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Developing an AI-Based Chatbot for the Department of Legal Justice

Sai Varshita T [1], Balaraju Anshitha[2], T Lakshmi Bhavana[3] , Vadlamudi Tejaswini [4] ,

Prof. Mahima M Gowda[5]

[1]Sai Varshita T Department of Computer Science and Information Technology Reva University
[2]Balaraju Anshitha Department of Computer Science and Information Technology Reva University
[3]T Lakshmi Bhavana Department of Computer Science and Information Technology Reva University
[4]Vadlamudi Tejaswini Department of Computer Science and Information Technology Reva University
[5]Prof. Mahima M Gowda Department of Computer Science and Information Technology Reva University

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Abstract - Today, Artificial Intelligence is revolutionizing public service delivery globally its integration into Indian government systems is still in its early stages. Currently, most Indian government departments rely on manual processes or basic digital portals that lack intelligent automation. Implementing AI-driven conversational systems could bridge this gap, modernizing how citizens interact with the state and making justice services more efficient. For Department of Justice websites, managing the sheer volume of daily inquiries regarding legal rights, court procedures, and government schemes is a massive challenge that often clogs traditional help desks. This paper presents a detailed literature survey focused on the development of AI-powered chatbots designed specifically for the justice sector. We look into the latest research on Natural Language Processing (NLP) and machine learning models that are currently being tested in government and legal environments.

The existing research clearly shows that AI chatbots can make legal information much more accessible to the common man, offering 24 hours 7 days support and reducing the heavy workload on government staff. However, several critical bottlenecks remain, including the risk of incorrect legal advice, data security concerns, and the difficulty of training AI on specific legal terminologies. Our survey highlights the pressing need for a secure and dependable system that doesn't just automate answers, but actually builds public trust in e-governance by providing accurate and transparent legal guidance.

***Key Words*:** AI chatbot, virtual assistant, legal justice, NLP, machine learning, e-governance, digital India.

1. INTRODUCTION

Artificial intelligence is changing how governments share information and services online. AI chatbots and virtual helpers are key players: they answer questions, handle routine work, and open up important resources. Using natural language processing and machine learning, these tools act like real conversations, giving fast and natural replies. In the legal field, getting access to justice is still very hard. Complex rules, low legal knowledge, and lack of quick advice Our AI chatbot for the Department of Justice website would be a smart helper. It would give reliable legal facts, guide users through basic steps, and link them to the right places. Open 24/7, it would cut staff workload, increase user interest, and provide accurate, consistent answers. Studies already prove chatbots work well in legal help, e-governance, and other systems by improving speed and access. Still, current chatbots have limits. They lack deep legal knowledge, risk wrong answers, face privacy issues, and raise ethical concerns about legal advice. These problems show the need for a custom, justice-specific design that is accurate and focused. Even as technology grows, legal information and services remain hard to reach for many people and businesses. Traditional ways—like seeing lawyers, using law libraries, or searching online—cost a lot, are not always available, and involve confusing terms. Huge amounts of documents and changing laws make reliable advice tough to find. The main problem is a lack of cheap, easy legal guidance. Current options like legal aid or online forums give uneven help without personal touch. Relying on people also causes delays, inconsistent advice, and growth limits.

A. Rationale and Motivation

The primary catalyst for developing a specialized legal chatbot is the persistent "justice gap"—the significant barrier created by high legal fees, procedural complexity, and the scarcity of professional counsel. While legal aid is a fundamental right, the reality for many citizens is that navigating the judicial system is an overwhelming and expensive endeavour. By integrating Natural Language Processing (NLP) into a public-facing interface, we can provide a scalable solution that delivers immediate, low-cost guidance. By offering 24/7 support through common web and mobile platforms, the system empowers the general public to approach complex legal challenges with greater confidence and clarity, effectively bridging the divide between institutional legal expertise and the everyday citizen.

B. Analysis of Conventional Architectures

Current iterations of legal assistants are largely built upon rule-based frameworks. These systems operate on a rigid "if then" logic, pulling responses from pre-defined databases of statutes and FAQs. While these models are valued for their transparency and predictable behaviour, they are inherently brittle. They often struggle to parse the nuances of natural human speech and fail when faced with multifaceted legal scenarios that fall outside their programmed scripts. Furthermore, rule-based systems are difficult to scale, as every new legal update requires manual reprogramming. This lack of adaptability highlights a critical need for transition. Unlike these static systems, machine learning-driven models can evolve through user interaction,

offering a more fluid, "human-like" understanding of intent—a necessity for the ever-changing landscape of public law.

C. Primary Research Objectives

The central aim of this study is to design a robust, accessible framework for a Department of Justice chatbot. Specifically, this project seeks to:

- Engineer a Cross-Platform Interface: Build a responsive user experience compatible with modern web browsers and mobile ecosystems.
- Synthesize a Legal Knowledge Repository: Curate a vast, reliable database of legal precedents, rights, and frequently encountered public queries.
- Optimize Retrieval-Augmented Generation (RAG): Implement advanced text-retrieval techniques to ensure that responses are both contextually accurate and generated in real-time.
- Prioritize Public Accessibility: Ensure the system remains a low-barrier resource, focusing on affordability and ease of use for marginalized populations.
- Quantify Social Impact: Establish a metrics-based approach to evaluate how effectively the tool increases legal empowerment and reduces the administrative burden on justice departments.

2. LITERATURE SURVEY

This review looks at studies using chatbots, machine learning, and smart language models to fix legal system problems. AI and natural language processing (NLP) are changing the legal world fast. Researchers are finding ways to make justice easier to reach and help government offices handle information better.

Digital tools are breaking down barriers for people who find legal help too hard or expensive. Woodlock et al. [1] studied how tech helps family violence victims. They found online platforms and automated systems cut costs and distance problems. These tools also need to be simple and kind for people in tough situations. Kabir and Alam [2] showed AI speeds up law enforcement cases but warned about privacy and ethics risks.

In government services, chatbots make it easier for citizens to talk with offices. They simplify complex rules and lighten staff workloads. Sajjanapu [8] showed virtual assistants help smart city residents connect with government faster. Srivastava and Sharma [10] explained how AI handles everyday questions in e-governance, freeing staff for bigger cases.

Accuracy matters most in legal chatbots. Faisal et al. [7] used "knowledge graphs" to connect legal facts, helping bots give spot-on answers.

New "transformer" models are game-changers. Vold and Conrad [4] compared old methods with models like RoBERTa and found new ones much better for tough legal questions. Greco and Tagarelli [5] reviewed these models for legal search and case predictions. Mapped legal NLP research from 2015-2022, confirming transformers now lead in handling complex legal language.

AI has risks too. Gromova et al. [3] warned that tools like ChatGPT can spread wrong info or leak data. For justice department websites, trustworthy AI and following rules are non-negotiable.

Still, real systems work well. Agreda et al. [6] created "ATTORNEY 209" for family law cases. Even with basic NLP, it proved chatbots can guide people who can't afford lawyers.

After studying these works, we see a clear gap. Many chatbots handle general legal help or specific tasks like document search. But almost no one has built a complete chatbot just for India's Department of Legal Justice website— one platform combining guidance, info search, and step-by step help for department workflows. This gap drives our project. We want to create a smart, easy-to-use virtual assistant for the Department of Legal Justice website. Using the best NLP and machine learning from these studies, our system will make legal info accessible, cut staff workload, and help citizens handle legal matters with confidence.

3. METHODOLOGY

The methodology describes the systematic approach followed to design, develop, and evaluate the AI-based chatbot intended for the Department of Legal Justice website. The proposed system focuses on providing accurate legal information, improving user accessibility, and reducing manual workload.

A. System Overview

Our proposed system is a smart AI chatbot for the Department of Legal Justice website. It helps citizens quickly find legal information and step-by-step guidance. The chatbot gives instant, accurate answers to common questions, cutting down on manual support and making justice easier to access. Users type natural questions, and the system uses natural language processing to understand them. It pulls answers from a well-organized legal knowledge base. The main focus is everyday citizens asking about legal procedures, government services, and frequent legal doubts. We prioritize simple design, correct information, and safe handling of legal advice.

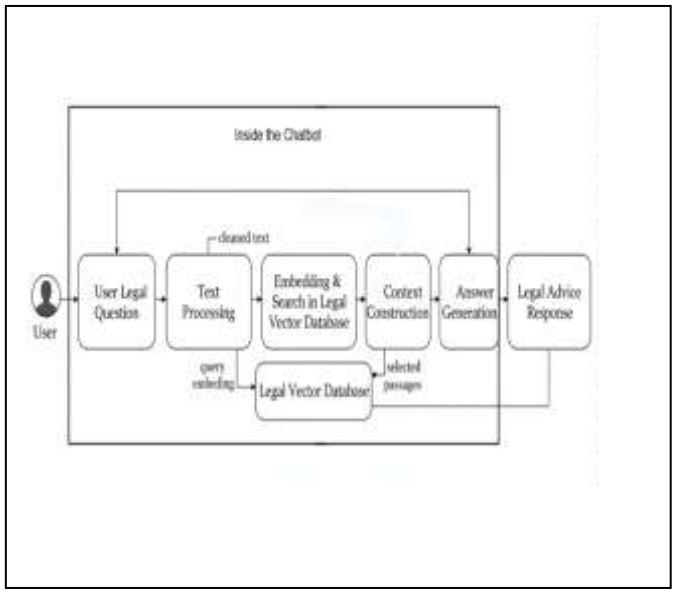

Fig. 1. Simplified Overview of the AI-Based legal chatbot.

B. Data Preparation

Good data preparation is key to making our chatbot work well. We'll collect legal information from trusted public sources like government legal websites, laws and acts, policy papers, FAQs, and step-by-step guides from the Department of Legal Justice. These authoritative materials ensure our answers are reliable

and up-to-date for citizens. Once gathered, the data goes through careful cleanup. We remove junk text, standardize formats, cut out irrelevant parts, and organize everything into a structure that NLP tools can easily process. Steps like tokenization (breaking into words), stop-word removal (dropping common words like "the"), and lemmatization (simplifying word forms) help the chatbot better understand natural user questions. We take extra care to exclude any sensitive or private information during this process. This keeps everything ethical and legally compliant, building trust while protecting user privacy.

C. Model Selection

Our system will use natural language processing (NLP) and machine learning to understand user questions and give helpful answers. We'll start with simple NLP methods like TF IDF and word embeddings to spot what users want and find the right information. For tougher legal questions, we'll try advanced transformer models to better grasp meaning and give more accurate replies. We'll pick models based on how well they work, how easily they grow, how clear their decisions are, and how fast they run. Transformers shine with legal language because they catch context and nuances, while basic models handle common FAQs and rule-based questions perfectly.

D. Implementation Steps

Figure 1 shows how our AI legal chatbot works, step by step—from turning a user's question into helpful legal advice. Users start by typing their legal question through the chatbot window. This could be anything from "How do I file a case?" to questions about rights or government services. The question goes to the text cleanup stage first. Here, we break it into words (tokenization), fix formatting (normalization), remove common words like "the" or "and" (stop words), and filter out junk. This makes the question clean and ready for processing. Next, we turn the cleaned question into a "embedding"—a smart math version that captures its true meaning. These embedding searches our legal database (full of vectorized laws, policies, and FAQs) to find the closest matches based on meaning, not just keywords. The system pulls the most relevant legal info—like specific rules or FAQs—that matches the question. These pieces get combined with the original question to build full context for a good answer. Then the answer generator takes this context and creates a clear, helpful response. It might use simple lookup methods or smart language models to make sure the reply is accurate and easy to understand. Finally, the chatbot shows the answer to the user. It gives useful guidance but always reminds people it's not a substitute for a real lawyer.

E. Evaluation Metrics

To check the performance of the proposed chatbot system, several evaluation metrics are intended to be used once the system is implemented. These include accuracy, precision, recall, and F1-score to evaluate the correctness of responses. Response time will be measured to ensure real-time interaction and usability. Additionally, qualitative evaluation metrics such as user satisfaction and feedback will be considered to assess the effectiveness of the chatbot from a user perspective. These metrics will help in identifying areas for improvement and ensuring that the system meets the requirements of the Department of Legal Justice.

4. SYSTEM ARCHITECTURE

From figure 2, We can see that our AI chatbot's system architecture shows how all the parts fit together to handle user questions and give helpful legal answers. We designed it in separate modules so it's easy to update, grow, and connect to the Department of Legal Justice website without breaking anything. At the top level, the system has four main parts: a user interface, natural language processing layer, legal knowledge base, and response generator. Each part has a clear job, but they all work together smoothly so citizens can chat easily with the bot. The user interface is where people start. It's a simple web chat box built right into the department's website. Anyone can use it—no tech skills needed. Whether you're on a phone, laptop, or desktop, it feels natural and welcoming for all kinds of users. The natural language processing (NLP) layer is the brain that understands what people say. When you type a question, it cleans up the text, figures out what you really mean (like spotting "file FIR" as a police report request), and breaks it down into smart data the system can use. The legal knowledge base is the heart of everything. It holds all the legal info—laws, policies, step-by-step guides, and common FAQs—in organized storage. We use vector tech so it can find answers by meaning, not just exact words, pulling the most relevant rules or advice quickly. The response generation module takes the found info and turns it into a clear, helpful reply. It makes sure the answer fits the question, sounds natural, and follows legal and ethical rules. Then it sends the final response back through the chat interface. This modular setup makes it simple to add new features later—like links to more legal databases, or even smarter AI models. Overall, our architecture creates a fast, flexible, and dependable way to deliver legal help through the chatbot.

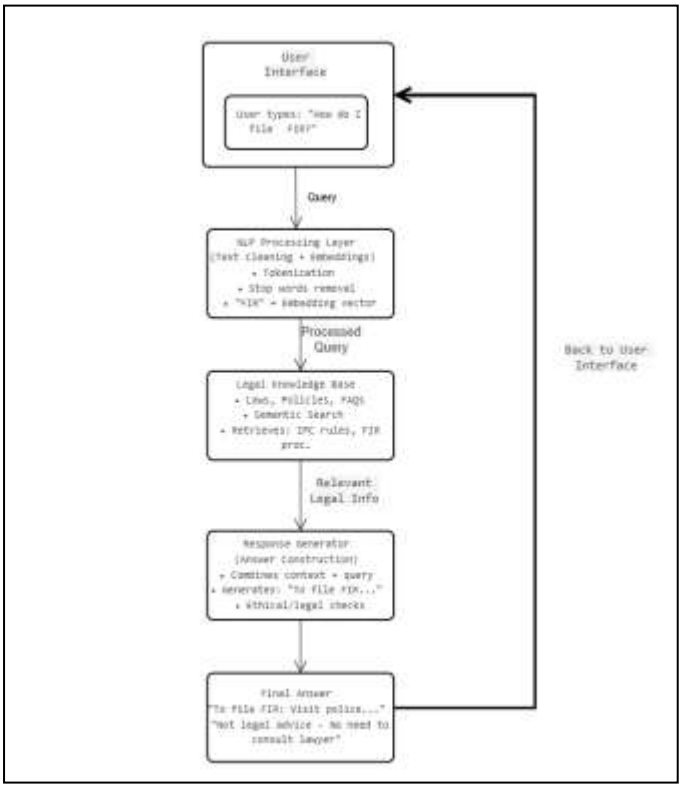

Fig. 2. Simplified Overview of the AI-Based legal chatbot.

5. EXPECTED RESULTS AND DISCUSSION

Our AI chatbot will make legal information much easier to access on the Department of Legal Justice website. Using natural language processing, it will give quick, accurate, and simple answers to everyday legal questions, helping citizens get the guidance they need without hassle. The biggest win will be better answer accuracy. Unlike old keyword searches that miss the point, our system uses smart embeddings and organized legal data to find truly relevant content and craft spot-on responses. Users asking "How do I file FIR?" will get clear steps from CrPC rules, not random matches. Responses will come fast too—real-time chats that feel natural. These cuts wait times dramatically and reduce the need for staff to handle basic questions. Legal teams can focus on tough cases while the bot manages FAQs and routine procedures. From the admin side, it lightens the workload big time. Staff spend less time on repetitive inquiries, freeing them for complex work that needs human judgment. Users will love the simple chat interface that works on any device, no tech skills required. We'll track user satisfaction through feedback to confirm it's working well. Sure, challenges like tricky legal questions or keeping data fresh will need ongoing attention, along with ethical checks and regular updates. But overall, this chatbot will transform legal services—making them faster, fairer, and more open to everyone.

6. CONCLUSION AND FUTURE SCOPE

This paper presented a proposed AI-based chatbot or virtual assistant designed for the Department of Legal Justice website with the objective of improving access to legal information and enhancing citizen engagement. By integrating artificial intelligence and natural language processing techniques, the proposed system aims to provide accurate, timely, and user-friendly responses to legal queries while reducing the manual workload on legal staff. The study discussed the system methodology, architecture, and expected outcomes, highlighting the potential benefits of deploying conversational AI in legal and e-governance environments. The modular design of the proposed system ensures scalability, maintainability, and ethical handling of legal information, making it suitable for real-world deployment in government platforms. As part of future work, the proposed system can be enhanced by incorporating advanced transformer-based language models to improve semantic understanding and response accuracy. Additional features such as multilingual support, voice-based interaction, and integration with real-time legal databases can further improve accessibility and inclusivity. Moreover, comprehensive evaluation through user studies and performance benchmarking can be conducted once the system is fully implemented. Overall, the proposed AI-based chatbot has the potential to contribute significantly to the digital transformation of legal services by promoting transparency, efficiency, and equitable access to justice.

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