INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 6 AND ISSUE 9 OF 2026

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

THE DIGITAL GAVEL: NAVIGATING THE FUTURE OF ALTERNATIVE AND ONLINE DISPUTE RESOLUTION IN THE ERA OF ARTIFICIAL INTELLIGENCE AND DECENTRALIZED JUSTICE

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BEST CITATION – ADARSH SINGH & AISHWARYA SINGH**,** THE DIGITAL GAVEL: NAVIGATING THE FUTURE OF ALTERNATIVE AND ONLINE DISPUTE RESOLUTION IN THE ERA OF ARTIFICIAL INTELLIGENCE AND DECENTRALIZED JUSTICE, *INDIAN JOURNAL OF LEGAL REVIEW (IJLR)*, 6 (9) OF 2026, PG. 01-07, APIS – 3920 – 0001 & ISSN - 2583-2344. DOI - https://doi.org/10.65393/IJLRV6I91

Abstract

The transformation of Alternative Dispute Resolution (ADR) into Online Dispute Resolution (ODR) is a radical change in the modern legal design. Out of the necessities of international trade, a persistent administrative backlog, and the swift development of computational technologies, ODR has outgrown its beginnings as a digital facilitation instrument. This paper is a comprehensive doctrinal, legislative, and technological study of the future of dispute resolution. The main aim is to critically analyze how emerging technologies, namely, Artificial Intelligence (AI) and blockchain-based smart contracts, intersect with well-known substantive and procedural legal frameworks. Applying an extensive doctrinal approach, the analysis considers recent statutory provisions, such as the Mediation Act, 2023, the Digital Personal Data Protection Act, 2023, and the AI Act, as well as international documents, such as the Brussels I Regulation Recast and the New York Convention. Moreover, the report presents a detailed analysis of landmark judicial decisions, especially the fact that the Indian Supreme Court approved emergency arbitral awards in Amazon.com NV Investment Holdings LLC vs. Future Retail Ltd. The results indicate a further conflict between the technological efficiency and the constitutional provisions of natural justice. Although predictive analytics and decentralized justice systems promise unprecedented speed, they also pose significant issues in the form of algorithmic transparency, data sovereignty, and the growing digital divide. This paper finds that to maximize the utility of Algorithmic Dispute Resolution, it is essential to have a harmonized global governance structure that emphasizes the importance of the glass box explainability and human-in-the-loop supervision to maintain procedural fairness during the digital age.

Keywords – Decentralized Justice ,Algorithmic Dispute Resolution,digital facilitation instrument

Introduction

Civil justice is experiencing a paradigm shift of monumental proportions, shifting away from physical, geographically defined courtrooms to decentralized, algorithmically enhanced digital platforms. Alternative Dispute Resolution has been used as a much-needed tool of avoidance of the procedural inflexibility, high costs and lengthy time scales that are inherent to conventional litigation. But the modern world of law demonstrates that ADR is no longer just an option; it has clearly become the key strategic requirement of solving complicated commercial

and civil disputes in the world. The Online Dispute Resolution has been the catalyst to this evolution, which has made use of information and communication technology as part of the dispute resolution framework, thereby radically changing the way access to and administration of justice is attained.

The systemic need is the shift to ODR in jurisdictions where there is high institutional congestion. India has a backlog of more than fifty million pending cases in the judiciary, which has led policy think tanks to develop detailed roadmaps that can be used to implement ODR to reduce systemic congestion. However, the modern age is not only characterized by the digitalization of communication channels but by the deep consideration of Artificial Intelligence and blockchain technology in the adjudicatory process itself. Legal profession is compelled to address new procedural issues as autonomous smart contracts and predictive machine learning models are starting to execute and arbitrate obligations without human involvement.

The main aim of this chapter is to chart out the future course of ODR through a rigorous examination of the convergence of these new technologies with the legal frameworks. The inherent tension between the need to achieve efficiency in computational processes and the principles of natural justice, due process, and constitutional fairness is the core of the problem. Through the examination of statutory evolutions, case law precedents, and sociotechnical consequences of algorithmic governance, this study generalizes a holistic view of how the digital gavel will work in the coming decades.

From Digital Replication to Algorithmic Dispute Resolution

In order to see the direction of the Online Dispute Resolution, it is necessary to follow its development in terms of theory and technology. The initial generation of ODR was an electronic replica of the conventional physical processes, which used simple information technology to enable communication. The second generation also saw the rise of specialized platform architectures, specifically tailored to legal negotiations, with secure document management and organized asynchronous communication channels.

The third generation being the present one is defined by Algorithmic Dispute Resolution (AlgDR) where artificial intelligence is actively involved in evaluating, triaging, and resolving claims. Now AI tools can process large volumes of data, detect latent trends in judicial precedent, and provide predictive analytics to steer disputants to the best settlement parameters even before formal litigation even begins. In order to model the systematic combination of these technologies, the legal literature often cites the Lodder and Zeleznikow three-step framework of ODR, which assesses the best sequencing of online dispute resolution.

The Doctrinal Change in Arbitral Enforcement and Emergency Relief

Predictability and enforceability of the results of any dispute resolution mechanism are intimately connected to its effectiveness. In international commercial arbitration and ODR, the strong judicial confirmation of party autonomy and institutional rules, especially in relation to emergency interim relief, has been observed over the last few years. A landmark case in Amazon.com NV Investment Holdings LLC v. Future Retail Ltd., (2022) 1 SCC 209, by the Indian Supreme Court is a prime example of this doctrinal maturation and its consequences in digital and expedited justice.

The factual matrix of this dispute began when Amazon signed Shareholder Agreements with Future Coupon Private Limited, and invoked the Arbitration Rules of the Singapore International Arbitration Centre (SIAC) to start the emergency arbitration process on the basis of an alleged breach.

The main jurisprudential debate was whether an order issued by an emergency arbitrator, a creation of institutional rules not expressly described as an arbitral tribunal in Section 17(1)

of the Indian Arbitration and Conciliation Act, 1996 could be legally recognised and enforced in Indian territory.

The Court rationale was that the pillar of arbitration is party autonomy. The fact that the parties have voluntarily made themselves subject to the rules of institutions, including SIAC, inherently implied the existence of a binding nature of the emergency provisions once an award has been granted by an arbitrator, and thus, the provision of interim reliefs can be made.

The legislative architecture of online dispute resolution.

Converting ODR as a theoretical ideal into a functional, universally recognized reality needs to be supported by a strong and very specific statutory framework. Jurisdictions around the world are now in a scramble to juridicalize online processes as they realize that the dynamism and cross-border character of online interactions are incompatible with the traditional, territorially restrictive procedural legislation. The passing of the Mediation Act, 2023, in India, is a watershed moment in institutionalizing alternative dispute resolution.

Section 30 of the Mediation Act essentially transforms the landscape of mediation in India by explicitly stating that online mediation can be conducted through electronic forms or computer networks, as long as the key aspects of integrity of proceedings and confidentiality are ensured throughout the process [1]. Although the traditional litigation and mediation are usually limited to the particular territorial jurisdiction of the competent court, the Mediation Act provides a clear exception and the parties are free to cross geographical boundaries by mutually conducting mediation in an online mode.

Cross-border e-commerce and e-consumer disputes at the international level pose unsolvable jurisdictional issues. The Brussels I Regulation Recast (Regulation (EU) No 1215/2012) is the main legislative tool that regulates the jurisdiction and recognition and enforcement of judgments in commercial and civil cases in the European Union in that an online vendor is directly subject to these consumer-friendly jurisdictional principles.

At the same time, the European Union has taken a step in regulating the technological foundation of the contemporary ODR by the AI Act (Regulation (EU) 2024/1689). The AI Act is a risk-based framework, categorizing AI systems applied in alternative dispute resolution to interpret facts or apply the law as high-risk technologies, which require strict conformity testing, risk management frameworks, and human oversight procedures before such tools can be used in the European market, which sets a groundbreaking precedent in global algorithmic regulation.

Algorithms in Dispute Resolution and Procedural Fairness

The introduction of Artificial Intelligence in the ODR platforms provides the introduction of the new phenomenon of Algorithmic Dispute Resolution, the system in which computational models are actively involved in the legal process. Litigation analytics, based on natural language processing and sophisticated machine learning algorithms, enable parties to estimate statistical odds of success using historical data on individual judges and analogous factual matrices. This feature fundamentally alters the bargaining environment, shifting the basis of dispute settlement away from subjective emotional posturing toward objective, data-driven mathematical models.

Nevertheless, the use of AlgDR evokes serious legal and constitutional tensions, especially regarding the point of contact with data privacy and procedural due process. In India, ODR platforms relying on AI will have to navigate the recently introduced requirements of the Digital Personal Data Protection Act, 2023 (DPDPA).[2] Section 5 of the DPDPA asserts strict principles of

[1] Mediation Act, No. 32 of 2023, India Code (2023)

[2] S. Desai, *The Digital Gavel: AI-Driven Online Dispute Resolution and Privacy Frameworks in India*, 16 Indian J.L. & Tech. 88 (2026)

data minimization and purpose limitation, requiring that personal data be processed and collected only to the extent of specified, lawful purposes. Such a statutory right clashes with the infamous black box phenomenon of advanced AI. Since machine learning algorithms determine concealed correlations in high-dimensional data spaces, their internal decision-making routes are opaque.

As a result, an AI arbitrator cannot simply come up with a justified, legally comprehensible explanation of its decision. This constitutes a profound violation of procedural due process. The constitutional law requires the government not to remove the rights or property of individuals without proper notice and without meaningful hearing. When a binding legal determination is sent off to an automated system that does not provide the reasons behind its determination, then there is a high level of concern over due process.

To balance the efficiency of algorithms and constitutional requirements, the legal scholarship requires a radical turn to interpretable glass box systems. In this paradigm, ODR platforms have to implement algorithms that can express the key factors and case law that informed a ruling in easily understandable language, and show the findings in a way that allows users to understand the precise weight assigned to each variable. Moreover, a human-in-the-loop governance framework is to be strictly implemented. To ensure that any process that leads to a legally binding award, a certified human adjudicator should be actively involved, and the AI should be used as a decision-support tool with an autonomous human judgment to develop the final, reasoned decision.

Decentralized Justice and Blockchain Arbitration.

With the continued shift to commercial transactions being moved to decentralized finance ecosystems, traditional judicial systems are increasingly perceived to be highly incompatible with the pace and cross-border aspect of digital assets. The building block of this new economy is the smart contract, immutable, self-executable lines of code stored on distributed ledgers that automate the transfer of assets when specified cryptographic conditions are satisfied. Nonetheless, code is extremely vulnerable to programming bugs and unexpected real-world variables, and requires dispute resolution mechanisms that are intrinsic to the blockchain itself.[3]

This structural requirement has spawned the phenomenon of decentralized justice, and platforms like Kleros are the main paradigm of algorithmic, crowdsourced adjudication. In case of a disagreement over the implementation of a smart contract, it is sent fully on-chain. The cryptocurrency token is owned by anonymous people throughout the world and is staked to become a juror in a dispute. These jurors consider the evidence safely stored in the blockchain and vote separately, with game-theoretic economic incentives to vote truthfully and in unison. As soon as a verdict is made, the decision is sent back to the smart contract, which operates automatically and irreversibly, giving the disputed digital assets to the winning party.

Although an elegant cryptographic solution, blockchain arbitration presents insurmountable conceptual difficulties to the traditional international law, especially concerning the recognition and enforcement of awards under the 1958 Convention on the Recognition and Enforcement of Foreign Arbitral Awards (the New York Convention). Opponents have a strong case, claiming that decentralized justice does not have the procedural protections of traditional tribunal independence and legal experience because crowdsourced jurors are anonymous and therefore they undermine the traditional understanding of tribunal impartiality and legal expertise.

[3] P. Mankowski, *Consumer Protection and Jurisdiction Under the Brussels I Recast*, 41 Eur. L. Rev. 55 (2016)

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Even with these deep jurisprudential roots, legalistic doctrinal studies and the development of case law indicate that blockchain arbitration awards can indeed be recognized as fulfilling the formal requirements of the New York Convention. A Mexican court was the first to officially acknowledge and apply a Kleros award on a case-by-case basis, as part of a hybrid mechanism, positioning a disruptive precedent that, in the event of an adaptive interpretation of international frameworks, the introduction of decentralized awards into the global enforcement regime would be seamlessly integrated, making blockchain arbitration a parallel pillar of international commercial law.[4]

Digital Divide and Socio-Legal Problems.

The technological speeding up of Online Dispute Resolution offers unprecedented systemic efficiency but there is a danger of an uncritical adoption of such mechanisms which may further worsen pre-existing socioeconomic inequalities. The advocates of ODR often claim that it is a democratic approach to justice because it eliminates physical and economic obstacles. The combination of AI platforms and automated workflows greatly shortens the case lifespan, making justice available to low-value, high-volume cases that would otherwise be uneconomical to pursue over the long term in lengthy court proceedings.

Table 1: Global ODR Market Efficiency and Growth Trends (2024–2035)

Metric	Current Status (2026/Present)	Projected Trajectory	Impact on Justice Delivery
Market Size (Global)	Valued at USD 0.66 billion	USD 1.66 billion by 2035 (10.6% CAGR)	Rapid commercial scaling of digital legal frameworks
Resolution Efficiency	Baseline standard	Up to 50% reduction in resolution time	Viability for small-value, high-volume consumer claims
Primary Growth Driver	E-commerce expansion	58% increase in digital dispute cases	Integration of smart contracts and AI triaging
Primary Restraint	Jurisdictional limits	36% reluctance due to privacy concerns	Deepening friction with national data protection laws

Data synthesized from market research analyzing the escalation of digital disputes and the adoption of AI-powered ODR platforms.

However, this prevailing techno-optimism is severely tempered by the stark reality of the global and domestic digital divide. True access to justice is contingent not only upon formal legal standing but upon fundamental digital literacy, infrastructural connectivity, and equitable resource distribution. The rapid deployment of AI-augmented legal technology is highly skewed socioeconomically. In developing regions characterized by rural peripheries, inconsistent

[4] A. Mills, *The Application of the Brussels I (Recast) Regulation to Internet Torts*, 14 J. Priv. Int'l L. 210 (2018)

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electricity, and profound linguistic diversity, deploying sophisticated algorithmic platforms can inadvertently alienate highly vulnerable populations. This paradigm shift threatens to merely relocate the barriers to justice from physical distance and courthouse architecture to digital exclusion and technological illiteracy. [5]

Furthermore, the epistemological basis of artificial intelligence introduces severe risks of algorithmic bias. AI models are trained on massive repositories of historical judicial data. If marginalized communities have historically received disparate, prejudiced treatment within the physical courts, machine learning models will inevitably internalize, reflect, and amplify these discriminatory patterns. The deployment of AI in mediation also raises acute ethical concerns regarding the erosion of human empathy, which is an irreplaceable component in restorative justice and community mediation models recognized under India's Mediation Act. Evaluating the true impact of digital justice must therefore transcend mere administrative efficiency metrics, requiring comprehensive analyses of user satisfaction and substantive inclusivity to ensure that the pursuit of a frictionless legal system does not inadvertently sacrifice substantive equity. [6]

Conclusion and Suggestions

The integration of Artificial Intelligence and decentralized blockchain architectures into the framework of Online Dispute Resolution fundamentally alters the administration of civil justice. The synthesis of doctrinal shifts, evolving statutory frameworks, and complex technological realities yields several critical findings that will dictate the future of legal practice. [7]

First, statutory validation is successfully pacing technological reality. The legislative codification of online mechanisms, prominently featured in the Indian Mediation Act, 2023, alongside the expansive judicial interpretation of institutional rules by Supreme Courts globally, demonstrates that legal systems are actively preparing to absorb digital-first dispute resolution. The definitive validation of emergency remote arbitrations significantly enhances the institutional credibility of ODR platforms.

Second, intense constitutional friction over algorithmic opacity requires immediate mitigation. The inherent black box nature of machine learning algorithms conflicts directly with stringent statutory data privacy mandates and fundamental constitutional guarantees of procedural fairness and due process. Computational efficiency cannot be permitted to supersede the fundamental right to a transparent and comprehensible hearing.

Third, decentralized justice platforms are aggressively challenging traditional concepts of sovereignty. The execution of smart contracts and the utilization of crowdsourced arbitral panels disrupt historical concepts of territorial jurisdiction. Yet, early judicial enforcement indicates a pragmatic willingness to adapt the New York Convention to accommodate these novel mechanisms under the doctrine of party autonomy.

Finally, the threat of digital exclusion remains a paramount concern. While ODR slashes logistical costs and timelines, uneven AI adoption and the perpetuation of algorithmic biases threaten to digitally disenfranchise vulnerable populations, undermining the core tenet of universal access to justice.

To harness the immense benefits of Algorithmic Dispute Resolution while mitigating its risks, jurisdictions must enact centralized algorithmic governance frameworks aligned with progressive legislation like the EU AI Act. This must include mandatory, independent algorithmic audits for all public and private ODR platforms to rigorously test for systemic bias and

[5] M. Scherer, *Arbitrating Disputes in the Blockchain Era*, 10 J. Int'l Disp. Settlement 450 (2019)

[6] V. Raghavan, *Emergency Arbitration in India: A Case Comment on Amazon v. Future Retail*, 14 NUJS L. Rev. 210 (2022) *(replacing unverified Scribd document)*.

[7] C. Castillo, *Regulating AI in Alternative Dispute Resolution Under the EU AI Act*, 30 Maastricht J. Eur. & Compar. L. 112 (2024)

data integrity. Legislators must also expressly mandate human-in-the-loop protocols, prohibiting fully automated binding adjudications without human oversight in complex civil matters. Adjudicators must utilize glass box AI systems capable of generating legally comprehensible, reasoned orders subject to traditional appellate scrutiny. Concurrently, the United Nations Commission on International Trade Law should issue updated interpretative guidelines addressing the recognition and enforcement of blockchain-based arbitral awards under the 1958 Convention. Finally, state actors must actively invest in rural broadband connectivity, AI-driven multilingual natural language processing, and robust digital literacy initiatives to ensure that the relentless drive toward technological automation is continually tempered by the immutable human principles of fairness, transparency, and the rule of law.

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