International Journal of
AI ELECTRICAL CIVIL AND MECHANICAL ENGINEERING
Peer Reviewed, Referred & Indexed Journal
ISSN: 3070-0434 www.zesterapublications.com Original Research Paper

AI-Based Legal Document Summarizer and Law Advisor

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ABSTRACT

The rapid growth of digital transformation has resulted in the generation of a large number of legal documents such as contracts, agreements, court notices, property documents, policies, and legal reports. These documents often contain complex legal terminology, lengthy descriptions, and technical language, making them difficult for ordinary users to understand without professional legal assistance. Manually reviewing and interpreting such documents requires significant time, effort, and expert knowledge, which creates challenges for individuals and organizations that need quick access to legal information. This project proposes an **AI-Based Legal Document Summarizer and Law Advisor**, an intelligent system that utilizes Artificial Intelligence (AI), Natural Language Processing (NLP), Machine Learning, and Large Language Models (LLMs) to automatically analyze legal documents and provide simplified summaries along with basic legal guidance. The proposed system processes uploaded legal documents by performing text extraction, preprocessing, semantic analysis, and information extraction to identify important clauses, obligations, rights, and key points. Advanced NLP models such as Transformer-based architectures are used to understand the context of legal language and generate meaningful summaries while preserving the original intent of the document. Additionally, the AI-based law advisor module enables users to interact with the system through natural language queries and provides understandable explanations of legal terms, document contents, and general legal information. The system aims to reduce the complexity of legal documents, minimize manual analysis time, improve accessibility to legal knowledge, and assist users in making informed decisions. By combining automated document summarization with intelligent legal assistance, the proposed approach provides an efficient, user-friendly, and scalable solution for modern legal information management while supporting legal professionals and individuals in understanding complex legal content.

Keywords: Artificial Intelligence, Legal Document Summarization, Natural Language Processing, Machine Learning, Large Language Models, Legal AI, Transformer Models, BERT, Text Analysis, Information Extraction, Question Answering, Deep Learning, Legal Assistance, Document Understanding, Intelligent Systems.

I. INTRODUCTION

The legal domain generates and manages a massive amount of textual information in the form of contracts, agreements, court judgments, legal notices, government regulations, privacy policies, and other official documents. These legal documents contain important information related to rights,

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responsibilities, conditions, and obligations; however, they are often written using complex legal terminology and lengthy structures that make them difficult for common users to understand. Reading and analyzing such documents manually requires considerable time, legal expertise, and effort, especially when dealing with large volumes of documents. As the amount of digital legal information continues to increase, there is a growing need for intelligent systems that can automatically process, analyze, and simplify legal content.

Traditional legal document analysis mainly depends on lawyers and legal experts who manually review documents to identify important information and provide interpretations. Although expert analysis provides accurate results, it is often time-consuming, expensive, and not easily accessible to everyone. Many individuals face difficulties in understanding legal agreements, contracts, and notices because they lack knowledge of legal language and terminology. Existing digital legal tools mostly rely on keyword searching and predefined rules, which limits their ability to understand the actual meaning and context of legal sentences. These limitations highlight the requirement for an advanced automated system capable of understanding legal text and generating meaningful insights.

Recent advancements in Artificial Intelligence (AI), Natural Language Processing (NLP), and Deep Learning have created new possibilities for automated legal document analysis. AI-based language models can understand human language, identify relationships between words and sentences, extract important information, and generate human-like responses. Transformer-based models such as BERT and other Large Language Models (LLMs) have demonstrated strong performance in tasks including text summarization, question answering, and document understanding. These technologies can be effectively applied to the legal field to develop intelligent systems that assist users in interpreting complex legal documents.

The proposed **AI-Based Legal Document Summarizer and Law Advisor** aims to develop an intelligent framework that automatically analyzes legal documents and provides simplified summaries along with basic legal guidance. The system accepts legal documents as input, performs preprocessing operations such as text extraction, cleaning, and normalization, and applies advanced NLP techniques to understand the content. The summarization module identifies key sections, important clauses, obligations, and essential information to generate concise summaries while maintaining the original meaning of the document. The law advisor module enables users to interact with the system by asking legal-related questions and receiving understandable explanations based on the analyzed document.

The main objective of this project is to make legal information more accessible, reduce the complexity of legal documents, and assist users in quickly understanding important legal content. The proposed AI-based solution helps save time, improves efficiency, and provides a user-friendly approach for accessing legal knowledge. Although the system can provide general legal information and document insights, it is designed as an assistance tool to support users and legal professionals rather than replacing professional legal consultation. By integrating AI, NLP, and intelligent question-answering capabilities, this project provides a modern approach toward automated legal document understanding and decision support.

II. LITERATURE SURVEY

1. Title: Legal Document Summarization Using Natural Language Processing Techniques

Author: K. P. Singh and R. Sharma

Abstract:

This research focuses on applying Natural Language Processing (NLP) techniques for automatically summarizing complex legal documents. The authors proposed a text summarization approach that extracts important sentences and key information from

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lengthy legal texts while maintaining the original meaning of the document. The study analyzed different preprocessing techniques such as tokenization, stop-word removal, and feature extraction to improve summarization quality. The research demonstrated that NLP-based summarization methods can significantly reduce the time required for legal document analysis and help users quickly understand important legal information. However, traditional extraction-based approaches have limitations in understanding deeper legal contexts and relationships between different clauses.

2. Title: Automated Legal Text Analysis Using Machine Learning Approaches

Author: A. B. Patel and S. K. Gupta

Abstract:

This paper presents a machine learning-based approach for analyzing legal documents and extracting meaningful information. The authors explored various classification and prediction algorithms to identify patterns in legal texts. The proposed system used document preprocessing, feature extraction, and machine learning models to categorize legal information automatically. The study showed that machine learning techniques can assist legal professionals by reducing manual document review efforts and improving the efficiency of legal information processing. The research highlighted the importance of selecting appropriate features and training data for achieving better accuracy in legal text analysis.

3. Title: Transformer-Based Models for Legal Document Understanding and Summarization

Author: J. Devlin, M. Chang, K. Lee, and K. Toutanova

Abstract:

This research introduced the Bidirectional Encoder Representations from Transformers (BERT) model, which significantly improved natural language understanding tasks. The transformer architecture enables models to understand contextual relationships between words and sentences, making it highly effective for legal document analysis. The study showed that transformer-based models can achieve better performance compared with traditional NLP methods in tasks such as text classification, information extraction, and summarization. This work became the foundation for advanced legal AI applications using pretrained language models.

4. Title: Legal-BERT: The Transformers of Legal Language Understanding

Author: Ilias Chalkidis, Manos Fergadiotis, Prodromos Malakasiotis, Nikolaos Aletras, and Ion Androutsopoulos

Abstract:

This paper introduced Legal-BERT, a domain-specific transformer model designed specifically for understanding legal language. Since legal documents contain specialized terminology and complex sentence structures, general language models may not always provide accurate results. The authors trained Legal-BERT using large collections of legal documents to improve performance in legal text classification and information extraction tasks. The study proved that domain-specific language models provide better understanding of legal content and can support applications such as legal document summarization and legal question answering.

5. Title: Deep Learning-Based Text Summarization Using Sequence-to-Sequence Models

Author: I. Sutskever, O. Vinyals, and Q. V. Le

Abstract:

This research introduced sequence-to-sequence deep learning models for automatic text generation and summarization. The proposed approach uses neural networks to convert long text inputs into shorter meaningful summaries. The model learns the relationship between input and output sequences and generates human-like summaries automatically. This research became an important contribution to modern automatic summarization systems and influenced later developments in AI-based document summarization applications

III. EXISTING SYSTEM

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The existing legal document analysis process mainly depends on manual review performed by lawyers, legal experts, or individuals themselves. In traditional systems, users need to read lengthy legal documents manually to understand important clauses, conditions, and obligations. This process requires significant time, professional knowledge, and experience because legal documents contain complex terminology and formal language that may not be easily understandable to common users. Existing online legal information systems generally provide only static information and keyword-based searching, which limits their ability to understand user queries and provide personalized explanations. Manual legal consultation can also be expensive and may not always be immediately available. Traditional text processing techniques used in some systems mainly rely on keyword matching and rule-based approaches, which fail to understand the deeper meaning and context of legal sentences. These limitations create difficulties in quickly extracting important information from legal documents and providing simple explanations. Therefore, an intelligent AI-based system is required to automate document analysis, generate accurate summaries, and provide interactive legal assistance.

IV. PROPOSED SYSTEM

The proposed system introduces an **AI-Based Legal Document Summarizer and Law Advisor** that uses Artificial Intelligence, Natural Language Processing, and advanced language models to automatically analyze legal documents and provide simplified explanations. The system accepts various legal documents such as agreements, contracts, court notices, and legal reports as input and performs preprocessing operations including text extraction, cleaning, and normalization. After preprocessing, NLP techniques are applied to understand the structure and meaning of the legal content. The summarization module identifies important sections, key clauses, obligations, and essential information from the document and generates a concise summary that is easier for users to understand. The law advisor module uses AI-based question-answering techniques to allow users to ask questions related to the uploaded document or legal concepts. Using transformer-based models and Large Language Models (LLMs), the system provides contextual responses and explains complex legal terms in simple language. The proposed system reduces manual effort, improves accessibility to legal information, saves time, and helps users gain better understanding of legal documents while serving as an assistance tool rather than a replacement for professional legal advice.

V. SYSTEM ARCHITECTURE

The system architecture of the proposed **AI-Based Legal Document Summarizer and Law Advisor** consists of multiple interconnected modules that work together to analyze legal documents, generate simplified summaries, and provide intelligent legal assistance. The architecture is designed to process complex legal information efficiently by combining document processing techniques, Natural Language Processing (NLP), Artificial Intelligence models, and user interaction mechanisms. The overall system begins with the **User Input Module**, where users can upload different types of legal documents such as contracts, agreements, court notices, and legal reports or enter legal-related questions through the application interface. The uploaded documents are then passed to the **Document Processing Module**, which performs essential preprocessing operations such as text extraction, removal of unnecessary characters, sentence segmentation, tokenization, and normalization to convert raw legal documents into a structured format suitable for AI analysis.

After preprocessing, the processed legal text is transferred to the **Natural Language Processing (NLP) Analysis Module**, which focuses on understanding the meaning, context, and structure of legal information. This module identifies important terms, legal entities, clauses, obligations, rights, and relationships between different sections of the document. Advanced NLP techniques are applied to extract meaningful information from complex legal language. The system then utilizes the **AI-Based Summarization Module**, which uses deep learning

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models and transformer-based architectures such as BERT, Legal-BERT, or Large Language Models (LLMs) to generate concise summaries of lengthy legal documents. Instead of displaying the entire document, the summarization module provides users with important points, key clauses, responsibilities, and major conditions in a simple and understandable format.

The next component of the architecture is the **Legal Knowledge and AI Advisor Module**, which provides interactive assistance to users. This module allows users to ask questions related to the uploaded document or general legal concepts using natural language. The AI model analyzes the user's query, understands the context, and generates relevant explanations or responses based on the available legal information. This module works using question-answering techniques, semantic search, and language generation models to provide meaningful guidance. It helps users understand complex legal terminology and provides basic legal information in an easy-to-understand manner.

The **Machine Learning and Deep Learning Model Layer** acts as the intelligence core of the system. It contains trained AI models responsible for text understanding, summarization, classification, and response generation. The models are trained using legal datasets containing different types of legal documents to improve accuracy and contextual understanding. The architecture may include transformer-based models, Natural Language Understanding models, and Large Language Models that are capable of handling complex legal language patterns.

The **Database and Knowledge Storage Module** stores processed documents, extracted information, legal datasets, model outputs, and user interaction history securely. This module helps the system retrieve previously processed information and improve response generation. Finally, the **Output and User Interface Module** presents the generated summary, extracted legal information, and AI-generated responses to the user in a simple and interactive format.

This architecture provides an automated and intelligent solution for understanding legal documents by reducing manual effort, improving accessibility, and enabling faster retrieval of important legal information. The proposed system combines modern AI technologies with legal domain knowledge to create an efficient platform that assists users in understanding complex legal documents while supporting legal professionals in document analysis tasks.

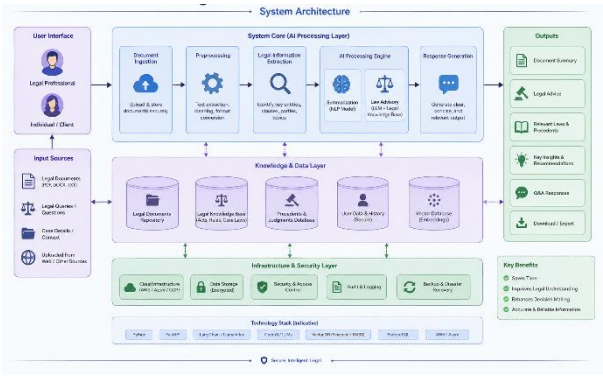


Fig 5.1: System Architecture

VI. IMPLEMENTATION

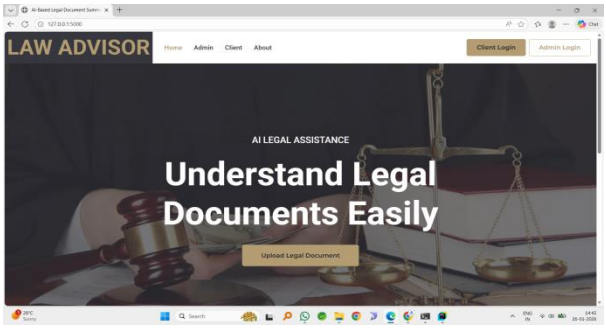


Fig 6.1 Index page

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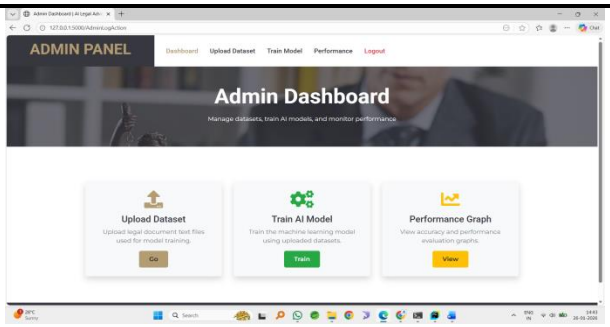


Fig 6.2: Admin home

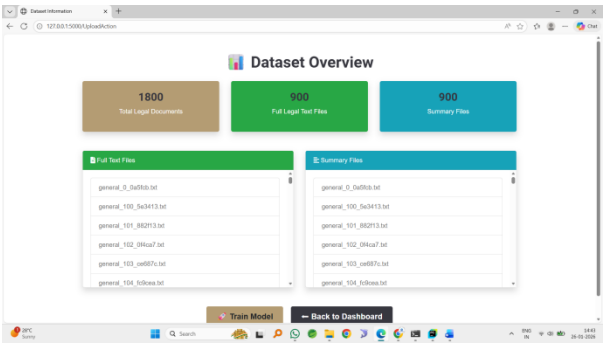


Fig 6.3: Upload dataset

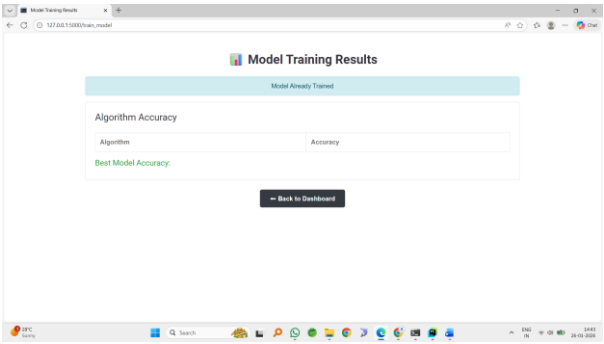


Fig 6.4: Model training

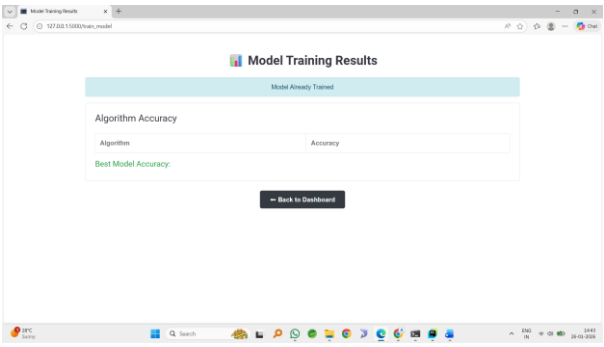


Fig 6.5: Performance

VII. CONCLUSION

The proposed **AI-Based Legal Document Summarizer and Law Advisor** provides an intelligent solution for simplifying and understanding complex legal documents using Artificial Intelligence, Natural Language Processing, and advanced language models. Legal documents often contain lengthy descriptions, complicated terminology, and technical information that require significant time and expertise to analyze manually. The proposed system addresses these challenges by automatically processing legal documents, extracting important information, generating concise summaries, and providing users with understandable explanations through an AI-based advisory module.

The system uses NLP techniques to analyze document structure, identify important clauses, and understand the context of legal content. By integrating transformer-based models and Large Language Models, the proposed approach improves the accuracy of text understanding and enables meaningful interactions between users and the AI system. The summarization module helps users quickly understand the essential points of legal documents, while the law advisor module provides basic legal information and answers user queries in a simple language.

VIII. FUTURE SCOPE

The future scope of the **AI-Based Legal Document Summarizer and Law Advisor** includes several improvements that can enhance the intelligence, accuracy, and practical usability of the system. In the future, advanced Large Language Models and domain-specific legal AI models can be integrated to improve the understanding of complex legal terminology and provide more accurate summaries and responses. The system can be enhanced by training models on larger legal datasets containing different categories of laws, court judgments,

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agreements, and legal cases to improve domain knowledge.

Future versions of the system can include multilingual support, allowing users to analyze and understand legal documents written in different languages. Real-time legal assistance can also be developed by integrating voice-based interaction, enabling users to communicate with the AI advisor through speech. Another possible enhancement is the integration of blockchain technology to improve document security, authenticity verification, and protection of sensitive legal information.

The system can also be extended with advanced features such as automatic contract risk analysis, clause comparison between multiple documents, legal compliance checking, and prediction of possible legal issues. Sentiment analysis and recommendation systems can be added to identify risky terms and suggest improvements in agreements. Additionally, cloud-based deployment can make the system accessible to users from different locations while ensuring scalability and availability.

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ISSN: 3070-0434 www.zesterapublications.com Original
Research Paper

Received: 05-10-2025 | Accepted: 12-11-2025 | Published: 18-11-2025 |