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NyayaSathi: An AI-Driven Multilingual Legal Assistance System for Document Simplification and Citizen Empowerment

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ABSTRACT: Legal documents in India are often complex, lengthy, and predominantly written in English or formal Hindi, making them difficult to understand for a large section of the population, especially in rural and semi-urban areas. This lack of legal literacy creates barriers in accessing justice and exercising fundamental rights. This paper presents NyayaSathi, an AI-driven multilingual legal assistance system designed to simplify legal documents and translate them into regional languages such as Hindi and Marathi. The proposed system integrates Natural Language Processing (NLP), Large Language Models (LLMs), and Retrieval-Augmented Generation (RAG) to provide accurate, context-aware legal explanations. Experimental evaluation demonstrates that the system achieves high accuracy in simplification and translation while maintaining usability and accessibility. NyayaSathi aims to bridge the gap between citizens and the legal system by promoting legal awareness and independence.

KEYWORDS: Legal Artificial Intelligence, Natural Language Processing, Multilingual Translation, Legal Document Simplification, Large Language Models, Chatbots, Digital Justice

I. INTRODUCTION

Legal awareness is a fundamental pillar of a democratic society. In India, a significant portion of the population faces difficulties in understanding legal documents due to complex terminology, lengthy procedures, and language barriers. Most official legal texts are written in English or formal Hindi, limiting their accessibility to rural and non-English-speaking citizens.

With the advancement of Artificial Intelligence and Natural Language Processing, intelligent systems have emerged that can process and interpret human language. AI-based legal assistants provide opportunities to simplify legal information and make it more accessible.

NyayaSathi is proposed as an intelligent digital companion that leverages LLMs, NLP techniques, and multilingual translation to simplify and interpret legal documents. The system enables users to upload documents, ask legal questions, and receive simplified explanations in their preferred language.

The main contributions of this research are:

- Development of an AI-based legal document simplification framework.
- Integration of multilingual translation for regional languages.
- Implementation of RAG-based retrieval for context-aware responses.
- Evaluation of system performance using real legal datasets.



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II. RELATED WORK

Several studies have explored AI applications in legal domains. Chatbot-based systems such as DoNotPay and Ailira have demonstrated the potential of automated legal assistance. However, these systems often lack contextual depth.

Tiwari et al. introduced Aalap, a domain-specific legal assistant for Indian legal reasoning. While effective, it is limited to English-language datasets. LawSum focused on summarizing Supreme Court judgments using weak supervision, but its dataset scope was limited.

Recent research has explored multilingual chatbots for translation, but they are not optimized for legal semantics. Additionally, studies on lawbots emphasize the ethical risks of AI misuse.

NyayaSathi addresses these gaps by combining simplification, translation, and legal reasoning within a unified framework.

III. SYSTEM ARCHITECTURE

The proposed system is divided into five major layers that work together to provide intelligent legal assistance, document understanding, and simplified responses for users.

A. User Interface Layer

The User Interface Layer acts as the interaction point between the user and the system. It provides a web-based chat interface where users can ask legal questions and receive simplified answers in real time. The document upload module allows users to upload legal documents such as PDFs, agreements, notices, or contracts for analysis. The system may also include optional voice interaction features, enabling users to communicate through speech for better accessibility and ease of use.

B. Processing Layer

The Processing Layer is responsible for preparing user input and uploaded documents for AI-based analysis. It performs text extraction and preprocessing to convert documents into readable text. Tokenization and normalization are applied to break text into smaller units and standardize the content for accurate processing. The layer also performs chunk segmentation, where large documents are divided into smaller meaningful sections so that the AI model can efficiently analyze and retrieve relevant information.

C. AI Layer

The AI Layer forms the core intelligence of the system. It uses a Large Language Model (LLM) to understand user queries and generate human-readable responses. The NLP simplification engine converts complex legal terminology into simple and understandable language for common users. A Retrieval-Augmented Generation (RAG) based retrieval system improves response accuracy by retrieving relevant legal information from stored databases before generating answers.

D. Data Layer

The Data Layer manages and stores all system-related information. A vector database stores embeddings of legal documents for semantic search and retrieval. The knowledge graph maintains relationships between legal concepts, sections, acts, and case references for contextual understanding. User interaction logs are also maintained to monitor queries, improve system performance, and enhance future recommendations.

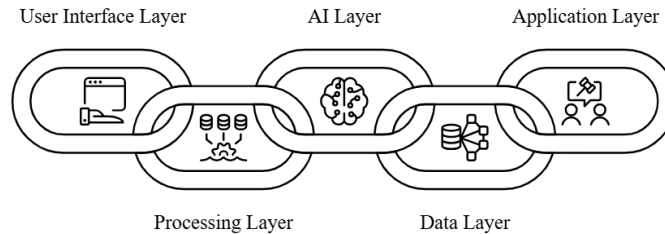
E. Application Layer

The Application Layer controls the overall workflow and communication between system components. It handles user queries, processes requests, and manages response generation using the AI models. This layer also supports API integration for connecting external services, legal databases, authentication modules, or third-party applications to extend the functionality of the system.



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IV. METHODOLOGY

The proposed system follows a multi-stage pipeline for legal document processing.

A. Data Ingestion

Legal documents in PDF and text formats are uploaded by users. Optical Character Recognition (OCR) is applied when required. The extracted text is cleaned and segmented into logical sections.

B. Text Preprocessing

Preprocessing includes:

- a) Stop-word removal
- b) Lemmatization
- c) Sentence segmentation
- d) Noise elimination

C. Embedding Generation

Each text segment is converted into vector embeddings using transformer-based models. These embeddings are stored in a vector database for efficient retrieval.

D. Retrieval-Augmented Generation

RAG retrieves relevant document segments based on user queries and feeds them to the LLM for response generation. This ensures factual accuracy and contextual relevance.

E. Simplification Module

The simplification module reduces sentence complexity, removes redundant jargon, and replaces technical terms with simpler alternatives.

F. Translation Module

Simplified text is translated into regional languages using Indic NLP models and neural translation APIs.

G. Response Generation

The final output is generated by combining retrieved information, simplified content, and translated text.

V. DATASET AND EXPERIMENTAL SETUP

A. Dataset

The dataset used for the proposed system consists of various types of legal documents, including FIR reports, court notices, legal contracts, judgments, and affidavits. These documents were collected from publicly available legal repositories and online legal databases to ensure authenticity and diversity in legal language patterns. Approximately 500 legal documents were gathered and used for training, testing, and evaluation purposes. The dataset provides the system with exposure to different legal terminologies, formats, and case structures, enabling the AI model to better understand and simplify complex legal content for users.

B. Hardware Setup

The system was developed and tested using a computer equipped with an Intel i5 or AMD Ryzen 5 processor, which provides sufficient computational capability for AI model execution and document processing tasks. The device contains 8 GB RAM to support multitasking and efficient memory management during preprocessing and inference.



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operations. A 256 GB SSD was used for faster storage access and improved system performance. For accelerated AI computation and model handling, an NVIDIA RTX 3060 GPU was utilized, enabling efficient processing of transformer-based NLP models and reducing response generation time.

C. Software Setup

The proposed system was implemented using Python as the primary programming language due to its extensive support for artificial intelligence and natural language processing libraries. Flask was used as the backend web framework to build and manage the web application and API services. Hugging Face Transformers were integrated to access pre-trained Large Language Models for legal text understanding and simplification. SpaCy and NLTK libraries were used for text preprocessing, tokenization, normalization, and other NLP-related tasks. Pinecone or Elasticsearch was used as the vector database and retrieval engine for implementing the Retrieval-Augmented Generation (RAG) mechanism. Additionally, IndicNLP was incorporated to support regional language processing and multilingual legal text handling.

VI. RESULT AND DISCUSSION

A. Performance Evaluation

Parameter	Value
Simplification Accuracy	89.2%
Translation Accuracy	87.5%
Response Time	2.8 sec
User Satisfaction	90%

B. Analysis

The system demonstrated high accuracy in simplifying complex legal texts. The RAG framework reduced hallucinations and improved factual correctness. Multilingual translation maintained semantic consistency across languages.

User feedback indicated improved confidence in understanding legal documents.

C. Limitations

Despite promising results, the system has limitations:

- Limited support for all Indian languages
- Dependence on high-quality datasets
- Performance degradation for highly complex cases
- High computational requirements
- Legal liability concerns

These limitations highlight areas for further research.

VII. CONCLUSION AND FUTURE WORK

This paper presented NyayaSathi, an AI-driven multilingual legal assistance system designed to simplify legal documents and enhance legal accessibility. By integrating NLP, LLMs, and RAG, the system delivers accurate and user-friendly legal explanations.

Future work includes:

- Expanding language coverage
- Mobile application development
- Voice-based interaction
- Legal form automation
- Integration with e-court systems
- AI-based case outcome prediction

NyayaSathi contributes toward building inclusive digital justice infrastructure.



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