, etc.

Cite this article: Peter O. Ale and Ifeoluwa A. Olubiye, Ph.D (2026). Advancing Access to Justice in E-Commerce Transactions through Blockchain-Based Online Dispute Resolution: Legal Framework and Future Directions. The Journal of Sustainable Development, Law and Policy. Vol. 18:2. 702-716. DOI: 10.4314/jsdlp.v18i2.26.



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Publisher: Institute for Oil, Energy, Environment and Sustainable Development (OGES Institute), Afe Babalola University, Ado Ekiti, Nigeria.

I. INTRODUCTION: THE CHALLENGE OF CROSS-BORDER E-COMMERCE DISPUTES AND THE PROMISE OF BLOCKCHAIN-BASED SOLUTIONS

The rapid increase of cross-border e-commerce has presented unique opportunities for global online business but, at the same time, highlighted the significant vulnerabilities in traditional dispute settlement mechanisms.¹ Cross-border e-commerce consumer market has grown to USD 1.21 trillion in 2025, with forecasts suggesting an expansion to USD 1.84 trillion in 2030 at a rate of 8.71% per annum.²

Nonetheless, this growth hides the critical regulatory dilemma, where about 40 percent of the surveyed jurisdictions lack proper systems to resolve disputes in cross-border e-commerce, resulting in a gap between regulatory frameworks and consumer protection needs in this field.³ Traditional means of resolving such disputes which include litigation have been found to be ineffective as it is a long process and is costly.⁴

Recent research has shown that blockchain, coupled with the smart contract, can be used to solve this problem through automation and transparency in resolving the disputes arising in cross-border e-commerce.⁵

This article focuses on the potential of blockchain-based ODR systems in democratizing access to justice for cross-border e-commerce and creating

¹ Balobanova, Daria, Ihor Shumak, and Nataliia Petrenko, 'Mediation In E-Commerce: Economic And Legal (Incl. Criminal) Aspects' (2026) 12(3) *Baltic Journal of Economic Studies* 155.

² Yahoo Finance, 'E-commerce sales to hit \$1.8 trillion by 2030 – thanks to the habits of one generation' (2024) <<https://finance.yahoo.com/news/e-commerce-sales-hit-1-124659304.html>> [accessed 31 July 2026].

³ Banerjee Jyotirmoy, 'The Role of Cross Border ODR in Standardizing E-Commerce Dispute Resolution Globally' (2025) 4(3) *Journal of Online Dispute Resolution* 700.

⁴ Yadav Sanya and Rimjhim Singh, 'Decentralized Dispute Resolution in International Trade with Blockchain and Smart Contracts' (2026) 18(2) *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*.

⁵ Yang Xin, Ziqing Zhang and Yi Zhou, 'The Application of Blockchain Technology in International Commercial Arbitration' in *Proceedings of the 2025 2nd International Conference on Digital Economy, Blockchain and Artificial Intelligence* (2025) 235.

appropriate legal structures to make sure that such processes are enforceable, fair, and safe for consumers.

The article contends that blockchain technology provides a revolutionary means to deal with these fundamental issues. In particular, the very characteristics of blockchain include decentralization, immutability, transparency, and the ability to automate processes with the use of smart contracts present a new level of potential in ensuring fairness, reducing the trust gap that exists in international trade, and resolving disputes.

The article is comprised of five parts. After this introduction, Part II is devoted to the discussion of the conceptual underpinnings of procedural fairness and consumer trust in e-commerce, as well as the connection between fair dispute resolution procedures and consumers' participation in the global digital economy, which is essential for sustainable development. In Part III, there is a comprehensive discussion on the functioning of blockchain technology as a mechanism for resolving disputes online with the evaluation of current implementations and the definition of gaps in terms of law, regulation, and institutions, which are hindering the application of BODR. Part IV contains a set of legal and policy recommendations aiming at filling those gaps in five specific ways: harmonization of legal regimes, promotion of hybrid dispute resolution regimes, improvement of user accessibility and education, standardization and interoperability of dispute resolution mechanisms, and governance of human-in-the-loop. Finally, Part V offers a concise conclusion.

II. PROCEDURAL FAIRNESS, CONSUMER TRUST, AND ACCESS TO JUSTICE IN THE DIGITAL ECONOMY: FOUNDATIONS FOR SUSTAINABLE DEVELOPMENT

A. Defining Procedural Fairness in Online Dispute Resolution

Procedural fairness or due process or natural justice or procedural justice is an important element in the resolution of disputes in a legitimate manner. With regard to ODR, the very nature of physical and digital

distance makes procedural fairness not just an important but an absolutely necessary component of the legitimacy of the process.⁶

The process of procedural justice in ODR is affected by the following major procedural aspects such as transparency, accessibility, and impartiality, among others.⁷ Transparency calls for the need for clarity about the rules governing the process, procedures and reasons behind the decision-making process.⁸ All the parties involved must have the opportunity of accessing all the information necessary to know the process of making of the decision.⁹ Impartiality calls for the avoidance of any bias on the part of the dispute resolver and the medium of technology itself. This involves the actual impartiality and perception of it on the part of the disputing parties. Accessibility deals with the process of being able to use the process in practice, including cost, language skills, technical issues and geographical factors.¹⁰ The right to be heard, called *audi alteram partem* in conventional jurisprudence, allows the disputing parties the opportunity to present their case, offer evidence, and rebut other parties' arguments.¹¹ Finally, the right to a reasoned decision requires that

⁶Aman Sanaullah, 'Future of Online Dispute Resolution: Revolutionizing Access to Justice' (2025) 5(2) *Minhaj International Journal of Economics and Organisational Science* 136.

⁷Park Jin, 'Mediating under the shadow of AI: Public reactions to procedural and substantive roles of AI in court-annexed mediation' (2026) 61 *Computers and Law Security Review* 106323.

⁸ Xiao Zhiming and Yun Zhao, 'The Regulatory Framework for Crowdsourced Online Dispute Resolution: Revisiting the Dispute Resolution Triangle' (2026) 26 *Pepperdine Dispute Resolution Law Journal* 58.

⁹Decker Marie, Laila Wegner and Carmen Leicht-Scholten, 'Procedural fairness in algorithmic decision-making: the role of public engagement' (2025) 27(1) *Ethics and Information Technology* 1.

¹⁰Okeke Uchenna, 'Enhancing Access to Justice Through Technology in Developing Countries: Technology-Based Initiatives, Challenges and Emerging Technologies' (2026) 16(3) *International Journal of Court Administration*.

¹¹ Wu Yuhang, 'Arbitrators in the Virtual World: The Evolution of Independence and Impartiality and the Safeguarding of Procedural Justice in Metaverse Dispute Resolution' (2025) 91(4) *Arbitration: International Journal of Arbitration Mediation and Dispute Management*.

decisions be grounded in evidence presented and explained in comprehensible terms.¹²

According to the research on procedural justice, the application of these components in a manner that is effective ensures that the parties consider the process as being just and consequently will be willing to accept the outcome of the decisions even if it is not in their favor. There is a direct connection between fairness and outcome acceptability.¹³

B. The Trust Deficit in Cross-Border E-Commerce

Cross-border e-commerce is characterized by high levels of asymmetry and uncertainty.¹⁴ There is a prevailing “trust deficit,” which affects participation in the market and hinders economic development.¹⁵ The ambiguity of the law makes it problematic to conduct business with individuals who operate within jurisdictions that have different national legal systems, thus making it difficult to ascertain the applicable laws and choice of law rules.¹⁶ It is also problematic to enforce favorable decisions because, although one may be awarded compensation in court, it is extremely difficult to recognize and enforce such a decision internationally.¹⁷ Deficiencies in information about foreign merchants, including their reputation, observance of consumer protection laws, and

¹²Kinchin Niamh, 'Voiceless: the procedural gap in algorithmic justice' (2024) 32(1) *International Journal of Law and Information Technology* eaee024.

¹³Mentovich Avital, Jeffrey Prescott and Orna Rabinovich-Einy, 'Legitimacy and online proceedings: Procedural justice, access to justice, and the role of income' (2023) 57(2) *Law and Society Review* 189.

¹⁴ Luis Camacho and others, 'Cross-Border Digital Commerce as Retail International Finance: Trustworthiness, Country-of-Origin Signals, and Online Purchase Intention in a High-Risk Emerging Market' (2026) 19(3) *Journal of Risk and Financial Management* 163.

¹⁵ Dong Yuanyuan, 'Navigating trust in cross-border e commerce: a systematic review of cultural and consumer dynamics' (2026) *Humanities and Social Sciences Communications* <<https://doi.org/10.1057/s41599-026-06579>>.

¹⁶ Giesela Ruhl, *Cross-border Consumer Protection* (2026).

¹⁷ Shataer Dilidaer, 'Consumer Rights Protection in Cross-border E-commerce: Data Flow The Balance Between Rights Protection and Other Interests' (2026) 3(4) *Journal of International Social Science*.

past performance, lead to uncertainties.¹⁸ Lastly, difficulties in communication due to language barriers also contribute to mistrust.¹⁹

C. The Interplay Between Procedural Fairness and Consumer Trust

A reciprocal link exists between procedural fairness and consumer trust.²⁰ Indeed, there exists extensive research evidence on the link between the perception of procedural fairness and trust in institutions and decision-making mechanisms from the fields of social psychology and organizational behavior.²¹ This is the case in legal, organizational, and business environments.²² In cross-border e-commerce, the presence of a procedure which is transparent, fair, accessible, and participatory such as ODR acts as an essential institution for consumer trust.²³ Buyers who have access to fair procedures in case of any dispute feel safe about making transactions internationally.²⁴ On the other hand, failure of procedural fairness results in the erosion of trust and hence customer withdrawal.²⁵

D. Access to Justice as a Sustainable Development Imperative

The relationship between dispute resolution and sustainable development is not tangential but rather direct.²⁶ United Nations Sustainable Development Goal 16 includes a target for the realization of 'peace, justice and strong institutions' through the promotion of rule of law and equal

¹⁸ *Ibid.*

¹⁹ Dong (n 15).

²⁰ Tom Tyler and Ayala Mentovich, 'Mechanisms of legal effect: Procedural justice theory' (2023) 1 Center Public Health Law Research 1.

²¹ Kulshrestha Sony, 'Efficiency and Effectiveness of Consumer Dispute Mediation: An Empirical Study of Government, Private, and Online Dispute Resolution Forums' (2026) Conflict Resolution Quarterly.

²² Tyler and Mentovich (n 20).

²³ Zheng Miaomiao, Chengxiang Chu and Cong Cao, 'Building bridges of trust: the role of payment, certification, logistics, and herd mentality in cross-border e-commerce' (2026) 38(4) Asia Pacific Journal of Marketing and Logistics 1093.

²⁴ Onțanu Alina and Eric Tjong, 'Digital Technology and Procedural Justice: Towards a Geography of Justice' (2025) 30(2) Tilburg Law Review.

²⁵ Chan Peter and Antonio Cabral, 'Digitization of judicial procedure: AI, ODR, blockchain and e-justice' in Comparative Civil Procedure (2025) 418.

²⁶ Okeke (n 10).

access to justice.²⁷ Specifically, Target 16.3 seeks to promote the rule of law and equal access to justice for all.²⁸ Dispute resolution processes that are in place currently have excluded low-income consumers, especially those in developing countries, from enjoying access to justice.²⁹ Unreasonably high costs of litigation, distance from courts, and complex procedures are some of the barriers that have kept large numbers of people from enjoying their rights.³⁰ This marginalization not only is unfair but actually constitutes an insurmountable barrier to participation in the global digital economy.³¹

III. BLOCKCHAIN TECHNOLOGY, BODR MECHANISMS, AND LEGAL-REGULATORY GAPS

A. Core Features of Blockchain and Their Relevance to ODR

The blockchain technology which was primarily designed as the backbone of the cryptocurrencies has grown into an effective distributed ledger technology which has numerous uses in dispute resolution.³² The blockchain's decentralized structure where the information is distributed on a peer-to-peer network without the involvement of any third parties limits the chances of discrimination and censorship and at the same time

²⁷Tan Ching and others, 'Redefining Peace at the Crossroads: Multilateralism, Justice, and Sustainability in the United Nations General Assembly (UNGA) 2025' (2026) 32(1) *Journal of Dhamma Life* 433.

²⁸Kaur Ranmandeep, 'Access to Justice and Legal Aid Systems: Contemporary Challenges in Inclusive Governance' (2026) 2 *Minnesota Journal of Business Law and Entrepreneurship* 1428.

²⁹Sharma Tanvi, 'Access to justice in the digital age: the effectiveness of e-courts and virtual hearings' (PhD Dissertation, Vilnius Universitetas 2026).

³⁰ Abedi, Fahimeh, Abbas Rajabifard, and Davood Shojaei, 'Enhancing access to justice for land and property disputes through online dispute resolution and artificial intelligence' (2025) 59 *Computers and Law Security Review* 106194.

³¹ Rasheed Ajise and Olusola Joshua Olujobi, 'The Journal of Sustainable Development Law and Policy' (2026) 17(1) *Development* 502.

³²Kumar Venkata and others, 'Navigating the next wave with innovations in distributed ledger frameworks' (2026) 22(1) *International Journal of Critical Infrastructures* 1.

removes single points of failure in traditional systems.³³ The immutability characteristic of blockchain guarantees that the recorded data cannot be changed or deleted thus providing permanent tamper-proof evidence records, submissions, and procedures.³⁴ The transparency feature (alongside pseudonymity) permits all members of the network to verify transactions and procedures without disclosing any confidential information.³⁵ Smart contracts which is a self-executing pieces of code which incorporate all the conditions of the contract, automate evidence deadlines and release of escrows, saving costs and reducing errors.³⁶ Consensus mechanisms, among which proof of work and proof of stake, make transactions approved by the network and, therefore, cryptographically secure and virtually immutable.³⁷

B. BODR Mechanisms and Current Implementations

ODR using Blockchain technology uses the features of Blockchain to come up with innovative models for dispute resolution.³⁸ There will be decentralized arbitration and mediation with no central body to appoint arbitrators or mediators but distributed bodies who have to be motivated through cryptocurrency to make decisions based on game theory mechanisms.³⁹ Escrow services using smart contracts ensure that the transactions are held in a trustless and automated environment until the disputes have been settled or conditions of the contract fulfilled, solving

³³ Kumtepe Kadioğlu, 'Unpacking the technology of trust: establishing trust and fairness in online dispute resolution through blockchain and smart contracts' (2025) 33 International Journal of Law and Information Technology eaaf017.

³⁴ Dweib Areej, Fadi Abu-Amara and Muath Alrammal, 'Toward Secure and Scalable Digital Evidence Preservation: A Blockchain-Driven Framework' (2026) 4(2) Blockchains 6.

³⁵ Yassine Chabba Yousra, Moulay Ali and Mustapha Ahlaqqach, 'From Collaborative Logistics Theory to Implementation: A Multi-Organizational Hyperledger Fabric Network for Vertical and Horizontal Collaboration' (2026) 18(8) Future Internet 382.

³⁶ Aburoub, Ra'ed and others, 'Smart Contracts From Coding To Execution' (2025) 35(2) Malaysian Journal of Law and Society.

³⁷ Chen Whencheng and others, 'Enhancing the Delegated Proof of Stake consensus mechanism for secure and efficient data storage in the Industrial Internet of Things' (2026) 23 IEEE Transactions on Network and Service Management 1842.

³⁸ Okezie Promise, 'Resolving smart contract disputes through blockchain arbitration' (2024) 90(1) Arbitration: International Journal of Arbitration Mediation and Dispute Management.

³⁹ McCarthy Sean, 'Transforming arbitration: Exploring the impact of AI, blockchain, metaverse and Web3 (Radboud University Press 2025).

the problem of enforcement that is usually associated with ODR through automation of the payment process based on dispute results.⁴⁰

This can be seen from the operations of some platforms that have emerged such as Kleros. The platform of Kleros is a decentralized arbitration platform whereby decisions are made by jurors randomly selected from the pools of token-holders.⁴¹ The decision-making process in Kleros is driven by the use of game theory whereby those who vote along with the majority earn rewards whereas the dissidents earn penalties.⁴² JUR another platform integrates legal expertise and blockchain by means of smart contracts and decentralized courts.⁴³

C. How Blockchain Enhances Procedural Fairness

Immutability and transparency make tamper-free recording possible. Whatever the information may be whether it is original claims, evidence, communication of the parties involved, or any decision, it can never be modified, deleted, or backdated once recorded on blockchain.⁴⁴ This ensures an unprecedented level of reliability in information serving as the basis of justice. There is no chance of document tampering or selective evidence submission.⁴⁵

Decentralization decreases any form of bias in the decision-making process. Through spreading out the decision-making process to a network rather than centralizing it within one entity, BODR systems prevent any

⁴⁰ Indunil Karunarathna and others, *Smart Contracts and FIDIC: Automating Dispute Resolution and Payment Clauses Using Blockchain* (2024).

⁴¹ Aditya Ansh and Himanshu Kumar, 'The Symphony Of Smart Contracts and Blockchain Arbitration: Automating Justice In Decentralized Systems' (2024) V(III) *Indian Journal of Integrated Research in Law*.

⁴² Shilina Sasha, 'DeSci and Tokenized Science Economies: Rewiring Research Incentives With Blockchain' in *The Impact of Blockchain in Token Economies* (IGI Global Scientific Publishing 2026) 215.

⁴³ Alyas Tahir and others, 'Multi blockchain architecture for judicial case management using smart contracts' (2025) 15(1) *Scientific Reports* 8471.

⁴⁴ Okezie (n 38).

⁴⁵ Tiwari, Vijaishree, Nilesh Verma, and Sheersha Saxena, 'Mediation in the Digital Age: Ensuring Justice Through Blockchain Technology' in *Enhancing Evidence Preservation With Blockchain* (IGI Global Scientific Publishing 2026) 225.

form of manipulation or bias.⁴⁶ The automatic use of algorithms in selecting dispute resolvers from global pools removes any form of manipulation of the arbitrators' choice process making corruption of the outcome almost impossible.⁴⁷

Both accessibility and efficiency help make dispute resolution available to all in Blockchain Online Dispute Resolution.⁴⁸ Automation through smart contracts and crowd-sourced adjudicators helps significantly lower costs of operation, making BODR cost-effective even for medium-value disputes which otherwise couldn't be resolved through traditional litigation because of high costs involved.⁴⁹ Shortening time taken in setting deadlines and reaching consensus helps resolve the matter within days or at most a few weeks rather than taking months or even years to be resolved.⁵⁰

D. Identification of Critical Legal and Regulatory Gaps

Despite BODR's transformative potential, substantial legal and regulatory gaps impede its implementation and effectiveness. These gaps cluster around five critical areas.

Gap 1: Absence of Legal Recognition for Decentralized Awards. Current international arbitration frameworks, including the 1958 New York Convention on Recognition and Enforcement of Foreign Arbitral Awards and the 2019 Singapore Convention on Mediation, provide no explicit recognition of awards rendered by decentralized BODR systems.⁵¹ Consequently, enforcement of BODR decisions often requires recourse to

⁴⁶ Yadav and Singh (n 4).

⁴⁷ Isabel Darryl, 'Resolving Blockchain Disputes: Embracing Arbitration In A Borderless Digital Economy' (2026) 1(1) ADR Law Journal.

⁴⁸ Chan and Cabral (n 25).

⁴⁹ Yadav and Singh (n 4).

⁵⁰ Choudhary Sushmita, 'Online Dispute Resolution: The Rising Justice Delivery Enhancer' (2023) 3 Legal Spectrum Journal 1.

⁵¹ Jovanovic Stefan, 'Recognition and Enforcement of the Blockchain Arbitral Awards under the New York Convention' (2025) 16 Union UL School Review 59.

national courts, undermining the promise of efficient resolution and defeating the purpose of blockchain-based automation.⁵²

Gap 2: Absence of Specific Legal Regulations for BODR Platform Operation. There is no country that has passed any complete legislation pertaining to the functioning of the BODR platform.⁵³ This results in an ambiguous regulatory environment for both the creators and users of the platforms. The existing laws pertaining to electronic commerce and arbitration were formulated without taking into account blockchain technology.⁵⁴

Gap 3: Lack of Clauses That Would Either Make or Ease BODR in E-Commerce Transactions.

BODR is yet to be incorporated into clauses that would make it possible for dispute resolution through e-commerce transactions.⁵⁵ The clauses included in most contracts still include traditional forms of dispute resolution such as arbitration and litigations.⁵⁶

Gap 4: Inadequate Capacity and Power to Enforce through National Courts.

Despite having the final award in place, there is no clear direction from the national court on enforcing the award based on blockchain.⁵⁷ Most courts treat the decentralized determination with skepticism, doubting its

⁵² Budhijanto Danrivanto, Prita Amalia and Naufal Shiddiq, 'Blockchain arbitration: roadmap to recognition and enforcement of arbitral award' (2025) 11(1) Cogent Social Sciences 2536726.

⁵³ Gupta Arun, Vivek Goyal and Bhavna Singh, 'Blockchain in International Trade Finance: Legal Risks, Compliance Challenges, and Regulatory Gaps' (2025) 6 Journal of International Commerce Law and Technology 1718.

⁵⁴ Von Hafe and others, 'Legal frameworks for blockchain applications: a comparative study with implications for innovation in Europe' (2025) 8 Frontiers in Blockchain 1655230.

⁵⁵ Bassan Fabio and Maddalena Rabitti, 'From smart legal contracts to contracts on blockchain: An empirical investigation' (2024) 55 Computers and Law Security Review 106035.

⁵⁶ Yun Zhao and Hui Chen, 'Enhancing access to digital justice: digital governance of dispute resolution and dispute prevention in online commercial activities' (2024) 15(2) Journal of International Dispute Settlement 273.

⁵⁷ Budhijanto, Amalia and Shiddiq (n 52).

authenticity and legitimacy and thus the judges, who have been brought up on the conventional form of arbitration, find it difficult to accept an award issued by an algorithmic system or non-expert jurors.⁵⁸

Gap 5: No Standards in Place for Platform Governance, Consumer Protection, and Quality Assurance. The BODR platforms run without any standard for platform governance, audits, limitation of liability, or competency of the arbitrator/jurors.⁵⁹ There is no provision in consumer protection akin to the ODR regulation.⁶⁰

IV. LEGAL AND POLICY RECOMMENDATIONS FOR ADVANCING BODR IMPLEMENTATION

Addressing the identified gaps requires a coordinated, multi-level policy response. Five essential steps are proposed.

Step 1: Development of Harmonized International Legal Framework for BODR Recognition and Enforcement

This requires the cooperation between international organizations such as UNCITRAL as well as national legislatures, to work towards the creation of an effective legal framework that will recognize BODR awards and create unified enforcement measures. It could either be done by amending the 1958 New York Convention to include decentralized awards, or through the creation of a new multilateral agreement specifically aimed at BODR awards recognition and enforcement. The framework would define BODR systems, set up minimum requirements for the functioning of the system, determine the legal effect of smart contract decisions, and

⁵⁸ Hochgürtel Anna-Sophie 'Take a Seat: Overcoming the Enforceability Challenges of Crowdsourced Blockchain Arbitration' (2026) 1 Journal of Dispute Resolution 6.

⁵⁹ Shankar Gauri and others, 'Blockchain Based Information Security and Privacy Protection: Challenges and Future Directions using Computational Literature Review' (2024) arXiv:2409.14472.

⁶⁰ Craig S Wright, 'Beyond 'permissionless': governance, commitment, and rule change in public blockchains' (2026) 22 Journal of Institutional Economics e21.

introduce efficient enforcement procedures that make use of blockchain technology to minimize judicial intervention.

Step 2: Adoption of Hybrid Dispute Resolution Models Combining Automation with Human Oversight

For future BODR systems, the algorithmic approach needs to be abandoned in favor of a combination of automation and human expertise where required. In addition to increased efficiency, automation brings objectivity into the picture but, owing to legal complications and issues of equity, human discretion is inevitable at times. Future BODR systems need to follow certain guidelines: use automation and algorithms to screen for evidence and predict the outcome of the case; assign human arbitrators or mediators in cases that cross complexity or monetary thresholds; give judicial discretion to overrule the automated solution whenever legal principle, consumer protection laws, force majeure, or any other public policy demands intervention; and develop appeals mechanism against automated decisions to human panels.

Step 3: Substantial Investment in User Interface Design, Education, and Digital Inclusion Initiatives

Cryptocurrency Wallet management, key management, transaction costs, and user interface problems create barriers to BODR engagement for both developing country users and elderly people. Addressing these issues will need an investment in three dimensions: making the process of using BODR simpler through easy-to-use interfaces; educating people about BODR through tutorial and webinar training sessions and certification programs; and creating digital inclusion by subsidizing access and translating into multiple languages and localized versions. Otherwise, the BODR process can perpetuate inequalities rather than eliminate them.

Step 4: Promotion of Standardization and Interoperability Across BODR Platforms and Blockchains

Right now, competing BODR systems are working on separate blockchains and different standards, leading to balkanization and inability to resolve disputes in case the parties in question belong to separate platforms or use different cryptocurrencies. It is important for all industry players as well as policymakers to come up with standardized protocols regarding how BODR works, what forms of evidence are to be used, decision-making processes, and enforcement measures. There needs to be standards for interoperability that would allow resolving disputes no matter what blockchain, cryptocurrency, or platform was used in the original transaction.

Step 5: Establishment of Effective Human-in-the-Loop Governance, Quality Assurance, and Consumer Protection Mechanisms

Governance is an essential factor in BODR platforms to make them fair, effective and safe for consumers. Such governance must include independent auditing and certification, professional norms for arbitrators and jurors, mandatory insurance to protect from fraud and failures, transparency in the form of published performance criteria, ombudsman role independently performed, and even compensation in the case of an unfair decision. The regulatory bodies of large e-commerce countries have to build the same sort of governance that we find in the regular ODR system.

V. CONCLUSION: TOWARD A FAIR AND SUSTAINABLE DIGITAL COMMERCE ECOSYSTEM

Cross-border e-commerce has come to define the modern economy, but ongoing institutional failure in the area of dispute resolution hampers its development, and leaves disadvantaged parties out of the reach of digital commerce. "The trust deficit" in cross-border transactions is not just the product of market inefficiencies, but rather a sign of basic institutional failings. Regular courts are ineffective and inappropriate for the task;

traditional ODR systems are opaque, biased, and lacking in enforcement mechanisms. Online dispute resolution through blockchain technology offers an innovative solution.

With the use of blockchain attributes such as decentralization, immutability, and transparency, along with smart contracts ability of self-enforcement, BODR brings up an unparalleled chance of integrating the element of procedural fairness in dispute resolution while bringing down costs and time involved in resolving disputes to levels which would allow people to have access to justice, regardless of their status as consumers or merchants. It is a change in the philosophy of dispute resolution, from institutional trust to technological one, based on transparency and verifiability.

Nevertheless, tapping into the potential mentioned above involves more than mere technological advancements. The lacunae in the laws and regulations discussed above present very difficult obstacles to the effective deployment and implementation of BODRs. There is a need for international harmonization of procedures of recognition and enforcement. Hybrid systems combining automation and human decision-making must be developed. Investment in accessibility and education must be made. There is a need for standardization and interoperability.

With the continued growth of the digital economy becoming an inevitable reality, there is no other option but for the policy makers, industry leaders and international institutions to take steps toward creating the necessary legal, regulatory, and governance infrastructure needed for the effective implementation of BODR, or face the fact that billions will be denied access to the economic benefits of fair dispute resolution.