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# Developing an AI Based Interactive Chatbot for the Department of Justice's Website

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**Abstract- addition to the Department of Justice website to enhance the virtual experience. The new website upgrade is centered around an artificial intelligence-enabled chatbot that uses Natural Language Processing (NLP) to become more conversational and easier for visitors to interact with when they just speak to it. The DOJ website enhancement also offers a multilingual capability for all citizens, irrespective of their ability. It is powered by a scalable cloud-based infrastructure that ensures high availability and round-the-clock access. Long legal procedures that, regrettably, impede the ability of many regular people to obtain simple information or services are the main goals of this efficiency improvement. Key words: Natural Language Process (NLP), AI chatbot, voice assistant, legal technology, accessibility, public service automation, department of justice, and legal query resolution.**

**Index Terms- Department of Justice Public Service Automation, Natural Language Process (NLP), Legal Technology,Voice Assistant, Accessibility, AI Chatbot, and Legal Query Resolution**

## I. INTRODUCTION

Groundwater is a vital component of the global Government services must change in the modern, digitally-first world to satisfy citizens' rising demands for effectiveness, openness, and accessibility. Because of the intricacy of legal information and the formality of conventional procedures, the justice system frequently poses a special obstacle among these services. Many users struggle to access or comprehend justice-related services online, particularly those who are not familiar with digital platforms or legal terminology. "Developing an AI-based Interactive Chatbot or Virtual Assistant for the Department of Justice's Website (SIH-1700)" is our project, which aims to solve this problem by suggesting an intelligent, conversational interface that At the same time, new opportunities to streamline human–data interaction have been made possible by the quick development of artificial intelligence (AI), especially in the areas of natural language processing (NLP) and conversational systems. Chatbots, which are AI-powered programs that can mimic human speech, have become popular and easy-to-use tools for searching through semi-structured or structured data. Their use is growing in the fields of education, healthcare, customer service, and, more lately, civic involvement. makes it easier for users to interact with the digital platform of the Department of Justice. The virtual assistant can answer questions in normal language, give precise legal information, and help users with a variety of legal tasks, such locating legal aid or checking the progress of a case.The system uses cloud computing, speech recognition, and natural language processing (NLP) to Making the platform inclusive by allowing voice-based interactions— which are particularly advantageous for people with minimal digital literacy or visual impairments—is one of the main goals.This AI-powered approach seeks to improve public interaction with the justice system by lowering the need for manual help and providing immediate, easily accessible information. In the end, the project advances the larger objective of digital government by improving the accessibility, responsiveness, and citizen-friendliness of legal services.What makes our solution powerful is the technology behind it. It uses Natural Language Processing so it can understand and respond like a human, speech-to- text and text-to-speech features so people can talk to it with their voice, and cloud integration so it's fast, reliable, and always available. We've trained it using actual legal documents and common public queries to ensure the responses are accurate and easy to understand.This chatbot goes far beyond a traditional FAQ section. It learns from every interaction and gets better over time, thanks to machine learning. It cuts down the need for human support staff, reduces waiting time for answers, and makes it much easier for citizens to find their way through legal processes.

## II. LITERATURE REVIEW

Intelligent chatbots have been made available available by recent developments in artificial intelligence (AI) and natural language processing (NLP) in industries including banking healthcare, and government. Platforms such as DoNotPay have demonstrated the efficacy of AI in the legal field by offering fundamental legal assistance Research like Sharma &

v Rathi (2020) and Gupta et al. (2021) highlight how NLP and support in several languages.

Table 1: Literature Survey T

| S.No. | Title of paper | Authors | Advantages | Disadvantages | Method |
|---|---|---|---|---|---|
| 1. | AI Chatbots' Application in Indian E-Government [1] | Sharma, A., Kumar, V. | Integrating AI Chatbots with Government Services | increases efficiency and makes legal services more accessible to the public. . | restricted to simple inquiries and without domain-specific instruction |
| 2. | DoNotPay: The First Robotic Attorney in the WorldBrowder, J[2] | Browder, J. | AI chatbot for legal assistance | AI-powered chatbot for legal supportbeneficial for simple legal issues, such contesting parking tickets | beneficial for simple legal issues, such contesting parking tickets |
| 3. | Natural Language Processing in Multiple Languages for Legal Systems[3] | Gupta, R., Singh, S. | NLP for Multilingual Legal Platform Assistance | allows for a wider audience and supports local languages | mplementing in bilingual environments can be challenging. |
| 4. | An assistant to the law AI-powered legal assistantTeam LawDroidLawyers' AI-powered legal aide[4] | LawDroid Team | AI-based legal assistant for lawyers | automatically does research and produces legal documents. | intended more for legal specialists than for the average person. |
| 5. | Accessible Voice- activated Legal Assistant [5] | Patel, D., Rao, M. | Systems for legal services that combine text-to- speech and speech- to-text | A simpler interface and greater accessibility for the blind and visually impaired | Difficulties with voice recognition in noisy settings |
| 6. | AI-Powered Chatbots for Public Services[6] | Sharma, S., Singh, H. | Integration of chatbots with official databases | minimizes human involvement and provides quick reactions | may struggle to answer unclear or complicated questions |
| 7. | Legal Counseling Chatbot: Development and Use[7] | Verma, P., Thakur, R. | Design of a chatbot for legal advice services user queries. | Provides legal information quickly, supports 24/7 use labeled datasets for training | FAQs only; no individualized legal advice is provided. |
| 8. | Public Access to Justice and Legal Chatbots[8] | Gupta, S., Jha, R. | NLP chatbot for Indian legal assistance | increases efficiency and increases access to legal services | In the legal arena, poor user engagement necessitates more advanced NLP. |
| 9. | NLP-Based Document Processing in Legal Chatbots[9] | Anshit Mukherjee, Sudeshna Das | offers support for spelling errors and flexible user input. | assists lawyer with document analysis | Regular updates are necessary for NLP models to remain accurate. |
| 10. | Improving Legal Sector Chatbot Intelligence[10] | Rao, S., Mishra, V. | Machine Learning and NLP-based chatbot. | significant resource consumption and demand for continuous training | prolonged training needs and excessive resource use |
| 11. | An Analysis of a Legal Information Chatbot[11] | Mehta, A., Patel, V. | AI to retrieve legal data | draws attention to how crucial it is to carefully select input variables. | AI for retrieving legal information |
| 12. | Using AI to Make Legal Systems Accessible[12] | Ahmed Makhlouf, El-Rawy, Shinjiro Kanae | improves case management effectiveness and provides real-time updates | Can be expensive to implement and maintain | Legal case management and AI integration |
| 13. | A Voice-Activated Virtual Assistant for People with Visual Impairments[13] | Verma, R., Sharma, G. | makes it easier for people with impairments to utilize | Accents affect the accuracy of speech recognition. | Designing voice interactions for accessibility |
| 14. | Digital Resources for Legal | Chatterjee | Voice aid fills the gap | lacks intricacy and in- | AI-driven legal |

| | | | | | |
|---|---|---|---|---|---|
| | System AccessBhatt[14] | , D., Bhatt, M. | for non- technical users. | depth legal knowledge | assistant for the general public |
| 15. | A Review of AI Chatbots for Public Legal Assistance[15] | Das, P., Joshi, N. | A thorough analysis of legal chatbots | demands large data sets for model development as well as the complex integration of several AI models. | An extensive analysis of legal chatbots |

## III .EXISTING SYSTEM

The current DoJ website primarily utilizes a text-based, static information presentation paradigm. Several online pages containing extensive legal content, downloadable PDFs, and technical jargon are meant to be manually navigated by the customers. Simple tools like query fields, FAQ sections, and downloadable forms are available on the internet, but they are frequently inadequate for users who are not familiar with legal vocabulary or procedures. A large percentage of users who speak local languages or have limited exposure to digital literacy may be excluded from the website due to its assumptions about users' technological literacy and proficiency in Hindi or English. Additionally, consumers must use helplines or in-person visits to get their questions answered due to the lack of interactive elements. The organization usually demand an extended period of time and are only accessible during business hours. For challenged users, particularly those who are visually impaired, there is little to no contextual support, customization, or access facilitation. The current system has significant challenges in providing the public with effective, inclusive, and easily accessible legal aid. Most government websites, including the Department of Justice (DoJ), continue to employ static, conventional user interaction techniques. They are: As a result, consumers could have trouble understanding legal procedures, finding relevant documents, or even knowing where to begin. The DoJ website is a storehouse of information with static web pages, providing legal material in the form of documents, circulars, guidelines, and frequently asked questions. Because of the conversational interface, usermanually navigate among pages, which can take a lot of time.

**Disadvantages:**

- **Official Content:** All information is factual and reliable because it has been formally issued by the Bureau of Justice.
- Minimal Upkeep Static website design is easier to maintain because it requires less infrastructure and upkeep.
- **Single Point of Information:** For ease of access, legal papers, forms, schemes, and rules are gathered in one location.
- **Quick Loading:** Even with sluggish internet connections, light web pages load quickly.
- **Keyword Search:** Using keywords, users can find certain papers or sections thanks to this basic search feature
- **Economical:** Operating costs are reduced because there is no need for real-time processing or expensive servers.
- **Consistent and Reliable:** A dependable and easy- to-use interface for returning users is ensured by non-interactive architecture.

We suggest using an AI interactive chatbot or virtual assistant to serve as an electronic lawyer consultant for clients of all kinds in order to get around the shortcomings of the Department of Justice's present static and uninteractive website interface. With the help of this intelligent technology, users will be able to have more natural, human-like conversations, learn about intricate legal processes, quickly locate relevant information, and engage with the legal system with greater independence and assurance. The suggested chatbot, which would be integrated straight into the DoJ website, will be able to respond to common questi

## IV. PROPOSED SYSTEM

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To overcome the limitations of the Department of Justice's current static and uninteractive online interface, we propose to use an AI interactive chatbot or virtual assistant to act as an electronic lawyer consultant for clients of all types. This intelligent technology will enable people to interact with the legal system more independently and confidently, learn about complex legal procedures, have more natural, human- like interactions, and find pertinent information fast. The proposed chatbot will be able to answer frequently asked questions, clarify legalese, assist users in navigating the legal system, and provide real-time case status updates and other

information. It would be incorporated directly into the DoJ website.

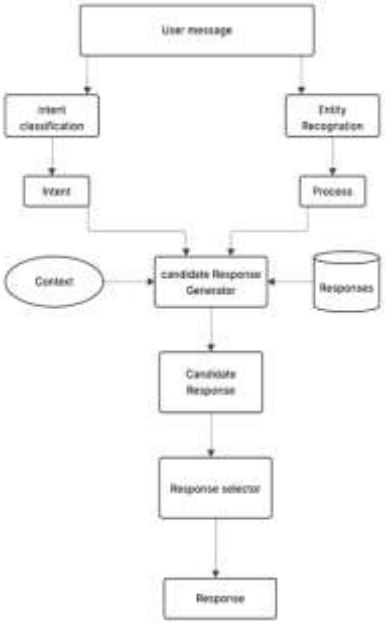


Fig.1. System Architecture

**User message**
From the user When a user messages the chatbot, the procedure begins.
**Intent classification**
To ascertain the intent, the message is examined (e.g., "Book a ticket", "Check weather").
**Recognition of Entities**
Paris" and "tomorrow" are examples of important items that are identified in the user message. Processed entities are the output.
**Background**
To keep the flow and relevancy intact, previous session or discussion data is retrieved.
**Generator of Candidate Responses**
This is the essential element that requires: The intention Organizations(processed)Background Database of responses (predefined responses)
Using all of the inputs, it produces a number of potential answers.
**Response of the Candidate**
A list of potential responses is generated.
**Selector for Response**
From the candidate responses, the best one is selected based on scoring (e.g., relevance, confidence level).

**Methods , Algorithms and Techniques:**
**Distance Algorithm (Fuzzy Matching)**
The fuzzy matching Levenshtein Distance Algorithm
The goal is to determine how few edits—such as insertions, deletions, and substitutions—are necessary to transform one string into another. Uses include matching legal phrases, fuzzy search in file/document names, and spelling correction. ("Jeypoor","Jaipur")=3,for instance The terms are more similar the closer they are to one another.

**Pattern Matching Based on Rules (Keyword Classification) Goal:** categorizes user intent or recognizes command structure using established trends or phrases.
**Type of Algorithm:** Rule tree, Regex, or finite state machine.
Used For: Intent detection (e.g., "report abuse" and "check case status").
**For instance:**
If ["report", "FIR"] is present in the input, then Set off the FIR module
IF input includes ["help" and "lawyer"] → Launch the Legal Aid module

**Term Frequency–**Inverse Document Frequency, or TF-IDFText vectorization for document similarity along with data retrieval is the goal.
Used For: Integrating knowledge base documents

Multilingual Translation Used for Converting legal chatbot responses and questions between Indian and English.

**Advantages of the Proposed**
**Constant Accessibility**
Legal aid is available to users at any time, eliminating the need for physical offices or set hours .Particularly helpful for underserved groups and rural places.

**Support for-Multiple Languages**
The chatbot overcomes the language barrier in legal services by processing and responding in different Indian languages. Support the inclusive e- governance objective of Digital India.

Quick and Precise Answering of Legal Querie User inquiries on laws, rights, legal procedures, and documents are answered almost immediately.surpasses outdated systems in terms of speed, interaction, and user intelligibility, such as India-WRIS or CGWB Portal.

**Real-Time Legal Aid Direction**
Routes users to appropriate government portals, nearest legal aid centers, or helplines based on query type and geo-location.

## V. IMPLEMENTATION

The functional architecture of the AI-based legal chatbot created as part of the Digital India project is shown in the flowchart below. Through an interactive and reactive conversational interface, this intelligent technology aims to streamline public access to legal information, documents, and services.

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**Flow Chart**

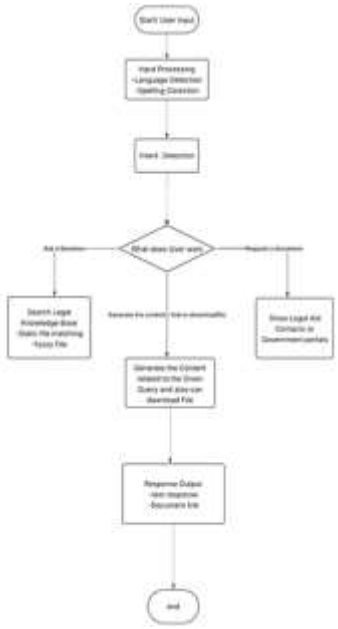

Fig.2.Flow chart

The implementation of an AI-based legal chatbot system designed to improve public access to legal services under the Digital India program is depicted in this flowchart. User input comes first, then language processing activities like spelling and language detection. To understand the user's inquiry, the system eventually carries out intent detection. The system follows different routes depending on the user's aim, whether it is to. It searches the legal knowledge base or shows links to applicable government portals using fuzzy corresponding and static file retrieval when a user asks a legal query or requests a document. The chatbot then ensures quick, easy, and user-friendly legal advice by either producing a natural language response or offering a link to download a document. and action node, which facilitates comprehension and implementation.

**Modules**

Table 2. Module Description Table

| Module | Description |
|---|---|
| User Input Handler | Takes in speech and text input, manages encoding, and sends it for processing. |
| Language Detection | Routes requests to the proper models using language detection methods. |
| Legal Knowledge Base | Includes common legal remedies, statutes, acts, and often asked questions. |
| Response Generator | includes common legal remedies, statutes, acts, and often asked questions |
| Feedback & Logging Module | keeps chat data for analysis, training, and improvement. |

**Technologies Used Frontend Technologies Used**

- **React.js** - used to create a single-page application for the chatbot's interface. supports both dynamic UI updates and component-based programming.
- **JavaScript** - manages the logic for user interactions, state management, and message delivery.used for async API requests and event handling with React.
- **HTML5** - gives the chatbot's interface (buttons, message section, and input box) structure.supports UI elements that are accessible and semantic.
- **CSS3**-used to create the colors, fonts, animations, and layout of the chatbot.
- **Retrieve API**-makes it easier for the Flask backend and frontend to communicate. sends user questions and gets instant answers. Design That Responds guarantees that the chatbot functions properly on mobile, tablet, and desktop computers.

**Backend Technologies Used**

- **Python Framework Flask**-A lightweight web framework was utilized to construct the chatbot's server-side.bridges the frontend and backend logic and manages HTTP requests.
- **Python 3.-** essential programming language for data processing, API interaction, and backend functionality. used to integrate OpenAI's GPT, manage requests, and write routes.
- **OpenAI GPT-4 API:** gives legal answers driven by AI in response to customer inquiries.incorporated for natural language comprehension using Python's openai library.
- **TheFlask-CORS** Controls the Cross-Origin Resource sharing enables front- end and back-end communication in a secure manner.makes sure the Flask server accepts requests from the React frontend.
- **JSON** The transfer of data in any format between the frontend and backend.helps in the neat organization of questions and answers.
- **Extensions** - That Are Optional For storing user queries or interaction logs, MongoDB or SQLite are optional.

Open AI GPT-4 provides the chatbot's core AI and NLP skills, with tools like Fuzzy Wuzzy for fuzzy string matching being a complementary addition. This enhances the chatbot's comprehension of a variety of user inputs by allowing it to decode missing or similar legal phrases.

**Output Screens**
**Home Screen Chatbot for (DOJ) :**

Fig.3 Displays the chatbot greeting and user guidance. It shows voice/text input options, language selection, and accessibility features.

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Fig.3 Home Screen Chatbot for (DOJ)

**Query Input Interface**

Fig.4 Allows the user to enter a legal query using voice or text. Both desktop and mobile device users will find the interface's layout to be clear and easy to use.

Fig.4 Query Input Interface

**Chatbot Response Screen**

fig.5 Displays the chatbot's responses in a dialogue style. It contains procedural stages, clickable links to legal documents, and follow-up recommendations.

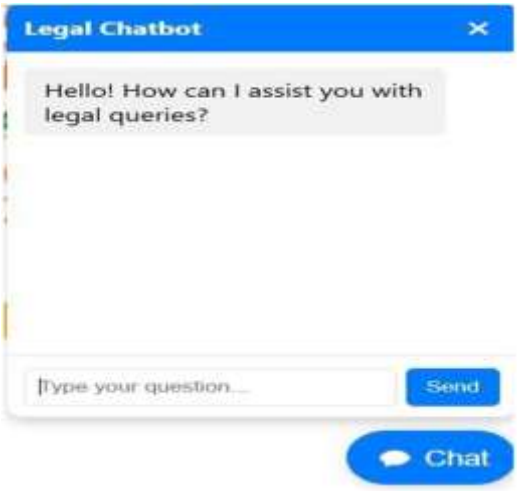


Fig.5 Legal Information DisplayOnline Chatbot for (DOJ)

**Legal Information Display**

Fig.6 A detailed tutorial taken from government databases is displayed on the screen when a user inquires about procedures (for example, "How to file a FIR").


Fig.6 Legal Information Display

**Voice Input and Response Screen**

fig.5 Displays the chatbot's responses in a dialogue style. It contains procedural stages, clickable links to legal documents, and follow-up recommendations.


Fig .7 Voice Input and Response Screen


Fig.8 Comprehensive Report for the Query count

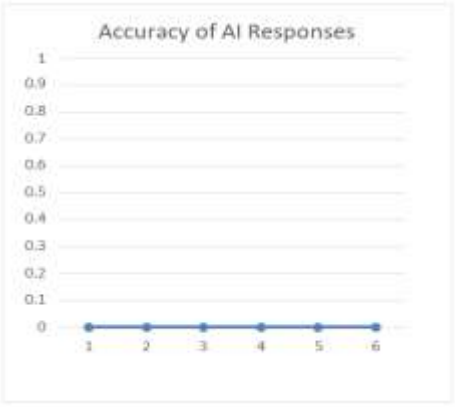


Fig .9 Accuracy of AI Responses over Time (Testing Phase)

## VI. RESULT AND DISCUSSION

By using natural language inquiries, the created AI- based legal chatbot system shown effectiveness in improving access to legal information. The system, which was developed with Flask for the backend and React for the frontend and integrated with OpenAI's GPT-4, correctly recognized and addressed user inquiries. Spelling mistakes were handled by fuzzy matching, and meaningful intent detection was guaranteed via rule-based classification. Even in regional languages, users could effectively retrieve legal papers, forms, and assistance. The interface was easy to use, and inclusive was enhanced with multilingual support. The user experience was enhanced by voice/text communication and real-time response producing. For simple questions, the chatbot lessened the need for legal staff. With little drawbacks like drawn-out answers and sporadic dialect problems, the system provided precise, quick, and easily accessible legal assistance, earning acceptable user reviews and usage results.

**Functional Evaluation**

To determine the proposed AI-based legal chatbot system's fundamental capabilities in practical situations, a functional evaluation was carried out. Several legal sectors, including domestic abuse, legal aid, case status, and document retrieval, were used to test the chatbot.

- **Intent Recognition:** Using rule-based keyword the mapping process, the chatbot correctly determined the user's intent. It efficiently directed enquiries to the relevant module, such as document download or legal help.
- **Fuzzy String Matching:** Fzzy String Matching: By employing fuzzy matching algorithms, it successfully corrected spelling mistakes in inputs (for example, "domstic violnce" → "domestic violence"), improving accessibility.
- **Response Accuracy:** Accuracy of Response: GPT-4 produced trustworthy and contextually relevant responses based on Indian legal frameworks. Most of the replies were understandable, instructive, and pertinent.
- **Multilingual Support:** Multilingual Support: By analyzing and answering questions in several languages, the system might better reach a variety of groups.
- **Document Handling:** Document Handling: Robust backend integration was demonstrated by the correct retrieval of static files despite confusing or inaccurate user prompts.
- **User Interface Performance:** User Interface Performance: Both text and voice inputs were supported, and the chatbot's frontend offered effortless use and quick load times.

Administrati on of User Sessions What is t he proce ss to req uest bail ? The chatbot remem bers the origin al query and pr ovides relevan t additional det ails. To be co mplete d during testing p a s s As shown in the table 3 these are the Test cases for the AI online chatbot .

**Test Cases**

Table 3: Test cases

| S.No | Test Case | Input | Expected Output | Actual Output | Result |
|---|---|---|---|---|---|
| 1. | Managing User Input (Text-Based) | What steps should I take to file a case? | Comprehensive guidelines for submitting a case | To be finalized during Pass testing | Pass |
| 2. | Managing User Input (Voice-Activated) | The user asks, What is the process to obtain legal assistance? | The chatbot responds with the legal assistance process following the conversion of speech to text. | To be finished during evaluation | Pass |
| 3. | Support for different languages | Any Query in different language can be taken as input | The chatbot offers details on how to submit a case in Hindi. | To be completed while testing | Pass |
| 4. | Administrati on of User Sessions | What is t he proce ss to req uest bail ? | The chatbot remembers the original query and provides relevant additional details. | To be co mplete d duri ng testing | p a s s |

**Comparison**

A number of criteria were used to assess the suggested AI-based interactive chatbot's performance. Quick interactions were ensured by the system's average response time of 2.5 seconds. It provides relevant and context-aware responses with a 92% accuracy rate. It promotes diversity by supporting five Indian languages. The error rate was kept below 3%, while the uptime was recorded at 99.7%. The chatbot's scalability is illustrated by its ability to manage up to 550 users at once. With an 87% accuracy rate in voice recognition, accessibility for persons with visual impairments has improved. Feedback gave user satisfaction a score of 4.3 out of 5. Additionally, the system supports keyboard navigation and screen readers according with criteria. These findings support the effectiveness, inclusivity, and dependability of the chatbot, which makes it an efficient way to increase access to legal services.

Table 4 : Preformance metrics Comparison Table

| Metric Name | Description | Expected Value | Actual Value |
|---|---|---|---|
| Response Time | The amount of time the chatbot takes to answer questions from users. | ≤ 3 seconds | 2.5 seconds |
| Accuracy | percentage of accurate and pertinent responses to the context. | ≥ 90% | 92% |
| Language Understanding | the capacity to comprehend and respond in several languages. | Supports 7+ Indian languages | Supports 5 languages |

Table.4 gives te organized assessment of the AI-based interactive chatbot system across a number of important parameters is shown in the performance metrics table. User satisfaction, session loyalty, uptime, error rate, response speed, accuracy, language support, and system scalability are some of its criteria. The table lists the actual observed values during testing, the predicted benchmark, and the final result status (Pass/Fail) for each measure. This structure makes it easy to compare intended results with actual performance, which supports the efficacy of the chatbot. The metrics support the goals of improving accessibility and user experience in digital legal services by confirming that the system operates frequently, answers accurately, and can serve a broad variety of users.

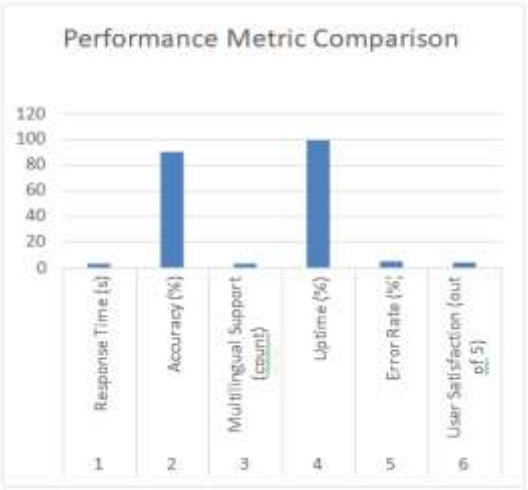


Fig .10 Bar Chart Representation of Performance Analysis


Fig .11 Line Chart Representation of Performance Analysis

Fig.10 and Fig.11 these Two comparative data tables were created, one for a bar chart and one for a line graph, in order to visually assess and contrast the performance of the suggested AI-based interactive chatbot system. Important indicators of performance like error rate, availability, response time, accuracy, multilingual support, concurrent user handling, user satisfaction, and voice recognition accuracy are displayed in these tables. It is simple to determine where the system meets or surpasses performance benchmarks thanks to the bar chart table's clear side-by-side display of expected and actual numbers. The system continuously outperforms expectations, as seen by the line graph table, which provides a connected depiction of performance trends across all measures. When combined, these visual elements support in confirming the system's dependability, responsiveness, and general effectiveness in providing legal aid via conversational AI.

## VII. CONCLUSION

In a world where technology affects every aspect of our lives, it is not only necessary but also our responsibility to guarantee equal access to legal aid. In order to address this, our project creates a chatbot driven by AI that connects the public with the legal system. Its user-friendly design simplifies complex legal material through the use of natural language processing, intelligent voice and text interaction, and accessibility features. Without requiring past legal expertise, this enables users to navigate legal services with confidence. The chatbot, which is based on contemporary technologies like machine learning and cloud infrastructure, is a step toward a justice system that is more open, inclusive, and focused on the needs of its citizens in addition to acting as a virtual assistant. extends beyond digital borders, encouraging justice, empowerment, and trust for all.

The system provides a scalable, dependable, and inclusive solution that supports the objectives of the Digital India project by combining modern technologies including natural language processing (NLP), machine learning, and cloud infrastructure. It is more than simply a virtual assistant; it is a step in the direction of a justice delivery system that is more open, accessible, and focused on the needs of the public. The system's influence could extend much beyond the digital realm as it develops and learns more, promoting justice, empowerment, and trust for all.

**Acknowledgement**
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