Digital Karma Jury: An Ai-Based Decentralized Dispute Resolution Platform Using Karma-Weighted Voting

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***Abstract*—Digital Karma Jury is an AI-based decentralized dispute resolution platform designed to address challenges in traditional legal systems. The system integrates artificial intelligence, karma-weighted voting, and legal databases to provide transparent and efficient decision-making. Users can submit complaints, jurors vote on cases, and an AI Judge analyzes cases to suggest applicable Indian laws. The system reduces dependency on centralized authorities and improves accessibility to legal guidance.**

***Index Terms*—AI Judge, Cyber Law, Dispute Resolution, Karma-Based Voting, Legal AI.**

I. INTRODUCTION

The rapid expansion of digital platforms and online services has significantly increased the number of disputes occurring in virtual environments. Issues such as cyber fraud, identity theft, online harassment, and financial scams have become increasingly common in recent years. As digital interactions continue to grow, traditional legal systems face challenges in handling these disputes efficiently. Conventional methods rely heavily on centralized authorities such as courts and law enforcement agencies, which often result in delays, lack of transparency, and limited accessibility for common users.

One major concern with existing systems is the complexity involved in legal procedures. Individuals are often required to possess legal knowledge or consult professionals to understand applicable laws. This creates a barrier for many users who seek quick and reliable solutions. Additionally, centralized decision-making can sometimes lead to biased outcomes, and the lack of transparency reduces trust in the system. With the increasing volume of complaints, it becomes difficult for authorities to process cases promptly, further highlighting the need for an automated and scalable solution.

Recent advancements in artificial intelligence, particularly in natural language processing and machine learning, have opened new possibilities for automating complex tasks such as legal analysis. AI models are capable of understanding textual data, identifying patterns, and generating meaningful insights. These capabilities can be applied to legal systems to analyze complaint descriptions, detect crime types, and suggest relevant laws. However, many existing AI-based systems lack transparency in decision-making and often fail to provide clear explanations for their outputs.

To address these challenges, a novel approach is introduced through the Digital Karma Jury system, which combines artificial intelligence with decentralized governance. The system allows users to submit complaints, which are then analyzed by an AI Judge module capable of identifying crime types and applicable Indian laws. In addition to AI analysis, the system incorporates a karma-weighted voting mechanism where jurors participate in decision-making. Each juror's influence is determined by their credibility score, ensuring that experienced and reliable participants have greater impact on the final verdict.

Instead of relying solely on predefined rules, the system integrates keyword-based detection with large language model (LLM) reasoning to improve accuracy and reduce unclassified cases. When traditional methods fail to classify a complaint, the LLM provides intelligent legal analysis, ensuring that relevant laws

are identified. This hybrid approach enhances both performance and reliability.

The proposed system emphasizes transparency by generating detailed judgement reports that include detected crimes, applicable laws, and explanations. By combining AI-driven analysis with community participation, Digital Karma Jury provides a scalable, efficient, and transparent solution for modern dispute resolution. This approach not only improves accessibility to legal guidance but also demonstrates the potential of integrating artificial intelligence into real-world legal systems.

II. RELATED WORK

Traditional dispute resolution systems have long relied on centralized legal authorities such as courts, arbitration bodies, and government complaint portals. While these systems provide structured legal procedures, they often suffer from delays, lack of accessibility, and limited transparency. Online grievance redressal platforms have attempted to digitize complaint handling, but they still depend heavily on manual review and lack intelligent analysis capabilities.

With the advancement of artificial intelligence, several studies have explored the use of machine learning and natural language processing for legal applications. Early approaches focused on rule-based systems that mapped predefined keywords to legal categories. Although these systems provided basic automation, they lacked flexibility and failed to handle complex or ambiguous cases effectively.

Recent developments in deep learning have introduced more sophisticated models capable of understanding textual data. Natural Language Processing (NLP) techniques have been used for tasks such as legal document classification, case prediction, and contract analysis. Transformer-based models, including large language models, have shown significant improvements in understanding context and generating human-like explanations. However, many of these systems operate as black boxes, making it difficult to interpret their decisions.

In parallel, decentralized systems have been proposed to improve transparency and fairness in decision-making. Blockchain-based dispute resolution platforms and community-driven moderation systems have gained attention for reducing reliance on centralized authorities. These systems enable multiple participants to contribute to decision-making, but they often lack integration with intelligent legal analysis.

Reputation-based mechanisms have also been studied in various domains, where users are assigned, scores based on their behavior and contributions. Such systems help in identifying trustworthy participants and improving decision quality. However, their application in legal dispute resolution remains limited.

The Digital Karma Jury system builds upon these existing approaches by combining AI-based legal reasoning with a karma-weighted voting mechanism. Unlike traditional systems, it integrates keyword detection, large language models, and a structured law database to analyze complaints effectively. Additionally, the inclusion of a reputation-based jury system enhances fairness and transparency. This hybrid approach addresses the limitations of both centralized legal systems and standalone AI models, providing a more robust and scalable solution for modern dispute resolution.

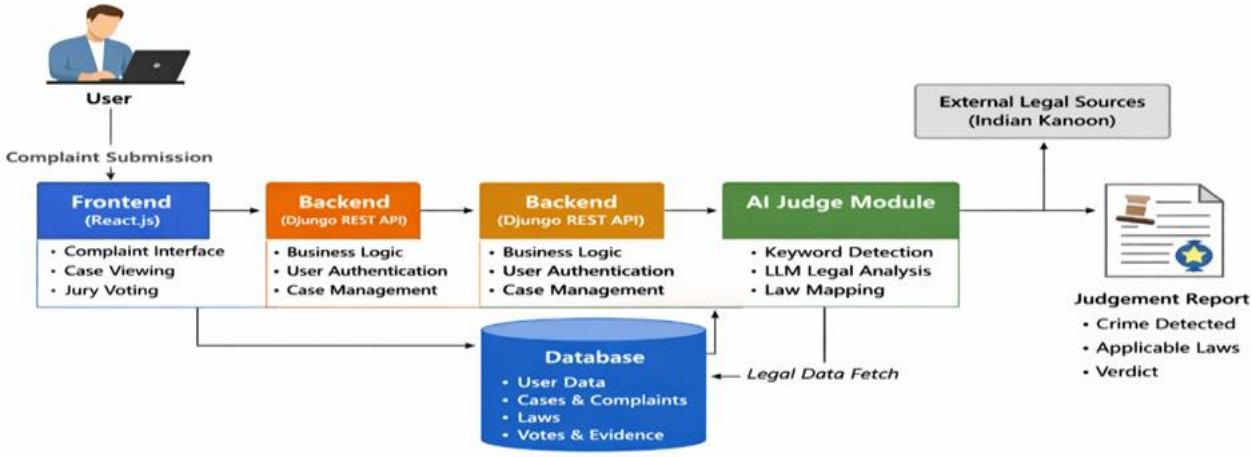


Fig 1. System Architecture of Digital Karma Jury

III. PROPOSED WORK

The proposed system, Digital Karma Jury, introduces an intelligent and decentralized approach to dispute resolution by integrating artificial intelligence with a karma-based voting mechanism. The system is designed to address the limitations of traditional legal systems by providing a transparent, efficient, and user-friendly platform for handling online disputes.

At the core of the system is the complaint submission module, where users can report issues such as cyber fraud, harassment, or financial scams. The submitted complaint is processed by the backend system and forwarded to the AI Judge module for analysis. The AI module plays a crucial role in identifying the nature of the complaint and mapping it to relevant legal provisions.

The AI Judge module follows a hybrid approach for legal analysis. Initially, keyword-based detection is used to identify common patterns in the complaint text. This includes recognizing terms related to fraud, phishing, identity theft, and other cyber-related crimes. However, keyword-based methods alone may fail in complex or ambiguous cases. To overcome this limitation, the system integrates a large language model (LLM) that performs advanced natural language understanding. The LLM analyzes the context of the complaint and suggests applicable Indian laws, ensuring that cases are not left unclassified.

Once the legal analysis is complete, the system moves to the jury voting phase. In this phase, registered jurors review the complaint and cast their votes. Each juror is assigned a karma score based on their previous participation and decision accuracy. The influence of each vote is weighted according to this score, ensuring that experienced and reliable users contribute more significantly to the final decision. This karma-weighted voting mechanism enhances fairness and reduces the impact of biased or malicious voting.

The system then aggregates the AI analysis and jury votes to generate a final judgement. The judgement report includes the detected crime type, applicable laws, relevant case references, and recommended legal actions. Additionally, the system integrates external legal sources such as Indian Kanoon to retrieve similar case laws and provide better legal context.

To ensure scalability and efficiency, the system is built using a layered architecture consisting of a React-based frontend, Django backend, AI analysis module, and a structured database. The integration of these components enables seamless data flow and real-time processing of complaints.

Overall, the proposed system combines AI-driven legal reasoning with decentralized decision-making to create a robust and scalable platform for dispute resolution. By reducing dependency on centralized authorities and improving accessibility to legal guidance, Digital Karma Jury represents a significant step towards modernizing legal assistance systems.

IV. RESULT ANALYSIS

The Digital Karma Jury system was evaluated based on its ability to analyze complaints, classify crime types, and suggest relevant legal provisions. The system demonstrates effective performance in handling various types of disputes, particularly in the domain of cybercrime.

The AI Judge module successfully identifies common cyber-related offenses such as phishing, online fraud, and identity theft using keyword-based detection. In cases where predefined keywords fail to classify the complaint, the integration of a large language model (LLM) significantly improves performance by analyzing contextual information. This hybrid approach reduces the number of unclassified cases and ensures that relevant laws are identified more accurately.

The system is capable of mapping complaints to appropriate Indian legal provisions, such as IT Act Section 66D and IPC Section 420, which are commonly associated with cyber fraud and cheating. Additionally, the integration of external legal sources enables the retrieval of relevant case laws, providing better context and supporting the generated judgement.

The karma-weighted voting mechanism plays a crucial role in improving decision quality. Jurors with higher credibility scores have greater influence on the final verdict, which helps in reducing biased or inconsistent decisions. Experimental observations indicate that this approach leads to more reliable and balanced outcomes compared to equal-weight voting systems.

The generated judgement reports include detailed components such as case summaries, detected crime types, applicable laws, and recommended actions. These reports enhance transparency and provide users

with a clear understanding of the legal implications of their complaints.

However, the system's performance depends on the quality of input data and the comprehensiveness of the law database. In some complex cases, further refinement of the AI model and expansion of the legal dataset may be required.

Overall, the Digital Karma Jury system demonstrates significant improvements in automation, accuracy, and transparency in dispute resolution. The combination of AI-based legal analysis and decentralized voting provides a scalable and efficient solution for modern legal assistance systems.

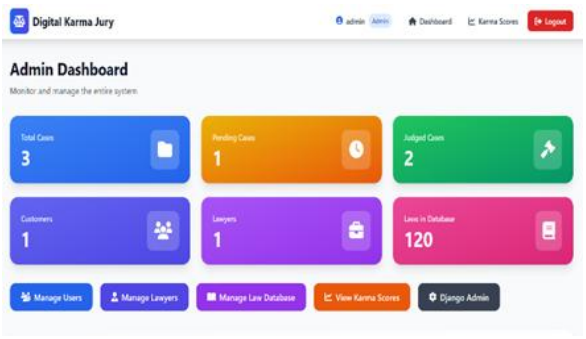
V. CONCLUSION

The Digital Karma Jury system presents an innovative approach to dispute resolution by integrating artificial intelligence with decentralized decision-making. The platform addresses the limitations of traditional legal systems, such as delays, lack of transparency, and limited accessibility, by providing an automated and user-friendly solution.

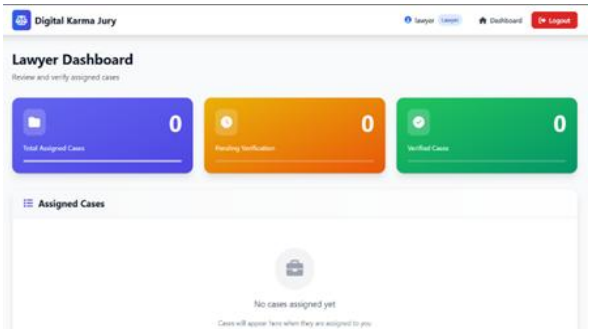
The system effectively utilizes an AI Judge module to analyze complaints, detect crime types, and suggest relevant Indian laws. The integration of keyword-based detection with large language model (LLM) reasoning enhances accuracy and significantly reduces unclassified cases. Additionally, the karma-weighted voting mechanism ensures fair and reliable decision-making by giving more influence to experienced and credible jurors.

The generated judgement reports provide clear insights into case details, applicable laws, and recommended actions, thereby improving transparency and user understanding. The system also demonstrates the potential of combining AI technologies with community participation to create scalable and efficient solutions for modern dispute resolution.

Although the system is not intended to replace traditional legal authorities, it serves as a valuable support tool for preliminary legal analysis and guidance. With further improvements, such as expanding the legal database and enhancing AI models, the Digital Karma Jury system can evolve into a more robust and widely applicable legal assistance platform



ADMIN DASHBOARD



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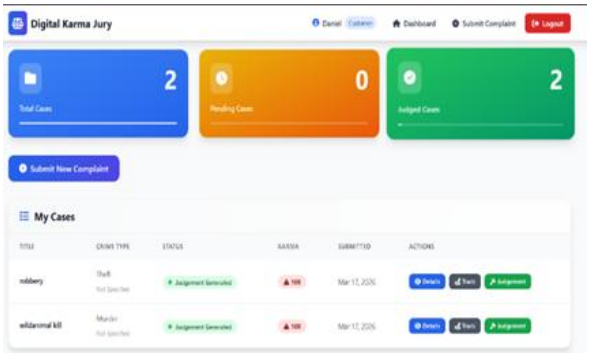
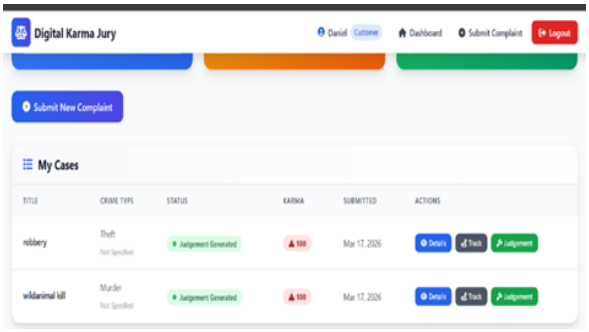


CUSTOMER DASHBOARD



COMPLAINTS

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