

AI-Driven Dispute Resolution As A Sustainable Institutional Innovation In India's Construction Entrepreneurship Ecosystem



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Abstract

This study examines the role of artificial intelligence (AI)-driven alternative dispute resolution (ADR) mechanisms as an institutional innovation within India's construction entrepreneurship ecosystem. The research investigates whether AI-enhanced negotiation systems improve dispute resolution efficiency, settlement outcomes, and stakeholder perceptions in construction dispute management. A mixed-methods research design was employed, combining quantitative survey analysis with qualitative semi-structured interviews. Quantitative data were collected from 247 professionals, including construction practitioners, legal experts, and ADR specialists across five major construction markets in India. Statistical techniques such as descriptive analysis, reliability testing, factor analysis, analysis of variance, and regression analysis were used to evaluate dispute resolution performance and stakeholder perceptions associated with AI usage. Additionally, 32 in-depth interviews were conducted and analyzed using thematic analysis to capture stakeholder perspectives and institutional dynamics related to AI adoption. The findings indicate that AI-enhanced ADR significantly improves dispute resolution outcomes. Resolution time decreased by 28.3%, while settlement rates increased by 16.3% compared with traditional negotiation methods. Perceptual indicators also improved substantially, with stakeholder satisfaction, cost efficiency, and process transparency increasing by more than 30%. Regression analysis further confirmed that AI usage is a strong predictor of dispute resolution efficiency. However, respondents identified algorithmic bias, data privacy concerns, and regulatory uncertainty as important barriers to large-scale adoption. Overall, the study demonstrates that AI-driven ADR represents a promising institutional innovation capable of strengthening dispute governance, improving operational efficiency, and supporting entrepreneurial resilience within the construction sector.

Keywords: Artificial Intelligence, Alternative Dispute Resolution, Construction Disputes, Institutional Innovation, Construction Entrepreneurship

1. INTRODUCTION

Construction projects are very complicated activities, which require numerous stakeholders, contracts, and huge investments of money. The relationship between the contractors, the project owners, consultants and the suppliers often results to disputes over the scope of projects, schedule, cost and the contractual requirements. Consequently, there has been an incidence of conflicts in infrastructure and construction initiatives around the globe. These conflicts may put a hold on the completion of projects, raise expenses, and

destabilise the finances of construction businesses. In the industry reports, the magnitude of these issues is regularly noted, which means that construction disputes are characterised by serious financial claims and prolonged dispute resolution that influence the sustainability of the project and relations with stakeholders (Arcadis, 2022). This has made the enhancement of the efficiency of dispute resolution mechanisms an issue of concern in the construction industry.

The conventional conflict management techniques that have been applied in the construction projects include litigation, arbitration and negotiation. Even

though the said mechanisms offer systematic steps in addressing conflicts, their procedures can be lengthy and expensive. Alternative dispute resolution (ADR) methods have thus become a growing trend because they offer more flexible methods of conflict solving. Nevertheless, the conventional ADR procedures remain very reliant on human computing and hand-reviewing of complicated contractual and technical data, which may restrict their effectiveness.

Recent developments in the field of artificial intelligence (AI) and machine learning have provided new opportunities in terms of enhancing the dispute resolution systems. The AI based technologies have the potential to examine vast amounts of data and pinpoint areas of disagreement, and help the negotiator or arbitrator understand possible outcomes. In law and administration AIs have been investigated as a decision-support system that can assist in increasing efficiency and transparency in adjudication procedures (Coglianese and Dor, 2020). Machine learning models have been used to detect negotiation behaviour and forecast the results of a negotiation, which allows making more informed decisions when resolving a dispute (Tijdean, 2024; Lewis et al., 2017).

Artificial intelligence in dispute resolution has developed an increasing interest in the areas of legal study and construction studies. The systems of dispute resolution based on AI have been offered as such innovative tools that can help enhance the speed and transparency of the process of dispute management (Ermakova and Frolova, 2021). In the field of construction disputes, where a significant amount of contractual documents and project records will have to be processed, AI-powered tools could be useful to help the parties recognise the elements that trigger the dispute, analyse their contractual duties, and guide them on their settlement plans. The possible efficiency and delay avoidance of AI-based systems of dispute resolution in managing construction disputes has also been highlighted in studies (Putera et al., 2021; Olugboyega et al., 2024).

With the advent of generative artificial intelligence, the possibilities of AI to use in dispute resolution have increased further. The mediators and arbitrators can use advanced AI technologies to help them analyse the information in the cases, and they can get a summary of the dispute, and evaluate potential settlements (Evans et al., 2024). These advancements imply that AI-based negotiation technologies can greatly change the way dispute management works.

The current paper explores the significance of artificial intelligence-based dispute resolution platforms in the construction entrepreneurship

ecosystem. The study will seek to bring information about the potential of technological innovations to enhance the efficiency and stakeholder perceptions of AI-enhanced ADR mechanisms and how it can help to create a more sustainable environment in projects.

2. LITERATURE REVIEW

The ever-increasing complexity of construction disputes and the rising accessibility of digital technologies have prompted researchers to consider the use of artificial intelligence in negotiation and dispute resolution procedures. Conventional dispute resolution processes tend to rely on human judgement and manual assessment of high amount of contractual and technical information. Consequently, researchers have started to consider how machine learning systems, computerized negotiating systems, and online dispute systems can enhance the efficiency and effectiveness of dispute resolution.

A significant body of research is automated negotiation systems and machine learning methods which learn to model negotiation conversations and forecast negotiation outcomes. The interactions during the negotiation process can be analysed using machine learning methods and deduce mutually beneficial deals in the form of computational learning. Research in end-to-end learning models of negotiation dialogue proves that the AI systems are able to analyse the pattern of conversational negotiation and assist in making decisions during the negotiation (Lewis et al., 2017). Likewise, the studies of automated negotiating agents have demonstrated that algorithmic negotiation arrangements are capable of acquiring the best negotiation approaches after multiple engagements in artificial settings (Aydoğan et al., 2020). The new trends indicate the possibility of automated negotiation systems in facilitating the resolution of disputes through enhancing analytical assessment and resolution policies.

The prediction of judicial decisions and the application of artificial intelligence in legal analytics is another research area. Legal models that are based on AI are able to examine previous cases and detect trends that shape the legal conclusion. As an illustration, computational methods have been used to forecast judicial action and the process of judicial decision-making by analysing massive collections of court rulings (Katz et al., 2017). Machine learning models have also been incorporated in the construction industry to predict litigation outcomes in project disputes, and this shows the potential in AI usage in the assessment of legal risks and assistance in making decision on dispute management (Mahfouz and Kandil, 2012). These predictive functionalities have the capacity to

decrease uncertainty and help the stakeholders to better evaluate the possible outcomes of disputes.

The application of artificial intelligence in the arbitration and dispute resolution systems is another issue that has been examined. Arbitrators and mediators can use AI to analyse sophisticated law-related data, discover precedents, and aid in the process of case assessment. The recent study indicates that AI-aided arbitration systems can be useful to enhance efficiency without affecting fairness and transparency in the dispute resolution processes (Broyde and Mei, 2024). On the same note, semi-automated arbitration systems have been suggested as a means of combining AI-informed legal reasoning to enable them to overcome the legal dilemmas and minimise possible cognitive biases in the assessment of the dispute (De'Shazer, 2024).

Another relevant development in the field is the online dispute resolution (ODR) platforms. ODR systems are digital communication technologies that integrate the process of negotiation and mediation into the context of structured negotiations with the use of digital means to assist the process of dispute resolution in virtual space. Early studies of artificial intelligence and ODR noted the possibility of computational technologies to organise negotiations, examine information about the dispute and help parties to conclude on mutually acceptable solutions to the problem (Lodder and Zeleznikow, 2012). These avenues eliminate geographical limitations and enable conflicts to be solved more effectively with the help of internet communication and decision support tools.

Theoretical premises of the negotiation studies also give valuable information about how AI-based dispute resolution systems should be developed. Classical theory of negotiation focuses on strategic behaviour of bargaining and rational decision-making in deciding the results of negotiations (Nash, 1950). Based on these ground, negotiation literature has also stressed the relevance of systematic approaches to negotiation and rational decision-making in the accomplishment of win-win agreements (Raiffa, 1985). These theoretical concepts can be applied to operationalize AI-based negotiation systems that model the behaviour of negotiation process and assess a variety of settlement options via computational analysis.

In the construction sector, it has been found the artificial intelligence capable of solving the long-standing issues in the management of disputes. Construction disputes are usually associated with sophisticated technical materials, contractual documents, and project information that entail extensive processing of the same. Dispute resolution systems based on AI may help practitioners to analyse these data, define patterns of the disputes and propose settlement strategies. Recent studies

emphasise that dispute resolution systems that use AI can be useful in minimising delays, increasing efficiency, and making decisions in construction dispute management procedures. In general, the literature indicates that artificial intelligence can greatly change the current practise of dispute resolution by enhancing the analytical power, facilitating the negotiation process, and making the process of dispute governance more efficient.

3. THEORETICAL FRAMEWORK

Negotiation Theory and Dispute Resolution

This study has a theoretical basis of the negotiation theory which describes the process of agreement between parties that disagree by using a strategic approach in bargaining and decision-making. One of the points that the classical theory of bargaining stresses is that the results of negotiations are determined by the balance of bargaining power, as well as the aspect of strategic interaction between the parties in dispute (Nash, 1950). This view holds that negotiation is intended to come up with mutually beneficial agreements that would maximise all the interests of the various stakeholders involved in the dispute process.

Based on this, the research of negotiation has pointed out the necessity of formulated decision bargaining, information processing, and tactical communication in the attainment of positive settlement results. Negotiation models reinforce that effective dispute management models must consider the assessment of various options and the selection of the best solutions to ensure that both sides are satisfied (Raiffa, 1985). Negotiation processes may be extremely complicated within such complex environments as those of construction projects where disputes may be accompanied by substantial volumes of both contractual and technical information. Thus, decision-support systems and analytical tools might be significant in enhancing the efficiency in negotiation.

Artificial Intelligence in Negotiation and Dispute Resolution

The progress of artificial intelligence and machine learning has provided new possibilities to enhance the process of negotiation and dispute resolution. Smart systems based on AI are able to process vast amounts of data, calculate the trends of negotiation, and help decision-makers to recognise possible settlement options. Studies of automated negotiation systems show that machine learning algorithms can recreate the process of negotiation and accurately estimate the result of a negotiation based on the patterns of interaction between the agents involved in the negotiation (Lewis et al., 2017). On the same note, research on automated negotiating agents indicates that algorithm systems

are able to acquire optimal negotiation strategies based on repeated interactions and competitive negotiation setup (Aydoğan et al., 2020).

Besides negotiation modelling, artificial intelligence has also been used in the legal analytics and prediction of the outcome of disputes. Artificial intelligence systems are capable of evaluating the past judgments and determining the trends that shape court cases. These predictive analytics would assist the stakeholders with risky assessment of the disputes and other possible legal results in a better way (Katz et al., 2017). Machine learning models have also been used, in the construction industry, to forecast the results of litigation involving project disputes, which give good decision-support systems in a dispute assessment and management (Mahfouz and Kandil, 2012).

Online Dispute Resolution and AI-Assisted Arbitration

The other significant theoretical aspect of the current research is connected with the construction of online dispute resolution (ODR) systems and AI-supported arbitration models. ODR platforms combine digital technologies and mediation systems and negotiation systems to promote the resolution of disputes in the virtual world. These platforms give the stakeholders the capability to solve the disputes more effectively as it minimises the communication barriers and integrates computational tools that can help in the dispute analysis and settlement procedures (Lodder & Zeleznikow, 2012).

Recent innovations in the field of artificial intelligence have also increased the prospects of AI-based arbitration systems. Arbitrators and mediators can also be assisted by AI in analysing the legal documents, drawing the attention to the cases, and analysing the situation in the dispute. Researchers believe that AI-based arbitration systems can enhance the efficiency of the procedures without reducing the fairness and transparency of the process of dispute resolution

(Broyde and Mei, 2024). Likewise, semi-automated arbitration systems have been suggested as the systems that combine AI with the legal reasoning systems to facilitate decision-making and minimise cognitive biases in dispute analysis (De'Shazer, 2024).

AI-Driven Dispute Resolution in Construction

The introduction of artificial intelligence into dispute resolution systems is a new institutional innovation within the construction sector. Construction disputes are characterised by complicated contractual documents, project records, and technical information, which would need thorough analysis. The dispute resolution systems based on AI could help practitioners to analyse these datasets, find patterns of disputes, and suggest the strategies to settle them. The recent studies emphasise that the use of AI-based dispute resolution systems can optimise efficiency, shorten the time of resolving the dispute, and optimise decision-making in the area of construction dispute management (Putera et al., 2021).

In general, these theoretical views indicate that artificial intelligence can play a vital role in promoting the process of resolving disputes by facilitating the analysis of negotiations, enhancing the accuracy of decisions made, and providing smoother dispute management systems. The combination of the theory of negotiation and AI-based analytical tools, thus, offers a significant idea of conceptual framework to assess how AI-based mechanisms of resolving disputes can enhance the performance of institutions within the field of construction entrepreneurship. Conceptualising AI-based dispute resolution in the light of the theoretical perspectives above, this study sees AI-powered dispute resolution as an institutional innovation, which can impact the efficiency of the dispute resolution mechanism, settlements, and the attitudes of the parties involved in the construction entrepreneurship ecosystem. Figure 1 represents the conceptual relationships that are discussed in this work.

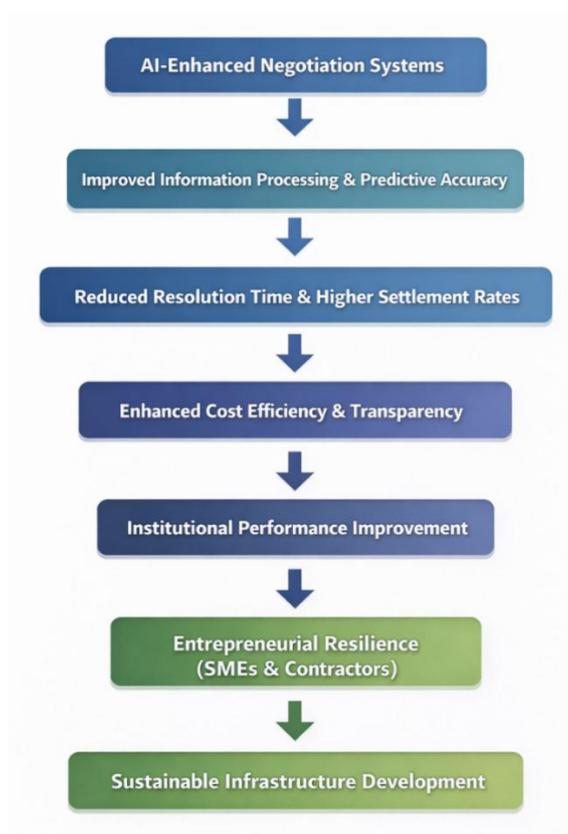


Figure 1. Conceptual Model of AI-Driven ADR within India's Construction Entrepreneurship Ecosystem

4. RESEARCH METHODOLOGY

Research Design

The research design used in the study is a mixed-method research design that entails quantitative survey analysis coupled with qualitative semi-structured interviews. This decision is explained by the fact that the investigation of AI-based dispute resolution as an institutional innovation in the environment of the Indian construction entrepreneurship is complicated. The combination of both quantitative and qualitative evidence allows not only to measure the results of dispute resolution but also gain a better insight into the experience and perceptions of the stakeholders.

The design used was a sequential explanatory design. During the initial stage, quantitative data were gathered to determine the impact of AI-enhanced negotiation tools on dispute resolution effectiveness, settlement rates, cost performance and stakeholder satisfaction that were measurable. The second phase involved qualitative interviews that were done to understand the impacts of such outcomes on negotiation processes, institutional trust and professional practise in construction dispute situations.

The research is based on practical research paradigm because it understands that technological and institutional changes in the emerging

economies need both statistical verification and interpretation. Such a design will provide methodological rigor and reveal the practical realities of the AI implementation in ADR mechanisms.

Population and Sampling

Three main stakeholder groups that acted as the target population of this study were as follows: professionals in the construction industry, who work on the dispute management on the project level, legal practitioners, who work on the matter of construction and commercial disputes, and Alternative Dispute Resolution (ADR) specialists, such as mediators and arbitrators, who operate in the construction setting. The geographical area of the study consisted of five large metropolitan markets of construction in the city of Delhi-NCR and Mumbai, Bengaluru, Chennai, and Hyderabad. These cities have been chosen because they are highly active in terms of infrastructure development, have a concentration of construction firms, and have developed ADR frameworks, which are characteristic of the Indian ecosystem of the construction and infrastructure sectors.

A stratified purposive sampling plan was followed to allow balancing the representation of the various professional groups and geographical areas. A target population of 250 respondents was identified based

on the power considerations of the multivariate analysis with a medium level of the expected effects. The last data set consisted of 247 valid data. Among these, 112 respondents were construction professionals, 89 were legal professionals, or 46 ADR professionals. Such distribution provided significant representation of every stakeholder group in the ecosystem of the dispute resolution. In the qualitative part, 32 of them were chosen to be interviewed through in-depth semi-structured interviews with maximum variation sampling. The participants were selected based on survey respondents that volunteered to take part in the follow-up research; sampling was developed by addressing multiple points of view of the participants, regarding their type of stakeholder, AI exposure level and an organisation.

Data Collection Instruments

The two quantitative and qualitative instruments were utilised in collecting data to ensure that measurable and contextual results of dispute resolution were recorded and stakeholder experiences. The quantitative tool was a structured questionnaire that was created in a multiphase procedure. That questionnaire had six sections with demographic and professional background details, exposure and familiarity with construction disputes and ADR procedures, beliefs concerning the perceived benefits of AI in solving conflicts, perceived anxieties and hindrances to AI adoption, and outcome measures in terms of efficiency of resolution and consumer contentment. The perception and attitude items were assessed on seven-point Likert-type scales on the strong disagreement to strong agreement. Outcome measurements were categorical measures (settlement occurrence), as well as continuous (resolution time).

The questionnaire was created based on the constructs identified in the literature on technology acceptance and dispute resolution and exerted with the use of the context-relevant items to the AI-enabled negotiation in construction disputes. The instrument was reviewed by experts who had knowledge in construction management, legal technology and research methodology to make it clear and relevant. Afterwards, pilot testing was done on the industry participants and there were some adjustments on the phrasing and structural arrangement before administering it in full.

The qualitative part relied on the semi-structured interview protocol that was aimed at toying with the career experiences of the participants regarding the use of the AI-based negotiation systems and the attitude toward the influence of this tool on the nature of the disputes. Questions covered in the protocol consisted of the professional background,

experiences related to AI application in the ADR processes, the perception of efficiency and transparency, and questions pertaining to the algorithm bias and data privacy, as well as thoughts about the wider implications of the institutions. The interviews were carried out either face-to-face or through video conferencing platforms that involve safe video conferencing and was conducted depending on the preference of the participants and was an average of 62 minutes in length with a range of 45 to 90 minutes. All the interviews were tape-recorded at the consent of the participants and transcribed word-to-word to be analysed systematically.

Data Analysis Techniques

The analysis of the quantitative data was performed using various statistical procedures that were relevant to research questions and data nature. Respondent characteristics and other important variables were summarised using descriptive statistics. The reliability analysis was done to determine internal consistency of the multi-item scales and it was found that all scales performed above the acceptable levels of reliability. Factor analysis was conducted to verify the dimensional structure of perception measure and attitude measure.

Independent samples comparisons and analysis of variance were used as inferential statistical methods of testing the differences between groups in terms of stakeholder categories. The predictive effect of AI use on dispute resolution efficiency was determined using multiple regression analysis as the independent variable was AI usage, and the dependent variable was the efficiency of the dispute resolution provided with controlling the factors like dispute complexity, professional experience, and the type of stakeholder. Appropriate non-parametric tests were used to test categorical results. The conventional level of statistical significance was considered at 5 percent.

Thematic analysis procedures were applied in analysing qualitative data. Textualized interviews were coded in a systematic manner in order to come across repetitive concepts, patterns, and themes. The analysis was carried out in an iterative fashion of coding, categorising, and subjecting to refinement of themes. The cross-case comparisons were made to obtain similarities and differences between the groups of stakeholders. To achieve credibility and ensure that the interpretations were accurate, member validation was performed with the chosen participants.

5. RESULTS

AI Adoption within the Construction Entrepreneurship Ecosystem

This analysis examined 247 valid answers to the research question that were gathered with construction professionals (n = 112), legal practitioners (n = 89) and ADR professionals (n = 46) in five of the largest metropolitan construction

markets in India: Delhi-NCR, Mumbai, Bengaluru, Chennai, and Hyderabad. Table 1 is the professional and geographic distribution.

Table 1. Distribution of Respondents by Professional Category and Location

Professional Category	Delhi-NCR	Mumbai	Bengaluru	Chennai	Hyderabad	Total
Construction Professionals	28	24	22	19	19	112
Legal Practitioners	21	19	18	16	15	89
ADR Specialists	11	10	9	8	8	46
Total	60	53	49	43	42	247

The data are representative of large regions with the kind of infrastructure and therefore, the results obtained would represent various institutional environments of the Indian construction entrepreneurship ecosystem. The dispersion suggests that AI-powered ADR is being followed and tested in different professional activities and market conditions.

On the aspect of technology integration, 68.4% of the respondents indicated that they were aware of

AI-enhanced negotiation systems and 41.3% reported firsthand experience in its use. The number of disputes per person utilised using AI-assisted systems was 3.8 cases among those who had some experience with its usage, which means that it is still only beginning to be adopted universally. Figure 2 shows the distribution of adoption.

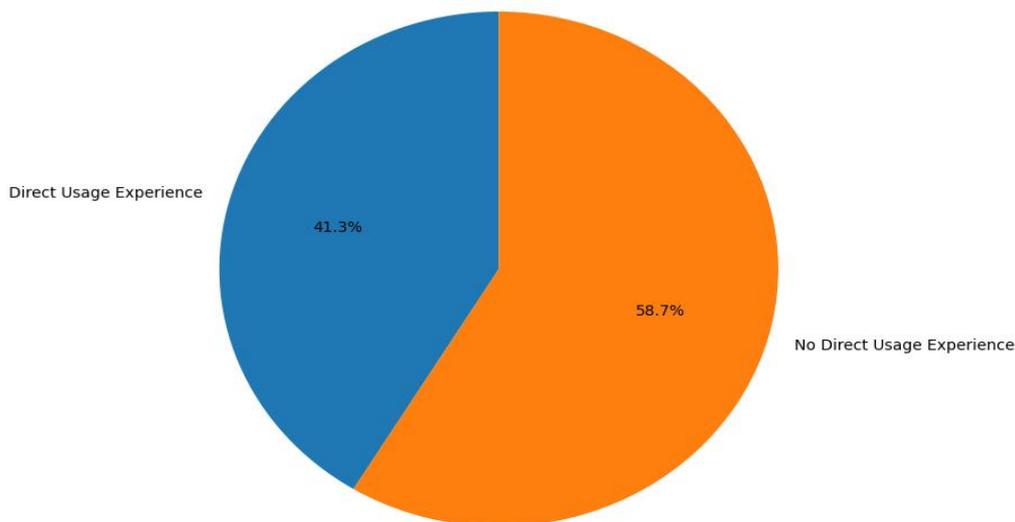


Figure 2. AI Adoption within Construction Ecosystem

Figure 2 shows that although the adoption of AI is not at a fully institutionalised stage, a large percentage of professionals already have direct experience with AI-powered negotiation tools. It means that there is slow innovation diffusion in the construction dispute ecosystem. In terms of sustainability, the rate of adoption is increasing implying modernization of all institutions but still in the changing phase.

Efficiency Gains and Institutional Performance

One of the key aims of the research was to compare the performance of AI-enhanced ADR to the traditional negotiation in terms of its effectiveness in conflict resolution. Table 2 is used to present comparative results and Figure 3 depicts the same visually.

Table 2. Comparative Analysis of Dispute Resolution Metrics

Metric	Traditional Method	AI-Enhanced Method	% Change	p-value
Resolution Time (months)	8.4	6.02	-28.3%	<0.001
Settlement Rate (%)	62.1	78.4	+16.3%	<0.001
Parties' Satisfaction (1-7)	4.12	5.47	+32.8%	<0.001
Cost Efficiency (1-7)	3.89	5.24	+34.7%	<0.001

Process Transparency (1-7)	4.34	5.81	+33.9%	<0.001
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The findings show statistically significant changes in all the dimensions measured ($p < 0.001$). The resolution time was 8.4 months with traditional negotiation and 6.02 months with AI-enhanced systems which is a reduction of 28.3%. This diminution directly covers capital blockage of

projects in infrastructure. Delays in the dispute resolution process tend to paralyse working capital, delay payments and interrupt contractual chains. The AI-augmented ADR helped to reduce the number of resolution cycles; this enabled quicker entrepreneurial turnaround and enhanced liquidity flow.

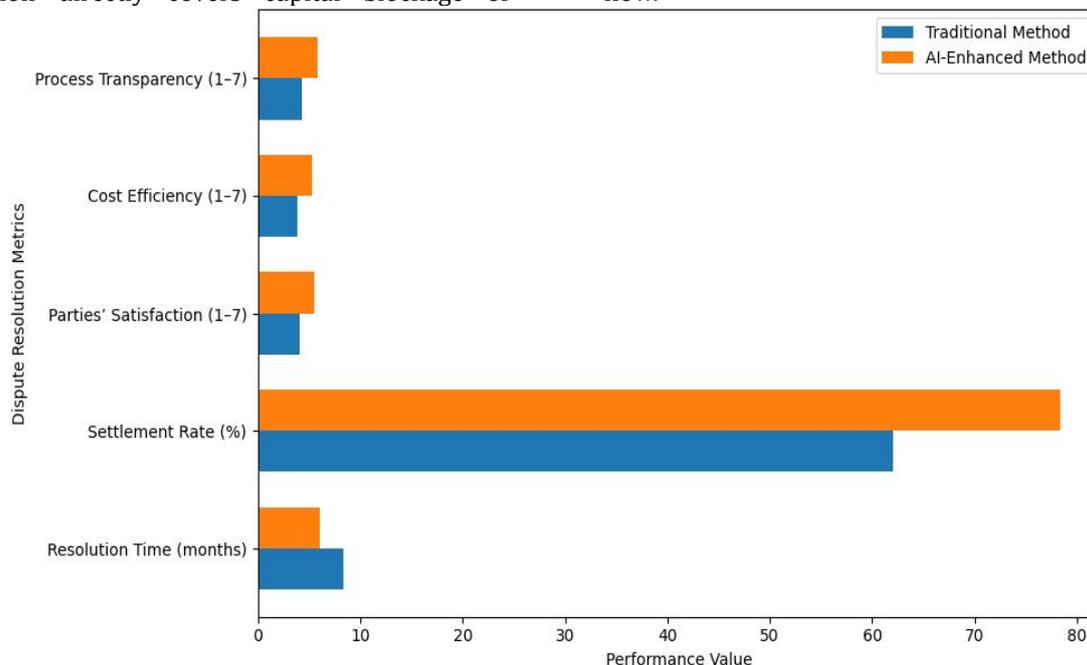


Figure 3. Comparative Performance of Traditional and AI-Enhanced ADR

The change in the rates of settlement was positive by 16.3 percent with a growth in rates to 78.4 percent. This enhancement minimises a spiral to a long-term arbitration or litigation that normally has greater financial and reputational expenses.

On perceptual metrics also there was an improvement. The satisfaction rose by 32.8, cost efficiency rose by 34.7 and transparency rose by 33.9. These gains imply that institutions have been performing better and this means that AI-based negotiation is making institutions more procedural and operational fairness.

Regression analysis revealed that AI use had the highest independent predictive value of dispute resolution efficiency with 47.3 percent of the variance in composite performance outcomes being explained. This means that the noted gains cannot be merely explained by the complexity of the disputes or the attributes of the stakeholders, but they are closely linked with the adoption of AI.

Settlement Rates and Entrepreneurial Stability

The result of settlement is one of the most

important measures of the sustainability of the dispute systems. Table 2 indicates that ADR with AI enhancement

showed a significant increase in the probability of settlement. The increased settlement rates will decrease financial unpredictability and smaller protracted litigation. In terms of entrepreneurship, better settlement results lead to better predictability in contractual networks. Construction SMEs tend to work on slim margins and they are highly reliant on payment punctuality. Quicker and more efficient settlement procedures would cut insolvency risks and stabilise the supply chains. The two effects of lowering the resolution time and increasing the chances of settlement enhance the trust of the institutional level and the durability of the business. This leads to systemic stability in the construction entrepreneurship ecosystem in India.

Stakeholder Perceptions of Sustainable Innovation

AI-enabled negotiation was perceived on major dimensions of benefits. Table 3 provides the results.

Table 3. Perceived Benefits of AI-Enhanced Negotiation by Professional Category

Benefit Dimension	Construction Professionals	Legal Practitioners	ADR Specialists	F-value
Improved Information Analysis	5.67 (1.12)	5.89 (0.98)	5.72 (1.08)	1.42
Enhanced Outcome Prediction	5.34 (1.24)	5.78 (1.06)	5.91 (0.94)	4.82*
Reduced Adversarial Dynamics	5.12 (1.31)	4.89 (1.28)	5.43 (1.14)	2.67
Time Efficiency	5.89 (1.02)	5.56 (1.18)	5.67 (1.21)	2.18
Cost Reduction	5.78 (1.08)	5.23 (1.32)	5.34 (1.26)	4.21*

In all professional groups, the mean scores were greater than 5, which implies that there are high positive perceptions of AI-driven negotiation. Predictive accuracy was a high priority on ADR specialists, whereas construction experts focused on the cost-efficiency and time-saving.

Such perceptions are indicative of the acknowledgment that AI-enhanced ADR is a sustainable institutional innovation that results in the increased levels of analytical transparency,

decreased uncertainties as well as more efficient procedures. The favourable attitude of diminished conflictual processes implies the possibility of cultural change in the practise of dispute resolution.

Institutional Barriers to Innovation Adoption

Although there were performance gains, respondents cited a number of institutional barriers. Table 4 summarises them.

Table 4. Implementation Challenges and Stakeholder Concerns

Challenge Category	Major Concern	Moderate Concern	Minor Concern	Not Concerned
Algorithmic Bias	31.2%	41.3%	18.2%	9.3%
Data Privacy	28.7%	39.6%	22.3%	9.4%
Human Judgment Reduction	22.3%	32.4%	28.7%	16.6%
Training Requirements	18.6%	42.6%	27.1%	11.7%
Regulatory Uncertainty	19.4%	28.4%	31.2%	21.0%

The most significant issues were algorithmic bias (72.5% moderate to major concern) and data privacy (68.3%). Another factor that stood out was training requirements and regulatory uncertainty. These results signify that although AI-optimised ADR positively influences the institutional performance, the sustainability of the integration requires the regulatory transparency, ethical protection, and professional capacity building.

6. DISCUSSION

The results of this investigation indicate that dispute resolution systems that rely on artificial intelligence have the ability to make the construction entrepreneurship system a significantly more efficient and institutionalised domain. The decrease in the resolution time and the increase in the settlement rates, the transparency, and satisfaction, among the stakeholders, are evidence that AI-driven negotiation systems will help overcome the long-standing issues linked to construction negotiation disputes. These results are consistent with the overall technological changes taking place in the construction sector, as more and more digital tools and intelligent systems are being incorporated to enhance project management, decision-making, and dispute governance (Brilakis et al., 2020; Alaloul et al., 2018).

Among the most interesting results of the research is the significant decrease in the time of dispute resolution in case ADR mechanisms that are

enhanced by AI are used. The empirical findings demonstrated that the resolution time was reduced by 28.3 percent than using the traditional negotiation techniques. Sustainably, the decline in the dispute cycles would mitigate on capital blockage and financial unpredictability in the infrastructural projects. Construction businesses - especially small and medium contractors, are usually tight on financial resources and long delays can interfere with cash flow and project schedules. The AI-based negotiation platforms also lead to enhanced continuity in operations and economic strengthening in the construction entrepreneurship system, as they help to resolve disputes more quickly. This result is in line with the earlier studies that mentioned the potential of artificial intelligence and digital technologies to enhance efficiency and decision-making in the process of construction management (Brilakis et al., 2020; Alaloul et al., 2018).

Another important finding of the study was that settlement rates were quite high in AI-enhanced negotiation contexts. The increased chances of settlement decrease the chances of arbitration or litigation processes that could be quite expensive. This helps to increase the institutional stability in the relationships in contractual relationships and enhances trust among the stakeholders in the project. Past studies on construction controversies have focused on the dilemma and adversarial character of construction disputes in the framework

of infrastructure developments that are usually the result of contractual ambiguities, delays, or unexpected site conditions (Cheung and Pang, 2013). The incorporation of AI based analytical tools can also be used to minimise these antagonistic forces by offering clearer information analysis and prediction of outcome thus settling disputes through collaboration.

The overall view of the stakeholders towards AI-powered dispute resolution was also favourable. It was found in the perception analysis that respondents of the various and professional categories understood the advantages of better information analysis, improved prediction of outcomes, and better economy. These results can be said to conform to the well known technology adoption theories, which imply that perceived usefulness and perceived ease of use make a significant contribution to the acceptance of new technologies (Davis, 1989). Likewise, the Unified Theory of Acceptance and Use of Technology stressed out that the perceived performance improvement and institutional support are the factors, which determine the adoption of technological advances in the professional setting (Venkatesh et al., 2003). Within the framework of conflict resolution, the favourable attitude towards AI tools implies that stakeholders start considering such systems as reliable decision-support tools, but not as the sources of decision-making.

Another key finding is that digital transformation is a critical component in defining the future of professional services, and the law and dispute resolution practise are not an exception. With the increasing technological potential, there is a structural shift in the way expertise is provided and used in numerous areas of professional life (Susskind and Susskind, 2017). Considering AI-assisted dispute resolution systems are the extension of this change as it enriches the process of human negotiation with predictive analytics, data-driven insights, and decision-support systems. The introduction of online dispute resolution services also evidences the way in which digital technologies may increase access to the Republican justice and optimise the processes of the dispute management (Zelevnikow, 2016; Zhao and Chen, 2024).

Even though this research has shown promising results, some institutional challenges to the implementation of AI can still be observed. The most prominent issues raised by the respondents and that could impede the large-scale implementation of the AI-enhanced ADR systems are the risk of algorithmic bias, the data privacy issues, and regulatory uncertainty. Such considerations represent a wider discussion of whether artificial intelligence can have ethical consequences to legal and decision-making activities. The transparency,

accountability, and fairness of the algorithm systems are necessary to ensure that stakeholders trust the system and avoid unintentional biases in the results of disputes resolution (Zhao and Chen, 2024). Dealing with these issues will involve coming up with relevant regulatory apparatus and systems of governance.

The other significant hindrance that was found during the research is associated with professional adjustment and training needs. The introduction of the AI-based dispute resolution instruments will compel the practitioners to acquire new skills that are connected to the digital technologies, data analysis, and decision support algorithms. Past studies in the field of organisational technology adoption have established that institutional support and training of the users form key factors in influencing whether new systems will be successfully implemented or not (Davis, 1989; Venkatesh et al., 2003). Lack of proper training and awareness can make the professionals unwilling to adopt AI-enabled systems even though they are beneficial.

The results of the current researches also add to the existing literature on the innovation in dispute resolution and conflict management systems. Previous studies have underscored the fact that alternative dispute resolution methods are changing due to variations in the organisational settings and technology capacity (Stipanowich and Lamare, 2014). The automated nature of artificial intelligence information processing in ADR processes is an extension of this change, making it possible to use more data-driven and predictive approaches to managing disputes. In addition, AI applications in construction dispute management have been systematically reviewed, which has shown the increasing use of machine learning models to predict the results of disputes and to assist in preventing proactive dispute prevention approaches (Francis et al., 2025).

The study is also a methodological way of revealing how quantitative analysis in surveys and the use of qualitative insights are useful in understanding institutional complex phenomena. The thematic analysis of the interview responses facilitated exploring the stakeholder feelings and their concerns about AI-enabled dispute resolution further. Their theoretical analysis is generally accepted as a powerful qualitative research technique of determining patterns and explanations of experiential research in social research scenarios (Braun and Clarke, 2006). Combining quantitative and qualitative data, the paper gives a deeper insight into the impact of AI-based negotiation systems on institutional performance.

There are some limitations of this study even with these contributions. The data utilised in the

empirical research were mostly gathered among professionals working in large metropolitan construction markets in India potentially restricting the applicability of the results to other regional or international locales. Future studies may encompass a broader target by analysing AI-based dispute resolution in other types of institutions and welcome the inclusion of longitudinal data of dispute cases to gain more insight into the long-term effect of AI-based negotiation systems on the construction dispute regulating and entrepreneurial sustainability.

7. CONCLUSION

This study examined the role of artificial intelligence-enabled alternative dispute resolution (ADR) systems in improving dispute management within the construction entrepreneurship ecosystem. Drawing on survey responses from construction professionals, legal practitioners, and ADR specialists, the research demonstrated that AI-driven negotiation tools can significantly enhance the efficiency and effectiveness of dispute resolution processes. The findings revealed that AI-enhanced ADR systems contribute to measurable improvements in key performance indicators, including reduced resolution time, increased settlement rates, improved cost efficiency, and greater procedural transparency. The results suggest that AI-assisted negotiation mechanisms can help mitigate longstanding challenges associated with construction disputes, such as prolonged litigation, financial uncertainty, and adversarial conflict dynamics. By enabling faster dispute resolution and higher settlement probabilities, these technologies can reduce capital blockage in infrastructure projects and support faster entrepreneurial turnaround. This is particularly relevant for small and medium contractors who operate within financially constrained project environments. In this way, AI-enabled dispute resolution systems can strengthen institutional stability and contribute to more sustainable construction ecosystems. The study also highlights the importance of stakeholder perceptions and institutional readiness in determining the successful adoption of AI technologies within dispute governance frameworks. While respondents generally recognized the efficiency and analytical benefits of AI-driven negotiation tools, concerns related to algorithmic bias, regulatory clarity, and professional adaptation remain important considerations for future implementation. Overall, the findings indicate that AI-driven ADR represents a promising institutional innovation capable of enhancing dispute governance and supporting entrepreneurial resilience within the construction sector. Continued technological

development, regulatory support, and professional capacity building will be essential for realizing the full potential of AI-enabled dispute resolution systems.

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