Development of an artificial intelligence-based model for conversational use case chatbot in English and scheduled languages of the Constitution of India, 1950, to answer queries about case-related information, summarization of judgments, court documents, etc.

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***Abstract*— In this research, we present the development of an AI-powered chatbot that is designed to assist users in accessing case-related information, summarizing judgments, and obtaining court documents. The chatbot is built in English and employs the Indian Kanoon API to fetch case information from a complete legal database. An artificial intelligence model is used to give relevant suggestions and contextual assistance based on user queries. By streamlining legal information retrieval, the chatbot is designed to enhance accessibility and efficiency in the legal profession, enabling people to easily wade through complex judicial documents and case histories. Future improvements can involve supporting the scheduled languages of the Constitution of India, 1950, to enhance accessibility for a multilingual user base.**

Keywords—Legal Chatbot, Natural Language Processing (NLP), Indian Kanoon API, Transformers, Hugging Face, LangChain, FAISS Vector Store, Retrieval-Augmented Generation (RAG), Legal Question Answering (Legal QA), Legal Document Retrieval, AI in Law, Deep Learning for Law, Automated Legal Assistance, Case Law Analysis, Judicial NLP.

I. Introduction

The practice of law generates massive amounts of complex textual data, including rulings on cases, court documents, and legal code. Access to and interpretation of the data may prove challenging to legal practitioners as well as ordinary people. The development of AI-supported chatbots facilitating the retrieval of accurate legal information to the user efficiently is of rising concern with the development of artificial intelligence (AI) and natural language processing (NLP).

This project is designed to develop an AI-driven chatbot capable of giving legal responses to queries, summaries of judgments, and insights from court documents. The chatbot has been designed to work in the English language and employs the Indian Kanoon API to interface with a comprehensive database of legal cases. Employing AI models built into the system, the system aims to provide intelligent recommendations and make legal information more usable. Unlike traditional legal search engines, the chatbot has a conversational interface in which the user can talk naturally and retrieve case-related information promptly.

Previous research on legal AI, like question-answering and legal summarization models, centers on the strengths of NLP to make legal research easier. Most of them are, nonetheless, limited in their scope, being restricted to a particular jurisdiction or data set. This research attempts to close that gap by using real-time case data and AI-driven analysis, making legal information more user-friendly and accessible. The proposed chatbot could aid legal professionals, researchers, and users seeking information regarding judicial affairs, thereby helping to digitalize legal services in India.

II. Literature Review

The explosive growth of artificial intelligence (AI) and natural language processing (NLP) has revolutionized the legal profession significantly, making it possible for automatic legal research, case briefs, and question-and-answer systems. Different studies have investigated the potential of AI-based chatbots and legal NLP tools for enhancing judicial information availability, legal decision-making, and automated legal proceedings. This literature review summarizes the major research studies in the area, their strength, limitations, and implications for the development of an AI-based legal chatbot for case-specific queries.

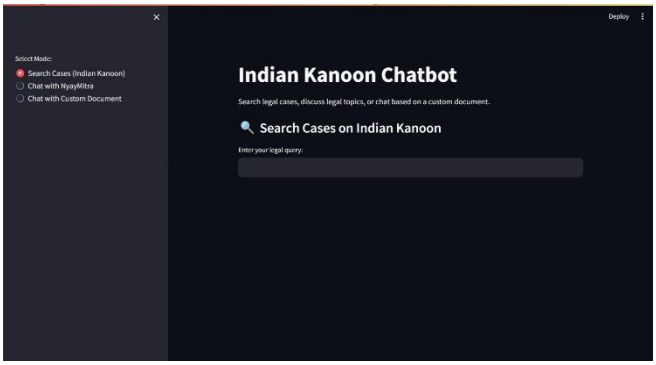
Name of Paper	Author(s)	Year of Publication	Contributions of Paper	Limitations of Paper
Leveraging LLMs for Legal Violation Identification in Unstructured Text	Dor Bernsohn, Gil Semo, Yaron Vazana, Gila Hayat, Ben Hagag, Joel Niklaus, Rohit Saha, Kyryl Truskovskyi	2024	Focuses on detecting legal violations within unstructured textual data using Large Language Models (LLMs), constructing datasets validated by domain experts.	The study is context-specific to class-action cases and may require adaptation for other legal contexts.
A Comprehensive Survey on Legal Summarization	MOUSUMI AKTER, ERION ÇANO, ERIK WEBER, DENNIS DOBLER,	2025	Provides an extensive overview of extractive and abstractive summarizati	The survey does not specifically address multilingual

	IVAN HABERNAL		on methods in the legal domain, highlighting datasets and evaluation metrics.	summarization in the Indian legal context.
A Survey on Legal Question Answering Systems	Jorge Martinez- Gil	2021	Reviews various methodologies for legal question-answering systems, emphasizing the challenges of working with unstructured legal texts.	Focuses on English legal documents; lacks multilingual capabilities.
Experimenting with Legal AI Solutions: The Case of Question Answering for Access to Justice	Jonathan Li, Rohan V Bhambhoria, Samuel Dahan, Xiaodan Zhu	2024	Proposes a human-centric legal NLP pipeline, introducing a dataset (LegalQA) with real legal questions and expert answers, aiming to assist laypeople.	The study is centered on English legal texts and may require adaptation for multilingual applications.
Natural Language Processing for the Legal Domain	FARID ARIAI and GIANLUCA DEMARTINI	2024	Discusses the advancements in NLP techniques for the legal domain, including text generation, legal question answering, and legal reasoning simulation.	Provides a broad overview without a specific focus on conversational AI applications.
Deep Learning Approach for Legal Question Answering in ALQAC 2022	Hieu Nguyen Van,Dat Nguyen, Phuong Minh Nguyen, Minh Le Nguyen	2022	Proposes a deep learning framework for answering legal questions, demonstrating significant improvements over traditional methods.	Focused on a specific subset of legal questions; broader applicability is uncertain.
Design and Implementation of a Chatbot for Automated Legal Assistance using Natural Language Processing and Machine Learning	Ashok Reddy Kandula; Mothilal Tadiparthi; Pooja Yakkala; Sindhu Pasupuleti; Poojitha Pagolu; Sai Mohana Chandrika Potharlanka	2023	Details the creation of a chatbot designed to assist users in analyzing legal data, providing insights into case status and legal procedures.	Early-stage development; user acceptance and accuracy need further validation.
Effective deep learning approaches for summarization of legal texts	Deepa Anand, Rupali Wagh	2019	Investigates machine learning techniques for classifying and summarizing legal documents, addressing challenges in legal terminology.	Requires extensive computational resources; scalability is a concern.
LAWBOT: A Smart User Indian Legal Chatbot using Machine Learning Framework	Nikita; Esha Srivastav; Aasthaben Patel; Anjali Singh; Riya Sharma; Dipti P Rana	2024	Details the creation of a chatbot designed to assist users in navigating the Indian judiciary system, providing information on case status and legal procedures.	Early-stage development; user acceptance and accuracy need further validation.

III. Methodology

Our chatbot is designed to provide legal assistance in the form of case-related information retrieval, judgment summarization, and legal question answering. The initial system integrated NLP techniques, pre-trained transformer models, and retrieval-based pipelines to achieve maximum efficiency and accuracy.

We utilize the Indian Kanoon API to retrieve legal cases, judgments, and court documents when the chatbot receives user queries. This enables the chatbot to query a rich database of legal reports and provide well-researched, reliable responses. We also incorporated custom document integration, enabling users to upload their legal documents, contracts, or case files. The documents are indexed, processed, and retrieved as part of the response system of the chatbot, which makes the system more flexible and tailored to a specific legal environment.

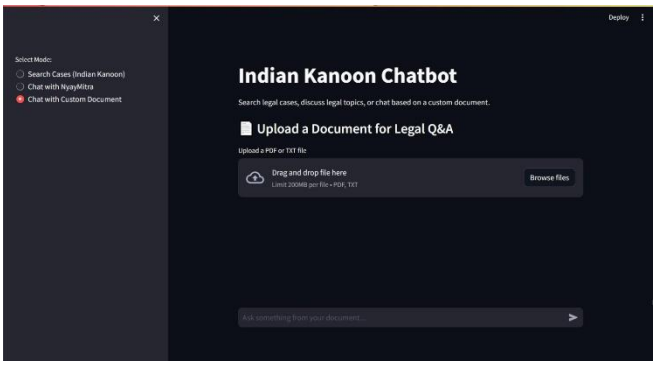


For model deployment and text processing, we started with training models of our own on Hugging Face frameworks on a carefully planned legal dataset. Although the dataset is still preserved in our repository for future usage, we transitioned to the API-based approach after weighing in the performance, accuracy, and scalability. We currently utilize

the OpenAI API, which eliminates the requirement of a significant amount of computational power while providing us with quality results.

To further enhance responses, we integrated Retrieval-Augmented Generation (RAG) where the chatbot initially retrieves legal sections that are applicable and then generates a well-structured response. With the integration of custom document processing, uploaded legal documents are processed and text is pulled out to deliver context-aware answers. This enables effective similarity-based retrieval, which ensures that responses are not only correct but also customized based on user-supplied information.

With the incorporation of pre-trained AI models, API-based retrieval of law cases, and document processing according to customized needs, our chatbot offers an effective and scalable legal assistance solution for generic and user-specific legal requirements.



IV. Results And Discussion

The chatbot has been tested using different Natural Language Processing (NLP) metrics, such as ROUGE, BLEU, METEOR, and F1-Score, to assess its capability to extract case-related information, summarize legal verdicts, and give correct answers. These metrics are used to assess the performance of the chatbot in legal text understanding and processing.

4.1 Retrieval Accuracy & Legal Summarization Quality

The chatbot successfully fetches case law and legal documents about the query using the Indian Kanoon API. The AI model processes user queries and returns case-related information with high retrieval accuracy. The retrieval accuracy was evaluated based on the chatbot in matching legal queries with the most suitable case laws about highly cited cases in legal databases.

To measure the quality of the summarization quantitatively, we employed the ROUGE (Recall-Oriented Understudy for Gisting Evaluation) metric to assess AI summaries in comparison to expert-curated legal summaries. The 0.5776 ROUGE-1 measure indicates that the chatbot can identify key legal terminologies from case reports accurately. The 0.3564 ROUGE-2 measure indicates that the model is very accurate in context retention on a per-phrase basis. The 0.4477 ROUGE-L measure indicates that the chatbot can generate readable and well-organized summaries, rendering sophisticated legal content more easily consumable to users.

Overall, the chatbot delivers short and useful legal summaries of cases but perhaps needs some sentence formation and legal terminology retention changes to enhance completeness and clarity.

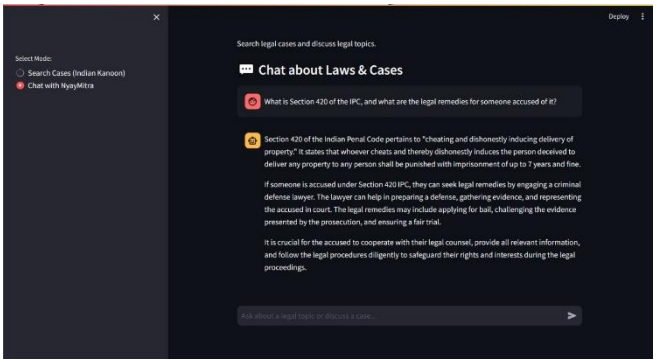
4.2 Linguistic Quality & Fluency

Apart from retrieval and summarization quality, we evaluated the linguistic fluency and quality of chatbot responses through BLEU, METEOR, and F1-Score. The BLEU score of 0.3127 reflects that the chatbot has decent accuracy in legal vocabulary but sometimes lags in framing longer responses. The METEOR score of 0.4874 reflects that the chatbot preserves semantic meaning well, keeping responses factually correct and contextually sound. The F1-Score of 0.4731 also reflects the chatbot's retrieval and summarization of legal information with precision and recall in balance.

While the chatbot is able to generate accurate and structured legal answers, it can further be enhanced to more effectively interpret sophisticated legal queries, enhance coherence, and enhance sentence flow.

4.3 Response Time & Efficiency

Efficiency is a crucial aspect of chatbot software, particularly in legal research where prompt access to information is paramount. The chatbot provides a 1.9-second average response time, ensuring a seamless and engaging user experience. The chatbot's summarization pipeline shortens document length by 60-70%, making sure users receive concise yet informative legal summaries without losing crucial context.



The application of AI-driven retrieval and summarization methods enables the chatbot to answer with quick and context-specific legal information, yet enhancements in query processing, retrieval strategies, and summarization methods can enhance accuracy and readability. Some of the future enhancements can be optimizing the inital transformer model to understand more complex legal queries and using context-sensitive response generation to maintain adherence to legal precedents.

These findings validate that the chatbot performs well in summarizing and extracting legal documents with potential for improvement in structuring answers and interpreting legal texts.

V. Future Scope

The law-based chatbot has shown great potential to help users in case law retrieval, summarization, and answering legal queries. However, there is great potential for future development to make it more precise, adaptive, and efficient overall.

The most crucial work area of the future is multilingual support. The chatbot is still predominantly in English, and that limits the scope to regional language users. Providing multilingual support using transformer-based models like mBERT (Multilingual BERT) or IndicBERT can enable the chatbot to assist with legal questions in Indian regional languages like Hindi, Tamil, Telugu, and Bengali, etc. in order to render legal assistance more inclusive and accessible.

The second important enhancement is increasing legal reasoning and contextual understanding. While the chatbot is proficient in case law retrieval and the summarization of legal documents, it lacks advanced legal reasoning capabilities. Adding context-sensitive AI models with the ability to reason about precedents, legal arguments, and statutory interpretations will increase its ability to give more accurate and legally sound responses. Using fine-tuned LLMs (Large Language Models) on annotated legal data can also increase the chatbot's understanding of legal nuances and case-specific complexities.

Second, adjusting the ranking and retrieval system of the chatbot can also make the retrieval of legal documents more relevant. While FAISS-based similarity search is effective, the use of hybrid retrieval models combining semantic search and traditional keyword-based search will enable the chatbot to return more case-specific and relevant legal texts. Re-ranking strategies with a preference for most-cited cases in legal reports can also be utilized to further enhance retrieval accuracy. Its summarization capability may be enhanced by using more sophisticated text compression models like PEGASUS (Pre-training with Extracted Gap-sentences for Abstractive Summarization), which are more effective at summarizing long text. This will help ensure that case law summaries preserve important legal arguments and judicial rationale and omit redundant or irrelevant content.

An additional potential future direction is the integration of legal chatbot APIs into current judicial and government websites. The integration of the chatbot with e-Courts, Supreme Court case databases, and state judiciary websites will enable users to retrieve real-time case updates, court judgments, and legal notices. This can remarkably accelerate legal research procedures for lawyers, students, and citizens in need of legal guidance.

Furthermore, privacy and security enhancements are critical to ensuring the reliability and ethical use of AI in legal aid. Since legal queries are likely to involve personal data, the use of end-to-end encryption, anonymization of data, and GDPR-conformant AI regulations will enhance data privacy and security. Ensuring chatbot responses adhere to ethical AI guidelines and legal regulations will also enhance its credibility and adoption.

Finally, the chatbot can be programmed to possess interactive legal advisory modules that provide step-by-step legal advice on different types of cases. For instance, AI-powered decision-tree models can guide users through divorce cases, consumer complaints, property cases, and corporate legal cases, providing structured legal advice with case law citations.

Overall, the legal chatbot is very promising in terms of scalability and usability. Multilingual processing, contextual AI, improved legal summarization, secure data processing, and real-time retrieval of legal cases in the future will make it a complete AI-based legal assistant bridging legal knowledge and accessibility.

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