

AI-Powered Mediation Platform for Multilingual Legal Dispute Resolution

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Abstract— The AI-Powered Mediation Platform is an intelligent digital system designed to facilitate the resolution of disputes through advanced natural language processing and multilingual AI technologies. This platform enables structured and impartial mediation between parties by analyzing submitted case data, legal documents, and real-time communication. Leveraging technologies such as sentiment analysis, language translation, intent recognition, and dialogue summarization, the system assists both clients and mediators in identifying core issues, areas of agreement, and viable resolutions. Users interact via a React-based web interface, while the backend integrates with cloud-based AI APIs including OpenAI, Azure, and Bhashini for multilingual and legal language processing. The platform supports real-time, secure conversations and uses AI-driven mediation strategies to guide discussions constructively. By automating repetitive legal workflows and enhancing human understanding through AI assistance, the system significantly reduces the time, cost, and complexity of traditional mediation processes. It offers a scalable, accessible, and legally compliant solution for civil disputes, workplace conflicts, and online consumer disagreements.

Index Terms— Artificial Intelligence, Mediation Platform, Online Dispute Resolution, Natural Language Processing, Multilingual Communication, Sentiment Analysis, Legal Technology.

I. INTRODUCTION

AI-powered mediation platforms have emerged as transformative tools in the field of conflict resolution, combining artificial intelligence with digital communication to offer faster, fairer, and more accessible alternatives to traditional mediation. These platforms range from simple rule-based systems to sophisticated machine learning models capable of understanding language, emotions, and negotiation patterns. Some rely on human mediators enhanced by AI tools, while others aim for full automation using chatbots and data-driven decision-making. In regions or situations with limited resources, cloud-based and mobile solutions provide an effective alternative by enabling dispute resolution without the need for physical infrastructure [1]. This variety of existing systems reflects the ongoing evolution of AI in the legal and conflict management space, offering scalable and innovative approaches to resolving disputes in legal, workplace, consumer, and cross-border domains [2].

A. Research Gaps

Although AI-powered mediation systems are rapidly emerging as transformative tools for dispute resolution, several research gaps remain unaddressed. Current platforms often focus on either automation through chatbots or mediator assistance, but very few achieve an effective balance that ensures fairness, transparency, and empathy in decision-making. Existing Online Dispute Resolution (ODR) frameworks tend to rely heavily on rule-based or domain-specific models, which limits adaptability across diverse case types, especially those requiring contextual understanding of emotions, intent, and cultural sensitivities [3].

Another gap lies in multilingual communication. While translation tools and NLP-based methods exist, they are often challenged by code-mixed languages, regional dialects, and domain-specific legal vocabulary. This results in reduced accuracy and potential misinterpretations in critical legal contexts. Emotional intelligence in AI mediators is also underdeveloped, as most systems fail to integrate deep sentiment and tone analysis that can identify stress, frustration, or hidden bias in conversations. Furthermore, explainability and trust in AI recommendations remain unresolved challenges, since black-box models cannot always justify their outputs in legally compliant ways [4].

Scalability and data privacy present additional gaps. Many platforms lack hybrid architectures that combine on-premises secure storage with cloud-based AI scalability, leaving them vulnerable to compliance risks. Finally, there is limited personalization in mediation strategies, as existing systems rarely adapt to individual negotiation patterns, past case histories, or user preferences. Addressing these research gaps will be essential to develop an inclusive, transparent, and robust AI-powered mediation platform capable of transforming legal and conflict resolution landscapes [5].

B. Trends and Applications

Recent trends highlight the integration of Artificial Intelligence (AI) into Online Dispute Resolution (ODR) to address inefficiencies in traditional litigation. A major trend is the adoption of Natural Language Processing (NLP) and multilingual AI for real-time communication, enabling cross-border and regional dispute resolution without language barriers. Platforms are increasingly embedding sentiment analysis and intent recognition to identify emotional tones and negotiation patterns, ensuring empathetic and constructive mediation. Another trend involves explainable AI (XAI), which enhances transparency by allowing mediators and clients to understand the reasoning behind AI-generated suggestions [6].

Applications of AI-powered mediation are expanding across multiple domains. In the legal sector, such platforms are being used to resolve civil disputes, contract disagreements, and consumer complaints efficiently. In workplace conflict management, they help HR departments mediate employee disputes confidentially and cost-effectively. E-commerce and online consumer services are also adopting automated mediation systems to handle transaction disputes, thereby reducing customer dissatisfaction. Additionally, cross-cultural and multilingual mediation is gaining momentum, where AI tools bridge cultural and linguistic divides in global collaborations [7].

Another emerging application lies in government and civic services, where platforms can guide citizens on constitutional rights, legal entitlements, and access to justice. By automating repetitive legal workflows and offering personalized dispute resolution, AI-powered mediation not only reduces costs and delays but also democratizes access to justice. These trends and applications indicate a paradigm shift toward more accessible, scalable, and inclusive conflict resolution mechanisms [8][9].

C. Related work

Development of Assistance System for Online Dispute Resolution and Legal Advice using AIML

This study introduces the Justice-Assist platform as an alternative to costly and time-consuming litigation. By integrating Python-based backend, React.js frontend, and AWS hosting, the system ensures scalability, real-time communication, and 24/7 accessibility [10]. Its innovation lies in eliminating the need for physical presence in mediation. However, the drawback is that despite accessibility, adversarial complexity in legal proceedings is not fully addressed. Adaptive AI for Real-Time User Prompt Correction in Conversational Systems The Justice-Assist platform is enhanced with adaptive AI to correct prompts in real time, ensuring clarity in communication. Its novelty lies in improving user interaction and reducing miscommunication during dispute resolution. A limitation is its reliance on predefined models, which may not capture nuanced cultural or legal interpretations [11]. BharatBhasaNet – A Unified Framework to Identify Indian Code-Mix Languages, This framework addresses multilingual challenges by supporting code-mixed Indian languages. Its strength lies in bridging linguistic gaps within ODR platforms. The drawback is that it still faces accuracy challenges when processing highly diverse dialects and informal expressions common in disputes [12].

LAWBOT [13] – A Smart User Indian Legal Chatbot using Machine Learning Framework

LAWBOT applies machine learning to build an intelligent chatbot for legal advice and dispute management. Its innovation is cost-effective, continuous support with human-like interaction. However, its limitation lies in handling complex cases where human legal expertise remains indispensable. Multilingual Mysteries: The Art of Automated Language Identification This research proposes a CNN-BiLSTM [14] model with attention for multilingual language identification. Its innovation is robust hybrid feature extraction for real-time language recognition. The drawback is that high computational demand may restrict deployment in low-resource environments. Enhancing Real-Time Multilingual Communication in Virtual Meetings through Optimized WebRTC Broadcasting

The study develops a hybrid WebRTC-SFU architecture to enhance translation and reduce latency in multilingual virtual meetings. Its novelty lies in reducing bandwidth usage by up to 90% with improved translation accuracy [15]. The limitation is that it mainly focuses on controlled test environments, leaving open challenges for scalability in unpredictable internet conditions. Benefits of Artificial Intelligence in the Legal System and Law Enforcement This work highlights AI's role in reducing judicial backlog through legal research, case prediction, and crime detection. The innovation is the wide application of AI in both legal and policing contexts, including tools like Lex Machina and predictive policing. However, a drawback is the lack of explainability and transparency in AI-driven legal decisions, which can affect trust and accountability [16].

D. Objectives

- To design and develop an AI-powered mediation platform integrating Natural Language Processing, multilingual translation, and sentiment analysis for effective Online Dispute Resolution.
- To implement a secure hybrid architecture combining cloud-based AI services and on-premises storage for real-time, compliant, and scalable mediation support.
- To evaluate the platform's effectiveness in enhancing accessibility, reducing cost and time, and improving fairness compared to conventional dispute resolution methods.

E. Methodology

Figure.1. shows the methodology flow, starting with case data collection and preprocessing, followed by a secure web platform for communication, then AI-driven multilingual processing, and finally comparison and resolution to suggest solutions.

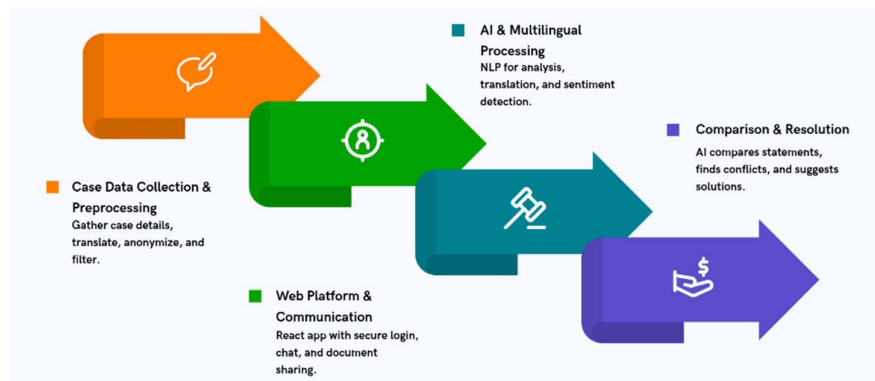


Figure 1. Methodology Flow of AI-Powered Mediation Platform

F. Problem Statement

Despite constitutional safeguards, many citizens, especially in rural areas, lack awareness of their rights and duties. This legal illiteracy limits access to justice and government schemes. A multilingual, user-friendly digital platform is needed to bridge this gap and empower citizens.

II. EXISTING SYSTEM FLOW

Figure.2. illustrates the flow of the existing ODR system. It begins with user login, followed by the step to select the dispute case. Once selected, the parties convene a virtual meeting to discuss the matter. The process then moves to dispute resolution, which is facilitated by a human mediator to guide discussions and finalize agreements.

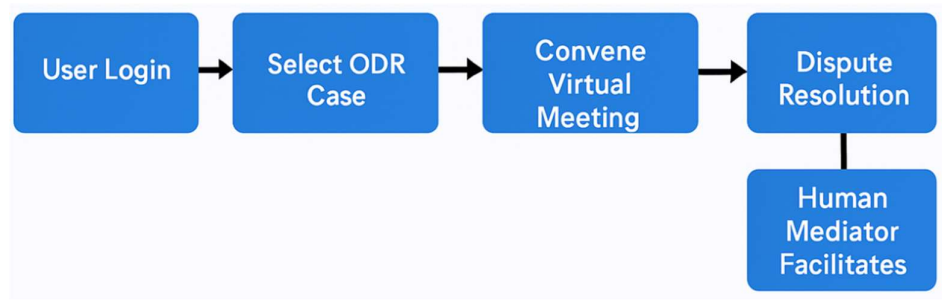


Figure 2 Existing System Flow Chart for Online Dispute Resolution (ODR)

III. PROPOSED SYSTEM AND ARCHITECTURE

Figure.3. represents the architecture of Samvidhan Mitra, a multilingual AI-powered mobile and web platform. It integrates interactive modules, simplified constitutional articles, quizzes, and voice-assisted navigation to support citizens, including those with low literacy. Features like a chatbot for legal FAQs, videos for learning, and government scheme updates make it more user-friendly. A dedicated section for students, educators, and legal professionals enhances civic education. The system thus empowers citizens to understand constitutional rights and participate actively in governance and justice.

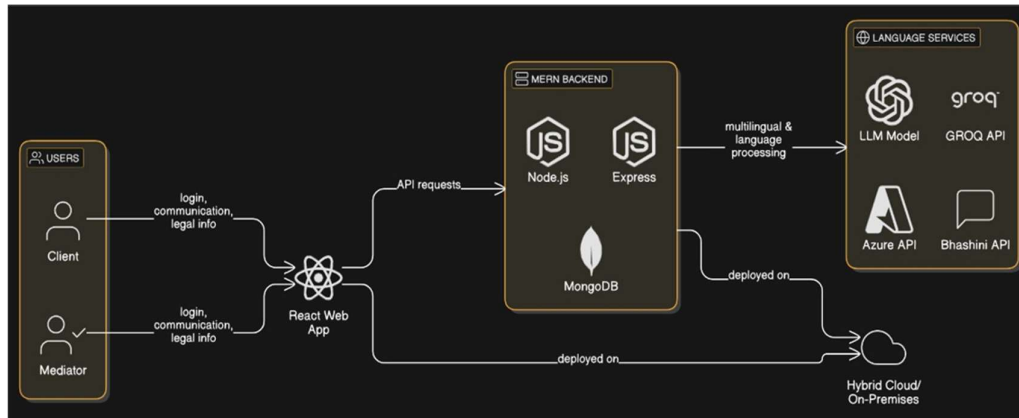


Figure 3 Proposed System Architecture of Samvidhan Mitra

A. Use Case Representation

Figure.3 illustrates the use case diagram of Samvidhan Mitra. The primary actors are Client and Mediator, who interact with the system for multilingual support, accessing legal information, and secure login. The platform integrates advanced tools such as LLM models, MERN framework, Groq API, Azure API, and Bhashini API to deliver multilingual and AI-powered legal assistance. Clients gain access to constitutional resources, while mediators support dispute resolution through the platform's intelligent features.

B. SAM-Resolve Mediation Algorithm

Multilingual, AI-assisted pipeline that analyzes party statements, maps issues and conflicts, retrieves relevant legal context, and recommends ranked resolution options with an auditable summary.

Step-by-step execution

Step_1: Collect and preprocess

Ingest case docs and chat; extract text, detect language, translate, anonymize, denoise.

Step_2: Authenticate and sessionize

Verify roles (client, mediator); open secure real-time chat; start encrypted logging.

Step_3: Analyze dialogue

Run intent, entity, and sentiment models; summarize turns; build an issue/conflict map.

Step_4: Retrieve knowledge

Query legal FAQs, scheme info, and past cases; filter by jurisdiction and relevance.

Step_5: Generate options
 Produce settlement options and mediator prompts; score by feasibility, fairness, and compliance.
 Step_6: Negotiate loop
 Present options, capture feedback, refine suggestions; track agreements and open points.
 Step_7: Finalize and record
 Draft resolution summary, export minutes, store audit trail, and close the session.

IV. RESULT AND DISCUSSION

Figure.4. illustrates the end-to-end interaction flow in the Samvidhan Mitra platform. The sequence begins with client and mediator login via the web app, validated through the authentication service. Once authenticated, mediators and clients exchange messages that pass through the LLM service for intent recognition and summarization. The system integrates multiple APIs: GROQ API for AI-driven responses, Azure API for legal database queries, and Bhashini API for multilingual translation. The responses are processed, translated, and displayed back in the user’s preferred language. Finally, the legal database ensures case-specific references and supports resolution logging, completing the mediation cycle.

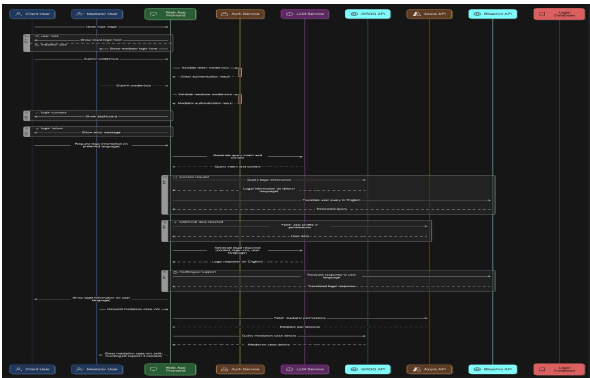


Figure 4 Sequence Diagram of Samvidhan Mitra Platform

C. Scope Representation

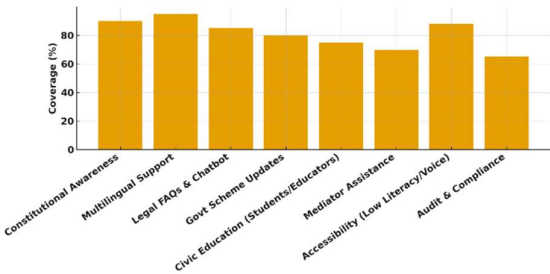


Figure 5 Bar Chart Representation of Samvidhan Mitra Scope

Figure.5 presents the scope of the Samvidhan Mitra platform across key functional areas. Major coverage is observed in Multilingual Support (95%), Constitutional Awareness (90%), and Accessibility with Voice/Low Literacy features (88%). Other areas include Legal FAQs & Chatbot (85%), Government Scheme Updates (80%), Civic Education for Students/Educators (75%), Mediator Assistance (70%), and Audit & Compliance (65%). This distribution highlights the platform’s emphasis on inclusivity, multilingual access, and constitutional awareness while also ensuring compliance and mediator support.

V. CONCLUSION

The Samvidhan Mitra platform establishes a strong foundation for bridging the gap between legal systems and citizens, particularly in multilingual and rural contexts. By combining AI-driven mediation, multilingual translation, and user-friendly web and mobile interfaces, it not only reduces the complexity of legal processes

but also ensures fairness and inclusivity. The integration of secure communication, NLP, sentiment analysis, and real-time document handling demonstrates how technology can simplify traditionally cumbersome legal procedures.

Beyond dispute resolution, the platform significantly contributes to constitutional awareness by offering simplified articles, quizzes, and interactive modules. This educational aspect strengthens democratic participation by empowering students, educators, and citizens with civic knowledge. The inclusion of mediator assistance tools ensures that human expertise is not replaced but augmented, creating a hybrid model of trust and efficiency.

Furthermore, the platform shows promise in reducing the cost, time, and emotional stress associated with traditional litigation while improving access to justice for underserved communities. With its scalability and adaptability across domains—civil disputes, workplace conflicts, consumer disagreements—it represents a model for future digital legal ecosystems.

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